National Oceanic and Atmospheric Administration

Information Exchange for Marine Educators

Archive of Educational Programs, Activities, and Websites

N to Z

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

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 N to Z

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 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

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

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 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
The National Environmental Education & Training Foundation (NEETF) will coordinate the second annual National EE Week, April 16 to 22, 2006. Participating 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.
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
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
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 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 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 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 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 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 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

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 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 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 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 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 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 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 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, 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/

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 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 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 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 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 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 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.
http://www.americanhiking.org/NTD.aspx

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 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*. 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

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 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 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.
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 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 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/

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

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.
http://nautiluslive.org/

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/

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

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

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

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 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/

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/

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 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 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 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 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 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 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

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

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

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

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

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

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/

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

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/

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 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 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 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/

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

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 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 – 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: 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 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 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 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 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 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

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 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 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 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 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 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 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 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 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

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 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 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 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/

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 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 - 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 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 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

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/

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 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 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 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 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 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 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 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/

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/

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
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

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

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 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 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

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 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/

Oceanus
Oceanus, the oceanography magazine produced by Woods Hole Oceanographic Institution (WHOI), continues to publish a free version on-line. The magazine explores ocean research, engineering, and education at WHOI. You can read the current issue or search retrieve articles by topic, including ocean policy, resources, sound in the ocean, and much more. The website includes information about research, interviews, fast-loading multimedia, and more.
http://oceanusmag.whoi.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/

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

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

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 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, 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 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

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 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

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 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 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

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 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 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 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

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/

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 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

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

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

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 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

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.

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 .

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/

Paddle Bayou Lafource, Louisiana
Back to the Bayou 2003, November 7-10, 2003, from the Barataria-Terrebonne National Estuary Program, featured a 4-day canoe and kayak trip, daytime and evening festivities, plus the opportunity to appreciate bayou communities and life along the bayou from Donaldsonville to the Gulf of Mexico.
http://paddling.btnep.org/

Papahānaumokuākea Expedition 2007
An expedition with archaeologists from the Maritime Heritage Program, the Pacific Islands Region and the Papahānaumokuākea Marine National Monument conducted non-invasive surveys on shipwreck sites at Midway Atoll, Pearl and Hermes Atoll, and French Frigate Shoals. The archaeology team's goal was to locate new wreck sites and continue the documentation of known sites. The website offers information about the mission and the wrecks.
http://sanctuaries.noaa.gov/maritime/welcome.html

Papahānaumokuākea Marine National Monument Explorations 2010
Follow along on a 25-day research expedition to Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands. The main objectives of the expedition for the maritime heritage team are to interpret these diverse archaeological sites through underwater mapping, video, and photography.
http://sanctuaries.noaa.gov/missions/2010monument/welcome.html

Parks Canada Videos on the Internet
Parks Canada has launched video channels on YouTube, MySpace, and Yahoo Video, with videos on Canada's national parks and national marine conservation areas, as well as other historic sites. Videos will include promotional pieces, wildlife and habitat shorts, and scientists and staff discussing issues facing these protected places.
http://www.youtube.com/ParksCanadaAgency
http://www.myspace.com/parkscanada
http://ca.video.yahoo.com/people/5743950

Parks Online Resources for Teachers and Students
The website for the distance education program, Parks Online Resources for Teachers and Students (PORTS) uses videoconference equipment and California's K-12 High-Speed Network to deliver units of study to classrooms around the state. These interactive programs allow California State Parks to educate students about park resources, delivering parks into the classroom. The website includes complete downloadable study units, including topics such as tidepools, elephant seals, and more.
http://www.ports.parks.ca.gov/

Parkwire
The George Wright Society is dedicated to the protection, preservation, and management of cultural and natural parks and reserves through research and education. The website offers the daily news service, Parkwire: Protected Area News from Around the World. Most articles consist of 2-3 paragraphs from the beginning of the story and a link to the full story. The focus is on management issues, relevant research, and more.

http://www.georgewright.org/

Participatory Management Clearinghouse for Wetlands
The Participatory Management Clearinghouse has been set up to facilitate the sharing of information concerning participatory management of natural resources and disseminate field experiences. Classified thematically by ecosystems, regions, or themes, the posted documents, specific projects and case studies cover issues such as biodiversity and traditional knowledge, gender, water, equitable sharing, protected areas, and indigenous peoples. The website includes dynamic maps and a search system.
http://www.PMCnet.org .

Passport to Adventure
"Passport to Adventure" is an educational game featuring all the San Luis Obispo, California area state parks. Passport holders visit any state park from Pismo Beach to Morro Bay and seek answers to 30 questions. There are different levels of prizes for the game. All proceeds go to supporting the educational efforts of the Central Coast Natural History Association.
http://www.ccnha.org

PAST Foundation
The mission of the nonprofit educational PAST Foundation is to promote a better understanding of history and culture by teaming professional anthropologists and historians with the public to explore potential cultural sites both locally and globally. Professional anthropologists and archaeologists are teamed with K-12 students to explore potential cultural sites in their area. Planning is currently underway for the PAST Foundation's 2005 Field School.
http://www.pastfoundation.org/

Patuxent Wildlife Research Center
The Patuxent Wildlife Research Center in Maryland has a diverse set of ongoing research projects dealing with wildlife and natural resources in and around the region. Their website offers links to a wide range of materials available on the web, including a section on frog calls (with species lists for many states and quizzes), video clips of Atlantic sea ducks, information about surface elevation tables, and much more. The education section includes ecotoxicology lesson plans, an extensive bird identification section with quiz, educational science notes, glossary, and more.
http://www.pwrc.usgs.gov/

The PBS Borders Environmental Project
Each POV Borders episode asks visitors to consider an aspect of their everyday lives in ways that challenge their preconceptions, and expand our own "borders" of understanding. Lesson plans for K-12 teachers are designed to facilitate online storytelling and sharing. Each of the three downloadable lesson plans focuses on Earth, Water, or Air. Also check out the link to the Watershed Game (http://www.bellmuseum.org/cgi-bin/start.pl?user=bellmuse&prog=start.pl&name=&submit=Let%27s%2Bgo!)
http://www.pbs.org/pov/borders/2004/educators/index.html .

Pelagic Realm Poster
This Pelagic Realm wall poster (25x36 inch) can be a useful classroom resource. It includes 109 pen-and-ink illustrations of pelagic marine life from bacteria to whales and

from the surface to the deep sea. The illustrations are clustered by trophic group and depth and are accompanied by the name, taxonomic group, and maximum known size of each species. The poster is available through EBay - search Pelagic Realm poster.
http://www.ebay.com/

Penguin Science
The 2010-2011 Adelie Penguin breeding season runs November 7, 2010-January 28, 2011. Follow along as Adelie Penguin families raise their chicks in one of the harshest environments on Earth. Check the website for information and educational activities.
http://www.penguinscience.com/

Penguin Science Education Page
This website offers activities to help students learn about Adelie penguin life, history, and their relationship to climate change. Students can also send questions to the researchers who study penguins. There are PowerPoint presentations for use in your classroom about Antarctic Penguins, Antarctica, and global climate change; teaching notes are included.
http://www.penguinscience.com/classroom_home.php

Pennies for the Planet
World Wildlife Fund sponsors the *Pennies for the Planet* campaign. Kids learn about three priority regions around the world, helping get them excited about conservation and connecting environmental education with environmental action. The 2003 program includes the Everglades and South Florida. The website includes links to free posters, education activities, and additional educator's materials.
http://www.worldwildlife.org/windows/pennies/

People in Fisheries
The Fall 2009 issue of *Eddies*, an online magazine from the Fish and Wildlife Service, explores the diverse careers of the fisheries workforce, from geneticists, maintenance workers, and veterinarians to pharmaceutical researchers, animal caretakers, and fish culturists. Be sure to check out all the archived issues.
http://www.fws.gov/eddies/

People and Reefs: Successes and Challenges in the Management of Coral Reef Marine Protected Areas
This 100-page publication was prepared by the UN Environment Programme in cooperation with the International Coral Reef Action Network. It features case studies of coastal coral-reef management initiatives worldwide, with lessons learned from each. The report introduces some of the key issues in coral reef conservation and the role of ICRAN and the UNEP Regional Seas Programme. Seven of the case studies are from the Caribbean. The report is downloadable from the UNEP website.
http://www.unep.org/regionalseas/Publications/itmems2reportfinal.pdf

The People Speak Global Debate
The United Nations Foundation project, The People Speak, encourages young people to be actively engaged on global issues and to understand the value of global cooperation. The 2007 People Speak Global Debate topic of climate change will involve high school students researching the debate topic and preparing clear, persuasive arguments for both sides of the issue. The debate topic is Resolved: Market mechanisms are preferable to regulatory approaches in reducing carbon emissions.

http://thepeoplespeak.org/peoplespeak/About/highscho

Peppy's Coral Kingdom
This children's book is aimed at educating students in Grades 1-5 about threats to coral reefs, with a heavy emphasis on coral disease and anthropogenic stressors. The book was created by a Nancy Lucas in consultation with scientists from the Marine Resources Center at Fort Johnson. The website includes links to several example pages, along with ordering information.
http://www.thirdfloorcell.com/peppy.html

Perfect Disaster
The Discovery Channel offers this website to complement *Perfect Disaster,* a series of programs on severe weather and other natural disasters. The site includes a number of historic disaster puzzles, where visitors can piece together the post-eruption locale of Pompeii and the mighty tornado that swept through Kirksville, Maryland in 1899. Other sections include information about tornados, solar storms and a hazard quiz.
http://dsc.discovery.com/convergence/perfectdisaster/perfectdisaster.html

Permafrost/Active Layer Monitoring Network
With support from NASA and the International Polar Year, the University of Alaska Fairbanks launched the Alaska Permafrost Project, a network of over 100 schools in Alaska and Yukon, Canada that measure permafrost temperature and active layer depth on a weekly basis. The network places all of their data plots and latest information on their website as well as Google Earth. The website also offers other education materials.
http://www.uaf.edu/permafrost/

Peter's Online Typing Course
For those still using the hunt and peck method but unable to build up speed, check out Peter Hudson's free website. It's a place for "beginning typists and frustrated hunt-and-peckers who want to move from four-finger typing to full-blown touch typing."
http://www.typing-lessons.org/

Pew Fellowship Nominators
The Pew Fellows Program in Marine Education solicited nominators for Pew Fellowships. Their goal was to recruit a diverse group of nominators who have knowledge of outstanding individuals doing innovative work in marine conservation around the world.
dmeck@neaq.org

Photo of the Week
SeaWeb and the Marine Photobank offer a new feature on SeaWeb's site - Photo of the Week. Each week, a photo illustrating current ocean issues will be displayed on the SeaWeb home page, along with the story behind the photo on the Marine Photobank Photo of the Week page.
http://www.marinephotobank.org/photocenter/photoofweek.php

PhotoZone
The National Wildlife Federation offers Ranger Rick's PhotoZone to help young photographers learn to take and share photos of wildlife and wild places. There are photo tips, tricks, contests, and more.

http://www.nwf.org/kidzone/kzPage.cfm?siteId=3&departmentId=80

Physical Geography Animations and Webcam
The Wycombe High School, UK website offers a variety of physical geography animations, including coastal processes, animated rivers, atmosphere, glaciers, and much more. The animations can help students understand some of the long term changes that take place on and close to the surface of the Earth. There are also links to live geography webcams.
http://www.school-portal.co.uk/GroupHomePage.asp?GroupID=12426

Physorg.com
Physorg.com offers online news and articles related to science, physics, and technology. Categories include Space & Earth science, General Science, and more. Topics one day might include climate change, tsunamis, carbon sequestration, and much more.
http://www.physorg.com/

Phytopia: Discovery of the Marine Ecosystem
This educational CD-ROM, developed by Bigelow Laboratory for Ocean Sciences, University of New England, and NASA's Jet Propulsion Laboratory, is available for the price of shipping. The CD provides a window to the world of the oceans' microscopic life. Phytopia consists of three major modules: "Phyto Files," "Phyto Factors," and "Special Topics." Other features include an image-based glossary and summaries of relevant topics.
http://www.bigelow.org/phytopia/.

Phytoplankton on the Web and in the Classroom
The online phytoplankton library from the Center for Integrated Marine Technologies was initially created to help provide information about the organisms behind the spring 2007 algal blooms in the Monterey Bay. It includes species found in the waters along California, Oregon, and Washington. The Central and Northern California Ocean Observing System created a classroom guide on phytoplankton and Harmful Algal Blooms, with a concentration on the West Coast and California species.
http://cimt.ucsc.edu/habid/habhome.html
http://www.cencoos.org/sections/classroom/algal_blooms.shtml

PicturePosts: Using Cameras to See Change at Local Parks
The Friends of Menotomy Rocks Park and Friends of Fresh Pond Reservation have created two PicturePosts in each park to help see and measure changes in local parks. They have installed that help visitors take pictures of the same landscape each time. The PicturePost is a secure post anchored in the ground, with a round disk and an octagonal plate attached to the top. Each post has specific information inscribed on it, so with the click of the camera, the location of the set of images is automatically marked.
http://www.picturepost.smugmug.com

Pictures from Andros
Sean Nash is a high school biology instructor in Missouri, and a prolific underwater (and above-water) photographer. He has posted images taken during Andros Island sailing field studies, part of the marine biology program in the Saint Joseph School District. He is happy to share the photos for educational purposes (as always, with attribution). Check them out at the two flickr websites, and while you're looking around, check out the links to his classroom network and blog site.

http://www.flickr.com/photos/nashworld/sets/72157616761811732/
http://www.flickr.com/photos/nashworld/3351791844/in/set-72157615192501798/

PIMRIS Portal
The Pacific Islands Marine Portal project is a collaborative project to improve access to Pacific marine information for the Pacific Islands community. The portal offers news, articles, and directories of websites relevant to Pacific fisheries and to the coastal and marine environment of the Pacific.
http://www.pimrisportal.org/pop/index.php?option=com_content&view=frontpage&Itemid=1

Pito Deep Expedition
Teachers and students can explore the geological, geophysical and geochemical study of the upper ocean crust exposed at Pito Deep, west of Easter Island. From January 30 - March 8, 2005, scientists will be documenting the scientific expedition through "Dispatches from Sea" located on the Pit Deep Expedition website.
http://www.nicholas.duke.edu/pitodeep/index.html

Place-Based Education
The second edition of *Place-Based Education—Connecting Classrooms and Communities* is available. The book reviews academic research, practical examples, and step-by-step strategies drawn from classrooms throughout the United States which emphasize the connection of school, community, and environment.
http://www.oriononline.org/pages/ob/nls/index_nls.html

Places We Live
Project Learning Tree has developed new curriculum materials to give students an awareness of the environmental, social, and economic impacts of decisions connected to community growth and change. *Exploring Environmental Issues: Places We Live* gets students exploring their own neighborhoods, learning about their community's development through time, and involved in local community action projects.
http://www.plt.org/cms/pages/31_41_39.html

Plan Your Summer with the Bridge
It is time to start planning your summer experiences, and the Bridge can help. The Bridge contains summer opportunities and year-round courses, workshops, and other programming for educators and students. Each program on the Bridge is complete with a link and brief description, and because we are constantly adding new resources and opportunities, we suggest checking back often. Those with summer programs that are not currently found on the Bridge are encouraged to submit their website for inclusion.
Educator Summer Programs http://www.marine-ed.org/bridge/index_teacher_summer.html
Student Summer Programs http://www.marine-ed.org/bridge/index_summer.html

Planet Connect
Planet Connect, a component of Classroom Earth, is an online social network where high school students can learn about current environmental issues, funding opportunities, green colleges, and environmental careers.
http://planet-connect.org/

Planet Earth
The Discovery Channel presents *Planet Earth*, an eleven-part series showcasing global habitats from deep oceans to mountains. The website offers video clips, background information, online animal guides, games, and much more. The Journey to Planet Earth website includes information about the programs, basic ecosystem and country profiles, educational resources including downloadable teacher guides, and more.
http://dsc.discovery.com/guides/planetearth/planetearth.html
http://www.pbs.org/journeytoplanetearth/

Planet Earth
Annenberg Media offers this video instructional series for college and high school classrooms and adult learners. It teaches earth science, geology, oceanography, climatology, and astronomy through footage and insights from noted scientists. *The Blue Planet* will air January 11 and May 17, 2006; the *Climate Puzzle* airs January 18 and May 24, 2006. The online Simulcast can be viewed at http://www.learner.org/channel/broadband/video.html.
http://www.learner.org/channel/series49.html

Planet H2O
Planet H2O, a two-part special from Thirteen/WNET New York, will premier on public television in April to mark Earth Day. The two episodes, The Secret Life of Water and Water World, focus on fresh water systems around the world and their impact on land, air, and living things. In addition, the website will offer a downloadable teachers' guide to accompany the program.
http://www.thirteen.org/edonline/educators.html

Plankton*net
Plankton*net is a communal source of information about marine phytoplankton. Users can browse through an extensive collection of descriptions and images organized alphabetically or by taxon. Links are provided with each species description to numerous websites containing information about the organism.
http://www.planktonnet.eu/

Plant Field Guide – Grand Bay NERR
The Mississippi Department of Marine Resources Grand Bay National Estuarine Research Reserve has posted its field guide on-line. *Selected Plants of Grand Bay National Estuarine Research Reserve and Grand Bay National Wildlife Refuge* includes some of the most popular regional plants and wildflowers. The guide provides visitors with color photos and descriptions of several coastal wetland and terrestrial plants found within the reserve, along with highlights of selected coastal habitats.
http://www.dmr.state.ms.us/Coastal-Ecology/GBNERR/field-guide/field-guide.htm

Plant Stalkers
Plant Stalkers is a citizen science program from Duke biologist Julie Reynolds and the Eno River State Park in Durham. Volunteers, many of whom have little or no specific scientific training, help scientists and park rangers monitor the distribution of invasive plants through the use of a GPS unit during routine outdoor activities such as hiking. After training and certification through the project, volunteers mark locations of invasive species and upload the data through the Internet.
http://www.science-writing.org/citizenscience.html

Plants of the Eastern Caribbean
This online photo database is devoted to the native and naturalized flowering plants of the islands of the Eastern Caribbean. The aim of the website is to serve as an accessible resource for identifying the plants of the archipelago and to provide a forum for sharing information on Caribbean plants and their conservation. The database comprises about two thousand flowering plants, mainly those found in the wild, although a few commonly cultivated plants are included.
http://ecflora.cavehill.uwi.edu/

Plastic in the Ocean
Marine debris has recently been highlighted in newspapers and was featured on Canada's Discovery Channel. TV documentary maker Ian Connacher describes a flood of junk flowing into the sea – some to circulate endlessly in currents, some to be eaten by fish, and then by humans. He produced a feature piece on ocean plastic sampling, highlighting the implications of land-based sources of pollution on the marine environment.
http://www.exn.ca/dailyplanet/view.asp?date=1/15/2004 .

