National Oceanic and Atmospheric Administration

Information Exchange for Marine Educators

Archive of Educational Programs, Activities, and Websites

H to O

Environmental and Ocean Literacy

Environmental literacy is key to preserving the nation's natural resources for current and future use and enjoyment. An environmentally literate public results in increased stewardship of the natural environment. Many organizations are working to increase the understanding of students, teachers, and the general public about the environment in general, and the oceans and coasts in particular. The following are just some of the large-scale and regional initiatives which seek to provide standards and guidance for our educational efforts and form partnerships to reach broader audiences. (In the interest of brevity, please forgive the abbreviations, the abbreviated lists of collaborators, and the lack of mention of funding institutions). The lists are far from inclusive. Please send additional entries for inclusion in future newsletters.

Background Documents

Developing a Framework for Assessing Environmental Literacy
NAAEE has released *Developing a Framework for Assessing Environmental Literacy*, developed by researchers, educators, and assessment specialists in social studies, science, environmental education, and others. A presentation about the framework and accompanying documents are available on this website.
http://www.naaee.net/framework

Executive Order for the Stewardship of Our Oceans, Coasts, and Great Lakes
President Barak Obama signed an Executive Order establishing the National Ocean Council. The Executive Order established for the first time a comprehensive, integrated national policy for the stewardship of the ocean, our coasts, and Great Lakes, which sets our nation on a path toward comprehensive planning for the preservation and sustainable uses of these bodies of water.
http://www.whitehouse.gov/administration/eop/oceans

Environmental Literacy in America - What 10 Years of NEETF/Roper Research and Related Studies Say About Environmental Literacy in the U.S.
http://www.neetf.org/pubs/index.htm

The U.S. Commission on Ocean Policy devoted a full chapter on promoting lifelong ocean education, *Ocean Stewardship: The Importance of Education and Public*

Awareness. It reviews the current status of ocean education and provides recommendations for strengthening national educational capacity.
http://www.oceancommission.gov/documents/full_color_rpt/08_chapter8.pdf

Environmental and Ocean Literacy and Standards
Mainstreaming Environmental Education – The North American Association for Environmental Education is involved with efforts to make high-quality environmental education part of all education in the United States and has initiated the National Project for Excellence in Environmental Education. Here are some of the products and initiatives:

- *National EE Certification Initiative* - NAAEE and EETAP are collaborating to explore development of a national certification program for environmental educators.
- *NCATE/NAAEE Program Standards for the Initial Preparation of Environmental Educators* – (in development) to be used by NCATE in their accreditation process of college/university teacher education programs across the country.
- *Higher Education Faculty and Program Directory Development* - electronic directory of EE programs and faculty in the college and university setting (with the National Council for the Accreditation of Teacher Education) - on-line in 2006.
- *Resource Review Program* for educational resources
- Guidelines, including *Environmental Education Materials, Nonformal Environmental Education Programs, Preparation and Professional Development of Environmental Educators,* and more.

http://naaee.org/

Science Content and Standards for Ocean Literacy is a product of workshops sponsored by National Geographic, NOAA, COSEE, NMEA, and the College for Exploration. It describes and presents essential principles and fundamental concepts for creating an ocean literate world and aligns them with the National Science Education Standards.
http://www.coexploration.org/oceanliteracy/index.html

Charting the Course for Ocean Science in the United States: The National Science and Technology Council Joint Subcommittee on Ocean Science and Technology is developing *Charting the Course for Ocean Science in the United States: Research Priorities for the Next Decade*, a draft document that outlines the national ocean research priorities for the United States for the next ten years. The document will describe a vision for U.S. ocean science and technology, highlight key areas of interaction of our society and the ocean, and identify critical ocean research priorities.
http://ocean.ceq.gov/about/sup_jsost_orpp_outreach.html

Ocean Literacy
This web site and online survey are the result of a partnership of agencies and institutions concerned with improving ocean literacy. Check out the extensive links under Education Resources, Links, and National & Regional Programs.
http://oceanliteracy.org/ .

Ocean Literacy Educational Materials Available
The National Geographic Office in Santa Barbara has had quantities of the following materials available:

- Ocean Atlas Teacher's Guides

- Oceans for Life Brochures

Contact Sally Ziegler at Sally.Ziegler@noaa.gov for inquiries.

Ocean Literacy Website
The College of Exploration has launched an Ocean Literacy website, with a complete set of scope and sequence charts which can be viewed as web pages or downloaded in a variety of different formats. Visitors can sign up for ocean literacy news, keep up with research, and more.
http://oceanliteracy.wp.coexploration.org/

Collaborations and Networks
American Zoo and Aquarium Association members are providers of animal care, conservation, and public education about wildlife, providing the highest standard of animal care while offering events and activities to help visitors understand how everyone can help keep our oceans and waterways safe.
www.azasweb.com

The Centers for Ocean Sciences Education Excellence is a network of seven regional centers that act locally and regionally, as well as think and act nationally. The goals of COSEE are to promote partnerships between research scientists and educators; to disseminate effective ocean sciences programs; and to promote ocean education to create a more scientifically literate workforce and citizenry.
http://www.cosee.net/

Coastal America's designated Coastal Ecosystem Learning Centers (CELCs) comprise a network of informal education institutions. Federal partners provide CELCs with information, expertise, and research vessel access for community education programs. The CELCs educate and involve the public in protecting our ocean ecosystems and coordinate community action projects.
http://www.coastalamerica.gov

The Environmental Education and Training Partnership is a consortium of leading national EE organizations, delivering environmental education training and support to education professionals for the purpose of increasing public knowledge about environmental issues, and enhancing the critical thinking skills necessary for individuals and their communities to make responsible environmental decisions.
http://eetap.org/

The Federal Task Force on Environmental Education, chaired by the EPA, facilitates communication and collaboration among federal agencies and departments that have common interests in supporting and implementing EE programs with emphasis on supporting joint interagency EE projects that leverage both federal and non-federal dollars.
http://www.epa.gov/enviroed/ftfee.html

The Global Learning and Observations to Benefit the Environment (GLOBE) is a worldwide network of students, teachers, and scientists working together to study and understand the global environment.
http://www.globe.gov/globe_flash.html

National Geographic Oceans for Life Internet Network - this website offers education resources, news, discussion and more on ocean literacy and bringing the ocean into the classroom.
http://www.ngsednet.org/oceans

National Marine Educators Association, affiliated with NSTA and the American Association for the Advancement of Science, brings together those dedicated to teaching and learning about the world of water, providing a focus for marine and aquatic studies world-wide. NMEA members are educators and scientists from K-12 classrooms, colleges and universities, museums, aquariums, research science centers, government agencies, and conservation organizations from 17 regional U.S. chapters and from 13 other countries. NMEA promotes awareness, appreciation, and conservation of our aquatic environment.
http://www.marine-ed.org/

National Oceanic and Atmospheric Administration's mission is to provide science, service, and stewardship to meet the nation's economic, social, and environmental needs. Creating an environmentally literate public is vital to NOAA meeting its mission and supports numerous educational materials and programs for students of all ages.
www.education.noaa.gov

The National Oceanographic Partnership Program is a collaboration of fifteen federal agencies to provide leadership and coordination of national oceanographic research and education initiatives. Since 1997, NOPP has invested $150M to support over 90 research and education projects involving roughly 200 public and private institutions, with comparable in-kind support from the research and education community.
http://www.nopp.org/

The Ocean Project works with its broad network of zoos, aquariums, museums and other conservation-oriented organizations to enhance ocean awareness among the public; change attitudes and behaviors for conservation; increase civic involvement in community conservation activities; and generate regional and national policy-focused action. Using values-based communications strategies and tools, their *Seas the Day* initiative promotes ocean awareness and encourages people to take action.
http://www.theoceanproject.org/

Ocean.US, the National Office for Integrated and Sustained Ocean Observations was created by NOPP to coordinate the development of an integrated ocean observing system, and includes education and outreach.
http://www.ocean.us

The United Nations Decade of Education for Sustainable Development - the overall goal is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning to encourage changes in behavior that allow for a more sustainable and just society for all.
http://portal.unesco.org/education/en/ev.php-URL_ID=27234&URL_DO=DO_TOPIC&URL_SECTION=201.html

Web Portals

The Bridge, supported by Sea Grant and an official partner of COSEE and NMEA, is a clearinghouse for K-12 ocean science education websites. It includes professional

development, lesson plans, ocean science research data, links to aquariums and research institutions, and career information.
http://www.marine-ed.org/bridge

The Digital Library for Earth System Education is an online library of web-based resources at all educational levels for teaching and learning about the Earth as a system. It can be searched by keyword, grade level, resource type, collection, and by national standards, both NSES and National Geography standards.
http://www.dlese.org

EE-Link from NAAEE provides electronic access to environmental education programs, professional development, jobs, events, organizations and other resources.
http://eelink.net/

NASA's OceanLiteracy.Org website is dedicated to helping those interested in the development of a populace knowledgeable about our oceans, to find resources that will assist toward that goal.
http://www.oceanliteracy.org/

The National Science Digital Library is an online library for education and research in science, technology, engineering, and mathematics.
http://nsdl.org/

Regional Initiatives

From Sea to Shining Sea: Priorities for Ocean Policy Reform
A national ocean policy action plan for Congress, *From Sea to Shining Sea: Priorities for Ocean Policy Reform*, developed at the request of a bipartisan group of ten influential Senators, was delivered to Capitol Hill on June 13, 2006. The report calls for Congress to adopt a statement of national ocean policy that acknowledges in legislation the importance of the ocean to the nation's economic and ecological health and establishes a framework for all other ocean legislation.
http://www.jointoceancommission.org/press/press/release0613_assets/seareport.pdf

The Online Guide to Environmental Education in Georgia provides EE lesson plans based on state standards, a searchable database of Georgia's EE organizations and the resources they offer, a statewide calendar of EE events, monthly e-newsletter, and easy-to-access facts about Georgia's environment. A customized web system for seven additional southeastern states is in development.
http://www.EEinGeorgia.org

Minnesota's Environmental Literacy Scope and Sequence provides a systems approach to environmental education in Minnesota for pre-K through adult learners. The SEEK website provides a directory of environmental education resources.
http://www.seek.state.mn.us/eemn_c.cfm

Ocean Revolution is a bilingual, international youth-oriented program designed to connect and inspire a new wave of ocean advocates.
http://www.oceanrevolution.org

Public ocean literacy for southern California - The Aquarium of the Pacific, in partnership with CORE, has begun a project to identify and prototype the best strategies to engage

the public in learning about the ocean through a regional initiative based at the aquarium. Initial workshops have been held with scientists and educators, with the workshop findings to be used to engage the general public through education, exhibitry, and the media. Contact Adam Lau at alau@lbaop.org

Educational Programs H to O

H_2O Conserve

H_2O Conserve is a web-based project that offers tools and information that enable individuals to make water conservation part of their everyday lives. The website includes links to lesson plans, issue sheets, a water use calculator, and more.
http://www.h2oconserve.org/home.php

H2OUSE

This website was developed by the California Urban Water Conservation Council under a cooperative agreement with the EPA. The website offers water-wise resources, including actions you can take around your house to conserve water, an extensive resources links section, water budget calculator, garden lists, and more.
http://www.h2ouse.org/

HAB Monitoring in Whyville

NOAA's National Centers for Coastal Ocean Science (NCCOS) is using a new way to teach kids about using of scientific inquiry to address environmental problems, inside the online virtual learning world "Whyville." Visitors can collect samples from the virtual ocean, use the lab to identify algal species and bloom-causing nutrient, trace the nutrient to its source, and stem the nutrient flow by restoring a virtual wetland. Be sure to check out the virtual reef, also.
http://www.whyville.net/smmk/nice

Habitable Planet

Annenberg Media offers a new video series in environmental science, *The Habitable Planet: A Systems Approach to Environmental Scienc*e. The 13 programs guide viewers through topics including the atmosphere, oceans, and ecosystems, as well as the impact of human activities and population growth on water and food resources, biodiversity, energy use, and global pollution. Each of the programs in the series includes two case studies featuring the work of top scientists in the field.
http://www.learner.org/resources/series209.html

Habitable Planet

Annenberg Media offers this website as an online textbook, in addition to the video series in environmental science, The Habitable Planet: A Systems Approach to Environmental Science. The website offers a multimedia course for high school teachers and adult learners interested in studying environmental science, with access to course content and activities developed by leading scientists and researchers in the field.
http://www.learner.org/channel/courses/envsci/index.html

Habitat Connections
The Fisheries Office of Habitat Conservation has re-launched their quarterly newsletter, *Habitat Connections*. The next three issues will focus on oyster habitat around the nation.
Laura.Walko@noaa.gov

Habitat the Game Enviro App
The Wildlife Conservation Society and Rainforest Alliance have created this app for kids to save virtual endangered species and reduce their carbon footprint while on real-life missions. Designed for players aged 7-12, Habitat encourages care of virtual endangered animals while players earn points by completing real-life missions, like recycling or visiting a park or zoo.
http://www.habitatthegame.com

Habitat Mapping Citizen Science
Scientists aboard Schmidt Ocean Institute's research vessel *Falkor* are looking for volunteers to take part in ocean research. A team of roboticists and scientists in the Timor Sea is collecting copious amount of oceanographic data using a fleet of underwater robots. Lend your eyes and with a few clicks of your mouse, you can help the science team understand and identity our undersea world.
https://squidle.acfr.usyd.edu.au/citizenscience/citizenSOI201503/

Halloween Fun
Check these out for your Halloween celebrations. EEinGeorgia has a listing of different scary creatures – from plants to insects to monsters. The Pinterest webpage offers pictures of the Red-lipped Batfish, Zombie Worm, Bloodybelly Comb Jelly, and many more. The Crowdsource page offers additional names along with some links to videos or other multimedia.
http://www.pinterest.com/coast4u/spooky-ocean-pins/
http://linoit.com/users/BiologyBennett/canvases/Creepy%20Creatures%20Crowdsource
http://eeingeorgia.org/resource/about.aspx?s=14267.0.0.4863

Handbook on Public Participation in International Waters Management
This downloadable draft publication is produced by the International Waters Learning Exchange and Resource Network. The handbook provides an overview of the considerations related to planning public and stakeholder involvement in international waters management and a set of tools for implementing those plans. Each chapter focuses on a specific topic related to participatory water management, and can be used as a reference for that particular issue or process. (Beware: large file).
www.iwlearn.net/abt_iwlearn/events/p2/p2-handbook.en

Handles
The National Park Service offers an updated interpretive resource, *Handles: Helping Visitors to Grasp Resource Meanings, a Survey of Interpretive Techniques*. The downloadable booklet offers a listing and definition of techniques which provide the audience with opportunities to make their own intellectual and emotional connections to resource meanings.
http://www.nps.gov/idp/interp/handlesupdate.pdf

Hands on the Land
Hands on the Land is a network of field classrooms stretching across America from Alaska to Florida and is sponsored by Partners in Resource Education, a collaboration of federal agencies, and other partners. Hands on the Land provides a national network of field classrooms, both inland and coastal, to enhance kindergarten through high school student-learning. The website provides teaching materials, resources for students, educational program information, teacher bulletins and more. FWS has recently doubled the number of Hands on the Land sites, now with 15 sites in seven FWS regions. Check out the educator resources, monitoring, and more.
http://www.handsontheland.org/

Hands-On Oceanography
The Oceanography Society offers Hands-On Oceanography, peer-reviewed activities appropriate for undergraduate and graduate classes in oceanography. The society has also published a supplement to the journal *Oceanography* that provides hands-on activities to teach physical concepts in oceanography. The activities are presented as they were presented to college undergraduates, but may be adapted for middle and high school.
http://www.tos.org/hands-on/index.html

Happenin' Habitats!
The Happenin' Habitats! website has a wealth of resources about the National Wildlife Federation's Schoolyard Habitats® Program. Check out the live electronic field trip on April 13, 2005. The website also includes teacher resources, a forum for information exchange, and information about inclusive instructional techniques for students with disabilities or language barriers.
http://happeninhabitats.pwnet.org/index.php

Harmful Algae
This website from NOAA and the Woods Hole Oceanographic Institution is meant to serve as a comprehensive resource for information about harmful algal blooms (HABs). Links include basic information about HABs, how they affect humans and ecosystems, the latest HAB news, and information about meetings and conferences.
http://www.whoi.edu/redtide/

Harmful Algae Digital Library
The Harmful Algae Digital Library from the National Sea Grant Library contains a collection of downloadable Sea Grant documents arranged by subject area: red tide/PSP, brown tide, ciguatera, killer algae, and Pfiesteria.
http://nsgl.gso.uri.edu/bloom.html

Harmful Algal Bloom Educational Resources
A request for information about a good lab to teach about harmful algal blooms (HAB) received the following responses, with additional options about HAB educational resources culled from the archives of this *Information Exchange* newsletter.

- Bigelow Lab for Ocean Science has an interactive CD-ROM available titled "Phytopia-Discovery of the Marine Ecosystem." Phytopia has three learning modules Phyto Factors, Phyto Files and the Bloom Activation tool. The website also includes many other HAB materials. http://www.bigelow.org/hab/
- The following monograph on brevetoxins can be a good primer for teachers http://ehp.niehs.nih.gov/members/2005/7501/7501.pdf

- The Bridge's April 2002 Data Tip entitled "In Full Bloom" is a classroom activity that uses HAB data from the NOAA Coastal Services Center. To access this activity, go to the Bridge's home page and type in Full Bloom in the search box. The Data Tip will be the first resource to come up. http://www.vims.edu/bridge
- While not all phytoplankton blooms are harmful, teachers can also refer to "When is Dinner Served? Predicting the Spring Phytoplankton Bloom in the Gulf of Maine, through the Earth Exploration Toolbook. http://serc.carleton.edu/eet/index.html
- The Southeast Phytoplankton Monitoring Network provides information and activities. http://www.chbr.noaa.gov/CoastalResearch/SEPMN/index.htm
- NOAA's Discovery Classroom includes an HAB lesson plan. http://www.nos.noaa.gov/education/classroom/07_algal.html

Harmful Algal Blooms
The Education and Outreach Office at NOAA Fisheries/Northwest Fisheries Science Center offers a film and curriculum booklet about the study of harmful algal blooms. The film documents the work of a team of scientists studying the problem of harmful algal blooms on the coast of Washington. Accompanying the film is a curriculum booklet, The Harmful Algal Bloom Hunter's Handbook, with activities and experiments, a cruise journal, phytoplankton identification chart, and more.
http://www.nwfsc.noaa.gov/hab/outreach/education.html

Harmful Algal Species Identification – There's an app for that
A volunteer from the NOAA Phytoplankton Monitoring Network's Texas Master Naturalist group, in collaboration with National Centers for Coastal Ocean Science (NCCOS) scientists, developed an iPhone application to assist marine phytoplankton and harmful algae identification. This "app" includes images from an NCCOS gallery of common phytoplankton and recordings of a staff scientist's pronunciation of each species' name.
http://www.gano.name/shawn/phyto/

Harvesting the River
This cooperative project provides an interactive look into the cultural and economic lives of the people who lived in the central Illinois River region between 1875 and 1950. The website is divided into three sections - Harvesting, Transportation, and History. Visitors can explore how local residents harvested ice, fish, mussels, and waterfowl from the river; while Transportation discusses different kinds of boats, roads, and railroads; and History includes first-hand accounts of life in the region.
http://www.museum.state.il.us/RiverWeb/harvesting/index.html

Have DATA?
Do you have data that tell a great story? Why not use those data to help increase ocean literacy? The Bridge staff works with scientists to translate real coastal and ocean science data into meaningful activities useful to classroom science teachers and informal educators. Bridge Data Analysis Teaching Activities (DATAs) present data in an organized, controlled format, which allows for easier analysis and comprehension, helping students better understand basic scientific concepts and learn about the issues.
http://www.marine-ed.org/bridge

HazNet
The Extension Disaster Education Network (EDEN) is a multi-state effort by Sea Grant Extension Services across the country to reduce the impact of disasters. The Hazard

Education K-12 Programs contain information on public awareness and formal educational programs. The Natural Hazards Theme Team has compiled lists of educational resources, lesson plans, and databases on a variety of coastal hazards including wind, flood, erosion, seismic activity, and more.
http://www.haznet.org/haznet_education.htm

Hawai'i Coral Reef Bibliography
The Hawai'i Coral Reef Initiative Computer Interactive Bibliography is a collaborative project between the Hawai'i Wildlife Fund and AECOS, Inc. This reference data base provides reference listings of surveys, studies, technical reports, and more on subjects ranging from physical oceanography, biology, taxonomy, water quality, ecology, and reef resources for the main Hawaiian Islands.
http://home.hawaii.rr.com/cpie/CoralReefBib.html

Hawaii Coral Reef Initiative YouTube Channel
The Hawaii Coral Reef Initiative has established a YouTube channel of their scientific presentations from project progress and final reports and workshops. Feel free to engage in a dialogue via the YouTube comments.
http://www.youtube.com/hcrirp

Hawaii's Marine Wildlife: Whales, Dolphins, Turtles, and Seals--A Course of Study
This website, based on a curriculum written for Earthtrust and the Hawaii State Department of Education, examines several of Hawaii's endangered and threatened marine species: the Humpback whale, Hawaiian monk seal, green sea turtle, and dolphins. Each section includes biology and natural history, factors affecting populations, protective measures, and suggested activities for teachers using the information provided on the web pages.
http://earthtrust.org/wlcurric/index.html

Hawaii's Outer Kingdom
National Geographic Interactive Edition features *Hawaii's Outer Kingdom*, with an excerpt of the National Geographic article, a brief photo gallery, links to additional websites for more information, and beautiful video and a narrated video clip by the researchers and photographers of the article.
http://www7.nationalgeographic.com/ngm/0510/feature4/index.html

Hazard Education and Awareness Tool
The Hazard Education and Awareness Tool (HEAT) is a website template that uses Google Maps technology, spatial hazard data, and preparedness information to help increase awareness of coastal hazards. NOAA's Pacific Services Center uses HEAT to develop a tsunami information service that provides residents and visitors convenient, online access to interactive evacuation zone maps, along with the education and awareness information needed to be prepared in the event of a tsunami.
http://www.csc.noaa.gov/psc/project_pages/HEAT.html

HD Under H2O
HD under H2O offers high definition underwater video production and stock footage. They are producing short videos for PBS Digital Studios that are available for free online on YouTube. The series combines marine science with the challenges of underwater film making. A new video will be released every other Tuesday.
http://www.youtube.com/user/UnderH2Oshow?feature=watch

Healthy Reefs for Healthy People
Healthy Reefs for Healthy People: A Guide to Indicators of Reef Health and Social Well-being in the Mesoamerican Reef Region is the product of a multi-institutional effort. It is intended to move beyond conventional metrics of biological and ecological health by connecting ecosystem processes with human activity for better management decisions for improved ecosystem health and human well-being in the region.
http://www.healthyreefs.org/

Healthy Rivers: A Water Course
Healthy Rivers: A Water Course was created by the Minnesota Department of Natural Resources. This free, interactive, online water course uses graphics, literary references, and testimonials from experts to help guide readers through the ecology of rivers, the threats facing them, and what can be done about the threats. Suitable for both students and educators, the course offers an overview of stream life and its importance.
http://files.dnr.state.mn.us/assistance/backyard/healthyrivers/course/index.html

Help! It's an HAB!
Help! It's an HAB!, from the Bigelow Laboratory for Ocean Sciences is part of a series of lessons that provide information and materials to teach students about the effects of harmful algal blooms on fish, as well as devising remediation techniques. The website features links to other related lessons and pages as well as a chart of education standards met by these activities by grade level.
http://www.bigelow.org/edhab/help_hab.html

Herpetological Conservation and Biology
The open access journal *Herpetological Conservation and Biology* offers articles about the ecology, life history, conservation, and management of amphibians and reptiles.
http://www.herpconbio.org/

Herpetology of Porto Rico
The classic herpetology publication of Leonhard Stejneger is available for downloading online. This book was published in 1902 and it includes drawings of the species as well as new species descriptions. It's a great resource to compare and contrast with some of the available herpetology web offerings.
http://www.coquipr.com/herppr/

Hidden Depths: Atlas of the Oceans
Explore the oceans through unique photographs from the ocean depths and state-of-the-art maps. Previously unpublished 3D views and images of the oceans will help reveal the amazing structure of the oceans. The impact the ocean has on the land we live is evident from hurricanes, pollution, tsunamis, and sea level rise. Man's history with the sea is also outlined from old sea charts and wrecks to the latest in submersible technology, satellite imagery, and echo sounding. Check out the YouTube overview.
http://uk.youtube.com/watch?v=4SkSI1m-By8

High School Environmental Center Website from EPA
This EPA website helps high school students explore and learn about their environment and ways to protect it. The website helps high school students find reliable environmental information, not just on EPA's website, but through other links as well. It

links to air and water issues, waste and recycling, conservation, health and safety, ecosystems, and community environmental conditions.
www.epa.gov/highschool/

High School Marine Biology Course
COSEE-West has developed a comprehensive Marine Biology course for Grades 9-12, linked to California Biology Standards. The course focuses on marine life and includes lesson plans, labs, activities, games, and web interactives/web quests. The downloadable materials can be adapted by teachers outside California. The course materials have recently been released and your input would be appreciated.
http://www.usc.edu/org/cosee-west/curricula.html#teachmarinebio

High School Teaching Resources
The *Life in the Papahānaumokuākea Marine National Monument* High School Teaching Resources were created to allow teachers to create lessons and units that engage their students in the process of discovery. The lessons were designed so that teachers guide students in the discovery process. Resources include teacher guides, slideshows, lessons, and more. Topics include the reef environment, cultural resources, top predators, and much more.
http://reinat.com/lpmnm/introduction/

High Tides Documentary
The Weather Channel presents *High Tides*, a 30-minute special, part of the cable channel's Forecast Earth series. The documentary covers land subsidence and storm surges along the Louisiana coast, flooding along the Maryland coast after Hurricane Isabel, and the use of air gap and tide station technology in Tampa Bay. It also tracks the historical use of tide predictions and how modern technology provided by NOAA has improved our understanding of tides.

Higher Education Directory
This online higher education directory from NAAEE is meant to be a comprehensive resource to undergraduate and graduate environmental programs at higher education institutions in North America. The directory provides details about institutions, programs, departments, and faculty. Contact NAAEE to make sure your program is included.
http://www.naaee.org/programs-and-initiatives/higher-education-directory/

Highlights from Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals
This report from UNEP and the Convention on Migratory Species aims to raise awareness about the effects of climate change on migratory species. Climate change is regarded as the main cause of loss of biodiversity in the future. The report features case studies that assess impacts of climate change on migratory species, and identifies possible solutions and mitigation measures. Note: if you have trouble opening the report, try accessing it through Internet Explorer.
http://www.cms.int/publications/pdf/CMS_CimateChange.pdf

Hiking Trails in America
The American Hiking Society's report, Hiking Trails in America: Pathways to Prosperity, provides a summary of 50 years of trail legislation and development. It offers a look at the economic impact of trails on local communities, the outdoor industry, and more.
http://atfiles.org/files/pdf/AHS-Hiking-Trails-in-America.pdf

Historical Happenings at Fish & Wildlife
The U.S. Fish and Wildlife Service offers a monthly e-newsletter with notes on cultural resource management in the Fish & Wildlife Service. The newsletter contains news of note, training opportunities, and requests for information.
eugene_marino@fws.gov

Historical Hurricane Tracks
The Historical Hurricane Tracks tool from the NOAA Coastal Services Center is an interactive mapping application that allows you to search and display more than 150 years of historical Atlantic Basin and East-Central Pacific Basin tropical cyclone data. This updated version allows you to query and display data by storm name, location, and even zip code.
http://hurricane.csc.noaa.gov/hurricanes/

Historical Sea Ice Atlas
This website allows users to make comparisons of the extent of sea ice past and present, download data from various collections, and more. Check out the common terms used in sea ice research.
http://seaiceatlas.snap.uaf.edu/

Historical Shoreline Survey Viewer
Discover how your coastline has changed over time. NOAA's Historical Shoreline Survey Viewer links to around 7800 historical shoreline surveys conducted by NOAA and its predecessor organizations, with the earliest dating back to 1841. In addition to overlaying a scanned image of the survey in Google Earth, the viewer provides links to download the original scan, a descriptive report compiled by the survey team, and more.
http://oceanservice.noaa.gov/news/features/feb13/historical-shoreline.html

Historical Reconstruction Article
The research article, "Historical reconstruction reveals recovery in Hawaiian coral reefs," published online in the journal PLoS ONE, concludes that historical changes in human societies and their relationships with coral reef ecosystems can explain whether these ecosystems exhibit patterns of sustainability and resilience or decline and degradation. The article is available for downloading free from the website.
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0025460

Historical USGS Maps
The USGS offers this new online map viewer, allowing visitors to search and browse the USGS collection of historical topographic maps. The maps, over 178,000 of them, date back to 1880, and cover the entire country. Visitors can type or zoom in on a particular place, limit a search to maps of a particular scale or from a particular range of dates, and download them in a variety of formats.
http://ngmdb.usgs.gov/maps/Topoview/

History of Maine Fisheries
The History of Maine Fisheries database contains digitized images of historical records relating to fishing. The collection will be regularly supplemented with additional materials, in order to support environmental and historical research that utilize records of Maine fisheries.
http://www.library.umaine.edu/speccoll/fisheries/

Hitchhikers Guide to Exotic Species
The Massachusetts Institute of Technology Sea Grant Program has produced the Hitchhikers Guide to Exotic Species. The guide contains color photographs and information on several introduced species that can be found along the New England coast, as well as some native species for comparison purposes, and is printed on waterproof paper.
http://massbay.mit.edu/

Hō‘Ailona’s Journal
The University of California, Santa Cruz offers this online Hawaiian monk seal education resource. The website provides information about a young monk seal, Hō‘Ailona, the ongoing research with her, and conservation observations. Follow along on monthly updates, and keep your eyes out for contests and other projects in which kids can participate.
http://www.monkseal.ucsc.edu/KP2/Home.html

Hofstra University Marine Lab Handbooks
St. Ann, Jamaica-based Hofstra University Marine Lab has developed an array of handbooks available free upon request. The handbooks vary in length and complexity, and have been written to help with lectures, field trips, student projects, and tourist activities.
http://people.hofstra.edu/faculty/john_f_morrissey/HUML/Handbooks.htm .

Hohm Press Family Health Series Books
Hohm Press publishes books that promote self-awareness, the recognition of interdependence, and compassion. *We Like to Nurse Too* uses simple text illustrations of sea mammals feeding their babies. It is a children’s picture book in their Family Health Series which focuses on our kinship with all mammals. You might also check out We Like to Live Green. The books are available in English and Spanish, and free samples are available.
http://www.familyhealthseries.com/

Hohonu Moana: Exploring Deep Waters off Hawai‘i
The NOAA Ship Okeanos Explorer Expedition - Hohonu Moana: Exploring Deep Waters Off Hawaii 2015, July 10-September 30, 2015 will conduct mapping and ROV operations in the deep waters of the Hawaiian Archipelago. The Campaign to Address Pacific monument Science, Technology, and Ocean NEeds (CAPSTONE), will collect baseline information to support science and management needs within and around the U.S. Marine National Monuments and other protected places in the Pacific Ocean.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1504/welcome.html

Hokule’a Worldwide Voyage
Follow along with the Polynesian Voyaging Society’s canoes Hokūle‘a and Hikianalea as they sail from Honolulu, Hawaii to American Samoa. NOAA’s Office of National Marine Sanctuaries is supporting this worldwide voyage, begun May 18, 2014. The Hawaiian voyaging canoes are journeying around the world to learn, create global relationships, and explore how to care for the oceans and earth. Ask the crew a question, track the voyage, check out the learning resources, attend a Google hangout, and more.
http://www.hokulea.com/

Holbrook Global Field Expeditions
Lifelong learners may consider joining one of these international environmental workshops for teachers or field programs for students. In collaboration with state, national and international partnerships, these programs are designed to offer the opportunity to explore topics focused on environmental literacy. The field-based learning seminars travel to Hawaii, Galapagos Islands, and other locations.
http://www.holbrooktravel.com/pages/educationExpeditions/default.aspx

Holding on to the Green Zone
The Bureau of Land Management, in collaboration with the University of Wisconsin-Extension and the USDA Cooperative State Research, Education and Extension Service, offers *Holding on to the Green Zone: A Youth Program for the Study and Stewardship of Community Riparian Areas*. The program engages students in activities to explore and understand the role and importance of riparian areas. A Student Action Guide and a Leader Guide are available for download.
http://www.blm.gov/wo/st/en/res/Education_in_BLM/riparian_module.html

Holding onto the Green Zone Curriculum
Holding onto the Green Zone is an earth science curriculum designed to encourage collaboration between land managers and youth educators/leaders to promote conservation of fragile riparian resources. The curriculum works through the processes of science inquiry and experiential learning. Check out the downloadable Student Action Guide and Leader Guide.
http://www.uwex.edu/erc/youth/riparian.html

Holiday Lighting Cost Calculator
WE Energies from Wisconsin offers this quick and easy holiday lighting cost calculator to help you figure the approximate electricity cost of your icicle lights, inflatable yard art, and more.
http://www.we-energies.com/home/holiday_calculator.htm

Holiday Tips—Environment-Friendly
Eco-friendly tips for the holiday season:
http://www.use-less-stuff.com/ULSDAY/42ways.html
http://www.earth911.org/master.asp?s=misc&a=misc/xmas/holiday.html
http://www.nwf.org/backyardwildlifehabitat/seasonaltips.cfm
http://www.ciwmb.ca.gov/PublicEd/Holidays/NoWaste.htm
http://www.care2.com/channels/solutions/home/343

Homeroom
Homeroom is the official blog of the U.S. Department of Education. The website addresses dozens of issues with multiple posts every week. Posts can be text-based, lean heavily on graphics, and/or include videos about programs, teachers, students, and communities.
http://www.ed.gov/blog/

Hot Science – Cool Talks
The Environmental Science Institute at the University of Texas at Austin hosts Hot Science - Cool Talks as a means for researchers from the University of Texas and other universities to communicate their research to the K-12 educational community and the public. Each lecture includes an Internet broadcast for those who cannot attend, a CD-

ROM that includes the PowerPoint presentation used during the lecture, detailed notes for each slide, links to websites, and additional resources on the subject material.
http://www.esi.utexas.edu/k-12-a-the-community/hot-science-cool-talks

HotChalk's Lesson Plans
HotChalk's LessonPlansPage.com links to over 3,500 free lesson plans. They can be searched by subject, specific topic, and more. Lesson topics include wetlands, 3D models of ocean animals, and more.
http://www.lessonplanspage.com/

How Climate Change May Affect You
Grist offers an interesting list of things that will be negatively influenced by climate change that may not immediately come to mind. It can be used as a jumping off point for students to consider additional effects.
http://grist.org/climate-energy/16-of-your-favorite-things-that-climate-change-is-totally-screwing-up/#.UhOPHYv78TM.twitter

How Do We Explore Education Materials
NOAA's Office of Ocean Exploration and Research offers Volume 2 of the NOAA Ship *Okeanos Explorer* Education Materials Collection - How Do We Explore? This volume targets the exploration strategy of the *Okeanos Explorer* and the technology used in modern ocean exploration, including telepresence, multibeam sonar, water column investigations, and underwater robots. Lessons are aligned with literacy principles.
http://oceanexplorer.noaa.gov/okeanos/edu/collection/hdwe.html

How to Get Free Classroom Supplies
Edutopia offers an article in which educators share tips for stocking up on classroom supplies without reaching into their own wallets.
http://www.edutopia.org/free-school-supplies-fundraising-donation

How-To Guides
The NOAA Coastal Services Center provides many publications and websites that relay information about how to best approach a variety of coastal management issues. Topics include marine boundaries, social sciences, remote sensing, hazards, and coastal issues. Check these out.
http://www.csc.noaa.gov/howtoguides.html

How Hurricanes Affect Wildlife and What Happens Underwater
The National Wildlife Federation's Wildlife Promise blog posted Seven Things to Know About How Hurricanes Affect Wildlife after Hurricane Irene – a quick review including wind dislocation, dune and beach loss, saltwater intrusion, and more. University of Miami's Rosenstiel School of Marine & Atmospheric Science blog posted What Happens Underwater During a Hurricane with information about effects on ocean properties. Teachers can use these as introductions to more in-depth inquiry.
http://www.rsmas.miami.edu/blog/2012/10/22/what-happens-underwater-during-a-hurricane/
http://blog.nwf.org/2011/08/seven-thngs-to-know-about-how-hurricanes-affect-wildlife/

How Much Is an Ecosystem Worth?
This lesson from the American Institute of Biological Sciences engages students in critical thinking about the value of ecosystems. Students assess ecosystem services,

consider the benefits of biomonitors, explore ecosystem databases, brainstorm what if scenarios, and more. The lesson is part of Ecosystem Services: A Primer, by the Ecological Society of America.
http://actionbioscience.org/environment/esa.html

How to Smile
Howtosmile.org, from the University of California, Berkeley's Lawrence Hall of Science, is an online collection of hands-on interactive science and math activities dedicated to making learning exciting and engaging. The website is funded by the National Science Foundation as part of the National Science Digital Library (NSDL), and brings together a consortium of science museums across the country to empower educators working with school-aged children in science, mathematics, engineering, and technology.
http://www.howtosmile.org/

How Stuff Works
HowStuffWorks offers easy-to-understand answers and explanations of how the world works. The website hosts Quizzes, Shows, Videos, and more. Categories include Environmental Science, Forces of Nature, Culture, and more. Oceanography (under Environmental Science/Earth Science) offers information about hydrology, desalination, rip currents, and more, while Forces of Nature explores Climate & Weather and Natural Disasters.
http://science.howstuffworks.com/

How to Talk to Fish
Digg reveals some secrets of fish communication, along with original animations and a rap video.
http://digg.com/2014/how-to-talk-to-fish

How to Turn Project-Learning Setbacks to Your Advantage
Edutopia offers resources to help make education meaningful. This guide offers tips about negotiating the uncertainty of a project-oriented curriculum and turning setbacks to advantages. Check out the related links to the right of the page for more advice.
http://www.edutopia.org/project-learning-curriculum-development-advice

How We Know What We Know About Our Changing Climate
Authors Lynne Cherry and Gary Braasch have released *How We Know What We Know About Our Changing Climate*, a new book for middle school-age children that explains climate science. The book presents scientific and photographic evidence gathered by scientists around the world. A preview of the book is available on the website. A teacher's guide is available for the book.
http://www.dawnpub.com/shopping_cart/INDEX.CFM?ProductID=135&do=detail

How is Your MPA Doing?
NOAA, the World Commission on Protected Areas, and the World Wildlife Fund have published four case studies that test the MPA management effectiveness guidebook, *How is Your MPA Doing?* Check out how the Miramare Natural Marine Reserve in Trieste, Italy, fared with their evaluation at
http://mpa.gov/mpaservices/library/notables.html .

> Contantini, Marco, Maurizio Spoto, Gonzalo Cid. (2003) Miramare: a demonstration case: application of the WCPA-Marine/WWF Guidebook on Evaluating Effective Management in MPAs.

Hudson River Lesson Plans
The Hudson River Estuary Program and New York Sea Grant offer place-based and interdisciplinary lessons that use the river as context. Topics cover climate change, English Language Arts, Social Studies, and much more.
http://www.dec.ny.gov/education/25386.html
http://www.seagrant.sunysb.edu/articles/t/hudson-river-estuary-climate-change-lesson-project-hudson-river-estuary-news

Human Dimensions Website
HD.gov is a dynamic interagency portal that provides information and tools related to the human dimensions of natural resource management. The website encourages users to share projects and resources by contributing site content and participating in forums. The front page offers a dynamic calendar of events; job, grant and training opportunities; and links to frequently asked questions. Major subdivisions include methods, tools, data, publications, case studies, laws and policies, and issues and topics.
http://www.hd.gov/HDdotGov/

Human Dimension Wheel
The Coastal Services Center has created an educational tool called the "Human Dimension Wheel." It provides information about many of the social science tools used to address coastal resource management issues. It's a good way to introduce your students to the benefits of understanding the human dimensions of resource management.
http://ekman.csc.noaa.gov/socialscience_2/wheel.jsp

Human Toll of Climate Change
The Center for American Progress has created an interactive map on the human toll of climate change. Compiled from multiple sources, the map provides scientific information on a variety of climate change threats and plots the information geographically to show areas of concern. Contributions of scientific research to the database are invited.
http://maps.scienceprogress.org/climate/index.php

Humpback Whale Awareness Month and Whale Count – Hawai'i
February is Humpback Whale Awareness Month in Hawai'i, an effort that includes distributing information to libraries throughout the state, lunchtime whale watches, a lecture series, and other events. Because whale population numbers are still relatively unknown, Hawaiian Islands Humpback Whale National Marine Sanctuary, the University of Hawaii's Marine Option Program, and the Kaho'olawe Island Reserve Commission engage the community in an annual census count.
http://hawaiihumpbackwhale.noaa.gov/

Humpback Whale Educational Materials
The Hawaiian Islands Humpback Whale National Marine Sanctuary website offers a variety of downloadable educational materials, including brochures, fact sheets, activity books, and more.
http://hawaiihumpbackwhale.noaa.gov/documents/education.html

Humpback Whale Migration Game
Humpback whales are found in the oceans worldwide. They hold the record for the longest migration among mammals. Play the interactive Migration Game to find out more about humpback whales and how you can help protect them.
http://sanctuaries.noaa.gov/whales/main_page.html

The Hunt for Lake Huron's Lost Ships
NOAA's Office of Ocean Exploration and Research has launched *Thunder Bay 2010: Cutting Edge Technology and the Hunt for Lake Huron's Lost Ships Expedition*. The website offers archives of daily logs, videos and images, an Ocean Explorer Expedition Education Module, lesson plans, and more.
http://oceanexplorer.noaa.gov/explorations/10thunderbay/welcome.html

Huntington Beach School Trips - California
Follow and Learn about the Ocean and Wetlands, FLOW, is an educational program located in Huntington Beach, California. School groups can schedule a tour where students can shadow and assist with monitoring activities and learn about methods, techniques, and equipment used to collect and analyze plankton. Teachers receive lesson plans, activities, and more. Free bus transportation for Title I schools may be available.
http://www.amigosdebolsachica.org/flow.html

Hurricane Development
Climate.gov offers a review of the reasons for a calm 2013 hurricane season, and factors that go into hurricane development for the United States.
http://www.climate.gov/news-features/featured-images/what-happened-last-year%E2%80%99s-atlantic-hurricane-season

Hurricane Digital Memory Bank
Hurricane Digital Memory Bank: Preserving the Stories of Katrina, Rita, and Wilma
The project has collected first-hand accounts of these hurricanes, along with archives of blog postings, podcasts, and on-the scene visual documentation. From the homepage, visitors can browse an interactive map of images submitted to the archive and also add their own materials to the existing archive. The site includes personal stories submitted by those who experienced the effects of the hurricanes.
http://hurricanearchive.org/

Hurricane Information for Educators
Following both Hurricanes Katrina and Rita, teachers around the country are helping students understand hurricanes. Many education websites have been set up to provide teachers with the background information and educational materials needed. The following were gathered from a variety of listservs.

- Resources from the National Science Teachers Association (NSTA)
  - Severe Weather SciGuide: http://sciguides.nsta.org
  - NSTA's SciLinks
    - Grades K-4, Storms: http://www.scilinks.org/retrieve_outside.asp?sl=566356104410551033

        - Grades 5-8, Hurricanes: http://www.scilinks.org/retrieve_outside.asp?sl=4735895674333355$741922112222$55557766
        - Grades 9-12
          Hurricane Fundamentals: http://www.scilinks.org/retrieve_outside.asp?sl=818144108888
          Hurricane Preparation: http://www.scilinks.org/retrieve_outside.asp?sl=818144109910
        - NSTA's Katrina Job Bank to help teachers forced to leave their communities. http://careers.nsta.org/katrina.asp
    - NSTA's relief efforts and new programs: http://www.nsta.org/katrina
- EE in Georgia – Hurricane Teaching Resources and Service Learning Opportunities: http://eeingeorgia.org/net/content/item.aspx?s=33997.5356.68.4863
- ED.gov Hurricane Help for Schools, for schools serving displaced students http://www.hurricanehelpforschools.gov/
- Association of State Floodplain Managers white paper on rebuilding the Gulf Coast after Hurricane Katrina: http://www.Floods.org/PDF/ASFPM_HurricaneKatrina_WhitePaper_090905.pdf
- Incident News, with information about spill response actions: http://www.incidentnews.gov/
- Environmental Literacy Council http://www.enviroliteracy.org/article.php/258.html
- Forming Hurricanes poster (see educational resources, below)

Hurricane Portal
Hurricanes: The Greatest Storms on Earth
NASA offers these websites with background information, data, images, and weblinks about hurricane formation, anatomy, climatology and more. The Hurricane web portal is designed for viewing and studying hurricanes with a variety of measurements from satellite-based NASA instruments.
http://disc.gsfc.nasa.gov/hurricane/index.shtml
http://earthobservatory.nasa.gov/Library/Hurricanes/

Hurricane Preparedness
The goal of the Hurricane Preparedness website is to inform the public about hurricane hazards and provide knowledge which can be used to take action. This information can be used to save lives at work, home, while on the road, or on the water. The site includes information about storm surge, high winds, tornadoes, flooding, and more. It offers information about how individuals and families can better prepare for possible disasters.
http://www.nhc.noaa.gov/HAW2/english/intro.shtml

Hurricane Preparedness Websites
NOAA teams up with the Gulf of Mexico Alliance and the Environmental Protection Agency to offer two websites to bolster gulf readiness for the 2010 hurricane season. StormSmart Coasts assists in identifying what can be done before, during, and after a storm to enhance community resilience. The sister website, StormSmart Connect, provides a venue for real-time collaboration, allowing users to share documents and expertise.
http://stormsmartcoasts.org/

http://stormsmartconnect.org/

HURRICANE RESOURCES

The following resources were excerpted from the newsletter archives and may provide pertinent background information, research explorations, and classroom lessons about hurricanes and their impact on society.

Barrier Islands: To Build or Not to Build?
This Internet WebQuest Science website offers a task for students along with research resources and a teacher page. Students are tasked with developing an educated opinion as to whether or not people should build permanent structures on barrier islands. They learn about the geological and physical nature of barrier islands, and how barrier islands change over time.
http://www.glencoe.com/sec/science/webquest/content/barrierisland.shtml

Coastal Growth Related Publications
South Carolina Sea Grant offers links to many documents related to coastal growth, including land use, economic development, recreation and tourism, and more.
http://www.scseagrant.org/content/?cid=156

CoSEE SouthEast Barrier Islands and Estuaries
CoSEE SouthEast offers links to barrier islands and estuaries lessons, activities, and educational resources.
http://www.cosee-se.org/ForEducators/EducatorResources/barrierislandsandestuaries/

Estuaries 101 Curriculum
Estuaries 101 curriculum modules from NOAA's National Estuarine Research Reserve System feature hands-on learning, experiments, field-based activities, and data explorations. Each module tells the estuary story through one of three domains - earth, life, or physical science.
http://estuaries.noaa.gov/Teachers/Home.aspx

Exploring the Environment – Hurricanes and More
The Exploring the Environment online series was developed at the NASA Classroom of the Future™ at Wheeling Jesuit University. The problems and activities in the modules ask students to address human activities and their impacts upon the environment.
The Severe Weather: Hurricanes! module is geared to students in grades 5-12. Other modules include water quality, global temperatures, and more.
http://ete.cet.edu/modules/modules.html

Folly Beach Educator's Guide
This website, from COASTeam at the Lowcountry Hall of Science and Math in South Carolina, is designed to offer basic information on South Carolina's barrier islands. The site contains introductory images, animation of coastal processes, and beach activities.
http://oceanica.cofc.edu/An%20Educator%27sl%20Guide%20to%20Folly%20Beach/guide/default.htm

Historical Hurricane Tracks
The Historical Hurricane Tracks tool from the NOAA Coastal Services Center is an interactive mapping application that allows you to search and display more than 150

years of historical Atlantic Basin and East-Central Pacific Basin tropical cyclone data. This updated version allows you to query and display data by storm name, location, and even zip code.
http://hurricane.csc.noaa.gov/hurricanes/

Hurricane Digital Memory Bank
Hurricane Digital Memory Bank: Preserving the Stories of Katrina, Rita, and Wilma is developed and maintained by George Mason University's Center for History and New Media and the University of New Orleans. The project has collected first-hand accounts of these hurricanes, along with archives of blog postings, podcasts, and on-the scene visual documentation. Visitors can browse an interactive map of images submitted to the archive and also add their own materials to the existing archive.
http://hurricanearchive.org/

Hurricane Information for Educators - Miscellaneous

- Resources from the National Science Teachers Association (NSTA)
  Grades K-4, Storms:
  http://www.scilinks.org/retrieve_outside.asp?sl=566356104410551033
  Grades 5-8, Hurricanes:
  http://www.scilinks.org/retrieve_outside.asp?sl=4735895674333355$741922112222$55557766
- EE in Georgia – Hurricane Teaching Resources and Service Learning Opportunities:
  http://eeingeorgia.org/net/content/item.aspx?s=33997.5356.68.4863
- Association of State Floodplain Managers white paper on rebuilding the Gulf Coast after Hurricane Katrina:
  http://www.Floods.org/PDF/ASFPM_HurricaneKatrina_WhitePaper_090905.pdf
- Environmental Literacy Council:
  http://www.enviroliteracy.org/article.php/258.html
- Hurricane Andrew Lessons:
  http://octopus.gma.org/surfing/weather/andyindex.html
- Hurricane Fran Lessons: http://octopus.gma.org/surfing/weather/franindex.html
- National Hurricane Center: http://www.nhc.noaa.gov/

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http://stormsmartcoasts.org/

http://stormsmart.org/

Hurricane Resources from the BRIDGE
The destruction from hurricanes raises questions in the classroom regarding hurricane frequency, strength, duration and effects. Teachers can address these questions and examine hurricane data in the following BRIDGE Data Activities:

- Haunted by Hurricanes - Access National Hurricane Center data to examine long-term hurricane patterns and questions regarding the impact of global climate change http://www.vims.edu/bridge/index_archive1004.html
- Hurricanes! - Background information about hurricane formation is featured in this activity, along with introductory hurricane mapping tips http://www.vims.edu/bridge/index_archive0899.html
- Without an Ark - Learn about some of the short-term and long-term effects of storm flooding on selected freshwater and estuarine organisms using data from the U.S. Geological Survey and plot Hurricane Floyd floods http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0403.html

Hurricane Season 2012 in 4.5 Minutes
Thanks to NOAA's Visualization Lab, you can relive the 2012 hurricane season virtually, and briefly, with this timelapse satellite video. The animation shows all of the GOES East satellite imagery from June 1-November 28, 2012. And be sure to check out the other videos on the website.
http://www.youtube.com/user/NOAAVisualizations

Hurricane Webinars
The Hurricanes: Science and Society webinar series introduces a range of hurricane topics including the basics of hurricane science, advances in forecasting hurricanes, preparing for an approaching hurricane, and more. Webinars are archived on the website.
http://www.hurricanescience.org/resources/webinar2012/

Hurricane Webinars for 5th Grade Classes - Online
The Hurricanes: Science and Society team at the University of Rhode Island's Graduate School of Oceanography, in partnership with the National Hurricane Center, will offer hurricane preparedness webinars for 5th grade students in U.S. regions that are impacted by hurricanes. A presentation on region-specific hurricane science and preparedness will be given with interactive questions prompting student responses. Advanced registration is required; see the website for details and registration deadlines.
http://www.hurricanescience.org/resources/nhc5grade/

Hurricanes: Science and Society
The Hurricanes: Science and Society website provides information on the science of hurricanes and their impacts on people, buildings, and the environment. The website offers inquiry-based activities about wind in a hurricane, building a coastal home, and utilizing hurricane imagery.
http://www.hurricanescience.org/

NASA Hurricane Resources
NASA has developed educational tools including posters, visualizations and graphics, and classroom activities on hurricanes.
http://www.nasa.gov/mission_pages/hurricanes/features/hurricane_educ_links.html

The National Hurricane Survival Initiative
A group of organizations, including the National Hurricane Center and the National Emergency Management Association, have banded together to create the National Hurricane Survival Initiative. This website offers information about hurricane preparedness to the general public. The site's materials are also available in Spanish.
http://hurricanesafety.org/

NOAA Hurricane Resources
NOAA's education resources portal is designed to assist educators in accessing the many educational materials offered throughout NOAA from one centralized interface. The Hurricanes resource collection includes multimedia resources, lessons and activities, real world data, background information, and much more.
http://www.education.noaa.gov/Weather_and_Atmosphere/Hurricanes.html

Online Hurricane Tools
The National Ocean Service offers online tools to monitor hurricanes and deliver relevant data before, during, and after a storm. Tools address water levels, observing systems, imagery, and long-term planning.
http://oceanservice.noaa.gov/news/features/sep11/hurricanetools.html

Potential Consequences of Climate Variability and Change
The Gulf of Maine Research Institute website offers materials to teach and learn about aquatic environments. Topics include What Could a Hurricane do to my Home? and includes classroom activities for grades 1-12.
http://octopus.gma.org/climate_change/index.html

The Science of Hurricane Sandy
Scientific American's live blog offers updates on the storm and its aftermath, answers readers' questions, and offers personal observations.
http://blogs.scientificamerican.com/observations/2012/10/29/the-science-of-hurricane-sandy-liveblog/

Teaching and Learning About Hurricanes
The Learning Network blog from Teaching & Learning with the New York Times offers links to many resources about Hurricane Sandy, along with many links to additional hurricane resources.
http://learning.blogs.nytimes.com/2010/09/01/teaching-and-learning-about-hurricanes/

Urban Forest Hurricane Recovery
The Urban Forest Hurricane Recovery website from University of Florida Extension offers disaster preparedness and recovery topics. Chapters include Restoring Trees after a Hurricane, Selecting Coastal Plain Species for Wind Resistance, and much more. The website links to many other resources available through EDIS (Electronic Data Information Source), including a variety of handbooks and guides. Be sure to check out Environment under the Topics tab.
http://edis.ifas.ufl.edu/features/series/hurricanerecovery.html

Virtual Barrier Island
The Bureau of Economic Geology along with the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University Corpus Christi, has developed a 3-D virtual

model of the Gulf of Mexico and Texas coastal environments. The model can be used in the classroom and by the general public to explore how relative sea level change rise, caused by climate change and other causes, may impact the coastal zone. The website offers the downloadable 3-D model, a lesson plan, teacher's introduction, and more.
http://coastal.beg.utexas.edu/thscmp/vbi.htm

Virtual Hurricane Classroom
This collection of resources on hurricanes from the SouthEast U.S. Atlantic Coastal Ocean Observing System (SEACOOS) includes a selection of activities in which students investigate storm surge, learn hurricane terminology, build and use their own weather instruments, and more.
http://seacoos.org/Community%20and%20Classroom/hurricane-classroom

Wetlands and Hurricanes
This instructional guide from the Northwest Center for Sustainable Resources is designed to provide instructors with lecture materials and resources that examine the complex relationship between wetlands and hurricanes, using Hurricane Katrina as a case study. The module describes the vulnerability of the Gulf Coast to damage from hurricanes and the role that wetlands and barrier islands play in coastal protection. Check out the full Wetlands Ecology and Management series.
http://www.ncsr.org/materials/WetlandsandHurricanes.html

What Animals Do Before a Hurricane
Sylvan Dell Books' *Ready, Set... Wait! What Animals Do Before a Hurricane* for the younger student is available for review by pdf, and for downloading through their new iPad app (see above).
http://www.sylvandellpublishing.com/BookPDFs-Previews/ReadySet-Preview.pdf

Hurricane Resources
The destruction from Hurricane Katrina will raise questions in the classroom regarding hurricane frequency, strength, duration and effects. Teachers can address these questions and examine hurricane data in the following BRIDGE Data Activities:

Haunted by Hurricanes: http://www.vims.edu/bridge/index_archive1004.html
Access National Hurricane Center data to examine long-term hurricane patterns and questions regarding the impact of global climate change.

Hurricanes! http://www.vims.edu/bridge/index_archive0899.html
Basic background information about hurricane formation is featured in this activity, along with introductory hurricane mapping tips.

Without an Ark: http://www.vims.edu/bridge/index_archive0403.html
Learn about some of the short-term and long-term effects of storm flooding on selected freshwater and estuarine organisms using data from the U.S. Geological Survey and plot Hurricane Floyd floods.

BRIDGE-recommended resources:

- Forces of Nature: Hurricanes: http://www.nationalgeographic.com/forcesofnature/interactive/index.html?section=h

- Hurricane Andrew Lessons: http://octopus.gma.org/surfing/weather/andyindex.html
- Hurricane Fran Lessons: http://octopus.gma.org/surfing/weather/franindex.html
- National Hurricane Center: http://www.nhc.noaa.gov/

Additional websites with images following Katrina:

- Earth Observatory Newsroom: http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3
- Global Security: http://www.globalsecurity.org/military/facility/new-orleans-imagery.htm
- NOAA's National Geodetic Survey: http://alt.ngs.noaa.gov/katrina

For more hurricane resources visit the Storms section on the BRIDGE Atmosphere page: http://www.vims.edu/bridge/index_climate.html

Hurricane Resources

Annenberg Media offers resources that can help you learn and teach about hurricanes. *The Habitable Planet: A Systems Approach to Environmental Science, Unit 2* describes hurricanes in Section 7 of the online textbook. MIT Professor Kerry Emanuel explains what a hurricane is and how it forms. The weather interactive helps you to understand the forces that influence weather, hurricanes, and other powerful storms. Dr. Emanuel explains what computer models and an energy systems approach can reveal about the behavior of hurricanes, while the last link offers additional information on hurricanes, tracking models, and various resources related to cyclonic storms.
http://www.learner.org/courses/envsci/unit/text.php?unit=2&secNum=0
http://www.learner.org/courses/envsci/scientist/scientist.php?shortname=emanuel
http://www.learner.org/interactives/weather/
http://www.learner.org/workshops/energy/workshop6/icon4.html
http://wind.mit.edu/~emanuel/home.html

Hurricane and Severe Storm Sentinel Educational Video

NASA's Hurricane and Severe Storm Sentinel mission uses NASA's Global Hawk Unmanned Aerial Vehicles to study tropical storms and hurricanes. This video describes the mission; offers a glimpse inside the command centers of both the ground-based pilots and the scientists who analyze satellite images to assist in flight navigation; and more, including information about getting students involved with the program.
http://nasawavelength.org/resource/nw-000-000-003-539/

Hurricane Webinars

The Hurricanes: Science and Society webinar series introduces a range of hurricane topics, including the basics of hurricane science, advances in forecasting hurricanes, preparing for an approaching hurricane, and more. Hurricane researchers discuss their research and answer questions from participants. Past webinars are archived on the website. The next webinar, Hurricane Hazards and Impacts, will be held April 24, 2012.
http://www.hurricanescience.org/resources/webinar2012/

Hurricane Webinars for 5th Grade Classes

The Hurricanes: Science and Society team at the University of Rhode Island's Graduate School of Oceanography in partnership with the National Hurricane Center will offer

hurricane preparedness webinars for 5th grade students in U.S. regions that are impacted by hurricanes. A presentation on region-specific hurricane science and preparedness will be given with interactive questions prompting student responses.
http://www.hurricanescience.org/resources/nhc5grade/

Hurricanes: Science and Society
The University of Rhode Island Graduate School of Oceanography offers Hurricanes: Science and Society. The website provides information on the science of hurricanes, methods of observing hurricanes, modeling and forecasting of hurricanes, how hurricanes impact society, and how people and communities can prepare for and mitigate the impacts of hurricanes. In addition to in-depth science content, the website includes case studies, a historical storm interactive, and more. In addition, there is an updated list of hurricane links for educators. A five-part webinar series will provide participants with an opportunity to listen to top hurricane scientists and will introduce a range of hurricane topics from the basics of hurricane science to advances in forecasting hurricanes to preparing for an approaching hurricane.
http://www.hurricanescience.org/

Hyperbolic Crochet Coral Reef
The Hyperbolic Crochet Coral Reef by the Institute for Figuring and Companions will be on display at the Smithsonian's Natural History Museum in the Sant Ocean Hall October 16, 2010-April 24, 2011. A sea of vibrant colors and fantastic structures, the Hyperbolic Crochet Coral Reef evokes a sense of stewardship of its real-life counterparts through this whimsical and beautiful display.
http://www.mnh.si.edu/exhibits/hreef/index.html

HyperStat Online
The HyperStat Online website contains an online introductory statistics textbook complete with sections on normal distributions, confidence intervals, prediction, and the logic of hypothesis testing. Visitors to this site can learn basic concepts of statistics, presented in a fashion that is both lucid and jargon-free. The website includes a number of external links to related resources, including a visual statistics site and a statistics "primer."
http://davidmlane.com/hyperstat/

I am Dolphin App
A team of neuroscientists and programmers studied the movements of dolphins at the National Aquarium in Baltimore in order to make the dolphin simulation video game, I am Dolphin.
https://itunes.apple.com/us/app/i-am-dolphin/id903959279?mt=8

I Love Sharks.org
A group of sixth grade students in California took the QuikSCience Challenge and formed a leadership team on shark preservation. This website offers middle school science lessons on sharks and materials for students and teachers, including shark labs, persuasive letter writing, and more.
http://www.ilovesharks.org/

Ice as Art
Ice can be damaging or deadly, but it can also inadvertently create beautiful and fascinating winter sights. The formation of ice is subject to many different variables, and

the tiniest change in humidity, temperature, or wind speed can create wildly different results. Check these out when you have a few minutes to spare, or want to introduce students to the intersection of art and science.
http://www.boredpanda.com/natural-winter-snow-ice-art/

Ice Planet Earth
Ice Planet Earth is a collaborative project led by the University of New Hampshire to promote understanding of Earth's polar regions and the uniqueness of Earth as an ice and water planet in our solar system. The website has polar fact sheets, resources and activities, a kids' section, and much more.
http://iceplanetearth.org/index.jsp

Ice Resources
April's topic for the Year of the Solar System was ice. This NASA website offers links to classroom and informal activities, multimedia, and more.
http://solarsystem.nasa.gov/yss/display.cfm?Year=2012&Month=4

Ice Stories: Dispatches from Polar Scientists
The Exploratorium celebrates the International Polar Year 2007-2008 by giving cameras to a group of penguin biologists, glaciologists, cosmologists, geologists, and marine scientists working in Antarctica and the Arctic. Visitors can learn about the thoughts and experiences of the scientists working in these two regions. Check out the archived materials, upcoming webcasts, and more.
http://www.exploratorium.edu/poles/index.php

Iced In
The Bridge features Data Activities to supplement curriculum material with timely and seasonal resources. **Iced In** explores the effects of ice in the Great Lakes, and how the United States and Canadian Coast Guards work to predict and react to this natural hazard. The activity also discusses the formation of the Great Lakes and their importance to North American commerce. Students will evaluate and draw conclusions from archived ice data and make comparisons between predicted and observed data.
http://www.marine-ed.org/bridge/index_archive0204.html

ICESCAPE
Karen Romano Young will be joining an Arctic research expedition aboard the Coast Guard Cutter *Healy*. ICESCAPE - Impacts of Climate Change on the Eco-System of the Arctic Pacific Environment is a NASA mission to the air-sea-ice interface in the far north, assessing the conditions and researching climate change impacts. Follow her previous adventures through the website, also.
http://www.karenromanoyoung.com/Pages/OceanScience.html

Ichthyology & Other Slimy Words
The Cabrillo Marine Aquarium, San Pedro, California, offers public classes, marine laboratory workshops, field trips, and voyages for all ages. Their *Ichthyology & Other Slimy Words* workshops allow you to explore the inner and outer workings of sharks and other fish through dissection, fish printing, and more. Two sessions are offered, July 19-23 and August 23-27. They also provide many other programs.
http://www.cabrilloaq.org/education.html .