Plastic Oceans
Plastic Oceans offers a documentary film about plastic in our oceans.
http://www.plasticoceans.net/

Plastics at SEA
The Sea Education Association offers this website allowing visitors to follow them as they embark on the Plastics at SEA: North Atlantic Expedition, a 35-day research cruise to study the accumulation of plastic marine debris in the North Atlantic Ocean. The website offers a daily journal, science results, biographies, and more.
http://www.sea.edu/plastics/index.htm

Plates on the Move
Plates on the Move is an interactive website from the American Museum of Natural History. It explains how plate tectonics cause earthquakes, volcanoes, and tsunamis.
http://ology.amnh.org/earth/plates/index.html

Play Decide
New Economics Foundation offers Play Decide, a website with a downloadable kit for a game that examines global warming and climate change, through play participation in setting policies. The website also allows users to upload their results for a worldwide regional comparison. (The game was inspired by Democs (deliberative Meeting of Citizens), a card game that is also downloadable at http://www.neweconomics.org/gen/democs.aspx).
http://www.playdecide.org/

Pocket Guide to Marine Debris
The Ocean Conservancy and the EPA published the booklet, *Pocket Guide to Marine Debris.* This book is designed for beach cleanups, to serve as a reference to standardize terminology for marine debris items and to help volunteers identify unknown debris items. It offers Quick Tips about what to bring and how to prepare for different situations that may be encountered during debris cleanup. The booklet can be found in different formats on the web: as html, a slideshow, and a downloadable pdf file.
http://sacoast.uwc.ac.za/education/resources/marinedebris/index.htm

http://www.slideshare.net/vicmanlapaz/pocket-guide-to-marine-debris-presentation
http://www.cobsea.org/cleanupeas/docs/ICC_PocketGuide_EN.pdf

Podcast of Life
Introduce your students to marine biology and biodiversity through the Podcast of Life. Developed for students aged 9-13, the 5-minute podcasts highlight marine species with high student appeal and available relevant classroom resources. The website also offers educational materials, meet the scientists, and extras. Student contributions are solicited. There will be a new podcast every two weeks.
http://education.eol.org/podcast

Point2Nature Environmental Education Software Developers
Point2Nature by CD Meyer, Inc. is a multimedia company that specializes in environmental education software for zoos, aquariums, nature centers, and museums. They use graphics, dynamic animations, music, sound effects, panoramic photography, and video to engage students.
www.point2nature.com

Poisoned Waters Documentary and Teacher's Guide
Poisoned Waters, a two-hour PBS documentary, examines how water pollution from many sources threatens human health and the environment and also explores potential answers to the crisis. The website includes the complete video, broken into easily viewed sections, along with a teacher's guide intended for grades 9-12. The transcript of the video is also available from the website.
http://www.pbs.org/wgbh/pages/frontline/poisonedwaters/

Polar Bibliography
A comprehensive polar bibliography has been prepared in the NOAA Central Library Network. *International Polar Year 2007-2008 Resources on Polar Research in the NOAA Central Library Network: A Selected Bibliography* reflects the NOAA Library Network's unique printed and online resources on exploration and research in the polar regions from the 18th century to the present, in all formats, including print, online full-text documents, digital videos and images, online cruise data, and web resources.
http://www.lib.noaa.gov/uhtbin/webcat

Polar Cruise Blog
This blog is a project associated with the Palmer Station site, a member of the Long-Term Ecological Research Network. The cruise, January 6-February 9, 2009, is one of the annual interdisciplinary cruises contributing to the creation of a long-term time series record which began in 1991.
http://pal.lternet.edu/outreach/blogs/cruise/

Polar-palooza
Polar-palooza is an International Polar Year education and outreach project through a multimedia effort to explain the importance of the polar regions and clear up misconceptions some people may have about them. Scientists and Arctic residents tell personal stories of life and research in polar regions. The website includes video footage and Internet resources. The multimedia exhibit and national tour will visit California, New Mexico, Florida, Georgia, and Louisiana in the fall of 2007.
http://www.nasa.gov/mission_pages/IPY/snow/PolarPalooza.html

Polar Regions Workshop Resources
The International Polar Year Online Workshop from COSEE West and the College of Exploration took place online April 16-28, 2007. The website offers archived lectures, PowerPoint shows, and educational materials related to both the Arctic and Antarctic regions. In addition, the Resources section offers an extensive list of websites with educational resources and activities.
http://www.coexploration.org/cosee_west/ipy/

Polar Sciences Special Collection
Teachers' Domain offers their Polar Sciences Special Collection, funded by the National Science Foundation, with 20 new resources about the Arctic and the Antarctic, plus resources from existing collections, a lesson plan, and more.
http://www.teachersdomain.org/exhibits/ipy07-ex/index.html

Polar Visions
Polar Visions is an educational film about the effects of changing climates on humans and ecosystems, particularly in polar regions. The film contains seven stand-alone segments appropriate for use in classrooms and informal settings from the middle level through college, and was developed to align with the National Science Education Standards across all science subjects. You can watch the first episode or download it from the website, or contact Tina Arthur for a copy and standards alignment information
https://www.denveropenmedia.org/project/polar-visions
Contact Tina Arthur at tina.arthur@colorado.edu

PolarTREC
PolarTREC (Teachers and Researchers Exploring Collaborating in the Arctic and Antarctic) is a program funded by the National Science Foundation in which K-12 teachers participate in polar research, working closely with scientists as a pathway to improving science education. The website will offer new Learning Resources, a Virtual Base Camp, and more, starting in spring, 2007. Check out the Antarctic Journal (above), and archives of earlier base camp portals and lesson plans.
http://www.polartrec.com/

PolarTREC Learning Resources
PolarTREC (Teachers and Researchers Exploring Collaborating in the Arctic and Antarctic) is a program funded by the National Science Foundation in which K-12 teachers participate in polar research, working closely with scientists as a pathway to improving science education. PolarTREC Learning Resources is a collection of articles, lessons, activities, interactive media, and more for educators, students, or anyone interested in teaching or learning more about the science of the Arctic and Antarctica.
http://www.polartrec.com/learning-resources

Pole-to-Pole Web Forum
GLOBE Seasons and Biomes is an inquiry- and project-based initiative that monitors the interannual variability of seasons in different biomes. Students from around the world will be able to join in a webchat and forum on April 10-11, 2008. They will be able to ask scientists questions about current polar and boreal forest research, their own research interests, and topics that will lead to successful school/student research projects.
http://globe.gov/fsl/html/templ.cgi?ipy_video08&lang=en&nav=1

Politics and Socio-Economics of Ecosystem-Based Management of Marine Resources
The journal Marine Ecology Progress Series has published 13 papers under the theme "Politics and socio-economics of ecosystem-based management of marine resources." Although the journal is traditionally available by subscription only, this theme section is available online for free.
http://www.int-res.com/articles/meps_oa/m300p241.pdf.

Pollinator Resources
The Pollinator Partnership celebrates the final week in June as National Pollinator Week. Pollinator Week has grown to be an international celebration of the valuable ecosystem services provided by bees, birds, butterflies, bats and beetles. The website offers links to many educational resources, including *Nature's Partners: A Comprehensive Pollinator Curriculum for Grades 3-6,* games, planting guides, and much, much more.
http://pollinator.org/index.html

The Polyquarium
The Macrogalleria is a website from the Department of Polymer Science at the University of Southern Mississippi. The project provides working knowledge of polymers and related concepts to students of all levels, at multiple levels. The program is informative and entertaining to both beginners and more advanced students of polymer science. The Polyquarium mimics aquarium displays.
http://www.psrc.usm.edu/macrog/sea/index.htm

P.O.N.D. – Protecting Our Natural Diversity
South Carolina High School students became interested in habitat encroachment and water pollution at their school. Students researched, designed, and implemented a variety of solutions aimed at increasing wildlife diversity, improving natural habitat, educating the community about environmental issues, and decreasing the amount of pollution entering wetlands. Projects included a riparian buffer zone around storm water retention pond, storm drain education, a nature trail, and bird habitat.
Contact Margaret Spigner at Margaret_Spigner@charleston.k12.sc.us

Population Connection
Population Connection's education program is a national population education program with a strong emphasis on teacher training for educators of grades pre-K through 12. The program offers age-appropriate curricula to complement students' science and social science instruction about human population trends and their impacts on natural resources, environmental quality, and human well-being. In addition to the curriculum, they provide hands-on training to teachers and student teachers.
http://www.populationeducation.org/index.jsp

Portal to Papahanaumokuakea
Join students from Duke University's Nicholas School of the Environment as they examine the challenges associated with managing and conserving marine biodiversity, using aspects of the Papahanaumokuakea Marine National Monument in the Northwestern Hawaiian Islands as the focus of several case studies. Check out their daily blogs and videos, and comment on what they are learning and the work they are doing at this remote marine wilderness.
http://www.nicholas.duke.edu/hawaii/
http://www.nicholas.duke.edu/hawaii/2010/

PortalOceanico.net - The Ocean Portal
This gateway is supported by UNESCO, and offers links to sources of ocean information on South America and the Caribbean. Some first-level topics include Education and Training; Information by Country; and more. Select "English" under the idiom box (left side of screen) to view site in English. Some items are available only in Spanish.
http://www.portaloceanico.net/

Postcards from the Eddy
ECOHAB Pacific Northwest is a 5-year multi-disciplinary project to study the physiology, toxicology, ecology and oceanography of toxic Pseudo-nitzschia species off the Pacific Northwest coast in the Juan de Fuca eddy. The resident Teacher At Sea, Herb Bergamini, posts "postcards" of his experiences on the R/V Atlantis during the 21-day research cruise including photos, daily logs, and interviews with the crew. He also responds to students' questions about oceanography and life at sea.
http://herb.northwestschool.org .

Postcards from the Poles: Antarctica
Scientists and science educators on expeditions Antarctica are describing what it's like to do science in Antarctica and what they are learning about the place. Educators will be sending in virtual postcards to describe the experience this season as Adelie penguin chicks hatch and grow on Ross Island. Other science educators on a research team with the Antarctic Geological Drilling Project will be sending in postcards documenting environmental changes that have affected the continent in the past.
http://www.windows.ucar.edu/tour/link=/people/postcards/antarctic_post.html&

Posters of Deepwater Gulf Species
The Flower Garden Banks National Marine Sanctuary research team offers a poster series depicting the conspicuous biota of the deepwater habitats of the Northwestern Gulf of Mexico, from depths between 50m to 150m. The poster series was developed to support the Secrets of the Gulf Expedition. The series includes separate posters for antipatharians, octocorals, sponges, fishes, and algae/invertebrates. High and low resolution versions of these posters are available.
http://flowergarden.noaa.gov/document_library/sci_documents.html

Posters of Marine Life
NOAA's National Marine Fisheries Service has reprinted its historic series of posters depicting species of fish, shellfish, marine mammals, and sea turtles that are indigenous to the United States. Commissioned over 30 years ago, these posters have become classics and continue to be one of the most requested items by constituents and school teachers alike. The eight posters can be viewed and purchased individually at the Government Printing Office's on-line bookstore.
http://bookstore.gpo.gov/collections/ocean_exploration.html

Potomac Highlands Watershed School
The Potomac Highlands Watershed School is a website where students in the Potomac Highlands and the rest of the Chesapeake Bay region can learn about local watershed issues, and teachers can come for educational support with lesson plans and ties to curriculum standards. The interactive website offers separate sections for elementary, middle, and high school students, along with a teacher site linked to activities, educational programs, references, and more.

http://www.cacaponinstitute.org/e_classroom.htm

The Power of Place: Geography for the 21st Century
The Annenberg Channel presents The *Power of Place: Geography for the 21st Century*, to teach the geographic skills and concepts that are necessary to understand the world. Geography educators and content experts from around the globe shed light on the physical, human, political, historical, economic, and cultural factors that affect people and natural environments. Maps, animation, and academic commentary bring into focus case studies from 50 sites in 36 countries.
http://www.learner.org/resources/series180.html

Power of Story
Master Storyteller Kendall Haven presented *Story: the Language of the Mind* at the ClimateWatch Summer Workshop, describing the science behind the power of story. The presentation can be watched on YouTube (in several parts), and the slides downloaded in pdf format on the NOAA website.
http://www.youtube.com/user/hunterba123#p/c/47CC56A7ABE17D4A/0/I2o34V6cs24
http://www.nodc.noaa.gov/General/NODC-About/Outreach/docs/10/OneNOAAScience_11Aug2010_Haven.pdf

Practical Uses of Math and Science
NASA's Practical Uses of Math And Science (PUMAS) website is a collection of brief examples showing how math and science topics taught in K-12 classes can be used in interesting settings, including every day life. The examples are primarily written by scientists, engineers, and other content experts. A peer-review process stresses originality, accuracy, presentation clarity, and connection to national math and science curriculum guidelines.
https://pumas.gsfc.nasa.gov/

PRBO Marine Division
The mission of PRBO's Marine Division is to use science to guide ocean ecosystem protection, conservation, and management. The website features detailed information about our many marine projects. These focus on predators as climate change and habitat quality bio-indicators; population dynamics; life history characteristics seabirds in relation to marine fisheries and pollution; and the creation of marine protected areas and marine reserves to protect ocean ecosystems.
www.PRBO.org/marine

Predicting the Weather
The Internet Scout Project focuses its Topic in Depth of the NSDL Scout Report for the Physical Sciences newsletter for June 10, 2005 on Predicting the Weather. The listed websites describe the basic tools and knowledge used to create weather forecasts; explore how the weather can impact local communities; provide graphics for five forecast models; and more.
http://scout.wisc.edu/Reports/NSDL/PhysSci/2005/ps-050610-topicindepth.php#1

PreK-8 Environmental Education Activity Guide
Project Learning Tree has released its PreK-8 Environmental Education Activity Guide. There were six main goals addressed with the comprehensive revision: improved reading connections; teacher support for differentiated instruction; assessment techniques; technology connections; content through updated issues, statistics, and

facts; and the overall design. Two new activities include *The Global Climate* and *Invasive Species*.
http://www.plt.org/cms/pages/21_21_10.html

Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments
The Climate Impacts Group offers the on-line Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments, designed to agencies prepare for climate change by recommending a detailed, easy-to-understand process for climate change preparedness based on familiar resources and tools. These steps include creating a climate change preparedness team; identifying community vulnerabilities to climate change; and identifying, selecting, and implementing adaptation options.
http://www.cses.washington.edu/cig/fpt/guidebook.shtml

Preserve America's Waterways
In partnership with several community-based youth organizations, Preserve America's Waterways seeks to generate one million community service hours to protect and preserve the nation's waterways. Visitors to the website can find ideas and guidelines, register their service projects, or find a local project.
http://www.pawaterways.org/index.php

Preserving Ocean Resources
This four page newspaper offers information relating long term ocean health and marine protected areas. Up to 10 copies are available to high school educators who are incorporating MPAs into their curriculum.
Contact christie_anastasia@nps.gov

A Primer on Invasive Species in Coastal and Marine Waters
What are invasive species? How long have invasive species been around? What changes can invasive species cause? How do invasive species get introduced? What agencies are trying to manage the influx of invasive species? These questions and more are addressed in this publication. The primer includes a glossary, international regulations, expert contact information, educational information links, and more.
http://www.flseagrant.org/program_areas/coastal_habitats/habitats_pm.htm

Prince William's Oily Mess
NOAA's National Ocean Service Communications and Education Division offers the newest Discovery Story entitled *Prince William's Oily Mess: A Tale of Recovery*. Aimed at the high school level, it includes educational materials on the Exxon Valdez oil spill that occurred almost 16 years ago in Prince William Sound, Alaska, and the research conducted since the accident. Included are an oil spill primer, hands-on activity using collected data, oil spill trajectory model, student and teacher guides, quiz, and more.
http://oceanservice.noaa.gov/education/stories/oilymess/welcome.html

Priority Conservation Areas: Baja California to the Bering Sea
The Commission for Environmental Cooperation and the Marine Biology Conservation Institute offer Priority Conservation Areas: Baja California to the Bering Sea, a new book and map that identify 28 aquatic environments which marine experts consider essential to safeguarding the biological diversity of the west coast of North America. The book presents key information regarding the biodiversity, ecological significance and threats

found in each area.
http://www.cec.org/pubs_docs/documents/index.cfm?varlan=english&ID=1756

Problem-Based Learning
Based at the University of Delaware, this set of peer-tested and vetted educational resources asks the question: "How can I get my students to think?" Problem-based learning is a method that asks students to work cooperatively in groups in order to seek solutions to real world problems. The website offers sample problem-based learning problems, which include several group exercises that deal with different scenarios from water problems to a case study problem in molecular evolution.
http://www.udel.edu/pbl/

Proceedings from the First International Marine Protected Areas Congress
Proceedings from the First International Marine Protected Areas Congress, held October 2005 in Australia, are now available. The document totals 665 pages and includes abstracts from all congress presentations, as well as full text of the meeting's plenary addresses. A full range of MPA issues is covered, including planning, management, science, and more. The file, 19 MB in size, is searchable by author, keyword, theme, and other criteria. It also includes a list of delegates with e-mail contact information.
http://www.impacongress.org/proceedings.htm

Professional Development Guidelines for Environmental Education
Developed by the National Project for Excellence in Environmental Education, the recently revised "Guidelines for the Preparation and Professional development of Environmental Educators" is a resource to help you design and implement effective high-quality EE professional development programs.
www.naaee.org/npeee

Project 3D-VIEW
Project 3D-VIEW (Virtual Interactive Environmental Worlds), designed and developed by U.S. Satellite Laboratory, Inc., is a NASA-funded, curriculum-based program for Grades 5 and 6. Students engage in simple-to-use, immersive 3D technologies with 3D imagery and animations, and learn standards-based concepts and practice inquiry in lithosphere, biosphere, hydrosphere, atmosphere, and Earth systems.
http://www.3dview.org

Project Archaeology
Project Archaeology uses archaeological inquiry to foster understanding of past and present cultures; improve social studies and science education; and enhance citizenship education to help preserve our archaeological legacy. The project offers publications, professional development for educators, networking opportunities, and continuing support for participants, teaching scientific inquiry, citizenship, personal ethics and character, and cultural understanding. Project Archaeology operates through a network of state programs.
http://www.projectarchaeology.org/

Project AWARE Teachers Guide
The Project AWARE Foundation conserves underwater environments through education, advocacy and action. The Foundation funds projects that have a direct benefit to the aquatic environment such as public education, grassroots conservation projects, volunteer-supported community activism, and more. The website highlights

wreck awareness through Respect Our Wrecks, including on-line public service announcements, a downloadable Aware Kids teacher's guide, grants, and more.
http://www.projectaware.org/

Project-Based Learning Newsletter
Project-Based Learning is a weekly resource for tools and information published by The George Lucas Educational Foundation. Each issue features original stories, as well as links to relevant news features, with a special focus on how K-12 students explore real-world problems, leading to a deeper knowledge of subject matter, greater motivation, and improved research and problem-solving skills. Issues in May explored a watershed project and a fish hatchery project.
http://www.edutopia.org/php/keyword.php?id=037

Project BudBurst 2009
Project BudBurst will officially launch the 2009 national field campaign for students, families and other volunteers on March 2, 2009. The project is designed to engage the public in the collection of important climate change data based on the timing of leafing and flowering of trees and flowers. New website features include field guides to phenophases, updated plant species Identification Guides, real-time mapping with Google Maps, new classroom resources, photo sharing of plant observations, and more.
http://www.windows.ucar.edu/citizen_science/budburst/

Project Budburst
Project BudBurst is a campaign of the National Phenology Network for citizen scientists. It is designed to engage the public in the collection of important climate change data based on the timing of leafing and flowering of trees and flowers. BudBurst participants take careful observations of the phenological events and the observations and records are reported into the BudBurst data base. The website offers an activity guides, teacher guides, data sheets, and more.
http://www.windows.ucar.edu/citizen_science/budburst/

Project Dolphin Campaign
NOAA Fisheries Office of Protected Resources has developed educational materials about the dangers of feeding and otherwise closely interacting with wild dolphins, including brochures, posters, warning signs, and public service announcements.
jill.lewandowski@noaa.gov

Project Evaluation Website Updated
The National Marine Sanctuary's California B-WET Program has completed the second phase of the Education Project Evaluation website. The website includes information on how to plan, design, implement, and report on evaluation of your education project, along an evaluation overview and links to helpful resources
http://sanctuaries.noaa.gov/education/evaluation/welcome.html

Project Kaisei
Project Kaisei will examine the largest area of the Plastic Vortex, an ocean gyre situated to the northeast of Hawaii, to collect and study plastic and other marine debris in order to showcase some of the new technologies that may be used for processing and recycling. Expected departure dates are August 2, 2009 for *The New Horizon* from San Diego, and August 4, 2009 for the *Kaisei* from San Francisco. Sign up to follow the expedition online, and check out the website for background information.

http://www.projectkaisei.org/

Project Oceanica
Project Oceanica continues to add new features to their website, including Fish Watch and Shelf Edge Reefs. Check out the Transects Program, designed to immerse undergraduate and graduate students in oceanographic research by taking them to sea to collect biological and geological samples and later analyze the data in the laboratory. Transects is funded for two years, and a total of four 5-day research cruises and follow-up oceanographic research courses will be offered over the 2 year project.
http://oceanica.cofc.edu/home.htm .

Project PHAEDRA 2006
NOAA's Ocean Explorer website offers archived information about the Partnership for Hellenic/American Exploration in the Deep Regions of the Aegean (PHAEDRA), the second season of a multi-year Greek-American ocean research partnership. An international team of engineers, geologists, geochemists, archaeologists, and historians embarked on the Greek research vessel Aegaeo to explore deep sites within Greek national waters.
http://www.oceanexplorer.noaa.gov/explorations/06greece/welcome.html

Project POWER
The New York Aquarium launched Project POWER, a national training seminar sponsored by the EPA with support from the New York State Department of Environmental Conservation. Participants represented 13 states with regulators from a broad range of agencies. The project stresses the need for a commitment to public education to protect our national wetland heritage and infuse marine science and wetlands conservation not only into a school's curriculum, but also into a community's curriculum. Project POWER is working to create the beginnings of a national network of state agency-environmental center partnerships with the capacity to provide educational workshops to wetland violators as well as to community members who live in environmentally sensitive areas so that violations can be avoided before they occur. Contact Merryl Kafka at mkafka@wcs.org

Project SeaCAMEL
On November 12-14, 2007, a special coral-reef research and education project will be taking place 20 meters below the sea surface in the underwater laboratory, Aquarius, studying corals and sponges on Conch Reef in the Florida Keys National Marine Sanctuary. The research will be broadcast live from Aquarius via the Internet, along with six classroom modules, each covering a different topic of coral reef sciences to classrooms of all levels all over the world.
http://www.marine-ed.org/bridge/index_seacamel.html

Project SeaCAMEL
Project SeaCAMEL (Classroom Aquarius Marine Education Live) is planned as the first in a series of "sea to shore" education missions planned by the Living Oceans Foundation, November 12-14, 2007. An underwater video crew from project partner Media Arts, Inc. will document the action in and around Aquarius, while project partner Immersion Presents will direct-link the SeaCAMEL mission ashore via satellite and the Internet, and will produce a multimedia science education and outreach program.
http://www.livingoceansfoundation.org

Project Shark Awareness
The Florida Museum of Natural History presents Project Shark Awareness, shark education and outreach programming for educators. This outreach program is created to educate the public about the myths and realities of shark biology, behavior, and conservation. The targeted audience consists primarily of students at middle schools, high schools, youth organizations, and environmental centers. The project has also received funding to hold professional development workshops.
http://www.flmnh.ufl.edu/fish/education/psa/psa.htm .

Project WILD Science and Civics: Sustaining Wildlife Curriculum
Project WILD's high school curriculum is designed to serve as a guide for involving students in environmental action projects aimed at benefiting the local wildlife found in a community. It involves young people in decisions affecting people, wildlife, and their shared habitat in the community. The program consists of four major components: awareness, participatory democracy, habitat exploration and taking action.
http://www.projectwild.org/materials/science_and_civics/science_and_civics.htm

Promise of Place
The Promise of Place website is a project of the Center for Place-based Learning and Community Engagement and is supported by the USDA Forest Service. It offers program ideas, case studies, research, links, and other resources to support place-based education projects. The Planning Tools section of the Resources and Curriculum offers tools and exercises; curriculum and other sections are being populated.
http://www.promiseofplace.org/

Protect Planet Ocean
The Protect Planet Ocean website aims to bring the best information on marine protected areas, including basic facts on each of nearly 5000 MPAs worldwide; the ability to upload information; discussions of the science of no-take marine reserves; multimedia content on MPAs; and more. *Oceans Live* offers live video from an underwater camera inside Glover's Reef Atoll World Heritage Area. The website also hosts The Official MPA Blog and MPA-related headlines from newspapers worldwide.
http://www.protectplanetocean.org/

Protect Your Climate Curriculum
The (California) Bay Area Air Quality Management District offers Protect Your Climate, a comprehensive climate protection curriculum with 16 lessons for grades 4-5, which can be easily adapted for other grades. The lessons investigate the science and causes of climate change and how students can take action to protect our climate through hands-on activities.
http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Climate%20Protection%20Program/protectyourclimate.ashx

Protected Area Tools
This section of the ConserveOnline website contains information, tools, and resources to help practitioners perform a variety of ecological, management, policy, and financial assessments that can contribute to an overall protected area system master plan. Materials include Marine Gap Assessment Quick Guide, Protected area systems monitoring, and more. While you're on the website, browse the library by subject category, including natural heritage programs, public education, and more.
http://conserveonline.org/workspaces/patools

Protected Area of the Week
The World Commission on Protected Areas (WCPA) and the Protected Area Programme (PPA) of the IUCN has launched a new initiative promoting protected areas worldwide as the best places on earth. Each week a different protected area from a different region and representing a different biome will be featured on the homepage of IUCN website, the WCPA website, on twitter, and igoogle.
http://www.iucn.org/about/work/programmes/pa/pa_paday/

Protected Areas Management Effectiveness Information Module
The Protected Areas Management Effectiveness Information Module contains information on protected areas management effectiveness. The module is linked to the World Database on Protected Areas, which allow users to obtain further information about the protected areas assessed. It also provides a space for users to submit information on management effectiveness methodologies and assessments as well as obtain further information on experts, publications, and links to related information.
http://www.unep-wcmc.org/wdpa/mehttp://www.unep-wcmc.org/wdpa/me

Protected Areas: Natural Solutions to Climate Change Crisis
The book, Natural Solutions: Protected Areas Helping People Cope with Climate Change, articulates how protected areas contribute significantly to reducing the impacts of climate change and what's needed for them to achieve even more. It is available for download from the website.
http://www.iucn.org/?4329/Protected-areas--natural-solutions-to-climate-change-crisis

Protected Planet
The United Nations Environment Programme (UNEP) has joined forces with the International Union for the Conservation of Nature (IUCN) to create protectedplanet.net, an interactive, social media-based website that aims to provide information on both widely known and lesser known protected places in the world. Using the latest satellite images, users can pinpoint individual protected areas, such as national parks or marine reserves, and zoom in for information on endangered species, native plant life, or terrain.
http://www.protectedplanet.net/

Protected Resources Education
The Office of Protected Resources works in cooperation with NOAA Fisheries Regions and Science Centers to provide educational experiences and materials for students, education professionals, and the public about the conservation and protection of marine species. The website includes links for kids to a variety of projects, activities, and information, including *The Kid's Times* about whales and turtles. There are also downloadable lesson plans and guidelines for responsible wildlife viewing.
http://www.nmfs.noaa.gov/pr/education/

Protecting Water Resources with Smart Growth
The EPA offers Protecting Water Resources with Smart Growth, intended for audiences already familiar with smart growth, seeking more ideas on how to protect their water resources. The document describes how communities and local governments have used smart growth practices to minimize impacts of new development on their water resources. Education sections describe how communities or local governments engage in activities such as water quality education, model town demonstrations, and more.
http://www.epa.gov/smartgrowth/water_resource.htm

Psychology of Climate Change Communication
The Center for Research on Environmental Decisions at Columbia University offers the online Psychology of Climate Change Communication. The guide is available in its entirety on the website, by individual chapter or as the complete guide.
http://cred.columbia.edu/guide/index.html

Public Lands Day
On September 29, 2007, lend a hand for the 14th annual coast-to-coast effort to clean up public lands to help preserve America's lands. The focus this year will be on countering the tide of invasive species taking over habitats and native species.
http://www.publiclandsday.org/

Publications Catalog – University of Delaware Sea Grant
This online catalog is designed to inform browsers of the wealth of publications and videos available from the University of Delaware Sea Grant College Program. Categories include Children's Activities, Hot Topic Fact Sheets, On-Line Expeditions, Videos, and more. Some are available for free downloading, others may be ordered.
http://www.ocean.udel.edu/seagrant/publications/pubcatalog.html

Publications on MMAs
The Science-to-Action partnership offers recommendations for successful implementation of marine managed areas (MMAs) to maximize the benefits to people and nature. Three new booklets draw on the results of more than 50 studies: *People and Oceans, Living with the Sea,* and *Marine Managed Areas: What, Why, and Where*.
http://www.science2action.org/

Public/Private Reef Conservation Campaign in Hawaii
The National Fish and Wildlife Foundation and partners has joined with Tesoro Corporation in developing a coral reef conservation program in Hawai'i that includes a public school curriculum and a community awareness campaign. The program is designed to support coral reef conservation and community projects.
http://www.honoluluadvertiser.com/apps/pbcs.dll/article?AID=/20080622/NEWS11/806220343/1021/LOCALNEWSFRONT

Pulse of the Planets' Educator Resources
The National Science Foundation's Pulse of the Planet offers lesson plans using Pulse of the Planet programs and sounds as a focus for learning activities on a variety of subjects. The lesson plans are aligned to national science education standards for grades K - 12. All lesson plans, along with downloadable audio files, are free for educational use; free registration is required.
http://pulseplanet.com/educatorresources/

Quahog Dissection
This Rhode Island Sea Grant informational page presents a descriptive guide to Quahog dissections. The page accompanies students performing the clam dissection, using colorful images and highlighted vocabulary terms to illustrate special features. In addition to general anatomy, the reference includes informational sections about feeding and digestion, and respiration and circulation. Linked terms direct users to related Sea Grant web pages.
http://seagrant.gso.uri.edu/G_Bay/HabitatEco/Shellfishing/quahog_dissect.html

Queen Anne's Revenge
North Carolina Department of Cultural Resources offers *Queen Anne's Revenge: Investigating, Interpreting & Preserving the Remains of Blackbeard's Flagship*. This website includes sections on archaeology, artifacts, conservation, education, and more.
http://www.qaronline.org/

Quick Guide to Conducting Marine Ecological Gap Assessments
Published by The Nature Conservancy, *A Quick Guide to Conducting Marine Ecological Gap Assessments* offers advice on analyzing gaps in conservation coverage for use in planning marine protected area networks. Featuring brief case studies from four nations (Ecuador, Grenada, Jamaica, and Palau) and best practices learned to date, the guide serves as an introduction and overview to ecological gap analyses.
http://conserveonline.org/workspaces/patools/resources/gapassessment/gapdocs/marinegapquickguide

QuikSCience Lesson Plans
The University of Southern California, Wrigley Institute for Environmental Studies, and Quiksilver Foundation offer downloadable lesson plans from the QuikSCience Challenge. Topics include global warming, marine pollution, and more.
http://www.usc.edu/org/cosee-west/quikscience/lesson_plans.html

Quizlet
Quizlet allows users to create flashcard sets with little fuss, and also share flashcards with friends via email, Facebook, or MySpace.
http://quizlet.com/

Race Around the World
The 2008-2009 Volvo Ocean Race education website, sponsored by Sail Newport and St. Michael's Country Day School, offers middle school students and teachers the opportunity to virtually race around the world with seven Volvo Ocean Race teams as they circumnavigate the globe. Track these teams while learning geography, marine science, math, history, physical science, and more. The website will be updated regularly, and currently offers activities for students, lesson plans, and more.
http://www.globallearning-sailnewport.org/

Rachel Carson Estuary Live
The Rachel Carson Component of the North Carolina National Estuarine Research Reserve site held their Estuary Live on September 21-22, 2004. The sessions were aligned with the North Carolina Science Standards will covered general estuary information, cephalopods, fouling communities, sustainable seafood, boating, and reptiles.
www.estuarylive.org .

Rachel Carson Online Book Club and Intergenerational Contest
Tthe Friends of the National Conservation Training Center has launched the Rachel Carson Online Book Club. Continuing through November 2007, the book club will focus on the life and work of Rachel Carson including her role as a female leader in science and government. Each month features distinguished guest moderators who will share insights and comments on the text.

The Intergenerational Contest Honoring Rachel Carson is a photo, essay, and poetry contest in honor of Rachel Carson sponsored by the EPA Aging Initiative, Generations United, and the Rachel Carson Council, Inc. The project must involve a person under age 18 and a person age 50 or older.
http://rcbookclub.blogspot.com/
http://www.epa.gov/aging/resources/thesenseofwonder/index.htm

Raising Your Water IQ
The Texas Water Development Board designed this learning resource to help K-6 students become more water wise. The site includes a series of interactive website modules, a 6th grade curriculum, and a K-3 coloring book with original Texas-centric characters.
http://www.twdb.state.tx.us/kids/

RAMP Cruise 2009
The Reef Assessment and Monitoring Program cruise to the Papahānaumokuākea Marine National Monument has begun aboard the NOAA ship *Hi'ialakai*. Scientists will revisit numerous sites around the remote islands and atolls to gather data on reef ecosystem health. Follow the mission through cruise logs, check out the crew biographies, and more.
http://sanctuaries.noaa.gov/missions/2009ramp/

Ramsar Site Database
The Ramsar Sites Database is now online. Wetlands International manages and develops the database. A search facility now makes it possible to find one or more Ramsar sites by selecting on nearly any combination of criteria, including wetland type or land use, designation date, and others.
http://www.wetlands.org/RSDB/default.htm .

Ramsar 'Toolkit', second edition (2004)
The 14-volume Ramsar Convention Handbooks for the Conservation and Wise Use of Wetlands, 2nd edition, is available for downloading. The Convention promotes an integrated package of actions to ensure the conservation and wise use of wetlands. The handbooks incorporate the guidelines, relevant material from other sources, and case studies designed to illustrate key aspects of the guidelines. Most of the full case studies can be found on the website of the Convention (http://ramsar.org/wurc_index.htm).
http://ramsar.org/lib_handbooks_e.htm .

Ramsar Video
The 22-minute Ramsar video, available in English, French, and Spanish, offers an introduction to the problems facing wetlands everywhere and focuses upon international case studies. For easier downloading, "Save Target As" (Microsoft Internet Explorer) or "Save Link Target As" (Netscape) and save the whole film to your hard disk, then launch.
http://www.ramsar.org/wwd2003_index.htm#offer

Rapid Assessment Protocols For Small Vessel Groundings
This paper discusses assessing impacts from small vessel groundings in coral or seagrass habitats. A series of 2-3 page protocols has been developed to provide guidance on collection of key ephemeral data after small vessel groundings, particularly where resources are limited and access is difficult.