ICRI IYOR Symposium
The International Coral Reef Initiative will be hosting a symposium on January 25, 2008, showcasing IYOR activities taking place around the world, allowing participants to meet, share, brainstorm, and coordinate their IYOR plans.
http://www.iyor.org/news/

ICRS 11 Proceedings
The International Coral Reef Symposium (ICRS) is held about every four years, and the proceedings have been made available online. The proceedings and contributions from ICRS 11 are now available on the website (search on 11 ICRS).
http://www.reefbase.org/resource_center/publication/icrs.aspx

ICRS 12 Proceedings
The 12th International Coral Reef Symposium was co-hosted by the ARC Centre of Excellence for Coral Reef Studies and James Cook University, July 9-13, 2012 in Cairns, Australia. The website offers a brief Outcomes Report for an overview of the 5-day event, along with proceedings and the book of abstracts, ePosters, and more.
http://www.icrs2012.com/Default.htm

ICRS Proceedings
The International Coral Reef Symposium (ICRS) is held about every four years. With funding from the MacArthur Foundation and the support and permission of the International Society for Reef Studies and the various proceeding publishers, ReefBase has been able to scan and import all individual papers from the proceedings of ICRS 1 to 10, and make these available for downloading from this website.
http://www.reefbase.org/resource_center/publication/icrs.aspx

ICT in Schools: A Handbook for Teachers
ICT in Schools: A Handbook for Teachers or How ICT Can Create New, Open Learning Environments is principally designed for teachers and educators who are currently working with, or would like to know more about, Information and Communication Technologies (ICT) in schools. A major theme in the book concerns how ICT can create new, open learning environments and their instrumental role in shifting the emphasis from a teacher-centered to a learner-centered environment.
http://unesdoc.unesco.org/images/0013/001390/139028e.pdf

ide@s
The Interactive Dialogue With Educators Across the State (ide@s) website offers educator resources that have been aligned to the state education standards and are readily available on the Internet. The website brings together teacher-reviewed and tested lessons, interactive tools, video, and other resources which can be used in the classroom or for curriculum development purposes. The subject list includes environmental education, science, service-learning, and more.
http://www.ideas.wisconsin.edu/

Identification Guide to Marine Organisms of Texas
The Marine Species Identification Project is an interactive web-based collection of photographs and information on marine species found off the Texas coast. The website provides detailed photos and descriptions to aid in the correct identification of individual organisms. The website includes interactive identification keys, a glossary, and more.
http://txmarspecies.tamug.edu/

If Reefs Could Talk
Mark your calendars to watch live broadcasts from Aquarius, the world's only underwater habitat, September 10-26, 2007. The September mission on Aquarius, located in the Florida Keys National Marine Sanctuary, is entitled *If Reefs Could Talk*. In addition to the Internet broadcasts, the mission will include several educational components.
http://oceanslive.org
http://www.uncw.edu/aquarius/

Ig Nobel Prize TED Talk
Marc Abrahams, MC of the Ig Nobel Awards and editor of the Annals of Improbable Research, focuses on research that makes you laugh, and then think. Well worth watching. And be sure to check out the Ig Nobel website.
https://www.youtube.com/watch?v=RA-imyU9je0
http://www.improbable.com/

IGES Classroom Resources
The Institute for Global Environmental Strategies (IGES) works with educators and scientists to develop educational resources for the classroom. Materials include Investigating the Climate System, Discover Earth Classroom Materials, and more.
http://www.strategies.org/education/index.aspx?sub=education&sub2=productdevelopment

Illinois-Indiana Sea Grant Program Resources
The Illinois-Indiana Sea Grant Program combines research, education, and outreach to empower southern Lake Michigan communities to secure a healthy environment and economy. Their education efforts include aquatic invasive species, fish consumption, water quality, and more. Check out the free lesson plans, including The ABCs of PCBs, Nab the Aquatic Invader! and more.
http://www.iisgcp.org/education/topics_education.html

Illinois Natural History Survey
The Illinois Natural History Survey offers on-line field guides to amphibians and reptiles of Illinois with species accounts with photographs, distribution maps, and brief entries on description, habitat, status, and more. The website also links to collections of crustaceans, mollusks, fish, birds, mammals, and more.
http://www.inhs.uiuc.edu/cbd/collections/collections.html

Illustrated Coral Glossary
The Coral Reef Information System (CoRIS) Glossary of Scientific and Technical Terminology contains nearly 3,000 technical terms, with their definitions, explanations, and illustrative materials where appropriate. The glossary contains terms concerned with ecology, biogeography, morphology, mapping, fisheries, oceanography, geosciences, conservation programs, and much more.
http://www.coris.noaa.gov/glossary/welcome.html

Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings
As part of the Technical Preservation Series from the National Park Service, The Guidelines on Sustainability offers guidelines on how to make changes to improve energy efficiency while preserving the character of historic buildings.
http://www.nps.gov/tps/standards/rehabilitation/guidelines/index.htm

Illustrating Fishes Fishinar
This free webinar from REEF, You do WHAT for a living? Illustrating Fishes by Marine Science Illustrator, Val Kells, November 13, 2013, will not show you how to paint your favorite fish. Val will describe the process she goes through to illustrate her books and how she got started and will include behind-the-scenes photos to help teach the finer points of identifying fish and invertebrates underwater. Free registration is required.
http://www.reef.org/resources/fishinars

iLoveSchools.com
iLoveSchools.com is a free matchmaking service for education. School teachers request materials and supplies while school supporters search for a school in need of their gifts of money, new or used goods or other educational supplies. iLoveSchools.com supports any institution that educates children, including pre-schools, home schools and private schools.
http://www.iloveschools.com/index.php .

iMarine
iMarine is an open and collaborative initiative that will establish a data infrastructure to support the ecosystem approach to fisheries management and conservation of marine living resources. Check out AppliFish and other mobile apps and more.
http://www.i-marine.eu/pages/Home.aspx

Immersion Presents: Black Sea 2007
Live video updates from August 18-26, 2007 from the Black Sea will be offered on the Internet and through Internet2, made possible by Immersion Presents in partnership with the Institute for Exploration, the Institute for Archaeological Oceanography, and NOAA's Office of Ocean Exploration. These updates will feature expedition researchers and will chronicle the exploration of two very different shipwrecks in Turkey and the Ukraine.
http://www.immersionpresents.org/

Immersion Presents: Secrets of the Gulf
Starting with live broadcasts March 4-9, 2007, Dr. Robert Ballard and a team of researchers will launch a virtual expedition to the Gulf of Mexico paralleling the actual research expedition. An important theme of the expedition will be connectivity. For the virtual expedition, Immersion Presents will develop an interdisciplinary multimedia curriculum that will include an Adventure Series with hands-on activities exploring the region's geography, geological history, human history, biology, ecology, conservation and careers; Curriculum Extensions to meet the needs of upper elementary and middle school classrooms; interactive content for the website; live broadcasts; and more.
http://www.mysticaquarium.org/index.cgi/1290
http://www.immersionpresents.org/

Immersion Presents through the Internet
The Immersion Presents team is working to provide schools with a viable auditorium quality live broadcast option for sites without access to Internet2. A collaboration between Mystic Aquarium & Institute for Exploration, the University of Rhode Island, and NOAA, they feature live broadcasts from one or more real-world scientific expeditions each year and include hands-on science activities and much more.
http://www.immersionpresents.org/

Impact: Earth!
This website from Purdue shows what would happen if a large meteorite or other object hit the Earth. Set your own parameters and see what would happen.
http://www.purdue.edu/impactearth

Impacts of Coastal and Ocean Tourism - Online
Sponsored by NOAA's National MPA Center and partners, the webinar Lessons Learned: Impacts of Coastal and Ocean Tourism, will be presented by the Executive Director of the Center for Responsible Travel. The free webinar, June 11, 2015, examines some of the problems caused by coastal resort and cruise tourism, as well as efforts by industry to construct and operate coastal and marine tourism in ways that minimize environmental impacts and mitigate and adapt to climate change.
https://attendee.gotowebinar.com/register/6674164588959491842

Impacts of a Warming Arctic: Arctic Climate Impact Assessment
In the Arctic Climate Impact Assessment, an international team of 300 scientists has determined that the Arctic is warming at nearly twice the rate as the rest of the planet. Increasing greenhouse gases from human activities are projected to make it even warmer, according to the four-year scientific study of the region.
http://amap.no/acia/

Implementation and Management of Marine Protected Areas
The December 2005 issue of the journal Conservation Biology provides a special free-content section dedicated to implementation and management strategies for marine protected areas (MPA), with cases drawn from sites worldwide. The special section was based on a symposium on MPAs held at the 2003 SCB Annual Meeting in Duluth, Minnesota, USA. To access the articles, click on the link for the December 2005 issue (Volume 19), then scroll down to the special section.
http://conbio.net/SCB/Publications/ConsBio/Search

Important Bird Areas Americas
The Americas Important Bird Area book provides a concise summary of 2,345 priority sites for biodiversity conservation in 40 national and overseas territory chapters. It may be downloaded from the website.
http://www.birdlife.org/action/science/sites/american_ibas/americas-ibas-downloads.html

Improving Public Speaking Skills
These 10 Helpful Online Resources for Improving Public Speaking Skills have been gathered together by the Graduate School at the University of Notre Dame in an effort to help students overcome stage fright. Visitors will find articles, videos, and podcasts that are designed to educate and, by extension, ameliorate the fear of public speaking.
http://blogs.nd.edu/graduate-school-professional-development/2013/02/12/10-helpful-online-resources-for-improving-public-speaking-skills/

In the Deep Ocean
The Ocean Technology Foundation (OTF) has a new science center exhibit, *In the Deep Ocean.* The exhibit explores the past, present and future of our oceans. Its centerpiece is a 12-foot interactive model of an undersea station called Ocean Base, where people can live for weeks or months at a time. This habitat is one of OTF's long-term goals. Watch for curriculum related to Ocean Base on the website in the future.
http://www.virtualtour.semapp.org .

In Search of the Bottom Dwellers
The Flower Garden Banks National Marine Sanctuary and the National Center for Coastal Ocean Science conducted fish surveys and mapping operations on board NOAA Ship *Nancy Foster* in the sanctuary. You can follow the mission with logs, background information, and more.
http://sanctuaries.noaa.gov/missions/2007nancy_foster/welcome.html

In Search of the Lost Whaling Fleets
The National Marine Sanctuaries website offers these web pages detailing stories about whaling fleets lost among the icebergs and icepacks of Alaska's North Slope. Read about the ships, their stories, and more.
http://sanctuaries.noaa.gov/whalingfleet/welcome.html

In Search of the World's Strongest Corals
Researchers and students will be in American Samoa and the Cook Islands from March 18-April 7, 2012 to find the world's strongest corals. Follow the team at with daily blog updates, photos, and videos from the field.
http://www.stanford.edu/group/microdocs/blogs.html

In-School Field Trips - Florida
Vone Research offers three programs that engage students while teaching science, language arts, social studies, and math. The in-school field trips are the Marine Archaeology Exploration Program, the Marine Ecology Exploration Program, and the Adaptation Ecology Exploration Program. Students become marine archaeologists or ecologists and discover the excitement of Florida, cultural and natural sciences, and archaeology or ecology while researching real artifacts or specimens found in Florida. Contact Kristen Hoss at voneresearch@bellsouth.net

In Search of Giant Squid Curriculum Guide
Compiled by the Smithsonian Institution Traveling Exhibition Service, NOAA's Ocean Exploration Program, and others, this curriculum is geared for 5-8 grade students with special "roadmaps" for older or younger audiences. The guide includes lesson plans, instructive websites, student worksheets, answer keys, and more.
http://www.sites.si.edu/exhibitions/gaint_squid_curriculum_guide.pdf

iNaturalist
iNaturalist is a free app for iPad and iPhone. The app allows users to record and share online what they see in nature, meet other nature lovers, and learn about the natural world. Check out the guides, projects, and more.
http://www.inaturalist.org/

iNaturalist for Echinoderms
iNaturalist is a website that allows users to submit images of the species they encounter along with geographical location and any other information about the observation (time of the day, depth, etc.). The community can discuss and validate the identity of the species observed. The project aims at improving our knowledge of echinoderm species worldwide. While on the website, check out the other web pages, such as Insects of the San Francisco Bay Are, Flora de Mexico, and more.
http://www.inaturalist.org/projects/echinoderms

Independent Generation of Research (IGoR)
IGoR's goal is to help everyone, from science enthusiasts and hobbyists to professionals, do scientific research by providing a platform for people to pool their knowledge and resources. Sections include projects, articles, sparks, and a contact list of scientists who may be able to provide advice or feedback.
http://igor.wikidot.com/

INDEX 2010
Join NOAA's Office of Ocean Exploration and Research online as NOAA ship *Okeanos Explorer* explores one of the most biologically diverse areas of the world's ocean in Indonesia, through the INDEX 2010: Indonesia-USA Deep-Sea Exploration of the Sangihe Talaud Region. Scientists will explore undersea ecosystems, particularly those associated with submarine volcanoes and hydrothermal vents within the 'Coral Triangle Region', the global heart of shallow-water marine biodiversity.
http://oceanexplorer.noaa.gov/okeanos/explorations/10index/welcome.html

Index of NASA Earth Science Portal Stories
The Institute for Global Environmental Strategies develops articles on NASA-sponsored education products and programs in Earth science. All products featured have passed the NASA Earth Science Education Product Review. An archived index of the stories is available on the website. Browse for resources that may be incorporated into the curriculum or used to help introduce a topic to students. *OceanWorld* and *Honey, I Shrunk the Beach* are just two resources of possible interest to this group.
http://www.strategies.org/education/index.aspx?sub=education&sub2=eartharticles

Indicators for the Evaluation of Environmental Education, Interpretation and Information in Protected Areas
This article, featured in *Applied Environmental Education and Communication: An International Journal*, presents a model of evaluation of environmental education, interpretation and information carried out in the protected areas of the Balearic Islands off Spain. The article proposes indicators that can be used to analyze communications activities in protected areas.

> Sureda, Jaume Oliver MIquel Castells Margalida, 2004. Indicators for the evaluation of environmental education, interpretation and information in protected areas. 3, 3: 171-81. Spain

Indigenous Peoples and Marine Protected Areas
The MPA Center's July 2013 issue of MPA Connections focuses on tribal and indigenous peoples and marine protected areas. Articles include Indigenous Cultural Landscapes, the Voyage of the Hōkūleʻa Voyaging Canoe, and more.
http://marineprotectedareas.noaa.gov/pdf/helpful-resources/connections/connections_jul13.pdf

Indonesian Discovery Links from NSTA
The discovery of nearly 100 new species in Indonesia made worldwide headline news this month. The National Geographic News article offers news and photos on this latest discovery, while NSTA's SciLinks online teacher-approved Internet service identifies several grade-specific websites and resources to help you expand your lessons without spending hours searching the web. Note that the online SciLinks sites are normally available to NSTA members only, but are available for a short time for non-members.

- Grades K-4: http://www.scilinks.org/retrieve_outside.asp?sl=638234471421103310661011
- Grades 5-8: http://www.scilinks.org/retrieve_outside.asp?sl=638234471455103310661011
- Grades 9-12: http://www.scilinks.org/retrieve_outside.asp?sl=638234471499103310661011

http://news.nationalgeographic.com/news/2006/02/0207_060207_new_species.html

Infographics
NOAA's National Ocean Service offer this website with downloadable Infographics on a variety of ocean topics, including coral bleaching, marine debris, coastal resilience, and more.
http://oceanservice.noaa.gov/infographics/

Information and Communication Technology Literacy Map
The National Science Teachers Association and the Partnership for 21st Century Skills, have released a Science Information and Communication Technology (ICT) Literacy Map. The guide demonstrates how educators can develop science lessons that combine learning skills such as information and communication skills, with tools such as the Internet and multi–media production tools. It guides K-12 educators through a wide range of learning skill examples, and cites specific student outcome examples.
http://www.21stcenturyskills.org/matrices/default.asp

Information Center for the Environment – Biological Inventory of the World's Protected Areas
The Information Center for the Environment, in cooperation with the United States Man and the Biosphere program, the Man and the Biosphere program of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and others, has produced databases containing documented, taxonomically standardized species inventories of plants and animals reported from the world's protected areas, with separate links for Biosphere Reserves, and another for all Protected Areas reported.
http://www.ice.ucdavis.edu/bioinventory/bioinventory.html

Information Exchange Newsletter Archive
Individual past issues of the *Information Exchange for Marine Educators* e-newsletter are now archived on the MPA Center website. These issues go back to 2004 (the individual documents from 2002-3 were lost in a computer crash). Topical archived information will continue to be posted as well.
http://www.mpa.gov/resources/archives/#infoexchange

Infotopia
Infotopia is an academic search engine designed for students, teachers, and homeschoolers. Created by librarians, it uses a Google custom search to provide access to previously vetted websites selected by librarians, teachers, and educational professionals. Topics include Sci/Tech, images, games, and more. Each topic is subdivided into many others; for example, science topics are further broken down into earth science, biomes, ask an expert resources, and more.
http://www.infotopia.info/

InnoCentive
The InnoCentive Open Innovation community offers problem-solvers the opportunity to earn money while solving some of the toughest problems facing the world today. There are challenges in a wide variety of disciplines, from Business and Entrepreneurship to Engineering and Life Sciences, each with a significant cash award. While there are no current marine-based challenges, the idea of open innovation with cash rewards may be of interest to some on this listserv.
http://www.innocentive.com/

Innovation 20/20 Series
The University of Georgia's School of Education offers the Innovation 20/20 Series to showcase teaching innovations from experts from around the institution. Each talk is about 20 minutes, followed by discussion. Topics include Using Metaphor to Explore Teaching and Learning; Designing and Motivating Students with Google Tools and More; and more.
http://www.coe.uga.edu/itt/2020-2/

Inquiry into Climate Change and Environmental Impacts on Coastal Communities
This report by an Australian House of Representatives committee on climate change spells out policy options available to coastal communities in addressing sea level rise: protect, redesign, rebuild, elevate, relocate, or retreat. The report describes the uncertainties local planning councils will face in deciding which policy would apply best in each circumstance. Individual chapters may be downloaded for convenience.
http://www.aph.gov.au/house/committee/ccwea/coastalzone/report.htm

Inquiry-to-Insight
The Inquiry-to-Insight (I2I) project offers free, interactive digital learning tools relating to climate change and ocean acidification and promotes international collaboration among high school students as they learn about, discuss, and envision solutions to shared environmental challenges.
http://i2i.stanford.edu/

Inside Birding
More from the Cornell Lab of Ornithology: Inside Birding is a new video series designed to provide birders with the information they need to improve their skills and make their experience more rewarding. The video series is made up of four, ten-minute video segments covering bird size and shape, color, behavior, and habitat. This series can serve as a primer for those interested in watching and identifying birds. The videos are a bit choppy for slow connections, but the wait can be worthwhile.
http://www.allaboutbirds.org/NetCommunity/Page.aspx?pid=1270

Inspirational People
Dive Into Your Imagination is a company that creates educational products and activities to educate people of all ages. The website's Kid's Corner showcases both kids and scientists people who are inspirational and motivational. The website also offers information about shooting video and photos, along with other sections.
http://www.diveintoyourimagination.com/kids-corner/

INSPIRE: Chile Margin 2012 Expedition
NOAA's Office of Ocean Exploration and Research offers the International South-East Pacific Investigation of Reducing Environments - INSPIRE: Chile Margin 2012

Expedition website. The website for the expedition, which ran April 20-30, 2012, includes daily logs, videos and images, an Ocean Explorer Expedition Education Module, lesson plans, and more.
http://oceanexplorer.noaa.gov/explorations/12chile/welcome.html

INSPIRE: Chile Margin Expedition
NOAA's Ocean Exploration and Research Program offers students the ability to follow along with the INSPIRE: Chile Margin 2010 Expedition with daily logs, videos and images, lesson plans, and much more. The expedition, February 24-March 17, 2010, is exploring the geologically unique Chile Triple Junction, the only known location on Earth that can co-host every known form of deep-sea chemosynthetic ecosystem: hydrothermal vents, cold seeps, oxygen minimum zones, whale-, wood- and kelp-falls.
http://oceanexplorer.noaa.gov/explorations/10chile/welcome.html

Inspiring Learning Through Video Production
Teachers' Domain offers this easy-to-follow online teacher activity, Inspiring Learning Through Video Production. In this activity, participants experience what it's like to go through the video production process, creating a portfolio to track their experience, and keeping classroom-planning notes to develop a successful video-production activity for their students.
http://www.teachersdomain.org/resource/avd09.pd.tavidprod/

Inspiring Places - Promote your Protected Area
Have images of your protected area displayed on the most viewed pages of IUCN's homepage and in their bi-monthly newsletter.
http://www.iucn.org/about/work/programmes/gpap_home/pas_gpap/paoftheweek/

Institute for Global Environmental Strategies Climate Change Resources
The Institute for Global Environmental Strategies works with educators and scientists to develop educational resources for the classroom. They offer scientifically accurate products that are geared toward students of varying grade levels. The *Potential Consequences of Climate Variability and Change* is a series of learning modules for grades 1-12. The activities focus on the impact of climate change on everything from agriculture to coastal areas to human health.
http://www.strategies.org/education/index.aspx?sub=education&sub2=productdevelopment

Integrated Wetland Assessment Toolkit
The IUCN has published *An Integrated Wetland Assessment Toolkit: A guide to good practice*. With this new set of tools, it should be possible to measure the economic value of a wetland, assessing the species that live there and the importance of a wetland for people's livelihood. The three main sections cover the integrated assessment process, the tools themselves, and illustrated examples of the application of the tools through detailed case studies.
http://cmsdata.iucn.org/downloads/iwa_toolkit_lowres.pdf

Integrating Marine Reserve Science and Fisheries Management
The National Fisheries Conservation Center has posted the Consensus Statement "Integrating Marine Reserve Science and Fisheries Management." The 30-page statement is the product of a two and a half day conference in June, 2004, featuring an expert panel from the fields of marine ecology, fishery management, economics,

population dynamics, and modeling. The statement provides an objective examination and assessment of the information regarding potential biological, social, and economic consequences of marine reserves, their potential effectiveness as a fishery management tool in the U.S., the methods for integrating their application with existing U.S. fisheries management and how marine reserves might be designed, monitored and evaluated. In addition, the statement addresses sources and magnitudes of uncertainty associated with marine reserves and conventional management approaches, and recommends areas for further study. For more information, check out http://nfcc-fisheries.org/consensus/index.php .

Consensus Statement. June 7-9, 2004. Integrating Marine Reserve Science and Fisheries Management. National Fisheries Conservation Center.

Integrating Research and Education
This website from Carleton College contains educational modules for use by teachers, students, and researchers. These collections offer numerous ways in which digital library technologies can be used to translate scientific discoveries into effective instructional practice. Each project features key topics, discovery pathways, and activities for students. The modules include thematic collections of resources, tutorials on how to access geoscience databases, and more.
http://serc.carleton.edu/research_education/index.html

Interactivate
Not marine, but very cool for those with high-speed Internet access. Interactivate is free, online interactive graphics and courseware for exploration in science and mathematics, with the emphasis on mathematics. The site is structured around collections of activities, lessons, and discussions and is browsable by subject, topic, audience, and resource type.
http://www.shodor.org/interactivate/guide/

Interactive Estuary Poster
Check out this new feature on the Padilla Bay National Estuarine Research Reserve education web site. To access it, select Education, then the Kids Page. Move the cursor around to an animal or plant to bring up more information about it.
www.padillabay.gov .

Interactive Media Tutorials
The Interactive Media Center at the State University of New York, University of Albany offers a series of online reference resources and web-based tutorials designed to aid people involved with web page building, image editing, audio and video projects, and electronic publishing. Topics include Tips to Better Digital Photos, Photoshop CS4: Basic Tips & Tricks, Web Design and Layout Tutorial, Search Engine Optimization, and more.
http://library.albany.edu/imc/tutorials_handouts.htm

Interactive Sea Turtle Activities for Kids
The Caribbean Conservation Corporation has a webpage of sea turtle games for kids. While you're on the website, check out the rest of their extensive offerings.
http://www.cccturtle.org/turtletides.php?page=games

Interactive Shipwrecks Website
The Ventura County Star newspaper hosts this website featuring coastal shipwrecks of the Channel Islands. The website links to an overview article and underwater views highlighting dives on several of the wrecks.
http://www.venturacountystar.com/special/shipwreck/

Interactive Species Poster
The National Marine Fisheries Service offers an interactive poster entitled *Sustainability – It's in our Hands.* The poster graphics show inter-relationships in marine ecosystems. Selecting any object on the poster depicts its identification and offers further information.
http://www.nmfs.noaa.gov/speciesid/Sustainability.html

Inter-American Biodiversity Information Network
The IABIN was created in 1996 as an initiative of the Santa Cruz Summit of the Americas meeting of Heads of State. Steadily gaining momentum, there are now 34 countries in the Americas that have officially named IABIN focal points. The website has extensive links to biodiversity databases, a search engine (both under tools), and other information.
http://www.iabin.net/defaulteng.html .

Interdisciplinary Climate Change Education Modules
The National Council for Science and the Environment has developed a curricular package using NASA data and web materials for an undergraduate general education course on climate change. A series of eight self-contained modules is available on this Encyclopedia of Earth website. Educators will have access to a parallel web portal to assist in course development and an additional web portal permitting communication among students at participating institutions.
http://www.eoearth.org/article/NCSE-NASA_Interdisciplinary_Climate_Change_Education

International Action on Global Warming
International Action on Global Warming (IGLO) is designed to raise worldwide public awareness about global warming and the particular ways that the polar regions profoundly influence the earth's climate, environments, ecosystems, and human society. The website includes a toolkit, a collection of educational tools and resources and includes downloadable hands-on activities, on-line interactives, and more; news and information; information about professional development opportunities; and more.
http://www.astc.org/iglo/index.htm

International Brant Monitoring Project
The International Brant Monitoring Project monitors the migration of a small sea goose, the brant. Project participants gain a greater understanding of the importance of local ecosystems and global environmental health through the observation of brants and sharing of information between participants in three countries. The project brings together participants that include students, wildlife biologists, national estuarine research reserves, the U.S. Fish and Wildlife Service and others along the Pacific flyway.
http://www.padillabay.gov/brant/index.html .
http://www.padillabay.gov/educationcurriculum.asp .

International Coastal Cleanup
The International Coastal Cleanup, September 18, 2004, September 16, 2006, September 17, 2011, September 21, 2013, September 20, 2014, September 19, 2015 sponsored by the Ocean Conservancy, is the world's largest one-day volunteer effort on behalf of the marine environment. Youth participation is a major key to success. Each year, groups such as schools, scouts, and churches take advantage of the unique opportunity offered by the cleanup. This website offers teacher resources along with activities and games.
http://www.coastalcleanup.org/pub1/index.cfm
http://www.oceanconservancy.org/our-work/international-coastal-cleanup/
http://www.signuptocleanup.org/index.cfm?fuseaction=Projects.Main&CFID=5699226&CFTOKEN=39878856
http://www.oceanconservancy.org/our-work/marine-debris/international-coastal-cleanup-11.html

International Continental Shelf Survey
This joint U.S.-Canada research cruise will use two icebreakers to collect data to identify the edge of the continental shelf in the Arctic Ocean. Scientists will measure seafloor bathymetry, collect high-resolution subseafloor data, monitor marine mammals and ocean noise through high frequency audio recording, and more. Join the PolarTREC teacher, Teacher at Sea, and others from August 2-September 6, 2010 as they blog about their experiences and check out the PolarTREC resources.
http://www.polartrec.com/expeditions/international-continental-shelf-survey
http://teacheratsea.noaa.gov/index.html
http://www.polartrec.com/

International Coastal Cleanup
Join thousands of people around the world on September 17, 2005 for the International Coastal Cleanup. A few opportunities around the U.S.:

- L.A. County, with over 55 cleanup locations. California Coastal Cleanup Day is coordinated in Los Angeles County by Heal the Bay in conjunction with the California Coastal Commission, Los Angeles County Department of Beaches and Harbors. http://www.healthebay.org/volunteer/ccd/
- New Jersey will have 4 cleanup sites along the Southern New Jersey Shore. http://www.southjersey.com/articles/?articleid=13379
- Florida cities are hosting coastal cleanups throughout Florida. Search individual cities in addition to this Palm Beach website http://www.volunteersolutions.org/uwpbc/org/opp/5843836.html

International Coral Reef Information Network
The Coral Reef Alliance (CORAL) manages the Coral Reef Education and Outreach Library as part of the International Coral Reef Information Network (ICRIN), the communications arm of the International Coral Reef Action Network. ICRIN provides internet resources for coral reef conservationists and houses a royalty-free Photobank and the International Directory of Coral Reef Organizations.
http://www.coralreef.org

International Day for Biological Diversity 2012
The Secretariat of the United Nations Convention on Biological Diversity has announced that the theme of the 2012 International Day for Biological Diversity, May 22, 2012, will be *Marine and Coastal Biodiversity*. The theme will contribute to the Rio + 20 meeting

and the work of the Global Forum on Oceans, Coasts and Islands taking place there in collaboration with the Secretariat; Expo 2012 in Yeosu, Republic of Korea May-July 2012; and the World Ocean Summit in Singapore in February 2012.
http://www.cbd.int/idb/

International Electronic Journal of Environmental Education
The *International Electronic Journal of Environmental Education* is a new refereed academic journal covering research on all aspects of environmental education. The aim of the journal is to provide environmental researchers, practitioners, and scholars a journal to further the study and practice of environmental and sustainability education. The journal offers open access to its content.
http://www.iejeegreen.com/index.php/iejeegreen

International Geosphere-Biosphere Programme
The International Geosphere-Biosphere Programme is a research program that studies the phenomenon of global change. The research goals of the program are to analyze the interactive physical, chemical, and biological processes that define earth system dynamics; research the changes that are occurring in these dynamics; and research the role of human activities on these changes.
http://www.igbp.net/

International Journal of Wilderness
The International Journal of Wilderness website offers free access to full copies of past issues of the International Journal of Wilderness. The journal contains peer-reviewed research articles and feature presentations covering wilderness management, research and recreation, sustainability of wildlands, community involvement in protected areas, policy issues, and more.
http://ijw.org/

International Marine Conservation Congress
Follow the OpenChannels blog from the International Marine Conservation Congress, held August 14-18, 2014 in Glasgow, Scotland. The blog combines notes from various IMCC sessions, comments from audience members, and more.
http://openchannels.org/chat/imcc-2014

International Migratory Bird Day
Environment for the Americas invites you to participate in International Migratory Bird Day 2009. The initiative focuses attention on migratory birds' journeys between summer and winter homes. This year, the bird conservation focus is *Celebrate Birds in Culture*. The website includes downloadable materials, activity ideas, lists of bird festivals, and more.
http://www.birdday.org/

International Migratory Bird Day
Environment for the Americas invites you to participate in International Migratory Bird Day 2008, May 10, 2008. The initiative focuses attention on migratory birds' journeys between summer and winter homes. This year, the bird conservation focus is *Tundra to Tropics: Connecting Birds, Habitats, and People*. The website includes downloadable materials, activity ideas, lists of bird festivals, and more.
http://www.birdday.org/

International Migratory Bird Day
International Migratory Bird Day celebrates the migrations of birds between their breeding grounds in the U.S. and Canada and their non-breeding grounds in Mexico, Central and South America and the Caribbean. 2004's theme is *Collisions: Clear the Way for Birds,* while the theme for 2006 (May 13) celebrates the *Boreal Forest: Bird Nursery of the Americas.* Examine the obstacles birds may encounter in flight and explores the many ways to minimize their impacts, the importance of the boreal forest to breeding birds, and threats to the forests, including habitat loss and climate change. Additional links to in-depth information are available.
http://www.birdday.org/imbd.htm

International Mud Day
International Mud Day is June 29, 2014. Join in! And check out the resources for the Mud Book and other great tools.
http://www.worldforumfoundation.org/working-groups/nature/international-mud-day/

International Polar Day – Land and Life
International Polar year 2007-8 celebrated its fifth polar day, focusing on Land and Life. The World Ocean Observatory presents global, live events to connect students and teachers in classrooms with scientists in the field. After the live webcast, the materials are archived for continued reference. Check out the other materials that have been added to the World Ocean Observatory event archive.
http://www.thew2o.net/events/polaryear/events.htm

International Polar Year
The polar regions play key roles in our global environment. Many important broad and interlinked research challenges involving both polar regions exist today. The International Polar Year (IPY) 2007-2009 will be an intense, coordinated campaign of polar observations, research, and analysis that will be multidisciplinary in scope and international in participation. IPY will use today's powerful research tools to better understand the key roles of the polar regions in global processes.
http://dels.nas.edu/us-ipy/index.shtml
http://www.ipy.org/

International Polar Year
On March 1, 2007, students and teachers around the world helped launch the International Polar Year in their classrooms. The website includes links to a few activities that can be carried out around the world in classrooms, science centers, parks, galleries, and at home. Check out this wonderful website for news and background information, picture galleries, education resources, and much more.
http://www.ipy.org/index.php?/ipy/detail/ipy_2007_2008_school_launch_event/

International Polar Year Integrated Collaborative Education Planning Workshop and Website
The Integrated Communication Effort strategic planning online workshop was held from March 17 to 31, 2006, in order to identify key science concepts and messages for the International Polar Year and to support broad, diverse and international collaboration and participation in this event. The website will offer update information on education communication messages and actions, including documentation of the workshop, a resource list for implementing educational programs, key concepts, and more.
http://coexploration.org/ipy/ice/

International Review of Research in Open and Distance Learning
The International Review of Research in Open and Distance learning is a free, refereed e-journal designed to advance research, theory, and practice in open and distance learning worldwide. Special issues have covered Open Education Resources: Opening Access to Knowledge; Mobile Learning; and more.
http://www.irrodl.org/index.php/irrodl/index

International Society for Reef Studies
International Society for Reef Studies offers this new website with links to organizations, publications, and more. The principal objective of the organization is to promote the production and dissemination of scientific knowledge and understanding of coral reefs, both living and fossil.
http://www.coralreefs.org/

International Society for Reef Studies
Located within the Florida Institute of Technology, the International Society for Reef Studies (ISRS) is designed to disseminate its findings on both living and fossil coral reefs. "Reef Encounters" (right side, pull-down menu) will give an overview of some of the projects the organization is currently working on.
http://www.fit.edu/isrs/

International Trails Symposium Presentations
The program at the 2015 International Trails Symposium featured concurrent sessions, core tracks, and more. The theme of the symposium was Solutions for Success. Many concurrent and core track presentations have been made available online in PowerPoint or PDF format.
http://www.americantrails.org/ee/index.php/symposium/sessions

International Wildlife Film Festival
The 37th Annual International Wildlife Film Festival is now available for touring. Read how to bring the films to your school or organization.
http://wildlifefilms.org/

International Year of Biodiversity
The United Nations Convention on Biodiversity has set up a website to celebrate 2010 as the year of biodiversity. The website offers links to worldwide celebrations, multimedia resources, and more.
http://www.cbd.int/2010/welcome/

International Year of Biodiversity Website
2010 has been declared the International Year of Biodiversity (IYB) by the United Nations. This website is supported by IYB-UK, the United Kingdom partnership supporting IYB. Check out the news, success stories, education links, and more.
http://www.biodiversityislife.net/

International Year of the Reef
The International Coral Reef Initiative designated 2008 as the International Year of the Reef (IYOR 2008). The initiative hopes to strengthen awareness about the ecological, economic, social, and cultural value of coral reefs and associated ecosystems; improve understanding ofl threats to coral reefs and generate practical and innovative solutions

to reduce these threats; and generate action to develop and implement effective management strategies for conservation and sustainable use of these ecosystems.
http://www.iyor.org/

International Year of Water Cooperation
The United Nations General Assembly declared 2013 as the United Nations International Year of Water Cooperation, and World Water Day, March 22, 2013, will also be dedicated to water cooperation. The objective of this International Year is to raise awareness, both on the potential for increased cooperation, and on the challenges facing water management in light of the increase in demand for water access, allocation, and services. Check out the UNESCO-Water link for resources.
http://www.unwater.org/watercooperation2013.html
http://www.unesco.org/water/water_links/

Into the Abyss
Follow a deep sea mission from 1998 to recover the top of a black smoker and learn about hydrothermal vent communities and the technology that lets us observe them. The website features background information on the vessels, the crew, journal entries, and information on the habitat. Be sure to check out the links to additional resources.
http://www.pbs.org/wgbh/nova/abyss/

Into the Dead Zone
EarthEcho Expedition: Into the Dead Zone explores the global issue of aquatic dead zones using the Chesapeake Bay as a model system. Follow along with Philippe Cousteau, Jr. and his Expedition Team while addressing ecosystem function, the hydrologic cycle, biodiversity, and more. The website offers lesson plans; service-learning curriculum; and more.
http://www.earthecho.org/programs/earthecho-expeditions/

Introduction to the Dinoflagellata
This website from the University of California Museum of Paleontology features an overview of the Dinoflagellata. The website offers introductory information, life history and ecology, systematics and morphology, and more.
http://www.ucmp.berkeley.edu/protista/dinoflagellata.html

Introduction to Geology
This undergraduate level Introduction to Geology course is offered as part of MIT's OpenCourseWare Initiative. The materials include readings, lecture notes, and more.
http://ocw.mit.edu/OcwWeb/Earth--Atmospheric--and-Planetary-Sciences/12-001Spring-2008/CourseHome/index.htm

Introduction to Planning and Facilitating Effective Meetings
NOAA's Coastal Services Center offers this facilitations skills primer. The guide explains the role of a facilitator and describes how to plan and execute meetings that deliver results. Topics include planning a productive meeting or workshop, conducting an effective meeting, using proper tools and techniques for meeting facilitation, and facilitating teleconferences, videoconferences, and webinars.
http://www.csc.noaa.gov/publications/effective_meetings.html

Introduction to Water and Climate
This edX course from Delft University of Technology explores how climate change, water availability, and engineering innovation are key challenges for the planet. The course consists of knowledge clips, movies, exercises, discussion, and homework assignments. The free course starts September 1, 2015 and runs for seven weeks.
https://www.edx.org/course/introduction-water-climate-delftx-ctb3300wcx-0?

Introductory Guide to Valuing Ecosystem Services
The aim of this guide is to provide an introduction to the valuation of ecosystem services. It builds on previous approaches to valuing the environment but takes a more systematic approach to the assessment of impacts on the natural environment. The central theme of the guide is to ensure that the true value of ecosystems and the services provided are taken into account in policy decision-making.
http://ec.europa.eu/environment/nature/biodiversity/economics/pdf/valuing_ecosystems.pdf

Intruders in Paradise
Intruders in Paradise: Invasive Species in Florida, a Teachers Guide is now available for easy downloading from the Tampa Bay Estuary Program website. This teaching guide is specifically about invasive species in Florida. Designed for middle-school students, the guide contains classroom activities, website references, a master vocabulary list, fact sheets about individual invasive plants and animals commonly found in Florida, and additional resources. CDs of the guide also are available by contacting Nanette Holland at nanette@tbep.org.
http://www.tbep.org/isteachersguide/index.html

Invasive Lionfish: A Guide to Control and Management.
This manual can assist coastal managers and field workers with local control and research efforts for invasive lionfish. The guide offers best practices for lionfish control and management including control strategies, outreach and education, research, monitoring, legal considerations, and ideas for securing resources and partnership. The website offers the manual in an online format, but it can also be downloaded as a pdf or printed.
http://lionfish.gcfi.org/manual/

Invasive Lionfish in Spanish
The Gulf and Fisheries Institute and partners offer the Spanish translation of Invasive Lionfish: A Guide to Control and Management. The manual can assist coastal managers and field workers with local control and research efforts for invasive lionfish. The manual loads quickly and is easy to read online and can be downloaded to a mobile device. It continues to also be available in English.
http://gcfi.org/index.php

Invasive Lionfish Web Portal
This website from the Gulf and Caribbean Fisheries Institute hosts a myriad of resources about lionfish. Topics include Education & Outreach, Research & Monitoring, Control, and Management.
http://lionfish.gcfi.org/

Invasive Plant Atlas of New England
This site includes an atlas with images and descriptive information for the invasive and potentially invasive plants in New England. Visitors can create customized maps that document these species by utilizing the online records database. The website also allows users to browse a list of species for which data has been collected thus far.
http://invasives.eeb.uconn.edu/ipane/

Invasive Species Compendium
The Invasive Species Compendium (Beta) contains datasheets on over 1500 invasive species and animal diseases. The website offers a developing encyclopedic resource containing datasheets on invasive species and animal diseases; basic datasheets on further species, countries, habitats and pathways; bibliographic database of over 65,000 records (updated weekly); and full text documents (updated weekly). Additional resources include identification keys, an image library, and more.
http://www.cabi.org/isc/default.aspx?site=144&page=4066

Invasive Species eFieldTrip - Online
The U.S. Fish and Wildlife Service presents a live eField Trip on April 5, 2005, on invasive species. Students can ask questions and participate in a live web chat with experts to learn about invasive species. This is a moderated chat and a moderator will screen all input to ensure only appropriate questions are entered into the chat room.
www.eFieldTrips.org/Invasives

Invasive Species Lectures On-Line
The Virtual Library of the American Institute of Biological Sciences contains plenary lectures by biologists recorded at AIBS annual meetings. Additional content includes presentations from the AIBS National Roundtable series. You can view synchronized audio and video of all presentations, plus slides and transcripts of presentations. The theme of the 2004 meeting was *Invasive Species: The Search for Solutions*.
http://www.aibs.org/virtual-library/ .

Invasive Species of Everglades National Park
Take your students on an electronic field trip to the Everglades National Park to explore invasive species. The eFieldTrip consists of three major components: a trip journal, a virtual visit, and posting questions via the Ask the Experts Web Form.
www.eFieldTrips.org

Invasive Species Lesson Plan
This lesson plan on invasive species in the Gulf of Mexico and Florida is aimed at students in Grades 1-4. It highlights an animation of lionfish distribution the Gulf.
http://gcoos.tamu.edu/documents/Lesson-Plans/Invasive-Species-March2014-Simoniello.pdf

Invertebrates of Alaska Posters
The NOAA Fisheries Alaska Fisheries Science Center has a new set of posters featuring chitons, sea stars, and shrimp from Alaska. One set of posters can be ordered free for your school or classroom.
http://www.afsc.noaa.gov/education/oceanlife/invertebrates.htm

Investigating the Climate System
Investigating the Climate System offers problem-based modules for studying clouds, energy, precipitation, weather, and wind. Learning activities, assessment rubrics, and prerequisite knowledge are included in these down-loadable booklets, correlated to national academic standards for Grades 5-12.
http://spacelink.nasa.gov/products/Investigating.the.Climate.System/ .

Investigating Earthquakes through Regional Seismicity
The Southern California Earthquake Center website offers an understanding of earthquakes and knowledge for reducing earthquake risk. This educational module is divided into three major sections, *What is an Earthquake?, The Distribution of Earthquakes,* and *Measuring Earthquakes*. Sections present background material and learning activities allowing students to understand such characteristics of earthquakes as their associated faults, rates of occurrence, magnitudes, and geographic distribution.
http://www.data.scec.org/Module/

Investigating Evidence
Investigating Evidence, from BirdSleuth, is now aligned with both Common Core and Next Generation Science Standards. The free curriculum includes a Teacher's Guide, accompanying Resource and Journal pages, and online resources that support citizen-science projects and outdoor explorations. Lead your students in making observations, crafting and testing hypotheses, collecting and graphing data, drawing meaningful conclusions, and sharing their work.
http://www.birdsleuth.org/investigation/

Investigating the Marine Environment in the 21st Century
This 13-part resource is designed to help students become more knowledgeable about the marine environment and its resources through emphasis on the Texas coastal zone and the Gulf of Mexico. The activities are designed for both traditional and integrated science courses, but also provide marine activities for social studies, language arts, and mathematics courses or for interdisciplinary thematic units. For a discounted offer, email sgpublications@seagrant.tamu.edu.
http://texas-sea-grant.tamu.edu/online%20publications/marinate.html

Investigating the Ocean
NOAA's National Environmental Satellite, Data, and Information Service, together with the Science House of North Carolina State University and Sea Grant, offer students six inquiry activities to investigate the ocean and the issues we face. The activities use satellite data and other online resources to explore the underwater world.
http://www.science-house.org/nesdis/index.html

Investigations of Daily High-Low Temperatures
Using this online activity from ESRI, students can analyze the spatial patterns of daily temperature extremes and examine the relationship of coasts, latitude, and altitude to temperature extremes across the U.S. in a hands-on, GIS-based environment.
http://blogs.esri.com/Info/blogs/gisedcom/archive/2009/03/06/investigating-temperature-extremes-in-the-usa-with-gis.aspx

Involving the Public: Legal Requirements for Public Participation
This reference guide highlights legislative mandates related to public participation in environmental decision-making. The guide is intended to help coastal and marine managers in designing and conducting a participatory process.
http://www.mpa.gov/redirect.html?newURL=http://www.csc.noaa.gov/mpa/RegulatoryRequirements.pdf .

IODP Distinguished Lecturer and Educator Workshop
Learn about the science that plays a role in our understanding of Earth by joining staff and scientists from Consortium for Ocean Leadership's Deep Earth Academy and the Integrated Ocean Drilling Program. The free workshop offers hands-on activities based on ocean drilling data. See the website for details.
http://iodp-usssp.org/outreach/distinguished-lecture-series/host-a-lecture/

IOOS Data Catalog
The Integrated Ocean Observing System (IOOS) launched the first version of the IOOS Data Catalog to help people find ocean observations. The goal is to allow users to find the data they want, for the location and time period of interest. The catalog is a work in progress. IOOS will add more features and more observing assets as available.
http://ioos.gov/catalog/

IOOS Messaging Materials
The Integrated Ocean Observing System (IOOS) is a system of systems that routinely and continuously provides quality controlled data and information on current and future states of the oceans and Great Lakes from the global scale of ocean basins to local scales of coastal ecosystems. It is a multidisciplinary system designed to provide data in forms and at rates required by decision makers to address seven societal goals.
http://www.ocean.us/node/978

IOOS Websites
Check out the updated Integrated Ocean Observing System websites. TThe Gulf of Mexico website includes map layers to show nautical charts, marine hazard warnings, and habitat maps such as essential fish habitat and marine protected areas. Great Lakes offers access to the Great Lakes Data Catalog. California has a new graphing system with quicker data plots and depth measurements.
http://www.ioos.gov/
http://gcoos.tamu.edu/products/
http://204.115.180.244/CeNCOOS/DataPortal.html
http://www.glos.us/

IOOS Wildlife Data
U.S. Integrated Ocean Observing System (IOOS) wildlife data is now available online, tracking monk seals and sharks. Users can plot monk seal locations, animate movement patterns, and explore how seal movement relates to their physical environment. Additionally, an international team of researchers, conservationists, commercial dive operators and government agencies have joined together to deploy and operate an array of acoustic devices to collect data on shark movement near Palau.
http://www.soest.hawaii.edu/hioos/map/

IPCC Report in 19 Illustrated Haiku
Greg Johnson, a Northwest oceanographer, has distilled the Physical Science Assessment from the International Panel on Climate Change, into 19 illustrated haiku.
http://daily.sightline.org/2013/12/16/the-entire-ipcc-report-in-19-illustrated-haiku/

IPCC Synthesis Report
The Intergovernmental Panel on Climate Change published its latest Synthesis Report. This report is the fourth and final element of the fifth assessment (AR5) of climate change. It distills information from the IPCC's reports on the science of climate change, climate impacts, and the ways climate risks can be addressed.
http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf

IPMEN Chile
The website for the 2012 Conference for the International Pacific Marine Educators Network offers recorded webcasts from the conference forum and presentations.
http://ipmenchile.wp2.coexploration.org/live-streaming/

IPY in the Classroom
In support of the International Polar Year, NASA scientists are participating in field expeditions to Earth's polar areas and conducting additional research focused on the poles of Earth and other planets and moons. This web page offers convenient links to a variety of NASA and NASA-sponsored projects with IPY-related classroom activities and resources.
http://www.nasa.gov/audience/foreducators/k-4/features/F_IPY_in_the_Classroom.html

Iron Science Teacher
Not marine science, but this website shows how any object can be used to convey different science messages. The San Francisco Exploratorium offers a myriad of on-line Iron Science Teacher presentations, parodying the Japanese TV program, *Iron Chef*. The downloadable webcasts showcase science teachers as they devise demonstrations around an everyday item such as a plastic bag, a milk carton, or red tape. Other areas of the website offer hands-on activities, science news, a magazine, and more.
http://www.exploratorium.edu/iron_science/index.php

Ishmael's Inclinations: Non-Use Values of Marine Protected Areas
The authors describe four important non-use values to consider when considering MPAs: option value, quasi-option value, bequest value, and existence value.
http://unicorn.csc.noaa.gov/mpa/barrnuv.pdf

Island Bright Spots In Conservation & Sustainability
The Global Island Partnership promotes public-private-civil society partnerships for biodiversity and sustainable livelihoods domestically, regionally, and internationally. This report supports the dedication of the 2014 International Day for Biological Diversity to islands biodiversity.
http://www.cbd.int/idb/image/2014/idb-2014-booklet.pdf

Island Ecosystem Game
The Western Pacific Regional Fishery Management Council is one of eight regional fishery management councils. Their Education Corner offers the online Island Ecosystem game, focusing on fish habitat and targeting grades 5 to 8. Be sure to check out the rest of the resources while on the website.

http://www.wpcouncil.org/island-ecosystem-game/

The Island Institute
Since 1983, the Island Institute has employed a wide range of individuals, including photographers, artists, policy experts, and others, all in the name of maintaining the viability of the fifteen year-round island communities in the Gulf of Maine. Website resources include information about fellowship opportunities, working waterfront initiatives, links to initiatives of interest, educational resources, and much more.
http://www.islandinstitute.org/

Islands on the Edge
The award-winning film, *Islands on the Edge - A Look at Climate Change in the Caribbean*, is now on YouTube in both standard and high definition. The film is split into two parts as it exceeds the maximum video length allowed on YouTube.
http://www.youtube.com/watch?v=k2Z-t5U-NpA
http://www.youtube.com/watch?v=_XDpdMftd10&feature=related

iSpecies.org
The term "mashup" was originally used to describe the mixing together of musical tracks, but now refers to websites that weave data from different sources into a new service. They are becoming increasingly popular, especially for plotting data on maps. iSpecies, a species search engine, is a test of E O Wilson's idea of a web page for each species. The data displayed are generated "on the fly" by querying other data sources
http://darwin.zoology.gla.ac.uk/~rpage/ispecies/

ISTEM: Lesson Plans
The Indiana STEM Network website offers student centered, experiential, and investigatory learning based lesson plans for all STEM subject areas and grade levels. Check out It's Lonely at the Top (food web), What Orbital Dynamic Variables are Responsible for Earth's Weather? and more.
https://www.istemnetwork.org/resource/educational/lesson.cfm

ITEST
The Innovative Technology Experiences for Students and Teachers (ITEST) program was established by the National Science Foundation in response to current concerns and projections about the growing demand for professionals and information technology workers in the U.S. and seeks solutions to help ensure the breadth and depth of the STEM workforce. The website includes publications, a resource library, and more. Teachers' Domain offers hands-on science, career exploration, and more.
http://itestlrc.edc.org/
http://www.teachersdomain.org/special/its/

IUCN Caribbean Fishes Weblift
The Caribbean Fishes Specialist Group is composed of ichthyologists and fishery scientists who are engaged in research and conservation of fishes in the Caribbean region. They have created a weblift that provides links to on-line databases around the world that contain information about Caribbean fishes.
http://caribbeanfish.org/english.html

IUCN Publications Available in Two Formats
An IUCN online publishing pilot project offers publications in both HTML and PDF format. Two main advantages to this new system include easy capture by search engines and on-line access to cross references, both within the publication and also to outside sources. Two of many such publications include *Protected Landscape Approach: Linking Nature, Culture and Community*, and *The Urban Imperative: Urban Outreach Strategies for Protected Area Agencies*.
www.iucn.org/wcpa/pubs/taskforce.htm#cities
http://www.iucn.org/bookstore/booksonline.htm

2007 IUCN Red List of Threatened Species
The 2007 IUCN Red List of Threatened Species has been released. There are now 41,415 species on the IUCN Red List and 16,306 of them are threatened with extinction. The website includes species case studies by region, background information about the list, links to video and photos, fact sheets about threatened species, and much more.
http://www.iucn.org/themes/ssc/redlist2007/index_redlist2007.htm

IYOR Public Service Announcements and Messaging Campaign
The International Year of the Reef 2008 is a worldwide campaign to raise awareness about the value and importance of coral reefs and threats to their sustainability, and to motivate people to take action to protect them. NOAA and partners have supported the production and distribution of a series of 30 second TV public service announcements and a united messaging campaign to educate the US public concerning ocean-coral reef and coastal environmental education.
http://www.iyor.org/

IYOR Web Seminar Series
The Australian Research Council offers downloadable presentations through their online seminar on coral reef futures, sponsored by the ARC Centre of Excellence for Coral Reef Studies. As part of its contribution to IYOR 08, the seminar series is designed to deliver scientific outcomes to the community in an informative and useful way. Topics include MPAs, climate change and coral reefs, adaptive management, and more.
http://www.coralcoe.org.au/events/webseminar/iyorwebseminar.html

JASON Expedition: Disappearing Wetlands
This year's mission for the JASON expedition to the bayous of Louisiana is to better understand what wetlands are, why they are disappearing, and how to best manage these ecosystems in Louisiana, in your neighborhood, and around the world. As students model the work of real researchers, they will gain proficiency in a range of core disciplines, including: math, technology, geography, history, language arts, and life, physical, earth and space sciences.
www.jason.org .

JASON Live
JASON Live delivers interactive events produced by The JASON Project, Immersion Learning, and Nautilus Live, with scientists and explorers sharing their expeditions of discovery. Check out upcoming and previously broadcast events and links to educational materials.
http://www.jason.org/public/whatis/live.aspx

JASON Live STEM Role Model Series
JASON Learning's free, live, interactive events can help inspire kids to pursue STEM careers. All webcasts are held on Thursdays at 1:30 pm Eastern. Check out the wide range of upcoming speaker interests, from sharks to climate to archaeology, on the website. Students can pre-submit questions on the submission form or through video, or submit using the form during the webinar. All events are archived and posted soon after the event ends.
http://www.jason.org/live

JASON Live Careers
Tune in to JASON Learning's free, live, interactive events which can help inspire kids to pursue STEM careers. Join engineer Clara Smart (one of the scientists of the Nautilus Corps of Exploration), December 12, 2013 and explorer/author Lorie Karnath (former president of the Explorer's Club), December 19, 2013. Students can pre-submit questions on the submission form or through video, or submit using the form during the webinar. All events are archived and posted soon after the event ends.
http://www.jason.org/live

JASON Live STEM Role Model Series
JASON Learning's free, live, interactive events can help inspire kids to pursue STEM careers. All webcasts are held on Thursdays at 1:30 pm Eastern, but one upcoming webcast will also be offered during out-of-school hours; check out the talk with Oceanographer Mone Behl. Students can pre-submit questions on the submission form or through video, or submit using the form during the webinar. All events are archived and posted soon after the event ends.
http://www.jason.org/live/stem-career-qa-mona-behl-oceanographer

JASON Online Games
All of JASON's games are available online in the JASON Mission Center. Teachers can search for games and labs by state standards in the JASON Mission Center Web site, where you will also find worksheets and handouts. Games include Operation: Resilient Planet, Storm Tracker, and more. Free registration is required.
http://www.jason.org/public/whatis/games.aspx

JASON Project Online Access Charges
On July 1, 2012, JASON online resources from the JASON Mission Center will no longer be free. A discount is available through August 31, 2012.
http://jason.pinnaclecart.com/online-access/

JASON Project Tsunami Resources
The JASON Project offers resources from their energy curriculum *Operation: Infinite Potential*, to educate students on the effects and causes of tsunamis, videos, modeling, and more.
http://www.jason.org/public/feature/FeatureDetail.aspx?fid=255

Jean-Michel Cousteau: Ocean Adventures
The six-part TV series premiering on PBS stations this April, *Jean-Michel Cousteau: Ocean Adventures*, is produced by KQED Public Broadcasting and the Ocean Futures Society. The series illuminates the need for better understanding and sustainable management of the oceans' natural treasures. The website includes standards-based

lesson plans, informal activities, on-line games, and more, designed for middle school but easily adaptable for other grades.
http://www.pbs.org/kqed/oceanadventures/

Jellyfish Gone Wild
Jellyfish Gone Wild features photos and videos of jellyfish, stinging statistics about jellyfish swarms, and explanations of how and why jellyfish swarms form. The report, available as text or interactive display, provides an overview of the science of jellyfish swarms, tinged with humor. The website also offers additional resources, including jellyfish anatomy, life cycle, and links to other information.
http://www.nsf.gov/news/special_reports/jellyfish/index.jsp

Jellyfish ROCK
You Tube videos of the Jellyfish ROCK outreach event that the Global Jellyfish Group hosted in Santa Barbara include 5 minute science presentations, winners from an art contest, and more. All of the children's artwork will be up on the blooms page soon.
http://www.youtube.com/watch?v=Wp8FXCywA2U
http://www.jellywatch.org/blooms/contest

Jellyfish ROCK
This outreach event, to be held November 20, 2010 in Santa Barbara, California, is free and open to the public. Join the Global Jellyfish Group for a night of short talks, video presentations, art, and discussions. Podcasts will be made available to download from the website in November, 2010.
http://www.jellywatch.org/blooms/jellyfishrock/

JellyWatch
This website encourages citizen science and international collaboration, offering the ability to record sightings of jellyfish and other marine organisms. If you've been on the beach or in the ocean lately, contribute to a long-term dataset by reporting the animals seen and the conditions of the beach. Visitors can post critter sightings and can also use the Clean Seas option to indicate jelly-free times.
http://jellywatch.org/

Jetstream - An Online School for Weather
This NOAA website provides educators, emergency managers, or anyone interested in learning about weather with comprehensive, well-organized, colorfully illustrated curricula designed to help teach about the Earth's atmosphere. The self-contained modules include complete lesson plans and review questions.
http://www.srh.noaa.gov/jetstream/matrix.htm

JetStream - Online School for Weather
NOAA's JetStream Online School for Weather can help middle and high school Earth science teachers enhance their knowledge of weather topics. The website is designed to help educators, emergency managers, or anyone interested in learning about weather and weather safety. The illustrated information contained in JetStream is arranged by subject; beginning with global and large scale weather patterns followed by lessons on air masses, thunderstorms, flooding, and more. There are lessons, quizzes, and more.
http://www.srh.noaa.gov/jetstream/

Jiminy Cricket's Environmentality Challenge
Through Jiminy Cricket's Environmentality Challenge, students are encouraged to blend the idea of thinking and acting environmentally at school, at home, and in the community into their daily lives. The downloadable Environmentality Challenge Handbook can be used to guide a class project. A message board is available for teachers to share stories, ask questions and provide feedback to each other.
http://disney.go.com/environmentality/jcec/home.html

John Muir Manuscript Letters
The Wisconsin Historical Society provides access to more than 100 pages of original letters written by John Muir, with the original handwritten letters side by side with typed versions and their transcriptions.
http://www.wisconsinhistory.org/turningpoints/search.asp?id=1224

Joides Resolution
The *R/V JOIDES Resolution* is an earth and ocean science research vessel run by the Integrated Ocean Drilling Program. The core samples and data that its scientists and crew bring up from the seafloor every day hold significant clues to Earth's history, climatic changes, geologic events, and more. The website includes activities for young children, classroom materials for teachers, tracking globes, multimedia, and much more.
http://joidesresolution.org/

Joides Resolution Expeditions
The Ocean Drilling Research Vessel *JOIDES Resolution* is at sea for *Expedition 334: Costa Rica Seismogenesis Project*, March 15-April 13, 2011. The current expedition is designed to better understand the processes that control large earthquakes at subduction zones, at the only known erosional end-member of convergent margins within reach of scientific drilling. *Expedition 335: Superfast Spreading Rate Crust* will take place April 14-June 3, 2011. Sign up for a live video events and follow the blogs.
http://joidesresolution.org/

Joint Oceanographic Institutions
Joint Oceanographic Institutions is a consortium of oceanographic research institutions that serves the U.S. scientific community through management of large-scale, global research programs in the fields of marine geology, geophysics, and oceanography. The website offers ocean drilling science information, professional development opportunities, and on-line educational activities and lesson plans based on scientific ocean drilling data.
http://www.joiscience.org/joi

Jonathan Bird's Blue World Season 2
Jonathan Bird's Blue World, an educational public television series, lets you bring the undersea world to the classroom via the internet. Topics covered in Season 2 include whale sharks, mangroves, venomous fish, and more. Each segment is approximately 10 minutes, and has an accompanying study guide.
http://www.blueworldtv.com/

Journal of Environmental Studies and Sciences
The new quarterly journal, *Journal of Environmental Studies and Sciences*, is the official publication of the Association for Environmental Studies and Sciences. The journal offers peer-reviewed publication of explicitly interdisciplinary environmental research,

policy analysis and advocacy, educational discourse, and other related matters. Contributions are welcome from any discipline or combination of disciplines.
http://www.springer.com/environment/journal/13412

Journal of Online Learning and Teaching
The objectives of the Journal of Online Learning and Teaching are to enable faculty to use technology effectively in teaching and learning and also to enable academic programs to design and deploy academic technology. The journal is published quarterly.
http://jolt.merlot.org/

JournalTOCs
JournalTOCs offers tables of contents (TOCs) for the newest issues of thousands of academic journals via this free website.
http://www.journaltocs.hw.ac.uk/

Journey of the Butterflies
The team at PBS's NOVA created this documentary on monarch butterflies migration to a sanctuary in the highlands of Mexico, using a helicopter, ultralight, and hot-air balloon to capture some aerial views along the route. The website offers the complete documentary, transcript, and links for more information.
http://www.pbs.org/wgbh/nova/nature/journey-butterflies.html

Journey of the Loggerhead:
This interactive DVD on marine turtles, from Environmental Media, was designed and filmed in the company of countless staff and volunteers of local nesting beach monitoring programs, domestic and international agencies, colleges and universities, aquaria, nature centers, and rehabilitation programs. The DVD contains GIS data, satellite tracking information, still photographs, extensive interviews, a curriculum correlations guide and a 26-minute video about the loggerhead and other marine turtle species.
http://www.envmedia.com/production/loggerhead/index.htm .