Contact jmichel@researchplanning.com

Rare Earthtones - Endangered Species Ringtones
The Center for Biological Diversity offers free endangered species ringtones and phone wallpapers, a collection of high-quality, authentic sounds and images of some of the world's most threatened birds, owls, frogs, toads, and marine mammals. Cell phone users - check this one out!
http://www.rareearthtones.org/ringtones/

Rare: Inspiring Conservation
The RARE Center for Tropical Conservation has pioneered innovative approaches to achieving conservation results through community-based education. Rare supports hundreds of grassroots conservationists around the world each year, providing them with training, technical support, and resources. Its Pride campaign bridges the gap between the scientific realm and the daily lives of local people through social marketing techniques, making conservation messages relevant to the local community.
http://www.rarecenter.org/ .

Rating Islands
The National Geographic Center for Sustainable Destinations, in collaboration with George Washington University, conducted a Destination Scorecard survey. A panel of 522 experts in sustainable tourism and destination stewardship review conditions in 111 selected islands and archipelagos. The scores reflect the experts' opinions and the website offers quoted phrases from their remarks which suggest the thinking behind the scores.
http://www.nationalgeographic.com/traveler/features/islandsrated0711/islands.html

Ravenswood Media
Ravenswood Media produces natural history and social documentaries. They have pioneered a new Internet genre called the "webumentary". The webumentary conforms the documentary format into an online non-linear program by posting streaming digital video on the web. They offer nature, wildlife, environmental, and science video productions. Check out their web offerings on invasives, frogs, and more.
http://www.ravenswoodmedia.com/

Reach the World
Reach the World is a nonprofit educational media developer and a provider of schoolbased training in instructional technologies. Its mission is to link students and teachers in low-income communities with real-world, global expeditions that have the power to expand learning beyond the classroom. Follow the voyage of the Makulu, as the trade winds carry her across the Atlantic Ocean towards Barbados in the Caribbean Sea. Check out the materials in the Floating Classroom.
http://reachtheworld.org/ .

Real-time Data Resources from Ocean Observing Systems
This resource list of over 70 annotated web sites was developed as part of a national focus group study of K-12 educators who currently use real-time data in their classrooms. This list focuses on ocean-related datasets, but also includes weather and watershed resources. A Real-time Data Educators Mailing List is also available for subscribers at https://email.rutgers.edu/mailman/listinfo/rtd_educators.
http://marine.rutgers.edu/outreach/rtd/resources.htm

RealClimate
RealClimate is a commentary site on climate science by working climate scientists for the interested public and journalists. Their aim is to provide a quick response to developing stories and provide the context sometimes missing in mainstream commentary. The discussion on the website is restricted to scientific topics and will not involve political or economic implications of the science.
http://www.realclimate.org/

RealOceans
The Nicholas Institute for Environmental Policy Solutions' Ocean Program offers the website, RealOceans.org, to provide straightforward and concise information on ocean issues that can be used by policy makers, activists, researchers, and educators. The first project is the Ocean Ecosystem Based Management Knowledge Base.
http://realoceans.org/

Recreational Visitor Diversity
The United States Forest Service has recently issued two social-science reports on culturally diverse recreational visitors to national forests. Many such visitors are from urban areas; they include immigrants and others who have come from places with very different natural environments and attitudes toward nature. The reports, *Recreation visitor research: Studies of diversity* and *Serving culturally diverse visitors to forests in California: A resource guid,* are available online.
http://www.fs.fed.us/psw/publications/documents/psw_gtr210/
http://www.fs.fed.us/psw/publications/documents/psw_gtr222/

Recycling Revved Up
ScrapHouse was a temporary demonstration home built entirely of salvaged material on Civic Center Plaza, adjacent to San Francisco City Hall. You can watch the streaming video about the project from this website.
http://greenplanetfilms.org/product_info.php?products_id=677

Red List of Threatened Species
The latest update of the IUCN Red List of Threatened Species, the authoritative source of information on the status of plants and animals, will be released on May 4, 2006. This publication is one of the key tools used to determine the status of the Earth's biodiversity. A major new element since the last update in 2004 is the inclusion of many freshwater and marine species, notably sharks and rays, for the first time.
http://www.iucn.org/themes/ssc/redlists/techdocs.htm

Rediscovering Cordell Bank
For the first time since the designation of the Cordell Bank National Marine Sanctuary in 1989, from October 6-11, 2010, technical scientific SCUBA divers will revisit the shallowest parts of Cordell Bank's reef crest from the research vessel *Fulmar*. Check out the mission blogs and more.
http://sanctuaries.noaa.gov/missions/2010reefcrest/welcome.html

Reef Education Network
The Reef Education Network website from the University of Sydney and Tech Talk Australia offers background information about coral reefs, including origins, design, energy cycles, plants, animals, research, management, a glossary, and more.

http://www.reef.edu.au/default.htm

Reef Encounter On-Line Game
The SpielByWeb website provides a way for people to play various strategy games on the web. One of the offerings is Reef Encounter, whose aim is to grow the largest and strongest corals on the reef and then to feed these to your parrotfish in the brief time available. Points are awarded at the end of the game for the number and type of polyps that your parrotfish has consumed. Extensive rules are provided. A similar board game is also available for purchase at
http://www.zmangames.com/boardgames/reef_encounter.htm.
http://www.spielbyweb.com/

Reef Environmental Education Foundation
The Reef Environmental Education Foundation (REEF) was founded out of growing concern about the health of the marine environment, and the desire to provide the scuba diving community a way to contribute to the understanding and protection of marine populations. REEF has numerous programs and projects. Two of the main programs are the REEF Fish Survey Project and REEF's Field Station Program that includes the organization's latest initiative, the Non-Profit/Academic Field Station Program.
www.reef.org .

Reef Fest
Reef Fest is billed as a whole lot of music festivals throughout Florida and the Caribbean raising support for music education and coral reef conservation. The concept is founded on the principle that everybody loves music, and this offers a chance to find enjoyment in actually doing something people can identify with in the service of the threatened coral reefs that surround, protect, and bring income to their Caribbean country and way of life.
http://www.reeffest.org./

Reef Fish Guide (for the responsible aquarium hobbyist)
The goal of Reef Protection International's Reef Fish Guide program is to increase public awareness about the ethical implications of keeping coral reef fish as pets and provide those entering the hobby, as well as existing hobbyists, with the knowledge to make informed buying choices that contribute to coral reef conservation. The downloadable, one-page guide ranks popular fish species according to several categories, assigning fish into "Take it Home" (recommended) and "Keep it Wild" (avoid) lists.
http://www.reefprotect.org/fish_guide.htm#

Reef Fish Identification
REEF now offers their popular reef fish identification classroom course into a home study DVD course package for beginning fishwatchers in the Caribbean, Florida, and Bahamas. *Reef Fish Identification – A Beginning Course* teaches the basics of fishwatching, including identification of 50 commonly sighted species found in Florida and the Caribbean. A waterproof fish identification booklet, underwater REEF survey slate, and REEF survey materials are included.
http://www.reef.org/node/3106

REEF Fish Survey Project Tutorial
The Reef Environmental Education Foundation (REEF) offers an online resource in English or Spanish for those who would like to conduct or teach REEF Fish ID and

surveys. The REEF Tutorial emphasizes carrying out the survey, including the paperwork.
http://www.reef.org/education/REEF_tutorial_eng
http://www.reef.org/education/REEF_tutorial_esp

A Reef Manager's Guide to Coral Bleaching
The report, *A Reef Manager's Guide to Coral Bleaching*, offers reef managers information that can maximize the resilience of reefs to coral bleaching. The guide provides information on the causes and consequences of coral bleaching along with management strategies to help local and regional reef managers reduce bleaching threats to coral reef ecosystems. The downloadable report includes contributions from over 50 experts in coral bleaching and coral reef management from 30 organizations.
http://www.coris.noaa.gov/activities/reef_managers_guide/welcome.html

Reef Relief Founders
Reef Relief founders Craig and DeeVon Quirolo offer an online resource on coral reefs assembled during their work over the past 23 years in the Florida Keys and the Caribbean. The website hosts educational resources, images, multimedia, and more.
http://www.reefrelieffounders.com/

Reef Relief Founders Educational Materials
The Reef Relief Founders.com website offers numerous educational resources, images, multimedia, and more. Check out the downloadable *Coral Reef Teachers Guide* and many other resources.
http://www.reefrelieffounders.com/

Reef Survey Report with Links in Google Earth
The Australian Institute of Marine Science long term monitoring survey updates can now be viewed in Google Earth (Version 4), allowing you to zoom to each surveyed reef and view geo-referenced underwater photos and information from previous surveys. Using links to the reef pages, you can also view enlarged photos and a description of the reef habitat.
http://www.aims.gov.au/pages/research/reef-monitoring/ltm/ltm200708-09.html

REEF Website Redesign
The Reef Environmental Education Foundation (REEF) is a grass-roots organization that seeks to conserve marine ecosystems by educating, enlisting, and enabling divers and other marine enthusiasts to become active ocean stewards and citizen scientists. The redesigned REEF website will enable REEF to more effectively recruit, train, and engage divers and snorkelers in the Volunteer Survey Project and other conservation science programs. The website will also facilitate communication through Member Forums.
http://www.reef.org/

Reefbase
Reefbase, a coral reef resource portal, has been recently updated. The website provides data and information on the location, status, threats, monitoring, and management of coral reef resources in over 100 countries and territories, and offers easy access to data, information, publications, photos, and maps related to coral reefs.
http://www.reefbase.org/main.aspx

ReefBase Pacific
The ReefBase Pacific project supports biodiversity conservation, sustainable fisheries, and reef-dependent communities in the Pacific region. The database contains a wide range of published and grey literature, images, maps, and more. Virtual Marine Resource Education Center offers a searchable database for materials that support reef related education and outreach activities developed by various organizations.
http://www.reefbase.org/pacific/

ReefCheck Australia Educational Program
Reef Check Australia has developed an Educational Program for Years 4-7 (although some activities can be adapted for older or younger audiences), focusing on coral reefs, sustainability, and environmental monitoring. The materials have been created to work towards increasing awareness and engendering behavioral change towards more sustainable practices. The website also includes quick fact sheets, photocards, and a teachers' guide.
http://www.reefcheckaustralia.org/for-teachers.html

ReefRanger
Reef Ranger is an educational game that immerses the player in the complex world of coral reef management. The effects on coral reefs of human activities in the mountains all the way to the open ocean are simulated. The game is meant to instill to players an understanding of the complexities of human-environment interactions, the ecological processes in the management of coral reefs and adjacent watersheds, and complexities involved in deriving management strategies.
http://www.ncoremiami.org/reefranger/index.htm

Reefs at Risk in the Caribbean
Reefs at Risk in the Caribbean, in English and Spanish, reflects the culmination of a two-and-a-half-year collaborative effort involving over twenty organizations working in the wider Caribbean region. The project provides a region-wide analysis of human threats to coral reefs and evaluates economic losses likely to result from coral reef degradation. In addition to the summary, the data are downloadable from the website.
http://reefsatrisk.wri.org/

Reefs at Risk in the Caribbean Report
Coral Reefs in the Caribbean span an estimated area of 26 thousand square kilometers, which the authors say dissipates wave and storm energy when hurricanes approach the Caribbean, as well as Florida. The Reefs at Risk in the Caribbean Report, downloadable on this website, reveals that shoreline protection offered by natural Caribbean reefs saves countries between $700 million and $2.2 billion annually. This economic information was calculated through a special threat measurement index.
http://marine.wri.org/pubs_description.cfm?PubID=3944 .

Reefs on the Web
Reefs on the Web is a collection of links to websites on coral reefs and reef-related resources as a result of research conducted for an article on coral reef websites. Still under construction, it currently hosts listings of publications, governmental and non-government sponsored websites, and a section on monitoring and surveys. While the Communication & Education link still remains to be populated, this website offers a quick source of useful information for students and teachers.
http://barbiemail.googlepages.com/home

ReefTemp
ReefTemp is a mapping product that provides information on coral bleaching risk for the Great Barrier Reef region through a Google Earth application. ReefTemp images are updated daily and include the raw SST, positive SST anomaly, the Degree-Heating Days, and a new thermal stress index, the Heating Rate, all calculated at 2km resolution. ReefTemp produces high-resolution now-casts of bleaching risk and provides an improved ability to monitor heat stress in the Great Barrier Reef.
http://www.cmar.csiro.au/remotesensing/gbrmpa/ReefTemp.htm

ReefVid
Dr. Peter Mumby provides a resource of free coral reef video clips for educational use. Currently, there are approximately 550 video clips on the website, designed for use in PowerPoint, covering reef ecology, diseases, coral bleaching, hurricane impacts, human impacts on reefs, corals, fish, sponges, mangroves, seagrass beds, and more. The website includes a search function and instructions for inserting the clips into your presentations. They can be played from the website or downloaded, and include brief descriptions of each clip.
www.reefvid.org

Referencing Made Easy
The Deadline Due beta website creates a Harvard Reference for a research paper when a book's title or ISBN is entered.
http://www.deadlinedue.com/

Regional Information Centers on MPA Planning Processes
The National Marine Protected Areas Center launched a series of web-based regional information centers designed to provide comprehensive information on ongoing federal, state, and tribal MPA planning processes. Stakeholders can search the information centers by region of the US or by state. While the information centers are a work in progress and not all regions are completely populated, the Pacific Coast and New England regions are either complete or include a significant amount of information.
http://www3.mpa.gov/mpa_calendar/query/searchbyregion.aspx

The Regional Ocean Conservation Club
The purpose of the Regional Ocean Conservation Club (ROCC) is to develop a student coalition where students are encouraged to take an interest and become involved in local marine and aquatic issues facing the environment. The mission is to have high school students work with local, state and national organizations to protect and restore the health of marine and aquatic resources through education and conservation programs.
http://www.igfa.org/ROCC.asp .

Remote Sensing and Coral Reefs
NOAA's Coral Reef Watch offers *Remote Sensing and Coral Reefs*, a free, downloadable curriculum unit for 4th – 6th grade students on remote sensing and its application to monitoring coral reefs. This set of 7 lesson plans is also appropriate for many middle school classrooms, and many of the lessons can stand alone as individual classroom activities. Topics include Remote Sensing and the Electromagnetic Spectrum, Introduction to Coral Reefs, Coral Reef Conservation, and much more.
http://coralreefwatch.noaa.gov/satellite/education/reef_remote_sensing.html

Remote Sensing Lesson Plans from IMaRS
The Institute for Marine Remote Sensing (IMaRS) provides education outreach through a number of venues. IMaRS has presented teacher workshops, with hands-on tools for the manipulation of satellite data as well as background information necessary to provide the correct information to their students. On-line lesson plans and background information are available on their website. The lesson plans include both broad marine science concepts as well as specific remote sensing lab work.
http://education.imars.usf.edu/index.html

Remote Sensing Toolkit
The aim of the online remote sensing toolkit is to show managers, scientists, and technicians working in marine, terrestrial, and atmospheric environments how images collected from satellites and aircraft can be used to map and monitor environmental features or processes and their change over time. Users can select to view graphics or read the text. The resources section offers a quick list of manuals and data sources.
http://ww2.gpem.uq.edu.au/CRSSIS/tools/rstoolkit_new/index.html

Repeat Glacier Photography at Kenai Fjords
Kenai Fjords National Park, located on the eastern edge of Alaska's Kenai Peninsula, is home to the largest concentration of tidewater glaciers in the U.S. National Park System. Changes in these glaciers have never been more obvious nor easy to comprehend, thanks to a cooperative project between the National Park Service and the U.S. Geological Survey.
http://www.oceanalaska.org/research/rptglacier-video.htm

Reports from a Warming Planet
American RadioWorks has released this special report on the early signs of climate change. A team of eleven reporters were led by environmental journalist Sandy Tolan. Their assignment was to identify different places around the world where global warming was making changes to both life and landscape. Visitors to the website can listen to the entire radio documentary and read about some of the individual locations profiled in this presentation.
http://americanradioworks.publicradio.org/features/earlysigns/index.html

Research-Based Online Learning Event Model Webinars
COSEE-Ocean Systems offers a series of Research-Based Online Learning Event (ROLE) Model webinars featuring ocean scientists and educators from across the country. Join these experts as they present marine science content through concept-map presentations of their research. The free, hour-long webinars provide direct access to scientists as well as customizable, take-home resources. Check out the link to previous webinars while on the website.
http://cosee.umaine.edu/programs/webinars/

Research and Monitoring in the National Estuarine Research Reserve System
Special Issue 45 of the *Journal of Coastal Research* is a volume dedicated to research and monitoring in the National Estuarine Research Reserve System (NERRS). It represents the outgrowth of many years of research and monitoring conducted at 26 NERRS sites around the country. The papers comprising this comprehensive publication consist of a wide array of studies conducted by individuals in academia, state and federal government agencies, and independent research institutions.

Contact Dr. Michael J. Kennish at kennish@imcs.rutgers.edu

Resilience Websites
The Nature Conservancy and partners offer two websites addressing the issues of resiliency: Reef and Coastal Resilience. Check out the downloadable Reef Resilience Toolkit, Future Scenarios Mapper, upcoming events, background information, and much more.
http://www.reefresilience.org/home.html
http://www.coastalresilience.org/

Resource Guide For Oceanography and Coastal Processes
The *Oceanography and Coastal Processes Resource Guide* has been developed by the Operation Pathfinder participants. These 81 lesson plans, aligned with National Science Education Standards, support the infusion of concepts and appropriate activities concerning oceanography and coastal process into classrooms across the country. The lesson plans cover coastal processes, organisms and habitats, geology, and chemistry. They range from ROV manipulator arms to camouflage to creatures in the coral.
www.coast-nopp.org/toc.html
www.usm.edu/aquarium

Resource Ranger Club
The Environmental Education Coordination Team was formed to coordinate EE efforts in the Pensacola, Florida area. Team members include agency and industry personnel, teachers, and others. They have developed the curriculum-based Resource Ranger Club, an environmental club in elementary and middle schools. This club includes classroom presentations, follow-up activities, field trips, and a series of award-winning video shows.
godwine@wfrpc.dst.fl.us or 850-595-8910 ext 226.

Resources for Earth Sciences and Geography Instruction
Central Michigan University hosts this clearinghouse for science educators and students interested in the fields of earth science and geography. The website is organized alphabetically around the sequence of topics that one might encounter in an introductory earth science or physical geography class, including Atmospheric Circulation, Earth Science Animations, Rivers, Water Resources, and much more. Each topical area includes links to online resources, complete with a short description.
http://webs.cmich.edu/resgi/

Resources for Environmental Literacy: Science-Environment Modules for Teachers
The Environmental Literacy Council's Resources for Environmental Literacy project brought together scientists, classroom teachers, and curriculum developers who gathered materials from a variety of disciplines and sources to produce professional development materials for middle level and high school teachers in physical science, earth science, life science, biology, and physics. Downloadable modules include:

- Earth Science - earthquakes, volcanoes, and plate tectonics;
- Life Science - species diversity and the impact of mass extinctions;
- Biology - the science, risks, and tradeoffs of genetically modified crops;
- Physical Science - Earth's energy balance and global climate change; and

- Physics - the science of radioactivity and issues surrounding the disposal of radioactive waste.

http://www.enviroliteracy.org/subcategory.php/316.html

Resources for Learning
The American Museum of Natural History offers Resources for Learning, an online collection of activities, articles, and more, for educators, students and anyone interested in teaching or learning about science. There are over 1000 resources to choose from, browsable by topic, keyword, and special collection. Topics include earth science and biology; special collections include water, climate change, and Ology, the museum's website for kids.
http://www.amnh.org/education/resources/

Resources for Scientists in Partnership with Education
Resources for Scientists in Partnership with Education (ReSciPE) is a project of the Coorperative Institute for Research in Environmental Sciences (CIRES) with funding from the National Science Foundation. ReSciPE is designed to assist scientists who are engaged with K-12 education. The program offers professional development workshops, development and sharing of resources, and a research study.
http://cires.colorado.edu/education/k12/rescipe/

Respect the Beach
Respect the Beach is a coastal educational program that includes classroom lectures, handouts, video, hands-on projects, and more, designed to teach coastal watershed processes, shoreline ecology and coastal areas stewardship. The program is brought into classrooms by Surfrider members, who represent ocean environmentalism from the surfer's perspective, and who are role models that students can relate to. Programs include Beachology, Watershed Works, and the Snowrider Project.
http://www.surfrider.org/programs/respectthebeach.asp .

Respected Access
Tread Lightly! has developed the first products from a multi-dimensional education and outreach campaign built around a central slogan, *Respected Access is Open Access*. The message is simple – responsible behavior leads to continued access. Check out the public service announcements, resources, and more.
http://www.respectedaccess.org/open-access/

Restore the Gulf
Created by the federal government, RestoretheGulf.gov provides the public with information on the response to the Deepwater BP oil spill, along with news updates and links to other governmental partners. The Assistance area contains information about claims and appeals, how to stay safe in and around the area, and also about how to volunteer with relief efforts. Other categories include news, response, and more.
http://www.restorethegulf.gov

Reuse Warehouse
Another Good Idea: The City of Houston Building Materials Reuse Warehouse accepts donated construction materials from builders, supply companies, remodelers, contractors, and individuals. These materials are made available at no charge for use by any non-profit organization. The warehouse benefits the community by providing

storage space for excess building material that would otherwise be dumped in local landfills.
http://www.greenhoustontx.gov/reuse.html

Richmond Bridge Harbor Seal Survey
The Richmond Bridge Harbor Seal Survey is a collaborative research project between San Francisco State University and the California Department of Transportation, examining possible effects of seismic-related bridge construction on resident harbor seals in the San Francisco Bay. The website provides an overview of the project; tracking and tagging activities; and basic information about harbor seals. The site also provides Kids' Pages with photo ID matching, and wildlife of San Francisco Bay.
http://userwww.sfsu.edu/%7Ehalmark/seals.htm

Ridge 2000 Deep Sea Explorations
Ridge 2000 is a multidisciplinary science research program focused on integrated geological and biological studies of the mid-ocean ridge system. The premise of Ridge 2000 science is that life in deep-sea ecosystems is linked to the flow of energy and material from Earth's deep mantle, through the volcanic and hydrothermal systems of the oceanic crust, to the deep ocean. The website offers a materials and information; the expeditions page links to current and past research cruises,
http://www.ridge2000.com/index.html .

Riffle Fish
Riffle Fish is an evolving webumentary about the plants and animals that live in the riffles of rivers and streams. The on-line documentary will include new clips about the insects, mollusks, fish, and amphibians that make up the riffle community. The site will also provide interviews about the science of riffle ecology and the conservation efforts to preserve their biodiversity.
http://www.rifflefish.com/

Right Whale Game
The Ocean Conservancy partnered has created a website devoted to right whales. The site offers an interactive right whale game where you can navigate the right whale safely through trash, lobster traps, and ships; right whale information; a coloring page, and more.
http://www.oceanconservancy.org/site/PageServer?pagename=OceanHall

Ring in Oyster Season
The Bridge features a series of Data Analysis Teaching Activities (DATAs) that can be used to supplement curriculum materials. The Bridge DATA, On the Half Shell, explores *Vibrio vulnificus*, a virulent bacterium that occurs naturally in warm coastal waters. Students will examine five years of Centers for Disease Control data to explore the dangers associated with improperly handled seafood.
On the Half Shell http://www.marine-ed.org/bridge/index_archive1204.html

Rip Currents: Break the Grip of the Rip
NOAA's National Weather Service and National Sea Grant Program, in partnership with the United States Lifesaving Association, are working together to raise awareness about the dangers of rip currents. Research is also being conducted in order to develop and improve the ability to predict the occurrence and strength of rip currents. A new website

has background information, a downloadable brochure and sign, and links to other information.
http://www.ripcurrents.noaa.gov/index.shtml .

Rivers Alive Clean-Up - Georgia
Register your cleanup event for Georgia's annual volunteer waterways cleanup by July 31, 2007 to receive free T-shirts or patches for your volunteers (first come first serve basis), a radio Public Service Announcement, educational posters, and promotional posters to help you advertise your cleanup event.
http://riversalive.com/ra_index.htm

Rivers to Reef
The Rivers to Reef segment of the Gray's Reef Ocean Science Course is now available. It includes a DVD of a feature length program that describes the Altamaha River Watershed and its direct influence on Gray's Reef. The DVD program features underwater footage of Gray's Reef and of inland areas through which the river flows as well as interviews with key players in studying the various links of the watershed. The package includes a manual of background information and activities.
Contact Cathy Sakas at Cathy.Sakas@noaa.gov

Rivers, Trails and Conservation Assistance Program
The Rivers, Trails and Conservation Assistance program provides staff time and technical assistance for projects that need an extra hand to take the next leap forward to success. The program works with citizens' groups and non-profits, helping them realize their vision of how to improve their communities. The website offers informational publications, information about applying for assistance, links to online resources for river conservation and trail development, and more.
http://www.nps.gov/rtca

Riverquarium
The Flint Riverquarium will open in Albany, Georgia, to promote conservation through aquatic exhibits and educational experiences that engage diverse audiences by interpreting the unique ecosystems of the Flint River watershed. Exhibits will feature fish and other aquatic animals from the Flint River and downstream, including Apalachicola Bay, Lake Seminole and the Gulf of Mexico. In addition, the Riverquarium hosts a World of Water exhibit featuring river systems from around the world.
www.flintriverquarium.com .

RMS *Titanic* Expedition 2004
Dr. Robert Ballard and scientists from NOAA and other institutions spent 11days, May 27-June 12, 2004, at the site of the sunken remains of the R.M.S. Titanic, mapping the ship and conducting scientific analyses of its rapid deterioration. The team worked aboard the NOAA research vessel Ronald H. Brown and used ROVs to document the current state of Titanic. Educators and scientists developed a series of lesson plans for students in Grades 5 – 12 that are specifically tied to the Return to Titanic Expedition.
http://oceanexplorer.noaa.gov/explorations/04titanic/welcome.html and www.returntotitanic.com .

Road to Recovery
The Center for Biological Diversity has created a website detailing the conservation efforts that caused the populations of 100 endangered species in every U.S. state and

territory to increase. The website includes information about the conservation efforts along with a chart of the species' population over time. Citations allow those interested to research deeper into each species' recovery.
www.esasuccess.org

Rock the Boat
The University of California Sea Grant Extension Program offers a myriad of online resources for boating environmental education. The program has published a variety of materials on how boaters can help to protect water quality and native marine life. The website offers information on clean boating practices, reducing pollution from antifouling paints, and preventing invasive species from riding on boat hulls. Materials include technical reports and fact sheets, video-documentary and radio PSAs, and more.
http://seagrant.ucdavis.edu

Role of Protected Areas in Sustaining Society
The proceedings of the World Congress on National Parks, which took place in Bali, Indonesia, in October 1982, *National Parks, Conservation, and Development - the Role of Protected Areas in Sustaining Society* can be downloaded in pdf format from the IUCN (World Conservation Union) Protected Areas Learning Network website. While on the website, check out other documents using the browse feature.
www.parksnet.org/docs/0/77231_documents_document_file_65.pdf

Roundhouse Marine Studies Lab and Aquarium School Programs
The Roundhouse Aquarium is now booking for 2008-2009 field trips. Classes include Marine Science Education Field Trips for grades K-12, Key to the Sea for K-5 teachers, Tidepool Field Studies and Tidal Wave Outreach, and more. Some grants are available.
http://www.roundhouseaquarium.org/school.html

ROV Competition
Teachers interested in learning about Remotely Operated Vehicle (ROV) technology and its application in ocean studies, and in learning how to build a ROV with students and pull together a student team to participate in a regional ROV competition, can join NOAA's Monitor National Marine Sanctuary and others for the 3rd Annual Mid-Atlantic Regional MATE Remotely Operated Vehicle Competition, April 19, 2008 in Hampton, Virginia.
http://marinetech.org/rov_competition/regional_contests/regional_contest.php?rov_competition_id=48

ROV Competition
The Marine Advanced Technology Education (MATE) Center and the Marine Technology Society's ROV Committee are partnering with Ocean.US and the Ocean Research Interactive Observatory Networks (ORION) Program to organize their 5th annual international student ROV design and building competition. The Neutral Buoyancy Laboratory at the NASA Johnson Space Center will host the event in June 2006. The 2006 ROV competition will focus on ocean observing systems.
http://www.marinetech.org/rov_competition/index.php

RSMAS Oil Spill Website
The University of Miami's Rosenstiel School of Marine and Atmospheric Sciences has established an oil spill educational outreach website. It offers a timeline, satellite images, modeling and predictions, and more.

http://www.rsmas.miami.edu/oil-spill/

RU COOL
Rutgers University Coastal Ocean Observation Lab focuses on the bio-physical processes of the coastal ocean. The lab is involved in research projects where operational observatories are used to collect real-time data for adaptive sampling. The website offers research data, papers, and presentations; sections for educators and students; multimedia; and much more.
http://rucool.marine.rutgers.edu/

RubiStar – Free Generic Rubrics for Teachers
Rubics can be quite time-consuming to develop. The RubiStar website provides tools to help the teacher who wants to use rubrics but does not have the time to develop them from scratch. RubiStar provides generic rubrics that can simply be printed and used for many typical projects and research assignments, or customize your own from their format.
http://rubistar.4teachers.org .

Run for Water
The Dow Live Earth Run for Water, April 18, 2010, will consist of events in countries around the world, featuring concerts and water education activities aimed at igniting a tipping point to help solve the water crisis.
http://liveearth.org/en/run

Russian-U.S. Arctic Census 2009
The RUSALCA mission set sail from Nome, Alaska on the Russian Research Vessel *Professor Khromov* on August 22, for a 40-day voyage into the Bering Strait and northwards to the Pacific side of the Arctic Ocean. RUSALCA stands for Russian-American Long Term Census of the Arctic, and also means mermaid in Russian. Visit the website for an overview of the mission, along with links to blog posts, RSS feed, and more.
http://oceanexplorer.noaa.gov/explorations/09arctic/

Rx Effects
Rx Effects is the newsletter of the Fire Effects Monitoring Program in the National Park Service. It is an outlet for information on Fire Effects Monitoring, fire research, and other types of wildland fire monitoring. The newsletter is annually produced for the National Park Service but anyone with an interest in fire ecology is encouraged to submit information about their program or research. The newsletter is a mixture of science, entertainment, and the occasional haiku. Rx Effects is issued each year in the spring.
http://www.nps.gov/fire/fire/fir_eco_rxeffects.cfm

Sad Day for Oxford Junior Dictionary
In order to make room for modern words like MP3 player, chatroom, and database, the latest edition of the *Oxford Junior Dictionary* removed many nature-related words as a result of the changing landscape. So BlackBerry now takes the place of blackberry, and it's a cautionary tale for ivy.
http://www.nextnature.net/?p=3110

Safeguarding Wildlife from Climate Change Webinars
The National Wildlife Federation offers a series of monthly webinars with experts on climate change and wildlife related issues. They will highlight experts in the emerging climate change and wildlife field as well as state and federal agencies in the forefront of integrating climate change into their wildlife management efforts. The archives are posted and include a pdf of the presentation, background reading, the recorded seminar, and more.
http://training.fws.gov/EC/Resources/climate_change_webinars/archives.html

Sally Ride Science Festivals
Sally Ride Science Festivals bring together hundreds of middle school girls for a festive day of science and socializing, to support girls in grades 5-8 in their interest in science and in possible science-related careers. Dr. Ride provides the keynote speech, and girls can enjoy a hands-on science street fair and attend discovery workshops on a variety of science careers. There are often workshops for parents and teachers.
http://www.sallyridefestivals.com/

Salmon & Steelhead: A Time for Recovery
The Steelhead and Stream Recovery Coalition has recently created and released a movie about the plight of Steelhead Salmon and how we can protect them. The QuickTime movie is downloadable from the website or available at no charge to marine educators for classroom use and distribution.
http://www.steelheadrecovery.org
Contact Marla Morrissey at marlamorrissey@gmail.com

Salt Marshes: A Natural and Unnatural History
This book puts salt marshes into a broad environmental context. Chapters include salt marsh basics, pollution, and restoration. The appendix has a species index, and the book comes complete with references and an index.
http://rutgerspress.rutgers.edu/acatalog/Salt_Marshes.html

San Diego Bay: A Story of Exploitation and Restoration
The book, San Diego Bay: A Story of Exploitation and Restoration, features a synthesis of artistry and information in describing a complex urban marine environment - the historic and present uses of San Diego Bay. The book was researched, written, and designed by a class of 64 high school students at High Tech High in San Diego. The stories revolve around progress in the region related to local geography and the utilization of resources. The book includes oral histories and much more.
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=SG022

San Diego Natural History Museum Exhibits
The San Diego Natural History Museum website offers companion material to a changing array of museum exhibits. The exhibit information includes online activities, educational resources, field guides, online lectures, and much more. In addition to the current exhibits, make sure to check out the archives of past offerings, including Glow: Living Lights, Earth, Wind & WILDFIRE, and much more.
http://www.sdnhm.org/exhibits/

San Diego Natural History Museum Field Guides
The San Diego Natural History Museum's Biodiversity Research Center of the Californias works to understand and interpret the biodiversity of Southern California and

the peninsula of Baja California. The museum provides links to information about its various departments and offers online access to databases for two collections. On-line checklists and field guides are available for a variety of regional plants and animals.
http://www.sdnhm.org/fieldguide/index.html

San Francisco Ocean Film Festival
The San Francisco Ocean Film Festival will take place February 3-7, 2010 in San Francisco, California. Three short films to be included were created by students in the National Marine Sanctuary and partners' Ocean For Life program this past summer; two will be featured in the main program, and the third in the special Youth Program which should draw up to 1,100 middle- and high-school students from 23 schools.
http://www.oceanfilmfest.org/

San Francisco Ocean Film Festival
San Francisco Ocean Film Festival is celebrating its 5th anniversary, February 2-3, 2008 in San Francisco, California. It is dedicated to using film to enhance the public's appreciation for the ocean's multifaceted importance to our planet. By screening a wide variety of films from all over the world, the audience is able to experience works that are largely unavailable to the general public. Participants will walk away entertained, better educated, and motivated to actively participate in ocean conservation.
http://www.oceanfilmfest.org/

Sanctuaries of the Caribbean
Sanctuaries of the Caribbean is a short film about MPAs in the Southeastern Caribbean, produced as part of the Coastal and Marine Management and Education in the Southeastern Caribbean project. It can be viewed on YouTube.
http://www.youtube.com/watch?v=sMKKkpLreXw

Sanctuaries Fun Pages
The National Marine Sanctuaries For Fun website offers games and downloads for young students. Download the new Ocean Guardian Activity Book, play the Kure Waste Chase game, go on a virtual submersible dive into Monterey Bay, work puzzles, and much more. Students can spend hours here, learning about the ocean all the while.
http://sanctuaries.noaa.gov/education/fun/

Sanctuary Atlas Maps, Images, and Videos
Download atlas maps, high resolution images, and watch compelling videos from the 14 marine protected areas managed by NOAA's National Marine Sanctuaries Program.
http://sanctuaries.noaa.gov/pgallery/

Sanctuary Calendars
The National Marine Sanctuary Foundation is a non-profit organization created to assist the National Marine Sanctuary Program with education and outreach programs designed to preserve, protect and promote meaningful opportunities for public interaction with the nation's marine sanctuaries. T
http://nmsfocean.org/

Sanctuary Integrated Monitoring Network
NOAA and partners have launched SIMoN, the Sanctuary Integrated Monitoring Network, a user-friendly website featuring background information about three West Coast national marine sanctuaries, Monterey Bay, Gulf of the Farallones, and Cordell

Bank, along with information about the latest scientific research in these locations. Topics include rocky shores, estuaries, geology, and much more. The website includes a photo library, interactive maps, species database, and more.
http://www.sanctuarysimon.org/index.php

Sanctuary Integrated Monitoring Network
The Monterey Bay National Marine Sanctuary launched the Sanctuary Integrated Monitoring Network (SIMoN). Users can access the website to obtain local water quality monitoring information, generate watershed maps, locate monitoring information, link to data sets from individual stations, and download GIS layers.
http://mbnms-simon.org .