Journal of Coastal Research
The Coastal Education and Research Foundation has released a special summer 2008 issue of its on-line journal, *The Journal of Coastal Research*, devoted entirely to research conducted in the National Estuarine Research Reserve System. The special issue, *Research and Monitoring of NERRS Aquatic Ecosystems*, focuses on biological monitoring and studies of the linkages between physical and biological components of estuarine ecosystems.
http://www.jcronline.org/perlserv/?request=get-toc&issn=1551-5036&volume=55&issue=sp1&ct=1

Journey North
Journey North is a free online program which tracks the arrival of spring and the migrations of numerous wildlife species, explores weather and climate, and more. Students share their own field observations with classrooms across the hemisphere. In addition, students are linked with scientists who provide their expertise directly to the classroom. The Annenberg Channel also offers free Journey North video programs, downloadable teaching tools and classroom lessons, and more.
http://www.learner.org/jnorth/

Journey North
Journey North begins again in February. It is a free online program engaging students in a study of wildlife migration and seasonal change, following tulips, monarch butterflies, whooping cranes, gray whales, and more. Students share their own field observations with classrooms across the hemisphere. In addition, students are linked with scientists who provide their expertise directly to the classroom. The Annenberg Channel also offers free Journey North video programs, teaching tools, and lessons, and more.
http://www.learner.org/jnorth/

Journey North
Journey North is a free online program engaging students in a study of wildlife migration and seasonal change. K-12 students share their own field observations with classrooms across the hemisphere tracking migration patterns of birds and mammals, the budding of plants, changing sunlight, and other natural events and are linked with scientists who provide their expertise directly to the classroom. Find standards-based lesson plan, activities, and information.
http://www.learner.org/jnorth/ .

Journey North App
Journey North has launched for 2012; explore the interrelated aspects of seasonal change. Check out the free app for mobile phones and report your own observations.
http://www.learner.org/jnorth/season/
http://www.learner.org/jnorth/mobile/index.html

Journey North on the Annenberg/CPB Channel
The Annenberg/CPB Channel is a free satellite channel for schools, colleges, libraries, public broadcasting stations, public access channels, and other non-commercial community agencies. One current highlight is Journey North, an Internet-based program that engages students in investigations of wildlife migration and seasonal change.
The 150 page Teacher's Manual comes in a tabbed three-ring binder which contains 35 interdisciplinary lessons, classroom organization techniques, and more.
http://www.learner.org/channel/series127.html

Journey North Begins
Begin tracking the arrival of spring and the migrations of numerous wildlife species using the Journey North web site. Journey North is a free online program engaging students in a study of wildlife migration and seasonal change, following tulips, monarch butterflies, whooping cranes, gray whales and more. Students share their own field observations with classrooms across the Hemisphere. In addition, students are linked with scientists who provide their expertise directly to the classroom.
http://www.learner.org/jnorth/

Journey North Begins
Journey North offers a free 10-week geography project, a Mystery Class, starting January 31, 2005. Teachers and students in grade 4-12 classrooms are invited to participate, in which students try to find ten secret classes "hiding" around the globe. Young geographers must use reasoning, graphing, and research skills to pinpoint exact locations of the mystery classes.
http://www.learner.org/jnorth/tm/mclass/About.html

Journey to Planet Earth Free Preview
Screenscope has extended an invitation to receive a 30-day online preview of the PBS series, Journey to Planet Earth, along with an offer through December for a 25% discount towards the purchase of any episodes. You can also request to receive the DVD set for preview.
http://video.webcasts.com/events/pmny001/viewer/index.jsp?eventid=32143

Journey South
Students get hands-on experiences with nature and wildlife by participating in the international Journey North program. The fall component, Journey South, tracks the migrations of birds, whales, and butterflies, as well as the growth of tulips from bulbs.
http://www.jnorth.org/

Journey South Begins
Track migration across the Northern Hemisphere. Investigate seasonal change, geography, and much more. Students share their own field observations with classmates across North America and analyze data from other classroom and professional scientists. Each study features standards-based lessons and challenges, weekly migration updates, interactive maps, connections with field scientists, and more. They also provide guidance to conduct local observations and fit them into a global context.
http://www.learner.org/jnorth/

Journey South with the Whooping Cranes
Follow the flight of whooping cranes south to the Gulf Coast wetlands. Lessons, activities, and information are available on the Journey North website. The Journey North program airs on the Learner Channel on November 3, 2005.
http://learner.org/redirect/november/jnorth90.html

Journey to Planet Earth for Grades 6-12
The Journey to Planet Earth video series has been re-edited for grades 6-12 to help teachers explain to students the science behind some of today's headlines. Teachers can receive a 30-day free preview of the entire 10-episode series or individual episodes, by emailing your name, institutional mailing address, and phone number to screenscope@screenscope.com. The website includes ecosystem profiles, teacher guides, action kit, and more.
http://www.pbs.org/journeytoplanetearth

Juan de Fuca Hydrogeology
Join scientists, educators, and artists on the *JOIDES Resolution* - Expedition 327: Juan de Fuca Hydrogeology, July 5-September 5, 2010. Expedition 327 will install sub-seafloor observatories to monitor fluid circulation and microbial activity in the ocean's crust, using cutting edge technology to help scientists explore unanswered questions about activity and life beneath the seafloor. The expedition will carry a team of educators and artists.
http://joidesresolution.org/node/1154

Juan de Fuca Ridge Expedition
REVEL expedition, June 14-July 13, 2004, explored the deep ocean off the Pacific Northwest coast on the research vessel Atlantis. During this expedition to the Juan de Fuca Ridge, 200 miles west of Washington and British Columbia, scientists, engineers

and educators used an Autonomous Underwater Vehicle to study the transfer of heat from hydrothermal vents plumes into the ocean.
www.ocean.washington.edu/outreach/revel .

Jumping the Grate
Jumping the Grate, the story of Sam the Kokanee Salmon, is an adventure book for children. Jumping the Grate contains elements not usually found in books: a CD of two theme songs written by the author and performed by her band, follow-up adventures in language arts and science, coloring pages, song lyrics with guitar chords, and more. You can preview some of the book and listen to portions of two songs on the website.
http://www.rayoflightbooks.com/index.php?nav=jumping

Junior Duck Stamp Curriculum Guides
Targeted at middle level students, these curriculum guides from the U.S. Fish and Wildlife Service Junior Duck Stamp program stress wildlife observation, nature journaling, and photography, while teaching students about conservation and developing art skills. The Educator's Guide contains background information for each study and drawing unit, while the Youth Guide provides instructions for students to complete the various activities.
http://www.fws.gov/juniorduck/EducationProgram.htm

K-12 Lesson Plans
The University of Texas at Austin's Environmental Science Institute offers a variety of downloadable lesson plans covering topics such as mapping, air and water quality, and more. The lessons can be searched by subject, grade level, and alphabetically.
http://www.esi.utexas.edu/gk12/lessons.php

K-12 Teaching Resources from Delaware Sea Grant
The University of Delaware, Graduate College of Marine Studies and the Sea Grant College Program offer a variety of free or low-cost resources to K–12 teachers seeking marine science information and curriculum materials. Check out the Neat Stuff with the Interactive Habitat, quick-loading on-line videos and presentations, and the Catch of the Day.
http://www.ocean.udel.edu/public/teacher.html

Keely's Mountain
WGBH Educational Foundation, through Teachers' Domain, offers this self-paced literacy lesson about the power of place for grades 5-12. Students learn about the use of symbolism in literature and examine how places can have symbolic meaning.
http://www.teachersdomain.org/resource/midlit11.ela.splhope/

Keep Oceans Clean Campaign
A multi-media public service ad campaign designed to educate, energize, and excite, this campaign aims to encourage everyone to protect the oceans from the harm caused by marine debris. The website includes links to educational materials and background information. Check the website out for new materials, including games, PSAs, and more.
http://www.keepoceansclean.org

Keeping Habitats Healthy eFieldTrip
The eFieldTrip, *Keeping Habitats Healthy: We All Can Help!* is the latest educational outreach program in the Bureau of Land Management's *Share the Adventure* series. The eFieldTrip has three major components – a virtual visit, a trip journal, and Ask the Experts, open April 29-May 1, 2008.
http://www.efieldtrips.org/Habitat/index.htm

Kelp Forest TV Shows
Dr. Bill Bushing is currently involved in the production of a proposed commercial cable TV show, *Munching & Mating in the Macrocystis*. The show will focus on the marine life, ecology, and conservation issues related to the giant kelp forests of southern California. The introductory episode is available for downloading from the website.
http://www.starthrower.org/products/tv%20show/M&M%20tv%20show.htm

Kenai Fjords Tours' Marine Science Explorers Program
The Seward-based *Marine Science Explorer Program* turns a whale watching boat into a floating laboratory/classroom where passengers become active observers and explorers, exploring Resurrection Bay. Students use hydrometers, Secchi disks, plankton nets, microscopes, and observation to learn about the Kenai Fjords area. The Prince William Sound Explorer Program explores glaciers, wildlife, weather and navigation.
http://www.kenaifjords.com/76.cfm

Kentucky Critter Files
The University of Kentucky Entomology Department offers the Kentucky Critter Files meant for hobbyists, enthusiasts, and students wanting to know more about locally found insects. While not meant as a scientific identification key, the website offers identification tips which could be useful for those starting to study arthropods.
http://www.uky.edu/Ag/CritterFiles/casefile/casefile.htm

Kentucky PRIDE
Kentucky PRIDE (Personal Responsibility in a Desirable Environment) unites volunteers with government resources to clean the region's waterways, end illegal trash dumps, and promote environmental awareness and education. PRIDE's educational projects include Project Clean Streams, a campaign to teach students about the importance of good water quality; and Water Quality Assessment and Stream Monitoring training for teachers with free curriculum and water monitoring equipment.
http://www.kypride.org/

Key Concepts in Geomorphology
With funding from the National Science Foundation and other organizations, a group of geomorphologists based at the University of Vermont are working on a new type of geomorphology textbook. There will be 14 chapters, with additional electronic supplements, images, and more.
http://www.uvm.edu/~geomorph/textbook/

Key to the Sea - California
Key to the Sea is Heal the Bay's free marine environmental education program for teachers and elementary school children (K-5) throughout Los Angeles County. The hands-on environmental education program incorporates learning about watershed stewardship for teachers and students throughout the school year. It includes teacher workshops, field trips, and comprehensive standards-aligned curricula and materials

packets. The program focuses on watershed stewardship, stormwater pollution prevention, and marine conservation.
http://www.healthebay.org/key2sea/

Keys Spill.Com
The Keys Spill.com website was set up to help protect the fisheries, living coral reefs, marine life, the Florida Keys economy, and the Keys way of life. The website is updated daily with the latest news on meetings and events, and works in partnership with the Nature Conservancy, U.S. Fish & Wildlife, and others. It offers information about training, volunteering, and more.
http://www.keysspill.com/

Kibin
Kibin is a proofreading and editing service; users can submit papers for review and receive assistance from someone in the Kibin community.
https://kibin.com/

Kids to Conservation
The National Park Service and partners support this website as a toolkit that uses recreation as the basis for engaging kids, and gets youth involved in the planning process so that they can make a meaningful difference in their communities. Kids to Conservation identifies six learning objectives as the foundations for engagement. The website also provides information for adults about finding youth to involve in a project, finding the right age youth to work with, funding opportunities, and more.
http://www.kidstoconservation.org/

Kids as Planners: A Guide to Strengthening Students, Schools and Communities through Service-Learning
The *Kids As Planners: A Guide To Strengthening Students, Schools And Communities Through Service-Learning* book provides teachers, school administrators, students and community partners with a process for designing, implementing and evaluating a service-learning project. It demonstrates how service-learning can effectively meet many educational reform objectives: standards-based learning, character education and school-to-career initiatives. The book includes examples, tools and strategies.
http://www.kidsconsortium.org/books_newsletters.html

Kids.gov
Kids.gov is the official kids' portal for the U.S. government. The website links visitors to U.S. government information and services from government agencies, schools, and educational organizations, geared to the learning level and interest of kids. The mission is to provide a safe place online where kids can create, play, and learn. The website is organized into four audiences: Grades K-5, Grades 6-8, Teachers, and Parents, and is further divided by Learn Stuff, Play Games, and Watch Videos.
http://kids.usa.gov/index.shtml

KidWind Project
The KidWind Project is a team of teachers, engineers, and scientists committed to innovative energy education to promote wind power through affordable tools and training programs that challenge, engage, and inspire students of all ages. The website offers lesson plans, science project ideas, and more.
http://www.kidwind.org/

KIDZONE
The National Wildlife Federation presents this all-new website, with ideas for specific age groups from toddler to teen. The pages contain online games, nature-related activities, and lots of other information and projects. The focus is terrestrial, but there are plenty of interesting ideas.
http://www.nwf.org/kidzone .

Kicking the Tires Expedition
NOAA's Office of Ocean Exploration and Research has launched the NOAA Ship *Okeanos Explorer* 2013 Shakedown: Kicking the Tires Expedition. Follow along with this mission online and through the archives March 18-April 5, 2013. The posting includes a an Ocean Explorer Expedition Education Module, lesson plans, a ship tracker, and more.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1301/welcome.html

Killer Tornado Map
Using NOAA data, Slate has created a visual representation mapping all the U.S. tornadoes since 1950 that have killed one person or more, including representations of each tornado's size and start and ending coordinates. Users can zoom in or out and pan across the map.
http://www.slate.com/articles/news_and_politics/map_of_the_week/2013/05/map_charts_killer_tornadoes_in_u_s_since_1950.html?wpisrc=newsletter_jcr:content

Kilroy Academy
Kilroy Academy is a collection of Science, Technology, Engineering, Art and Math (STEAM) resources, including video tutorials, hands-on demonstrations, and more. Links include worksheets and other resources designed to make data accessible to students from water quality monitors in Florida's Indian River Lagoon.
http://www.kilroyacademy.org/index.html

Kindergarten EE Resources
The California Coastal Commission offers two new Kindergarten-level Environmental Education resources on their website. The classroom activities introduce the topics of global warming (*The Earth has a Fever!*) and the origin of drinking water (*Our Melting Ice Cube*), with tips on how students and their families can help protect the earth.
http://www.coastal.ca.gov/publiced/directory/global_k.html

Kinetic City
Developed by the American Association for the Advancement of Science, this website offers an assortment of science experiments, on-line games, activities, and projects. As an example, *A Touch of Class* is an on-line classification game, while the Grinder explores biodiversity. There are also downloadable leader guides for the activity kits.
http://www.kineticcity.com/

King Tides Project
King Tides Project International is an initiative of organizers on coastlines around the world. Participants work through photodocumentation, community mapping, art, and science to help people understand how sea level rise may impact their lives.
http://kingtides.net/

Kings of Camouflage
This documentary from NOVA explores the world of the cuttlefish and its behaviors. The website offers users the opportunity to view the complete film, along with a downloadable teacher's guide, transcript, links to related materials, and much more.
http://video.pbs.org/video/1150618835/program/979359664

Kiwi Conservation Club
The Kiwi Conservation Club helps teach children about New Zealand's plants, animals, conservation, and respect for nature. The website offers news, games, quizzes, and more. After clicking Wildlife and Wild Places, visitors can investigate Wild Places, Wildlife, Plant Life, and Threats and Impacts. Wild Places links to different habitats, while Plant Life offers information about coastal, wetland, alpine, and forest plants.
http://www.kcc.org.nz/

Knight Science Journalism Program at MIT
Based at MIT, the Knight Science Journalism program offers fellowships and workshops to journalists seeking to increase their understanding of science, technology, medicine, and related fields. This website offers science journalism. The Tracker section offers peer review within science journalism via daily commentary on items dealing with health and medicine reporting, environmental issues, and related matters.
http://ksj.mit.edu/

Know More
Know More, from the Washington Post, looks at a range of complex topics through a simple picture, line graph, or other visual representation. When readers find themselves intrigued, they may click "know more" to navigate to a longer explanation.
http://knowmore.washingtonpost.com/

Know Your Earth 3.0, Local Connections
Know Your Earth 3.0, Local Connections is an educational partnership among 22 of NASA's Earth-observing missions focusing on educating students, teachers, and the public about NASA Earth science research. Each mission has selected a scientist or engineer who were featured on NASA websites throughout April 2013. Have your students check out what these scientists work on and get inspired.
http://www.nasa.gov/topics/earth/earthmonth/KnowYourEarth.html

La Fete d'Ecologie - Louisiana
The Barataria-Terrebonne National Estuary Program and Foundation are gearing up for this year's La Fete d'Ecologie: Barataria-Terrebonne, on November 15, 2008 in Thibodaux, Louisiana. This educational festival highlights the natural, cultural, and historical resources of the Barataria-Terrebonne National Estuary with food, music, educational kids' activities, and more.
http://lafete.btnep.org/

La Fete d'Ecologie: Barataria-Terrebonne - Louisiana
The Barataria-Terrebonne National Estuary Program and Foundation offered "La Fete d'Ecologie: Barataria-Terrebonne," on September 30, 2006 in Thibodaux, Louisiana. This educational festival highlights the natural, cultural, and historical resources of the Barataria-Terrebonne National Estuary with food, music, educational kids' activities, and more. La Fete d'Ecologie educates people about the environment that they live in, the history of the region, and the unique blend of cultures found in the estuary.

http://www.btnep.org/client_files/nl_files/fete%2006%20crablines(1).pdf

Lab Out Loud
The National Science Teachers Association (NSTA) has launched *Lab Out Loud*, a biweekly series in which hosts discuss science news and education with leading scientists, researchers, science writers, and others. The hosts are high school teachers from Wisconsin keenly interested in sharing ideas via the web, and the website includes the downloadable episodes along with links to associated materials.
http://www.nsta.org/publications/laboutloud.aspx

Laboratory Techniques Videos
Those with the need to work in an organic chemistry lab may find this website from the University of Calgary helpful. Created by a team of educational experts at the university, videos demonstrate a variety of techniques that are commonly used in laboratory settings. There are also interactive tutorials for different techniques.
http://www.chem.ualberta.ca/~orglabs/Techniques.html

LaCoast
The Louisiana Coastal Wetlands Conservation and Restoration Task Force website contains information and links relating to coastal restoration projects in coastal Louisiana. The Louisiana Wetland Education Coalition provides an education website to help distribute materials and workshop information that are focused on wetlands information. The education pages include a summary of wetland functions and values, the Louisiana Wetland Web Quest with guided questions, videos and PSAs, and more.
http://www.lacoast.gov/

Lake Champlain Maritime Museum
The Lake Champlain Maritime Museum offers interpretation of the maritime past and present in and around Lake Champlain. Materials on the website are divided into sections that include Education, Shipwrecks & History, and more. The education section contains links to archived shipwreck webcasts and information for educators. The Maritime Research Institute section hosts information about ongoing work at the conservation lab.
http://www.lcmm.org/index.htm

Lake Erie Science Shipboard Curriculum
The Pennsylvania Sea Grant website hosts lesson plans developed for use on the US *Brig Niagara* and the Research Vessel *Environaut* to facilitate science instruction. The contents include pre- and post-field experiences, assessment, and much more.
http://www.paseagrant.org/education-programs/lake-erie-science-aboard-gannon-university-environaut/

LandHelp
The Landhelp website helps private land-holding professionals, students, and other learn how to better manage their lands. Active management keeps land productive and healthy for present and future owners, and for increasing economic, environmental, and aesthetic land benefits. Each topic offers links to information and resources.
http://www.landhelp.info/Framify.php?Page=Home.php

Landsat Image Mosaic of Antarctica
A team of researchers has created a new map of

Antarctica, Landsat Image Mosaic of Antarctica (LIMA), which offers geographically accurate, true-color, high-resolution views, created from more than a thousand images from three years of Landsat satellite observations. The website includes links to a flying tour of the McMurdo area, educational materials, downloadable versions of the mosaic, and more.
http://lima.nasa.gov

Landscapes of the Heart
Scholars, writers and environmentalists are invited to submit manuscripts for consideration in an expanded edition of the book *Landscapes of the Heart* – one that will cross the boundaries of ecology, economics, law, culture, health, the social sciences and the humanities.
http://www.telusplanet.net/public/aleksiuk/homepage/call_for_papers .

LandScope America
LandScope America is a collaborative project of NatureServe and the National Geographic Society. This website is meant to be an online resource for the land-protection community and the public. The site brings together maps, data, photography, and information about the environment from a variety of sources and presents them in dynamic and accessible formats. The goal is to inspire and inform collaborative place-based conservation in the U.S..
http://www.landscope.org/

Last Journey of the Leatherback
This documentary from the Sea Turtle Restoration Project, about the plight of Leatherback sea turtles, is available to teachers and non-profit educational organizations at discounted teachers' price, along with a free teacher's kit. It is appropriate for ages 12 and up. The DVD version is available in English and Spanish.
http://seaturtles.org/press_release2.cfm?pressID=220
http://www.seaturtles.org/pdf/ACF36A.pdf

Last Wild Places in the Ocean – Washington, D.C. and Online
To celebrate World Ocean Day, National Geographic Ocean Fellow Enric Sala takes participants on a virtual expedition to the biologically-rich waters of Chile, Costa Rica, and Kiribati, June 8, 2011. Join Sala in-person at the Smithsonian's National Museum of Natural History or tune in to the live webcast on the Ocean Portal.
http://ocean.si.edu/ocean-videos/last-wild-places-ocean-webcast
http://www.mnh.si.edu/calendar.asp?trumbaEmbed=view%3Devent%26eventid%3D94172278

LeadAmerica
LeadAmerica is a youth leadership organization which sponsors college-accredited, academic-, and career-focused leadership programs for promising young leaders. The Ambassadors Abroad programs provide students with a dynamic, academic, and interactive introduction to the complex historical and contemporary issues facing nations around the world.
http://www.lead-america.org/

Leaf Pack Network
The Leaf Pack Network is a network of teachers and students investigating their local stream ecosystems . Participants create an artificial leaf pack and place it in a stream for

three to four weeks then collect and examine the packs in the classroom and share their data. Students can discover aquatic insects that indicate stream health and learn more about the connection between trees and streams. Check out the links in the Learning Center, look into the resources, and more.
http://www.stroudcenter.org/lpn/

Leafsnap App
Leafsnap is an electronic field guide developed by researchers from Columbia University, the University of Maryland, and the Smithsonian Institution. This free mobile app uses visual recognition software to help identify tree species from photographs of their leaves.
http://itunes.apple.com/us/app/leafsnap/id430649829?mt=8

Learn about Fisheries
Teach about the country's commercial and recreational fisheries with help from The Bridge's Human Activities sections. The listing of links to teacher-reviewed fisheries websites contain information for all grade levels and ages, with fact sheets, lesson plans, and more. Check out the interactive games that demonstrate the importance of the world's fisheries and how to preserve them. Learn about over-fishing, the different kinds of gear used to catch fish, by-catch, and the importance of water quality.
http://www.marine-ed.org/bridge/index_fisheries.html

Learn More About Climate
Learn More About Climate – Climate Change and Colorado's Future is an initiative of The University of Colorado at Boulder's Office for University Outreach in the Division of Continuing Education and Professional Studies. The website offers interviews, problem-based lessons, and more. . Watch videos, find standards-based lessons and interactive resources, and more. Categories include Climate & Weather, Resiliency, Ecology, and more.
http://learnmoreaboutclimate.colorado.edu/

Learning about Renewable Energy
This website provides basic information about solar, wind, biomass, hydrogen, and geothermal power. Students can view a video on how solar panels work, learn about advanced vehicles, alternative fuels, energy delivery and storage, and more. The website also offers information about internships, fellowships, and professional development opportunities.
http://www.nrel.gov/learning/

Learn About Weather, Climate
The USA Today website offers a weather links page, with frequently asked questions and categorized links to USATODAY.com weather background information. There are animated graphics, the basics of weather science, and more. It may take a couple of clicks to find what you're looking for, but the explanations and graphics are easy to understand.
http://www.usatoday.com/weather/wresources.htm

Learn Something New This Summer
In the Ocean Science Topics section of the Bridge, you will find resources in all disciplines of science that can be easily integrated into your biology, physics, chemistry and even English classes. Each discipline is broken down into fine levels of granularity

to help you find exactly what you are looking for. The Bridge even includes a section on ocean literature for those teachers that work cross-curriculum with language arts and English teachers.
http://www.marine-ed.org/bridge

Learning Barge
The non-profit Elizabeth River Project is building a floating wetland classroom, The Learning Barge, powered by sun and wind. The Learning Barge will traverse the polluted and urbanized Elizabeth River. Educational spaces and interactive exhibits will provide hands-on education about the tidal estuary ecology, restoration and remediation technologies, human impact on this ecosystem, sustainable practices, and the importance of environmental stewardship.
http://www.arch.virginia.edu/learningbarge/

Learning Center on Caribbean Weather and Climate
The Learning Center on Caribbean Weather and Climate is designed for a wide range of users, especially from the secondary school level upwards. The general, fundamental phenomena that create weather and climate are explained, including atmospheric composition, solar radiation, the hydrological cycle, and more. Learning projects in the Caribbean are presented alongside tips and resources for teachers.
http://cawedu.net/index.htm .

Learning Landscapes
The new Bureau of Land Management's website contains resources and information for kids, teachers, and learners of all ages. The Kids section includes links to History Mysteries, Burning Issues, Silent Invaders, and more. The Teachers section includes classroom activities and teachers guides along with links to background information.
http://www.blm.gov/wo/st/en/res/Education_in_BLM/Learning_Landscapes.html

Learning from EPA's Climate Showcase Communities
In the course of completing their climate and energy projects, EPA's Climate Showcase Communities learn a lot that can help others interested in starting or expanding their own climate and energy programs. This website collects much of this knowledge, resources, and tips in one location. Topics include Working Across Ideological Differences, Conducting and Evaluating Pilot Projects, Incentive Techniques, and much more.
http://epa.gov/statelocalclimate/local/showcase/csc-learn.html

Learning From the Fossil Record
These lessons from the University of California's Museum of Paleontology integrate physics, biology, and geology to help high school students understand planetary processes that contribute to climate change, biodiversity, and more through time. The lesson plans include island biogeography, sea floor spreading, using foraminifera to interpret past climates, and more.
http://www.ucmp.berkeley.edu/fosrec/Learning.html

Learning from the Sea
Learning from the Sea: Reading and Math Exercises for Young Turks and Caicos Students, is a marine education series that consists of a workbook and an interactive DVD that will be distributed to schools in the Turks and Caicos Islands in an effort to incorporate more marine education and awareness into the school curriculum. This

website contains many features of the DVD, a virtual dive and snorkel, and other material. Additional features include videos, news, and links to other material.
http://www.learningfromthesea.com/

Learning for Sustainability
This website offers an online resource for improving participation and engagement in environment, health, and development for groups working to support multi-stakeholder learning processes. This website offers a guide to on-line resources and highlights a number of activity areas, including topics such as networking, dialogue, adaptive management, and evaluation. The growing role of the Internet is treated as a separate section. Feed back is welcomed.
http://learningforsustainability.nethttp://learningforsustainability.net

Learning Resources at the Royal BC Museum
The website of the Royal BC Museum, British Columbia, hosts a variety of information about topics drawn on the museum's research and public programming. On-line programs offer information about endangered species, whales, the giant Pacific octopus, and more. Included are activity sheets, lesson plans, and background information.
http://www.royalbcmuseum.bc.ca/programs/index_programs.html

Learning Science in Informal Environments
The National Research Council report, *Learning Science in Informal Environments: People, Places, and Pursuits*, reviews science learning across settings and learner age groups and over varied spans of times, and stresses the need for professional development among educators in the field.
http://www.nap.edu/catalog.php?record_id=12190

LearningScience.Org
Using the National Science Education Standards as their framework, learningscience.org is an organization dedicated to sharing the newer and emerging "learning tools" of science education. Tools include real-time data collection, simulations, inquiry-based lessons, interactive web lessons, among others, can help connect students with science in ways that were impossible just a few years ago. Links include science as inquiry, life science, science and society, and more.
http://www.learningscience.org/index.htm

LearningSpace
The LearningSpace website is offered through Open University in Britain. It contains dozens of different online courses, categorized into disciplines such as education, science and nature, and history. Registration, though not required, allows visitors to discuss the materials in a forum, write journal entries, and complete different quizzes. Units include Global warming, Finding information in science and nature, and Inclusive education: knowing what we mean.
http://openlearn.open.ac.uk/

Legacy Magazine
Legacy, the National Association for Interpretation's periodical, offers a forum for professionals in the field to exchange ideas and information. Articles, columns, and commentaries deal with practical issues relevant to frontline interpreters, planners, and managers. It is published six times a year. Upcoming themes include Interpreting the

Sea, Interpretation for Diverse Audiences, and more. Check out the website for submission and subscription information.
http://www.interpnet.com/nai/Resources/Publications/Legacy_Magazine/nai/_publications/Legacy_Magazine.aspx

Legal Frameworks for MPA Enforcement in the Caribbean
This report presents a comparative assessment of enforcement provisions in fisheries and marine protected area legislation in different Caribbean countries. It can be used to compare MPA legislation across the Caribbean and promote the adoption of successful legislative techniques to help achieve a more uniform approach to MPA enforcement throughout the region.
http://www.gcfi.org/Publications/ELIEnforcementReport.pdf

Lehigh Earth Observatory's Envirosci Inquiry
The LEO EnviroSci Inquiry website is an inquiry-based earth and environmental science website aligned to a variety of education standards. A main goal is to present science to K-12 students in a historical perspective by engaging in a detailed study of the Lehigh River watershed. The focus on this watershed presents learners with an opportunity to observe how industry has impacted the environment over time. Be sure to look through Coastal Explorations under Geology, the Educator's Guide, and the GIS data.
http://www.leo.lehigh.edu/envirosci/index.html .

Less Than One Campaign
SeaWeb and the Ocean Wilderness Network, a non-profit coalition of regional and national organizations dedicated to protecting the ocean, have launched *Less Than One,* a public awareness campaign calling for greater protection of the ocean through the establishment of a network of fully protected marine reserves along the U.S. Pacific Coast.
www.lessthanone.org

Lesson Collaborations
The Encyclopedia of Life is partnering with The Encyclopedia of Earth and Listen Edition, a company that creates teaching materials around public radio stories. Together, they are giving educators free access to relevant lesson plans and teaching resources that support using of EOL's One Species at a Time podcasts in classrooms. The first three lesson plans in the collaboration are now available for teachers to use for free with their middle and high school students.
http://www.listenedition.com/2014/05/15/killer-whales/
http://www.listenedition.com/2014/05/19/spotted-dolphins-and-spinner-dolphins/
http://www.listenedition.com/2014/05/15/right-whales/

Lesson Plans
The Arizona Game and Fish Department has developed a number of free standards-based lessons for all grade levels which can be downloaded or accessed online. They can be viewed by grade or browsed alphabetically. Check out Fashion-A-Fish, Mapping Your School Site, The Trouble with Crayfish, and much more.
http://www.azgfd.gov/i_e/ee/focus_lessons.shtml

Lesson Plans & Classroom Resources
The National Museum of Natural History has a myriad of resources to teach about natural history. Three sections, Lesson Plans, Web-based Student Activities, and

Resources for Teachers & Classrooms, offer lesson plans, fact sheets, mapping activities, and much more. Topics include biodiversity, the ocean, anthropological research, and much more.
http://www.mnh.si.edu/education/classroom_resources.html

Lesson Plans Inc.
Lesson Plans Inc. is a science curriculum resource for high school physical science and life science teachers. The website offers high school science teachers curriculum that are aligned to California state standards. While the website isn't completely populated, check out the lesson plans on ecology, scientific method, and more.
http://www.lessonplansinc.com/index.php

Lessons from the Bay
Lessons from the Bay helps Virginia school teachers of grades 3-6 incorporate into their classrooms a variety of activities and projects related to protecting and restoring the Chesapeake Bay watershed. The website includes a Project Action Guide, downloadable lesson plans, and more.
http://www.doe.virginia.gov/instruction/science/elementary/lessons_bay/index.shtml

Lessons in Conservation
The Center for Biodiversity and Conservation at the American Museum of Natural History has launched a new online journal, *Lessons in Conservation* (LinC), designed to provide educators and students with up-to-date resources in biodiversity conservation. All materials in LinC are peer-reviewed, and are a part of NCEP teaching modules. Easily modifiable versions of the materials found in LinC, along with additional teaching modules, are available on the website.
http://ncep.amnh.org/linc/

Lessons from the Deep
NOAA's Office of Ocean Exploration and Research has sponsored 11 expeditions to explore deep-sea organisms and ecosystems in the Gulf of Mexico and are archived on this website, including lesson plans and an Educators' Guide for grade 5-12 educators. *Lessons from the Deep: Exploring the Gulf of Mexico's Deep-Sea Ecosystem Education Materials Collection* includes a wide variety of topics related to physical science, life science, Earth science, and technology applications.
http://oceanexplorer.noaa.gov/edu/guide/welcome.html

Lessons from the Deep Education Materials Collection
NOAA's Office of Ocean Exploration and Research offers the downloadable *Lessons from the Deep: Exploring the Gulf of Mexico's Deep-Sea Ecosystems Education Materials Collection*, with an Educators' Guide and associated lesson plans. Additional lessons and activity guides will be added to the collection as more information is produced from ongoing exploration and research activities in the Gulf of Mexico. Lessons offer opportunities for cross-curricular activities.
http://oceanexplorer.noaa.gov/edu/guide/welcome.html

Lessons Learned About Collaboration
The Eisenhower Mathematics and Science Consortia and Clearinghouse Network is producing a series of Lessons Learned reports from its 12 years of work in mathematics and science reform. The first publication, *What Experience Has Taught Us About Collaboration*, looks at how collaboration is characterized in the literature, presents

strategies and steps for building effective collaborative relationships, and explores several "deep structure" issues that represent barriers to collaborative work. http://www.mathsciencenetwork.org/collaboration.pdf .

Lessons Learned from Large Scale Environmental Restoration
The Northeast Midwest Institute has released *Large-Scale Ecosystem Restoration: Lessons for Existing and Emerging Initiatives.* The downloadable report outlines the importance of multi-stakeholder collaboration and consensus; understanding local and regional governance; comprehensive planning that includes science, economics, and partnership; implementation strategies; and accounting methods that include projecting and tracking expenses, enforcement of actions and ecosystem health status. http://www.nemw.org/restoration_products.htm

Lessons from Packard Foundation's EBM Initiative
The David and Lucile Packard Foundation dedicated funding for coastal and marine ecosystem based management projects worldwide from 2004 to 2009. The *Synthesis Report for the Ecosystem-Based Management for Sustainable Coastal-Marine Systems Initiative* describes the design of the initiative, highlights key insights that have been gained through grantees' accomplishments, and identifies lessons learned. http://www.packard.org/assets/files/conservation%20and%20science/EBM_Report_06.21.10.pdf

Lessons Learned from Sharknado
HK Strategies offers this blog post dissecting why Sharknado became a social media phenomenon. A useful posting if you are interested in creating your own social media stir about a subject of environmental urgency. http://www.hkstrategies.com/Lessons_Learned_from_Sharknado

Let the River Run Silver Again
Let the River Run Silver Again is an environmental conservation story for students ages 10-15 and the teachers, parents, and others who mentor them. It is a source of information and insight for those who want to learn about and benefit from the success of others as well as those who are interested in developing environmental restoration programs in their own watershed. The greater part of the book follows students from one elementary school in Maryland through restoration efforts. http://www.mwpubco.com/LetRiverRunSilver.htm

LETSNet Science Lesson Units
LETSNet – the Learning Exchange for Teachers and Students through the Internet - from Michigan State University College of Education and Ameritech offers curriculum units in a variety of subjects, including science. Science Units include Climate and Weather, Severe Weather, Global Warming, Investigating Environmental Legislation, and more. While on the website, check out other offerings by selecting the *Choose Your View* icon. http://commtechlab.msu.edu/sites/letsnet/noframes/Subjects/science/index.html

Library of Congress Nature and the Environment
The Library of Congress has compiled a collection of resources supporting education on nature and the environment. The multimedia resources include presentations, exhibitions, webcasts, news, and classroom materials. Selections include The

Everglades: Exploitation and Conservation, Global Warming and Climate Change, and more.
http://www.loc.gov/teachers/classroommaterials/themes/nature/exhibitions.html

Life Cycle of a Mineral Deposit
The USGS offers the online teacher's guide, The Life Cycle of a Mineral Deposit - A Teacher's Guide for Hands-On Mineral Education Activities. The guide covers a range of topics including the use of mineral resources in everyday life and how minerals are mined. There are ten different activity-based learning exercises that can be used to educate students on basic geologic concepts and the processes of finding and identifying resources from any given mineral deposit.
http://pubs.usgs.gov/gip/2005/17/

Life in Extreme Environments
The Astrobiology Web offers this list of links about life in extreme environments. Subjects include general information, thermophilic life, deep ocean thermal vents, recommended books, and more.
http://www.astrobiology.com/extreme.html

Life of a Vertebrate Fossil
Through the Smithsonian's Natural History Museum Department of Paleobiology website, visitors learn what paleontologists do in each stage in the life of a vertebrate fossil. Short video clips, interactive diagrams, and photographs show how fossils are prepared for examination, how scientists unravel the stories of these paleontological finds, and how fossils are stored and preserved.
http://paleobiology.si.edu/LVF/#start

Life on an Ocean Planet
Current Publishing Corporation offers a high school marine science program for students to discover, explore, and investigate the world of ocean and aquatic sciences. *Life on an Ocean Planet* is correlated to the National Science Teachers Association's SciLinks Internet site. It balances its content with student-tested investigations and hands-on activities to ensure students achieve science understanding. The text uses an interdisciplinary approach to integrate the curriculum.
http://www.currentpublishingcorp.com/

Life on the Edge
The inaugural issue of *Life on the Edge*, a quarterly newsletter of the Jacques Cousteau National Estuarine Research Reserve, was recently published and is posted on the reserve website. This publication highlights the current research, education, and stewardship being performed by the reserve.
http://www.jcnerr.org/index.htm

LIFE Program
Learning in Florida's Environment (LIFE) is an initiative to establish a series of field-based, environmental-science, education programs around Florida. Each program will represent a partnership between the Florida Department of Environmental Protection and a local school district. The goal of each program site is increased student achievement and teacher professional development in science. The website offers news, contact information, and more.
http://www.dep.state.fl.us/secretary/ed/

Life Story of the Queen Conch
The life story of the Queen Conch, *Strombus gigas*, is available in Spanish, French or English on this website, by CD, or available for downloading in pdf format. (Note: the pdf loads very slowly). The book is a revised and updated edition of *La vie des Lambis* by Katherine Orr and Liliane Frenkiel published in 1986 in Guadeloupe and used in the French Caribbean for educational purposes.
http://www.mda.cinvestav.mx/biblioteca/strombus/inicio.htm .

Life Support: Tennessee's Water
The Cumberland River Compact offers the free, downloadable Life Support: Tennessee's Water, which can be used to supplement to existing science curricula, covering environmental issues that may not be dealt with in existing science texts. It includes information on water science, water resources, and water management, and offers interactive exercises to engage students and help them to understand water issues in a hands-on way. Both teacher and student editions are available.
http://cumberlandrivercompact.org/life-support-tennessees-water/

Limnology and Oceanography
A special issue of the peer-reviewed journal *Limnology and Oceanography* advances the understanding of eutrophication in freshwater and marine ecosystems. The issue, available on-line, provides a valuable multidisciplinary synthesis of the current understanding of the causes and effects of excessive amounts of nitrogen and phosphorus entering lakes, rivers, and coastal waters. The articles also identify gaps in existing knowledge to help guide future research endeavors.
http://aslo.org/lo/toc/vol_51/issue_1_part_2/index.html

LiMPETS Curriculum
The Farallones Marine Sanctuary Association has completed a five-unit pilot curriculum for the LiMPETS Sandy Beach and Rocky Intertidal Programs. Evolved from a teacher handbook, this new curriculum offers scientific background materials and an array of classroom activities for grades 6 to 12.
http://limpetsmonitoring.org/

LiMPETS Website Redesign
The Long-term Monitoring Program and Experiential Training for Students, known as LiMPETS, is an environmental monitoring and education program for students, educators, and volunteer groups throughout California. Approximately 3,500 teachers and students along the coast of California are collecting rocky intertidal and sandy beach data as part of the LiMPETS network.
http://limpetsmonitoring.org/

Linkages and LAND-L List
The International Institute for Sustainable Development supports Linkages, offering news, information, and analysis on international environment and sustainable development, negotiations, and policy making. Many lists are available, including OCEANS-L, CLIMATE-L, WATER-L, and more. The latest launch is LAND-L, allowing subscribers to post announcements related to desertification, land degradation and drought, sustainable land management events, new initiatives, and more.
http://www.iisd.ca/email/subscribe.htm

Linking Girls to the Land
Linking Girls to the Land is an interagency partnership between Girl Scouts of the USA's Elliott Wildlife Values Project and federal natural resource agencies. The partnership works toward the vision that every girl will have an opportunity to participate in conservation and outdoor programs. It encourages partnerships between Girl Scout and federal natural resource agency representatives on national and local levels in order to offer more joint conservation and outdoor programs to 3.8 million Girl Scouts nationwide.
http://www.epa.gov/adopt/patch/index.html

Lionfish Invasion
This USGS website offers a good visualization of the progressive invasion of lionfish into eastern North American waters. These map layers are a compilation of lionfish sighting reports in North America from 1992 though 2008, offering geographical and historical information to show distribution over space and time.
http://fl.biology.usgs.gov/lionfish_progression/lionfish_progression.html

Lionfish Invasion Newsclip
A segment featuring research on the invasion of the Indo-Pacific Lionfish into the western Atlantic and Caribbean was featured on NBC Nightly News, June 30, 2008, and is available for viewing on this website. NBC worked closely with REEF, NOAA, the National Aquarium in Washington DC and others to produce the story.
http://www.msnbc.msn.com/id/3032619/#25462218

List of Caribbean Marine Protected Areas
A list of Caribbean marine protected areas was gleaned from the *Reefs at Risk* publication and the World Resources Institute. The website also includes important metadata and descriptor information. In addition, users can copy the latitude and longitude information and paste it directly into Google Earth.
http://www.coral.aoml.noaa.gov/mpa/sites/

List of Publications on Shipwrecks and Shipwreck Related Topics in NOAALINC
This is a bibliography of shipwreck related titles of print and online resources which have been cataloged in the NOAA Library Network's online catalog. Entries are organized alphabetically by title and include call numbers and URLs if available. The document also includes a section of selected Internet resources. .
http://www.lib.noaa.gov/edocs/Shipwrecks1.pdf

Listen: Making Sense of Sound
The Exploratorium, a hands-on museum in San Francisco, offers a set of online activities giving users the opportunity to listen closely to the particular sounds of the natural world. Listening Guides include suggestions about listening to wildlife, urban environments, and more. The Online Activities sections lets users practice new ways of listening and test their skills.
http://www.exploratorium.edu/listen/index.php

Listen for Whales
Listen for Whales is a project of Cornell Lab of Ornithology's Bioacoustics Research Program that is working to protect Right Whales from the shipping coming in and out of Boston harbor. The website offers background information, interactives, and links to more resources and information.
http://www.listenforwhales.org/

Listening for Orcas
The Listening for Orcas website offers visitors the opportunity to learn about the vocal and behavioral cultures of orcas and listen to recorded vocalizations of the three Southern resident pods in the Salish Sea.
http://listen.orcasound.net/

Litter Clean-Up Initiative
The concept of the Nicodemus Wilderness Project is to provide incentives for youth to explore and expand their horizons through volunteerism, environmental stewardship, and development of writing skills. The Apprentice Ecologist Program aims to engage 1000 kids and teens in a wilderness or nature litter clean-up project by 2006.
http://www.wildernessproject.org/volunteer_apprentice_ecologist.shtml

Little Cayman Research Centre
The Central Caribbean Marine Institute announces that the Caribbean's newest field station, the Little Cayman Research Centre, fringed by the coral reefs of Bloody Bay Marine Park, is open to researchers. Shallow lagoon, wall, and deep ocean habitats are all within swimming distance of the field station. The coral reefs of Little Cayman are isolated from continental and anthropogenic influences and water quality is excellent.
http://www.reefresearch.org

Live (and Archived) from Stellwagen Bank National Marine Sanctuary
Join NOAA scientists and archaeologists from the National Undersea Research Center at the University of Connecticut and the Stellwagen Bank National Marine Sanctuary on July 15, 2006 as they explored the shipwreck of the coal schooners *Frank A. Palmer* and *Louise B. Crary* via a remotely operated vehicle (ROV).
http://www.nurc.uconn.edu

Live Earth
Live Earth, a 24-hour concert on July 7, 2007, will bring together top musical acts with the proceeds from the concerts going to create the foundation for a new, multi-year global effort to combat the climate crisis.
http://liveearth.msn.com

Live from IPY!
Live from IPY! celebrates the International Polar Year by transporting the public to remote polar locations through live from the field calls and Internet presentations. Registration and participation is free. Upcoming presentations include archaeological research at Nuvuk on August 5, 2008 and High Arctic Change '08 from Svalbard, Norway on August 6, 2008. Previous expeditions are archived. *Live from IPY!* continues to transport the public to remote polar locations through live from the field calls and Internet presentations.
http://www.polartrec.com/live-from-ipy/overview

livebetter Magazine
The Center for a Better Life is focused on bettering the human condition, within a real-world scenario, using a sustainable business model. They offer the e-magazine *livebetter*, available free through email or online. The November issue includes STEM Education & America's Future; September's issue features articles about climate change.

http://livebettermagazine.com/eng/magazine/

LiveScience
LiveScience is a science news website which covers scientific breakthroughs, research ventures, and odd facts from around the world, in an online newsmagazine format.
http://www.livescience.com/

Living Data on Facebook
Living Data is a program for understanding climate change and reconnecting to the natural world. Scientists and artists share knowledge of the impacts of climate on people and the environment. Check out the Living Data Atrium, scanning electron microscope pictures, and more.
https://www.facebook.com/pages/Living-Data/390971427676138

Living Edens
This website for the PBS series, The Living Edens, offers a variety of free educational materials meant to accompany the individual programs, but which can be useful stand-alones. There are teacher resources, featured creatures, and individual profiles from each shoot. Check out Palau, with the Aquatic Classroom and Under the Sea; Madagascar, with Eden Evolution and Classroom Resources; and much more.
http://www.pbs.org/edens/

Living Marine Legacy of Gwaii Haanas V: Coastal Zone Values and Management around Haida Gwaii
The Gwaii Haanas National Park Reserve and Haida Heritage Site, on the Pacific coast of Canada, has released a 413-page report synthesizing nearly all information available about the site, including traditional indigenous knowledge, modern human uses, geology, biodiversity, habitat distribution, and more. For a hard copy of the report, contact Norm Sloan or provide an FTP site to which the document may be sent. The website includes background information
Contact Norm Sloan at norm.sloan@pc.gc.ca

Living on the Ocean Planet Video Contest Winners
These Gulf of Maine Area Census of Marine Life website hosts winning videos submitted to the 2009 National Ocean Sciences Bowl "Living on the Ocean Planet" Video Contest. Check these out by clicking on the "Watch the winning videos" link.
http://www.usm.maine.edu/gulfofmaine-census/

Living Oceans Foundation Education Materials
The Living Oceans Foundation conducts coral reef research expeditions and offers real-time access to coral reefs and coral reef health to educators, students, parents, and the public. The website offers a variety of education materials and opportunities, including photos and videos, archived classroom broadcasts, a marine-themed reading list, and more.
http://www.livingoceansfoundation.org/index.php?option=com_content&view=article&id=182&Itemid=551

Living Schoolyard Guide
The Living Schoolyard Month Activity Guide was developed by Green Schoolyards America in collaboration with organizations across California. The guide includes more

than forty hands-on activities for preK-12th grade students. Themes include: Art, Wildlife Habitat, Place-Based Understanding, and much more.
http://www.greenschoolyardsamerica.org/

Living Waters: Aquatic Preserves of Florida
A one hour documentary, "*Living Waters: Aquatic Preserves of Florida*", highlights 12 aquatic preserves in Florida. Clyde Butcher, the Department of Environmental Protection through the Florida Coastal Management Program and the Office of Coastal and Aquatic Managed Areas cooperated with several sponsors to create this educational and artistic documentary to educate, inform and entertain, letting us experience the complexity of the essential components of these water-bound ecosystems.
http://www.liveoakproductiongroup.com/Aquatic%20_Preserves/AP_Home.html .

Living in the Weather
NOAA's Ocean Service Education website offers new *Living in the Weather* resources for teachers, explaining how meteorologists observe and predict the weather. The resources will help teacher engage their students in the exploration and prediction of atmospheric conditions responsible for weather patterns and climatic conditions, and investigate how extreme weather impacts people and the environment.
http://oceanservice.noaa.gov/education/pd/living_weather/

Local Fisheries Knowledge Project
Looking through the lens of marine fisheries, high school students learn about history, culture, science, language arts, and business as part of NOAA's pilot Local Fisheries Knowledge Project. This new website highlights a pilot education project in which high school students interview fishermen and others in related industries. The site includes a description of the project, its educational framework, and will be updated as the project progresses.
http://www.st.nmfs.gov/lfkproject/ .

Locally-Managed Marine Area Guidebook
A new book offers step-by-step guidelines to help coastal communities and conservation partners plan and maintain locally managed marine areas (LMMAs). The downloadable guidebook, *Locally-Managed Marine Areas: A Guide to Supporting Community-Based Adaptive Management* (CBAM), is published by the LMMA Network, an initiative to help LMMAs in the Western Pacific benefit from the collective experience of their practitioners.
http://www.lmmanetwork.org/

Loggerhead Lessons
The College of Charleston's Project Oceanica offers *Loggerhead Lessons: A Web-Based Educational Resource* for middle school. All lessons are inquiry-based and aligned with National Science Standards. In addition to the lessons, the website includes pre- and post-tests, answer keys, and the Loggerhead Board Game. (Editor, Rachel Teller)
http://oceanica.cofc.edu/LoggerheadLessons/LoggerheadHome.htm

Long Island Sound Curricular Resource Guide
Connecticut Sea Grant offers the *Long Island Sound Curricular Resource Guide*. Funded by the EPA – Long Island Sound Study, the 148 page guide is a resource for educators teaching about Long Island Sound. The sections include background

information about the sound, activities, lesson plans, science lessons at a field site, and resources. Print copies are free (except shipping), and electronic copies should be available by September 2009.
Contact Karen Massaro at Karen.Massaro@uconn.edu

Long Island Sound Study
The Long Island Sound Study website offers teachers different ways to incorporate Long Island Sound into their curriculum and classroom. The newly redesigned website offers a section for Educators, including a virtual tour of the sound, classroom resources, and links to other websites. Check out the downloadable Long Island Sound Curricular Resource Guide.
http://longislandsoundstudy.net/get-involved/teaching-resources/

Long-term Monitoring Program and Experiential Training for Students (LiMPETS)
NOAA's National Marine Sanctuary Program introduces the LiMPETS network for middle school, high school, and other volunteer groups to monitor the rocky intertidal, sandy shore, and offshore areas of the five west coast sanctuaries (Olympic Coast, Cordell Bank, Gulf of the Farallones, Monterey Bay and Channel Islands). The collected data allows users to follow long-term changes. All of the information in this website is public and free to be used in any way.
http://limpets.noaa.gov/ .