Sanctuary Sam
The NOAA National Marine Sanctuary Program has announced the launch of a new national ocean literacy, education, and public awareness campaign featuring Sanctuary Sam, a California sea lion who will be the program's "spokes-sea lion." Sanctuary Sam will help convey messages to the American public, particularly children, about the marine environment, highlighting the current problems facing the oceans, including pollution, marine debris, and habitat destruction. Learn more by visiting his MySpace page.
http://myspace.com/sanctuarysam

Sanctuary Science Conservation Series
The Marine Sanctuaries Conservation Series provides a forum for publication and discussion of the complex issues the National Marine Sanctuary Program faces. Topics of published reports vary and may include descriptions of educational programs, discussions on resource management issues, and results of scientific research and monitoring projects.
http://sanctuaries.noaa.gov/science/conservation/welcome.html

Sanctuary Watch
Sanctuary Watch is a publication produced by NOAA's Office of National Marine Sanctuaries. It includes news about happenings in the sanctuary program, "Critter Files" that highlight specific species of animals, spotlights on sanctuary partners and staff, and beautiful photos. Subscribe to the online publication and look through past editions on the website.
http://www.sanctuaries.noaa.gov/news/sw/welcome.html

Sanctuary Watch: Education Edition
Ocean education and hands-on field activities from around the country are highlighted in the new education edition of the Sanctuary Watch newsletter produced by NOAA's National Marine Sanctuary Program. You can subscribe to Sanctuary Watch electronically by sending an email to requests@willamette.nos.noaa.gov and putting "subscribe sanctuarywatch" in the subject line.
Sanctuary.Education@noaa.gov .

Sands Teach
The recent scuttlebutt discussion on using sand in teaching has generated an exchange of great websites that can help you incorporate sand as a teaching tool in your classrooms. Check out some of these resources, and don't forget to check out the links from the Bridge (search on "sand").
http://www.sandcollectors.org/ISCSHomeIndexx.html

http://www.jaster.20m.com/Trading/TradeList.html
http://www.educationworld.com/a_tech/tech/tech080.shtml
http://www.chariho.k12.ri.us/curriculum/MISmart/ocean/sandintr.html

Sandwatch
Sandwatch is a volunteer network working together to monitor and enhance their beach environments. The Sandwatch Manual is available for downloading from the website. This manual includes activities, such as making a set of sieves to measure sand composition, using Google Earth to map the beach, and steps for designing and implementing a Sandwatch project. The manual also has information relating to climate change and a set of climate change adaptation activities to build beach resilience.
http://www.sandwatch.ca/index.htm

Sandwatch
Sandwatch seeks to modify the lifestyle and habits of children, youth, and adults on a community-wide basis and to develop awareness of the fragile nature of the marine and coastal environment and the need to use it wisely. It is an educational process through which school students and community members learn and work together to critically evaluate the problems and conflicts facing their beach environments and to develop sustainable approaches to address these issues. With a strong field monitoring component, Sandwatch tries to make science 'live' yet remains inter-disciplinary with applications ranging from biology to woodwork and from poetry to mathematics.
http://www.sandwatch.ca/index.htm

Santa Barbara Ocean Film Festival
Santa Barbara's Ocean Film Festival will be held October 22-23, 2008 in Santa Barbara, California.
http://www.ocean.com/index.asp?LocationID=311&CatId=311

Satellite Observations in Science Education
The Satellite Observations in Science Education website from the University of Wisconsin promotes the teaching and learning of the Earth system through quality educational resources that make use of satellite observations. The website includes learning activities, resources useful to building your own learning activities, satellite data, and more.
http://www.ssec.wisc.edu/sose/

Satellites and Bleaching
NOAA Coral Reef Watch offers an online tutorial that takes the student through coral bleaching, satellite technology, and how we use satellite data to monitor for the conditions that cause bleaching. The tutorial uses non-technical language and can be useful for students, teachers, and others wanting to learn more about coral reefs and satellite technology. The lessons are tied to National Science Education standards for use in the classroom.
http://coralreefwatch.noaa.gov/satellite/education/tutorial/welcome.html

Satellites and Orbits: an Introduction
NOAA's Satellite and Information Service takes complex satellite and orbit information and transforms them into easy to understand concepts with lots of animation sure to catch a student's attention, for grades 8-12. Highlights include a short satellite history, a non-mathematical review of basic orbital physics, orbital terminology, and orbit types

with a focus on Earth observation and environmental monitoring. Other features include a hands-on demonstration, a student activity, background information and instructions.
www.npoess.noaa.gov

Satellite Resources
NOAA's Satellites and Information Service manages data relating to the Earth and solar environments. The National Environmental Satellite, Data, and Information Service has compiled a website listing resources of interest to students and educators. Materials include posters and slide sets, teacher guides and quizzes, fact sheets and handouts. Links lead to numerous related sites, such as the World OceanAtlas, the Climatic Data Center, and sources of information on sea ice, ice shelves and glaciers.
http://www.nesdis.noaa.gov/outreach_edu.html

Satellite Tagging of Marine Mammals and Turtles
These satellite tagging units from WhaleNet can be used in learning different concepts, including geography, habitat use by organisms, math, map skills, comprehensive reading, and more. The active tags are highlighted, and over 155 archived satellite tagging events are available.
http://whale.wheelock.edu/whalenet-stuff/stop_cover.html

Save Our History
This History Channel website provides a downloadable Educator's Manual designed to help educators incorporate local history into the classroom and introduce students to the concept of preservation. The manual includes lesson plans for elementary, middle, and high school teachers linked to state history standards in all 50 states.
http://saveourhistory.com/

Save Our History, Save Our Ships
"Save Our Ships" is the History Channel's effort, in conjunction with National Maritime Historical Society, to stem the tide of deterioration and destruction of historical ships. The website offers a short teacher's manual with lesson plans, as well as a special online exhibit of five ships featured in The History Channel's documentary, *Save Our History: Save Our Ships*. The resource page provides links to websites and books for more information.
http://www.historychannel.com/classroom/saveourships/default_home.html

Save the Whales Outreach Programs
Save The Whales offers hands-on classroom programs in Monterey and Santa Cruz Counties. Programs include the Land & Sea Watershed Model, Marine Mammals: Adaptations and Communications, Sea Otters: A Story of Survival, and more.
http://www.savethewhales.org/wow.html

Saving Springer
The NOAA documentary, Saving Springer, is a story about the work that the NOAA Fisheries Office of Protected Resources, does on a daily basis. It is about a young killer whale and the dedication of NOAA professionals helping return her to her family. It will air on 90 public television stations around the nation over the next several months. The next airings are Mobile, Alabama/Pensacola, Florida, on November 14 and 17, 2004, and Champaign, Illinois on November 14 and 18, 2004.
Check local Public Broadcast Stations.

Saving Sturgeon
Sturgeon are unusual fish that have changed very little since prehistoric times. Learn about this living dinosaur and their fight for survival in the Bridge Data Analysis Teaching Activity (DATA), *Saving Sturgeon*. Students will explore Virginia Institute of Marine Science data that evaluates the interaction of sturgeon with the commonly used gill net. These nets, which can stretch for tens to hundreds of meters, trap fish by entangling them as they try to swim through the net. This DATA can also be used to investigate by-catch and its effect on slow-to-mature species.
http://www.marine-ed.org/bridge/index_archive1107.html

Scaling Up Marine Management: The Role of Marine Protected Areas
This report from the World Bank assesses factors likely to determine marine protected areas' success and identifies opportunities for the bank and its partners to scale up MPA implementation to meet global conservation targets. The report focuses on how best to capture the potential benefits of MPAs for helping the world's poor while addressing the sociocultural and political realities of restricting access to the sea and regulating what has traditionally been considered common property.
http://siteresources.worldbank.org/INTCMM/Publications/21108865/Final_Printed_Version_MPA_ESW.pdf

Scaling Weather – Northeast Snowfall and Tornadoes
NOAA has devised two enhanced scales for rating severe weather phenomena – northeast US snowfall impact, and an enhanced Fujita scale for tornadoes. NESIS, or the Northeast Snowfall Impact Scale, calculates the impact of a powerful snowstorm soon after it strikes, giving it a rank similar to that given to tornado strength. The enhanced Fujita scale for tornadoes will continue to rate tornadoes from F0 to F5, but the range of wind speed in each category will now be more accurate and more variables will be taken into account, including building type, structure and trees.
http://www.ncdc.noaa.gov/oa/climate/research/snow-nesis/
http://www.spc.noaa.gov/efscale/

SCHOLARS Program from the National Climatic Data Center
The National Climatic Data Center (NCDC) hosted approximately 60 students for the unveiling of their educational CD and educational packets. The NCDC signature program, SCHOLARS (Serving Customers and Helping Others Learn through Applications Involving Remote Sensing), can also be viewed on the website. The students toured the museum, listened to presentations on both geostationary and polar orbiting satellites and experienced the Magic Planet.
www.ncdc.noaa.gov/oa/edu.html

Schoolyard Geology
The U.S. Geological Survey's Schoolyard Geology website offers activities and examples of what to look for to turn your schoolyard into a rich geologic experience. It introduces teachers to the possibilities for teaching geology to students in familiar, easily accessible, and personally relevant settings through a series of complete lesson plans. The website is divided into mapping your schoolyard, rock stories, and GeoSleuth Murder Mystery.
http://education.usgs.gov/schoolyard/

Schoolyard Habitats
The National Wildlife Federation assists schools in developing outdoor classrooms called Schoolyard Habitats®, where educators and students learn how to attract and support local wildlife. The downloadable How-To Guide for Schoolyard Habitats walks through the steps to creating a successful and sustainable wildlife garden, provides information on teaching in an outdoor classroom, and offers resources to help create and maintain the habitat.
http://www.nwf.org/schoolyard/

Schoolyard Wildlife Habitats Best Management Practices
The Georgia Wildlife Federation has been helping schools with schoolyard wildlife habitat since 1987. The program provides an outdoor classroom where students can apply what they learn in the classroom to the natural world. Many of similar projects have been difficult for schools to maintain over time. Tthe Georgia Wildlife Federation provides "Planning First to Make Your Outdoor Classroom Last; A Best Management Practices (BMP) Guide for Creating and Sustaining Outdoor Classrooms in Georgia."
www.gwf.org/bmpindex.htm

Schreyer Institute for Teaching Excellence: Tools for Teaching and Learning
The Schreyer Institute for Teaching Excellence at Pennsylvania State University has created this website to give educators access to a wide range of teaching and learning tools. Sections include Course Design and Planning, Teaching and Assessment Strategies, Tools for Course Evaluation, and more. Users can read and download specific activities geared towards syllabus improvement, writing effective and meaningful tests, and incorporating problem-based activities into the classroom.
http://www.schreyerinstitute.psu.edu/Tools/

Science
The peer-reviewed general-science journal *Science* is an outlet for scientific news, commentary, and cutting-edge research. The website offers the full text of the journal's news stories, research reports, and commentary articles in a searchable database. The website is enhanced by additional information, links, multimedia, and more; science jobs; science careers; and a Science Express area with selected original, peer-reviewed hot research weeks ahead of its print publication date.
http://www.sciencemag.org/

Science Animations
Practical demonstrations of various scientific principles may be difficult, if not impossible. North Harris College offers this website, which functions as a clearinghouse for science animations created by a wide range of institutions from the University of Hawaii to Cambridge University. Categories include ecology, plants, animals, with animations of the greenhouse effect, classification schemes, pond life videos, and more.
http://science.nhmccd.edu/biol/animatio.htm

Science Animations
Created by staff at North Harris Community College, this website offers animations in a number of topics, including plants, ecology, geology, and more. Each section contains links to animations from various institutions.
http://science.nhmccd.edu/biol/animatio.htm#ecology

Science Approach
Science Approach is dedicated to translating scientists' research and data into inquiry-based lessons for students. They offer a variety of educational materials including free, downloadable materials; registration is required. Check out the GIS lesson on zebra mussel distribution, sign up to become a reviewer, read about the CoastLines project to facilitate rapid deployment of GIS in schools, and more.
http://www.science-approach.com/

Science Behind the Scenery
This free DVD, *Science Behind the Scenery*, is available to middle school and high school educators from the Point Reyes National Seashore. The DVD explores the Science at Point Reyes National Seashore, Northern Elephant Seals, Coho Salmon and Steelhead Trout, Fire Management, Vegetation Mapping, and much more. English and Spanish subtitle options are included.
http://www.nps.gov/archive/pore/educate.htm

Science Buddies
Science Buddies offers free science fair project ideas, answers, and tools for students and teachers. The project includes science and technology professionals interacting directly and indirectly with the students, making science real and helps lead students to projects that are more challenging and have greater science content than projects they might choose on their own.
http://www.sciencebuddies.com/

Science Bulletin Website
The Science Bulletin website, sponsored by the American Museum of Natural History, highlights breaking news on astrophysics, earth sciences, and biodiversity. The bulletins present current science news stories through interactive videos (5- to 7-minute video stories that follow scientists into the field), photographs, graphics (using 3-D computer models), and interactive data visualizations (using NASA satellite data). Be sure to look through *Jellies Down Deep*.
http://sciencebulletins.amnh.org/ .

Science Careers
Science magazine from the American Association for the Advancement of Science (AAAS) offers this Science Careers website, with information and commentary on the state of the science workplace environment. The site is dedicated to furthering careers in science and technology, and offers a searchable science job database. In addition, visitors can check out the Forum to ask questions about future employment opportunities and career development, the Grants and Funding section, and much more.
http://sciencecareers.sciencemag.org/

Science, Education, and Marine Archeology Program in Portugal (SEMAPP)
The Ocean Technology Foundation offers a submersible diving expedition to explore Portimao Canyon off the coast of Portugal from April 12-19, 2004. They will study the biodiversity and geology of the canyon and look for 14th-18th century shipwrecks from the Age of Exploration. The web offerings will include "Ask the Explorers," daily logs, and questions related to the expedition that can be turned into lessons for your students.
http://www.oceantechnology.org/semapp.htm .

Science Events At Your Fingertips
The National Science Teachers Association has an online calendar identifying science-related events and activities. This information includes programs, grants, and workshops in the field of science. Visitors can search by category, grade level, or region, and submit their own upcoming event.
http://www.nsta.org/main/calendar/events.php

Science Explorations
Science Explorations is a collaboration between the American Museum of Natural History and Scholastic, created to promote science literacy among students in grades 3-10. Science Explorations offers a series of online investigations featuring the latest scientific discoveries of the museum's experts. Upcoming investigations include invertebrates (in February) and reptiles (in May). The website includes a searchable database of lesson plans and activities, teaching tools, and more.
http://teacher.scholastic.com/activities/explorations/

Science Fair Season
Help your students plan, carry out, and present a great science fair project this spring with help from the Bridge. In our *Guiding Students* section you will find teacher-reviewed resources to help students get a leg up on the competition with annotated links to information on preparing a great project and tips for presenting it to the judges. Presentation information covers oral presentations, reports, and posters, and discusses the most effective way to convey experiments to the public.
Science Fair Resources http://www.marine-ed.org/bridge/index_student_res.html

Science Fairs Central
Discovery Education provides digital resources to schools and homes with the goal of making educators more effective, increasing student achievement, and connecting classrooms and families to a world of learning. They offer the Scotch Science Fair Central website, a resource center for science fairs.
http://school.discoveryeducation.com/sciencefaircentral/

Science of Fire
QUEST is a TV, radio, web, and education series by KQED that explores science, environment, and nature in Northern California. This website with *Into the Inferno, The Science of Fire* offers great fire footage, information about fuel treatments, Smokey the Bear cartoons, and fire ecology. It goes inside the fire season, looking at how the history of forest management could be feeding today's flames. The website also offers links to additional fire resources.
http://www.kqed.org/quest/television/view/609

Science is Fun!
The *Science is Fun!* website includes sections on wildlife games, environmental science games, science fair projects, and much more. Links from the website include the Annals of Improbable Research, The Yuckiest Site on the Internet, Bad Astronomy, and more, along with more conventional game and information websites. Check this one out.
http://science.house.gov/resources/science_fun.shtml

Science Friday Kid's Connection
Science Friday is a weekly National Public Radio show that discuses the latest research with science and policymakers. Science Friday Kids' Connection takes that material and turns it into science lessons for middle school kids. Each topic includes a summary of the discussion that took place on the show, resources, references, and more.
http://www.kidsnet.org/sfkc/

Science from the Poles
This site from the Exploratorium in San Francisco is designed to celebrate the start of the International Polar Year with webcasts that highlight the work of scientists at both the North and South Poles. Sections include presentations on climate change and another that focuses on the work of scientists who are constructing the largest telescope ever utilized in a polar region. In addition, users can view videos that address different themes, including sense of place, ice diving, penguins, and more.
http://www.exploratorium.edu/poles/index.html

Science Nation
National Science Foundation's *Science Nation* is billed as the online magazine that's all about science for the people. The online magazine reports on science breakthroughs and technological developments using video clips, first-hand reporting, written articles. Topics include tornadoes, climate change effects on Emperor penguin populations in Antarctica, and much more.
http://www.nsf.gov/news/special_reports/science_nation/index.jsp

Science Netlinks: Web Resources for Science Teachers
The American Association for the Advancement of Science website offers background information and useful resources for educators, including Science Books and Film; Science Careers; and Science Netlinks. Science NetLinks offers standards-based Internet resources for students including downloadable lesson plans and links to additional background materials and websites.
http://www.aaas.org/port_educators.shtml
http://www.sciencenetlinks.com/

Science News
Science News is the magazine of the Society for Science and the Public. Major topics include Earth, Environments, Science & Society, Science News for Kids, and more. The Bookshelf offers reviews of the latest science-oriented, books, while Multimedia offers videos and photo slideshows to explain scientific research. Issues can be read online; visitors can also subscribe to a variety of blogs.
http://www.sciencenews.org/

Science of Marine Reserves
The *Science of Marine Reserves* is now available online in an interactive format. The new educational layer in Google Earth, the MPA Layer, shows the locations of over 4000 MPAs around the globe. The case studies are highlighted in the layer through interactive graphics, along with meta-analysis depicting responses inside marine reserves around the world. In addition, the expanded information from the case studies booklet is hosted on Protect Planet Ocean.
http://www.piscoweb.org/outreach/pubs/reserves
http://earth.google.com/outreach/kml_entry.html#tMarine%20Protected%20Areas
http://www.protectplanetocean.org/somr/effectsInside.html

The Science of Marine Reserves
The updated Science of Marine Reserves is offered by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). The booklet is now presented in two English versions: a U.S. version and an international version. These resources provide the latest scientific information about reserves in an understandable and accessible format. They are designed to be used by natural resource managers, government officials, scientists, and the interested public.
http://www.piscoweb.org/outreach/pubs/reserves

Science Nation
The National Science Foundation offers Science Nation, a weekly series of video programs examining breakthroughs and the possibilities for new discoveries. Each program features a two-minute and five-minute version. Current videos include extremophiles, tornadoes, and more.
http://www.nsf.gov/news/special_reports/science_nation/index.jsp

Science Objects - Online
Science Objects, professional development from NSTA, are two-hour, online, interactive, inquiry-based content modules that help teachers better understand the science content they teach. Check out Ocean's Effect on Weather, Earth's Changing Surface, Plate Tectonics, and more. Many are available for free.
http://learningcenter.nsta.org/search.aspx?action=browse&subject=38

Science and Photography through the Microscope
Dennis Kunkel Microscopy, Inc. presents the Microscopy and Science Education Web Site. This site provides both a fine image bank for general use and general information about the art and science of this scientific field. The education image library database allows you to browse the contents by category or perform a search. Educators and students may request permission for image use through the website.
http://education.denniskunkel.com/

Science Reference Services
The Library of Congress Science Reference Services website hosts a myriad of useful and interesting information. The Everyday Mysteries offers archived questions and answers about questions you've thought about but never pursued. The Science Tracer Bullet Series contains research guides that help locate information on science and technology subjects. They offer brief introductions to the topics and lists of resources and strategies for finding more. For help with student science projects, the website offers a long list of useful references, both Internet and hard copy. Additional reference lists are provided for subjects such as The Crisis in Science Education, Selected Internet Resources for Teachers, and much more.
http://www.loc.gov/rr/scitech/

Science and the Sea
Check out this website from the University of Texas Marine Science Institute in Port Aransas. You will find 2-minute radio broadcasts, information about marine debris and man-made structures in the sea, quizzes, and more.
http://scienceandthesea.org/

Science Snacks
The Exploratorium: Museum of Science, Art and Human Perception in San Francisco offers *Science Snacks*, miniature science exhibits that teachers can make using common, inexpensive, easily available materials. The Snacks are divided into easy-to-follow sections that include instructions, advice, and helpful hints. Most of the Snacks can be completed by one person. A section called "etc." offers interesting bits of additional scientific and historic information.
http://www.exploratorium.edu/snacks/index.html

Science as Storytelling
This classroom exercise was peer-reviewed by participants at the *Preparing Teachers to Teach Earth Science* Workshop at Carleton College, and was authored by B.R. Bickmore and D.A. Grandy of Brigham Young University. The exercise can help students gain a more sophisticated conception of the nature of science. The site contains teaching notes and tips, learning goals, and the essay.
http://serc.carleton.edu/teacherprep/resources/activities/storytelling.html

Science Today
Science Today is a one minute radio program produced by the University of California. The website provides the program on demand, in audio and text, as well as the archives for the program. Visitors can also browse by subject, including air quality, oceanography, and more, and get more in-depth information through the features, including marine mammal, global warming, and fire issues.
http://www.ucop.edu/sciencetoday/index.php

Science Tracks Downloads From Teachers' Domain
Teachers' Domain offers free science track downloads for IPods. Topics available include Life Science, Earth and Space Science, and more. Resources available for download include videos and educator guides with discussion questions, background essays, and additional materials.
http://deimos3.apple.com/WebObjects/Core.woa/Browse/wgbh.org

ScienceEducation.gov
ScienceEducation.gov is a portal for federal agency resources on science, technology, engineering, and mathematics education content. The website includes lesson plans, curricula, classroom activities, professional development, and more. Searches can be filtered by resource type, grade level, and agency. This is a newly released website and changes and additions will continue to be made.
http://www.scienceeducation.gov/

Scientific Committee on Antarctic Research
The Scientific Committee on Antarctic Research is charged with initiating, developing and coordinating high quality international scientific research in the Antarctic region. This website will be a useful research site for those interested in the International Polar Year. The Publications section of the website includes many downloadable resources, including topical articles addressing sea-level changes and climate transformation and a link to the Antarctic Digital Database for GIS users.
http://www.scar.org/

Scientific Principals
NSTA offers a complimentary, monthly e-newsletter written especially for elementary school principals, dedicated to helping their teachers in science. Scientific Principals offers a science toolbox of new ideas and practical applications.
http://science.nsta.org/scientific_principals/

Scientific Visualization Studio
NASA's Scientific Visualization Studio facilitates scientific inquiry and outreach within NASA programs through visualization. The studio works with scientists in the creation of visualization products, systems, and processes in order to promote a greater understanding of Earth and Space Science. Animations include hurricane upwelling, island underwater flybys, beach erosion, and much more.
http://svs.gsfc.nasa.gov/index.html

SciGuides
The National Science Teachers Association offers SciGuides™ as an online "science toolbox". The SciGuides tools allow teachers to quickly locate targeted science content information and teaching resources from NSTA-reviewed science websites. Teachers can also use SciGuides to transform science content into effective classroom resources by locating and incorporating online lesson plans and providing tips for teaching the content and examples of effective student assessments.
http://www.nsta.org/main/SciGuides

SciLinks about Squids
SciLinks are normally available to NSTA members only, but links to a variety of marine animal information have been made available to all for a brief period of time. Browse through the links for animal diversity, mollusks, squid, pond scum, and more. Be sure to look at "Octopus Walking".
http://www.scilinks.org/retrieve_outside.asp?sl=74456611444466$7445773311$9911551066

SciLinks Assignment Tool
SciLinks®, NSTA's Internet referencing system, now features a new Assignment Tool to help teachers create and review student online assignments, and help gauge student progress. SciLinks is accessible using print-linked codes found in many textbooks, NSTA Press books and journals, and independently as a benefit for all NSTA members.
http://science.nsta.org/nstaexpress/nstaexpress_2004_05_10_extra.htm .

SciLinks on Weather and Global Warming
NSTA's SciLinks program links teachers and students to teacher-approved web sites to support science instruction. While SciLinks is primarily offered through the pages of science textbooks and NSTA Press publications, NSTA Express is making three popular topics available for free access, for a short period of time.

- What is Weather? (K–4)
  http://www.scilinks.org/retrieve_outside.asp?sl=63823447142110221066
- Measuring Motion (5–8)
  http://www.scilinks.org/retrieve_outside.asp?sl=63823447145510221066
- Global Warming (9–12)
  http://www.scilinks.org/retrieve_outside.asp?sl=63823447149910221066

SciJinks Weather Laboratory
NOAA and NASA offer the SciJinks Weather Laboratory, an interactive web site for middle school students, teaches about predicting weather patterns. The Educators link at the bottom of the page offers suggestions on how to use the SciJinks resources in the classroom.
http://scijinks.jpl.nasa.gov/weather/

SciPacks
SciPacks from the NSTA Learning Center are 10-hour online learning experiences that teachers can use to help better understand the content you teach. SciPacks are aligned with the National Science Education Standards. Select SciPacks are available at no charge, with topics including weather and climate, plate tectonics, water, and much more.
http://learningcenter.nsta.org/products/scipacks.aspx

S'COOL - Students' Cloud Observations On-Line
Students' Cloud Observations On-Line (S'COOL) is a project which involves school children in real science. The CERES (Clouds and the Earth's Radiant Energy System) is a high priority scientific satellite instrument orbiting the Earth which scientists use to study the ways clouds may affect the Earth's climate. S'COOL Students provide ground truth measurements to assist in the validation of the CERES instrument. They also compare the surface- and space-based observations to learn about clouds and climate.
http://asd-www.larc.nasa.gov/SCOOL/pamphlet.html
http://asd-www.larc.nasa.gov/SCOOL/SCOOL.html

The Scoop on Soil
The National Geospatial Development Center presents educational pages featuring "The Soil Game," hands-on educational materials, posters, lesson plans, and links to other soil-related resources. *The Scoop on Soil* is an interactive game for elementary grades; the website includes a related 4th grade lesson plan.
http://www.ngdc.wvu.edu/~hferguson/educationNGDC/

SCUBA Scouts
The SCUBA Scouts were started in 2001 and provide project leadership for the Coral Reef Evaluation and Monitoring Program in the Tampa Bay, Gulf of Mexico, and Florida Keys. The SCUBA Scouts train in advanced SCUBA and scientific diving to observe underwater phenomena relating to artificial coral reefs and to acquire the scientific data. They receive training and mentorship from Florida Fish and Wildlife Research Institute and other professional research scientists and graduate students conducting research.
http://scubascouts.org/

Scuttlebutt
Ocean science educators can talk informally about marine education ideas, issues, and questions on "Scuttlebutt", the Bridge email discussion list. The listserv is monitored by Bridge staff, who also locate expertise for posted questions as needed. All educators and scientists interested in marine science education are invited to subscribe. Scuttlebutt is a unique list, just for marine educators and researchers interested in marine education.
http://www.vims.edu/bridge/index_scuttle.html

Sea Aggie Preview for Prospective Students - Texas
The Office of Student Relations of the Texas A&M University at Galveston (TAMUG) held its Fall Sea Aggie Preview as an opportunity for prospective university students and parents to visit the campus to learn all about the opportunities at TAMUG to study ocean-oriented academic programs in transportation, science, engineering, business and liberal arts at the by-the-sea campus. Research and public service involve the Gulf of Mexico and Galveston Bay, which border the island campus.
http://www.tamug.edu/admrc/preview/Sea%20Aggie%20Preview/index.htm

Sea Around Us
The Sea Around Us Project provides an integrated analysis of the impacts of fisheries on marine ecosystems, and to devise policies that can mitigate and reverse harmful trends whilst ensuring the social and economic benefits of sustainable fisheries. The website includes Internet GIS maps, background information, and downloadable reports, including *Competition between Marine Mammas and Fisheries: Food for Thought* and *Seamounts: Biodiversity and Fisheries*.
http://www.seaaroundus.org/project.htm
http://www.seaaroundus.org/BooksReportsF.htm

Sea Ducks of Alaska
The Center for Alaskan Coastal Studies has developed a hands-on activity guide for grades 4-6 on the Sea Ducks of Alaska. The guide offers teacher background information and teaching activities that explore sea duck adaptations, their role in food webs, provides an opportunity to research Alaskan species, and looks at conservation issues.
www.akcoastalstudies.org

Sea Education Association K-12 Lesson Plans
The Sea Education Association offers at-sea experiential programs with shore and sea components to develop students' and teachers' ability to apply scientific thinking and method to the marine environment. Lesson plans are posted for teachers to help bring the ocean into the classroom. Topics include marine biology and ecology, geological and physical oceanography, and nautical science, listed by grade level and topic.
http://www.sea.edu/k12LessonPlans/k12pgmtop.htm

Sea Floor Mapping
NOAA's Ocean Service Communications and Education Division, in cooperation with NOAA's Office of Coast Survey, launched this new educational offering, Sea Floor Mapping. Designed for students in grades 3-5, the activity teaches young people about mapping the sea floor and why it is important. The website includes the online activity, movies and pictures, background information, and more.
http://oceanservice.noaa.gov/education_new/seafloor-mapping

Sea Grant Reporter
The University of Delaware, College of Marine Studies' annual Sea Grant Reporter provides an update about its research and educational activities as a Sea Grant institution, encouraging Delawareans to become informed, become involved and stay connected through the various programs of the college. In addition, public input is sought on coastal issues through a survey; the publication also lists volunteer opportunities.
www.ocean.udel.edu/publications/Newsletter/reporter/2005/

Sea Ice
NASA's Earth Observatory features an article on sea ice in the Arctic and Antarctic, including background information, monitoring, references, and more.
http://earthobservatory.nasa.gov/Features/SeaIce/

Sea Level Affecting Marshes Model
The U.S. Fish and Wildlife Service has posted simulations of sea-level rise impacts for several coastal estuaries online on this website. The simulations are the product of the landscape-change model which uses existing wetland, land use, and elevation data combined with local information on subsidence, accretion, and other factors, along with a variety of projections of sea level rise to predict the effect of 45 different sea-level rise scenarios on coastal marshes and shorelines.
http://www.fws.gov/slamm/

Sea Level from Space
NASA's Jet Propulsion Laboratory offers the Ocean Surface Topography From Space website. Continuous data from satellites like TOPEX/Poseidon and Jason help us understand and foresee the effects of the changing oceans on our climate. The website offers an education section with links to interactive exhibits, classroom activities, and much more. Other website features include news, mission information, a gallery, and more.
http://sealevel.jpl.nasa.gov/index.html

Sea Level Rise Conference Online
The International Conference on Sea Level Rise in the Gulf of Mexico took place March 1-3 in Corpus Christi, Texas. The oral presentations and recorded videos of sessions are available online for downloading.
http://www.sealevelrise2010.org/video/
http://www.sealevelrise2010.org/oral%20Presentations.htm

Sea Level Trends
The Bridge Data Analysis Teaching Activity: Sea Level Trends is designed as an introductory activity exploring just one facet of global climate change. Students will access real scientific data to investigate and compare long-term changes in sea level from different coastal locations around the United States.
http://www.marine-ed.org/bridge/sealeveltrends.html

Sea Monsters: A Prehistoric Adventure Movie
National Geographic and the National Science Foundation offer *Sea Monsters: A Prehistoric Adventure Movie*. This website provides photos and video clips from the movie about creatures that roamed the seas 82 million years ago. Discover sea monsters of the past and present using the interactive timeline. Excavate fossils on a "virtual dig." The website links to lesson plans and more.
http://www.nationalgeographic.com/seamonsters/

Sea Partners Campaign
The U.S. Coast Guard Sea Partners Campaign is an environmental education and outreach program. Its aim is to develop community awareness of maritime pollution issues and to improve compliance with marine environmental protection laws and regulations. For more information about local Sea Partners efforts, contact your nearest

Coast Guard Marine Safety Office or Captain of the Port. The directory is available for downloading from the first website.
http://www.uscg.mil/units.html
http://www.uscg.mil/hq/g-m/nmc/seapart.htm

Sea Search
Sea Search is a monitoring program for community groups volunteering in Victoria, Australia's Marine National Parks and Sanctuaries. Volunteers can explore and learn about the diversity of marine plants and animals found in Victoria's marine protected areas while adding to the scientific knowledge of the parks. Community and school groups work with park rangers and a project officer to collect seasonal data in their local MPA and at nearby control sites. The website includes an overview document for community-based monitoring, individual guides for intertidal, subtidal, and seagrass monitoring, data entry sheets, and field fact sheets. *MPA News #81* (at http://www.mpanews.org) includes a discussion about the program, challenges faced, and lessons learned.
http://www.seasearch.org.au/index.htm

Sea & Ships
The goal of the National Maritime Museum in England is to illustrate the importance of the sea, ships, time, and the stars and their relationship with people. The Sea and Ships Directory divides the material up by Subjects, People, Collections, Online Galleries, and Games and Interactives. Check out the Your Ocean link from the Games and Interactives. The *Your Waste* lesson gives visitors the opportunity to test their skills at managing an oil spill clean-up operation; other interactives include *Your Climate*.
http://www.nmm.ac.uk/explore/sea-and-ships/

Sea Stories
The Sea Stories Project, an international initiative of the Blue Ocean Institute, accepts first-person writing and art about the sea, coast, and sea-life from ocean-lovers of all levels and backgrounds. Memoirs, essays, poetry, and imaginative nonfiction are all welcome, as are photographs, drawings, or other visual arts. The inaugural issue of Sea Stories is now online, devoted to nurturing appreciation and concern for the world's oceans through writing, art, and conversation.
http://www.seastories.org/
http://www.seastories.org/current.html

Sea to Shining Sea – Partners in Conservation Webcast from Texas and Alaska
The *Sea to Shining Sea – Partners in Conservation* webcast, November 14, 2003, covers global topics and issues from Alaska to Texas. It is divided into three major topical areas: A Sense of Place: Understanding the Habitat; Wildlife: Adaptations and Concerns; and Human Impact and Involvement. Topics, guiding questions, curriculum standards, Internet resources and activity ideas are included online.
http://www.tpwd.state.tx.us/expltx/eft/seacenter/guide.phtml

Sea Talk
As a public service in conjunction with more than 35 area radio stations, Delaware Sea Grant produces SeaTalk, a bimonthly series of 30- and 60-second radio announcements on subjects ranging from sharks to sand dunes to current marine science research. The series has been in production at the University of Delaware for more than 30 years. You can download audio clips, read the scripts, and subscribe to podcasts.

http://www.ocean.udel.edu/seagrant/seatalk/

Sea Turtle Curriculum
NOAA's Southwest Fisheries Science Center offers a downloadable Sea Turtle Curriculum for 6th Graders, compiled by a veteran teacher who has taken part in Teacher at Sea, in the Air, and in the Lab programs. The materials include lessons, resource lists, links to additional websites, videos, and much more.
http://swfsc.noaa.gov/uploadedFiles/Education/Sea%20Turtle%20Curiculum%20Complete-10-26-09.pdf

Sea Turtle eFieldTrip
The U.S. Fish and Wildlife Service has sponsored *Sea Turtles: Endangered Ocean Navigators,* an eFieldTrip on Sea Turtles. Have your students visit Pea Island National Wildlife Refuge and learn about these amazing animals. Each program has four major components: a virtual visit, a trip journal worksheet, ask the experts, and a live webchat. Archives of the questions are posted on the website.
www.eFieldTrips.org

Sea Turtle Migration-Tracking and Coastal Habitat Education Program
A program of Caribbean Conservation Corporation, this Sea Turtle educator's guide provides information about sea turtle natural history, coastal habitat ecology, high technology research, and conservation efforts to protect sea turtles and their habitats. The guide can be used as a reference to teach sea turtle biology and coastal ecology and offers marine background material and lesson plans. The guide is downloadable for free in English and Spanish (registration is required).
http://www.cccturtle.org/satellitetracking.php?page=educatorsguide

Sea Turtle Migration-Tracking Education Program
The Sea Turtle Migration-Tracking Education Program is an educational service of the Sea Turtle Survival League, part of the non-profit Caribbean Conservation Corporation. Through this website, you can view maps showing the migratory movements of endangered sea turtles being tracked by satellite. In addition, the site offers a downloadable Educator's Guide, background information about sea turtles; tips on how to make the best use the program; and classroom activities.
http://www.cccturtle.org

Sea Turtle Resources
SEE Turtles is a non-profit ecotourism project. In addition to study trips, they offer lesson plans, in-class presentations, and other education resources. The curriculum was teacher-developed to engage students from grades 6-12 on various subjects related to sea turtles.
http://www.seeturtles.org/1352/classroom-resources.html

Sea Turtles
The Caribbean Conservation Corporation has updated the Sea Turtle Information section of their website. This includes an expanded section on threats to sea turtles, educational animations, additional sea turtle habitat information, and interactive sea turtle nesting site maps powered by Google Maps.
http://www.cccturtle.org/seaturtles

Sea Turtles Resources
Check out these sea turtle web resources
http://www.sefsc.noaa.gov/seaturtlepublications.jsp .
http://www.nmfs.noaa.gov/prot_res/PR3/Turtles/symposia.html .
http://www.floridamarine.org/features/view_article.asp?id=2156 .
www.widecast.org .
http://www.ex.ac.uk/~pcthornt/EuroTurtle/homep.htm .
www.seaturtles.org .
www.seaturtle.org/mtn .
www.floridaleatherbacks.com .