Looking at the Environment from the WorldWatcher Project
The WorldWatcher project at Northwestern University recruited teacher leaders in environmental science to support *Looking at the Environment*, a new research-based GIS-based environmental science curriculum for high school.
http://www.worldwatcher.org

Loop Scoops
Loop Scoops Sustainability Videos and Lessons from WGBH Boston are two-minute segments that aim to help six to nine-year-old children think about product life cycles in ways they can understand. This series of child-friendly videos can help kids think about where their stuff comes from, what's in it, and what happens to it when it's thrown out. Besides the additional information on the website, the Teacher Resources links to appropriate materials on the Teachers Domain website.
http://pbskids.org/loopscoops/

Lophelia II 2010: Cold Seeps and Deep Reefs
NOAA's Office of Ocean Exploration and Research announces the launch of the *Lophelia II 2010: Cold Seeps and Deep Reefs*, October 14-November 4, 2010. The expedition posting (which will be active later tonight) will include daily logs, videos and images, an education module, lesson plans, an "Ask an Explorer" feature, and more.
http://oceanexplorer.noaa.gov/explorations/10lophelia/welcome.html

Lophelia II 2009: Deepwater Coral Expedition: Reefs, Rigs, and Wrecks
NOAA Ocean Exploration and Research Program has launched the *Lophelia II 2009: Deepwater Coral Expedition: Reefs, Rigs, and Wrecks Web* page, complete with archives of the mission. A basic goal of the study was to be able to predict deep-water coral distribution in the Gulf of Mexico. Educators working with scientists from the cruise developed an Ocean Explorer Expedition Education Module for the mission, and the website also includes logs, video, OceanAGE Career Connections, and other resources.

http://oceanexplorer.noaa.gov/explorations/09lophelia/welcome.html

Lophelia II 2008: Deepwater Coral Expedition: Reefs, Rigs, and Wrecks
NOAA's Ocean Exploration and Research Program has launched the *Lophelia II 2008: Deepwater Coral Expedition* website. It highlights the first cruise of a 4-year project funded by the US Mineral Management Service and the NOAA Office of Ocean Exploration and Research to explore new deepwater coral communities at both natural and man-made sites in the Gulf of Mexico. Educators have developed an Ocean Explorer Expedition Education Module for the mission.
http://www.oceanexplorer.noaa.gov/explorations/08lophelia/welcome.html

Lophelia II 2012: Deepwater Platform Corals Expedition
NOAA's Office of Ocean Exploration and Research has launched Lophelia II 2012: Deepwater Platform Corals Expedition with daily logs, videos and images, lesson plans, an Ask an Explorer feature, and more. The expedition, July 12-23, 2012, is the final cruise in a four-year research mission to explore and study deepwater coral communities in the Gulf of Mexico. This cruise is the first dedicated scientific study of deep-sea corals on actively producing oil and gas platforms.
http://oceanexplorer.noaa.gov//explorations/12lophelia/welcome.html

Losing Louisiana
This multi-media website offers a visual look at Louisiana after Hurricane Katrina. The site offers an aerial view of the region, complete with interactive elements that allow users to click on a number of locations. Within each section are a series of photographs, augmented by audio that include interviews with coastal restoration experts and locals affected by the hurricane, videos offering explorations of some of the sites are profiled. Also included is a history of the levees as well as information about subsidence.
http://digitalartwork.net/wetlands/losinglouisiana/index-ie.html

Louisiana Marine Education Resources
The Louisiana Sea Grant College Program offers La MER, (Louisiana Marine Education Resources), a website repository for regionally relevant marine education resources. The website links to aquatic education projects, including Native Fish in the Classroom and Ocean Commotion; classroom resources, including On Again, Off Again: the Dead Zone and Manatee Activities; and other useful aquatic links.
http://lamer.lsu.edu/index.htm

Louisiana Public Broadcasting Digital Media Library
The Louisiana Public Broadcasting LearningMedia is a free digital media library with more than 18,000 resources for all age levels. Registration is required after an initial trial.
http://beta.lpb.org/index.php/education/

Louisiana Public Broadcasting Education Website
Louisiana Public Broadcasting has just launched LPB LearningMedia, an educational website. The website offers links to electronic field trips, streaming videos, webinars, and more, with additional content to be added in the future.
http://beta.lpb.org/index.php/education/

Louisville Seamount JOIDES Resolution Videoconferencing Opportunity

The next expedition (Expedition 330) of the *JOIDES Resolution* will start December 13, 2010 from Auckland, New Zealand and will explore the movement of the Louisville and Hawaiian hotspots to look at plate motion in the Pacific. It will sample ancient lava flows to provide insights into the evolution processes of the Louisville volcanoes between 80 and 50 million years ago. Sign up for a live ship-to-shore video interaction with Expedition 330 scientists and Education Officers.
http://joidesresolution.org/
https://spreadsheets.google.com/viewform?formkey=dFA4T1BzaEdENXJvMnlDREVDUGRBZHc6MA

Loxahatchee River District Environmental Poster Series
The Loxahatchee River District in South Florida is pleased to announce the debut of its environmental poster series. The first poster features the seven species of seagrass found in the Loxahatchee River Estuary and southern Indian River Lagoon. The poster provides a way to educate the public about the importance of seagrasses and how residents can alter their actions to minimize their impact on seagrasses. The poster, along with other materials, is available for downloading from the website.
http://www.loxahatcheeriver.org/videos.php

LSI: Attack of the Alien Invaders
LSI: Life Science Investigation - Attack of the Alien Invaders uses the news story of the potential Asian carp invasion of the Great Lakes to interest students in life science. This collection of nine multimedia resources provides teachers and students access to real scientists and science practices used in the field to manage and control invasive species and to monitor ecosystem health.
http://www.wviz.org/lsi

LTER Education Library
The Long Term Ecological Research Network (LTER) is committed to providing scientific expertise, research platforms, and long-term datasets necessary to document and analyze environmental change. The mission of LTER Education is to use the uniqueness of the network to promote learning about long-term ecological processes and the earth's ecosystems.
http://www.lternet.edu/Education

Lucas Miller, the Singing Zoologist
Lucas Miller, the singing zoologist, uses music, stories, puppets and humor to teach about monarch butterflies, wetlands, animal defenses, endangered species, and other nature-related topics. On the website, listen to examples of his songs, from wetlands to invasive species and more.
http://www.lucasmiller.net/

Made in Countdown 2010
Countdown 2010 is a network of active partners working together towards the 2010 Biodiversity Target. The Made in Countdown 2010 publication is a collection of success stories by Countdown 2010 partners which have helped to make a difference for biodiversity. Examples of successful actions include adoption of protection measures, implementation of action plans, raising awareness, and reduction of biodiversity impacts. The report is downloadable from the website.
http://www.countdown2010.net/year-biodiversity/what-can-you-do/made-in-countdown-2010

Maggie's Earth Adventures
Maggie's Earth Adventures is an educational website offered in both English and Spanish. Animated stories address environmental issues such as over-fishing, invasive species, animal habitats, and more. Online interactive games and downloadable standards-based activities in four subject areas are available. Teachers can sign up for a free weekly activity packet with self-directed lesson plans at the emergent reader, primary, and upper elementary level.
http://www.missmaggie.org/

Maggie's Earth Adventures
Maggie's Earth Adventures offers materials designed to provide children with the knowledge and motivation to make educated and responsible decisions so they may protect and build a sustainable future for our planet. Ocean Conservancy recently partnered with Maggie's Earth Adventures to create classroom-ready activities on ocean acidification. Produced in English and Spanish, the lessons are available on three reading levels for grades preK-6. Check out the example activities and subscribe to the weekly email packets.
http://www.missmaggie.org/

Magic Porthole
Horizon International has created a way for young people to experience coral reefs through the Magic Porthole™ experience. The Magic Porthole takes visitors into the world of coral reefs with videos, photographs, reef creatures who will be guides, games to enjoy while making discoveries about the lives of boxing crabs, and more. Check back periodically for additional resources, as the website has just come on-line. These include a memory game, a Special Environment Achievement contest, news, and more.
http://www.magicporthole.org/

Magic Porthole Coral Reef Playing Cards
In advance of the International Year of the Reef, Horizon International has launched its Magic Porthole coral reef playing cards with photographic mirror-images of coral reef creatures. One version of the cards has all the same backs so they can be used to play card games, while a second version has backs with information about the species so they can be used for memory games and flash cards. The website includes a variety of resources, news, and more.
http://www.magicporthole.org/

Magnetic Anomalies of the World's Largest Volcano
Follow along with the Schmidt Ocean Institute's R/V *Falkor* to the western Pacific Ocean's Shatsky Rise, an undersea oceanic plateau where the Tamu Massif is located. The six-week expedition starts early October 2015. Sign up to connect your classroom in real-time to learn about the voyage.
https://texasstateaquarium.org/programs-camps/stem-professional-in-residence/

Making Connections for Bird Conservation
Partners in Flight has published *Making Connections for Bird Conservation: Linking States, Provinces & Territories to Important Wintering and Breeding Grounds*. This document offers maps which summarize migratory connections between individual U.S. states, Canadian provinces and territories, and the regions that support the same birds

at the other end of migration. The document includes maps of migratory connections for each state, province and territory, and a series of appendices.
http://www.partnersinflight.org/pubs/ts/04-Connections

Making Waves
Making Waves is a multimedia outreach project designed to help bring science and math to life in your middle school classroom by unlocking the mysteries of the oceans. Partners for the website include the College of Marine Science at the University of South Florida, USGS, and InterActive Teacher Magazine. Resource topics include Sea Level Rise, Red Tides, Oceans from Space, Real Time Data, and much more. Check out the background information, activities, and links on this website.
http://waves.marine.usf.edu/mwhome.htm

Making Waves
NOAA's National Ocean Service (NOS) Communications and Education Division has launched a weekly podcast, *Making Waves*. The podcasts highlights current activities, recent discoveries, and other happenings around NOS and will be launched each Friday. The website also offers links from each episode, along with downloadable transcripts of the podcasts.
http://oceanservice.noaa.gov/podcast.html

Management of Biological Invasions
Management of Biological Invasions is an open access, peer-reviewed, online journal focusing on experiences in the field of biological invasion management. It admits worldwide contributions on management of bio-invasions provided they may contribute to a better diffusion of technical and scientific ideas, approaches, and results throughout the world.
http://www.managementofbiologicalinvasions.net/index_archivos/Page298.htm

Managing Ecosystems, Managing Fisheries Webinar
The webinar, *Managing Ecosystems, Managing Fisheries: How do EBM and EBFM Relate?* explores the relationship between ecosystem-based management and ecosystem-based fisheries management. A recording will be available.
www.ebmtools.org/about_ebm/meam.html

Managing Effectively the World's Most Iconic Marine Protected Areas
Managing effectively the world's most iconic Marine Protected Areas: A best practice guide outlines how using area-based tools, such as marine spatial planning, can help to plan for and achieve environmental, social, and economic objectives that lead to sustainable use and effective management over time.
http://whc.unesco.org/en/news/1300

Managing for Resilience
The Marine Ecosystems and Management, Volume 7, Number 4, offers an overview of managing for resilient ecosystems. There are different viewpoints discussed, along with links for additional information. While on the website, check out previous topics, including citizen science, food production vs marine conservation, and more.
http://depts.washington.edu/meam/issues.html

Managing Tourism and Biodiversity
This User's Manual on the Convention on Biological Diversity's Guidelines on Biodiversity and Tourism development is a revised version of a draft prepared pursuant to a meeting of experts. In addition to the user's guide, the manual includes checklists and additional resources.
http://www.biodiv.org/doc/programmes/socio-eco/tourism/tourism-manual-en.pdf

Mangal Cay
Mangal Cay is virtual tour of a Caribbean mangrove island, brought to us by the Animal-Plant Interaction Lab at the Smithsonian Environmental Research Center and the National Science Foundation. Educators can use it in conjunction with their own webquests to highlight the special ecology of mangrove wetlands. Note that a fast Internet connection is needed for an optimal tour.
http://www.serc.si.edu/labs/animal_plant_interaction/Trail/VirtualTour.html

Mangrove Video
The Mullet Pond Coalition offers an on-line video showcasing the ecological diversity and value of Mullet Pond in Simpson Lagoon, St. Maarten. This five minute video provides a view into the underwater world and wildlife encountered among the mangrove trees and seagrass. It also outlines why Mullet Pond is so environmentally important and how it may be under threat. This video can be seen along with others on the popular website, You Tube.
http://www.youtube.com/watch?v=lQEgQhy8QAE

Manta Ray Catalogue
A catalogue of individual manta rays visiting the Flower Garden Banks National Marine Sanctuary is available at the sanctuary offices and online. Markings on the undersides of each animal are unique and help scientists to try to learn more about these animals. The website also offers a downloadable poster.
http://flowergarden.noaa.gov/science/mantacatalog.html

Many Learning Pathways in the Ocean Science
This series highlighted ocean scientists sharing strategies for increasing diversity in their community. The archived webinars are available online, in addition to interactive concept maps, related resources, and more.
http://cosee.umaine.edu/programs/webinars/mlpios/

Many Strong Voices
The goal of Many Strong Voices is to promote the well-being, security, and sustainability of coastal communities in the Arctic and Small Island Developing States by bringing these regions together to take action on climate change mitigation and adaptation, and to tell their stories to the world. Check out the resources pages with links to podcasts, video, and more; read portraits of resilience; and access the free peer-reviewed journal articles.
http://www.manystrongvoices.org/

Map of the Month
The Earth Institute *State of the Planet* blog produces a new map each month filled with interesting data and includes an in-depth article explaining what is being shown on the map.
http://blogs.ei.columbia.edu/tag/map-of-the-month/

Map Projections
This website features examples of eighteen common map projections, including a description that explains the properties and uses of the projection, disadvantages, and more. There are also summary tables of projection properties, general uses, and geographic areas most suitable for mapping with a given projection.
http://egsc.usgs.gov/isb/pubs/MapProjections/projections.html

Map Scales
This quick lesson shows students how to use various types of scales to measure distances on a map. Topics include the statement of equivalency, bar scales, the representative fraction, and how to measure distances along a curve.
http://academic.brooklyn.cuny.edu/geology/leveson/core/linksa/scale_use.html

Mapping Activities from NOAA OER
NOAA's National Coastal Data Development Center provides a map-based atlas that links to information about past expeditions of NOAA's Ocean Explorer program that began in 2001. The Digital Atlas can be used to obtain information about past NOAA Ocean Explorer expeditions, education resources associated with the expeditions, ship tracks, bathymetric maps, dive tracks, and more.
http://www.ncddc.noaa.gov/website/google_maps/OE/mapsOE.htm

Mapping Cultural Dimensions of Marine Ecosystem Services
This report analyzes ways of increasing the visibility of cultural values in the marine spatial planning process, with the goal of improving the identification and mapping of culturally significant ocean areas. Topics include what is meant by cultural values and what are the issues, methods for identifying places of socio-cultural importance, risk assessment, mapping, and more.
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGHIE/2013/WKCES13.pdf

Mapping Demonstrations
Check out three more EBM Tool Demonstrations on mapping: California Ocean Uses Atlas, Google Earth and Google Maps, and Participatory GIS through the Ecosystem-Based Management Tools Network. All demonstrations are archived a few days following the event.
http://www.ebmtools.org/tools_training/presentations.html

Mapping Human Activity in the Marine Environment: GIS Tools and Participatory Methods
This report summarizes a workshop convened by the National MPA Center focused on mapping human activity in the marine environment using GIS tools and participatory methods. The goal of the workshop was to develop general design criteria for practical participatory methods to collect spatial data on human use patterns to inform local and regional MPA planning processes. The report identifies the types of data needed and includes recommendations for collecting the data types both at regional and local levels.
http://www.mpa.gov/information_tools/social_science.html

Mapping Human Uses of the Ocean
The MPA Center published a best practices manual on mapping human uses of the ocean using participatory GIS techniques. *Mapping Human Uses of the Ocean:*

Informing Marine Spatial Planning Through Participatory GIS provides lessons learned from various participatory mapping projects and provides insight to the successful planning and implementation of mapping efforts to capture spatial data on human uses of the ocean in different regions and at varying scales.
http://www.mpa.gov/pdf/helpful-resources/mapping_human_uses_nov2010.pdf

Mapping an Ocean Sanctuary – GIS in the Classroom
Mapping an Ocean Sanctuary introduces the techniques and applications of geographic information systems. Developed by the Center for Image Processing in Education and the Channel Islands National Marine Sanctuary, in collaboration with Sustainable Seas Expeditions, the six lessons teach fundamental marine and environmental concepts. Students work with case studies, data, and images from the Channel Islands, California.
http://www.cinms.nos.noaa.gov/edu/edu_teacher.html

Mapping the Uncharted Diversity of Arctic Marine Microbes Project
NOAA's Office of Ocean Exploration and Research has launched the Mapping the Uncharted Diversity of Arctic Marine Microbes Project web page on its Ocean Explorer website. The website includes background essays, images and video, an Ocean Explorer Expedition Education Module, lessons, and more.
http://oceanexplorer.noaa.gov/explorations/15arctic-microbes/welcome.html

Maps Tutorials
The Knight Digital Media Center produces a range of media tools designed to assist journalists and others with their work and projects. This maps tutorials website is designed to help people get started with using maps in various publications and presentations. The presentations include Google Map Basics, Embedding Map Mashups, and more. The website also offers links to additional resources.
http://multimedia.journalism.berkeley.edu/tutorials/cat/maps

MAREX Teacher Resources
University of Georgia Marine Extension Service hosts a teacher resource page with background information on coastal Georgia, field guides, and more. Field guides highlight coastal Georgia flora and fauna. The first curriculum offered is on marine debris; others are planned for future distribution. While on the website, make sure to check out the upcoming professional development opportunities.
http://www.marex.uga.edu/aquarium/TchrRes.html

Marine Animals and Human Noise
NOAA Fisheries and scientists from various academic institutions are sponsoring a free national lecture series on marine mammals and human noise, at public aquariums and marine laboratories around the country. The objective of this unique series is to present current scientific information about human sources and uses of sound in marine environments, the physics of sound and hearing, and biological and behavioral factors that relate to noise impacts.
http://www.nmfs.noaa.gov/prot_res/acoustics/lecture.htm .

Marine Aquarium Council Certification and Standards
The Marine Aquarium Council's mission is to conserve coral reefs and other marine ecosystems by creating standards and certification for those engaged in the collection and care of ornamental marine life from reef to aquarium. It offers certification, training, outreach, and more.

http://www.aquariumcouncil.org/

Marine Archaeology Resources
The Bridge offers a variety of resources about marine archaeology. Topics include *Queen Anne's Revenge*, *USS Monitor*, and more.
http://www2.vims.edu/bridge/search/bridge1output_menu.cfm?q=archeology

Marine Biology Coloring Book
The Marine Biology Coloring Book can serve as a useful resource and guide through hand-drawn illustrations and updated text. The process of coloring can focus attention and leave a visual imprint on memory. The latest edition includes ocean currents and global weather, the deep-sea realm, and more. Those interested can preview pages from the book before purchase.
http://www.harpercollins.com/browseinside/index.aspx?isbn13=9780062737182

Marine Biology Topic Overviews
Odyssey Expeditions offers marine science educational resources from the Marine Biology Learning Center. Topics include oceanography, mangroves, fish, and more. The resources offer an overview of the topic with literature citations.
http://www.marinebiology.org/science.htm

Marine Biology Website
MarineBio.org is a nonprofit volunteer organization of marine biologists, students, professors, and conservation advocates working to share the wonders of the ocean realm to inspire education, research, and a sea ethic. The website includes links to the marine biology news, research, games, species information, photo galleries, and more.
http://www.marinebio.org/

Marine Careers
This Sea Grant website introduces visitors to a wide range of marine career fields and to people working in those fields. The interviews include what those interviewed like and dislike about their careers, what they see for the future in their fields, and more.
http://www.marinecareers.net/

Marine Conservation Agreements Toolkit
The Nature Conservancy, with the assistance of partners, offers a Practitioner's Toolkit for Marine Conservation Agreements. The website includes a field guide, descriptions of field projects, and more. Be sure to check out the resources, which include funding databases and sample proposals, sample legal documents, contacts, and much more.
http://www.mcatoolkit.org/

Marine Conservation Biology: the Science of Maintaining the Sea's Biodiversity
Marine Conservation Biology brings together leading experts to apply the lessons and thinking of conservation biology to marine issues, offering insights on the nature of marine biodiversity, threats, and what can be done to recover the biological integrity of the world's estuaries, coastal seas, and oceans. Sections examine distinctive aspects of marine populations and ecosystems; threats to marine biological diversity; place-based management of marine ecosystems; and the human dimensions of marine conservation.
http://www.islandpress.org/books/detail.html/SKU/1-55963-662-9

Marine Conservation Photo Gallery From Norbert Wu
Underwater photographer Norbert Wu has established a website where photographs taken under his Pew Fellowship are available at a nominal cost as a discretionary service to valid nonprofits and researchers.
www.norbertwu.com/pew/index.html

Marine CSI
Marine CSI: Coastal Science Investigations is offering free sample lessons from their two books. Each book contains over 50 lessons divided into eight units correlated to the Next Generation Science Standards. Amazon offers a preview of the books on their website. Kimberly Belfer is offering a sample lesson; contact her with your grade level of preference and your location.
http://www.amazon.com/Marine-CSI-Coastal-Science-Investigations/dp/1492840718
http://www.amazon.co.uk/Marine-CSI-Coastal-Science-Investigations/dp/1497427223
Contact Kimberly Belfer at kimberly.belfer@gmail.com

Marine Cultural and Historic Newsletter
NOAA's National Marine Protected Areas Center distributes the monthly *Marine Cultural and Historic Newsletter*. It includes news and updates from around the world, providing a short summary followed by the link to the original news site and/or relevant agency website. Sections include Federal Agencies; Activities in States and Territories; From the Halls of Academia; Global Perspectives; The Reference Library; and Upcoming Events. Access the newsletter through the MPA Center's Cultural Resources website.
http://www.mpa.gov/information_tools/cultural_resources.html

Marine Debris
MarineDebris.Info is an online community for sharing knowledge on research, management, and prevention of marine debris. MarineDebris.Info consists of the MarineDebris.Info listserv, an online discussion forum, along with webinars on subjects of interest to the marine debris community.
http://marineaffairs.org/marinedebris.html

Marine Debris
Each year, Ocean Conservancy provides a global snapshot of marine debris collected and recorded at more than 6,000 sites all over the world on a single day during the International Coastal Cleanup. The world's largest volunteer effort for the ocean and waterways works towards global solutions through the cumulative efforts of volunteers around the world.
http://www.oceanconservancy.org/site/PageServer?pagename=program_marinedebris

Marine Debris 101
NOAA's Marine Debris Program is a national and international effort focused on identifying, reducing, and preventing debris in the marine environment. This educational website seeks to inform people about the sources, impacts, and solutions of the marine debris issue. The website offers downloadable brochures, posters, fact sheets, guidebooks, and activity books tailored to specific audiences, including beachgoers, fishermen, boaters, students, and educators.
http://marinedebris.noaa.gov/marinedebris101/welcome.html

Marine Debris Animation
The National Marine Sanctuaries offers an online marine debris flash animation. At the end of the animation is a Response Blog, allowing the public to tell how they will make a difference.
http://sanctuaries.noaa.gov/makeadifference/

Marine Debris App
The Marine Debris Tracker mobile application, an app for both Android and iPhone, allows users to track trash on coastlines and waterways. The homepage is automatically updated with the five most recent items tracked by various users. The website also offers a map of the data that participants have tracked.
http://www.marinedebris.engr.uga.edu/

Marine Debris Assessment Expedition
Follow the R/V Manta on its journey as it headed out into the Gulf of Mexico for the 2009 Marine Debris Assessment Expedition, July 20-25, 2009. You can follow along on the web as technical divers tackled the challenge of evaluating and removing derelict fishing nets and more from the Stetson Bank. Learn about the focus of the expedition, meet the team of divers and scientists that made it happen, and read the daily blogs.
http://flowergarden.noaa.gov/science/techdive09.html

Marine Debris Calendars
NOAA's Marine Debris Program has 2011 Marine Debris Calendars that they would like to be utilized and disseminated throughout the nation. They can provide up to 30 calendars per site on a first come, first served basis while supplies last. Please provide the following: quantity requested, full name, organization, mailing address, and how the calendar will be disseminated or used.
Contact Carey Morishige at Carey.Morishige@noaa.gov

Marine Debris CDs
Marine Debris of the Northwestern Hawaiian Islands: Ghost Net Identification is an effort to increase public awareness of the Northwestern Hawaiian Islands derelict fishing gear problem. This 2-disc set includes a CD document on marine debris in the Northwestern Hawaiian Islands and a narrated DVD slide show presentation that illustrates the magnitude of the marine debris problem in the NWHI and focuses on the removal process through the eyes of a marine debris diver.
Contact Kerry Irish irish@hawaii.edu or Molly Timmers at molly.timmers@noaa.gov
http://www.nmfs.hawaii.edu/cred/mdr.php

Marine Debris Curriculum
NOAA's Marine Debris Program offers a variety of downloadable marine debris educational materials. Turning the Tide on Trash: A Learning Guide on Marine Debris is a set of lesson plans and background information which introduces the topic of marine debris. The Educator's Guide to Marine Debris is designed for educators in both formal and informal education situations. Check out the other materials on this website.
http://marinedebris.noaa.gov/educate-others/curriculum

Marine Debris to Energy Project
The New Hampshire Marine Debris to Energy Project studies marine debris at sea and on the shore, incorporating waste-to-energy and recycling as part of cleanup efforts.

The website includes individual beach debris breakdowns, a reporting form, and more. Individual beach maps will be available in the future.
http://www.nhmarinedebris.org/

Marine Debris Materials
NOAA's Marine Debris Program offers a 2011 Marine Debris Planner (calendar) featuring the winning artwork from the 2010 *Keep the Sea Free of Debris!* art contest, along with an educational poster on the garbage patches. Check these and other free items on the website.
http://marinedebris.noaa.gov/outreach/resources.html

Marine Debris Module
This module looks at marine debris' impact on the Northwestern and Main Hawaiian Islands and performing related scientific investigations. It is designed for grades 4-12. Students will examine issues related to current scientific studies, develop and implement their own related scientific investigations, and use their findings to take positive actions related to stewardship in their own backyards. The website includes a downloadable Teacher's Guide, introductory materials and scientific articles, and much more.
http://www.hawaiiatolls.org/research/NWHIED2005/resources/MDM/MDM.html

Marine Debris Monitoring Field Guide
The NOAA Marine Debris Program provides information to individuals or groups interested in undertaking shoreline monitoring studies for Japan tsunami marine debris. Request a copy of the Shoreline Survey Field Guide and electronic data sheet.
Contact MD.monitoring@noaa.gov
http://marinedebris.noaa.gov/info/japanfaqs.html

Marine Debris Poster
The North American Marine Environment Protection Association offers a downloadable marine debris poster, "Do You Know Where Your Litter Is? Right Where You Left It."
http://www.namepa.net/Downloads/News/NAMEPA_Marine_Debris_Poster.pdf

Marine Debris Program
NOAA's Marine Debris Program has identified four strategies to address marine debris: identification, monitoring, research, and information transfer; reduction through removal; prevention, including education and outreach; and emergency response. The website includes background information, a glossary, links to education and outreach programs, a glossary, and more.
http://marinedebris.noaa.gov/welcome.html

Marine Debris PSAs
The Sitka Sound Science Center has created three, one-minute videos highlighting the role individuals play in reducing marine debris. The project is called "A Drop in the Bucket, Every Drop Counts!"
https://www.facebook.com/permalink.php?id=156006977745168&story_fbid=797718413575442

Marine Debris Video and Slidepacks
The Offshore Operators Committee offers information about marine debris in both English and Spanish. The website has pdf, PowerPoint, and downloadable videos about marine debris. While geared toward people who work offshore on oil and gas production

platforms, they offer good information and demonstrate how even simple actions can help.
http://www.offshoreoperators.com/marinedebris/

Marine Debris Webinars
In this two-part series, learn from scientists researching plastic pollution at the microscopic level and learn about how computer models can be used to predict where debris will go once it reaches the ocean. The second webinar will take place May 7, 2014. Webinars will be archived online for viewing after the presentation, and a link will be provided to the webinar archive to anyone registered.
http://cosee.umaine.edu/programs/webinars/marinedebris/

Marine Ecology, Human Impacts, & Conservation
National Geographic Education offers the Marine Ecology, Human Impacts, & Conservation website for exploring the importance of ocean health and the establishment and management of MPAs. The nine lessons include The World Ocean, Marine Ecosystems and Biodiversity, Fisheries, and more. The lessons are meant to incorporate into a high school biology curriculum.
http://education.nationalgeographic.com/education/collections/marine-protected-areas/?ar_a=1

Marine Ecoregions of North America
The Commission for Environmental Cooperation offers Marine Ecoregions of North America: a Tool for Ocean Conservation, compiled by specialists from Canada, Mexico, and the United States, describing and mapping the North American oceanic and coastal waters, classifying them into 24 marine ecoregions according to oceanographic features, and geographically distinct assemblages of species. The website offers both downloadable GIS files and an electronic version of the book.
http://www.cec.org/Page.asp?PageID=122&ContentID=2715&SiteNodeID=437&BL_ExpandID=

Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas
This paper in the July/August 2007 edition of the journal BioScience proposes a new global system for classifying coastal and shelf areas. Intended to help identify and address gaps in conservation coverage, the system divides the world's coastal and shelf areas into 12 "realms". Each realm is then subdivided into "provinces", which in turn consist of ecoregions - with a total of 232 ecoregions worldwide. The authors expect the classification to be useful for conservation planning.
http://www.aibs.org/bioscience-press-releases/070628_new_tool_for_marine_conservation.html

Marine Ecosystem Illustrations
National Geographic offers two new sets of marine ecosystem illustrations, free and downloadable from the National Geographic Education website. Ecosystems include abyssal plain communities, antarctic, arctic, abyssal water column, hydrothermal vents, kelp forest, mangroves, open ocean, coral reefs, rocky shores, and sandy shores.
http://education.nationalgeographic.com/education/multimedia/marine-ecosystem-illustrations-grades-3-5/?ar_a=1&ar_r=999
http://education.nationalgeographic.com/education/multimedia/marine-community-illustrations-grades-9-12/?ar_a=1

Marine Ecosystem Services Mapper
The Marine Ecosystem Services Partnership is a virtual center for information and communication on the human uses of marine ecosystem services around the world. The mapper helps visualize data from valuation studies for the use of policy makers, environmental managers, researchers, and others.
http://marineecosystemservices.org/explore

Marine Ecosystem Services Partnership
The Marine Ecosystem Services Partnership is a virtual center for information and communication on the human uses of marine ecosystem services around the world. Visitors can explore ecosystem services on an interactive map, which offers basic information about marine ecosystem service valuations conducted across the globe from a variety of extant and extinct databases. The website also offers a news feed, information about training and conferences, links to resources, and more.
http://www.marineecosystemservices.org/

Marine Ecosystems and Management
The first issue of *Marine Ecosystems and Management*, a new quarterly newsletter on marine ecosystem-based management worldwide, has been produced by the same team as *MPA News*, and is funded in part by the David and Lucile Packard Foundation. To subscribe, send an email to meam@u.washington.edu. Type "subscribe" on the subject line and include your name, mailing address, and daytime phone in the text of the message.
http://depts.washington.edu/meam/

Marine Education Interactive Lessons
Maryland Sea Grant offers interactive, downloadable lessons and references on their website. Lessons include Biofilms and Biodiversity, What is the Key to Classification, and Oysters in the Classroom. The website also includes a link to their quarterly newsletter, workshops, and more.
http://www.mdsg.umd.edu/Education/lessons.html

Marine Education Resource Kits
The Woods Hole Oceanographic Institution is offering, free to educators (other than shipping charges), eight different students' books on ocean science, along with teacher's classroom resources. The books are suitable for intermediate readers, are filled with remarkable images, and conform to national science teaching standards. They are available (while supplies last) as Classroom Kits with 30 copies of one title plus teacher's resource material or Book Packages of 5 of each title (40 books).
http://www.whoi.edu/seagrant/whatsnew/turnstone.html

Marine Education Society of Australasia
MESA - the Marine Education Society of Australasia, Inc. website has a number of resources which can help you to teach about marine and coastal environments. These include teaching units on the Great Barrier Reef and coastal areas (including sample activities for young students), Field Activities for Coastal and Marine Environments, a monthly newsletter, and more.
http://www.mesa.edu.au/teachers.asp

Marine Education in Urban Settings

The Sea Grant Program at the University of Southern California offers resources and helps educators teach marine science and environmental stewardship to urban youth, ensuring that minority students in urban areas have opportunities to learn about the marine environment. Programs include the Island Explorers Program, Parent/Child Education Program, Girls and Boys Science Camps, and the Island Scholars Program. The website includes online activities, links to more information, and a career guide.
http://www.usc.edu/summer
http://www.usc.edu/org/seagrant/MSEdu.html

Marine Fisheries Curriculum
The Northwest Center for Sustainable Resources has completed a comprehensive series of curriculum modules on marine fisheries. The Marine Fisheries Series consists of nine modules covering the background, current status, causes for decline, management approaches, and anticipated future of marine fisheries. The modules are most appropriate for inclusion in undergraduate courses; they can be downloaded from the website or ordered in hard copy (including a CD). Check these out.
http://www.ncsr.org/materials/index.html

Marine Fisheries Series Activity Guide
PBS and Habitat Media offer an on-line Marine Fisheries Series Activity Guide to help you dive deeper into the topics covered in the Marine Fisheries documentary series. The guide includes six peer reviewed activities correlated to national science and social studies education standards. The guide links with each of the hour-long documentaries, *Empty Oceans, Empty Nets* and *Farming the Seas*.
http://www.pbs.org/emptyoceans/educators/index.html

Marine Geological Discoveries
This site by Norwegian researcher Martin Hovland features descriptions of marine geological formations: pockmarks, mud volcanoes, deep-water coral reefs, and gas hydrates. The website displays photos of these deep seafloor features, and compares them to geological structures seen on land and elsewhere, including the moon.
http://www.martinhovland.com/

Marine Geospatial Ecology Tools
Marine Geospatial Ecology Tools (MGET) is a free, open-source geoprocessing toolbox designed for coastal and marine researchers and GIS analysts who work with spatially-explicit ecological and oceanographic data in science and management. MGET includes over 180 tools useful for a variety of tasks.
http://code.env.duke.edu/projects/mget

Marine Highlights from World Conservation Union Congress
The 3rd IUCN World Conservation Congress was held from November 17-25, 2004 in Bangkok, Thailand. The IUCN Global Marine Programme has brought together the marine highlights from this event that include information on adopted resolutions, recommendations, and news on the main themes discussed, including the high seas, marine protected areas, coral reefs, and marine invasives.
http://www.iucn.org/themes/marine/pdf/PostWCC_KeyMarineMsgs.pdf

Marine Job Postings
If you have a job related to marine or coastal environmental issues for any career background (e.g. educators, oceanographers, marine biologists, anthropologists,

lawyers, engineers), please email it to: oar.sg.knauss.joblist@noaa.gov. This listserv is distributed to over 300 people in these fields (many who are Knauss Sea Grant Fellowship alumni) and numerous marine and coastal societies and universities. Contact Nikola Garber at Nikola.Garber@noaa.gov

Marine Laboratory Meeting Proceedings
The Association of Marine Laboratories of the Caribbean has posted all its meeting proceedings published since its founding in 1957. Earlier proceedings offer summaries of the presentations, while later meetings offer more complete articles.
http://www.amlc-carib.org/meetings/proceedings.html

Marine Life Blog
The Marine Life Blog follows the travels and marine life discoveries of Ned and Anna DeLoach and Paul Humann, the authors/photographers of the Reef Set marine life identification book series. The blog offers reports, photos, and video from dive locations around the globe on their marine life encounters. Check out these fantastic visuals.
http://fishid.com/marinelifeblog/

Marine Life Encyclopedia
Oceana, the international ocean conversation organization, has launched a searchable marine life encyclopedia with information about more than 500 marine creatures. The content is licensed from an ocean encyclopedia by a leading educational publisher. Click on the website to explore creatures, places, and science.
http://na.oceana.org/en/explore

Marine Mammal / Geodome Outreach Events – North and South Carolina
Fort Fisher staff, along with the NC Museum of Natural Sciences and partners, offer a variety of marine mammal outreach events for 2011. These events use programs, activities, and a presentation in an inflatable GeoDome theater to reach teen audiences with messages about ocean health and marine mammals. Check these spring events out if you're in the area.
http://www.ncaquariums.com/fort-fisher/teachersstudents/conservation-education-through-marine-mammals

Marine Mammal Habitat Modeling
This website from Woods Hole Oceanographic Institution is dedicated to marine mammal habitat modeling. The website is a repository for presentations, resources, and references.
http://www.whoi.edu/sbl/liteSite.do?litesiteid=7272

Marine Mammal Smart Phone Apps
NOAA Fisheries has unveiled two new smartphone apps, Dolphin & Whale 911 and See & ID Dolphins & Whales, as a way to assist citizens reporting sick, injured or dead marine mammals and identify and view marine mammals responsibly in the wild.
http://sero.nmfs.noaa.gov/protected_resources/outreach_and_education/mm_apps/index.html

Marine Mammals of the Arctic
Immersion Learning's Marine Mammals of the Arctic program includes hands-on activities, videos, and interactive online games to support student studies in science, technology, and exploration. The program focuses on key Arctic animals such as beluga

whales, ice seals, narwhals, and polar bears and provides information about the population dynamics of the animals, current threats, and conservation efforts. Additional topics include Arctic geography, climate change, adaptations, and more.
http://www.immersionlearning.org/arctic

Marine Mammals of the Arctic - Online
Immersion Learning presents live *Marine Mammals of the Arctic* webcasts February 10-12, 2010. Viewers had the opportunity to interact with scientists and trainers who work with marine mammals to better understand their behaviors and physiology, as well as the impact of humans and climate change on these animals. Check out their archived programs, including Dolphins, Life at the Extremes, and more.
http://www.immersionlearning.org/index.php?option=com_content&task=view&id=479&Itemid=231

Marine Mammals Ashore: A Field Guide for Strandings
This updated manual for understanding and dealing with stranded marine mammals describes rescue operations, how to organize a response team, and how to deal with the media and the public. It includes basic information on marine mammal biology, life history, and health, and an extensive bibliography. The 372-page second edition features water- and tear-resistant paper, a vinyl cover, and durable plastic coil binding.
http://www.aqua.org/research_marinemammalsashore.html

Marine Mammals Ashore: A Field Guide for Strandings
The National Aquarium in Baltimore announced reduced prices for *Marine Mammals Ashore: A Field Guide for Strandings* by J.R. Geraci and V.J. Lounsbury (1998). The CD-ROM includes the Field Guide (a comprehensive manual for understanding and dealing with a stranded seal, manatee, dolphin, whale, or sea otter), a multimedia overview of the CD-ROM including discussions by marine mammal experts from around the world, photographs, and more.
mmashore@aqua.org

Marine Matters
The Marine Matters website, funded by World Wildlife Fund Canada, is about awareness, respect, conservation and wise use of what drifts, swims, crawls, floats, walks, and breathes in the ocean. The website provides information to assist with marine planning and highlighting activities ranging from grassroots outreach to formal education. The goal is to facilitate development of a community and conservation-based marine strategy for Haida Gwaii/Queen Charlotte Islands – a blueprint for Islanders to chart their maritime future. The website includes background information, maps, links to publications, downloadable lesson plans, and much more.
http://www.marinematters.org/index.html

Marine Microbial Ecology
This image-rich website from the Australian Antarctic Division's Biology program describes its research in marine microbial ecology. The program studies the microscopic life in the Southern Ocean: single celled plants and animals (phytoplankton and protozoa), bacteria and viruses. The website includes an introduction of microbial ecology and microbial processes, information about the research project, and much more, all discussed using vivid imagery.
http://www-old.aad.gov.au/science/AntarcticResearch/Biology/MME/default_print.asp

Marine Mineral Studies
The U.S. Department of the Interior's website on marine mineral mining on the Outer Continental Shelf is primarily concerned with providing information about the environmental impact that dredging activity has on marine life, with links to renourishment projects. The Kid Connection offers downloadable booklets and directions for simple experiments which allow kids to see erosion and sedimentation in action, along with links to careers in marine minerals.
http://www.mms.gov/SandAndGravel/MarineMineralStudies.htm

Marine Navigation in the Age of Exploration
The Seattle Art Museum hosted the exhibition, Spain in the Age of Exploration, 1492-1819. To accompany it, they developed an interactive website illustrating the use of four ancient nautical instruments: the quadrant, astrolabe, octant, and chronometer. Each instrument's section includes pictures, a bit of history, and a description of how it was used.
http://www.seattleartmuseum.org/exhibit/interactives/spain/launchWin.htm

Marine News – Marine Protection Special
The IUCN Global Marine and Polar Programme offers this special edition of its e-newsletter, *Marine News*. As part of its focus on Marine Protection, the October 2013 issue celebrates the choice of 31 new ocean Hope Spots, areas of ocean that merit special protection due to their wildlife and significant underwater habitats. You can also check out back issues of the publication and subscribe to the newsletter from the website.
http://www.iucn.org/about/work/programmes/marine/gmp_newsletter/

Marine and Ocean Sciences ePrints @ Plymouth
The Marine and Ocean Sciences ePrints @ Plymouth is a digital archive providing access to papers produced by the staff of the Marine Biological Association of the United Kingdom, Plymouth Marine Laboratory, and the Sir Alister Hardy Foundation for Ocean Science. Articles from 1887 to 1938 have been loaded so far, along with a few more recent additions. You can run searches and access the full text at sabellla, or download a particular document by following the links from the second website.
http://sabella.mba.ac.uk
http://www.mba.ac.uk/nmbl/publications/pub_lists/publications.htm

Marine Ornithology
Marine Ornithology presents peer reviewed contributions concerning international seabird science and conservation. *Marine Ornithology* is supported and published biannually through a partnership between global seabird societies. A reference site, it offers complete, downloadable peer reviewed articles on seabirds, covering such subjects as population dynamics, marine debris issues, diseases, and more.
http://www.marineornithology.org/index.html

Marine Parks Primary Schools Education Kit
The aim of this project from New South Wales, Australia is to educate primary school children about the marine environment and marine protected areas. The downloadable kit offers a structured and directed primary level teaching resource with four separate modules covering marine parks and conservation, estuaries, rocky shores, and Aboriginal cultural heritage. Each module includes fact sheets, identification guides, risk assessments, and activity plans.

http://www.mpa.nsw.gov.au/index_kit.html

Marine Photobank
The Marine Photobank, a program of SeaWeb, is a free resource of ocean imagery that highlights pressing ocean issues and includes accompanying downloadable Photo Stories. The Marine Photobank was founded in response to a lack of readily available, high quality underwater and above water marine imagery. Images are available at no cost for non-commercial purposes as well as for media use. Some subjects covered are Marine Pollution and Trash, Fishing Methods, and Reefs in Peril/Coral Bleaching.
http://www.marinephotobank.org/home.php

Marine Planning Concierge
This website from the Natural Capital Project is designed to make it easier to learn about and implement marine spatial planning, incorporating ecosystem services. The information organizes existing technical approaches, information, and tools in a generalized spatial planning framework.
http://msp.naturalcapitalproject.org/msp_concierge_master/

Marine Protected Area Resources and Concepts for Teaching Ocean Literacy
This new publication developed by the National Geographic Society, NOAA, and partners links MPA Center educational resources with National Ocean Literacy Principles. The information is intended to help educators improve ocean literacy by highlighting MPA Center resources on marine protected areas and conservation.
http://www.mpa.gov/resources/education/

Marine Protected Areas
Thank You Ocean has launched this web page on marine protected areas, in both English and Spanish. The page provides basic information about MPAs, an overview of both state and federally-designated MPAs, and links to more in-depth information.
http://www.thankyouocean.org/threats/marine-life-decline/mpas/

Marine Protected Areas and Coastal Communities
This website from the Caribbean Natural Resources Institute offers tools and resources for managers with a focus on marine protected areas and sustainable coastal livelihoods, to help them better understand and respond to the needs of coastal communities. The website includes downloadable reports, case studies, guidelines, and training materials, along with links to other websites.
www.canari.org/mpa.htm

Marine Protected Areas Inventory Online
NOAA's National Marine Protected Areas Center, in cooperation with the Department of the Interior, has released the online inventory of the nation's marine protected areas (MPAs). This comprehensive inventory catalogs and classifies marine protected areas within US waters. Both tabular and GIS spatial data can be down-loaded, as well as mapping products and analysis reports created using the MPA Inventory data.
http://www.mpa.gov/helpful_resources/inventory.html

Marine Recreation Community Workshop Online Toolkit
National Geographic, with the support of Oracle, offered a series of workshops for the ocean recreation community to share current marine and conservation science, and discuss how the ocean recreation community can educate, motivate, and inspire the

public to be stewards of the ocean in order to ensure the future of ocean recreation. Resources include a planning guide, invitation templates, sample presentations on a variety of subjects, facilitation guides, and much more.
http://ocean.nationalgeographic.com/ocean/marine-recreation-workshop-toolkit

Marine Regime Shifts
Royal Society Publishing has recently published *Marine regime shifts around the globe: theory, drivers and impacts*. Individual articles or abstracts are available to read online.
http://rstb.royalsocietypublishing.org/content/370/1659

Marine Renewable Energy
The June 2010 issue of *Oceanography* focuses on marine renewable energy. The contributing authors to this special issue come from many areas of the marine renewable energy arena—academia, industry, federal and state government, social science, and commercial fishing. Visitors can read it online.
http://www.tos.org/oceanography/issues/current.html

Marine Reserves Special Feature Articles
A special issue of the journal Proceedings of the National Academy of Sciences (PNAS) published in February 2010 is dedicated to recent science on no-take marine reserves, with a focus on how reserves can help meet conservation and fisheries goals simultaneously. The issue's articles are downloadable for free. On the website, do a repeated search on "marine reserves special feature" to view each article.
http://www.pnas.org/content/early/recent

Marine Sanctuaries Conservation Series
The Marine Sanctuaries Conservation Series provides a forum for on-line publication and discussion of complex issues the National Marine Sanctuary Program faces. Topics of published reports may include descriptions of educational programs, discussions on resource management issues, and results of scientific research and monitoring projects. The Series will facilitate integration of natural sciences, socioeconomic and cultural sciences, education, and policy development.
http://www.sanctuaries.noaa.gov/science/conservation/welcome.html

Marine Sanctuaries Issue of *Current*
The education program of NOAA's National Marine Sanctuary Program is featured in quarterly issue of the National Marine Educators Association's *Current: The Journal of Marine Education* (Volume 21, Number 1, 2005). The issue illustrates how national marine sanctuaries serve as living classrooms where learners of all ages can see, touch, and learn about America's ocean and Great Lakes treasures.
Contact Michiko Martin at Michiko.Martin@noaa.gov

Marine Sanctuaries Media
The National Marine Sanctuary Foundation has teamed with Marine Sanctuaries Media for this website, which offers the public the opportunity to purchase high-resolution images from the National Marine Sanctuaries library of exclusive content. The library contains more than 200,000 high-resolution images from within the national marine sanctuaries around the United States and American Samoa.
http://www.marinesanctuariesmedia.com

Marine Science Apps
Fish Navy Films is a small production company that explores the relationship between the ocean and mankind. They have posted a webpage with ten fun, interesting, and free marine science apps, along with several available for a small charge. Check out some of the previous blogs, including five favorite blogs of the year, trawlers as lawnmowers of the sea,and more.
http://www.fishnavy.com/image/10-fun-interesting-free-marine-science-apps-2/

Marine Science Curricula
The Florida non-profit, Inwater Research Group, is dedicated to providing the scientific community and general public with information to promote conservation of coastal and marine species and their habitats. They will be creating free curricula centered around ocean conservation and focused on STEM initiatives. Sign up to receive the materials through a short survey.
https://www.surveymonkey.com/s/P6PYKVC

Marine Science Graduate Research Blog
Students with an interest in marine science and research should check out the Northeastern University Marine Science Center's graduate student blog. It's easy to scroll through and offers a look into the lives of grad students in the field and lab.
http://cosresearch.wordpress.com/

Marine Science Lab Manuals
AMSCO offers textbooks and support materials to the educational community. The course texts, review, and test prep books reflect national and state standards for curriculum and assessment. They offer each new title available for downloading from their website, for a limited time. They also provide sample chapters from some additional titles. In addition, they provide a 30-day free trial on selected Amsco titles in digital format.
http://www.amscopub.com/frameset.htm

Marine Science Review - Oil Spills
SeaWeb produced Marine Science Review 371 as a special edition on Oil and Oil Spills: the Gulf of Mexico. The brief document offers summaries of articles and reports of relevant literature from the last three decades, to offer insights not only to the impact of oil on the marine and coastal environment in the Gulf of Mexico, but highlighting experiences, issues, and research from similar oil spills in other regions of the world.
http://www.seaweb.org/resources/documents/MSR_371SpecialEdition-Oilandoilspills.pdf

Marine Science Today
Marine Science Today is an online magazine with articles and analysis about the people, the technology, the policy, and the various research disciplines involved in modern marine science.
http://marinesciencetoday.com/

Marine Sciences
This website, written by Genevieve Anderson, author of online Marine Science at Santa Barbara City College, offers an introduction to the ocean sciences. The website includes information on habitats, oceanic fauna, oceanographer's tools, and case studies that forecast the future of the ocean.
http://www.marinebio.net/marinescience/01intro/index.htm

Marine Spatial Planning Presentations
A symposium sponsored by NOAA's National Marine Sanctuaries examined how science, both natural and socioeconomic, has been applied to coastal and marine spatial planning. Presenters described cases from across the U.S. Fifteen presentations from the symposium are available online.
http://sanctuaries.noaa.gov/news/msp_symposium.html

Marine Technology Society Club
The Marine Technology Society has launched the Marine Technology Society Club, a free club for students (grades 6-12) who have a thirst for knowledge about technology and the oceans. Members receive a bimonthly newsletter featuring information on careers, academics, student programs, and stories about technology and the people who use technology to investigate and understand the oceans. Members will also have access to an experts directory.
http://www.mtsociety.org/youthclub.cfm\

Marine Virtual Explorer: Hydrothermal Vents on the East Pacific Rise
The *Marine Virtual Explorer* is a simulation of a research dive in the Alvin submersible to a hydrothermal vent field on the East Pacific Rise, part of the global mid-ocean ridge system. Mid-ocean ridges are volcanic and, of course, underwater. When you put all the heat and all the water together, you get spectacular hydrothermal activity.
http://pangea.stanford.edu/marve/

Marine World Heritage App
This new free itunes app allows users to learn about marine world heritage sites, view videos, and follow the work of UNESCO's World Heritage Marine Programme.
http://itunes.apple.com/us/app/marine-world-heritage/id530961776?ls=1&mt=8

MarineCadastre
MarineCadastre.gov, a joint effort between NOAA and the Bureau of Ocean Energy Management, is an integrated marine information system that provides data, tools, and technical support for ocean and Great Lakes planning. The project has three primary focus areas: web map viewers and decision-support tools, a spatial data registry, and technical support and regional capacity-building.
http://marinecadastre.gov/

MarineMap
MarineMap, a web-based decision support tool, has been designed to allow stakeholders and resource managers to experiment with different MPA designs on their own computers, at their own pace. MarineMap was developed to meet the specific needs of the California's Marine Life Protection Act Initiative. The consortium that developed MarineMap is interested in adapting it for use in other marine spatial planning efforts.
http://marinemap.org/marinemap/

MarineNZ
MarineNZ is a conservation and education website from the Mountains to Sea Conservation Trust. The site features underwater photos, videos, and information. There are resources for teachers and students, along with interviews with people working in marine conservation. The aim of the website is to inform, to educate, and to

inspire marine conservation projects around New Zealand. The website includes news from New Zealand and around the world; feature stories on New Zealand's marine reserves, people in marine conservation, and more; science, resources, and more.
http://www.marinenz.org.nz/

Mariners' Museum
The Mariners' Museum hosts exhibits on the seafaring life, including the recently added Monitor Center. The Collections Online area allows users to search over 30,000 items. Check out the distance learning programs in history, science, and language arts, along with the lecture series, online exhibits, and more.
http://www.marinersmuseum.org/

Maritime Archaeology Expedition to Papahanaumokuakea 2008
If you missed the maritime archaeology expedition in July 2008 to the Papahanaumokuakea Marine National Monument in the Northwestern Hawaiian Islands, you can still follow the adventure online through daily blogs and highlight videos. Make sure to follow the links to the shipwrecks, with details of each infamous wreck and survivors' ordeals.
http://sanctuaries.noaa.gov/missions/2008pmnm/

Maritime Heritage of America's Underwater Treasures
The NOAA National Marine Sanctuaries Maritime Heritage Program has launched a new website highlighting their commitment to preserving historical, cultural and archaeological resources within the National Marine Sanctuaries. The site includes background information about maritime archaeology, our whaling past, native cultures and more. You can also follow archaeologists' mission logs during an expedition to create high resolution photo-mosaics of shipwrecks in the Florida Keys.
http://sanctuaries.noaa.gov/maritime

Maritime History of Massachusetts
The National Park Service's National Register of Historic Places and Maritime Heritage Program created this guide to the maritime history of the Bay State. Visitors can explore the sites through a series of interactive maps and then read essays that deal with maritime commerce, shipbuilding, the U.S. Navy, and lighthouses and lifesaving stations. The website offers a brief history of each destination.
http://www.cr.nps.gov/nr/travel/maritime/

Maritime Poetry in Google Earth
Ira Bickoff has posted another Google Earth tour on Sail the Book, this time of maritime poetry linked to marine science topics and geography.
http://www.sailthebook.net/

Maritime Spatial Planning in Cartoon Format
WWF Germany has published a cartoon guide to implementing maritime spatial planning (MSP) in the Baltic Sea, titled *Become a Maritime Spatialist in 10 Minutes*. The 28- page guide uses drawings, humor, and limited text to explain what MSP is, why it is needed, and what a Baltic sea zoning plan could look like. It is designed to be easily understood by a range of audiences, and is available in multiple languages, including English and German. The guide is downloadable.
http://www.baltseaplan.eu/downloads/WWF_Cartoon_MSP.pdf

Mark Trail Activity Book
Mark Trail's *Living on the Wild Side Responsibly* is a fire education activity book, appropriate for grades 3-6, about living near wildlands. The activities in this book address either all or part of some of the National Achievement Standards depending on how thoroughly the activity is completed or if expansions to the base activity are created. (Note: it is not downloadable from the website.)
http://www.sref.info/spotlight/News_Item.2006-07-13.4738

Marsh Mania – Texas
The Galveston Bay Foundation will host the annual Marsh Mania planting event on May 31, 2008. The goal of this restoration project is to involve local citizens in hands-on wetlands restoration activities while increasing awareness and appreciation of wetland habitats and functions.
http://www.galvbay.org/events_marsh.html

The Marsh Project
Environmental Concern, Inc. has expanded their schoolyard habitat curriculum into the Marsh Project, a comprehensive approach to schoolyard wetland habitats design, construction and utilization that involves the entire school – administration, faculty, facility managers, and most importantly students. The five-step process includes teacher training; habitat design; on-going technical support and guidance; wetland construction; and AZA certification as a wildlife friendly schoolyard.
http://www.wetland.org/EC%20main/edu_marsh.htm

Maryland Coast Day
Maryland Coast Day, September 16, 2006 in Berlin, Maryland is celebrated with a festival at the beach, replete with Eastern Shore eats, arts, crafts, live animal touch tanks, canoe rides, surf casting, sand castle building, along with more than 30 conservation organizations showing what they do to protect the coast.
www.mdcoastalbays.org

Massachusetts Coastal Zone Management Publications
A new annual magazine from the Massachusetts Office of Coastal Zone Management, *Coastlines*, is available online. It focuses on coastal and marine habitats and explores these habitats as critical components of sound coastal management. Other publications include CZ-Mail, available tools and publications, upcoming workshops and events, and grants. Guides include a Personal Watercraft Management Guide, a Volunteer's Handbook for Monitoring New England Salt Marshes, and more.
http://www.mass.gov/czm/publications.htm

Massachusetts Marine Educators Projects and Curriculum
The Massachusetts Marine Educators website offers links to projects, activities, and curriculum. Check out Ocean tides, Kelp in the Cupboard, Fish Activity Cards, and more.
http://massmarineeducators.org/curriculum/

Massachusetts Ocean Education Guide Website
The Massachusetts Coastal Zone Management Ocean Education Program has developed a dynamic directory of state ocean education resources. The directory includes field trips, speakers, curricula, after school programs, workshops, films/videos, newsletters/periodicals, library/resource centers, volunteer opportunities, and other

programs designed to assist K-12 educators in teaching about the Massachusetts' ocean resources.
http://www.mass.gov/czm/oceanmanagement/education/guide/index.htm

MATE International ROV Competition
Follow along with the annual MATE competition, Exploring the Great Lakes: Shipwrecks, Sinkholes, and Conservation in Thunder Bay National Marine Sanctuary, June 26-28, 2014. Students will pilot their ROVs to explore and document an unknown shipwreck, collect scientific samples, inventory invasive species, and remove trash and debris, and more.
http://www.marinetech.org/

Math and Science Song Information, Viewable Everywhere
Math And Science Song Information, Viewable Everywhere (MASSIVE), is a database containing information on more than 1700 science and math songs. The songs, suitable for a variety of ages and of varying sound quality, are both silly and serious. Visitors can search on a song or listen to MASSIVE radio, "an Internet radio station devoted entirely to science/math songs."
http://www.science-groove.org/MASSIVE/ .

Math in Video Games
Teachers' Domain offers many STEM resources, including Math in Video Games. After watching a video about using algebra to develop online games, students must use algebraic reasoning to complete videogame challenges involving spaceships and submarines.
http://www.teachersdomain.org/resource/GTM11.math.algebra.var.splmathvid/

Mathematics across the Curriculum
Mathematics across the Curriculum features an "electronic bookshelf" of materials for teaching math through art, history, literature, & music, as well as science, engineering, and other disciplines traditionally associated with math. Topics include misleading averages, bar codes, data analysis, expert systems, information theory, and much more.
http://www.math.dartmouth.edu/~matc/eBookshelf/index.html

MathScience Innovation Center Resources
The MathScience Innovation Center's mission is to be the innovator, incubator and advocate of 21st Century math and science programs for the Capital region's K-12 educators and students. The website offers a searchable database of resources, including lesson plans, activities, tutorials, and more. Resources can be searched by subject, core area, resource type, grade level, and more.
http://www.mathinscience.info/

MaudNESS Cruise
This website offers archived reports of a 56-day cruise into the Southern Ocean (Antarctic) to learn about conditions and events that cause ocean circulation, a key factor in setting the climate around the world. The story is told through the journal of a 5th grade teacher aboard the icebreaker ship. Learn about crew members (their roles and backgrounds), the science, and day-to-day life aboard a research cruise.
http://www.esr.org/maudness_cruise/cruise_main.html

McDonald and Woodward Publishing
McDonald and Woodward Publishing offers a variety of natural history books of interest, including an award-winning environmental education title, *Let the River Run Silver Again!* Other topics include water quality, watershed management, and wetlands publications. Resource management/protection titles, technical publications, and field guides from other publishers are also available.
http://www.mwpubco.com/

Meaningful Bay Outdoor Experience
NOAA's Chesapeake Bay Office is committed to connecting individuals and groups to the Bay through their shared sense of responsibility and action. The office administers the *Bay Watershed Education and Training Program*, B-WET, to provide a meaningful outdoor experience for school students in the watershed, and to provide teacher training supporting meaningful outdoor experiences for students.
http://noaa.chesapeakebay.net/education.htm

Meaningful Watershed Educational Experience Resources
The Virginia Department of Environmental Quality hosts Virginia Naturally, with links to many K-12 education resources.
http://www.deq.state.va.us/vanaturally/mwee/mwee_curriculum.html

Measuring Coral Reef Ecosystem Health: Integrating Societal Dimensions
Measuring Coral Reef Ecosystem Health: Integrating Societal Dimensions, from the World Bank, identifies causes of the rapid deterioration of coral reefs being witnessed today through indirect impacts from human activities, including overfishing, destructive fishing practices, chronic pollution, sedimentation from degraded watersheds, and physical alteration associated with coastal development, tourism, oil, and gas exploration. The report offers a framework for measuring societal dimensions of coral reef ecosystem health and applies it to the Mesoamerican Reef.
http://www.cep.unep.org/newsandevents/news/2006/measuring-coral-reef-ecosystem-health

Measuring Environmental Education Outcomes
In this downloadable e-book, 20 environmental educators across the U.S. look at environmental education outcomes and their measurement. Chapters address such questions as: What counts as outcomes of environmental education?, How can their measurement be part of environmental education curricula?, and more.
http://www.naaee.net/publications/MEEO

Measuring Teacher Effectiveness
The RAND Corporation provides research on a range of topics, and this website provides access to papers and commentaries produced as part of their initiative on measuring teacher effectiveness. The site is designed for teachers, administrators, policymakers, and others seeking objective information on measuring teaching effectiveness.
http://www.rand.org/education/projects/measuring-teacher-effectiveness.html

Media College
MediaCollege.com is an educational and resource website about all forms of electronic media. Topics include video and television production, audio work, photography, graphics, web design, and more. The website offers hundreds of tutorials with

supporting illustrations, videos, sound bytes, and interactive features. You'll also find reference material, utilities, and other useful tools, as well as a helpful forum.
http://www.mediacollege.com/

Media Watch on Climate Change
The EcoResearch Media Watch on Climate Change provides a continuous update of media coverage on climate change and related issues from 150 news media sites.
http://www.ecoresearch.net/climate/

Mediterranean MPA monitoring: What is going on in my MPA?
This edition of Science for MPA Management reviews the scientific literature published on the topic of sound and regular monitoring being essential to effective MPA management. It addresses best practices, limited resources, and more.
http://www.medpan.org/documents/10180/0/Science+for+MPA+management+-+Issue+4/478f0de0-2104-49ed-a2bf-501ea320fbf1

Mediterranean Outflow
The *JOIDES Resolution* will be exploring Mediterranean Outflow Waters during Expedition 339: Mediterranean Outflow, November 17, 2011-January 17, 2012. Follow along on this international expedition and sign up for a live video broadcast from with the crew (note that broadcast spots fill up quickly).
http://joidesresolution.org/node/2053
https://docs.google.com/spreadsheet/viewform?formkey=dDY3X1AyUzA4R3lCSnA0TVcxSjZPS3c6MA#gid=0

MedPAN
MedPAN is an European Union-funded initiative to network MPA managers in the Mediterranean whose aim is to facilitate exchange between Mediterranean marine protected areas in order to improve the efficiency of the management of these areas. The website, available in English and French, features a directory of Mediterranean MPAs by country, MPA-related documents, and more. Documents include the workshop proceedings on Education and Communication in Marine Protected Areas.
http://www.medpan.org

Meet David Doubilet - Alabama
Dauphin Island Sea Lab is offering two chances to meet National Geographic Photographer-in-Residence, David Doubilet. *Cocktails with the Critters*, on May 3, 2007, will take place at Five Rivers in Mobile, Alabama. On May 4, 2007, Mr. Doubilet will host a multi-media presentation, Water Planet - a Look beneath the Surface.
http://press.disl.org/1_31_07doubiletl.html

Meeting Standards Naturally
A free CD-ROM, *Meeting Standards Naturally*, developed for K-12 educators, was developed by the Environmental Education and Training Partnership (EETAP) which is funded by the U.S. EPA's Office of Environmental Education. The CD explores how teaching about the environment can be used to achieve national education standards for core disciplines, discusses what environmental literacy means, and how it helps prepare students to effectively make environmental decisions that impact their daily lives.
http://www.eetap.org/html/new_products.php#CDROM .

Mendeley Bibliography Software
Mendeley's bibliography maker is a free reference management tool that allows users to extract citations from pdfs, index research paper collection, and generate bibliography lists automatically.
http://www.mendeley.com/bibliography-maker-database-generator/

MentorNet
MentorNet is a web-based national electronic mentoring network for undergraduate and graduate women students in engineering and science, linking students with industry and research professionals in over 70 fields.
http://www.mentornet.net/about_us.aspx

M-EOL: a Biodiversity Game
Become an explorer, discovering different plant and animal species by traveling around the world. Earn points as you journey by answering questions about which species live on the continents that you visit. Each level of the game provides different collections of species, and earning points will unlock new collections. Improve your knowledge about each species through descriptions, images, distribution information, and conservation status from the Encyclopedia of Life website.
https://itunes.apple.com/us/app/meol/id679021914?mt=8
https://play.google.com/store/apps/details?id=eu.NaturalSolutions.Meol

Mercury is Rising
Mercury (Hg), toxic to most organisms, is present in the natural environment in small quantities. However, through industrial activities such as coal-burning power plants, humans cause the release of mercury into the atmosphere at concentrations higher than would naturally occur. The mercury then rains down with precipitation and is deposited on land and in water. The Data Analysis Teaching Activity (DATA), *Mercury is Rising* allows students to learn about the sources and effects of mercury in our waters, and the reasoning behind limiting the amount of some fishes we eat.
http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1203.html
http://www.marine-ed.org/bridge

Merlin Bird ID App
The Merlin Bird ID app for iOS7 and Android OS4 devices is available for free from the Cornell Lab. It asks five simple questions about the bird seen and then gives a short list of the most likely possibilities. The app currently covers 400 species, and has 2,000 photos and 1,000 songs and calls to help you confirm your ID.
http://merlin.allaboutbirds.org/download/

Mesoamerican Coral Reef Watch Program
A website has been launched to encourage individuals, tourism operators, and organizations to submit regular reports of coral reef health throughout the Mesoamerican region. The primary aim of the site is to provide information and education regarding bleaching events, detect early stages of coral bleaching events over a wide geographic range, and to use coral bleaching as a means to communicate the broader impacts of climate change on the Mesoamerican Barrier Reef.
http://www.marcoralwatch.net/

Mesophotic Coral Ecosystems
Mesophotic.org is an on-line resource database that serves as a repository for information on Mesophotic Coral Ecosystems (MCEs). MCE refers to light-dependent coral communities (and associated communities of algal, sponge and fish species) that occur in the deepest half of the photic zone, often referred to as the twilight zone. The website hosts news, information about technology and management techniques, photos and videos, and more.
http://mesophotic.org/

Messages from the BRIDGE
http://www.marine-ed.org/bridge

- ***Kids in Boats***. This Australian site includes boating safety resources and student activities about navigation, map reading, weather, and tides.
  http://www.safeboating.org.au/Boating/Kids_in_Boats/
- ***Newton's Apple*** offers two lesson plans that focus on scuba diving and the bends.
  http://www.tpt.org/newtons/15/scuba.html
  http://www.tpt.org/newtons/11/bends.html

These recreational sites offer safety messages for students, and address important ocean science subjects such as physics, chemistry, and the atmosphere. For more ocean recreation links, visit the Bridge Recreation page http://www.marine-ed.org/bridge/index_recreation.html.

Message in a Glider
In April, Rutgers University scientists and students will send an underwater robotic glider on a mission to cross the Atlantic Ocean. The 3,300 mile voyage will take at least 6 months for the slow-moving low-energy glider. Classrooms around the country are invited to participate in this adventure, by sending a message in the glider and following the journey as the glider crosses the ocean.
http://rucool.marine.rutgers.edu/atlantic/bottle/

Meteorology Education and Training
Designed as part of the Cooperative Program for Operational Meteorology, Education and Training, the Meteorology Education and Training website provides a wide range of resources. Within the Topics section, visitors will find information on fields such as fire weather, coastal weather, basic climate, and space weather. The Resources area offers learning modules, covering convective storm matrices, an introduction to anticipating hazardous weather and community risk, and more.
http://www.meted.ucar.edu

MetLink: Weather and Climate Resources
The Royal Meteorological Society offers the MetLink website for educators seeking to teach their students about meteorology and climatology. The website offers Observations and Data, teacher resources, and more. The Resource of the Week brings together a range of interesting resources. The Teachers area contains links to curricular materials, guides for in-class demonstrations, quizzes, and fact sheets.
http://www.metlink.org/

Methods for Ecological Monitoring of Coral Reefs
Methods for Ecological Monitoring of Coral Reefs, published by the Australian

Institute of Marine Science, provides a comprehensive guide to methods for monitoring all aspects of coral reef ecology. The report also offers advice on establishing a monitoring program
http://www.aims.gov.au/pages/facilities/bookshop/monitoring-methods/monitoring-methods.html .

Michigan Environmental Education Curriculum
Michigan Technological University has developed eighteen interactive web modules in the Michigan Environmental Education Curriculum. The modules are designed for upper elementary and middle school students, but have also been used for high school and even college-level courses. Topics cover Water Quality, Ecosystems and Biodiversity, and Energy Resources.
http://techalive.mtu.edu/meec_index.htm

The Microbe Zoo
This virtual zoo, part of the Digital Learning Center for Microbial Ecology at Michigan State University, is filled with exotic specimens from the microscopic worlds around, inside of, and on us. The zoo includes pictures of microbes; data about their size, scientific classification, feeding habitats, and more; and descriptions of how the microbes fit into and interact with their environment and other microorganisms. Zoo specimens are arranged in habitat pavilions, including Water World.
http://commtechlab.msu.edu/sites/dlc-me/index.html .

Microbial Lessons
The 2013 EARTH workshop was held at the University of Hawai'i and teachers presented various lessons focused on microbes. The lessons are still in rough draft form but can be found at this link.
http://www.mbari.org/earth/2013/schedule13.htm#Friday

Microbial Life
The Science Education Resource Center at Carleton College offers Microbial Life, focusing on the ecology, diversity, and evolution of microorganisms. Learn about marine microbes and extremophile microbes that live in inhospitable environments. Explore the Gulf of Mexico Dead Zone and red tide through case studies. Find out about microbial observatories and extreme environments.
http://serc.carleton.edu/microbelife/index.html

Microdocs
Microdocs - Short Attention Span Science Theater offers a new ecological sustainability education resource. The website hosts more than thirty, 2-4 minute micro-documentaries written by leading scientists. Supporting each microdoc is text expanding on the concepts introduced by each film and links to further reference material. The main topic explored is ecological sustainability, taking the viewer for a quick trip around coral reefs of the world. Check out the latest videos (including Ocean Babies on Acid), teacher resources, Solutions Around the World, and more.
http://www.stanford.edu/group/microdocs/index.html
http://www.microdocs.org/

Microplastics
This website from the University of Florida / Florida Sea Grant offers a downloadable PowerPoint presentation addressing microplastics. Be sure to read through the notes section for each slide, which includes several links and citations.
http://stjohns.ifas.ufl.edu/sea/microplastics.shtml

Micropolitan Museum
Hosted by Microscopy UK, the Micropolitan Museum exhibits images of microorganisms in the freshwater collection, marine collection, and insectarium. Exhibitions within the first two collections include forams, diatoms, desmids, and more. The images are accompanied by brief captions.
http://www.microscopy-uk.org.uk/micropolitan/index.html

Mid-Atlantic Ridge Microbiology
The *JOIDES Resolution* is exploring microbiology in the Mid-Atlantic, September 16-November 17, 2011. The education officer will post blog entries, background information, links to educational activities, and more.
http://joidesresolution.org/node/1983

Mid-Cayman Rise Expedition 2011
The expedition of the NOAA Ship *Okeanos Explorer,* August 5-15, 2011 to the Mid-Cayman Rise south of Grand Cayman Island in the Caribbean highlighted a new model of telepresence-enabled ocean exploration. Most of the expedition scientists were on watch or on call ashore at a network of Exploration Command Centers connected to the ship's sensors, systems, and people in near-real time by satellite and high-speed Internet. Check out the education module, ship's logs, and more.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1104/welcome.html

Middle School Math & Science Portal
The Middle School Portal 2: Math and Science Pathways project supports middle grades educators with high-quality, standards-based STEM resources and promotes collaboration and knowledge-sharing among its users. Resources include math and science resource guides, teacher and student opportunities, and much more.
http://www.msteacher2.org/

MidwestFrogs
This website offers downloadable frog calls and documentary video clips of scientists discussing frog issues, including declining amphibians and malformed frogs. This is not just about the Midwest.
http://www.midwestfrogs.com/

Migration for Memory: A Disaster Mitigation Framework for Cultural Resources
This framework is meant for those safeguarding community treasures, offering tools they need to make sure cultural resources make it through major disasters. The report discusses training, logistics, and more.
http://mblc.state.ma.us/costepma/wp-content/uploads/2015/01/COSTEP-MA_Mitigation_for_Memory_Framework_2015_FINAL_Web.pdf

Migration Science and Mystery – A Distance Learning Adventure
Students in grades 5-8 are invited to join millions of shorebirds as they migrate, through webcasts, web chats with experts, videos, and more. The Migration Science and

Mystery distance learning adventure takes participants on a journey totaling more than 6,500 miles from Panama to Alaska with stopovers in between. The programs will be broadcast live, and wildlife biologists will be on site to talk about migration and answer questions. Migration is underway, so register now to participate in the journey.

- Bay of Santa Maria, March 22, 2007
- San Francisco Bay, April 19, 2007
- Fraser River Delta, April 24, 2007
- Stikine River Delta, May 3, 2007
- Copper River Delta, May 10, 2007
- Arctic Slope on May 17, 2007

The website offers downloadable lesson plans.
http://migration.pwnet.org

Migratory Connectivity Project
The Migratory Connectivity Project was created to facilitate development of new technologies and serve as a portal for gathering and disseminating information to advance the conservation and understanding of animals throughout their full life cycle by promoting the science of migratory connectivity. Note that this is a fairly new project.
http://www.migratoryconnectivityproject.org/

Migratory Species: Biological, Cultural, and Economic Assets of the Americas
Migratory Species: Biological, Cultural, and Economic Assets of the Americas offers an overview about the importance of migratory species, the Western Hemisphere Migratory Species Initiative and its products to date, migratory species conventions, and conservation challenges and solutions. The publication is also available in Spanish and French.
http://www.eco-index.org/migratory/

Migratory Species Resources
The Rainforest Alliance offers the bilingual Western Hemisphere Migratory Species Initiative Pathway. Supporting the initiative's goal of conserving migratory species through international cooperation and communication as a means to share valuable project information and best practices across geographic and language barriers, the website features resources related to migratory species conservation. Materials include lessons learned, monitoring and evaluation, and an Eco-Initiative of the month.
http://www.eco-index.org/migratory/

Millennium Assessment Reports
The Millennium Ecosystem Assessment assessed the consequences of ecosystem change for human well-being. This involved the work of more than 1,360 experts worldwide, from 2001 to 2005. Their findings provide a scientific appraisal of the condition and trends in the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve and use them sustainably. The website includes full reports, synthesis reports, slides and graphics, and more.
http://www.millenniumassessment.org/en/Index.aspx

Millennium Ecosystem Assessment
The new Millennium Ecosystem Assessment collates research from many specific locales to create the first global snapshot of ecosystems. The report was assembled by the U.N. Environment Program and includes contributions by 1,300 authors from 95

countries. The Millennium Ecosystem Assessment Synthesis Report presents a synthesis and integration of the findings of the four working groups, condition and trends, scenarios, responses, and sub-global assessments.
http://wdc.nbii.gov/ma.
www.MAweb.org

Millennium Ecosystem Assessment Toolkit
The Millennium Ecosystem Assessment is a study of the global environment and human well-being. Island Press has developed a toolkit called *Millennium Ecosystem Assessment, A Toolkit for Understanding and Action: Protecting Nature's Services. Protecting Ourselves.* This toolkit describes the assessment, ecosystem services, and valuation, and lays out lessons learned from effective policies and practices to increase human well-being and to solve environmental and development problems.
http://www.islandpress.org/MAToolkit

Millennium Coral Reefs Landsat Archive
NASA announces the availability of 1,490 Landsat 7 images of coral reefs in an Internet-based library for the Millennium Coral Reef Project. The collection was created in a partnership which includes NASA, international agencies, universities, and other organizations to provide natural resource managers a comprehensive world data resource on coral reefs and adjacent land areas. This archive contains standardized data that is tiled, zoomable, and downloadable via FTP.
http://seawifs.gsfc.nasa.gov/cgi/landsat.pl

Milstein Hall of Ocean Life Resources
The American Museum of Natural History's Milstein Hall of Ocean Life offers a variety of online resources and activities explaining key concepts related to the ocean's diverse and complex web of life. Resources include a downloadable educator's guide and associated activities, along with additional resources on ocean life, the properties of water, ecosystems, conservation, and more. The website also offers reference lists of books and websites.
http://www.amnh.org/education/resources/halls/oceanlife/

Mindset List
The Mindset List was created at Beloit College in 1998 to reflect the world view of entering first year students. What started as a witty way of saying to faculty colleagues "watch your references," has turned into a guide to the adolescent consciousness. Besides its usefulness for teachers needing to make sure they can connect with their students, we can all check this out when we need a reminder that we're getting old.
http://www.beloit.edu/mindset/

Minerals Management Service Marine Education Materials
The Minerals Management Service manages more than a billion offshore acres and collects billions of dollars in mineral revenues annually. *MMS Ocean Science*, the agency's bimonthly magazine, reports on research, including biological resources (fish, turtles, birds, whales), habitat resources (water quality, sediment quality), and socioeconomic resources (communities, archaeology, fiscal impacts). The Alaska, Pacific, and Gulf of Mexico regions provide lesson plans, posters, and teacher guides.
http://www.mms.gov/mmskids/ , http://www.mms.gov/alaska/kids/ , www.gomr.mms.gov, http://www.mms.gov/omm/pacific/kids/educate.htm, and
http://www.gomr.mms.gov/homepg/lagniapp/lagniapp.html .

MinuteEarth
This YouTube channel offers quick scientific explanations about the planet. Subjects range from plate tectonics through meandering rivers, from clouds to ocean confetti. Use the search function to check out minute physics and minute science videos.
https://www.youtube.com/user/minuteearth/videos

The Missing Link
Not marine related, but deeply intriguing. The Missing Link is a monthly podcast on the strange history of science, medicine, and technology. The website includes the archived materials, along with lists of suggested readings for those who are looking for additional information. These podcasts are for people who are scared of science but deeply intrigued by it, and for scientists who know there must be a better back story than what's told in the sidebars of their textbooks.
http://missinglinkpodcast.wordpress.com/

Mission 31
Mission 31 will be an ocean exploration led by Fabien Cousteau this fall from the Aquarius Lab, to test new science and tech-based experiments with underwater motorcycles, autonomous robots, and Kirby Morgan tech diving helmets. Aquarius, owned by NOAA, is now managed by Florida International University; it will serve as Mission 31's base camp for Cousteau's team to explore climate, pollution, and more.
http://fabiencousteau.org/tag/aquarius/
http://mission-31.com/

Mission Ocean
The Mission Ocean website is an interactive view of the Global Ocean Commission's final report, an 18-month study into the state of the high seas. The commission developed a rescue package of eight proposals to restore and protect its natural capital and services, with a five-year timeline. Visitors can download the report or view a series of interactives.
http://missionocean.me/

Mississippi Aquatic Plants Website
This website, developed from research supported by the Mississippi-Alabama Sea Grant Consortium, offers photographs, habitat information, and other details about more than 100 species of Mississippi aquatic and wetlands plants.
http://jcho.masgc.org/

MIT OpenCourseWare Global Warming Science
MIT's OpenCourseWare offers free college-level curricula online to the public. This course looks at the science behind global warming, and was originally offered to undergraduate students in the spring of 2012. Content includes lecture notes, assignments, and student projects.
http://ocw.mit.edu/courses/earth-atmospheric-and-planetary-sciences/12-340-global-warming-science-spring-2012/index.htm

MIT+K12 Videos
MIT+K12 Videos are made for students by students. Current MIT students write and host free webisodes about their favorite science, technology, engineering, and math (STEM) topics for kids and kids-at-heart. Their mission is to use MIT's unique resources

to inspire the inner scientist in all learners. Pilot videos include the Earth's tilt, chemiluminescence, and more.
http://k12videos.mit.edu/

MIT Video
The MIT Video website curates video produced by MIT's offices, laboratories, centers, and administration. This includes feature and editorial videos, event recordings, academic content, and more. "Channels" include Earth, Atmospheric and Planetary Sciences; Environment; and more. The site also includes a search function.
http://video.mit.edu/

Mitigating Coastal Hazards
The Association of State Floodplain Managers offers an on-line handbook, *No Adverse Impact in the Coastal Zone*. The handbook provides a vision, principles, and tools that communities can use to help mitigate the effects of coastal hazards. The No Adverse Impact principle holds that the actions of a community or property owner should not adversely impact other people or the coastal resource.
http://www.floods.org/noadverseimpact/cnai_handbook_10-06.pdf

Mixing It Up
Mixing It Up is a compilation of 25 articles from the National Science Teachers Association's elementary school member journal, *Science & Children*. The collection of teacher-tested methods blends science with math, language and the arts. Each article is categorized by grade Science Education Standards. They include lesson plans and idea starters using interdisciplinary, integrated, and thematic approaches.
http://store.nsta.org/searchBasic.asp?searchTerm=Mixing+It+Up

Mobile Coral Reef Conservation Program
A mobile version of the Coral Reef Conservation Program website is now available. The mobile site features news stories, coral facts, images, a glossary, and acronym lists for smartphone users.
http://coralreef.noaa.gov/m/

Mobile Manatees
Dauphin Island Sea Lab has established Mobile Manatees, a program that encourages the public to report their sightings of these animals in Alabama waters, particularly in Mobile Bay. By calling the toll-free number or visiting the website to e-mail sightings, the public can help scientists find, study, and protect these vulnerable creatures. The program is part of a larger study that will include aerial and ground surveys of manatees in Mobile Bay and research to determine what manatees eat while in the Bay.
http://manatee.disl.org

Modeling And Simulation Tools For Education Reform
The Shodor Education Foundation is a non-profit education and research corporation dedicated to the reform and improvement of mathematics and science education by the incorporation of appropriate computational and communication technologies. This website provides educational tools that help students and teachers learn through observation and modeling activities. Tools include Environmental Models, SimSurface, and more.
http://www.shodor.org/master/

The Mollusks: A Guide to Their Study, Collection, and Preservation
This new volume, entitled *The Mollusks: A Guide to Their Study, Collection, and Preservation*, is the work of 29 international contributors. The book includes chapters on collecting and cleaning shells, SCUBA, dredging, archival methods, digital and film imaging, dredging, and more. There are chapters covering all seven extant classes of mollusks as well as fossil mollusks. The book is geared to the amateur as well as the professional biologist. The first 25 pages may be downloaded for free.
http://universal-publishers.com/book.php?method=ISBN&book=1581129300

Monitor National Marine Sanctuary
The Monitor National Marine Sanctuary protects the wreck of the famed Civil War ironclad *USS Monitor*, best known for its battle with the Confederate ironclad Virginia in Hampton Roads, Va., on March 9, 1862. The revised website offers student activities, downloadable lesson plans for teachers, updates on past expeditions, a listing of upcoming events, and more.
http://monitor.noaa.gov

Monitoring Climate Effects in temperate MPAs
This publication provides a framework for monitoring the impacts of climate change on marine protected areas. Focusing on MPAs in California, the report aims to inform adaptive management of the state's temperate marine ecosystem. Among other guidelines, it describes how certain species can indicate the impacts of climate change, and how these species can be incorporated in existing monitoring programs.
http://monitoringenterprise.org/pdf/Monitoring_climate_change_effects_in_temperate_marine_ecosystems.pdf

Monitoring Estuarine Water Quality
The NOAA Data in the Classroom curriculum module, Monitoring Estuarine Water Quality, helps teachers and students use scientific data to explore dynamic Earth processes and understand the impact of environmental events on a regional or global scale. The website features five activities at different levels, along with a teacher's guide and other materials. Be sure to check out the other curriculum on El Nino, Sea Level, Ocean Acidification, and Coral Bleaching.
http://dataintheclassroom.noaa.gov/SitePages/water-quality/index#.VNDtDC7Lkbh

Monitoring for Marine Invasive Species
The Massachusetts Office of Coastal Zone Management offers the guide, *Monitoring for Marine Invasive Species: Guidance and Protocols for Volunteer Monitoring Groups,* online. It includes information on site selection, monitoring protocols, safety, and identification resources.
http://www.mass.gov/czm/invasives/monitor/monitoringprotocol.htm

Monster Guard
Monster Guard, a free app from the Red Cross, lets children ages 7-11 attend Monster Guard Academy where, as the monster character of their choice, they bone up on ways to prepare for a variety of hazards. After all the lessons are learned, the kids graduate to a world where disasters are a little less scary.
http://www.redcross.org/monsterguard

Monterey Bay Aquarium Learning Center
The Monterey Bay Aquarium website hosts a number of educational materials for both students and teachers. The Kid's Corner has numerous on-line activities and games, including art projects, puzzles, music, and much more; a career corner; live web cams, and more. The Teacher's Place offers standards-based teaching units, a Sea Searchers Handbook, and a quarterly newsletter. There's also an animal field guide and an on-line dictionary.
http://www.mbayaq.org/lc/

Monterey Bay National Marine Sanctuary's Ocean Fair - California
Celebrate the ocean at the Monterey Bay National Marine Sanctuary's 2009 Ocean Fair, September 19, 2009 from 11:00 am - 3:00 pm. Check the website for details and directions.
http://montereybay.noaa.gov/

Monterey Bay Photo Database
The Sanctuary Integrated Monitoring Network, SiMoN, has launched a new photo database containing 1,200 digital images of species, habitats, locations, and issues of the Monterey Bay National Marine Sanctuary. You can search or browse thumbnails of images then download a high resolution version for educational purposes.
http://sanctuaries.noaa.gov/education/tour/gallery.html

Month at the Museum
The Museum of Science and Industry in Chicago conducted a nationwide search for a curious, adventurous, outgoing individual to live in the museum 24/7 for 30 days this fall as part of its Month at the Museum experiment. The winner mingles with visitors, students, and teachers while having access to all the fun and education the museum offers daily. Sleep aboard the U-505 submarine. Visit the coal mine at night. Lead a class in eyeball dissection, or help blow things up in the chemistry show.
http://www.msichicago.org/matm

Mountains in the Sea
The March 2010 issue of *Oceanography* magazine is a special issue on deep-sea seamounts. The open-access articles are posted online.
http://tos.org/oceanography/issues/current.html

Mountaintop to Ocean Trench Infographic
The website, LiveScience, hosts this graphic depiction of altitude and depth, from 36,000 feet above to 36,000 feet below sea level.
http://www.livescience.com/27551-our-amazing-planet-top-to-bottom-mountaintop-to-ocean-trench-infographic.html

Movebank
Movebank is a free, public, online data repository and community for animal tracking and photo monitoring. Movebank acquires new data in real-time by linking data streams coming from satellites, cellphone networks, or other local area networks. In addition, historic animal movement databases are uploaded to the database. Movebank facilitates long-term comparisons of these data, making it possible to address questions such as the effects of global climate change and human-caused landscape change.
http://www.movebank.org/

MPA Blog
The MPA Center offers a new monthly blog about MPAs, hosted on OpenChannels. It will explore the implications of new information; tools and trends for MPA design and management; and more.
http://openchannels.org/blog/cmwahle/welcome-national-marine-protected-areas-centers-new-blog

MPA Blog
The IUCN's World Commission on Protected Areas has launched The Official MPA Blog to offer news and views from IUCN/WCPA. The system allows users to link the site as a news feed; search through news for particular subjects or through a structured archiving of old posting; and email stories of interest to friends and colleagues directly from the website.
http://officialmpa.blogspot.com/

MPA Campaign Tracker
The Marine Conservation Institute has developed a new online tool called MPA Campaign Tracker, allowing viewers to explore and track the progress of MPA campaigns and initiatives worldwide. The tool is available on the MPAtlas website.
http://www.mpatlas.org/campaign/

MPA Community News
The National Marine Protected Areas Center offers a variety of sources to keep up to date with MPA news, including blogs, a newsletter, and more. Subscribe to the newsletter, check out their facebook page, and keep up with the latest partnerships and tools.
http://openchannels.org/community/national-marine-protected-areas-center
http://marineprotectedareas.noaa.gov/subscription/
https://www.facebook.com/usmarineprotectiongov

MPA Guardian
MPA Guardian is a tool that will allow anyone to help protect sensitive marine reserves through the crowdsourced reporting of activities observed by concerned citizens. Reports of possibly illegal activities can be submitted on the website or through free smartphone applications. MPA Guardian is currently focused on California's marine protected areas, with plans to expand it to MPAs across the country.
http://www.mpaguardian.org/

MPA List
Created by MPA News and hosted by OpenChannels, MPA List is an email-based discussion forum for the marine protected area community. It provides a way for managers, researchers, and others to share knowledge, discuss current issues, and stay up-to-date on the latest news and announcements.
http://openchannels.org/community/mpalist

MPA Mapping Tool
The MPA Center has created an interactive online mapping tool that allows users to view boundaries and access data for over a thousand marine protected areas in the United States. The tool provides simple functions to visualize MPA boundaries, review MPA classification information (e.g. level of protection, managing agency, fishing restrictions, etc), and explore all MPAs in a given location.

http://www.mpa.gov/dataanalysis/mpainventory/mpaviewer/mpaviewer.swf

MPA Mapping Tool
NOAA's National Marine Protected Areas Center has created a new interactive online mapping tool that allows users to view boundaries and access data for more than a thousand marine protected areas in the United States. Data for the mapping tool comes from the newly updated MPA Inventory, a comprehensive database of existing U.S. MPAs, containing a range of information on each of the 1,637 protected areas established or managed by federal, state, or territorial agencies or programs.
http://mpa.gov/

MPA Network Planning Process Lessons
The March 2013 special issue of the *Ocean & Coastal Management* journal provides articles about California's multi-year process to plan a coherent network of MPAs in its state waters. The process, the Marine Life Protection Act initiative, incorporated significant stakeholder input and resulted in an increase both in total MPA area and no-take area coverage. Access to the articles is free.
http://www.sciencedirect.com/science/journal/09645691/74

MPA Networks
The MPA Center sponsored a special edition of *Current: The Journal of Marine Education* focused on networks and systems of marine protected areas. The issue includes articles written by authors who have had extensive experience in MPA network management and research. The activities and additional resources at the end of the articles can help you bring the concept of MPAs and networks of MPAs directly into your classroom. The special issue, along with some additional lesson plans, is downloadable.
http://mpa.gov/resources/education/

MPA News in Spanish
MPA News issues dating back to January 2008 are now available in Spanish.
http://depts.washington.edu/mpanews/issues.html

MPA Teaching Materials
The California Marine Sanctuary Foundation hosts a collection of teaching and training guides, and curriculum based materials about MPAs. Check out the teaching materials, mobile resources, and more.
http://californiampas.org/

MPA Videos
The National Marine Protected Areas Center has posted four new videos on their website. Topics include protecting cultural resources, natural resources, and more.
http://www.mpa.gov/

MPA Virtual Library
The National Marine Protected Areas Center, in collaboration with the NOAA Central Library, hosts the MPA Virtual Library to facilitate access to information on MPAs. The MPA Virtual Library serves as a searchable database of print, electronic, and web-based resources on U.S. and international marine protected area issues. The resources described and linked to in the MPA Library are organized by bibliography, conferences and workshops, institutions and organizations, and web sites.
http://www2.mpa.gov/mpa/mpaservices/virtual_library/virtual_library.lasso

MPAs: Conserving Our Oceans One Place at a Time
The National Marine Protected Areas Center offers the downloadable report on the state of marine protected areas in the United States, Marine Protected Areas of the United States: Conserving Our Oceans, One Place at a Time. The document provides a snapshot of the coverage, level of protection, resources protected, and ecological representativeness of MPAs in the United States, along with brief case studies in MPA management from around the country.
http://marineprotectedareas.noaa.gov/pdf/fac/mpas_of_united_states_conserving_oceans_1113.pdf

MPAs – Local and Traditional Fishing Community Perspectives
The International Collective in Support of Fishworkers has launched a new website on MPAs, providing perspectives from local and traditional fishing communities. The website currently includes an overview of MPAs, an outline of international legal instruments protecting the resource rights of local communities, and summaries of case studies from five countries: Brazil, India, Mexico, South Africa, and Thailand.
http://www.icsf.net/icsf2006/jspFiles/mpa/

mPING
Meteorological Phenomena Identification Near the Ground (mPING) is a project designed to collect weather information from the public through smart phones or mobile devices with GPS location capabilities. Through these crowdsourcing weather reports using the free mPING app, anyone can submit an anonymous weather observation. The data is displayed on an accessible map.
http://www.nssl.noaa.gov/projects/ping/

MSN Virtual Earth
MSN's Virtual Earth website draws on detailed aerial photographs of the United States. Visitors can look at photographs of their home, school, or other location. Visitors can also type in city names, and zoom in on various features at their leisure. The software works directly from the website.
http://virtualearth.msn.com/

MTV Switch
Switch is MTV Networks International's Global Climate Change Campaign. It is available in English and Spanish. The website offers ads, videos, tips from Environmentors, and a blog.
http://www.mtvswitch.org/

Museums and the Web
Museums and the Web offers museum specialists the opportunity to learn about each other's work, engage in online discussion, and share information about research activities. Discussion topics include educational practices and in-house evaluation practices.
http://conference.archimuse.com/

Museum of Comparative Zoology: Entomology Primary Type Specimen Database
The Museum of Comparative Zoology at Harvard University has an incredible collection of insects on their website. This online database contains records for primary types in the entomology collections of the Museum of Comparative Zoology (MCZ). In addition to

type label data, type stage and status, the database includes high-resolution images of the type specimens. Check out the other department databases (e.g.ichthyology), too.
http://mcz-28168.oeb.harvard.edu/mcztypedb.htm

Museums in the Sea
The Florida Coastal Management Program and partners are developing Museums in the Sea, offering a virtual tour of Florida's Underwater Archaeological Preserves. Learn about Florida's underwater heritage, ecological, and recreational tourism opportunities at eleven shipwreck locations around the state. Through the website, visitors can choose a shipwreck, take a guided underwater tour of the wreck site, watch a narrated history of the vessel, and observe the marine life that lives in the wreckage.
http://www.museumsinthesea.com/

Museum of New Zealand Te Papa Tongarewa
The website of the Museum of New Zealand Te Papa Tongarewa offers visitors the opportunity to navigate the site in English or Maori. First-time users will want to take a look at Tai Awatea, or Knowledge Net, which offers interactive modules that offer insight into the peoples of the Pacific Islands along with other materials. The website also allows visitors to explore some of the hazards that happen in New Zealand - earthquakes, volcanic eruptions, and tsunami.
http://www.tepapa.govt.nz/TePapa/English/

Museum of Underwater Archaeology
The Museum of Underwater Archaeology introduces students to the work of underwater archaeologists and maritime historians. Explore shipwrecks, lost colonies, and underwater archaeological projects around the world. Learn about the six steps in conducting an underwater archaeology project. Resources include a teaching kit, a worldwide site map, and more.
http://www.uri.edu/artsci/his/mua/MUA.htm

Musical Plates Project
Musical Plates, from the Center for Innovation in Engineering and Science Education, is a multidisciplinary project that challenges students to tap into real-time earthquake data, interact with experts online, and publish their investigative work on a special website. Four core activities teach students how to access and interpret online earthquake and volcano data and use this information to solve real-world problems. The website offers a teacher guide, reference material, projects, ask an expert, and more.
http://www.k12science.org/curriculum/musicalplates3/en/index.shtml

My Earth Changing Moment
Create and upload a short video, essay, art, etc. describing your "aha" Earth Changing Moment -- the moment when you realized the importance of the environment and your connection to it. Be sure to explore others' stories through the word cloud.
http://myearthchangingmoments.org/

My Environmental Education Evaluation Resource Assistant
The website, My Environmental Education Evaluation Resource Assistant (MEERA), provides evaluation resources for formal and non-formal environmental educators. Current offerings include professionally selected and reviewed how-to guides and other resources for evaluating environmental education programs as well as a discussion

forum. Future offerings will include searchable examples of evaluations of environmental education programs.
http://meera.snre.umich.edu/

My Green Job
KABC-TV's *Green Right Now* offers this series, profiling people who working in the emerging green economy. Read the stories of how they started working in these sometimes-new fields, learn about their training, and get their advice on how you can move into the green-collar workforce.
http://www.greenrightnow.com/kabc/2009/04/10/special-report-my-green-job/

My Maps Tutorial
Google's My Maps tool helps visualize data. EarthEcho International offers a free, online tutorial on using My Maps in the classroom.
http://earthecho.org/news/HOA-110414

My NASA Data Lesson Plans
Each lesson on MY NASA DATA provides students an in-depth opportunity for learning to access and use authentic satellite data. Each unit plan provides an implementation guide including at least three lessons, related activities, and resources. The datasets provide information on the atmosphere, ocean, and land surface and are available online along with lesson plans, teacher-friendly documentation, computer tools, and an Earth science glossary. Science project starter ideas are also available.
http://mynasadata.larc.nasa.gov/unit_lessons.html

My Science Box
K-college teachers will find classroom-tested hands-on science lessons at My Science Box. The website offers individual lessons for various grade levels as well as "curriculum boxes," or units, for middle and high school students. Topics include ecology, measurement and observation, and more. Each box contains lesson plans, assessments, field trip planning materials, resources, and even sub-plans with independent activities such as webquests.
http://www.mysciencebox.org/node/12

My Social Security
The Social Security Administration has just launched My Social Security, a new Internet portal that allows individuals to access information related to current or future Social Security benefits. Employees not yet receiving benefits can review their earnings record as well as the Social Security and Medicare taxes they have already paid on covered earnings. The new portal also includes a calculator that can be used to estimate future Social Security retirement, disability, and survivor benefits.
https://secure.ssa.gov/RIL/SiView.do

My Wonderful World
The GLOBE Program has joined a coalition in a public-engagement campaign designed to give students tools, improving the geographic literacy of young people ages 8-17 by motivating parents and educators to expand geographic learning in school, at home and in their communities. The website provides a variety of resources, including suggestions for family activities, links to geography games and online adventures for kids and teens, classroom materials for educators, and more.
http://www.mywonderfulworld.org/

myRefuge App
This iTunes app from the National Fish and Wildlife Foundation gives users access to maps and information on bird watching, special events, trails, and historic sites in National Wildlife Refuges. It is free for an introductory period.
http://itunes.apple.com/us/app/id482928719?mt=8

Myrtle's Coastal Adventure
Myrtle's Coastal Adventure 5th Grade Activity Booklet explores Georgia's coastal world. The booklet provides information on Georgia's islands, an offshore word find puzzle, fish identification, word banks, flora and fauna comparisons, and more.
http://www.knowtheconnection.com/pdf/Myrtles%20Coastal%20Adventure.pdf

Mystery Class – Exploring Sunlight and the Seasons
Teachers and students in grades 4-12 classrooms are invited to participate this winter and spring in Journey North's Mystery Class project, February 2-May 15, 2009, January 28-May 10, 2013, in which students try to find ten secret classes hiding around the globe, using the changing sunlight at each site as the clue.
http://www.learner.org/jnorth/tm/mclass/About.html
http://www.learner.org/jnorth/mclass/fall2012/update120112.html
http://www.learner.org/jnorth/mclass/

Mystery Class and Fall Planting – Exploring Sunlight and the Seasons
Teachers and students are invited to participate in Journey North's Mystery Class project. Starting January 31, 2014 students try to find ten secret classes hiding around the globe using the changing sunlight at each site as the clue. Through the Tulip Test Garden Experiment, students across the northern hemisphere can track change in seasons and global climate.
http://www.learner.org/jnorth/

Mystery of the Megaflood
The dusty scablands of eastern Washington are the result of a massive flood that moved across the region. This website, created by the NOVA program on PBS, provides a number of complementary online materials. These include an interview with an expert and interactive features.
http://www.pbs.org/wgbh/nova/megaflood/

NAI Webinars – Online
The National Association for Interpretation hosts a variety of webinars designed to advance interpretation techniques and help you connect with your audiences. Upcoming webinars include Interpreting for the Latino Community, Holistic Training, Interpretive Message Writing, and more.
http://www.interpnet.com/NAI/interp/Certification/Webinars/nai/_certification/Webinars.aspx

Nai'a Guide
The Nai'a Guide is a free mobile iPad app featuring Hawaiian spinner dolphin ecology and conservation. Within the app, you can watch a video of dolphins herding their prey, listen to spinner dolphin whistles, and more.
http://www.naiaguide.org/

NAMEPA
The North American Marine Environment Protection Association (NAMEPA) is a marine industry-led initiative that operates as a voluntary, non-profit, and nongovernmental organization committed to preserving the marine environment. The organization is comprised of marine industry professionals and works to educate seafarers, port communities, and others about the need and strategies for protecting the marine environment. Check out upcoming sponsored events, educational materials, and more.
http://www.namepa.net/

Narragansett Bay Estuary Program
The Narragansett Bay Estuary Program website features a downloadable journal, an interactive feature on projected sea level rise in Rhode Island, links to publications, and more. Check out the journal articles, including *A Tale of Two Rivers* - articles on efforts to secure federal Wild & Scenic designation for the Taunton River in Massachusetts and Buckeye Brook in Rhode Island, *Bay in Brief*" featuring river restoration projects, *StormSmart Coasts Prepares Mass. Communities*, and more.
http://www.nbep.org/index.html

NASA Data Lesson Plans
Check out the new additions to the MY NASA DATA lesson collection, including lessons on Correlation of Variables by Graphing, Ocean Impacts of an El Nino Event, Phytoplankton in the Gulf of Maine, and more. MY NASA DATA is a project to enable K-12 teachers and students, as well as citizen scientists, to explore the large volumes of data that NASA collects about the Earth from space. Students use scientific inquiry and math skills as they access and display microsets of the Earth System.
http://mynasadata.larc.nasa.gov/lessons.html

NASA Data Lesson Plans
Four new lesson plans on climate have been developed by teachers who are alumni of the 2007 MY NASA DATA summer workshop. MY NASA DATA is a project to enable K-12 teachers and students, as well as citizen scientists, to explore the large volumes of data that NASA collects about the Earth from space. Students use scientific inquiry and math skills as they access and display microsets of the Earth System. Additional lessons explore coral bleaching, Great Lakes snow analysis, and many more.
http://mynasadata.larc.nasa.gov/User_lessons.html

NASA e-Clips
NASA eClips are short video segments available for downloading. The video clips are designed to inspire students to learn more about science, technology, engineering and mathematics, and to understand the application of these subjects in the real world. More videos will be added in the future, but those currently available include *Why are Oceans Salty, What is Weather*, and more.
http://www.nasa.gov/audience/foreducators/nasaeclips/index.html

NASA Earth Explorers Series
This monthly NASA series introduces a variety of learning adventures and lesson plans designed for K-12 educators and students. The articles focus on the investigators researching a wide variety of topics, with links to further information. Recent issues have investigated migrating land and marine animals, ocean satellites, women in science, and more.
http://science.hq.nasa.gov/education/earth_explorers/index.html

NASA Earth Sciences Expert Directory
The NASA scientists and NASA-funded researchers in this expert directory represent over 30 scientific disciplines, from oceanography and ecosystems to natural hazards and global climate change. In addition, each expert has expressed an interest in working with the news media. Search by field or name.
http://experts.nasa.gov/

NASA Education e-Newsletter
The NASA Science Mission Directorate-Earth Science Education Update is a monthly email newsletter describing the latest news, programs, events, and resources related to NASA's earth science education program. It also includes related earth system science education news from other agencies and organizations. Current and back issues of this report are available on the website.
http://science.hq.nasa.gov/education/edreports/index.html

NASA Education Website
The NASA education pages have been updated and can be launched from the new website homepage. Basic navigation includes news, sections for kids, students, and educators, and education programs. The site includes a search engine, which will help you find programs included in previous *Information Exchange* newsletters. Check out Windward, a simulation game that challenges students to outsmart the weather to win a sailboat race around the world.
http://education.nasa.gov/home/index.html

NASA Hurricane Education
NASA has developed several educational tools including posters, visualizations and graphics, and classroom activities on hurricanes. The website offers links to news, research, and educational materials.
http://www.nasa.gov/mission_pages/hurricanes/main/index.html

NASA Images – Visible Earth
NASA presents The Visible Earth, a catalog of over 32000 images and animations of our home planet. Topics include Human Dimensions (environmental impacts, natural hazards, etc), Hydrosphere, Oceans, and more.
http://visibleearth.nasa.gov/

NASA Innovations in Climate Education
NASA Innovations in Climate Education (NICE) promotes climate and Earth system science literacy and seeks to increase the access of underrepresented minority groups to science careers and educational opportunities. Features include climate education news, resources, and more. The educator resources links to online materials specifically related to climate education, along with links to data that can be used to explore climate change.
https://nice.larc.nasa.gov/

NASA International Polar Year Website
This website offers a one-stop shop for the latest NASA images and videos on polar exploration combined with a searchable storehouse of related information.
http://ipy.nasa.gov/

NASA Oceanography Website
See what NASA does in the field of oceanography. NASA Oceanography conducts a program of satellite missions and research projects with its partners to enable global ocean science. This website has links to NASA missions, projects, partnerships and educational materials. For more information, check out
http://oceans.nasa.gov/Home.htm

NASA Presentation Series – Washington, DC
NASA Goddard Space Flight Center and the Library of Congress continue a series of free public presentations by NASA scientists on current science topics. All programs will be held in Washington, DC. Webcasts are typically posted for each program a couple of months after the event.
http://www.loc.gov/rr/scitech/events/events.html

NASA SCI Files™ and The Case of the Ocean Odyssey
The NASA SCIence Files™ is an award-winning series of instructional programs for grades 3-5, integrating mathematics, science, and technology through the use of Problem-Based Learning (PBL), scientific inquiry, and the scientific method. The series seeks to motivate students to become critical thinkers and active problems solvers. Each episode in the series includes a 60-minute instructional broadcast, an educator's guide, a unique interactive online PBL activity, plus instructional resources.
http://scifiles.larc.nasa.gov

NASA STEM Webinars
The NASA STEM Educator Professional Development Collaborative is presenting a series of free webinars open to all educators. Check out both upcoming and archived webinars.
http://www.txstate-epdc.net/events/

NASA Wavelength
NASA Wavelength is a digital collection of Earth and space science resources for educators of all levels – from elementary to college, to out-of-school programs. The resources were developed through funding of the NASA Science Mission Directorate and have undergone a peer-review process through which educators and scientists ensure the content is accurate and useful in an educational setting. Topics include Earth processes, the nature of science, and more.
http://nasawavelength.org/

NASA Wavelength: Earth Science
Part 2 of the NASA Wavelength Authentic Data, Authentic Learning! covers Earth Science. A variety of links to useful data sets, lesson plans, and more are highlighted.
http://nasawavelength.org/blog/authentic-data-authentic-learning-part-2-earth-science

NASA Women of STEM
The NASA Women of STEM website is dedicated to celebrating women who have made contributions to NASA in the related fields of science, technology, engineering, and math. Profiles are included for astronauts, interns, scientists, and more. Be sure to check out the other, linked educational resources for students and teachers.
http://www.nasa.gov/education/womenstem/

National Academies Press Books
The National Academies Press, publisher for the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council, has made all PDF versions of books downloadable to anyone free of charge. This includes a current catalog of more than 4,000 books plus future reports produced by the Press. Few exceptions apply.
http://www.nap.edu/

National Academies of Sciences Year in Review
The National Academies of Sciences publishes a myriad of reports each year. This web page offers highlights of 2013, including reports on topics such as climate change, land use, and more.
http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=01022014b

National Aquatic Invasive Species Tool Kit
The Florida Aquarium has joined a National Sea Grant project. State Sea Grant offices from across the nation have assembled to design and produce an aquatic invasive species tool kit for use in American Zoo and Aquarium Association zoos and aquariums. The Florida Aquarium will be a collaborative author for an interactive public program to be implemented across the country, which will be a part of a tool kit including fact sheets, materials, DVDs, curriculum, and other educational resources.
Contact Debbi Berger at Dberger@flaquarium.org

National Archeological Database Reports Module
The National Archeological Database, Reports module, is an expanded bibliographic inventory of over 350,000 reports on archeological investigation and planning, mostly of limited circulation. This "gray literature" represents a large portion of the primary information available on archeological sites in the U.S.
http://www.cast.uark.edu/other/nps/nadb/nadb.mul.html

National Atlas of the United States
The online National Atlas of the United States is designed to make it easy to find, get, and use geographic information about our nation. Natural phenomena and human activities, such as water quality, tropical cyclone data, toxics release inventory, and ecoregions, are just some of the data layers that you can select from. The maps can be displayed on-line or printed. An additional section hosts subject matter articles.
http://www.nationalatlas.gov/

National Biological Information Infrastructure
The National Biological Information Infrastructure is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The website links diverse biological databases, information products, and analytical tools maintained by partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. The program focuses on wildlife biology and issues surrounding wildlife such as ecosystems, land cover, habitats, and more. Each topic major category (Plants, Animals & Other Organisms, Habitats, Ecological Topics, Geographic Perspectives, and Toolkit) opens to a myriad of useful resources. Ecological Topics alone includes bird conservation, fire ecology and management, invasive species, threatened and endangered species, and more. Under Habitats-Marine, check out OBIS-USA, a one-stop source for biogeographic data collected from U.S. waters and oceanic regions. As an added bonus, all images on the

website are available for most noncommercial uses. NBII LIFE (Library of Images From the Environment) offers different categories, special collections, and even a kids section with games, stories, coloring pages, projects, and more. Set aside some time to look through this resource.
http://www.nbii.gov/portal/server.pt/community/nbii_home/236

National Center for Case Study Teaching in Science
The National Center for Case Study Teaching in Science, based at the University of Buffalo, has developed a number of helpful resources. Visitors to the website can review the case study collection divided into topical areas, check out upcoming conferences and workshops, and more. Case studies on the website of possible interest include weather forecasting, invasive species, a section on ecology and the environment, geology, geography/GIS, and much more.
http://ublib.buffalo.edu/libraries/projects/cases/case.html
http://sciencecases.lib.buffalo.edu/cs/

National Centers for Coastal Ocean Science's Educational Materials
NOAA's National Centers for Coastal Ocean Science's educational materials website has been updated and includes topics for teachers and kids, along with a game section. Materials include Fish Gut Chromatography/Chemistry curricula and more. Kids activity books cover different regions and organisms. The Games section offers materials for NOAA Jeopardy with different marine categories.
http://coastalscience.noaa.gov/about/education/

National Climate Assessment
The National Climate Assessment and Development Advisory Committee has overseen the development of this draft climate assessment report, engaging over 240 authors in its creation. Share your thoughts about the report with the authors and federal agencies who are preparing the report.
http://ncadac.globalchange.gov/

National Climate Assessment Videos
The Story Group has produced a series of short (2-4 min) videos to accompany the National Climate Assessments. You can watch all nine videos back to back, or select individual chapters, including water, oceans, and more from the right side of the page.
https://www.youtube.com/watch?v=VC9T50WL8rM&list=PLYmuc_StVH6Fz4UIgpu5gRhTrpGSfA6Jl&index=1

National Climate Game Jam
NOAA is announcing a national climate game jam October 2-4, 2015. This event offers a unique opportunity for educators, students, scientists, game designers, and interested public members to work together on the development of climate game jam prototypes that span a range of platforms, topics, and audiences. The Climate Game Jam will encourage the creation of new game prototypes that allow players to learn about climate change and resilience through science-based interactive experience.
http://climategamejam.org/

National Climate Predictions & Projections Platform
The National Climate Predictions & Projections Platform works to advance the provision of regional and local information about the evolving climate and to accelerate its use in

adaptation planning and decision making. Activities include climate data and indices; evaluation and translation of downscaled data; and building and supporting community. Check out Open Climate GIS and additional projects in the works.
https://earthsystemcog.org/projects/ncpp/

National Coastal Condition Reports
The National Coastal Condition Reports from the EPA summarize the condition of ecological resources in the coastal waters of the United States and highlight several exemplary federal, state, tribal, and local programs that assess coastal ecological and water quality conditions. The *2005 National Coastal Condition Report II* rates the overall condition of U.S. coastal waters as fair. The reports are downloadable from the website by region, and include graphics.
http://www.epa.gov/owow/oceans/nccr/

National Coastal and Marine Spatial Planning Workshop
The National Ocean Council invites the public to a public session on Coastal and Marine Spatial Planning (CMSP) in Washington, D.C. on June 21, 2011. Workshop participants will learn about CMSP and help shape how it can be used to help harmonize the often competing water use, such as national security, energy and economic security, and conservation. Those who cannot attend the session in person can participate through a live webcast.
http://www.whitehouse.gov/administration/eop/oceans/cmsp-workshop
http://www.doi.gov/news/video/live.cfm

National Coastweek
National Coastweek is coordinated by the Coastal States Organization in conjunction with NOAA, state Coastweek and Coast Day observances, and in partnership with a variety of federal government agencies and national coastal and ocean organizations. Events are held around the country to celebrate the vibrancy of our coastal communities and beauty of our coastal resources. Start the celebration with the Ocean Conservancy's International Coastal Cleanup, and bring it to a close with National Estuary Day.
http://www.living-edge.org

National EE Week
National Environmental Education Week 2014, April 13-19, 2014, is dedicated to increasing the environmental knowledge of K-12 students, with a focus on Greening STEM. The website's new goal is to expand beyond a single week's focus in April, and become a leading educator portal for Greening STEM resources. Sign up for upcoming webinars, check out the educator toolkits, and more. Be sure to register for EE Week 2014.
http://www.eeweek.org/

National EE Week
National Environmental Education Week 2013, April 14-20, 2013, is dedicated to increasing the environmental knowledge of K-12 students. Check out the extensive resources and curricula library. Register for the webinar, 21st Century Tools for Environmental Learning in the Community, April 3, 2013. Watch the video and download the Educator Toolkit for Using Technology to Connect Students & the Environment.
http://www.eeweek.org/

National EE Week
Get ready for National Environmental Education Week 2013, April 14-20, 2013 with the website's *Greening STEM: Taking Technology Outdoors* resources. Register for upcoming webinars and look through the archives. Check out the extensive resources and curricula library.
http://www.eeweek.org/

National EE Week
The National Environmental Education & Training Foundation (NEETF) will coordinate the second annual National EE Week, April 16 to 22, 2006. April 14-20, 2013, is *Greening STEM: Taking Technology Outdoors*.articipating schools, environmental education organizations, education associations, nature centers, zoos, museums, aquariums and state and federal agencies can use National EE Week to prepare for Earth Day and involve thousands of educators and millions of students. Check out the suggested Top 10 Apps for Taking Tech Outside.
http://www.eeweek.org

National Ecological Observatory Network
The National Ecological Observatory Network (NEON) project is a continental-scale research instrument consisting of geographically distributed infrastructure, networked via state-of-the-art communications. NEON will provide nationally networked research, communication, and informatics infrastructure for collaborative and interdisciplinary measurements and experiments on ecological systems. NEON will provide learning environments for students and foster integration of research and education.
http://www.nsf.gov/bio/neon/start.htm ,

National Energy Education Development Project
NEED (National Energy Education Development) develops curriculum and conducts teacher training for K-12 teachers and students. The program is focused on the production, uses and science of energy in all its forms. The NEED program and website includes curriculum materials, professional development, evaluation tools, and an awards program. Note that you may be more successful opening some of the pdf files from the website if your Adobe Acrobat Reader© is already open.
www.need.org .

National Environmental Education Week 2011: Ocean Connections
Make sure you register for EE Week 2011, April 10-16, 2011. Check out the resources, register your activities, and more.
http://www.eeweek.org/ocean_connections

National Environmental Education Week
National Environmental Education Week, April 11-17, 2010, promotes the understanding and protection of the natural world by actively engaging K-12 students and educators of all subjects in a week of environmental learning and service before Earth Day. This year's theme is *Be Water and Energy Wise!* Registered partners have access to a wide variety of free environmental education resources and discounts.
http://www.eeweek.org/

National Environmental Education Week
National Environmental Education Week, April 12-18, 2009, promotes understanding and protection of the natural world by actively engaging K-12 students and educators of

all subjects in an inspired week of environmental learning and service before Earth Day. This year's EE Week theme is *Be Water Wise!* Registered partners have access to a wide variety of free environmental education resources, including a school water auditing tool and water quality monitoring resources.
http://www.eeweek.org/

National Environmental Education Week
National Environmental Education Week promotes understanding and protection of the natural world by actively engaging K-12th grade students and educators of all subjects in a week of environmental learning and service before Earth Day. This year will focus on Carbon Footprints. Participants can access a wide variety of free environmental education resources, including standards-based environmental education lessons and activities.
http://www.eeweek.org/register.htm

National Environmental Education Week
National Environmental Education Week, April 15-22, 2007, April 12-18, 2009, *Be Water Wise!* offers a full week of educational preparation, learning, and activities in K-12 classrooms, nature centers, zoos, museums, and aquariums. An on-line Nature Bee which will encourage student identification of wildlife habitats, flora, and fauna in their communities. Questions will be posted in March, 2007. Become a formal partner by registering on the home page.
http://www.eeweek.org/

National Environmental Education Week
National Environmental Education Week, April 10 - 16, 2005 and April 16-22, 2006, is a full week of educational preparation for Earth Day and will involve some 400,000 educators and 15 million students. Educators can participate by conducting environmental education programming during the week. Check out the "To-Do List" and "Tools and Links" sections on the site for suggested activities, ideas, and resources to involve, educate, and inspire.
http://www.eeweek.org

National Environmental Education Week
National Environmental Education Week, April 13-19, 2008, offers a full week of educational preparation, learning, and activities in K-12 classrooms, nature centers, zoos, museums, and aquariums; the week's theme is *Carbon Footprints*. The website includes a participant toolkit, teaching resources, nature journaling blog, and much more. Become a formal partner by registering on the home page.
http://www.eeweek.org/

National Environment Research Council
The Natural Environment Research Council is a leading funding agency for academic research and training in the environmental sciences at higher education institutions across the United Kingdom. The website contains a number of general interest publications, such as the quarterly magazine, *Planet Earth*. In addition, the science activities pages highlight summaries and background materials, along with links to some of the work that is done under the auspices of the council grants.
http://www.nerc.ac.uk/funding/science.shtml

National Estuaries Day
National Estuaries Day is September 24, 2011. In honor of the nationwide event, a multitude of activities are planned for the entire family at different National Estuarine Research Reserves, such as guided walks, boat tours, live animal presentations, touch tanks, and more.
http://estuaries.gov/GetInvolved/Default.aspx?id=526

National Estuaries Day
The last Saturday in September is National Estuaries Day. The annual event offers a national campaign with festivities across the country. The website also links to EstuaryLive, a free, interactive field trip over the internet hosted by the NOAA's National Estuarine Research Reserves in collaboration with the U.S. Environmental Protection Agency's National Estuary Programs.
http://www.estuaries.gov/

National Estuaries Week
National Estuaries Week is September 19 -26, 2015. Every year, Restore America's Estuaries member organizations, NOAA's National Estuarine Research Reserve System, and EPA's National Estuary Program organize special events, including beach clean-ups, hikes, canoe and kayak trips, cruises, workshops, and more. Check out events near you.
https://www.estuaries.org/national-estuaries-week
http://nerrs.noaa.gov/about/national-estuaries-week.html

National Extension Water Outreach Education
The Water Outreach Education - Facilitating Access to Resources and Best Practices Project is a collaborative effort of the United States Department of Agriculture Cooperative State Research, Education, and Extension Service and other public and private clean and safe water partners to identify and promote the use of Best Education Practices and improve access to education resources and strategies. Check out the many downloadable resources available on the website.
http://wateroutreach.uwex.edu/

National Fire Plan
The National Fire Plan was developed with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The website also includes success story case studies, a state-by-state project list, and a link to Firewise, with community education materials. There are many fire related lesson plans available on the web. Check out the Mammoth Cave National Park's Fire Curriculum for grades 4-8. It can be easily adapted to your region.
www.fireplan.gov
http://www.nps.gov/maca/FireCurriculum.pdf

National Fossil Day Activities
National Fossil Day, October 12, 2011, is a celebration of the United States' rich paleontological resources. Learn about fossils with these activities developed by education specialists in the National Park Service, fossil sites, and various museums. Check out the art and photo contest, local events, and more.
http://nature.nps.gov/geology/nationalfossilday/activities.cfm
http://nature.nps.gov/geology/nationalfossilday/

National Geographic Classroom Companions and Resource Library – Global Fish Crisis
The National Geographic Magazine Community is a partnership between EdNet and National Geographic. The Resources section offers a library of material on numerous subjects, easily searchable by keyword. April 2007 highlights the Global Fish Crisis with articles, lesson plans, multi-media, and more.
http://www.ngsednet.org/community/resources_view.cfm?community_id=168&resource_id=7388

National Geographic Education: Collections
The National Geographic Education website has a number of collections dedicated to different areas within the natural sciences. Topics include ocean education, ecosystems, natural disasters, endangered species, and much more. Resources can be selected by grade, subject, type, and more.
http://education.nationalgeographic.com/education/collections-topics/?ar_a=1

National Geographic Crittercam
The Crittercam is a research tool using a video camera temporarily attached to animals (including marine mammals) to study their behavior. The National Geographic Channel hosts a TV series highlighting Crittercam footage and research. Samples of the videos are available on the website, along with excerpts from the shows.
http://www.nationalgeographic.com/channel/crittercam/ .

National Geographic: Environment
The Environment section of the National Geographic website has photos, quizzes, blogs, games, and news. Check out the Ocean Extremes Quiz, The Hidden Water We Use, and much more.
http://environment.nationalgeographic.com/environment/?source=NavEnvHome

National Geographic Kids Website
The website shows the amazing diversity of animals, people, and our beautiful world. Students can learn about the planet, play games, watch videos, print out experiments, and more.
http://kids.nationalgeographic.com/

National Geographic: The Ocean
This section of the National Geographic website is dedicated to the ocean. As expected from National Geographic, it hosts incredible videos and photos of underwater worlds, as well as articles and exposés of various issues. Categories include Ocean Life, Protecting the Ocean, and more.
http://ocean.nationalgeographic.com/ocean/

National Geographic Oil Spill Resources
In conjunction with three television programs on the oil spill, National Geographic, with funding from Oracle, has developed a series of educator materials.
http://www.nationalgeographic.com/educator-resources/oil-spills/

National Geographic Xpeditions
The National Geographic Xpeditions website hosts the lesson plan, *Taking Care of Our Oceans*. In this lesson, students consider why so many people live near the coast and

learn about the impacts of this trend on ocean animals. They will make posters to educate coastal residents and visitors about human impacts on marine life.
http://www.nationalgeographic.com/xpeditions/lessons/14/gk2/seascare.html

National Geographic Xpeditions Lesson Plans
The National Geographic Xpeditions Lesson Plans have been written by educators and tested in the classroom. Categories include the world in spatial terms, places and regions, environment and society, and more. A recent addition, Human Footprint, shows how everything we consume, use, and discard over a lifetime has an effect on our planet. Others include Wave Properties, River Sources and Stories, and more.
http://www.nationalgeographic.com/xpeditions/lessons/

National Geologic Map Database
This portal provides links to online map indexes of the USGS and other organizations, which can be used to locate, view, or create maps. The maps are available in a wide variety of scales and themes, and cover the United States, many countries, and more.
http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html

National Geophysical Data Center
NOAA's National Geophysical Data Center website includes a climate timeline tool which to demonstrate the transformation of the Earth's climate over the past 100,000 years, along with interactive hands-on activities that include an origami balloon of global elevations and a dodecahedron globe that offers a three- dimensional visualization for use by students and teachers. Visualizing Data area offers animated dives to the bottom of the Marianas Trench, coastal relief imagery, Great Lakes bathymetry, and more.
http://www.ngdc.noaa.gov/education/education.html

National Glider Asset Map
The U.S. Integrated Ocean Observing System (IOOS) launched a new map that displays where partner gliders are currently patrolling and where they have been. The National Glider Asset Map is a collaborative effort and includes all the current and historical glider missions dating back to 2005 from Southern California, Northern Pacific, and Mid-Atlantic. Users can see where gliders are located at sea and can retrieve an historical collection of data from completed missions.
http://www.ioos.gov/observing/observing_assets/glider_asset_map.html

National High School Policy Debate Topic
The high school policy debate topic is selected annually under the auspices of the National Federation of State High School Association's Speech, Debate, and Theater Association. The 2014-15 Policy Debate topic will be: Resolved: The United States federal government should substantially increase its non-military exploration and/or development of the Earth's oceans. NOAA offers this website with useful links to use as a starting point for debate.
http://www.education.noaa.gov/Special_Topics/Ocean_Debate.html

National Historic Trails – Certification
The U.S. Fish and Wildlife Service is increasing its focus on the National Trails System. It is interested in gaining recognition for refuges and hatcheries along National Historic Trails, forming partnerships which help landowners protect and preserve their historic trail properties, and share them with others. It is also increasing its role with National

Scenic Trails that cross lands it administers and increasing its participation in the National Recreation Trails program, nominating 18 trails for designation for 2005. Contact Nathan Caldwell, (703) 358-2205, nathan_caldwell@fws.gov
http://data2.itc.nps.gov/parks/poex/ppdocuments/Certification%20Brochure%20web_view.pdf

National Hurricane Preparedness Week
May 25-31, 2015 is National Hurricane Preparedness Week. Check out NOAA's website, with links to background information about hurricanes, outreach & education, YouTube videos, and more. And be sure to check out the H-O education program archives of the Information Exchange for Marine Educators newsletter for hurricane topics.
http://www.nhc.noaa.gov/prepare/
http://marineprotectedareas.noaa.gov/resources/education/#exchange

The National Hurricane Survival Initiative
This website offers information about hurricane preparedness to the general public. The site includes a storm readiness checklist, a hurricane questionnaire, and basic hurricane evacuation procedures. The "Storms Stats" area provides a primer on what exactly hurricanes are along with concise summaries of the wind and water damage that hurricanes can inflict. The site's materials are also available in Spanish.
http://www.hurricanesafety.org/home2.shtml

National Lab Day
National Lab Day is a nationwide initiative to build local communities of support that will foster ongoing collaborations among volunteers, students, and educators. Volunteers (university students, scientists, engineers, other STEM professionals and members of the community) will work together with educators and students to improve labs and discovery-based science experiences for students in grades 6-12. In May, 2010 participants will celebrate this collaboration with National Lab Day activities across the country.
http://www.nationallabday.org/

National Lab Network
National Lab Day is now the National Lab Network, connecting teachers with science professionals, local volunteers, and online resources to support and encourage hands-on K–12 STEM projects with project ideas and lesson plans, funding for public school teachers, events, and more.
http://www.nationallabnetwork.org/

National Landmarks at Risk
The Union of Concerned Scientists offers the downloadable report, National Landmarks at Risk: How Rising Seas, Floods and Wildfires are Threatening the United States' Most Cherished Historic Sites. The report covers different landmarks through 25 case studies. The range and scale of impacts discussed include erosion, rising seas, wildfires, and more.
http://www.ucsusa.org/assets/documents/global_warming/National-Landmarks-at-Risk-Full-Report.pdf

National Library for the Environment
The National Council for Science and the Environment hosts the online National Library for the Environment. Visitors can view Congressional Research Service reports, environmental news, and more. The reports can be searched by topic (such as biodiversity or climate change), or through a keyword search engine. Additional offerings include links to foundations providing environmental grants and educational resources.
http://www.ncseonline.org/NLE/

National Map
The National Map is an interactive map service published by the United States Geological Survey (USGS). Users can create and print high-resolution shaded relief maps of a local area, a state, or the entire U.S. A variety of data layers are available, including geology, land use/land cover, and more.
http://nationalmap.gov/

National Marine Debris Monitoring Program Final Report
The Ocean Conservancy has released key findings from the National Marine Debris Monitoring Program, a five-year national study of trash in the ocean. The goal of the study was to set a nationwide scientific baseline of the marine debris problem in the U.S. The downloadable report can help federal and state agencies and local communities better understand where trash in the ocean is coming from and assist them in developing solutions for preventing this serious problem.
http://www.oceanconservancy.org/site/PageServer?pagename=mdm_debris

National Marine Sanctuary System Condition Report
The National Marine Sanctuary System Condition Report 2013 describes priority issues and challenges facing the 14 sites within the system and discusses actions to address them. Both natural and archaeological resource concerns are identified in the report, including marine debris entanglement, loss of biodiversity, invasive species, and more.
http://sanctuaries.noaa.gov/library/pdfs/ncr2013.pdf

National Marine Sanctuaries Education Website
NOAA's National Marine Sanctuary Program has launched a new education website to enhance public awareness, understanding and appreciation of the marine environment. Take a Sanctuary Tour of image galleries or explore the section for teachers, which includes curriculum, online activities, professional development opportunities, high tech learning, multicultural programs and much more. You can also take a virtual dive in a submersible, download puzzles, read online story books and engage in digital labs.
http://sanctuaries.noaa.gov/education .

National Marine Sanctuaries Expeditions
Expedition coverage for five current or upcoming missions within the National Marine Sanctuaries Program is available online. These projects launch with a complete set of background materials, including maps, mission plans, team bios, history essays, technology features and more, providing web site visitors with everything they need to know about an upcoming expedition. Once underway, the teams send back daily expedition logs with photos and videos that are posted to the web site.
http://sanctuaries.noaa.gov/missions/welcome.html

National Marine Sanctuaries: Experience California Mobile App
The National Marine Sanctuaries: Experience California mobile app covers more than 8,600 square miles of federally protected ocean and coastal waters stretching from Big Sur to the Farallon Islands, including Monterey Bay, San Francisco, and Santa Barbara. Educational resources include information about the sanctuaries and features a searchable encyclopedia, glossary, and photo galleries.
https://itunes.apple.com/us/app/national-marine-sanctuaries/id665924513

National Marine Sanctuaries Media Library
The Media Library is an online resource with a collection of select video clips and high-resolution still images from the National Marine Sanctuaries, available for download. Users can search by keyword, media type, and category, or browse the galleries, including human impacts, education and outreach, fish portraits, and more.
http://sanctuaries.noaa.gov/photos

National Marine Sanctuaries Media Library
NOAA's Office of National Marine Sanctuaries has launched an online multimedia library offering public access to thousands of high-resolution, ocean-related photos, and videos taken by NOAA scientists, educators, divers, and archaeologists. The National library database contains a collection of high-quality still images and video footage featuring all 13 national marine sanctuaries and the Papahānaumokuākea Marine National Monument.
https://marinelife.noaa.gov/media_lib/index.aspx

National Marine Sanctuaries Online News
The National Marine Sanctuary Program offers a monthly e-newsletter to keep subscribers informed about the many program activities and accomplishments that take place within the national marine sanctuaries and marine national monument. The website allows visitors to download several past issues of the printed newsletter and instructions on how to subscribe to the monthly e-newsletter.
http://sanctuaries.noaa.gov/news/sw/

National Marine Sanctuaries of the West Coast
Learn more about the National Marine Sanctuaries of the West Coast through this downloadable 16-page guide. Explore the habitats, wildlife and culture of the five sanctuaries in California and Washington State, and learn how they are all interconnected by ocean currents. The guide also offers advice on how to practice daily conservation and get involved.
http://sanctuaries.noaa.gov/education/teachers/awareness_outreach.html

National Marine Sanctuaries of the West Coast
The five West Coast national marine sanctuaries encompass nearly 12,000 square miles of ocean. Explore the habitats, wildlife and culture of the five sanctuaries in California and Washington State, and how they are interconnected by ocean currents. This downloadable guide also shows readers how they can practice daily conservation and get involved.
http://sanctuaries.noaa.gov/education/teachers/awareness_outreach.html

National Marine Sanctuary Calendars
The National Marine Sanctuary Foundation has produced six dynamic calendar products filled with brilliant, colorful photos taken in our national marine sanctuaries. Choices

include three wall calendars, a phone/address book, a desk blotter, and a monthly pocket planner. Half of all proceeds from sales will benefit the Foundation's nationwide education and outreach efforts.
http://nmsfocean.org

National Marine Sanctuary Program YouTube Channel
Discover the marine life and extraordinary habitats that make up your nation's 13 marine sanctuaries and one marine national monument. Find out more about our continuing efforts to conserve these ocean and coastal treasures. Check out videos about Sanctuary Sam, whale disentanglement, turtles, sharks, and more.
http://www.youtube.com/sanctuaries

National Marine Sanctuary System Expeditions
Check out the latest expeditions from across the National Marine Sanctuary System. New archives include:

- Live Webcasts from Shipwreck Montana
- Battle of the Atlantic Expedition
- Deep-Sea Coral Expedition
- Gray's Reef Expedition
- Papahanaumokuakea Marine National Monument Explorations 2010
- East Carolina University Nearshore Expedition
- Exploring Deep Sea Coral

http://sanctuaries.noaa.gov/missions/welcome.html

National Ocean Economics Program
The National Ocean Economics Program provides a full range of the most current economic and socio-economic information available on changes and trends along the U.S. coast and in coastal waters. The program is funded by federal, state, university, and private grants and contracts. Check out this updated website.
http://noep.mbari.org/

National Ocean Sciences Bowl
The National Ocean Sciences Bowl (NOSB) prepares the next generation of marine scientists, policy makers, teachers, explorers, researchers, technicians, environmental advocates, and informed citizens. The NOSB provides an educational forum for students to excel in math and science and receive national recognition for their diligence and talents. The competition generates student and teacher interest and excitement about science and the oceans, fosters collegiality, teamwork, and factual recollection.
http://www.nosb.org/

National Ocean Sciences Bowl
The upcoming National Ocean Sciences Bowl regional competitions will be held on February 9, and February 23, 2008. The national competition will be held in Seward, Alaska, April 25-27, 2008. This year, the materials distributed for the national competition will highlight the International Polar Year. More than 200 research projects are planned, involving more than 50,000 people and 60 nations.
http://www.nosb.org/

National Ocean Service Discovery Centers
NOAA's National Ocean Service has launched the NOS Education Discovery Center, presenting educational materials about the breadth of scientific research, technology, and activities conducted by NOS in the areas of oceans, coasts, and charting and navigation. The Discovery Center offers Discovery Classroom, Stories, and Kits incorporating numerous multimedia features. Current topics include coral reef conservation, international collaboration, marine protected areas, and more.
http://www.nos.noaa.gov/education/welcome.html

National Ocean Service RSS Feed Library
NOAA's National Ocean Service (NOS) offers a wide variety of RSS feed covering diverse topics. Feeds include news, in-dept overviews of topics ranging from oil spills to global positioning, images, and much more. Podcasts include *Diving Deeper, Making Waves,* and more. Check out the extensive list and sign up to get the latest content on subject of interest, and look through the archived information.
http://oceanservice.noaa.gov/rss.html

National Ocean Service Widgets
A widget is a small piece of web programming code that adds content to your blog, wiki, or web page. Information in a widget can feature updated content or let the readers do something like use a search box. NOAA's National Ocean Service offers widgets for Ocean Facts, the NOS YouTube Channel, the NOS Twitter account, and more.
http://oceanservice.noaa.gov/widgets/welcome.html

National Park Service Photos & Multimedia
This redesigned National Park Service website offers photos and multimedia resources from the full range of the Park Service holdings. Offerings include webcams, photo galleries, multimedia presentations, and virtual tours.
http://www.nps.gov/photosmultimedia

National Ocean Service Website
NOAA's new NOS website offers interactive presentations of topics covered by the organization. Explore its role in marine navigation, learn more about the National Estuarine Research Reserve System, read about contaminants in the environment, and more.
http://oceanservice.noaa.gov/topics/

National Oceanographic Data Center
NOAA's NODC provides scientific and public stewardship for national and international marine environmental and ecosystem data and information, maintaining a national ocean archive with environmental data including physical, biological, and chemical measurements derived from in situ oceanographic observations, satellite remote sensing of the oceans, and ocean model simulations. Check out the flyers for quick overviews of some of the products available.
http://www.nodc.noaa.gov/

National Oceans Month at NPS
This website from the National Park Service helps visitors learn about the oceans and Great Lakes, how the National Park Service is working to conserve and restore our ocean heritage, and how you can get involved. Explore the Ocean Park Finder, the

educational resources, volunteer opportunities, and more. Check back to find updated features as National Oceans Month (June) progresses.
http://nature.nps.gov/features/oceans/index.cfm

National Park Foundation Electronic Field Trips
These electronic field trips give students the opportunity to learn about a particular topic through national parks they may never get a chance to visit. Each program consists of two components: a televised broadcast from a national park featuring National Park Service Rangers and youth hosts, and a website featuring downloadable lesson plans for teachers and interactive games for students.
http://www.nationalparks.org/npf-at-work/our-programs/electronic-field-trip/

National Park Service Teacher Resources
The National Park Service offers this set of educational resources which draws on national parks from the Delaware Water Gap to the volcanoes of Hawaii. The materials are specifically designed for teaching geology, but can easily be incorporated into lessons. The homepage features teacher guides and links to park programs with lessons and programs. Additional links bring visitors to information about coastal geology, soils, inventory and monitoring, and much more.
http://www.nature.nps.gov/geology/education/

National Park Week
National Park Week, April 18-26, 2009, April 18-26, 2015 is an annual week for celebration and recognition of National Parks. Parks can provide recreational experiences, opportunities to learn and grow, and places of quiet refuge. Check the website for a schedule of Park Week events.
http://www.nps.gov/npweek/
http://www.nationalparks.org/national-park-week

National Parks America Tour
Unilever's National Parks America Tour is a volunteer-driven initiative designed to engage employees, community groups, school children, scouts, and citizens of all ages in volunteer service-to-the-land activities in America's National Parks. With more than 25 events each year, National Parks America Tour volunteers assist by completing priority improvement projects.
http://www.unilevernationalparks.com/npat.html

National Parks Fee-Free Weekends
More than 100 national parks across the country will be offering fee-free days during the summer and fall this year, including August 14-15, September 25 (National Public Lands Day) and November 11, 2010. In addition, many national parks never charge an entrance fee. Check out these opportunities to get outside and share our national heritage.
http://www.nps.gov/findapark/feefreeparks.htm

National Parks of New York Harbor
Aiming to make National Park Service rangers as recognized in New York City as they are on the trails of Yosemite, the National Parks of New York Harbor Project, a new public-private partnership of the National Park Service and the National Park Foundation, unveiled the first phase of an effort to heighten public support and increase

access to 22 national park sites around the region of New York Harbor. Its centerpiece is an audio tour, the *Gateway to America: National Parks of New York Harbor Tour*.
http://data2.itc.nps.gov/digest/printheadline.cfm?type=ParkNewsEvents&id=14951

National Preservation Institute
The National Preservation Institute offers continuing education and professional training for those involved in the management, preservation, and stewardship of cultural heritage. The website offers information about scholarships, online resources, and professional development.
http://www.npi.org/

National Public Lands Day
Participate in National Public Lands Day, September 30, 2006, and help build upon the lasting legacy of the Civilian Conservation Corps for the greater enjoyment and enrichment of all Americans. National Public Lands Day provides an opportunity for volunteers across the nation to work together in improving our public lands.
http://www.publiclandsday.org/

National Public Lands Day Manual
National Public Lands Day is September 29, 2012. This website offers a downloadable Manual for Site Managers with suggestions for choosing volunteer projects, resources needed by site managers, and more.
http://www.publiclandsday.org/resources/site-manager-resources/manual-site-managers

National Saltwater Angler Survey
This NOAA Fisheries survey aims to identify what matters most to saltwater recreational anglers. The survey provides insights into anglers' motivations, characteristics of successful trips, and preferred management objectives to help NOAA Fisheries better understand what saltwater recreational anglers care most about.
http://www.st.nmfs.noaa.gov/economics/fisheries/recreational/attitudes-and-preferences-of-anglers/index

National Science Digital Library
The National Science Digital Library was created by the National Science Foundation to provide organized access to high quality resources and tools that support innovations in teaching and learning at all levels of science, technology, engineering, and mathematics education. It offers an easy-to-use search engine, or browsing by selections. A special portal has been created for middle school teachers to provide a direct path to selective online resources for instruction and professional development.
http://www.nsdl.org

National Science Foundation: Current
The National Science Foundation publishes the *NSF Current* newsletter in order to inform the public about its research and education efforts. The website hosts the downloadable current issue, along with archives of the issues dating back to 2005. The material covered here is as diverse as science. Articles contain links to additional resources including original research papers, visualizations, and data sets.
http://www.nsf.gov/news/newsletter/

National Science Foundation Education News
The National Science Foundation education overview website links to news about NSF-funded educational materials, including classroom resources, reports on recent studies, and more.
http://www.nsf.gov/news/overviews/education/

National Science Teachers Association's (NSTA) Resources and Resource Lists
The National Science Teachers Association periodically publishes lists of different web resources. Recent lists include

- Free Opportunities for High School Science Teachers, http://science.nsta.org/enewsletter/2004-06/high_school.htm
- Free Resources For Science Teachers, at http://science.nsta.org/enewsletter/2004-06/news_stories_high.htm
- Summer reading list for books, http://science.nsta.org/enewsletter/2004-07/highcatalog.pdf

Check the NSTA website for links to other websites, resources, and educational materials.
http://www.nsta.org/

National Sea Grant Library
This searchable database of 40,000 records is the most comprehensive collection of Sea Grant funded documents covering a wide variety of subjects including marine education, aquaculture, fisheries, coastal zone management, oceanography, marine recreation, and law. The library includes marine science K-12 activity sheets and teacher's guides. Staff lend documents, CD-ROMs, videos, DVDs, and other materials worldwide to aid scientists, teachers, students, fishermen, and others in their research and studies. All of the documents, CD-ROMs, videos and DVDs may be borrowed from the NSGL for one month and most can be obtained from the sponsoring Sea Grant programs. The website also features digital libraries on education and marine careers.
http://nsgl.gso.uri.edu/

National Seafood Month
October is National Seafood Month; check out these resources from One World One Ocean. Get to Know Your Seafood through Seafood Watch and fish2fork, explore sustainable seafood recipes, and more.
http://www.oneworldoneocean.com/initiatives/gofish

National Service-Learning Clearinghouse
The National Service-Learning Clearinghouse offers this website supporting the service-learning efforts of schools, higher education institutions, communities, and tribal nations. Find information and relevant resources, free online resources, a library of service-learning materials, reference and technical assistance services, and more.
http://www.servicelearning.org/index.php

National Service-Learning Partnership
National Service-Learning Partnership is a national network of members dedicated to advancing service-learning as a core part of every young person's education. Service-learning is a teaching method that engages young people in solving problems within their schools and communities as part of their academic studies or other type of intentional learning activity. The website includes background information, lesson plans, professional development opportunities, and a professional services directory.

http://www.service-learningpartnership.org/

National Severe Weather Preparedness Week
National Severe Weather Preparedness Week is March 2-8, 2014. The annual event is a public education effort aimed at improving the way people prepare for and respond to severe weather. This website provides different resources to raise awareness of severe weather and help increase disaster preparedness.
http://www.nws.noaa.gov/com/weatherreadynation/severe.html#.UxCtRYV9IQ0

National Snow and Ice Data Center
The National Snow and Ice Data Center researches the cryosphere, and this website offers information on their work on the world of ice and snow. The website offers links to information about Sea Ice, Snow, Glaciers, Arctic Climate, and more. To stay relatively warm on these cold winter nights, check out the Photo Gallery, with photos of blizzards, snow phenomena and formations, and more.
http://nsidc.org/cryosphere/

National Status and Trends Program
NOAA's National Centers for Coastal Ocean Science (NCCOS) conducts and supports research, monitoring, assessments, and technical assistance to meet NOAA's coastal stewardship and management responsibilities. The National Status and Trends Program website offers all the toxicology data from the National Status and Trends program in an easily searchable format.
http://ccma.nos.noaa.gov/stressors/pollution/nsandt/welcome.html

National STEM Centre: Technology Resources
Britain's National STEM Centre website offers resources related to science, technology, engineering, and math, with an emphasis on technology. Topics are aimed at different age groups. Check out Water for the World, The Splitting Earth, and more. Free registration is required.
http://www.nationalstemcentre.org.uk/elibrary/technology/

National STEM Directory
The Lawrence Hall of Science is working with Time Warner Cable to promote after school and summer programs focused on Ocean Literacy. Time Warner Cable is launching a national directory to identify STEM learning beyond the classroom. Note that this is not an organization directory; programs and events must be in your profile to come up in search results.
http://directory.scienceafterschool.org/signup/

National Student Summit on Ocean Issues
Coastal America is partnering to host a National Student Summit on Ocean Issues, January 14-16, 2004, Washington, DC. Students, teachers, and marine educators from 14 Coastal Ecosystem Learning Centers will present their research on regional ocean issues to a panel of experts, and present their findings as a national issue paper, along with a "Proclamation of Student Commitment to Action on Ocean Issues."
Contact gene.cope@noaa.gov for more information

National Teach-in on Global Warming Solutions
On February 5, 2009, the National Teach-In on Global Warming Solutions will engage Americans in solutions-driven dialogue, including young people, national political

leaders, and other key decision-makers. The website has links to information about weekly planning calls, educational resources, and more.
http://nationalteachin.org/

National Trails Day
American Hiking Society's trail awareness program, National Trails Day, June 7, 2008, inspires the public and trail enthusiasts nationwide to seek out their favorite trails to discover, learn about, and celebrate trails while participating in educational exhibits, trail dedications, gear demonstrations, instructional workshops and trail work projects. Register your event through this website. National Trails Day, the first Saturday in June (June 4, 2011), is celebrated annually by the American Hiking Society and partners. Find or register an event near you.
http://www.americanhiking.org/National-Trails-Day/Info/
http://www.americanhiking.org/NTD.aspx
http://www.americanhiking.org/national-trails-day/

National Trails Symposium Presentations
Dozens of educational sessions and 15 mini-workshops highlighted the theme of the 2010 American Trails National Symposium, *Trails: The Greenway for America*. American Trails offers more than 40 of these presentations on their website. Files include Linking the Landscape: Conservation Strategies Along Land and Water Trail Corridors, Blue Ways: Long Trails, Education Opportunities, Dealing with Obstacles, and more.
http://www.americantrails.org/2010/concurrent.html

National Undersea Research Program
NOAA's National Undersea Research Program (NURP) has launched a new website that features NURP's scientific and research discoveries in simple and easy to understand language. The site also contains a searchable database of underwater video and photos that are all public domain.
http://www.nurp.noaa.gov/

National Water Management Center
The National Resources Conservation Service offers the National Water Management Center website to provide leadership, assistance, information, and technology on water-related issues for natural resources conservation. Learn about water resource planning, watershed assessments, water policy implementations, and more.
http://wmc.ar.nrcs.usda.gov/

National Water Quality Monitoring Council Webinar Series
The National Water Quality Monitoring Council will offer the webinar, Effective Science Communication with emphasis on visual science communication tools, September 15, 2015. The webinar will discuss the art of storytelling to capture the key messages from scientific research and make the data compelling. Note that many of the council's webinars are archived for future viewing.
http://acwi.gov/monitoring/webinars/index.html

National Water Trails System
A new Secretarial Order establishes national water trails as a class of national recreational trails under the National Trails System Act of 1968. The Chattahoochee

River Water Trail has been designated as the first National Water Trail. The National Park Service will coordinate the water trail nomination process.
http://www.americantrails.org/resources/water/AGO-first-blueway-designation.html
http://www.americantrails.org/resources/water/National-Water-Trails-overview.html

National Week of the Ocean - Florida
This year's theme of National Week of the Ocean celebration in Fort Lauderdale, Florida is *Exploring and Caring for the Ocean,* held on six weekends from March 5-May 7, 2011. The annual event is dedicated to educating young people to develop a sense of stewardship towards the ocean. National Week of the Ocean members encourage year-round ocean study from the arts to commerce, from history to foods, from endangered sea creatures to issues such as offshore drilling or ocean dumping. Check out the schedule of events for the Week of the Ocean Seas-on, to be held March 10-June 8, 2012.
http://www.national-week-of-the-ocean.org/

National Wetland Plant List Update
The National Wetland Plant List is used to delineate wetlands for purposes of the Clean Water Act and the Wetland Conservation Provisions of the Food Security Act. Other applications of the list include wetland restoration, establishment, and enhancement projects. The website provides details about providing comments on the proposed updated list.
https://rsgis.crrel.usace.army.mil/apex/f?p=703:1:3818319567236099

National Wetlands Research Center
The mission of the National Wetlands Research Center is to develop and disseminate scientific information needed for understanding the ecology and values of our nation's wetlands and for managing and restoring wetland habitats and associated plant and animal communities. The on-line library includes species profiles, produced in the 1980's, of more than 100 coastal aquatic organisms, principally fish of sport, commercial, or ecological importance.
http://www.nwrc.usgs.gov/publications/specintro.htm

National Wildlife Week
The theme for this year's National Wildlife Federation's National Wildlife Week, March 15-21, 2010 is *Be Out There At Home, School and Play*. March 19-25, 2012, rch 17-23, 2014 with the theme Wildlife and Water; March 9-15, 2015 with the theme Living with Wildlife.: From the mountains to the rivers to the oceans. The website offers free downloadable nature-themed activities and curricula, information and activities about greening your school, and more.
http://www.nwf.org/Get-Outside/Be-Out-There/Events/National-Wildlife-Week.aspx
http://www.nwf.org/national-wildlife-week.aspx

National Wildlife Week
National Wildlife Week is April 22-30, 2006 and the National Wildlife Federation is encouraging everyone to *Get outside and explore your community*. The website includes a marketing toolkit. Activities to get involved in include:

- Rebuild places for wildlife; wildlife-related volunteer work on April 22-23, 2006
- Read with Ranger Rick; week-long literacy and reading program
- Monitor and record spring wildlife species during National Wildlife Watch on April 29-30, 2006

http://www.nwf.org/nationalwildlifeweek

National Wildlife Refuge Week
Americans will flock to national wildlife refuges for National Wildlife Refuge Week. The National Wildlife Refuge System is pivotal role in offering outdoor recreational opportunities as well as showcasing the conservation and recovery of wildlife species on refuges across the country. Bald eagles, whooping cranes and the California condor are some of the endangered and threatened species that have been helped back from the brink of extinction by the work of biologists in national wildlife refuges.
http://refuges.fws.gov/ .

Native American Heritage Month from the Scout Report
The Scout Report from the University of Wisconsin is celebrating November as Native American Heritage Month with links to a variety of pertinent resources.
https://scout.wisc.edu/report/2013/1018

Native Hawaiian Education Program
The Native Hawaiian Education program supports innovative projects that enhance the educational services provided to Native Hawaiian children and adults.
http://www.ed.gov/legislation/FedRegister/announcements/2009-1/012309f.html

Natural Calendar
The Natural Calendar is an on-line webpage published at the beginning of each month on the LEAPS website. It details upcoming natural events in the sky and in the natural world. Sections typically include astronomy, amphibians (complete on-line guide including calls), birds, and insects. Suggestions for additional information (e.g. marine and wetland-oriented events) are welcome. While on the website, check out the frog and toad identification pages.
http://www.leaps.ms/

Natural Hazards - Earth Science Week
This year, Earth Science Week, October 10-16, 2004 focuses on Natural Hazards and the ways that Earth Scientists study hazards in order to understand their causes and minimize their impact on society. The website has a variety of educational activities grouped by suggested grade level.
http://www.earthsciweek.org/ .

Natural Hazards Observer
The Natural Hazards Observer, the bimonthly periodical of the Natural Hazards Center, covers disaster issues, recent disaster management and education programs, resources and Web sites, and more. It focuses on human adaptation and response to natural hazards and is a forum for interested individuals to express opinions through invited personal articles. Articles in the November 2012 issue include Your classic climate change fish stories, What is resilience, and more.
http://www.colorado.edu/hazards/o/index.html

Natural Heroes Project Guide
Natural Heroes is a PBS broadcast series profiling an individual or group doing something positive for the environment. To help teachers and students take advantage of the content of these stories, this classroom guide offers six projects aligned to

Common Core State Standards to accompany the films. Also included are interactive links to additional resources and short video clips from the film.
http://naturalheroes.org/educational-resources/

Natural Inquirer Journal from USDA
This journal, *The Natural Inquirer*, was created so that scientists can share their research with middle school students. Each article describes scientific research conducted by scientists in the USDA Forest Service. The website lets you search for articles by topic and by issue. While it focuses, naturally, on forests, topics of interest for marine educators include wildlife, habitat, and water. The articles include educational add-ons, and the website offers additional lesson plans. The website offers lists of articles relating to birds, climate change, soil, and water, along with additional search abilities.
http://www.naturalinquirer.org/
www.naturalinquirer.usda.gov .

Natural Capital Project
The Natural Capital Project develops tools to incorporate natural capital into decisions. InVEST is a family of software-based tools for Integrated Valuation of Ecosystem Services and Tradeoffs, helping decision-makers to quantify the importance of natural capital, to assess the tradeoffs associated with alternative choices, and to integrate conservation and human development. The program offers webinars of Marine InVEST (check it out through the EBM Tools Network).
http://naturalcapitalproject.org/home04.html

Natural Resource Technical Reports
The National Park Service offers the Natural Resource Publication series, which addresses topics that are of interest and applicability to a broad readership in the National Park Service and to others in the management of natural resources. Posted reports include the results of research that addresses natural resource management issues; natural resource inventory and monitoring activities; resource assessment reports; scientific literature reviews; and workshops, conferences, or symposia.
http://www.nature.nps.gov/publications/NRPM/nrtr.cfm

Natural Resources Year in Review
The 2005 National Park Service Natural Resources Year in Review is now available. It contains is news of the Natural Resource Challenge programs, a preliminary overview of impacts to national parks from the 2005 hurricane season, and articles on other natural resource issues. The report can be accessed on-line.
http://www2.nature.nps.gov/YearInReview/

Nature History of Alaska
This course, Nature History of Alaska, was offered during the spring semester in 2005 through the University of Alaska Southeast. The participants included students in non-science majors, who had the opportunity to investigate some of the natural aspects of Alaska landscapes. Classes included a variety of investigative field trips including birding, creek bank exploration, and an in-depth tour and examination of the sea floor mapping research work conducted in southeast Alaska waters by the NOAA research vessel *Fairweather*. For more information, contact Faith Duncan at fduncan@fs.fed.us.

Nature Journaling Weblog
In celebration of EE Week 2009's *Be Water Wise!* theme, the National EE Week website offers a series of water-themed Nature Journaling Blogs, developed in partnership with the Roger Tory Peterson Institute. The blogs provides educators ideas for incorporating nature journaling into the curriculum.
http://www.eeweek.org/nature_journal

Nature News Special: 2012 Review
Nature magazine presents this website allowing non-subscribers access to a yearly round-up of key science issues and discoveries. The website offers information about the human stories behind key developments from the year, 366 Days about daily scientific events of the past year in a variety of media, readers' choice, and more.
http://www.nature.com/news/specials/2012/index.html

Nature Rocks Activity Finder
Nature Rocks is a national program to inspire and empower families to play and explore in nature. The Nature Rocks Website offers ideas for outdoor explorations keyed to time available, location, age, and more.
http://www.naturerocks.org/find-activities.aspx

Nature Soundmap
The Nature Soundmap provides snippets of sounds and video from the natural world. The website hosts an interactive map of the world, complete with markers which include information about the animal or setting profiled, along with a link to more information. Check this out. There are over 400 recordings from 81 countries and 93 contributors. Be sure to check out Blakiston's Fish Owl from Hokkaido, Japan.
http://www.naturesoundmap.com/

Nature is Speaking
Conservation International's Nature Is Speaking project aims to raise awareness that people need nature in order to survive. The campaign features a series of short films voiced by recognizable Hollywood stars. In the series, Nature reveals serious misgivings about the way humans are treating the Earth from the viewpoint of a cast of characters — from Mother Nature to The Ocean and The Rainforest. Of course, the photography is phenomenal.
http://natureisspeaking.org/

Nature Stories Podcast
The Nature Conservancy presents the Nature Stories audio podcast, audio downloads of great stories and great places. Each week, Nature Stories will offer a new tale of people's connections with the natural world as an audio download. Many of the stories will be drawn from an upcoming public radio series, *Stories from the Heart of the Land*. Currently online are features focusing on fire, frogs, fishing culture, and more.
http://www.nature.org/podcasts/

Nature Video Archive
This website from Nature, the International Weekly Journal of Science, is designed to complement selected articles and letters from their print magazine. These videos feature analysis and commentary from Nature editors and selected scientists. Video topics include ancient tsunamis, deep sea biodiversity, and more.
http://www.nature.com/nature/videoarchive/

Nature Works Everywhere
Hosted by the Nature Conservancy, Nature Works Everywhere offers videos, interactive games, and lesson plans that align to standards. Topics range from coral reefs to bee gardens, from Maine's snowy forests to Africa's grasslands.
http://www.natureworkseverywhere.org/

NatureBridge
NatureBridge provides hands-on environmental field science education for children and teens through National Park-based overnight field science programs. Parks include Channel Islands, Olympic, and others. NatureBridge provide scholarships to more than 35% of their participating schools in order to reach more students from underserved communities. Sign up for email updates, download lesson plans, and more.
http://www.naturebridge.org/

Nature's Fury: The Science of Natural Disasters
The American Museum of Natural History offers the website, Nature's Fury: The Science of Natural Disasters, to support the exhibition of the same name. Sections include Earthquakes and Tsunamis, Tornadoes, and more, with background information and multi-media. The Additional Resources page features links to disaster agencies.
http://www.amnh.org/exhibitions/current-exhibitions/nature-s-fury-the-science-of-natural-disasters

Nature's Notebook
The U.S.A. National Phenology Program hosts Nature's Notebook, enabling citizen scientists, educators, and students of all ages to monitor the impacts of climate change on plants and animals in the United States. Participants use scientifically-vetted observation guidelines developed for over 900 species, to ensure that data are useful to researchers and decision-makers.
https://www.usanpn.org/natures_notebook

Nature's Toolbox
This website from *Nature, the International weekly journal of science*, offers a hub for scientific software, apps, and online tools. Current links include Sharing online: how to make data open; Citizen science: how to get volunteers engaged; and more.
http://www.nature.com/news/toolbox

Nature's Voices Project
The Nature's Voices Project: Stories of Hope from the Next Generation is seeking personal and inspiring stories and testimonials about outdoor and/or environmental education experiences. Check out the stories, and submit your own.
http://naturesvoices.org/home.html
Contact Susan Silber at susansilber07@gmail.com

Nautical Chart Data
NOAA's Office of Coast Survey now provides nautical chart data to The National Map, a U.S. Geological Survey Project with an application similar to Google Earth. Layered with data that can be integrated on multiple levels, The National Map ensures that key coast-to-coast geographic information is immediately available to industry and governments at all levels. Depth areas, navigation routes, buoys, and harbor facilities, are now incorporated into The National Map.

http://nationalmap.gov

Nautical Charts: Message in a Bottle!
NOAA's National Ocean Service Education section offers interactive activities, tutorials, and case studies for use in the classroom. The latest offering is *Nautical Charts: Message in a Bottle!*, designed for grades 3-5, in cooperation with NOAA's Office of Coast Survey. The activity uses animation to teach chart symbols, safe boating, and the importance of nautical charts. The website includes movies, pictures, and links to other resources.
http://oceanservice.noaa.gov/education/nautical_charts/welcome.html

Nauticus Teacher Resources
The Education Department at Nauticus, a maritime-themed science center, offer a variety of online educational resources, including the *It's Happenin' in Hampton Roads Harbor Teacher's Manual*, an interdisciplinary unit for third grade students, shark resources, weather activities, and more.
http://www.nauticus.org/education/online-teacher-resources

Nautilus Expedition
This cruise is part of a larger research program focused on examining the ecosystem-level response to oil and gas in the Gulf of Mexico. The team is studying both natural oil and gas seepage into the Gulf of Mexico and ecosystem responses and effects directly attributable to the 2010 Deepwater Horizon oil spill. The focus is on deep-sea corals, animals that live on and around them, and their response to the oil spill. Follow the expedition, send a question, and more.
http://www.nautiluslive.org/

Nautilus Expedition
Dr. Robert Ballard and the international Corps of Exploration aboard Exploration Vessel (E/V) *Nautilus* will be at sea in the Black, Mediterranean, and Aegean Seas off the coasts of Turkey and Cyprus from early July through September, 2012. Watch live video and audio feeds transmitted from the ship 24/7 throughout the expedition. Send a question to the Corps of Exploration during operations, and browse highlight videos, blogs, and photos. Educators and students sailed aboard the expedition.
http://www.nautiluslive.org/

Nautilus Exploration Program
Follow along as Educators at Sea, students, and researchers sail aboard *E/V Nautilus* and other research vessels during expeditions in the Gulf of Mexico, Caribbean Sea, and Mediterranean Sea. Watch live streaming events, check out the learning resources, play interactive games, and more.
http://www.nautiluslive.org/

Nautilus Live
You can experience the next generation of deep ocean exploration from your desktop. With the opening of the Nautilus Live Theater and launch of the Nautilus Live website, visitors can virtually join Sea Research Foundation's Dr. Robert Ballard and his team aboard his new ship of exploration, the *E/V Nautilus*. The current expedition will visit the Black Sea and Aegean Sea. Scientists will map the sea floor, study underwater volcanoes, investigate unusual life forms, explore shipwrecks, and more. From

November 1–18, 2013, the Nautilus will explore the Kick'em Jenny Volcano and Trinidad Tar Seeps. Yearly explorations occur.
http://nautiluslive.org/

Navassa Expedition
Follow along with Mike Trimble, a teacher from Corona del Sol High School in Tempe, Arizona, as he joins the research staff of the Khaled bin Sultan Living Oceans Foundation aboard the *M/Y Golden Shadow* on the week-long mission to survey Navassa Island, an uninhabited island between Jamaica and Haiti currently managed by the U.S. Fish & Wildlife Service.
http://www.globalreefexpedition.com/index.php?option=com_content&view=article&id=271&Itemid=709

Navigating Change
The goal of Navigating Change is to motivate, encourage and challenge people to take action to improve the environmental conditions in their own backyards, especially as it pertains to our coral reef ecosystems. Navigating Change promotes responsibility for the stewardship and sustainability of our islands and our ocean. Classroom videos, teacher curriculum and more are available.
http://www.hawaiianatolls.org/research/NavChange2002/index.php .

Navigating Change Teacher's Guide
The Navigating Change Teacher's Guide is a five part curriculum for grades 4-5, aligned to Hawai'i Department of Education standards. The teacher's guide includes five units that are designed to help students explore their relationships to the environment and ways that they can "navigate change" in their own communities. The instructional activities focus on science, social studies, and language arts standards as well as guidelines for culturally healthy and responsive learning environments.
http://www.hawaiiatolls.org/teachers/NavChange.php

Navigating the Nation's Marine Managed Areas
The MPA Center and NOAA's Office of Coast Survey are working jointly to include information about the nation's marine managed areas (MMAs) in the U.S. Coast Pilot® series to improve safe navigation and coastal stewardship. You can review *Navigating the Nation's MMAs*, which uses the coast of central California as a model. The purpose of this document is to provide an overview of the project and an example of how information on MMAs is intended to be presented in the U.S. Coast Pilot series.
http://mpa.gov/

Navigation Education Materials
The Institute of Ocean Navigation offers lessons on nautical skills from dead reckoning and celestial navigation to the reading of charts and topo maps. Each lesson includes motivations for the students, background and assessment material for the teacher and mentor, activity descriptions and worksheets, and additional tips and resources. Lessons include Where is Here, GPS on the Move, and more.
http://www.ion.org/outreach/lesson-plans.cfm

NBII Website Termination
In the 2012 President's Budget Request, the National Biological Information Infrastructure (NBII) is terminated. As a result, all resources, databases, tools, and applications within the website will be removed on January 15, 2012.

http://www.nbii.gov/portal/server.pt/community/termination_of_nbii_program/2057

NCCOS Publications Database
The National Centers for Coastal Ocean Science (NCCOS) conducts and supports research, monitoring, assessments, and technical assistance to meet NOAA's coastal stewardship and management responsibilities with a focus on coral reefs, estuaries, National Marine Sanctuaries, and coastal ocean regions, and activities focused on climate change, extreme natural events, pollution, invasive species, and land and resource use. The on-line publications database hosts reports and references.
http://www8.nos.noaa.gov/nccos/publications.aspx

NCSR Curriculum
Once the website for the Northwest Center for Sustainable Resources has been removed, arrangements have been made for all 58 curriculum items to be made available on the following websites.
ATE Central (Advanced Technological Education), https://atecentral.net/
Applied Math and Science Education Repository (AMSER) https://amser.org/
National Science Digital Library (NSDL) http://nsdl.org/

NCSEteach
The National Center for Science Education offers educators resources to teach about evolution and climate change. They are starting a teacher network with opportunities to connect with teachers across the country, connect with local scientists, and more. The website also offers links to online teaching resources.
http://ncseteach.com/

Nebraska Earth Systems Education Network Lessons
The goal of the Nebraska Earth Systems Education Network, part of the School of Natural Resources of the University of Nebraska-Lincoln, is to improve linkages between K-12 educators and Earth science resources. The website hosts a variety of lessons about the atmosphere, hydrosphere, geosphere, and interdisciplinary.
http://nesen.unl.edu/Lessons/Lessons.asp

Need Volunteers?
The Verizon Foundation's Employee Engagement team is inviting environmental organizations to post their volunteer projects, especially those scheduled in April and during Earth Week, on the Verizon Volunteer Connections website. Through this website, Verizon employees will be able to review your volunteer opportunities and sign up to lend a hand with your project.
http://foundation.verizon.com/pls/cybergrants/ao_login.login?x_gm_id=1&x_proposal_type_id=250

Neighborhood Explorers
The U.S. Fish and Wildlife Service offers an online video game aimed to encourage kids to go outside and learn about the environment. Designed for children ages 8-11, the website is geared to reach those children not currently participating in outdoor programs and activities. Read about it on the *Let's Go Outside* website.
http://www.fws.gov/letsgooutside/

NeMO – New Millennium Observatory
This New Millennium Observatory website allows students to explore a seafloor observatory geographically or by topic. Learn about seafloor animals, hydrothermal vents, mid-ocean ridges, axial volcano, lava flow, technology, and tools. Operate (remotely) a vehicle that takes you to the seafloor near an active submarine volcano. Explore black smoker vents, new lava flows, and unusual life forms. The website includes background information, curriculum, and interactive virtual explorations.
http://www.pmel.noaa.gov/vents/nemo/index.html

NEON
The NASA Educators Online Network (NEON) is a learning community developed by NASA's Aerospace Education Services Project and managed by Penn State University's College of Education. The network allows teachers to collaborate with scientists, engineers, and other STEM educators to help support their classroom work. Free registration is required.
http://neon.psu.edu/

NEOSEC Café - Online
The NEOSEC Café is a monthly, virtual reading club that doubles as an informal professional development opportunity. This initiative aspires to share current literature related to research and practice in marine education with colleagues by conference call. Each call is hosted by a NEOSEC (New England Ocean Science Education Collaborative) member representative who will present a summary of the reading and lead a discussion. The café is the second Wednesday of the month.
Contact Carole McCauley at C.McCauley@neu.edu

NEPA and NHPA Handbook
The White House Council on Environmental Quality and the Advisory Council on Historic Preservation have released a handbook designed to help coordinate required review processes under the National Historic Preservation Act and the National Environmental Policy Act: NEPA and NHPA – A Handbook for Integrating NEPA and Section 106. The handbook provides practical advice to practitioners and stakeholders to improve the efficiency and effectiveness of federal agencies' environmental review.
http://www.whitehouse.gov/sites/default/files/nepa_and_nhpa_handbook.pdf

Nepris
The core mission of Nepris is making industry engagement part of the everyday classroom by empowering teachers to engage students in STEAM (Science, Technology, Engineering, Arts, and Math). Nepris connects teachers and students with industry experts, virtually. Free registration is required. For more information, check out the upcoming webinars.
http://www.nepris.com/

NESDIS Education & Outreach
The National Environmental Satellite, Data and Information Service (NESDIS) maintains this website with resources within NESDIS and NOAA that are of interest to students, educators, and others with an interest in the Earth-Sun environment. Materials include an online weather school, a primer on estuaries, and many more resources.
http://www.nesdis.noaa.gov/EducationOutreach.html

NestWatch
Cornell Lab of Ornithology, the group that offers eBird, All About Birds, The Birds of North America Online, and more, has a new citizen science project, NestWatch. Participants visit nests during spring and summer to collect simple information about location, habitat, species, number of eggs, and number of young in the nest and submit their observations online. The observations can help scientists measure the impact of such things as climate change and habitat destruction.
http://watch.birds.cornell.edu/nest/home/index

Net Sortings
The New York State Marine Education Association's website offers pages of useful links for marine educators. Net Sortings offers a list of links to interesting and useful websites, including news, careers, and more.
http://www.nysmea.org/Net%20Sortings.htm

Network of Conservation Educators and Practitioners
The Network of Conservation Educators and Practitioners is a global project to improve the practice of biodiversity conservation by improving training in biodiversity conservation. The network seeks to connect those involved in doing and teaching biodiversity conservation; create and make widely available a variety of resources to teach biodiversity conservation; and develop networks and resource centers to increase mentoring and training opportunities in biodiversity conservation worldwide. A work in progress, the website includes free (registration is required) downloadable educational modules, including an Introduction to Marine Conservation Biology, The Importance of Invertebrate Biodiversity, and more. They also seek authors for additional modules.
http://ncep.amnh.org

Never Lost: Polynesian Navigation
The Exploratorium Museum in San Francisco offers this online resource exploring Polynesian navigation. Visitors can interact with a canoe model by clicking on its various parts; learn about knot tying techniques; and review the necessary provisions for such a journey. *Navigation* features a primer on the basics of wayfinding and a slideshow that offers some insights into the voyage on the open ocean. *Voyage* offers stories and first-hand narratives about the experience.
http://www.exploratorium.edu/neverlost/

New England Aquarium Activities
The New England Aquarium offers downloadable activities and teacher guides on their website. Check out Get to Know a Fish, How Animals Stay Warm, concept maps, and more.
http://www.neaq.org/education_and_activities/teacher_resources/classroom_resources/classroom_activities/index.php

New England Climate Adaptation Simulations
The New England Climate Adaptation Project collaborated with four at-risk coastal New England communities to assess local climate change risks, identify key challenges and opportunities for adaptation, and test the use of role-play simulations as a means to educate the public about climate change threats and to help communities explore ways of decreasing their vulnerability and enhancing their resilience to climate change impacts.
http://necap.scripts.mit.edu/necap/simulations/

New England Seamount Chain Expedition
NOAA's Office of Ocean Exploration and Research conducted the New England Seamount Chain Expedition, June 11 – 29, 2013. Visitors can explore the expedition on the archived website through videos, lesson plans, and more. One lesson explored how to use live expedition feeds in the classroom.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1303/welcome.html

A New Home For An Old Friend
A New Home For An Old Friend is a children's book that promotes responsible aquarium stewardship. The book tells a story, in rhyme and illustrations, about a family's search for a new home for their pet lionfish when a move requires them to empty their aquarium. It is designed for pre-Kindergarten through 2nd grade learners. Funding is through US Fish and Wildlife and the books are for free distribution to educators and home aquarium owners. There are also lesson plans that meet state standards.
http://www.usc.edu/org/seagrant/Publications/publications.html
http://www.usc.edu/org/seagrant/caulerpa/publications/teacher_curricu_for_invasives.pdf

New Jersey Environmental Digital Library
The New Jersey Environmental Digital Library brings together materials on New Jersey's environment, mostly from state government agencies, non-profit organizations, research institutes, and academic departments. The News and Features area highlights some of the latest additions, while Past Spotlights includes direct links to reports on mitigating floods on the Delaware River and *Trout in the Classroom: A Guide for Teachers*.
http://njedl.rutgers.edu/njdlib/index.cfm

New Jersey Institute of Technology OpenCourseWare
The OpenCourseWare page of the New Jersey Institute of Technology brings together dozens of courses from their College of Engineering, School of Management, and the College of Science and Liberal Arts. Files include archived video from class meetings, along with tutorials and handouts. Visitors can even suggest future courses for inclusion. Check out the science and liberal arts offerings, including professional and technical communication with online design, proposal writing, editing, and more.
http://ocw.njit.edu/csla/index.php

New Jersey Sea Grant Education Resources
The Education Program at the New Jersey Sea Grant Consortium provides educational activities in marine and related environmental science in an effort to increase environmental stewardship, provide unbiased information for informed decision making, and increase science literacy for all. Lesson plans include marine science, harbor education, and more. Check out beach profiling, seashell mapping, squid dissection, and much more.
http://www.njmsc.org/gofish.html

New Paradigms for Supporting the Resilience of Marine Ecosystems
This article discusses recent trends in understanding and moderating human impacts on marine ecosystems. The authors focus on the temporal and spatial scale of ecosystem dynamics and management, as well as the importance of biodiversity to the function and resilience of marine ecosystems.
http://www.sciencedirect.com/science/journal/01695347

New Project WET Guide
A revised, updated, and expanded Project WET Curriculum and Activity Guide is being released. This revision is driven by emerging water issues, changing educational priorities and reform, new scientific discoveries and breakthroughs, and the availability of information technology and social connectivity. The new Project WET program encompasses the new guide, a portal, expanded resources, and networking opportunities.
http://www.projectwet.org/
http://eeingeorgia.org/resource/about.aspx?s=97800.0.0.4863

New Scientist
The *New Scientist* website offers news about science and technology, with over 76,000 online content pieces. There are three channels, Space, Tech, and Environment, a YouTube channel, podcasts, blogs, and more. The content is delivered by New Scientist's editors and journalists, citizen journalists, and external bloggers. The archive hosts over 15 years of magazine content online.
http://environment.newscientist.com/home.ns

New York Public Library Digital Gallery
This large-scale digital image gallery has been years in the making and currently offers more than 275,000 items for online viewing. You can search for specific images or keywords, or browse by subject (e.g. fish), collection (e.g. Nature Illustrated or Ocean Flowers), or library division. Set aside time to explore this extensive website.
http://digitalgallery.nypl.org/nypldigital/index.cfm

New York Sea Grant Education
New York Sea Grant offers a variety of downloadable educational resources covering estuaries, fishing, and more. Be sure to browse the rest of the website for publications and news.
http://www.seagrant.sunysb.edu/article.asp?ArticleID=51

New York Times Learning Network
The New York Times Learning Network is a free service for students, their teachers, and parents. The Web Exploration provides a guided web tour of different topics, including endangered species and biomes. Lesson plans are available on a wide variety of topics, written in partnership with The Bank Street College of Education in New York City for grades 6-12. Lesson plans can be searched by key word or accessed by thematic topic, including animals, insects and marine life, environmental issues, and weather.
http://www.nytimes.com/learning/

New Zealand American Submarine Ring of Fire Expedition
The New Zealand American Submarine Ring of Fire 2007 expedition site is available on NOAA's Ocean Explorer website. The expedition took 26 scientists and engineers from New Zealand, Germany, and U.S. aboard the R/V *Sonne* to Brothers submarine volcano, a site of vigorous geothermal activity north of New Zealand along the Kermadec Arc. Website coverage for this mission includes content essays, logs, images, interactive computer animations, and more.
http://oceanexplorer.noaa.gov/explorations/07fire/welcome.html

New Zealand Seeps
Seep sites in the cold, deep waters off New Zealand provided the first in situ observation of cold seep fauna in the southwest Pacific. To observe these cold seeps, which are over 3000 feet down, a video and still camera system was lowered over each site to identify seep organisms and determine the size of each seep. This innovative imaging system fed video live to scientists back on the ship, allowing them to observe the seeps and the ecosystem that exists there in real time.
http://oceanexplorer.noaa.gov/explorations/06newzealand/welcome.html

New Zealand's National Institute of Water & Atmospheric Research
New Zealand's leading provider of atmospheric and aquatic science is committed to education in New Zealand at all levels. *Water & Atmosphere* is their flagship education publication; *Aquaculture Update* and *Biodiversity Update* are industry-focused with a strong educational message. The publications are also available online. The website includes a section on activities and classroom resources, common weather and hydrological terms, and stuff for students.
http://www.niwa.co.nz/

Newsela
Newsela is an online news-as-literacy website featuring current articles in seven categories, including Science, Arts, and more. It is updated weekly, and all articles are Common Core-aligned and available in five different Lexile levels. Many of the articles are accompanied by a comprehension quiz. Free registration is required for the kid-focused version.
https://newsela.com/

NEwswave
NEwswave is the e-journal of the New England Ocean Science Education Collaborative, bringing news and events from member organizations and associates, a collaboration of forty institutions from across the region including aquaria, museums, universities, and science and research centers. The NEwswave Blog is updated daily with information about ocean science education in New England and includes Member News, Ocean Science Education e-Resources, Professional Development, and much more.
http://neosec.wordpress.com/

Next Generation Science Standards Draft
Check out the final review draft of the Next Generation Science Standards for Today's Students and Tomorrow's Workforce, based on the Framework for K–12 Science Education developed by the National Research Council.
http://www.nextgenscience.org/

Next Generation Science Standards
NSTA offers the final version of the Next Generation Science Standards. These standards establish learning expectations in science for K–12 students combining three important dimensions—science and engineering practices, disciplinary core ideas, and crosscutting concepts.
http://www.nextgenscience.org/

NGDC Educational Resources Page
NOAA's National Geophysical Data Center (NGDC) educational resources website has been redesigned and offers both internally generated material and vetted resources from

other institutions and partners. The website offers dive animations, images, and links to many additional resources.
http://www.ngdc.noaa.gov/mgg/education.html

NGDC Map Viewers
The NGDC has made sea floor maps and other data on the world's coasts, continental shelves, deep ocean, and more available for easy viewing online. Anyone with Internet access can now explore undersea features and obtain detailed depictions of the sea floor and coasts, including deep canyons, ripples, landslides, and more. Check out the Bathymetry Data Viewer, Marine Geology, and more. Note: these are large data sets and a fast connection may be required.
http://maps.ngdc.noaa.gov/viewers/

NGOpolis
This social network for the conservation and development sector, is a free online initiative which offers a space through which field scientists, academics, students, and others can search for relevant peer groups, projects, data, and more; share knowledge; collaborate; connect with funders; and more.
http://ngopolis.com/

NGSS-Based Teaching in Action
NSTA offers a series of eight free videos showing what it looks like to teach the science and engineering practices called for in the Framework and science standards. The videos, with accompanying lesson plans, highlight the major shifts in science instruction, explore the new role of the teacher, and demonstrate new instructional strategies in the high school classroom.
http://ngss.nsta.org/ngss-videos.aspx

NGSS Hub
The NGSS@NSTA Hub now offers a dynamic version of the Next Generation Science Standards. Standards can be accessed via a simple matrix, then displayed in a clear and easily understood format. Accompanying each standard are student performance expectations and the corresponding science and engineering practices, disciplinary core ideas, and crosscutting concepts. The hub also provides key connections to the Common Core State Standards in literacy and mathematics.
http://ngss.nsta.org/

Nicholas Institute for Environmental Policy Solutions
The Nicholas Institute for Environmental Policy Solutions currently focuses on the areas of climate, energy, coasts and oceans, and water. Downloadable files include policy briefs, working papers, commentary, and more. Reports cover climate change, ecosystem services, offsets, and much more.
http://www.nicholas.duke.edu/institute/products.html

Nicholas Institute Website
Duke University's Nicholas Institute has launched a new website with advanced navigation and search functions that allow visitors to find the information they need, faster. Main menu portals on the new site are organized by subject and include climate and energy, water, oceans and coasts, ecosystem services, environmental economics, geography, and more. An expert's guide, organized by topic, helps identify which Institute staff members have the specific expertise users seek.

http://nicholasinstitute.duke.edu

Nicholas Talks
Nicholas Talks is an online collection of lectures available from Duke's Nicholas School and the Nicholas Institute for Environmental Policy Solutions. Throughout the year they will tape lectures at Duke that are either sponsored by the School or Institute or feature one of their researchers. MP3 files of the lectures will be available on the website. Please note that these are full lectures, so the file sizes may be large.
http://www.nicholas.duke.edu/nicholastalks

NMEA News
NMEA News, The National Marine Educators Association's quarterly on-line newsletter, keeps members up-to-date with news from regional chapters and committees, information about professional development opportunities, and communications from NMEA leadership. Check out the latest issue, available for downloading from the website. Make sure to note the extensive opportunities for students and teachers.
http://www.marine-ed.org/

NMEA News Online
NMEA News, the National Marine Educators Association's newsletter, keeps members up-to-date with news from regional chapters and committees, information about professional development opportunities, and communications from NMEA leadership. NMEA News is being published exclusively online, and will be posted four times each year, in mid-March, mid-June, mid-September, and mid-December.
http://www.marine-ed.org/

No Student Left Indoors
The purpose of this website is to help K-12 teachers, homeschoolers, and other educators to conduct a Field Guide Project, creating a field guide to your schoolyard with a species account, a catalog of the animals and/or plants found in your schoolyard. The website offers lesson plans, resources, and more to help you plan and manage your project.
http://www.nostudentleftindoors.com/

NOAA 200 Years for Kids and Educators
NOAA's 200th Celebration in 2007 highlights the rich history of science, service, and stewardship provided to the American public by NOAA and its predecessors. The section For Kids and Educators offers links to online resources to help teachers, students, and parents learn about our ocean, coasts, and skies. Each section, Explore, Understand, and Protect, includes links to websites, downloadable lesson plans, and educational materials.
http://celebrating200years.noaa.gov/welcome.html

NOAA Careers
NOAA Careers is a new recruitment website designed to showcase NOAA career opportunities and all that NOAA has to offer. The website showcases a variety of career fields and allows a search for current vacancies by location or nation-wide. In addition, the website offers links to student opportunities.
http://www.careers.noaa.gov/index.html

NOAA in the Caribbean Newsletter
The NOAA Southeast and Caribbean Regional Team and partners offer this quarterly publication designed to engage and educate regional stakeholders about the on-the-ground science, management, and operations taking place throughout the Caribbean. The newsletter will provide news items on a variety of topics concerning the Caribbean audience, updates on new regional data and tools, announcements of funding opportunities, upcoming events, and more.
http://noaaoceanscience.wordpress.com/2012/02/29/noaa-in-the-caribbean-newsletter/

NOAA in the Carolinas EstuaryLive
Celebrate National Estuaries Day and embark on an estuarine odyssey with the *NOAA in the Carolina*s EstuaryLive, broadcast through the Internet September 26-27, 2007 from the ACE Basin Reserve at Forth Johnson near Charleston, South Carolina. This interactive field trip features segments on local fish, birds, reptiles, salt marshes, and habitat restoration, along with other topics.
http://www.estuaries.gov/elive.html

NOAA Celebrates 200 Years
NOAA's 200th Celebration in 2007 will highlight the rich history of science, service, and stewardship provided to the American public by NOAA and its predecessors. Stories range from the founding of the U.S. Survey of the Coast by Thomas Jefferson to the present-day activities of an agency dedicated to the protection, management, and understanding of our ocean, coasts, and skies. The website includes a section For Kids and Educators, Feature Stories, Historical Resources, and more.
http://celebrating200years.noaa.gov/welcome.html

NOAA Central Library Website
The NOAA Central Library web site features a variety of resources useful to marine educators. The ***NOAA Library Catalog*** is the gateway to the records of the NOAA Library Network's comprehensive research collection covering hydrographic surveying; oceanography, meteorology, and hydrology; living marine resources; and meteorological satellite operations. The site's ***WINDandSEA: Oceanic and Atmospheric Sciences Internet Locator*** features links to science and policy sites in the oceanic and atmospheric sciences, as well as a ***Teachers' and Students' Corner*** link in the top-of-page menu row, which links to NOAA webpages devoted to education, NOAA photo websites, science education organizations, and organizations concerned with introducing new technologies to the teaching profession. The ***Databases & Article Searching*** page provides access to citation databases, abstracts, and full-text documents; and the ***E-Journals*** page links to full-text of many journals, and tables of contents/abstracts for others. The ***NOAA History Page*** and ***NOAA Heritage Page*** provide access to information documenting the legacy of NOAA and the predecessor agencies that make NOAA America's oldest science agency. The ***Photo Collection*** features thousands of weather and space images, hundreds of images of our shores and coastal seas, and thousands of marine species images ranging from the great whales to minute plankton.
http://www.lib.noaa.gov/

NOAA Climate Services Portal
NOAA has launched the NOAA Climate Services Portal prototype, offering climate data and services, articles and information, education resources, and tools for engagement and decision-making. *ClimateWatch Magazine* is designed for the public user, hosting

stories and images for a broad audience. Data & Services targets advanced users with access to data. Understanding Climate provides resources, and Education offers interactive tools, lesson plans, and opportunities for professional development.
http://www.climate.gov/

NOAA Coral Reef Conservation Program Launches External Newsletter
NOAA Coral Reef News is a new monthly e-newsletter established to provide current information on the activities of NOAA's Coral Reef Conservation Program and other relevant NOAA programs. The NOAA Coral Reef Conservation Program supports effective management and sound science to preserve, sustain and restore valuable coral reef ecosystems.
http://www.coralreef.noaa.gov .

NOAA Deepwater Horizon Library
NOAA offers this web archive of the maps, wildlife reports, scientific reports and other previously released public information used by emergency responders, fishermen, mariners, and local officials during the Deepwater Horizon oil spill. The archive also contains image and video galleries, fact sheets and publications, press releases and transcripts, educational resources, and more.
http://www.noaa.gov/deepwaterhorizon/

NOAA Earth Day Events
From mid-to-late April, NOAA and community partners will begin highlighting NOAA Earth Day events on the main NOAA website. Check back often for items of interest.
http://www.noaa.gov/index.html

NOAA Economic Statistics
The *Economic Statistics for NOAA* booklet serves as a common reference to the latest economic benefits NOAA products and services provide to the nation's gross domestic product and the environment. It contains a consistent set of statistics helpful to NOAA management, staff and the outside community. The booklet contains statistics on the economic effects of hurricanes, fisheries, travel and tourism, and more. It can be downloaded from the website, along with other materials.
http://www.economics.noaa.gov/

NOAA Education
NOAA's education resources portal is designed to assist educators in accessing the many educational materials offered throughout NOAA from one centralized interface. Materials are organized by Themes, topical Collections, and content type. Linked resources are organized into collections which provide the user with a toolkit of materials and activities suitable for integration into a variety of educational settings. Featured resources collections include hurricanes, oil spill resources, tides, and coral ecosystems.
http://www.education.noaa.gov/

NOAA Education Oil Spill Resources
NOAA educators have compiled some oil-spill related resources. These include general websites, data sources, multimedia, classroom lessons, and more.
http://www.education.noaa.gov/oilspill.html

NOAA Environmental Visualization Lab
The NOAA Environmental Visualization Lab offers this new website with a wealth of content, including streaming and downloadable video files, high resolution satellite images, and various educational resources. Imagery and animations will continue to be updated. For best viewing quality, it is recommended to download the video file locally by right clicking on the file link and saving to a local computer drive.
http://www.nnvl.noaa.gov/

NOAA Fisheries Bycatch Website Updated
The bycatch section of the NOAA Fisheries website has received a major update to include recent activity, including sea turtle bycatch reduction research; amending the fishery management plan for Atlantic tunas, swordfish, and sharks; management to reduce seabird incidental take; and amending the fishery management plan for the shrimp fishery of the Gulf of Mexico.
http://www.nmfs.noaa.gov/bycatch.htm .

NOAA Fisheries Climate Science Strategy
The National Marine Fisheries Service (NOAA Fisheries) has released the NOAA Fisheries Climate Science Strategy. The Strategy offers information and tools to prepare for and respond to climate impacts on marine and coastal resources. The document identifies seven objectives to provide decision-makers with information to reduce impacts and increase resilience in a changing climate.
http://www.st.nmfs.noaa.gov/ecosystems/climate/

NOAA Fisheries West Coast Region Education & Outreach
These resources and lesson plans help teachers and students understand the role of the oceans, coasts, and atmosphere in the global. Explore them by grade level or by species. Units explore salmon, pinnipeds, cetaceans, and much more. Be sure to check out the links to additional resources.
http://www.westcoast.fisheries.noaa.gov/education/index.html

NOAA Heritage Week Open House – Maryland
Learn how NOAA takes the pulse of the planet every day and protects and manages ocean and coastal resources. Visit NOAA's Silver Spring, Maryland, campus for a series of free activities, February 7, 2015, including talks by NOAA experts, interactive exhibits, special tours, and hands-on activities for ages 5 and up. Meet and talk with scientists, weather forecasters, hurricane hunters, and others.
http://preserveamerica.noaa.gov/hw15.html

NOAA Jeopardy
NOAA Jeopardy has been expanded to include more categories, answers, and questions. Now the game has materials for Grades K-5, 6-8, 9-12, and Honors. Contact Susan Baker for the power point game, pre-loaded with general, Honors, or Marine Mammal categories. The game is easily modified by changing the text. Additional categories may be found on the website.
http://coastalscience.noaa.gov/education/jeopardy/welcome.html
Contact Susan Baker at susan.baker@noaa.gov

NOAA's National Marine Sanctuary Education Listserv
The new National Marine Sanctuary Education Listserv is a closed list server that allows for efficient communication between America's teachers and National Marine Sanctuary

Program Education Coordinators. Please use this list server for disseminating pertinent information about NOAA and National Marine Sanctuary education opportunities and other related information to the entire group.
Claire Johnson, at claire.johnson@noaa.gov.

NOAA at the National Science Teachers Association Conference
Visit the NOAA exhibit booth at the National Science Teachers Association Conference in Dallas, Texas, March 31-April 3, 2005. The NOAA booth will have information on weather, fish, and satellites, meteorologists from the Dallas area Weather Forecast Office, as well as a Speakers' Corner, which will feature talks about how NOAA sciences can be translated into the classroom. NOAA also has several free educator kits which contain educational information, inquiry-based lessons, posters, and more.

NOAA NOS on Pintrest
NOAA's National Ocean Service (NOS) is now on Pinterest. New items are typically added weekly to keep you abreast of what's new at NOS. Categories include Ocean Education, Life on a Coral Reef, National Marine Sanctuaries, and more.
http://pinterest.com/noaaocean/

NOAA Ocean Data Education Project
The NOAA Ocean Data Education (NODE) Project offers free curriculum modules for grades 6-8 that demonstrate techniques for using data in the classroom to learn about El Nino, sea level, water quality, and ocean acidification. The NODE curriculum is designed to help teachers and students use real scientific data to explore dynamic Earth processes and understand the impact of environmental events on a regional or global scale.
http://dataintheclassroom.org/

NOAA Ocean Explorer Educator E-mail Update List
NOAA Ocean Exploration has developed a new listserv for educators. The listserv will include professional development, virtual courses and other online offerings, notifications of upcoming NOAA Ocean Exploration Expeditions and launches of associated web site materials and lesson plans, and information about ocean career webcasts and web forums.
http://oceanexplorer.noaa.gov/backmatter/email_update.html .

NOAA Ocean Film Festival - Georgia
NOAA Ocean Film Festival: Coastlines is a National Estuaries Day celebration in Brunswick, Georgia, on September 30, 2006. Sponsored by Sapelo Island National Estuarine Research Reserve in partnership with Gray's Reef National Marine Sanctuary, the festival will feature a series of award winning films that highlight the nation's rich coastal habitats and maritime heritage.
http://www.sapelonerr.org/film_festival.htm

NOAA Paleoclimatology Education and Outreach
This website offers a collection of links to paleoclimate information and data. Links are organized by topic, which include: highlights from the paleoclimatology program; ocean sciences; coral cores; tree rings; pollen; and additional resources.
http://www.ncdc.noaa.gov/paleo/education.html

NOAA Photo Library
The new and updated NOAA Photo Library is a significant improvement on the old version, with more than 10,000 new images, new search capability, Hurricane Katrina images, and thousands of ocean exploration, coral reef, and polar photographs. Additions include remarkable lightning photography, a medley of American lighthouses, and thousands of newly digitized historical photographs detailing the work of the Coast Survey, Fisheries Commission, and the Weather Bureau.
http://www.photolib.noaa.gov/

NOAA Photo Library's Photostream
NOAA has launched the social media photo sharing website, NOAA Photo Library's Photostream on Flickr, the Internet photo sharing website. A selection of over 4,000 photos (a subset of the 47,000 public domain images presently on the NOAA Photo Library) can be viewed in collections, sets, in slideshow format, and by using the Flickr search engine to search for imagery thematically. Themes include Weather and Related Events, NOAA's Ark, and more.
http://www.photolib.noaa.gov/
http://www.flickr.com/photos/noaaphotolib

NOAA Research for K-12
This website from NOAA's Office of Oceanic and Atmospheric Research is a joint effort with the College of Education at the University of South Alabama. The website offers middle school science students and teachers research and investigation experiences using on-line resources. Topics include Storms, Fisheries, Atmosphere, and more.
http://www.oar.noaa.gov/k12/index.html

NOAA Research Vessel Operates Petroleum Free
The 41-foot NOAA *R/V Huron Explorer* is the first U.S. research ship to operate free of petroleum products. Powered by soy biodiesel combined with bio-hydraulic and bio-motor oils, the environmentally-friendly vessel conducts research and helps to catalogue shipwrecks that lay beneath the waters of Lake Huron. The ship will help to collect data that can be integrated into the emerging Global Earth Observing System of Systems. Other NOAA boat operations are implementing similar bio-product conversions.
http://www.noaanews.noaa.gov/stories2006/s2615.htm

NOAA Science Camp
A weeklong pilot program summer session designed to expose school age children to NOAA's activities in the monitoring and protection of the environment was piloted in the Seattle area at Sand Point. The camp is for youth entering 7th and 8th grades in 2005.
http://www.nwfsc.noaa.gov/sciencecamp.cfm

NOAA Social Media
Social media provides a platform from which content transforms into community. NOAA is using social media tools to share information and greatly increase the potential for better understanding for all about our oceans, coasts, climate, and weather sciences. Topics include whale disentanglements, sea turtle rescues, underwater volcanoes, oil spills, marine debris, corals, dam removals, fisheries management, weather and climate, and much more. Media used includes Twitter, YouTube, Podcasts, and more.
http://www.noaa.gov/socialmedia/

NOAA View Data Exploration Tool
This map-based exploration tool provides access to more than 100 environmental variables from NOAA's archive of satellite images, climate model results, and other observations. Categories include Ocean, Land, Climate, and more.
http://www.nnvl.noaa.gov/view/

NOAA View Data Imagery Portal
The beta version of NOAA View is an online educational tool that provides interactive access to NOAA environmental data. The website lets users view, animate, and explore global datasets of the world's oceans, land, atmosphere, and cryosphere. NOAA View provides access to maps of data from a variety of satellite, model, and other analysis sources.
http://www.nnvl.noaa.gov/view/

NOAA Watch: NOAA's All-Hazard Monitor
NOAA's All-Hazard Monitor website draws on an array of weather-tracking devices, satellites, and more. Visitors can monitor a number of types of weather and hazards here, including tropical weather, droughts, floods, coral bleaching, harmful algal blooms, oil spills, and more. The website offers background information along with useful links to more in-depth information and educational materials.
http://www.noaawatch.gov/

NOAA World
The NOAA World website offers easy-to-find information about NOAA's work, people, and resources. The website features news stories, regional links, multi-media, and more. Check out the Best of the Web, Image of the Day, Education News, and more.
http://www.noaaworld.noaa.gov/index.html

NOAA YouTube Movies
NOAA's Ocean Media Center creates high definition video products showcasing the many services that NOAA provides to the public. On the YouTube channel, you'll find many kinds of videos including natural history documentaries about our national marine sanctuaries, industrial documentaries about how NOAA responds to oil spills, and historical documentaries covering wide ranging topics from shipwrecks in the Great Lakes to the history of surveying in the United States.
http://www.youtube.com/profile?user=NOAAOceanMediaCenter

NOAA's Island on Second Life
NOAA's Earth System Research Lab developed an Earth-science "island" in the online world of Second Life. On Meteora, one can soar through a hurricane on the wing of a research aircraft, rise gently through the atmosphere atop a weather balloon, or search for a hidden underwater cave on a side trip from a NOAA submarine. A virtual beach demonstrates how to recognize the onset of a tsunami, and eventually the site may enhance public awareness of rip tides, hurricanes, tornadoes and other natural disasters. Science on a Sphere makes its virtual debut with four examples of its 80-plus dramatic visualizations of planetary data, including a view of nighttime lights around the globe and a 3-D panorama of ocean, sea, and lake depths.
http://www.esrl.noaa.gov/outreach/sl/

Nominate Websites to the Bridge
Nominate new ocean science resources you have come across, or produced, to the Bridge. Nominating a site is easy and the review process will provide you with valuable feedback on what teachers liked about your site and what can be improved to make it even more useful.
Site Nomination Form – http://www.marine-ed.org/bridge/index_nomination.html

Nominate Your Video
Videos instantly grab students' attention and are a good way to share research or demonstrate a science concept. Does your group have a YouTube video for science classrooms? Nominate it to the Bridge using the online form on the website.
http://www2.vims.edu/bridge/search/nominate.cfm
http://web.vims.edu/bridge/

Nonformal EE Programs – Guidelines For Excellence
The *Nonformal Environmental Education Programs – Guidelines for Excellence* comprises a set of recommendations for developing and administering high quality nonformal environmental education programs. The guidelines describe six key characteristics that can help guide the program development process: Needs Assessment, Organizational Needs and Capacities, Program Scope and Structure, Program Delivery Resources, Program Quality and Appropriateness, and Evaluation.
www.naaee.org/npeee

Nonpoint Source Outreach Toolbox
The Nonpoint Source Outreach Toolbox from the EPA is intended for use by organizations interested in educating the public on nonpoint source pollution or stormwater runoff. The toolbox contains resources to help develop an effective and targeted outreach campaign.
http://www.epa.gov/owow_keep/NPS/toolbox/

Nonpoint Source Pollution Articles and Activities
The EPA offers a series of articles and activities about nonpoint source pollution for middle school students. The downloadable materials include background information and links to further information.
http://www.epa.gov/owow/nps/nps_edu/index.html

Nonpoint Source Pollution Discovery Kit
A new Discovery Kit on nonpoint source pollution has been added to the NOS Discovery Center. The website includes a tutorial describing the categories of nonpoint source pollution, the various pollutants that originate from nonpoint sources, and research and monitoring efforts; links to online resources; and lesson plans designed to be used at the high school level.
http://oceanservice.noaa.gov/education/kits/pollution/

Non-Point Source Pollution Model from Environment Canada's Georgia Basin Ecosystem Initiative
The *Non-Point Source Pollution Model* is an interactive environmental education tool for understanding pollution, where it comes from, and what we, as individuals, can do about it. Instructions for making the model are available on the website, along with resources and curriculum connections.
http://www.pyr.ec.gc.ca/EN/IPM/index.shtml

NonProfitReady.org
NonProfitReady.org is an online portal that offers learning, webinars, and other resources to develop, train, and broaden the skills of the nonprofit professional. The website links to more than 200 free courses to support the most common jobs in the sector, including Fundraising, Leadership, Marketing and Communications, Volunteer Engagement, and more.
http://www.nonprofitready.org/

Nordic Underwater Archaeology
Learn about maritime archaeology worldwide, from a north European perspective. From basic background information to links to worldwide wreck databases, from tools and techniques to literature archives, this website is a good place to start on your underwater archaeology journey.
http://www.abc.se/~m10354/uwa/index.html

Normal Faults in Sand in a Shoe Box
A great deal can be learned by observing a sand box, and this instructional resource is designed to help students use sandbox models to investigate the characteristics of normal faults and parameters that influence their development. The website includes an overview of the context in which the activity should be used, a complete set of notes for instructors, student handouts, and a list of supporting materials and references
http://serc.carleton.edu/NAGTWorkshops/structure04/activities/3872.html

North American Breeding Bird Survey
The North American Breeding Bird Survey website is a cooperative effort between the Patuxent Wildlife Research Center and the Canadian Wildlife Service's National Wildlife Research Centre, to monitor the status and trends of North American bird populations. Data are collected by participants along thousands of randomly established roadside routes throughout the continent.
http://www.pwrc.usgs.gov/bbs/

North American Environmental Atlas
The Commission for Environmental Cooperation works with key mapping agency partners in Canada, Mexico, and the United States to promote understanding of significant continental-scale environmental issues through the North American Environmental Atlas. Available map layers include renewable energy capacity, priority conservation areas, and other environmental themes. Users can download the shapefiles for the layers.
http://www.cec.org/naatlas/

North American Mammals
The Smithsonian Institution presents a searchable database of the approximately 400 living mammals of North America. The database may be searched by species, geographic location, conservation status, and family tree. For each mammal, visitors can view several renderings and photographs and also read a short scientific and narrative description. Visitors can create their own printable field guides by clicking a box next to each mammal's scientific name, and print these materials out as they wish.
http://www.mnh2.si.edu/education/mna/

North American Native Fishes Association
The North American Native Fishes Association is dedicated to the appreciation, study and conservation of the continent's native fishes. The website features a checklist of freshwater fishes native to North America and a *Fish in Focus* section with images and brief descriptions. The site also contains information about an award program for breeders, grant programs, related links, and more.
http://www.nanfa.org/

North Atlantic Stepping Stones 2005 Expedition
This expedition from NOAA's Ocean Explorer education program will run August 7–September 3, 2005. Scientists will explore the very old New England and Corner Stone seamount chains which range in age from 75 to 100 million years and are part of a volcanic chain extending from Canada to the African tectonic plate. The website contains content essays and lesson plans directly tied to this exploration. These inquiry and standards-based lessons have been developed for students in Grades 5-12.
http://oceanexplorer.noaa.gov/explorations/05stepstones/welcome.html

North Cascades Institute
The North Cascades Institute seeks to inspire a closer relationship with nature through direct experiences in the natural world. Their programs help connect people, nature, and community through science, art, literature, and the hands-on study of natural and cultural history. They offer seminars, school programs, summer youth adventures, teacher education, and graduate courses. Check out the Procession of the Species Parade.
http://www.ncascades.org/

Northeast Florida Sea Grant Resources
The NE Florida Sea Grant Extension Program offers a variety of educational programs throughout the year. This website offers downloadable PowerPoint slideshows on corals, estuaries, beaches, and more. The slideshows are accompanied by downloadable activities. Check the website for additional links, including photos of plants of northeast Florida, newsletters, and further educational materials.
http://stjohns.ifas.ufl.edu/sea/education.html

Northeast U.S. Canyons Expedition
Follow along with the *Okeanos Explorer*, July 8–August 17, 2013, as it explores the diversity of benthic habitats and features, including deep-sea corals, gas seeps, and landslide features in and along the northeast deepwater canyons and seamounts off the U.S. East Coast. Using telepresence technology, scientists on board the ship will collaborate with scientists participating remotely from shore. Check out the lesson plans, mission logs, and more; the website will be built close to the expedition launch.
http://oceanexplorer.noaa.gov/okeanos/explorations/explorations.html

Northeasters
Coastal Currents, a new publication series produced by the University of Delaware Sea Grant College Program in partnership with the Center for Applied Coastal Research, is designed to share timely information about coastal hazards and the natural processes that occur along Delaware's shoreline. The first issue covers northeasters and includes information on historic northeasters in Delaware, provides a web-based calculator for determining a northeaster's damage, and highlights storm preparedness tips.
http://www.ocean.udel.edu/seagrant/publications/images/coastalcurrents.pdf

Northern Fur Seal Curriculum
This K-6 curriculum from Alaska Fisheries Science Center addresses northern fur seal natural history: the fur seal's importance to Unangam (Aleut) culture; the history of the fur seal commercial harvest; and research, conservation, and sustainability of the northern fur seal population. All lessons include an overview presentation and hands-on activities over a range of subjects. While on the website, check out the other activities and curriculum.
http://www.afsc.noaa.gov/education/Activities/northernfursealcurriculum.htm

NCSR Curriculum
Once the website for the Northwest Center for Sustainable Resources has been removed, arrangements have been made for all 58 curriculum items to be made available on the following websites.
ATE Central (Advanced Technological Education), https://atecentral.net/
Applied Math and Science Education Repository (AMSER) https://amser.org/
National Science Digital Library (NSDL) http://nsdl.org/

Northwest Center for Sustainable Resources
The Northwest Center for Sustainable Resources is a national clearinghouse for natural resource curriculum materials used by college faculty and high school science teachers. Materials cover major subject areas of environmental science and natural resources, including fisheries, forestry, wildlife, and more. Guides for developing community-based or place-based instruction for middle and secondary science courses are also available. The Center offers professional development institutes covering environmental topics.
http://www.ncsr.org/

Northwest Center for Sustainable Resources
The Northwest Center for Sustainable Resources offers this pdf file containing information about their myriad materials and services. The file contains information about courses, manuals, educator guides, modules, and much more.
http://www.ncsr.org/documents/NCSRAboutUs.pdf

Northwest Invention Center
The Northwest Invention Center helps educators by empowering creativity and innovation in the classroom. They offer workshops in innovation and inventive learning; traveling exhibits for museums, and more. The blog highlights hands-on activities, including balloon powered boats, puff cars, and much more. The newsletter features open-ended, hands-on STEM activities. Follow the blog, sign up for the newsletter, and more.
http://www.invention-center.com/

Northwestern Hawaiian Islands Education Project
From August 12 through 21, 2005, the NOAA research vessel Hi'ialakai ("embracing pathways to the sea") carried educators on NOAA's first-ever dedicated education voyage. While visiting Nihoa, Mokumanamana, and French Frigate Shoals, educators learned about the natural and human history of the Northwestern Hawaiian Islands and the challenges of restoration and resource management. Journals and activities have been and will continue to be posted to the website.
http://hawaiianatolls.org/

Northwestern Hawaiian Islands Research Expedition
From May 19 through June 11, 2006, the NOAA ship Hi'ialakai will be conducting a research expedition to the Northwestern Hawaiian Islands. The expedition includes ecosystem connectivity research, apex predator tagging and movement studies, as well as coral health assessment missions. Also stay tuned for web coverage of the upcoming NOAA ship Hi'ialakai 30-day expedition to conduct mapping, maritime heritage archaeology, and education and outreach in the islands from June 23-July 20, 2006.
http://sanctuaries.noaa.gov
http://hawaiianatolls.org/research/May2006/index.php

Northwestern Hawaiian Islands Newspaper Insert
A newspaper insert prepared during the period in which draft fishing regulations are being developed for the proposed Northwestern Hawaiian Islands National Marine Sanctuary discusses the history and importance of the islands' ecosystem, fishery management plans and coral reef preservation actions, the seafood market and its importance to consumers, and research on fishing effects on the ecosystem.
http://www.wpcouncil.org/NWHI/Documents/NWHI_Insert.pdf

Northwestern Hawaiian Islands Research Partnership
The Hawai'i Institute of Marine Biology offers this website showcasing the science from the Northwestern Hawaiian Islands Research Partnership. The objective of the website is to bring the research findings from this partnership to community members, students, and partners. The website includes news, links to education programs, an events calendar, online forums, and more.
http://www.hawaii.edu/himb/nwhi/

NOS Data Explorer
The National Ocean Service Data Explorer website allows users to search NOS data holdings, view metadata, and link to and/or download specific data sets. The data explorer offers interactive mapping tools that allow users to locate NOS products in any area in the United States and its territories through a metadata catalog. Search results provide users with metadata records and links to websites with additional information.
http://oceanservice.noaa.gov/dataexplorer/

NOSB Ocean Sciences Quiz
The NOSB's Ocean Sciences Quiz was created to promote ocean literacy. The online game simulates the NOSB buzzer competition, making the competition available to a broad audience regardless of age or location. Three game modes are available: a timed single-player version and timed two-player versions for players on the same or different computers.
http://osq.nosb.org/

Not Just Mine: Kids and Plovers on the Beach
The Western Snowy Plover website is devoted to the protection and recovery of the Western Snowy Plover, and offers resources for information, education, and community involvement. Not Just Mine is a movie about kids and plovers on the beach and can be downloaded fast, in low quality, or more slowly at a higher quality. In addition, the film is available at no charge to marine educators for classroom use and distribution.
http://www.westernsnowyplover.org
Contact Marla Morrissey at marlamorrissey@gmail.com

NOVA Labs
NOVA Labs is a new digital platform where students explore the scientific process by visualizing, analyzing, and sharing the same data that scientists use. The website currently has three labs available about clouds, energy, and the sun lab, and more will be added in the future.
http://www.pbs.org/wgbh/nova/labs/

NOVA scienceNOW: Explore Teacher's Guides
This website from PBS NOVA offers downloadable teacher's guides designed to be used in conjunction with the scienceNOW programs. The guides are divided into thirteen topical areas, including Earth Science, Oceanography, and more. The website also includes program segments, program overviews, and more
http://www.pbs.org/wgbh/nova/sciencenow/educators/subject-ocea.html

NOVA Tsunami and Earthquake Resources
NOVA has aired programs about tsunamis and earthquakes and provides websites for off-TV explorations. Japan's Killer Quake offers an eyewitness account of the recent disaster, while the Wave that Shook the World reconstructs the 2004 Indian Ocean tsunami. The websites link to expert questions and answers, videos, teacher resources, and more,
http://www.pbs.org/wgbh/nova/earth/japan-killer-quake.html
http://www.pbs.org/wgbh/nova/tsunami/

NOW Classroom Global Warming Lesson Plan
NOW on PBS offers the NOW Classroom website, allowing teachers to select skill-based activities and lessons, incorporating their choice of NOW on PBS programs. NOW topics cover many themes, including the environment, government in action, social policy, business, and more. The NOW Classroom standards-linked lesson on global warming can help students in grades 9-12 research and form credible opinions on this topic.
http://www.pbs.org/now/classroom/globalwarming.html

Now-casting Sea State from Your Classroom
In the current Bridge DATA, Sea State, students use real-time data from the NOAA National Data Buoy Center to determine wave conditions around the coastal United States. Learning how wind is created and its effects on the sea surface, students will compare real-time wind speeds to the Beaufort Wind Force Scale in order to now-cast sea state conditions at each of the buoy sites. Use this DATA to supplement your atmosphere unit and bring real scientific data into your classroom.
http://www.marine-ed.org/bridge/index_archive0906.html

NowCOAST: Web Mapping Portal to Real-time Coastal Observations and NOAA Forecasts
NOAA's Coast Survey Development Laboratory has released an updated version of its Internet mapping portal, nowCOAST. The website allows one-stop access to real-time coastal observations and NOAA forecasts for any coastal region in the U.S. The new version features several enhancements including a new map viewer, a separate data browser window, an accompanying informational web page, and new links to additional observations and NOAA forecasts.
http://nowcoast.noaa.gov

NowCoast Website Updated
NOAA has released an updated version of nowCOAST, providing map displays of recent GOES weather satellite imagery, surface in-situ meteorological data, and sea surface temperature observations. Data and imagery are updated hourly, and National Weather Service Doppler weather radar is updated every 15 minutes.
http://nowcoast.noaa.gov/

NPSArcheology Twitter Feed
The NPS Archeology twitter feed highlights projects, accomplishments, and news items related to archeology in national parks, other Federal archeology projects, and general interest archeology news.
http://twitter.com/NPSArcheology

NSDL on iTunes U
The free National Science Digital Library iTunes U offers a different multimedia resources on a range of subjects including Physical Science and Technology, Life Science, and Earth and Environmental Science. The Beyond Campus section includes museums, public radio and television stations, and other non-profit educational providers.
http://nsdl.org/page/iTunesU/

NSDL K-6 Science Refreshers
The National Science Digital Library K-6 Science Refreshers provide quick and easy access to high-quality science content. The refreshers include interactive tutorials, diagrams, and articles that are selected and organized by grade level and subject area. The website is in beta release; help them out by providing your feedback.
http://nsdl.org/refreshers/science/

NSDL Wiki
The National Science Digital Library (NSDL) offers NSDL Wiki, which provides a collaborative online environment where users can create educational content, organize project documentation, and submit and annotate educational resources in the NSDL Data Repository. It advances their work toward the goal of creating more connections and fewer barriers to getting high quality annotations and resources into the library.
http://wiki.nsdl.org/index.php/NSDL_Wiki

NSF Classroom Resources
The National Science Foundation offers Classroom Resources, a collection of lessons and web resources. Materials are arranged by subject area, including Arctic & Antarctic, Education, Earth & Environment, and more.
http://www.nsf.gov/news/classroom/

NSF Discoveries
This website from the National Science Foundation features discoveries and advances from NSF-funded researchers. Visitors can browse by research area, including Earth & Environment, Education, Arctic & Antarctic, and more; a search option is also available. You can also sign up for email updates to follow along with the latest discoveries.
http://www.nsf.gov/discoveries/

NSF Special Reports
The National Science Foundation has developed a number of special reports that showcase the latest research done under their general direction. Many of these features deal directly with a host of issues of interest to this group, including predicting seasonal weather, disasters, seafloor science, the chemistry of water, and more.
http://www.nsf.gov/news/special_reports/

NSTA Blog
The NSTA blog currently consists of fourteen sub-blogs. Check out Science, Ms. Mentor, SciLinks, and much more. Each category opens a page for quick viewing, with active links to more detailed articles and resources.
http://nstacommunities.org/blog/

NSTA Free for All
The June 2005 issue of the elementary edition of NSTA's *Science Class* features more than 60 free online opportunities teachers can use to get ready for next year. Websites of note include:

- Information Today, Inc., free and fee-based online science resources for the K-12 community, http://www.infotoday.com/MMSchools/nov04/lackie_congleton.shtml
- BUBL Information Service, with subject menus including math, earth sciences, animals, and more, http://bubl.ac.uk
- Educator's Reference Desk, with access to ERIC—a database of information on education research and practice, http://www.eduref.org/

http://www.nsta.org/main/newsletters.php

NSTA Learning Center
The NSTA offers an online hub that provides on-demand professional development to help educators boost their knowledge about various science topics. The Learning Center has more than 3,000 electronic professional development resources and opportunities, including books, journal articles, web seminars, and online courses. More than 50 free, on-demand Science Object lessons allow teachers to increase their content knowledge at their own pace.
http://learningcenter.nsta.org/

NSTA Press Manuscript Central
NSTA Press welcomes proposals for new books of significant relevance and value to teachers of science grades K-college, and authors may now submit proposals of their work for consideration online at a new NSTA Press Manuscript Central site. NSTA Press publishes science content updates; books on best teaching practices; books that explicate and link to the National Science Education Standards; applications of the latest findings from science education research; and classroom activity books.
http://mc.manuscriptcentral.com/nstapress

NSTA STEM Newsletter
National Science Teachers Association is publishing *STEM in the Classroom* to provide a forum for ideas and resources middle and high school teachers will need to support science, technology, engineering, and math education.
http://ecommerce.nsta.org/stemenewsletter/

NSTA Teacher's Grab Bag
The National Science Teachers Association's Teachers' Grab Bag is on the web. You can find hundreds of free and almost free items such as videos, publications, CD-ROMs, lab kits, and much more. The database is searchable by cost and type of product. Keep it in mind if you have items you'd like to distribute, as the current database comes up empty from a search on "marine."
http://www.nsta.org/resourcesgrabbag

NTEN Classroom Materials and Activities
Montana State University offers free Science Lesson Plans, Virtual Explorations of Contemporary Science Issues (including extremophiles and ecological footprints), Alternative Energy Interactives, and Multi-Cultural Classroom Activities.
http://eu.montana.edu/nten/profres/

NWF and Nim's Island
The National Wildlife Federation is partnering with Walden Media for the national release of the family movie, *Nim's Island*, to reach millions with a story, conservation education, and opportunities for action to protect wildlife. Check out the Our World Environmental Challenge (deadline for application, April 11, 2008), downloadable educator's guide, and more.
http://www.nwf.org/nimsisland/

NWS Climate Services Seminar Series
The NWS Climate Services Division Seminar Series was created to build capacity in National Weather Service field offices on climate-related topics. Seminars are archived on the website. Titles include Strategies for Communicating Climate Science to People in Denial, Climate Communication: Tools and Tips, and many more.
http://www.nws.noaa.gov/om/csd/index.php?section=seminar

NYSMEA Website
The New York State Marine Education Association offers a newly redesigned website with lesson plans, job postings, research opportunities, field trip destinations, and marine-related links.
http://www.seagrant.sunysb.edu/nysmea/

OBIS-SEAMAP
OBIS-SEAMAP is an open access data center for marine mammal, sea bird and sea turtle observations, the primary purpose of which is to encourage collaborations and improve the understanding of these species by making it easy to share and visualize biogeographic data with advanced mapping and query tools.

OBIS-SEAMAP Digital Archive
The Ocean Biogeographic Information System – Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) project is part of the Census of Marine Life initiative. It is a publicly-available, web-based digital archive of marine mammal, seabird and turtle data, along with oceanographic and environmental data. Useful tools include on-line mapping capabilities, species profiles, and down-loadable data.
http://obis.env.duke.edu

Observatorium
NASA's Observatorium is a public access site for Earth and space data, with picture of the Earth, planets, and more, as well as the stories behind those images. The Educator's Resources includes topics in remote sensing, teacher's guides, and more. Education projects can be browsed by grade level and topic, including atmosphere and water. Recent additions cover hurricanes, wind chill, and more.
http://physics.ship.edu/~mrc/astro/NASA_Space_Science/observe.arc.nasa.gov/nasa/core.shtml.html

Observe Everything
Science Friday is celebrating observation, and challenging you and your students to get out and observe everything. The initiative is an invitation to practice the skill of observation with Science Friday's community of scientists, students, and educators. Submissions will be highlighted throughout the month of October on the Science Friday website and its social media outlets.
http://www.sciencefriday.com/segment/09/26/2014/science-friday-science-club-observe-everything.html

Observing the Coastal Ocean: Buoys, Ships and Science
COSEE SouthEast announces a new resource for teachers and informal educators about coastal ocean observing systems. The DVD, *Observing the Coastal Ocean: Buoys, Ships and Science*, explores coastal ocean observing systems using a fully automated and narrated, graphic-rich presentation. It focuses on the installation of a buoy off the coast of the Carolinas, a guided underwater tour to investigate the buoy, and experiences of consultants, graduate students and technicians in oceanography. Contact Carolyn Robinson at carolyn.robinson@scseagrant.org

Ocean 180 Video Challenge Finalists
The Ocean 180 Video Challenge produced video abstracts which highlight the significance and implications of recently published research. Check out Wavechasers and the Samoan Passage, Innocence by Viral Tagging, and more.
http://ocean180.org/previous-winners/video-abstract-entries.html

Ocean Acidification
This new website on ocean acidification is aimed at researchers, policymakers, and the public and offers infographics, news, publications, and more. Be sure to check out the multmedia page.
http://ocean-acidification.net

Ocean Acidification
The California Coastal Commission hosts this overview of ocean acidification, along with links to additional resources.
http://www.coastal.ca.gov/publiced/oa.html

Ocean Acidification
KQED's QUEST Science blog offers this primer on ocean acidification with pre- and post-discussion questions, vocabulary flash-cards, and links to more information and activities. Check out the links to additional topics, including biodiversity, water, and more.
http://science.kqed.org/quest/ed-collection/ocean-acidification-2/

Ocean Acidification
The December 2009 issue of *Oceanography* magazine is a special issue on ocean acidification. The open-access articles are posted online.
http://tos.org/oceanography/issues/current.html

Ocean Acidification
COSEE Alaska hosts an Ocean Acidification in Alaska's Seas resource page. The website offers basic background information, links to lesson plans, multimedia, news and journals, and much more.
http://www.coseealaska.net/oceanacidification/

Ocean Acidification Antarctic Cruise
A five-week expedition to the Antarctica aboard the *RRS James Clark Ross* will study the effect of ocean acidification in the Southern Ocean. Scientists will study the impact of the changing chemistry on marine organisms and ecosystems, on the cycling of carbon and nutrients in the sea, and on how the sea interacts with the atmosphere to influence climate. Follow along with the cruise with daily blogs and more.
http://www.antarcticoacruise.org.uk/sample-page/

Ocean Acidification Curriculum Collection
This website is funded or supported by the EPA, US Fish & Wildlife, Washington Sea Grant, Suquamish Tribe, and the Northwest Indian Fisheries Commission. It offers a curated collection of free K-12 resources on ocean acidification for educators and communicators. Browse the collection, ask an expert, and more.
http://www.oacurriculumcollection.org/

Ocean Acidification Data-in-the-Classroom Module
NOAA's Coral Reef Conservation Program and partners have developed a new Ocean Acidification Data-in-the-Classroom Module, as part of the NOAA Ocean Data Education (NODE) Project. The module incorporates real and near-real time ocean acidification data collected in the Caribbean region and maintained by the National Oceanographic Data Center. These data sets support a collection of five scalable lesson plans designed for grades 10-12, simulations, and more.
http://www.dataintheclassroom.org/content/oa/

Ocean Acidification – Distance Learning
The Seacoast Science Center in Rye, New Hampshire offers a new distance education program on Ocean Acidification. Students will be introduced to ocean acidification; learn what it is, what is causing it, and what its effects could be on our oceans. These concepts will be reinforced with participation in lab experiments featuring acids and bases, pH, calcification, and the carbon cycle. The course can be tailored to fit in 40-60 minute periods or in shorter time blocks.
http://www.seacoastsciencecenter.org/programs/distance_learning.php

Ocean Acidification FAQs
The U.S. Ocean Carbon and Biogeochemistry program has compiled a list of frequently asked questions (FAQs) about ocean acidification. The website also offers additional links to presentations, educational tools, and resources.
http://www.whoi.edu/OCB-OA/FAQs/

Ocean Acidification: A National Strategy
Requested by Congress, this report, *Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*, reviews the current state of knowledge, identifies gaps in understanding, and provides scientific advice to help guide the national ocean acidification research program. The report can be read online on the National Academies Press website.
http://dels.nas.edu/Report/report/12904?utm_medium=etmail&utm_source=The%20National%20Academies&utm_campaign=Aetos-Report_v1
http://www.nap.edu/catalog.php?record_id=12904

Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean
The long term consequences of ocean acidification are not known, but are expected to result in changes to many ecosystems and the services they provide to society. Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean reviews the current state of knowledge, explores gaps in understanding, and identifies several key findings.
http://dels.nas.edu/Report/Ocean-Acidification-National-Strategy/12904

Ocean Acidification Resources
Workshop teachers offered presentations about ocean acidification lessons and activities. The website posting of the presentations offer rough draft resources. Scroll down to Tuesday on the website.
http://www.mbari.org/earth/2011/schedule11.htm

Ocean Acidification Videos
The California Academy of Sciences posted this ocean acidification video, which will be used by the Academy as part of their effort to educate the public about ocean acidification online and in their exhibits. While on the website, pull up other YouTube videos on ocean acidification through a simple word search.
https://www.youtube.com/watch?feature=player_embedded&v=dbMomQgl3Fk

Ocean Acidification Webcast
The World Ocean Observatory offers information, education and public discourse about the ocean. Their first online webcast, on Ocean Acidification, aired November 13-14, 2006. This opportunity allowed students, educators, and interested individuals to participate in an ongoing series of global online events to explore ocean issues.
http://www.thew2o.net/

Ocean Acidification Webinar Series – Online
Note that this is a new link. This series of free webinars jointly sponsored by NOAA's National Marine Sanctuaries and the Ocean Acidification Program is entitled Sharing Ocean Acidification Resources for Communicators and Educators (SOARCE). The webinars provide ocean acidification communication tools to formal and informal educators and stakeholders across the country.
http://oceanacidification.noaa.gov/AreasofFocus/EducationOutreach/SOARCEWebinarSeries.aspx

Ocean Acidification Webinars
This series of free webinars jointly sponsored by NOAA's National Marine Sanctuaries and the Ocean Acidification Program is entitled Sharing Ocean Acidification Resources

for Communicators and Educators (SOARCE). The webinars provide ocean acidification communication tools. Check out upcoming webinars and review archived presentations. http://oceanacidification.noaa.gov/AreasofFocus/EducationOutreach/SOARCEWebinarSeries.aspx

Ocean Adventure
The Thinkquest website, Ocean Adventure, explores the hydrothermal vents in the depths of the Earth's oceans. Learn what hypothermal vents are, where they are located, how they are formed, and why they are important. Take a virtual dive in an actual submersible to learn more about these vents and their environments. Make sure to check out the downloadable classroom activities.
http://library.thinkquest.org/18828/index.html

Ocean Adventures in the Classroom
PBS's Ocean Adventures website offers resources designed primarily for middle school educators and students, appropriate for use in both formal and informal educational settings. The themes of adaptations, ecosystems and human impact are interwoven throughout the Ocean Adventures episodes and educational materials. The website offers new educational resources including episode-based viewing guides, activities, standards-based lesson plans and in-depth articles.
http://www.pbs.org/kqed/oceanadventures/educators/

Ocean Adventures Continue
Part three of this six-part TV series airing on PBS stations is *Sharks at Risk*, July 12, 2006. This is followed by *The Gray Whale Obstacle Course*, July 19, 2006. *America's Underwater Treasures* (parts 1 and 2) will air September 20 and 27, 2006, bringing viewers to the National Marine Sanctuary System. The website includes a variety of educational offerings, including standards-based lesson plans, informal activities, on-line games, and more, designed for middle school but easily adaptable for other grades.
http://www.pbs.org/kqed/oceanadventures/

Ocean Alaska Science and Learning Center
The Ocean Alaska Science and Learning Center, a partnership dedicated to understanding and preserving the marine ecosystem connecting Alaska's National Parks through research and education, announces the launch of its new web site. The site has information, images, video clips, and audio clips related to marine research in Alaska's National Parks. Also, review the Request for Proposals.
http://www.oceanalaska.org .

Ocean Animal Aquarium Teachers' Guide
The Marine Biological Laboratory's Marine Resources Center offers a downloadable Ocean Animal Aquarium Teachers' Guide, with lessons and activities that you can do with an ocean animal aquarium in your classroom, and ways to integrate the aquarium into daily classroom activities.
http://www.mbl.edu/mrc/services/pdf/teachers_guide.pdf

Ocean Artist
Deidre Sassano is an artist offering design and production of ocean-themed arts projects and workshops. Her "Ocean Arts" encourages creativity and conservational awareness for the oceans and their inhabitants and promotes the use of environmentally sensitive materials by utilizing recycling/recycled materials for projects.

Contact Deidre at hollow_arts@yahoo.com

Ocean Blogs
Check out this list of ocean blogs, compiled by Andrew Thaler through Southern Fried Science.
http://www.southernfriedscience.com/?p=17988

Ocean Book Lists
One recurring question from teachers is "What books do you recommend? - fiction, text, and inspirational. A variety of organizations pull together recommended lists. Here are just a few lists to start with.

- Los Angeles Unified School District - http://www.usc.edu/org/cosee-west/oceanbibliog.html
- The Ocean Project's Book of the Month - http://www.theoceanproject.org/action/book.php
- Children's Environmental Literature Bibliography http://www.dnr.state.wi.us/org/caer/ce/eek/teacher/childlit.htm
- The Bridge
  - Frequently Asked Questions - http://www2.vims.edu/bridge/search/faq.cfm
  - Resource Center - http://www2.vims.edu/bridge/search/bridge1output_menu.cfm?q=literature

Ocean Blogs
The folks at Upwell offers a list of ocean conservation blogs. Currently, there are 88, listed in alphabetical order. You can add yours to the list and subscribe to the Big Blue Blogs Bundle from the website.
http://www.upwell.us/big-blue-blogs-88-ocean-conservation-blogs

Ocean Book of the Month
Each month, The Ocean Project will highlight a book focused on our blue planet or environmental sustainability. Books for all age groups, non-fiction and fiction, prose and poetry will be covered.
http://seastheday.theoceanproject.org/seastheday/book/index.htm

Ocean Careers
This new resource on ocean careers comes from the Centers for Ocean Sciences Education Excellence. The website includes information on more than 50 careers, as well as information on schools and universities that offer related training programs, internships, and jobs; professional societies, profiles, and more.
http://www.oceancareers.com/2.0/index.php

Ocean Challenge Puzzle
Visitors to NOAA's redesigned Ocean Explorer Web site can team up with other players around the globe to answer ocean science questions to reveal pieces of a puzzle. The redesigned website also includes a new section, 'For Fun.' Improved navigation and more awaits your ocean explorations.
http://www.oceanexplorer.noaa.gov

Ocean Challenge Puzzle
Try your hand at this online interactive quiz puzzle from NOAA. Answer questions to help uncover an ocean image and have fun while you learn a variety of ocean-related facts.
http://www8.nos.noaa.gov/oequizx/welcome.html

Ocean Classrooms
The Ocean Classrooms website offers a free Ocean Literacy online course along with a portal for live ocean data from around the globe. Sign up for a free 30-day trial to check out the online course, Marine Science 101, a semester-long high school course.
https://oceanclassrooms.com/learning/marine-science-101

The Ocean and Climate Change
The IUCN has released *The Ocean and Climate Change – Tools and Guidelines for Action,* to help decision-makers understand the importance of the ocean in the global climate debate, and the cost of not taking action. The report offers mitigation and adaptation strategies, as well as action recommendations.
http://cmsdata.iucn.org/downloads/the_ocean_and_climate_change.pdf

Ocean and Climate Sciences for Teachers
This collaborative program focuses on science related to how oceans and climate are connected. The resources focus on how the coupled ocean/atmosphere and the Earth's energy balance impact the climate system and offers ten modules that focus on the connection between the world's oceans and their effects on the weather and climate of inland regions of the U.S. Lecture, videos of NOAA and CIRES scientists, classroom activities, and analysis questions or assessments are included in each module
http://cires.colorado.edu/education/k12/ocean-climate/

Ocean-Climate Forum
Ocean-Climate, produced by the World Ocean Observatory, is a forum designed to explore the relationship between climate change and oceanic conditions, and inform marine resource management on mitigation and adaptation strategies. Some of the issues addressed include extreme weather, ocean acidification, biodiversity, and more.
http://www.oceanclimate.org/content/home

Ocean-Climate Website
The World Ocean Observatory, in collaboration with the Global Forum, has created a website to address the interrelation between ocean and climate. The website includes video interviews, online links and resources, a news feed, and an interactive forum for comment.
http://www.oceanclimate.org/

Ocean Communicators Workshop Report
The Ocean Communicators Workshop, *Communicating Science,* was held August 20-21, 2007 in Santa Barbara, California, with communicators representing ocean-related agencies, organizations, and businesses in California. The workshop identified key messages for top ocean topics in California as well as provided workshop participants with expertise and experience in communicating those messages through new and traditional media outlets. The workshop report and more are available on the website.
http://www.thankyouocean.org/oca_workshopdocs

Ocean Community
Ocean Community is the National Ocean Council's portal for data, information, and tools to support people engaged in planning for the future of the ocean, our coasts, and the Great Lakes. The goal is to be a one-stop hub to support planners and to provide useful information to the public. Check out the federal data currently available, and join the forum to offer advice about additional resources needed.
http://www.data.gov/communities/ocean

Ocean Connections from COSEE-Florida
The Florida Center for Ocean Science Education Excellence publishes their quarterly newsletter, *Ocean Connections*, on their home page. The newsletter features information about professional development and other events, and highlights a web portal and education program each month. In addition, if you register on the website, you will be able to post your materials, lesson plans, images, articles and data sets for others to share. http://floridacosee.net/ .

Ocean Conservation Booklets
Pew Environment Group and Marine Fish Conservation Network have colorful educational booklets available for free, which provide a general background on ocean conservation and overfishing. They would be happy to ship requests of over 100 to those interested. The booklet is also available for downloading from the website.
http://www.endoverfishing.org/resources/OceanConservationBooklet2008-PewLogo.pdf
Contact Joseph Gordon at JGordon@pewtrusts.org

Ocean Conservation Careers
The Speak up for the Blue website hosts weekly videos with tips on building a career in ocean conservation, interviews with industry professionals, and more.
http://www.speakupforblue.com/category/ocean-conservation-careers

Ocean Cores
This University of Arizona course website features an outline to interpreting ocean cores as they relate to past environmental conditions such as sedimentation rates and climate. The outline includes figures and information about sedimentation, the history of interpreting ocean cores, how proxies in ocean cores reveal past climate, and use of oxygen isotopes to infer past climate. Key terms are hyperlinked to related pages and further information, and an extensive reference list is posted.
http://www.geo.arizona.edu/palynology/geos462/06ocencore.html

Ocean Currents Radio Show
Discover the depths and far reaches of the ocean realm by tuning in to these live or archived radio broadcasts. Listen as Cordell Bank National Marine Sanctuary personnel talk with experts in the field about current research, management issues, natural history, and stewardship associated with the marine environment. Check out the schedule for live broadcast dates and times, download archived radio shows, or subscribe to Ocean Currents podcasts. Check out upcoming shows or look through the archives.
http://cordellbank.noaa.gov/newscalendar/welcome.html
http://cordellbank.noaa.gov/education/radiopodcast.html
http://cordellbank.noaa.gov/education/radioshow.html

Ocean Currents Tutorial
NOAA's Ocean Service Education website offers the new Ocean Currents Tutorial, presenting an overview of some of the major factors that cause coastal and open ocean currents including tides, winds, and changes in water temperature and salinity. Longshore, rip currents, and upwelling events are discussed in the context of the coastal environment. Coriolis, the Ekman spiral, and thermohaline circulation are discussed in relationship to the open ocean. The Roadmap to Resources presents data on ocean currents from a variety of resources, and two inquiry-based lesson plans emphasize hands-on activities using online data.
http://oceanservice.noaa.gov/education/kits/currents

Ocean Data Viewer
The Ocean Data Viewer was developed to help inform decisions for the conservation of marine and coastal biodiversity. The website offers sixteen datasets combined in a mashup style format with a political map of the world. Visitors can toggle different datasets, including distribution of coral reefs, mean sea surface temperature, and more. The website links to additional databases including coral diseases, the Global Reporting and Assessment of the Marine Environment, and more.
http://data.unep-wcmc.org/

Ocean Desktop and Wallpaper Photos for PC and Mac
Check out NOAA's extensive collection of free desktop and wallpaper photos for PCs and Macs. Both widescreen and square monitor formats are available.
http://oceanservice.noaa.gov/wallpaper.html

Ocean Directory
The World Ocean Observatory is dedicated to providing information, education, and public discourse about the ocean. It offers a myriad of easy-to-find links to resources, including education materials, ocean news, and much more. The World Ocean Directory is a dynamic list of ocean-related organizations located throughout the world, currently with more than 18,000 entries. Add your organization and look through the list to see others that might offer a good partnership to your activities.
http://www.worldoceanobservatory.org/sitemenu

Ocean Discovery Day - Texas
Flower Garden Banks National Marine Sanctuary and the NOAA Fisheries Service Galveston Laboratory sponsor NOAA Ocean Discovery Day, March 26, 2011. March 22, 2014. The free event is designed to engage residents and visitors in fun, creative, and educational hands-on activities that illustrate how NOAA programs are relevant to the community.
http://flowergarden.noaa.gov/newsevents/odd2011article.html
http://flowergarden.noaa.gov/newsevents/oddarticle.html

Ocean Discovery Kits
NOAA's National Ocean Service has launched three discovery kits explaining the science behind NOS activities, designed to make complex subjects accessible to teachers and students at the high school level. Each kit includes an on-line tutorial, a roadmap to resources, and a set of lesson plans correlated to National Science Education Standards. Discovery Kits have been developed for Corals, Tides & Water Levels, and Geodesy.
http://oceanservice.noaa.gov/education/welcome.html .

Ocean Drifters
Dr Richard Kirby is the Plankton Pundit and offers a look at the secret world beneath the waves. Check out the online video, Ocean Drifters.
http://www.planktonpundit.org/

Ocean Education
National Geographic's Ocean Education website offers mini-lesson plans, student activities, computer simulations, multimedia, and other resources for all grade levels. Diverse topics and ecosystems are explored, with a special high school unit on marine ecology, human impacts, and conservation. The Teacher Resources button links to additional resources.
http://education.nationalgeographic.com/education/program/oceans-education/?ar_a=1

Ocean Etiquette and Responsible Marine Wildlife Viewing
NOAA Fisheries and NOAA's National Marine Sanctuary Program have developed the Ocean Etiquette program to promote ocean stewardship. Anyone who visits, works, or plays in the marine environment and those who visit remotely (i.e. the Internet and aquariums) have an opportunity to make a difference in protecting the ocean. Ocean Etiquette is designed to provide the public with guidance on minimizing impacts to marine life and habitats.
http://www.nmfs.noaa.gov/pr/education/viewing.htm
http://www.sanctuaries.noaa.gov/protect/oceanetiquette.html

Ocean Exchange
The Ocean Exchange offers a platform for identifying, accelerating, and promoting the solutions and innovations that positively impact the environment, economies, and health. They do this by connecting innovators and organizations, advocating for collaborations, and providing capital investment through an annual contest and financial awards.
http://www.oceanexchange.org/

Ocean Exploration Facts
NOAA's Office of Ocean Exploration and Research offers this new Ocean Exploration Facts section on the Ocean Explorer web site. The section provides short answers to common or intriguing ocean questions. New information will be added every few weeks. The questions are categorized according to the seven Ocean Literacy Essential Principles and Fundamental Concepts for grades K-12.
http://oceanexplorer.noaa.gov/facts/facts.html

Ocean Exploration: H.M.S. Challenger and Beyond
Join the College of Exploration's Challenger Team under the sponsorship of NOAA's Office of Ocean Exploration for this upcoming virtual workshop, April 19-May 7, 2004. Dialogues with colleagues and experts will explore topics from the mid-19th century history of ocean exploration, current expeditions, and a glimpse into the future of ocean exploration.
http://www.coexploration.org/oe2004 .

Ocean Exploration – Summer Expeditions
NOAA's Office of Ocean Exploration will be launching several expeditions during the upcoming summer months of 2005. Follow along with scientists and educators through

daily web logs, images, and video as they explore unknown areas of the ocean from the Arctic to the Lost City Site along the Mid-Atlantic Ridge.
New Zealand American Submarine Ring of Fire – April 3 – May 10, 2005
Hidden Ocean Expedition, June 26 - July 16, 2005
Lost City Expedition, July 15 – August 4, 2005
DeepScope, August 19 - September 4, 2005
North Atlantic Deep Sea Corals Expedition, August 5 – September 5, 2005
http://oceanexplorer.noaa.gov

Ocean Explorer Education Theme Pages
NOAA's Office of Ocean Exploration and Research offers Education Theme Pages to provide educators with easy access to popular ocean science topics. Each Theme Page provides links to content essays, lessons, multimedia interactive activities, career information, and associated past expeditions. Theme Pages include Seamounts, Deep-sea Corals, and more; check back as additional pages will continue to be added.
http://oceanexplorer.noaa.gov/edu/themes/welcome.html

Ocean Explorer on YouTube
The NOAA Ocean Explorer YouTube website offers videos for all who wish to learn about, discover, and virtually explore the ocean realm. The site provides a platform to follow explorations in near real-time, learn about exploration technologies, observe remote marine flora and fauna in the colorful multimedia gallery, read about NOAA's 200-year history of ocean exploration, and discover additional NOAA resources in a virtual library.
http://www.youtube.com/oceanexplorergov

Ocean Facts Website
NOAA's National Ocean Service offers an ever-growing Ocean Facts Website. The questions range from basic (What is an estuary?) to the more unusual (What does peanut butter have to do with the ocean?).
http://oceanservice.noaa.gov/facts/welcome.html

Ocean Film Festival - Georgia
Gray's Reef National Marine Sanctuary and partners will host the Ocean Film Festival in Savannah, Georgia, September 22-25, 2011. If you're in the area, don't miss this opportunity.
http://graysreef.noaa.gov/news/features/2011/film_festival_2011/welcome.html

Ocean Film Festival - Georgia
Gray's Reef National Marine Sanctuary and partners will host the Ocean Film Festival in Savannah, Georgia, September 20-23, 2012. If you're in the area, don't miss this opportunity.
http://graysreef.noaa.gov/news/features/2012/film_festival_2012/welcome.html

Ocean Frontiers
The film, Ocean Frontiers, takes a bipartisan approach to both the problems we face in managing our oceans and the solutions at hand. The film features on-the-ground reporting from places across the country that are implementing promising new approaches to ocean and coastal management. Check out the website for information about where it's playing, how to host a screening, view video clips, and more.
http://ocean-frontiers.org/

Ocean Frontiers Film
Ocean Frontiers II: A New England Story for Sustaining the Sea premiered in Providence, Rhode Island. You are invited to request a free DVD to share with your community, at work, in the classroom, and elsewhere. Fill out the Host-a-Screening Form and reserve a free DVD and screening toolkit.
http://ocean-frontiers.org/trailer/

Ocean Frontiers Film Guides
The National Sea Grant Law Center and the Cooperative Institute for Research in Environmental Sciences have produced Discussion/Study Guides for the Ocean Frontiers film. The guides are for university and middle/high school levels and are downloadable from the website along with video clips and information about hosting a film screening.
http://ocean-frontiers.org/discussion-guides/

Ocean Frontiers Film Series
Green Fire Productions produces films on conservation and sustainability issues and makes them available for viewing on YouTube and through other means. The films tell the stories of people finding solutions to environmental challenges they face on land and at sea. Topics include ocean stewardship, river restoration, and more.
https://www.youtube.com/user/GreenFireMedia
http://ocean-frontiers.org/host-a-screening/

Ocean Frontiers Movie - Massachusetts
Mass Audubon and the Broadmoor Wildlife Sanctuary are sponsoring a free showing of the movie, Ocean Frontiers, November 7, 2013 in Natick, Massachusetts. Ocean Frontiers features on-the-ground reporting from places across the country that are at the forefront of implementing promising new approaches to ocean and coastal management.
https://www.massaudubon.org/catalog/listing.php?program_code=BR29016

Ocean Health Index
The Ocean Health Index is a tool for the ongoing assessment of ocean health. The index is a collaborative effort, made possible through contributions from more than 65 scientists/ocean experts and partnerships. The index is organized by ten public goals, including food provision, coastal protection, sense of place, and more.
http://www.oceanhealthindex.org/

Ocean Health Index Newsletter
The Ocean Health Index is a tool for the ongoing assessment of ocean health, organized by ten public goals, including food provision, coastal protection, sense of place, and more. The online newsletter features monthly stories on a marine theme, including MPAs, aquaculture, and more. Check out the short videos in the MPA Film Festival.
http://www.oceanhealthindex.org/

Ocean Garbage Patches and Predicting Oil-Spill Trajectories
The Ocean Motion website offers a review of the surface circulation of Earth's ocean and classroom investigations appropriate for various disciplines at the high school level. Follow the path of plastic to the ocean gyres and read about what happens to plastic after it circles the ocean gyres for decades. Check out the Casco Bay and Exxon Valdez oil spills.

http://www.oceanmotion.org/html/impact/marine-resources.htm

Ocean Gazing
The Bridge recommends COSEE NOW's Ocean Gazing, a collection of 50+ podcasts with interviews with OOS scientists, covering topics from melting sea ice to commercial clamming, from ocean poetry to songs of the Banana Slug String Band. Each podcast is 10 minutes long, and all are correlated with the National Ocean Science Standards and include links to related educational resources.
http://www.coseenow.net
http://www.oceangazing.org

Ocean Gazing Podcast
COSEE Networked Ocean World offers the biweekly podcast *Ocean Gazing*, highlighting the science, researchers, and sounds of Ocean Observing Systems. Find out how to detect underwater earthquakes, take photos of some of the smallest ocean creatures, measure the ocean's temperature, and more.
http://coseenow.net/category/ocean/

Ocean Guardian Activity Book
The Ocean Guardian Activity Book, created by the NOAA Office of National Marine Sanctuaries and the Marine Debris Program, is appropriate for children in grades K-3. Learn about the ocean and its importance through word searches, games, and coloring pages.
http://sanctuaries.noaa.gov/education/fun/welcome.html

Ocean Guardian Classroom
NOAA's National Marine Sanctuaries are offering classrooms nationwide the opportunity to participate in an educational program to help students understand that no matter where they live, they have an impact on the world's single, interconnected ocean. Students and their teacher commit to the protection and conservation of local watersheds, the world's ocean, and special ocean areas, like national marine sanctuaries, by proposing and implementing a based conservation project.
http://sanctuaries.noaa.gov/education/og_classroom/welcome.html

Ocean Guardian Classrooms for All
NOAA's Office of National Marine Sanctuaries is offering classrooms throughout the United States the opportunity to be involved environmental conservation as Ocean Guardian Classrooms.
http://sanctuaries.noaa.gov/education/og_classroom/welcome.html

Ocean Guardian Kids Club
The purpose of the NOAA National Marine Sanctuaries Ocean Guardian Kids Club is to encourage children to explore their natural surroundings to form a sense of personal connection to the ocean and/or watersheds in which they live. The Kids Club offers children an opportunity to express their insights, observations, and understanding of their natural environment through the creation of original stories, poetry, and visual art. The club is open to all students K-8.
http://sanctuaries.noaa.gov/education/kids_club/

Ocean Guardians
The National Marine Sanctuary Program's Ocean Guardian Kid's Club can help classes in some California counties get involved as an Ocean Guardian Classroom. The **Ocean Guardian Kid's Club** offers children an opportunity to express their insights, observations, and understanding of their natural environment through the creation of original stories, poetry, and visual art. All K-8 students are eligible and encouraged to join. The **Ocean Guardian Classroom** can help your class make a difference and promote environmental conservation at your school or in your local community,
http://sanctuaries.noaa.gov/education/kids_club.html
http://sanctuaries.noaa.gov/education/ocean_guardians.html

Ocean Leadership Employment Opportunities
The Consortium for Ocean Leadership is a nonprofit organization that represents public and private ocean research education institutions, aquaria, and industry with the mission to advance research, education, and sound ocean policy. The organization also manages ocean research and education programs in areas of scientific ocean drilling, ocean observing, ocean exploration, and ocean partnerships. As a service to the ocean community, job announcements are posted on the Ocean Leadership website.
http://www.oceanleadership.org/about/employment

Ocean for Life
The Ocean for Life: One World, One Ocean program is an initiative to increase cultural understanding through ocean science. The pilot yearn provided immersive ocean field studies and follow-on education programs to facilitate cross-cultural learning, appreciation, and lasting experiences between Middle Eastern and Western students.
http://www.oceanforlife.org
http://sanctuaries.noaa.gov/education/ofl/welcome.html
http://sanctuaries.noaa.gov/education/ofl/app.html

Ocean for Life Field Study
Ocean for Life: One World, One Ocean, the Ocean for Life field study brings together high school students of diverse backgrounds and cultures to discover marine science, conservation, and how the ocean connects us all. The program increases cultural understanding through ocean science by providing high quality, immersive ocean field studies and follow-on education opportunities. The program's are a sense of place, interconnectedness, and ocean conservation and stewardship.
http://sanctuaries.noaa.gov/education/ofl/welcome.html

Ocean Life Map
This map developed by Duke University researchers, in partnership with the Census of Marine Life and National Geographic Maps, provides a detailed overview of life in the world's oceans. The two-sided, poster-sized map, available online, is based on 10 years of data from the international Census of Marine Life and other sources.
http://comlmaps.org/oceanlifemap/diversity-distribution-abundance

Ocean Literacy
The World Ocean Observatory website offers a new section devoted to the Ocean Literacy Curriculum, providing an at-a-glance overview of the materials available at Ocean Literacy. The website offers the curriculum, broken it down into its fundamental concepts. Each principle has its own page, and includes links to the expanded curriculum on the Ocean Literacy website.

http://worldoceanobservatory.org/content/ocean-literacy

Ocean Literacy
This web site and online survey are the result of a partnership of agencies and institutions concerned with improving ocean literacy. Check out the extensive links under Education Resources, Links, and National & Regional Programs.
http://oceanliteracy.org/ .

Ocean Literacy Corner
The New England Ocean Science Education Collaborative offers an Ocean Literacy Corner, a column in their newsletter which will focus on one of the ocean literacy principles and offer curriculum associated with it. The information can also be found on their website. Sign up for their newsletter, and check out Principle 1: The Earth has one big ocean with many features.
http://www.neosec.dreamhosters.com/ocean-literacy/

Ocean Literacy Educational Materials Available
The National Geographic Office in Santa Barbara has had quantities of the following materials available:

- Ocean Atlas Teacher's Guides
- Oceans for Life Brochures

Contact Sally Ziegler at Sally.Ziegler@noaa.gov for inquiries.

Ocean Literacy Principles Brochure
An Ocean Literacy brochure offers a definition of ocean literacy, seven essential principles and associated key concepts of ocean literacy, and a matrix mapping the principles and concepts to the National Science Education Standards Science Content Standards. Materials include a downloadable version of the full brochure or principles and concepts only, along with a spreadsheet for the overview matrix that shows how the seven essential principles and associated concepts relate to the standards.
http://oceanliteracy.wp.coexploration.org/?page_id=164

Ocean Literacy Summit Materials
The Northeastern Regional Association of Coastal and Ocean Observing Systems has compiled speakers' materials on their website from the 2012 Ocean Literacy Summit. Presentations discussed telepresence, citizen science, and much more.
http://neracoos.org/OLSummit2012

Ocean Literacy Website
The College of Exploration has launched an Ocean Literacy website, with a complete set of scope and sequence charts which can be viewed as web pages or downloaded in a variety of different formats. Visitors can sign up for ocean literacy news, keep up with research, and more.
http://oceanliteracy.wp.coexploration.org/

Ocean Motion
Learn to identify weather-related patterns in satellite data of ocean surface currents, ocean temperature, and winds with special attention given to El Niño. Read about the mechanisms that trigger this ocean phenomena. Find out about the interplay between the ocean and the atmosphere that creates global weather patterns that affect millions of people.

http://www.oceanmotion.org/

Ocean Motion
Ocean Motion is a NASA website aimed at students in grades 9-12. The website contains a review of the surface circulation of Earth's ocean and classroom investigations appropriate for various disciplines. The site features satellite and model data, quick evaluation quizzes, classroom investigations, and more.
http://www.oceanmotion.org/

Ocean Motion
The Ocean Motion, designed for students in grades 9-12, offers a review of the surface circulation of Earth's ocean, along with classroom investigations. The website features a toolbox of satellite and model data, allowing investigation of ocean surface current patterns and how they relate to issues of navigation, weather/climate, natural hazards, and marine resources.
http://oceanmotion.org/

Ocean Mysteries
Georgia Aquarium launched an educational TV series on ABC stations, Ocean Mysteries with Jeff Corwin. Accompanied by experts from Georgia Aquarium, animal expert Jeff Corwin uncovers the secret world of aquatic environments. Created specifically for learning and featuring 22 original episodes in the first season, teachers can use the series and its curriculum to enhance learning and inspire interest in caring for and conserving aquatic animals around the world. Check out the teachers guides.
http://www.georgiaaquarium.org/ocean-mysteries/

Ocean Now
National Geographic's *Ocean Now* is a project to study healthy, undisturbed places in the ocean. Follow Dr. Enric Sala and a team of scientists as they explore the waters of the southern Line Islands. The crew will document and study water quality, fish populations, predator populations, and the health and diversity of the coral reefs. The website includes an Ask the Crew feature, links to educational resources, and more.
http://ocean.nationalgeographic.com/

Ocean Observing from the BRIDGE
The Bridge Data Activities have taken a new shape this fall by featuring real-time data from ocean observing systems throughout the coastal United States and the Great Lakes. The September Data Activity focuses on real time conductivity data and evaluates how changes in water's abiotic characteristics affect the water's ability to conduct electricity. The October Data Activity investigates wave energy as a possible alternative, renewable energy source in the United States.
http://www.marine-ed.org/bridge

Ocean Observing Systems
For educators interested in bringing real-time coastal and open ocean data into their classrooms, the Bridge introduced its new section devoted to ocean observing system technology. Educators can find a multitude of annotated links to the country's top ocean observing websites. Also featured on the site are several classroom-ready Data Analysis Teaching Activities (DATAs) which use real-time and archived ocean observing data.
http://www.marine-ed.org/bridge/index_oos.html

Ocean Observing Systems
Ocean observing systems (OOS) include a wide variety of equipment designed to collect and transmit oceanographic data such as temperature, salinity, water depth, and more. The instruments sample continuously and provide scientists with a long-term record. The OOS Primer offers an instrument fact sheet and links to ocean observing system websites. There are lesson plans using real-time and archived OOS data which cover topics such as sea level change, coastal storms, coral communities, and more.
http://www2.vims.edu/bridge/search/bridge1oos_menu.cfm?q=oos

Ocean Observing Systems
The Bridge Data Analysis Teaching Activity (DATA) Series offers a number of activities that incorporate ocean observing system data. The activities cover a range of topics including conductivity, upwelling, temperature, waves, sea level, and more. Please fill out the brief feedback survey to help improve the DATA activities to better meet your needs. The survey will open when you click on one of the activities.
http://www2.vims.edu/bridge/search/oosarchives.cfm

Ocean Observing Systems - Promoting Lifelong Ocean Education Using
Ocean Observing Systems, both in-water and space-based, are becoming a reality. The ocean education community has begun to plan for the application of these systems' assets to science and technology learning for citizens of all ages, ethnicities, and locales and in learning environments from classrooms to sanctuaries to media. Two newly published workshop reports provide a comprehensive set of recommendations.
http://www.ocean.us/documents/workshop.jsp
http://www.geo-prose.com/projects/orion_report.html
http://www.ocean.us/

Ocean Observing Systems Workshop - Online
COSEE-West presents this free online workshop, Ocean Observing Systems: From your Eyes to Satellites, on the College of Exploration Online Campus, with all materials archived on the website for those unable to take advantage during the interactive hours. The course is designed especially for educators, with resources for classroom teachers and informal educators. Keynotes cover Ocean Observing Systems, Harmful Algal Blooms, and Satellites.
http://www.coexploration.org/cosee_west/fall2011/

OCEAN-OIL
The Online Clearinghouse for Education And Networking: Oil Interdisciplinary Learning (OCEAN-OIL) is a free, peer-reviewed electronic education resource about the Deepwater Horizon disaster. Resources include hyper-linked articles about the spill, teaching resources including games and teacher guides, links to additional sites, and much more.
http://www.eoearth.org/oceanoil

Ocean Park Stewardship Plan
National Parks contain more than 5,100 miles of beaches, coral reefs, kelp forests, wetlands, historic shipwrecks and forts, and other features that attract more than 75 million visitors every year. In 74 parks spanning 25 coastal states and U.S. territories, people come to camp, fish, snorkel, scuba dive, boat, and watch wildlife. The Ocean Park Stewardship Action Plan was unveiled, representing the commitment to restore and

maintain productive fisheries, habitats, and wildlife in the ocean parks, and ensure the recreational opportunities they afford to hundreds of communities and millions of visitors.
http://www.nps.gov/pub_aff/oceans/conserve.htm

Ocean Picture of the Day
The Ocean Project will maintain an Ocean Picture of the Day service for world citizens to show and profess their affection for the ocean. They need contributions from around the world with a picture and caption as to what emotions it evokes in you or how the picture makes you feel. An example posting is on-line; to contribute, digitize your favorite ocean-themed photograph (to which you have copyright) as a JPEG- or PNG-formatted image, and upload it using the Ocean Picture of the Day form.
http://theoceanproject.org/opod/index.php?date=2009-01-09

Ocean Planning Publications
OpenChannels offers a weekly literature email update, helping subscribers to stay informed of the latest publications on MPAs, EBM, and marine spatial planning. There are news updates, literature updates, and more. Create a free OpenChannels Member Account and check the boxes for the Weekly Update and/or Literature Update newsletters.
http://openchannels.org/ocnewsletters/weekly-update

Ocean Podcasts
NOAA's National Ocean Service Communications and Education Division celebrated the launch of their 100th audio podcast episode. Check out *Making Waves* and *Diving Deeper*; subscribe to the service, and check the archive for any missed episodes.
http://oceanservice.noaa.gov/podcast.html

Ocean Policy Recommendations for the New Administration
Both the Joint Ocean Commission and The Ocean Foundation have prepared recommendations for the new administration.
http://www.jointoceancommission.org/
http://www.oceanfdn.org/index.php?tg=articles&topics=32

Ocean Policy Task Force's Interim Report
The Ocean Policy Task Force's Interim Report provides proposals for a comprehensive national approach to uphold our stewardship responsibilities and ensure accountability for our actions. The website hosts the downloadable report along with a comment section which allows you to read public comments and submit your own. Principle 6 on page 16 addresses education, while page 32 addresses training and informal education and outreach.
http://www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/

Ocean Portal
The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) supports a web portal which provides a high-level directory for ocean data and information web sites. Links to MPA resources are currently available from the "Administration, Conservation and Policy" category, while the "Data Resources" links to databases around the world.
http://ioc.unesco.org/oceanportal/index.php

Ocean Principals Videos
These videos were produced by high school students in Ánimo Leadership Charter High School, in both English and Spanish. Check these out.
https://www.youtube.com/watch?v=-irPPkM6YnY&list=PLBiYiSrGEo8m_CuKIiEW0P2NiNkuLWvzR

Océano Profundo 2015: Exploring Puerto Rico's Seamounts, Trenches, and Troughs
The latest expedition for NOAA's Office of Ocean Exploration and Research's Okeanos Explorer is Océano Profundo 2015: Exploring Puerto Rico's Seamounts, Trenches, and Troughs, February 24-March 11, 2015. April 9-30, 2015 The expedition posting includes a Mission Plan, an Ocean Explorer Expedition Education Module, lessons, and topical theme pages. Legs I and II will focus on mapping. Leg III with deep ROV dives will begin in April, 2015.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1502/background/leg1/welcome.html
http://oceanexplorer.noaa.gov/okeanos/explorations/explorations.html

The Ocean Project Community Conservation Action Map
The Ocean Project website has a searchable map of their partner organizations that utilize the help of volunteers and members. Website visitors can click on their state or Canadian province and find a list of organizations and volunteer opportunities related to aquatic or ocean conservation in their community.
http://www.theoceanproject.org/action_map/

The Ocean Project Market Research
The Ocean Project offers an update on their market research and outreach initiative. The latest round of market research, New Insights: Public Awareness and Opinion on Ocean Acidification, reveals the extent to which the issue of ocean acidification has yet to show up on the public radar. On a possibly brighter note, new data suggests online advertising could be the key to shifting conservation attitudes.
http://theoceanproject.org/

Ocean Race Adventure
This education website uses extreme ocean sail racing as a context for educating students about oceans, weather, and world cultures. The Volvo Ocean Race is a round the world sailing race which covers 32,500 nautical miles, makes port in 9 countries, and travels through 4 oceans over a period of eight months. Using the curriculum materials and information on the race from this site, teachers can give students an appreciation of the oceans and the Chesapeake Bay, while tracking the progress of the boats.
betsy.kulle@oceanracechesapeake.org.
www.oceanraceadventure.net

Ocean Science / Art Collaborations
Lynchpin – the Ocean Project was developed to support research into the significance of the oceans to life on the planet, and to encourage arts/ocean science conversations and collaborations that bring these stories to the wider community in new ways. *Living Data: Connecting to Change* makes and presents visualizations that combine climate science data and personal connections to the environment. *Synergy* is an experimental program that catalyzes partnerships between artists and research scientists. The *Art for Science Ocean Fund* promotes interest on the part of the public in understanding and

appreciation of the ocean environment by combining art with science for the purpose of education.
http://www.lynchpin.org.au/
http://www.livingdata.net.au/index.html
http://synergyexhibit.org/
http://www.oceanfund.org/

Ocean Science Journal
Ocean Science is the science and technology journal of the Department of the Interior's Bureau of Ocean Energy Management, Regulation and Enforcement. The bureau is the federal agency responsible for overseeing the safe and environmentally responsible development of energy and mineral resources on the Outer Continental Shelf. Check out the current and archived issues.
http://www.gomr.boemre.gov/homepg/regulate/environ/ocean_science/

Ocean Science App
The Ocean Science App for iTunes offers a journey deep into the sea through the seven essential principles of Ocean Science with movies, 360° pictures, animations, and more.
https://itunes.apple.com/us/app/ocean-science/id612611622?mt=8&ign-mpt=uo%3D2

Ocean Science Concept-Driven Teaching Interactive
The jointly developed NOAA Environmental Cooperative Science Center (ECSC) / NSF Ocean Science Concept-driven Teaching Interactive (OSCI) Teaching Module blends both traditional lecture-based and concept-driven/interactive methodologies through the integration of mini-lectures, readings, writing, in-class activities and focused group discussions. The website offers prospective users a comprehensive overview of the module and understanding of its implementation.
http://www.famu.edu/oldsite/acad/colleges/esi/OSCI/

Ocean Science Journal
Ocean Science is the science and technology journal of the Department of the Interior's Bureau of Ocean Energy Management, Regulation and Enforcement. Check out the latest issue on the new website, including *Evaluating Potential Visual Impacts on Historic and Cultural Resources*, *For the Birds: An Overview of Renewable Energy-Related Avian Studies*, and more.
http://www.boem.gov/BOEM-Newsroom/Library/Ocean-Science/Ocean-Science.aspx

Ocean Science Links from NSTA
The issue of the August 2006 elementary and high school editions of NSTA's Science Class features the theme *Ocean Science*.
http://science.nsta.org/enewsletter/2006-08/member_elementary.htm
http://science.nsta.org/enewsletter/2006-08/member_high.htm

Ocean Science: Roles of Traditional Knowledge in Environmental Stewardship
The online version of the April-June issue of *Ocean Science,* the science and technology journal of the Bureau of Ocean Energy Management, is available on the bureau's library website. The issue explores the use of traditional knowledge in fulfilling their environmental stewardship role.
http://www.boem.gov/BOEM-Newsroom/Library/Ocean-Science/Ocean-Science.aspx

Ocean Science Summaries
The Pew Charitable Trusts' Ocean Science Division supports projects related to marine conservation, including scientific research, technical analyses, and syntheses of scientific information that help to explain critical emerging issues, inform policy, and advance solutions to conservation problems. They offer several publications about fisheries and economics, including *Overfishing Trends and the Global Food Crisis, Marine Fisheries and the World Economy, Subsidizing Global Fisheries,* and others.
http://www.pewtrusts.org/our_work_detail.aspx?id=148

Ocean Sciences Quiz
The National Ocean Sciences Bowl and the MIT Sea Grant College Program has developed an online game to promote ocean literacy and engage students, teachers, and teams worldwide. The single-player version of the Ocean Sciences Quiz is now available to play online; the multi-player mode will be available later this spring.
http://osq.mit.edu/

Ocean Stewardship: Education and Outreach
Oikonos works locally and internationally to increase ecosystem knowledge through science, art, technology, education, and applied conservation. A goal of OikonosEcosystem Knowledge is to form collaborations with education experts and develop innovative programs that disseminate project specific results to a broad diverse community. The website has a variety of downloadable marine debris information resources and an interesting gallery.
http://www.oikonos.org/projects/oceanstewardship.htm

Ocean Summer Soundtrack
The National Marine Sanctuary Foundation has put together a soundtrack for your "Ocean Summer of 2014" with national marine sanctuary-themed music to enjoy and share. Free registration is required.
http://nmsfocean.org/OceanSummer14

Ocean Technology Internships Best Practices
From Harbor Branch Oceanographic Institution and the Marine Advanced Technology Education (MATE) Center, *A Best Practices Manual for Effective MATE Internships* looks at creating effective ocean technology internships by giving an overview of strategies as well as policies and procedures to help institutions design and implement effective practical training programs. The manual is divided up into eleven sections, including recruiting, experience, evaluation, resources, and references.
http://www.marinetech.org/education/Internship_manual.pdf

Ocean Today
This website provides access to current and archived videos of the Ocean Today kiosk. Ocean Today illustrates both the ocean's influence on humans and their influence upon the ocean. The website offers an online archive, including a transcript of each video along with links for more information. The main content themes are Ocean News, Ocean Life, Science & Technology, and Discoveries. If you are interested in expanding the Ocean Today network to your institution or venue in kiosk form, please contact them.
http://oceantoday.noaa.gov/

Ocean Today Kiosk Online
This website provides access to current and archived videos of the Ocean Today kiosk at the Sant Ocean Hall in the Smithsonian Institution's National Museum of Natural History. The Ocean Today Kiosk is a dynamic, visitor-friendly multi-media experience that illustrates both the ocean's influence on humans and their influence upon the ocean. The website offers a transcript of the video along with links for more information.
http://oceantoday.noaa.gov/

Ocean Topics from WHOI
The Woods Hole Oceanographic Institution is dedicated to research and education to advance understanding of the ocean and its interaction with the Earth system, and to communicating this understanding for the benefit of society. This website offers information about a great number of ocean topics, including climate and ocean, coastal science, hazards, ocean life, and much more. Follow the interactive life cycle of a scallop, check out the ocean conveyor, and more.
http://www.whoi.edu/main/ocean-topics

Ocean Tracks
Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) support this website where visitors can see the tracks of selected marine animals tagged by CSIRO and partner agencies. There are both low-tech and animated/3D versions.
http://www.oceantracks.csiro.au/

Ocean Voices
A sound artist and a marine biologist have joined forces to collect the voices of people around the world recounting their personal experiences with the ocean. When combined with music, these voices become an integral part of audio collages which listeners can create to suit their own preferences. Help by sharing your voice and spreading the words of all participants around the globe. An iPhone application and an Internet website allow anyone to participate.
http://www.oceanvoices.org/

Ocean Voyager
Mother Jones offers Ocean Voyager, a 5-week series of emails and interactive opportunities designed to introduce the general public to the state of the ocean and what can be done to improve things. Each week, participants visit another part of the world's ocean through this website and learn about a new issue, including links to positive ideas and action steps. Topics include pirate fishing, dead zones, toxins in marine mammals, global warming and polar bears, and more.
http://oceanvoyager.org/

Ocean + Web TV Call for Films
Ocean + Web TV seeks films to be shown at the World Parks Congress, November 12-19, 2014 in Sydney, Australia. Upload your video on the protection of the oceans.
http://www.impac3.org/en/news/all/394-ocean-tv-launches-a-second-call-for-films1

Ocean and You
Cynthia Cudabeck promotes ocean literacy and maintains this website with links to hands-on ocean science resources, ocean crafts instructions, and more. Check out the updated resources, including *Mythbusters: Environmental Edition* with links to games, stories, and other resources.

http://oceanandyou.com/index.html

OceanAGE Careers
Through December 9, 2005, NOAA Ocean Explorer hosted another *Ocean Careers to Inspire Another Generation of Explorer*. featuring four scientists from the Deep Atlantic Stepping Stones Expedition and the Lost City Expedition.
http://oceanexplorer.noaa.gov/edu/oceanage/welcome.html

OceanAGE Web Chats with Marine Explorers
Ocean Careers to Inspire Another Generation of Explorers (OceanAGE) invites students to interact with women and men who explore our ocean planet to better our world Explorers provide students with first-hand knowledge of careers through live interviews, profiles, and mission logs. Video profiles, biographies, and background materials related to their work are available, and the website features interactive video Web Casts.
http://oceanexplorer.noaa.gov/edu/oceanage/

OceanElders
OceanElders was created to be a locus of collaboration in the field of ocean conservation. It is an independent group of global leaders who have joined together to use their collective influence and experience, supported by science and data, to promote ocean conservation, pursue the protection of the ocean's habitat and wildlife, and preserve its ecosystems and species biodiversity.
http://www.oceanelders.org/

Ocean FEST
Ocean FEST (Families Exploring Science Together), developed by educators at the University of Hawai'i at Mānoa, aims to interest Hawai'i's kids in careers in ocean science and related Science, Technology, Engineering and Mathematics (STEM) fields through fun, hands-on activities. The website offers links to information on marine science careers, program information for Hawaii schools, and additional links, resources, and activities for teachers.
http://oceanfest.soest.hawaii.edu/

OceanFest - California
Celebrate OceanFest on October 6, 2007, with the Gulf of the Farallones National Marine Sanctuary, its sister sanctuaries, and San Francisco Bay Area residents. The free beachfront festival takes place during Fleet Week and is the ideal place to watch the Blue Angels air show, participate in interactive children's activities, and much more.
http://www.farallones.org/news/event_calendar.php

OceanGLOBE and the COSEE-West Website
OceanGLOBE guides, classroom exercises, and Powerpoint shows had been hosted on the UCLA Marine Science Center website, but is closing down. The materials can be accessed now on the COSEE West website. Other resources include a high school marine biology curriculum, materials given out at past COSEE-West educator workshops, and more.
http://www.usc.edu/org/cosee-west/curricula.html

OceanGLOBE
OceanGLOBE is a beach research and outdoor environmental education program for upper elementary, middle, and high school students created by the UCLA Marine

Science Center. OceanGLOBE provides a mechanism for students to conduct marine science over an extended period of time, giving them experiences that anchor the national and state science standards learned in the classroom. The website includes slide shows, photos, and classroom activities and field research guides.
http://www.msc.ucla.edu/oceanglobe/about.htm

Oceanic Research Group Resources
The Oceanic Research Group, a non-profit environmental organization dedicated to ocean conservation, has produced several educational videos that can be viewed online. Film topics include coral reefs, adaptations, manatees, and more. In addition, the Wonders of the Sea section offers information about the biology of different kinds of animals. Check out *Sharks: Predators with a Purpose,* which discusses the importance of sharks in the marine ecosystem and the troubles that they face.
www.oceanicresearch.org/education/films/predators.html

Ocean Today
The Ocean Today website provides access to current and archived videos of the Ocean Today kiosk exhibit in the Smithsonian's Sant Ocean Hall. It offers a new 3-part video series, The Depths Below, which includes Lakes in an Ocean, Life on a Vent, and the Ring of Fire. Check these out, and look through the previous videos.
http://oceantoday.noaa.gov/welcome.html

Ocean Today Videos
The short Ocean Today videos are available for free download in two different sizes, depending on your needs. Topics include Danger Zone, Exploration, Fix the Ocean, Go Fish, Marine Life, and Research. Check out Students at Sea, Deep Ocean Volcanoes, and much more.
http://oceantoday.noaa.gov/

Oceanbites
Oceanbites is a website run mostly by graduate students who summarize current marine science articles in an accessible manner. The goal is to make cutting edge research in the ocean sciences accessible to all. Check out the glossary, archives by category, and even blog posts by authors for an interesting way to get a feel for graduate interests.
http://oceanbites.org/

OceanLink
OceanLink, from Bamfield Marine Sciences Center, offers information about the effects of climate change, marine biology education, and careers; answers to questions about the ocean and marine organisms; and more. Check out the archive for Ask a Scientist, the glossary, and more.
http://oceanlink.info/index.html

Oceanography Section of National Academies Website
The Earth and Life Studies Division of the National Academies focuses on the intersection of science and policy. The website features news, reports, projects, and upcoming events. The Ocean Studies topic area section posts recent reports and projects in ocean research and policy. There is also an electronic newsletter.
http://watson.nap.edu:8080/gateway-dels/dels/subjectNews.jsp?subject=69 .

Oceanography Through Time
Oceanography Through Time is an interactive timeline of surface exploration and deep-sea exploration from Rutgers Marine and Coastal Sciences, part of their COOL Classroom. While on the website, check out what's been added to the COOL Classroom since your last visit, such as Gone Fishing, Follow that Bloom, and more.
http://www.coolclassroom.org/cool_projects/lessons/miniunits/lesson2.html

Oceanplus TV
Oceanplus.tv is the WebTV of the 3rd International Marine Protected Areas Congress and focuses on marine protected areas and on marine conservation issues. It allows experts and participants to keep a record of their exchanges and watch events they were not able to attend. Among the general public, this platform aims to raise awareness of the services rendered by marine protected areas and oceans at large.
http://www.oceanplus.tv/en/

OceanRep
OceanRep is the open access digital repository of the Leibniz Institute of Marine Sciences at the Christian-Albrechts Universität zu Kiel (IFM-GEOMAR). It contains research publications of staff and students including journal articles, conference papers, and more, discussing ocean circulation and climate, marine biogeochemistry, marine ecology, and more.
http://eprints.ifm-geomar.de/

Oceans Alive!
The Museum of Science, Boston and the Science Learning Network offer the Oceans Alive website. It features information about our water planet, including physical features and the water cycle; currents, waves, and tides; life in the sea; and an introduction to scientific exploration. Additional links to resources are included.
http://www.mos.org/oceans/

Ocean's Effect on Weather and Climate SciPack
NSTA is offering free access to the SciPack on the Ocean's Effect on Weather and Climate, for elementary and middle school teachers. The focus is on standards and benchmarks related to weather and climate, the water cycle, climate change, and the role of solar energy and its affect on the atmosphere and oceans. The unique role oceans play in defining Earth's weather and climate patterns is also specifically addressed. Non-NSTA members can open a free account.
http://learningcenter.nsta.org/products/scipacks.aspx?lid=exp

Oceans and Human Health Initiative
NOAA's Oceans and Human Health Initiative investigates the relationship between environmental stressors, coastal condition, and human health to maximize health benefits from the ocean, improve the safety of seafood and drinking waters, reduce beach closures, and detect emerging health threats. Check out the news, multimedia, and more, along with the link to three studies revealing connections between human health and climate change.
http://oceansandhumanhealth.noaa.gov/
http://oceanservice.noaa.gov/news/weeklynews/mar11/ohh-climate.html

Oceans for Life
The Ocean for Life program brings together students of diverse cultures and backgrounds to discover marine science, conservation, and how the ocean connects us all. A two-week field study for 30 high school students will be hosted by Channel Islands National Marine Sanctuary and the University of California Santa Barbara's Marine Science Institute in Santa Barbara, California and on Santa Cruz Island from June 22-July 4, 2013. Follow along on the Ocean for Life Facebook page.
https://www.facebook.com/oceanforlife
http://oceanforlife.org
http://sanctuaries.noaa.gov/education/ofl

Oceans for Life Lesson Plans
The NOAA National Marine Sanctuary Program in collaboration with National Geographic Society has launched a new series of marine education lesson plans highlighting cutting-edge research, maritime heritage, cultural resources and environmental issues in our national marine sanctuaries. The multi-media Oceans for Life series of lessons and videos gives students an opportunity to explore the history, biology, and ecology of the National Marine Sanctuary System.
http://sanctuaries.noaa.gov/education

Oceans for Life Lesson Plans and Videos
NOAA's National Marine Sanctuary Program has launched a series of marine education lesson plans highlighting cutting-edge research, maritime heritage, cultural resources, and environmental issues in the national marine sanctuaries. Designed for K-12 teachers and marine educators, the *Oceans for Life* series of lessons and videos gives students an opportunity to explore the history, biology, and ecology of the National Marine Sanctuary System.
http://www.oceanslive.org/portal/index.php?module=pagesetter&func=viewpub&tid=1&pid=293

Oceans for Life: One World, One Ocean
The Ocean for Life: One World, One Ocean program from the NOAA Office of National Marine Sanctuaries, increases cultural understanding through ocean science by providing immersive ocean field studies and follow-on education programs. The programs encourage students to discover common ground in marine science, conservation, and how the ocean connects us all. Check out these powerful youth media projects put together by the Ocean for Life students in 2009
http://sanctuaries.noaa.gov/education/ofl/videos.html
http://www.oceanforlife.org/
http://sanctuaries.noaa.gov/education/ofl/welcome.html

Oceans for Life Resources
This National Geographic Blue Frontier now hosts the Oceans for Life educator materials developed with the National Marine Sanctuary Program. Virtual expeditions link the classroom experience with the individual National Marine Sanctuaries, research methods and technology, and researchers' experiences. Free, archived, on-line teacher workshops feature ocean researchers and policy makers.
http://www.nationalgeographic.com/seas/

Oceans of Life—An Educator's Guide to Exploring Marine Biodiversity
World Wildlife Fund presents their new educator's guide, *Oceans of Life*. The marine biodiversity module, designed for middle-school educators and students, has background information, activities, and case studies. Appendices offer a framework, mini case studies, marine legislation, planning charts, a glossary, a bibliography, and more. Order the guide through Acorn Naturalists.
www.acornnaturalists.com

Oceans for Life Resources
The National Geographic EdNet Oceans for Life website offers a wide selection of news articles, weather resources, maps, photos, teacher guides, interactive media activities and more. The materials can be browsed by category or alphabetically, or searched by key word. Video clips can be used in conjunction with associated lesson plans. Educators can also get a year's subscription to National Geographic magazine for a sharply discounted rate.
http://www.ngsednet.org/community/index.cfm?community_id=128

Oceans Live
The National Marine Sanctuary Program and Immersion Presents have launched OceansLive.Org, a marine science portal to educate about the ocean, including national marine sanctuaries. In addition to watching live video from research expeditions, the portal's visitors can learn more about oceanography, marine life, conservation and preservation, marine research technologies, and the nation's maritime heritage. The portal offers lesson plans, videos, puzzles and games based on the marine environment.
http://www.oceanslive.org/portal/

OceansLive! from Monterey Bay
OceansLive! from Monterey Bay was broadcast live from the Monterey Bay National Marine Sanctuary in California from March 2-7, 2008. The expedition explored the region's ecosystems, including estuaries, kelp forests, and submarine canyons. Educational materials are available for downloading from the web portal.
http://OceansLive.org.

OceansLive Videos
OceansLive.org aims to bring the ocean world to communities worldwide and make oceans accessible and local through a multi-media system approach. Visit OceansLive.org to view new archived videos, including the Northwestern Hawaiian Islands Marine National Monument, the Hunt for the Alligator, History of the Macon, and more. Live video feeds are also available, along with downloadable complimentary educational resources.
http://oceanslive.org

OceansLive Videos - Albatross
OceansLive.org aims to bring the ocean world to communities worldwide and make oceans accessible and local through a multi-media system approach. Visit OceansLive.org to view new archived videos, including a necropsy of a Laysan Albatross chick, highlighting the effect of marine debris on seabirds, and the banding of Masked Booby and Laysan Albatross chicks on Green Island in the Kure Atoll.
http://oceanslive.org

Oceans and Marine Resources in a Changing Climate
The report, Oceans and Marine Resources in a Changing Climate, is designed to help marine resource managers, communities, and businesses understand, prepare for, and respond to climate impacts on U.S. ocean ecosystems. It details the impacts of climate change and ocean acidification, and then summarizes what is known about how those changes will affect human uses of marine ecosystems.
http://www.nmfs.noaa.gov/stories/2013/08/8_27_13climate_change_us_ecosystems.html

Oceans in the News
Oceans in the News is an editorial service from COSEE-Ocean Systems populated with current ocean research and news articles, compiled monthly. The service is intended to provide a clearinghouse of ocean-related articles for teachers and students from reliable sources. The articles are categorized by key phrases listed on the website, and most can be accessed in their entirety.
http://cosee1.umaine.edu/news.php

Oceans Online
MatchACollege.com, an online resource of information for college information, offers additional web pages to help students find relevant information to help research their goals. They offer a page listing 100 websites for exploring the ocean online, with categories including explorations and expeditions, video, interactives, data and monitoring, learning and education, and more. Take time to check out their list of photo galleries. You may want to bookmark this page for future reference.
http://www.matchacollege.com/blog/2009/100-excellent-websites-for-exploring-the-ocean-online/

Ocean's Role in Weather and Climate
NOAA offers this website with materials to help you understand factors that impact the Earth's weather and climate, and how changes in temperature or air circulation are part of complex, long-term cycles. Understanding the influence of ocean conditions on the Earth's climate and monitoring changes in ocean conditions are key to predicting climate change. The website offers classroom resources, teacher tutorials, web seminar archives, and more.
http://oceanservice.noaa.gov/education/pd/oceans_weather_climate/

OceansLIVE
OceansLIVE is a partnership between NOAA's Office of National Marine Sanctuaries, the National Marine Sanctuary Foundation, and the University of Rhode Island's Inner Space Center. The program's mission is to bring the ocean to communities nationwide through a multi-media approach highlighting ocean topics occurring across the globe. Web-based technology is used to link people to scientists, educators, and others engaged in marine research during expeditions and events around the globe.
http://oceanslive.gso.uri.edu/

OceansWatch
OceansWatch North America uses sailboats to deliver marine conservation and humanitarian aid to islands and coastal communities in developing countries. Working with sailors, divers, students, volunteers, doctors, nurses, ecologists and scientists, they undertake projects that help islands and coastal communities protect their marine

environment, develop sustainable, healthy living standards, and ensure that all children can attend primary school.
http://oceanswatch.org/north-america/

Oceanus Magazine
Woods Hole Oceanographic Institution's (WHOI) *Oceanus* magazine explores the oceans in depth, highlighting the research and researchers at WHOI in news, features, and interviews written by magazine staff. Each issue covers a wide spectrum of oceanography, spanning coastal research, marine life, deep-ocean exploration, and the ocean's role in climate, as well as ocean technology and policy. Check out the archives, special series, browse by topic, and much more.
http://www.whoi.edu/oceanus/

Oceanworld
Oceanworld is a web site for middle-school, high-school, undergraduate, and graduate students and teachers interested in the ocean. It has tutorials for middle-school and high-school students, materials for middle-school teachers, an on-line textbook in physical oceanography, all course material for five college courses, and on-line resources which include links to hundreds of site with on-line data. The tutorials cover fisheries, weather, Forams, coral reefs, currents and more.
http://oceanworld.tamu.edu/

Ocracoke Shipwreck Explorer
The Ocracoke Shipwreck Survey offers a database of submerged cultural resources along North Carolina's Outer Banks, and educational outreach. Underwater archaeology, historical research, and remote sensing help locate and identify submerged cultural resources off the coast of North Carolina, after which the project researchers assess their research potential and historical significance. The website has background information, methodology and fieldwork links, educational resources, and more.
http://www.ecu.edu/maritime/Projects/OcracokeWebSite/index.htm

OCRM in Your State
The Office of Ocean and Coastal Resource Management (OCRM) offers this interactive website that employs GIS/web technology to illustrate the nation's investments in coastal management programs in 34 states and territories. *OCRM in Your State* allows users to click on a map to view current federal funding and state/territory matching funds for coastal programs administered by NOAA. Thumbnail descriptions highlight successes and link to more information.
http://coastalmanagement.noaa.gov/inyourstate/#

October Days
National Energy Awareness Month
http://www.eere.energy.gov/femp/services/energy_aware.cfm
October 3, World Habitat Day http://www.unhabitat.org/whd/2005/default.asp
October 5, World Teachers' Day http://www.ei-ie.org/worldteachersday/en/
October 9-15, Earth Science Week http://www.earthsciweek.org/
October 18, World Water Monitoring Day http://www.worldwatermonitoringday.org/

Of Sand and Sea: Teachings From the Southeastern Shoreline
Of Sand and Sea: Teachings From the Southeastern Shoreline, by Paula Keener-Chavis and Leslie Reynolds Sautter, is an introductory text which covers the ocean's geology,

biology and chemistry. It is written at a reading level for middle and high school students. While you're on the website ordering a copy, check out the other offerings available at nominal or no charge. The South Carolina Sea Grant Consortium now offers the text online in pdf format.
http://www.scseagrant.org/oldsite/library/library_pubs_sos.htm
http://www.scseagrant.org/library/library_pubs_marine.htm

Official MPA Map
This map produced by the UNEP World Conservation Monitoring Centre and the World Commission on Protected Areas is based on the World Database on Protected Areas. The map offers a visual tally of global MPA coverage, now estimated to be at 2.8% of the world ocean.
http://www.protectplanetocean.org/official_mpa_map

OFFSET
NASA's Climate Kids offers a new educational game: OFFSET! Take matters into your own hands and help cut back on carbon emissions. The game plays like part Pong and part resource-management. The web page links to information about carbon sources, sinks, offsets, and more.
http://climatekids.nasa.gov/offset/

Offshore Fresh Groundwater
Ocean News & Technology has posted this article reviewing a study of newly discovered reserves of low salinity water beneath the seabed on continental shelves around the world. The study article, *Offshore fresh groundwater reserves as a global phenomenon*, was published in *Nature* 504, December 5, 2013.
http://ocean-news.com/news-archives/ocean-science-archives/2013/12/17/vast-freshwater-reserves-found-beneath-the-oceans?utm_source=Ocean+E-news+December+18%2C+2013&utm_campaign=Ocean+E-news12-18-13&utm_medium=email

Offshore New Harbor Project
The Offshore New Harbor Project will study sediments deposited in Antarctica during the transition from the Greenhouse World to Icehouse World, as part of the Antarctic Geological Drilling Program (ANDRILL). The expedition team will include scientists, students, and a schoolteacher. The website will include background information, videoconferencing opportunities, and more.
http://qcpages.qc.cuny.edu/offshore_new_harbor/offshore.htm

Oil Spills Bibliography
In support of research on oil spills, response, and restoration, the NOAA Central Library published the Oil Spills Bibliography in pdf and docx format. Included are electronic resources, selected videos, select journal articles, and more.
http://docs.lib.noaa.gov/noaa_documents/NESDIS/NODC/LISD/Central_Library/current_references/current_references_2010_2.pdf
http://docs.lib.noaa.gov/noaa_documents/NESDIS/NODC/LISD/Central_Library/current_references/current_references_2010_2.docx

Oil Spill Educational Resources
This series of PowerPoints and hands-on activities from COSEE-NOW is designed for teachers to use in their classrooms to help discuss the BP oil spill in the Gulf of Mexico.

Teachers can decide which activities and topics to include, download the appropriate PowerPoint, and then modify the PowerPoint according to their class level and the time available. Information for the teacher is included in the notes section of each PowerPoint. The website also includes a link to sample unit plans.
http://coseenow.net/blog/oil-spill-resources/

Oil Spill Resources
The National Environmental Education Foundation EE Week project has compiled a summarized list of resources and curricula on the BP oil spill that are tied to educational standards from the EPA, NOAA, Smithsonian, and National Geographic.
http://eeweek.org/oil_spill.htm

Oil Spill Resources
NAAEE's EE-Link website has many resources on the oil spill listed: curriculum for K-12 classrooms, news, real-time map links, background, government agencies' response, and more; more are added frequently.
http://eelink.net/pages/Oil+Spill

Oil Spill Resources
The Bridge has just updated its oil spill collection with many new resources ready for classroom and/or science-center use. Dig deeper into the causes and effects of oil spills than what is on your local news channel or in the newspaper. The recent events in the Gulf serve as an excellent teachable moment at every educational level and have provided numerous topics for your students to debate. Look to the Bridge for the web's best, educator-reviewed resources on this, or any environmental current event.
http://www2.vims.edu/bridge/search/bridge1output_menu.cfm?q=spill

Oil Spill Science Seminars and Publications
The Gulf of Mexico Sea Grant program offers the Oil Spill Science Outreach Program, with downloadable publications, and a series of webinars that can be viewed live or downloaded as archived files. Sign up to be informed about upcoming seminars.
https://gulfseagrant.wordpress.com/oilspilloutreach/

Oil Spill Simulation
This curriculum was developed by Pacific Education Institute in partnership with the Olympic Coast National Marine Sanctuary, funded through Pacific NorthWest B-WET. The website includes the *Olympic Coast Oil Spill Simulation: An Introduction to Geospatial Analysis through Google Earth* with the .kmz link, in addition to the teaching curriculum.
https://pacificeducationinstitute.box.com/s/6v4z8pkxs7bfkzr21lvq

Oil and Water Don't Mix
The Australian Maritime Safety Authority offers oil spill information and educational materials relating to oil pollution of the marine environment. The online activity, *Oil and Water Don't Mix*, is meant for primary school; additional materials include a bioremediation exercise, mathematics and oil spills, and more.
http://www.amsa.gov.au/Marine_Environment_Protection/Educational_resources_and_information/Oil_Spill_Information_and_Educational_Material.asp

Okeanos Explorer: 2015 Field Season Overview
From February through September 2015, NOAA Ship *Okeanos Explorer* will embark on journeys to investigate and document the Caribbean and the Hawaiian Islands. Scientists, technicians, and engineers will map and explore the geological, biological, archaeological, and chemical features of these vast areas. The first series of cruises, scheduled for February 18-April 30, 2015, will focus on the diversity and distribution of deepwater habitats in Caribbean trenches and seamounts.
http://oceanexplorer.noaa.gov/okeanos/explorations/2015-overview/welcome.html

Okeanos Explorer East Coast Mapping Expedition
From May 7-22, 2014, the NOAA Ship Okeanos Explorer traveled from Tampa, Florida to Davisville, Rhode Island, while conducting seafloor and water column mapping of focus areas. Check out the archived resources for this expedition.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1403/welcome.html

Okeanos Explorer Education Materials Collection
The Okeanos Explorer Education Materials Collection encourages educators, students, and citizen scientists to become personally involved with the voyages and discoveries of America's first federal ship dedicated to ocean exploration. Lesson plans focus on reasons for ocean exploration; exploration methods; and recent discoveries. For each of these, there is a Leader's Guide for Classroom Explorers and an Initial Inquiry Lesson.
http://oceanexplorer.noaa.gov/okeanos/edu/welcome.html

Okeanos Explorer, A New Paradigm for Exploration
In 2008, NOAA will commission a ship of exploration, the *Okeanos Explorer*, which will operate with a new paradigm: most of the scientists will be ashore rather than on the ship. Exploration Command Centers in several locations in the United States will connect to the Okeanos Explorer and its sensors via satellite and high-speed Internet2 to transmit live images and other data from the seafloor. Via this "telepresence," scientists ashore will have the capability to control the exploration missions. Internet coverage includes content essays written by the mission explorers, a special Education essay written for educators, and links to content-related educational materials for teachers of students in grades 5-12.
http://oceanexplorer.noaa.gov/explorations/07blacksea/welcome.html

Okeanos Explorer ROV Shakedown Cruise
NOAA's Office of Ocean Exploration and Research website hosts educational materials about the Okeanos Explorer ROV Shakedown Cruise May 13-June 6, 2013. This cruise marks a milestone with the unveiling of the 6,000m Remotely Operated Vehicle (ROV). With this new vehicle, the Okeanos Explorer Program will be able to access the vast majority of the seafloor. Check out the mission plan, lessons, and more.
http://oceanexplorer.noaa.gov/okeanos/explorations/ex1302/welcome.html

Ology
OLogy, the American Museum of Natural History's science website for kids ages seven through twelve, is designed as a place for kids to explore, ask questions, get answers, and more. It offers age-appropriate content in archaeology, astronomy, biodiversity, genetics, marine biology, paleontology, and physical science. Educators can find suggestions and tips on how to use the OLogy Web site in the Educator's Guides. They can also sort by grade, title, type, and topic.
http://www.ology.amnh.org

On the Half Shell
The Bridge can help you incorporate current events and real scientific data from the Center for Disease Control with the Data Analysis Teaching Activity (DATA), *On the Half Shell*. In this activity, students will learn about *Vibrio vulnificus*, analyze eight years of illness data, and evaluate trends. On the Half Shell is one of many Bridge DATAs that has been reformatted to more closely match a formal lesson plan, complete with summary, objectives, and list of vocabulary words.
http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1204.html
http://www.marine-ed.org/bridge

On the Line
On the Line is a NOAA Fisheries podcast about marine fish and wildlife and their ocean habitats, with stories told by the people who study, manage, and protect these resources. Each podcast comes with photos and a short feature story. Sign up for the latest feature and check out the archives.
http://www.nmfs.noaa.gov/podcasts/index.html#.VM0svC7Lkbg

On The Rocks: Shipwreck Database
This website from the Maritime Museum of the Atlantic offers an online shipwreck database of 5000 shipwreck records from the Nova Scotia Museum's Marine History Database, along with 250 images. Read castaway stories, explore mystery wrecks, and more.
http://museum.gov.ns.ca/mmanew/en/home/researcheducation/shipwreckdatabase.aspx

A Once and Future Gulf of Mexico Ecosystem
The Pew Charitable Trusts released a new report, *A Once and Future Gulf of Mexico Ecosystem*. The Pew Environment Group assembled a team of experts to identify strategies and specific actions for a successful recovery of the Gulf of Mexico. The report presents this working group's recommendations for recovering Gulf resources and restoring this natural system.
http://www.pewtrusts.org/our_work_report_detail.aspx?id=85899364520

Once Upon a Tide
The Center for Health and the Global Environment at Harvard Medical School has produced a short educational film, Once Upon a Tide. The website offers the downloadable film, along with some links to complementary lesson plans and more.
http://chge.med.harvard.edu/programs/healthyoceans/once_upon_a_tide/

One Earth Sangha
For a different reflection on climate change, One Earth Sangha seeks to galvanize a Buddhist response to climate change by raising awareness of the science, providing an interactive space where teachers and community members can discuss the issues, and creating opportunities for focused action. Articles cover topics such as emotional resilience and reports on climate action. Resources on Dharma and Climate offers links to resources on climate change from Interfaith and other organizations.
http://www.oneearthsangha.org/

One Fish Two Fish: Monitoring Marine Protected Areas
This online video and accompanying educator guide from KQED's QUEST explores the use of California's marine reserves to help replenish fisheries.

http://science.kqed.org/quest/video/one-fish-two-fish-monitoring-marine-protected-areas/

One Million Acts of Green
Cisco offers the One Million Acts of Green website to show that individual, organizational, and community acts of green add up to something significant. The project allows visitors to record acts of green and share ideas to encourage others. The calculator shows your positive impact. The website offers educational resources on climate change, a green career guide, and more.
http://www.greennexxus.com/omaog/index.aspx

One Ocean : A Guide for Teaching the Ocean
The National Geographic Education iBook One Ocean : A guide for teaching the ocean grades 3-8 is now available as a free download on iTunes. The guide was developed to support teachers in teaching topics with real-world context, and provide them with the background to feel competent and comfortable when teaching about the ocean. The iBook version includes additional interactive diagrams, embedded videos, and more.
https://itunes.apple.com/us/book/one-ocean/id775248912?mt=11

One Species at a Time
The Encyclopedia of Life has launched a second series of podcasts, *One Species at a Time*, with a focus on biodiversity and public participation. Each podcast features a 3-5 minute audio report, a Meet the Scientist feature, and an Extras page with additional information about the species, as well as ways for listeners to connect with biodiversity.
http://education.eol.org/podcast

One Well: The Story of Water on Earth
One Well: The Story of Water on Earth asks readers to think of all the water on earth as belonging to one well: a well which is shared by all the people and animals of the earth; a well which is influenced by all of the activities on our planet. The text presents information about where water is found on our planet, how the water cycle functions, the importance of water for plants, for animals and their habitats, and for people, and more.
http://www.umanitoba.ca/outreach/cm/vol13/no12/onewell.html

One World One Ocean Campaign
The One World One Ocean Campaign is a multi-year, multi-platform nonprofit campaign that aims to harness the power of film, television, and new media to generate greater global awareness of the ocean's importance to society and spark a global movement to restore a healthy ocean. Expected releases include 3D IMAX Theatre films, a television series, a 3D theatrical documentary, and online videos; educational materials should include classroom presentations, traveling exhibits, companion books, and outreach.
http://www.oneworldoneocean.org/

One World One Ocean Online Ocean Series
One World One Ocean offers a look into a wide range of ocean topics with video tailored for all audiences. Topics include news, expeditions, and more. Series include: The Weekly Dive, Boat to Belly, Artists & Oceans, and Ocean Heroes.
http://www.oneworldoneocean.org/

OneGeology
OneGeology is an international initiative of the geological surveys of the world with the aim to create dynamic digital geological map data for the world. Use the portal for your

mapping needs but be sure to check out OneGeology eXtra with culture, geodiversity, and more. Let the younger students check out the OneGeology Kids section where they can investigate what geology is all about, from dinosaurs and volcanoes to water and energy.
http://www.onegeology.org/

O*Net OnLine
This website is dedicated to career exploration and the art and science of finding a new job. It doesn't list available jobs, rather it gives the visitor the tools to find where the jobs are, or aren't, what jobs are up-and-coming, and which are dying out. This site helps jobseekers and students looking for a career path to look for careers that play to their skills, preferences, strengths, geographic location, education level, and many other criteria.
http://www.onetonline.org/

Online Access to Research in the Environment
Online Access to Research in the Environment, an international public-private consortium, enables developing countries to gain free access to one of the world's largest collections of environmental science literature. Over one thousand scientific journal titles are now available free in low income countries. Research is provided in a wide range of disciplines, including climate change, ecology, energy, environmental economics, environmental law and policy, and many others.
http://www.oaresciences.org/en/

Online Colleges
This website offers overviews of schools that offer online programs; guides on what it's like to be an online student, from researching schools, to the application process, to life after graduation; and more.
http://www.onlinecolleges.net/

Online Communications Case Study
How do you communicate among hundreds of ocean scientists and educators spread across the world? COSEE-Alaska identified the development and support of SeaNET: the Network of Scientists and Educators in Alaska, as a high priority and decided to begin building a communications network with a combination of a listserv and a social networking site. This web page describes what they found about the use of these tools.
http://www.cosee.net/ningmailchimp/

Online Chart Viewer
The Office of Coast Survey offers the On-Line Chart Viewer. The viewer lets mariners and the public display any of the 1,000-plus nautical charts in the national suite using only an Internet browser. Each chart is updated weekly for Notice to Mariner corrections by NOAA's experienced nautical cartographers. The website can be used for planning and research, as an easy reference document for navigation for recreational boaters, and as a quick tool for professional mariners to examine recent changes in routes.
http://www.NauticalCharts.gov/viewer

Online Education Resources from the Yale Peabody Museum
The fellows at the Yale Peabody Museum have developed a variety of curriculum units that are available for downloading for use by educators in classroom settings. Offerings include *Biodiversity and Global Change: Lobster Die-off!, Happy as a Clam: Mollusks of*

Long Island Sound, Connecticut Population Ecology, The River Runs Through It, and others.
http://www.peabody.yale.edu/education/ed_curric.html

Online Hurricane Tools
The National Ocean Service offers online tools to monitor hurricanes and deliver relevant data before, during, and after a storm. Tools address water levels, observing systems, imagery, and long-term planning.
http://oceanservice.noaa.gov/news/features/sep11/hurricanetools.html

Online Instructional Resources
Michigan State University offers links to instructional resources from across the Internet. The three broad categories are Teaching and Learning Resources, Resources for Teaching in the Disciplines, and Resources for Teaching to the Competencies. The website offers quick and logical access to the resources, including multiculturalism, assessment, instructional design, and more.
http://fod.msu.edu/OIR/index.asp

Online NAAEE Directory
Take a few minutes to add your organization to NAAEE's Online Environmental Education Directory, the simple first step to building a consistent, quality process for helping EE practitioners find the resources they need. After your organization is in the system, you can gradually add descriptions of all your publications and programs, so that they are easily found by Internet searchers. Having your resources listed is also the first step in the Resource Review system, NAAEE's effort to build a culture of quality based on the Guidelines for Excellence.
http://naaee.org/cgi-bin/risee/noram/login

Online Ocean Sciences Quiz
The NOSB (National Ocean Sciences Bowl), in partnership with MIT Sea Grant and with support from National Science Foundation, has created a free education tool to promote ocean literacy and engage students, teachers, and teams involved with the NOSB. Now everyone can compete from school or home with this online game which simulates the NOSB competition. In addition, players can comment on the questions or submit their own ocean science questions.
http://osq.mit.edu/

Online Ocean and Weather Studies
Online Ocean Studies and *Online Weather Studies* are introductory college courses developed by the American Meteorological Society (AMS) for licensing and local offering by undergraduate institutions nationwide. Topics in *Online Ocean Studies* include the ocean in the earth system, plate tectonics, marine sediments, life in the ocean, and more. *Online Weather Studies* includes weather monitoring, the atmosphere, storms, and more. Both online courses are turnkey packages with print and Internet-delivered materials that can be offered by faculty members in a variety of teaching environments, ranging from traditional lecture/lab to completely online.
http://www.ametsoc.org/amsedu/online/info/
http://www.ametsoc.org/amsedu/online/oceaninfo/

Online Ocean and Weather Studies Diversity Project
The AMS/NSF/NOAA Online Studies Diversity Project provides expenses-paid workshops for faculty offering either course at minority serving institutions, along with additional support. Workshops will be offered in May and June, 2007.
http://www.ametsoc.org/amsedu/online/info/
http://www.ametsoc.org/amsedu/online/oceaninfo/

Online Oceanography Expeditions
Designed for students in a general oceanography college course at San Jose State University, this website provides links to online expeditions in oceanography. Topics include marine resources, visualizing beneath the sea, global circulation and the California Current, marine ecosystems, and more. Additional resources include field guides, downloadable handouts and background information, and much more.
http://oceansjsu.com/105/expeditions.html

Online Tools Guidebook
The COSEE Excellence in Networking Tools subgroup invites you to use the Online Tools Guidebook. The guidebook provides easily accessible information on a wide range of online tools for collaborating, teaching, promoting, and much more. The tools are grouped into function categories, including Graphics/Visual Tools, Project Management, Collaborative Editing, and more.
http://coseenow.net/ents/index.php/Main_Page

Only One Ocean
The CD, Only One Ocean, offers new songs from the Banana Slug String Band, designed to inspire young people and their families to learn about and care for the ocean. The album focuses on the content found in Ocean Literacy: The Essential Principles of Ocean Sciences K-12. Pre-release copies are available now, for your holiday shopping pleasure.
http://www.bananaslugstringband.com/

One Stop for Ocean Sciences Education Resources
The Bridge website is a growing collection of the best marine education resources available on-line. It provides educators with a convenient source of accurate and useful information on global, national, and regional marine science topics, and gives researchers a contact point for educational outreach. The resources found on the Bridge are educator-reviewed to assure that the collection contains qualified, useful sites for formal and informal ocean sciences education. The Bridge gladly accepts site nominations via our online form. Researchers are especially encouraged to submit their education-friendly websites. If you know of a good ocean sciences education resource, share it with your fellow educators.
http://www.marine-ed.org/bridge
Site Nomination Form http://www.marine-ed.org/bridge/index_nomination.html

O'Neill Sea Odyssey in Monterey Bay National Marine Sanctuary
The *Sea Odyssey* program is a 3-hour learning experience that takes place aboard the 65-foot Team O'Neill catamaran with follow-up lessons at the shore-side Education Center. The students rotate through three stations: marine biology, ecology, and navigation. There is a curriculum guide, *Investigations in a National Marne Sanctuary*, which accompanies the different stations.
http://www.oneillseaodyssey.org/

Open Knowledge Repository
The World Bank Open Knowledge Repository is the World Bank's official open access repository for its research outputs and knowledge products. Currently, there are over 9,200 works online.
https://openknowledge.worldbank.org/

Open Science World
Open Science World is a science webzine whose mission is to enable active interaction between the general public and researchers. Researchers can post pieces about their academic research in an understandable way and visitors can post through the Leave a Reply feature. Topics include Environment, Life on Earth, and more.
http://openscienceworld.com/

Open Spaces
The U.S. Fish & Wildlife Service has created the Open Spaces blog to showcase some of their wildlife refuges and to offer the general public an inside view of the day-to-day operations. Blog posts profile their work in the Everglades, migratory birds, and more. Entries link to additional materials, including lesson plans and more.
http://www.fws.gov/news/blog/index.cfm

OpenChannels
OpenChannels is designed to be a comprehensive source for news, guidance, and community discussion on sustainable practices in ocean planning and management -- from marine spatial planning to ecosystem-based management to marine protected areas. The website is in its experimental beta version but already offers an array of tools including a searchable library, open discussion forums, instructional videos, and more. Please look through the website and offer feedback for further development.
http://openchannels.org/

OpenOcean Global
OpenOceans Global is a non-profit organization dedicated to linking people to the world's oceans through sharing information that will result in more informed decisions. Its ultimate goal is to aggregate the world's ocean data and creatively present those data online using advanced visualization technologies. The new website includes a Marine Education Pick of the Month, news and events, an e-newsletter, and more. The website build-out will include ocean jobs, educational resources, and much more.
http://www.openoceans.org/

Operation DeepScope Expedition
NOAA Ocean Exploration launched the Operation DeepScope Expedition, August 3-14, 2004. This expedition used advanced technologies, such as the sophisticated Eye-in-the-Sea underwater camera system. The Harbor Branch Oceanographic Institution's research vessel Seward Johnson and its manned submersible, the Johnson-Sea- Link, took scientists to the northern Gulf of Mexico, with basins, canyons, escarpments and methane seeps. The website includes lesson plans, logs, videos and more.
http://oceanexplorer.noaa.gov/explorations/04deepscope/welcome.html

Operation IceBridge
Operation IceBridge, a six-year NASA mission, is an airborne survey of Earth's polar ice, offering a three-dimensional view of Arctic and Antarctic ice sheets, ice shelves, and sea

ice. These flights will provide a yearly, multi-instrument look at the behavior of the rapidly changing features of the Greenland and Antarctic ice. Check out the blog, twitter, and more.
http://www.espo.nasa.gov/oib/

Operation Laser Line 2006
NOAA's Ocean Explorer website highlights Operation Laser Line 2006, a 6-day research cruise from November 8-13, 2007 to survey several sites off the coast of Maui. This new technology called laser line scan (LLS) may provide a bridge between broad-scale approaches such as side-scan sonar and fine-scale video and still photography. LLS systems can detect objects as small as about one centimeter. LLS systems provide two to five times the coverage of video but less than side-scan sonar
http://www.oceanexplorer.noaa.gov/explorations/06laserline/welcome.html

Operation Laser Line Mission Summary
The mission summary from Operation Laser Line Scan 2006 has been published on Ocean Explorer. The purpose of this six-day research cruise, funded by the NOAA Office of Ocean Exploration, was to test the ability of laser line scanning technology to address questions related to the management of coral reef ecosystems. The mission summary offers an insight into some of the problems encountered with cutting edge research.
http://oceanexplorer.noaa.gov/explorations/06laserline/logs/summary/summary.html

Operation: Monster Storms
From The JASON Project, this free online curriculum is designed to teach students in grades 5-8 how powerful storms form and how advanced technology is used to better understand and forecast weather. Developed in partnership with NOAA, NASA, and the National Geographic Society, *Operation: Monster Storms* examines current research to improve forecasting, allowing communities to better prepare for storms and avoid their destructive potential.
http://www.jason.org/public/Curriculum/Curriculum.aspx?pos=1

Operation: Resilient Planet Game
The Jason Project and National Geographic offer *Operation: Resilient Planet*, a game which brings students along on real-life science expeditions with practicing researchers and explorers. Students will need to use the right tools, find the right data, and be prepared to argue their case. The game offers 3D graphics, stereo sound, and fun-to-use controls. It is correlated to National Science Education standards for grades 5-8.
http://www.jason.org/Public/Curriculum/ORPGame.aspx?pos=1

Operation: Tectonic Fury
The JASON Project's new geology curriculum for middle school, Operation: Tectonic Fury, features scientists and takes your students from the top of Mount St. Helens to the depths of a West Virginia mine in search of answers to Earth's geologic mysteries.
The free, online unit offers research articles, inquiry-based activities, videos, games, and other multimedia, and allows students to investigate and analyze Earth's past, present, and future to unlock its geologic mysteries.
http://www.jason.org/public/WhatIs/CurrOTFIndex.aspx

Orbiting Carbon Observatory
The Orbiting Carbon Observatory-2 will map carbon dioxide in Earth's atmosphere. NASA Wavelength has created a list of educational resources on this greenhouse gas, along with mission background information and links to articles and activities for students.
http://www.nasa.gov/mission_pages/oco2/#.U8v7x7EzPo4

Orcas in our Midst
The Orca Network offers *Volume 3* of *Orcas in Our Midst*, focusing on orcas, salmon, and research about the different ecotypes of orcas in the Pacific Northwest and world-wide. They offer special prices for educational organizations and for quantity orders. Orca Network also offers free downloads of the accompanying Student Activity Guide and Volumes 1 and 2.
http://www.orcanetwork.org/nathist/OIOM1smallest.pdf
http://www.orcanetwork.org/nathist/OIOM2006edited.pdf
http://www.orcanetwork.org/resources/guides.html
http://shop.orcanetwork.org/Orcas_In_Our_Midst_p/oiom3.htm

Oregon Sea Grant Resources
Oregon Sea Grant supports research, education, and public outreach to help people understand, responsibly use, and conserve ocean and coastal resources. Spend some time looking through this website and check out the research and outreach pages. Don't miss the downloadable videos on ocean acidification and invasive species.
http://seagrant.oregonstate.edu/index.html

Oregon's Institute of Marine Biology Curricula
The University of Oregon's Institute of Marine Biology offers online marine science lessons, developed as part of its National Science Foundation Graduates in K-12 grant. The lessons are sorted by habitat and age group. While the K-12 lessons are posted by grade, the lessons are appropriate for a range of ages and can be adjusted for older or younger students. The website also offers links to additional curriculum, photo and video libraries, ocean literacy standards, and more.
http://pages.uoregon.edu/oimb/Academics/GK12/
http://oimb.uoregon.edu/k-6/curricula/

Organization Assessment Tool
The Organization Assessment Tool is a self-assessment tool that can be used by the leaders of EE organizations to increase the effectiveness of their organizations. It was written to promote learning and growth within environmental education organizations. The website offers the tool along with an introductory PowerPoint presentation.
http://www.eetap.org/pages/dynamic/web.page.php?page_id=35&topology_id=31&eod=1

Ornithological Research Archive
The Searchable Ornithological Research Archive is a resource for professional and amateur ornithologists. This online journal archive is produced jointly by the University of New Mexico, Association of Field Ornithologists, Cooper Ornithological Society, American Ornithologists Union, and Wilson Ornithological Society. At present, it contains seven journals, including *The Condor, Journal of Field Ornithology, Studies in Avian Biology,* and more. You can browse the journals or use the search engine.
http://elibrary.unm.edu/sora/index.php

Osprey-Watch
The Center for Conservation Biology has launched Osprey-Watch, a project created to engage a global community to collect data on breeding osprey. Osprey-Watch is a user-friendly, web-based platform that allows observers across the globe to map their nests, log observations, upload photos, and interact within an observer forum. Information entered into the platform will be immediately accessible to users and will be summarized following the breeding season.
http://www.osprey-watch.org/

Other Invertebrates
The Natural History Museum in London's Nature Online website is designed for those visitors who can't visit personally. Other Invertebrates offers visitors information about the world of the backbone-deficient, which comprise the majority of animals on earth. Make sure to check out many of the links to other information, including the deep ocean, natural disasters, reptiles, amphibians and fishes, and much more.
http://www.nhm.ac.uk/nature-online/life/other-invertebrates/index.html

Otter Spotter
Otter Spotter is meant to be a resource for teachers, researchers, students, and zoo visitors who wish to learn about otters. The website offers teacher resources, research, news, and more.
http://otterspotter.com/

Our Living Oceans
Our Living Oceans: Report on the Status of U.S. Living Marine Resources is part of a series of national status reviews by NOAA Fisheries. The report provides a report card to the American public on the biological health of U.S. living marine resources. The report can be downloaded from the web in full or by unit.
http://www.st.nmfs.noaa.gov/LivingOceans.html

Our Environment and Ocean Literacy
The National Geographic Society has expanded its *Our Environment & Oceans for Life* website. The website provides facts, news, and classroom activities for all teachers and their students. Some resources include a multimedia teacher's toolkit; tools and resources to instruct students on the importance of a healthy environment; "green" actions to help preserve the environment; expert scientist reports; and more.
http://www.ngsednet.org/oceans

Our Ocean Space
The World Ocean Observatory has launched Our Ocean Space, a web-based network for the exchange of ocean related projects—art, audio-visual presentations, and other formats—created and uploaded by students and teachers to share with their counterparts worldwide. The intent is to link together young people through their understanding and interpretation of ocean systems.
http://thew2o.net/our-ocean-spaces

Our Wetlands, Our World
Our Wetlands, Our World, a high school activity guide, is available for downloading from the California Coastal Commission. While site specific to Upper Newport Bay, it is easily adaptable to your region. The guide provides information and activities to help high

school students learn about the importance of wetlands and to become involved in the restoration of these valuable, unique environments. California educators can also participate in upcoming professional development orientation workshops.
http://www.coastal.ca.gov/publiced/pendx.html

Out & About
Out & About is the quarterly Pacific region outreach e-newsletter from the U.S. Fish and Wildlife Service to highlight outreach success stories around the region, provide resources, offer tips to improve outreach and customer service, and encourage new outreach activities. The articles feature trainings and workshops, resources, case studies, and more. The Winter 2005 issue includes an article about Navigating Change, the Hawaiian canoe voyage with a focus on education.
http://pacific.fws.gov/ea/outreach/out&about.htm

Out2See
Journey with your students to Palmer Station, Antarctica with the Palmer LTER Education and Outreach Program and Out2See: Sights, Sounds and Science at Palmer Station. Through the blog, you can track the ship, explore the environment, view photographs, and learn about what research is taking place. Educators can download newly designed instructional materials that parallel the scientific research.
http://pal.lternet.edu/outreach/

Outdoor Biology Instructional Strategies
Outdoor Biology Instructional Strategies (OBIS) from the Lawrence Hall of Science is an outdoor program that offers young people opportunities to investigate ecological relationships in their local environment. The activities, which can be used together or individually, take youngsters outdoors to investigate biology in order to increase their environmental awareness. Examples of the activities are categorized by Experiments, Biodiversity, and Schoolyard, and can be accessed from the website.
http://www.outdoorbiology.com/#

Outdoor Nation
Outdoor Nation is dedicated to reconnecting youth with the outdoors. They host summits around the country, offer grants, lead outdoor outings, and more in an effort to mobilize a movement to get people back outside. Summits in Chicago, Illinois and Seattle, Washington will be held July 2013.
http://outdoornation.org/

Outdoor Recreation Economy
The Outdoor Industry Association has released their latest economic study, Outdoor Recreation Economy, detailing the role that outdoor recreation plays as an economic driver in the United States. The website offers a summary with graphics, along with the downloadable report.
http://www.americantrails.org/resources/economics/outdoor-recreation-economy-report-2012.html

Outdoor Safety and Survival Publications and Videos
Publications and videos produced by Alaska Sea Grant, developed by survival experts, can help save lives and increase your comfort level at sea. The messages of survival are targeted to children, parents, teachers, and youth group leaders, among others. Fourth-grade reading level publications deal with hypothermia, frostbite, and dressing for

cold weather. An outdoor survival training curriculum is geared to students and their teachers in grades five through high school. A four-volume "Surviving Outdoor Adventures" for kids in grades K-12 stresses cold water survival skills, ice safety, personal flotation devices, and surviving when lost or stranded. "It Could Have Been Prevented" examines small boat safety and was produced in partnership with Alaska Native leaders.
http://seagrant.uaf.edu/bookstore/safety.html.

Outer Banks Maritime Heritage Trail
The Outer Banks Maritime Heritage Trail website offers videos highlighting iconic locations along Highway 12 on the Outer Banks of North Carolina, along with videos focusing on the Monitor National Marine Sanctuary, the Cape Hatteras Lighthouse, and much more. Additional materials include oral histories and topical images. The website highlights the culture, history, people, and natural and cultural resources that can be found along the Outer Banks.
http://monitor.noaa.gov/obxtrail/

Outreach and Interpretation for Archeologists
The National Park Service offers online resources useful for archeologists for outreach and education. Offerings include Interpretation for Archeologists: A Guide to Increasing Knowledge, Skills, and Abilities; Archeology for Interpreters; the NPA Archeology Guide module on Archeology Outreach; and much more. Check these out.
http://www.nps.gov/archeology/sitemap.htm

Outstanding Science Trade Books
NSTA and the Children's Book Council have selected an annual list of Outstanding Science Trade Books for Students K–12 for books published in 2013. This year, science teachers and mentors have been challenged to meet the expectations of the Framework for K–12 Science Education and the Next Generation Science Standards. It includes not only traditional science content but also engineering and design.
http://www.nsta.org/publications/ostb/ostb2015.aspx
http://www.nsta.org/publications/ostb/

Outstanding Science Trade Books for Students K-12
The National Science Teachers Association, in conjunction with the Children's Book Council, releases an annual list of outstanding science books for Students. The 2004 list is out and includes books on marine-related topics. Each entry includes a brief description of the book, the name of the publisher and current price, and recommended reading levels.
http://www.nsta.org/ostbc .

Oyster Gardening
The Southern Regional Aquaculture Center posts this fact sheet on Non-Commercial Oyster Culture, highlighting oyster gardening and some engaging ways of using oysters with students. It reviews regulatory issues, site evaluation, educational resources, and much more.
https://srac.tamu.edu/index.cfm/getFactSheet/whichfactsheet/236/

Oyster Gardening - Alabama
The Mobile Bay Oyster Gardening Program is recruiting oyster gardeners and adopters for the 2013 season. Volunteers who have access to "conditionally approved" waters in

Baldwin or Mobile counties can grow oysters for this restoration program, which will be transplanted in Mobile Bay and the Mississippi Sound at the end of the oyster gardening season in November.
http://masgc.org/oyster/oysterhome.htm

OzCoasts
OzCoasts represents a collaborative effort between coastal scientists from a range of government agencies and universities across Australia, to provide comprehensive information about Australia's coast, including its estuaries, coastal waterways, and climate change impact. The materials are divided into six primary areas, including Coastal Indicators, Habitat Mapping, Natural Resource Management, and more. Each section documents a wide range of natural and man-made phenomena.
http://www.ozcoasts.org.au/

Ozone Forecasts
Experimental air quality forecasts have begun. NOAA's National Weather Service will produce hourly forecasts updated twice daily for the northern U.S. from Maine to the Carolinas and west to Indiana, Kentucky and Tennessee. The air quality forecast was developed by NOAA Research and the weather service, in partnership with the EPA. EPA's site will also include interpretive health-based air quality index maps based on the forecast guidance.
http://www.epa.gov/airnow/