Sea Turtles: An Ecological Guide
This book features more than 350 color photos and original graphics to illustrate basic concepts of taxonomy, ecology, and physiology, as well as human impacts and conservation. A unique reference for naturalists, divers, eco-tour operators, resource managers and policy-makers, the book is also designed to be used as a text. The authors are currently working on a Teacher's Resource Guide, which will be available at no charge to anyone who orders 10 or more copies of the book for classroom use.
Dr. Karen Eckert at keckert@widecast.org

Sea Turtles Teacher's Activity Manual
The authors of the textbook, "Sea Turtles: An Ecological Guide" which features more than 350 color photos and original graphics to illustrate basic concepts of sea turtle taxonomy, ecology, and physiology, as well as human impacts and conservation, have revised and reprinted the accompanying Teacher's Activity Manual. The Activity Manual brings these concepts alive with field, lab, and classroom activities that are easy to implement and adaptable to any age.
Contact Karen Eckert at keckert@widecast.org

Seabean Website
The purpose of this web site is to educate people about sea-beans - their identification, source, travels, variety, beauty, and the plants that they produce. This website contains images and information about sea-beans (drift seeds) commonly found on the beaches of the Northwest Atlantic Ocean.
http://www.seabean.com/

Seabird Aware Brochure
As animals of the open ocean, seabirds are important allies in the effort to conserve ocean environments. To encourage kayakers, pilots, fisherman, and others to respect the sensitive nature of seabirds, PRBO Conservation Science has developed a brochure that identifies the problem of disturbance to seabirds and simple solutions that can reduce human impact. This brochure and website will help to prevent disturbance to seabirds during the sensitive breeding period.
www.prbo.org/seabirdaware .

Seafloor Characterization Cruise
Join NOAA for the latest National Centers for Coastal Ocean Science (NCCOS) research cruise to explore conservation areas in Puerto Rico. Visitors can watch video clips and access a wealth of supporting information and images for cruises from 2004 through the recent 2008 seafloor characterization cruise. The website includes

background information, video, data, and scientist profiles. Some materials are also available in Spanish.
http://ccma.nos.noaa.gov/products/biogeography/usvi_nps/details.html#

Seafood Watch Pocket Guides
The Seafood Watch program has launched a new pocket guide for the Southeast region and updated the West Coast pocket guide. The Southeast guide includes several new species such as tilefish, conch, mackerel, and mullet. Seafood Watch has also added or updated species reports to their website. To learn more about these new recommendations please visit the All-Fish List on their website. Seafood Watch recommendations are updated twice each year. Check out the latest information and download your pocket guide.
http://www.montereybayaquarium.org/cr/seafoodwatch.asp
http://www.seafoodwatch.org/cr/cr_seafoodwatch/ .

Seafood Watch Quiz
The Monterey Bay Aquarium offers a quick quiz on their Seafood Watch website. The on-line quiz is an entertaining way to teach about sustainable seafood. Note the great Sherman's Lagoon characters by Jim Toomey. While on the website, check out the regional seafood guides, newsletter, and more.
http://www.montereybayaquarium.org/cr/cr_seafoodwatch/sfw_quiz.asp

SEA-GEOFISH
The southeast geographic fishery-independent survey and historical (SEA-GEOFISH) database is a web-based mapping application presenting data from a long-term fishery survey conducted by the South Carolina Department of Natural Resources. The geographic database includes data collected during more than 30 years of research cruises, sampling fishes and fish habitat off the Atlantic coast of the southeastern U.S. The maps include distribution of fish species; data on abundance, diversity and more.
http://ekman.csc.noaa.gov/seageofish/seageofish.htm

Seagrass-Watch News
Seagrass-Watch News is the official magazine of the global seagrass and assessment program. All issues are available online. The current issue includes a discussion of ten years of monitoring.
http://www.seagrasswatch.org/magazine.html

Seahorse Poster
Project Seahorse has created a free educational poster on seahorses and marine conservation. *Take Action for Seahorses and the Seas* is based on a map of the world and highlights four critical marine conservation issues: over-fishing, nonselective fishing, habitat damage, and poor land-use. Each conservation topic is linked with two seahorse species that exemplify the issue. The poster is targeted to 10-14 year olds, but should appeal to a broad audience interested in marine conservation.
Contact Heather Koldewey at heather.koldewey@zsl.org

SEAICEBOX Interactive Sea Ice Explorer
SEAICEBOX lets users view and measure changes in monthly sea ice concentration since 1979 in the Arctic and Antarctic regions. Users can view the latest daily image of sea ice concentration and compare changes in sea ice over time. The tutorial for first

time visitors includes background information on sea ice and its importance to climate and also has student activities for exploring sea ice.
http://iceplanetearth.org/seaicebox/index.jsp

Seal Watch and Prudence Island Tour – Rhode Island
Explore Prudence Island, see seals at one of the best haul-out spots in Narragansett Bay, and learn about cutting edge ecological research in the bay. Narragansett Bay National Estuarine Research Reserve offers these outreach opportunities in April for groups of six to ten participants; registration is required.
http://www.nbnerr.org/seals.htm

Seamounts
The SeamountsOnline website provides data on species that have been observed or collected from seamounts worldwide. The online portal is designed to facilitate research into seamount ecology, and to act as a resource for managers. It is also the database component of the Global Census of Marine Life on Seamounts. The Seamount Catalog is a complementary but separate initiative that provides bathymetric maps on more than 1800 seamounts and data on their geology, rather than ecological data.
http://pacific.sdsc.edu/seamounts/
http://earthref.org/cgi-bin/er.cgi?s=sc-s0-main.cgi

SeaNET
COSEE-Alaska recently launched SeaNET, a network of ocean scientists, educators, and communicators involved in communicating about research in Alaska's seas. The goal is promoting ocean and climate change literacy, sharing best practices, and integrating ocean science with local and traditional knowledge. The website includes a calendar of upcoming events, science news briefs about recently published research, featured resources, and more.
http://oceanseanet.ning.com/

Search for the *Bonhomme Richard*
The Ocean Technology Foundation and Naval Historical Center are searching for one of the most famous ships of the Revolutionary War, the *Bonhomme Richard*, which was commanded by John Paul Jones. A survey expedition in the North Sea last summer revealed several shipwreck sites of interest, and another expedition is planned for this summer. This presentation highlighted the unique combination of history and modern technology that is being used to find this artifact of American maritime history.
http://www.oceantechnology.org/BHR.htm

The Search for Bonhomme Richard
The Ocean Technology Foundation offers this website in support of its June expedition to search for the *Bonhomme Richard*. The website offers lesson plans focusing on ocean technologies, careers in marine technology, and surveying a shipwreck site, appropriate for middle and high school levels and correlated with the NSES and Ocean Literacy Principles. There will be additional lessons created to continue the series. In addition, the website offers information about the expedition and the history of the battle.
http://www.oceantechnology.org/BHR.htm

The Search for Trouvadore
This website from NOAA's Ocean Explorer offers insight into the July 2006 research and exploration cruise to seek the final resting place of Trouvadore, a Spanish slaver that

wrecked offshore of East Caicos island 165 years earlier, bringing the direct ancestors of some of today's modern inhabitants to the islands. The website includes background information about slave trade and the ship's history.
http://oceanexplorer.noaa.gov/explorations/06trouvadore/welcome.html

Seas the Day
To complement, reinforce, and expand upon The Ocean Project's focus of helping their partners customize conservation for their visitors and members, this website features different conservation themes each month, with an emphasis on personal awareness and action. The new Seas the Day tools and products include the Seas the Day 2006 desktop calendar, with a new look and conservation content for each themed month.
http://www.theoceanproject.org/seas_the_day/

Seas the Day Conservation Calendar
The Seas the Day conservation education and action calendar is available from The Ocean Project. It helps one strengthen their connection with our ocean through inspiring underwater imagery and monthly tips on simple ways to take action. The calendar is available at wholesale rates for Ocean Project Partners and their staff.
http://seastheday.theoceanproject.org/seastheday/order/index.htm

Seas the Day Initiative
The Ocean Project, together with SeaWeb, launched *Seas the Day* to promote awareness and elevate importance of the ocean, and also to encourage people to take action to makes a difference for the health of our ocean planet. The initiative will include development of mission-driven products. The first product is a monthly calendar.
www.TheOceanProject.org .

Seas the Day Water Conservation
Seas the Day focuses on a different conservation theme each month, providing inspiration and information for taking conservation personally; August's theme is *water conservation*. The website offers useful background materials and links along with specific actions we can do to promote sustainability of our ocean resources. Check out the colorful Seas the Day Desktop Calendar as a promotional item for your organization.
http://seastheday.theoceanproject.org//2006/august.htm

Seascape Modeling
The Ecosystem Modeling Lab is a joint project of the University of Maine's School of Marine Sciences and the Gulf of Maine Research Institute. The Seascape Modeling website presents the news, results, and opinions from the lab on efforts to understand the link between physical and biological conditions in the ocean. Current project pages focus on ecosystem forecasting and sea surface photogrammetry.
http://www.seascapemodeling.org/index.html

Seascapes: Getting to Know the Sea Around Us
Quebec-Labrador Foundation's Marine Program offers this guide describing the process for developing a comprehensive compendium of information about coastal marine areas in the Gulf of Maine. Included is a description of each of the basic physical, biological, and socio-economic components that together create a unique identity for any nearshore area in this region.
http://www.qlf.org/publications/seascapes.html

Seashells: the Plainness and Beauty of Their Mathematical Descriptions
Jorge Picado of the Universidade de Coimbra recently looked into the question of how seashells grow, and offers this very math-focused article. The author illustrates that many aspects of the growth of plants and animals may be described by simple mathematical laws.
http://mathdl.maa.org/mathDL/23/?pa=content&sa=viewDocument&nodeId=3294

Seashore Survivors eField Trip
The Alaska SeaLife Center launched *Seashore Survivors*, a virtual tour of Alaskan intertidal invertebrates. The tour focuses on the adaptations that intertidal animals need to brave the surf, tides, and predators. In addition to the virtual tour, students can submit their questions for scientists to answer, and teachers can download a trip journal for their students to complete as they follow the tour.
http://www.efieldtrips.org/Invertebrates/index.htm .

Seasonality Module
Earth-Sun relationships play an important role in governing seasonality and climate patterns on Earth. This lab exercise from NASA and posted in the Encyclopedia of Earth is designed to explore seasonality and climate, including climate change, from the perspective of satellite map interpretation.
http://www.eoearth.org/article/NCSE-NASA_Curriculum_Module_-_Seasonality

SeaTrek
SeaTrek brings multimedia science programming right into the classroom using videoconferencing and Internet technology. These programs feature scientists working in the field with interviews showing how their interests led them to their careers. Each program is supported by a free, downloadable, companion curriculum, aligned with National and Sunshine State Science Education Standards, hosted on the Mote website.
http://www.seatrek.org/

SeaWeb Resources
SeaWeb, working to raise awareness of the growing threats to the ocean and its living resources, is a communications-based, international nonprofit organization that utilizes social marketing techniques to advance ocean conservation. Their resources include marine science citations, ocean issue briefs, public opinion research and analysis, and more. The Marine Science Review offers summaries of new marine science articles, generally focused around a specific theme.
http://www.seaweb.org/resources/msr.php

Seaweek
The Marine Education Society of Australasia runs a national themed Seaweek each year. The website hosts many downloadable materials and other resources. Check out the resources on the decline of sawfish, bycatch, sharks, ocean cultures, and much more. There are lesson plans, puzzles and games, information sheets, and useful links for more information.
http://www.mesa.edu.au/seaweek.asp

SeaWIFS Teacher Resources
The SeaWIFS project uses space technology to study phytoplankton. The website offers the downloadable Living Ocean Teacher's Guide, a guide for grades 9-10 that discusses satellites, ocean color, phytoplankton, the carbon cycle, and greenhouse

effect; a tutorial about ocean color using SeaWIFS images; and many other useful resources.
http://oceancolor.gsfc.nasa.gov/SeaWiFS/TEACHERS/

SeaWinds Scatterometer
One of NASA's Earth-observing instruments, the SeaWinds scatterometer, Midori 2, transmits radar data to measure wind speed and direction over Earth's oceans. It provides high resolution and broad geographic coverage of ocean wind speed and direction, sea ice extent and properties of Earth's land surfaces.
http://winds.jpl.nasa.gov

SeaWorld Educational Resources
The SeaWorld website has books, teacher's guides, and videos both for sale through our catalog and free online. The down-loadable teacher guides include Shark, Splash of Math, Whales, and many more. The kids' Fun Zone includes song books, stories and activities. There is also a toll-free number or "Ask Shamu" email that students and teachers can contact with questions about animals.
http://www.seaworld.org/education-programs/index.htm

SECORE Website
Focusing on sexual reproduction of reefbuilding corals around the world, SECORE (SExual COral REproduction) provides tools for live stock management in public aquaria. They promote cooperation between top scientists in coral reproduction biology and related fields.
http://www.secore.org/

Secret Life of Scientists and Engineers
The Secret Life of Scientists is a web-exclusive series from NOVA which helps the public understand how and why scientists study what they do, as well as what happens when the lab coats come off. Sixteen scientists are currently highlighted on the site, and visitors can visit each scientist's videos and blog posts, as well as ask a question of any of the scientists.
http://www.pbs.org/wgbh/nova/secretlife/

The Secret Lives of Wild Animals
Scientists are developing innovative tracking and information-management technologies to unobtrusively follow the movements of wild animals. Multidisciplinary teams of biologists, computer scientists, and engineers are observing and tracking animals in their natural environment to learn exactly how animals spend their minutes, days and years. The website hosts video downloads of some of the research undertaken to track dragonflies, deals, deer, and others, along with additional information.
http://www.nsf.gov/news/special_reports/animals/index.jsp

Secrets of the Gulf Expedition
Dr. Robert Ballard and a team of scientists will be exploring the Gulf of Mexico in and around the Flower Garden Banks National Marine Sanctuary as part of the Secrets of the Gulf expedition. From March 4-9, 2007, researchers on board the submarine support vessel and at various consoles around the country will be following live video feeds from the Argus ROV, and these will be available on the Oceans Live website.
http://www.oceanslive.org/
http://flowergarden.noaa.gov

http://sanctuaries.noaa.gov/missions/
http://immersionpresents.org
http://flowergarden.noaa.gov/document_library/sci_documents.html

See the New Bridge
The Bridge, with over 1000 teacher-reviewed websites and new, easy-to-use navigation, features an updated look. Ocean science educators will find dynamic resource pages, a more powerful search engine, and mouse-over navigation menu.
http://www.marine-ed.org/bridge

Semester of Service Strategy Guide
The 2010 version of Youth Service America's Semester of Service Strategy Guide was developed to help educators engage young people in an extended service-learning framework of at least 70 hours, and presents step-by-step instructions on how to identify and implement meaningful service and learning experiences.
http://www.ysa.org/2010-sos-guide

Semester of Service Strategy Guide
Youth Service America's (YSA) Semester of Service Strategy Guide provides instructions on planning and implementing semester-long service-learning projects. The guide is designed to complement the many other resources available from YSA, including the Service-Learning Curriculum Guide, Project Planning Toolkit, Classroom Poster, and more.
http://www.semesterofservice.org/

SE-PORT Ocean Awareness Days from SouthEast COSEE
The South East Portal to Ocean Research for Teachers (SE-PORT) is an initiative from the SouthEast Center for Ocean Sciences Education Excellence (SouthEast COSEE). The targeted region includes Georgia, North Carolina and South Carolina. SE-PORTs are partnerships between SouthEast COSEE, an informal education institution (e.g. aquarium, science center), and the teachers who participate in the SouthEast COSEE Ocean Sciences Education Leadership Institutes.
http://www.scseagrant.org/se-cosee/partners.htm .

Service-Learning: Education Beyond the Classroom
The EPA offers *Service-Learning: Education Beyond the Classroom*, describing seven environmental conservation projects that schools and community groups have conducted with elementary school-aged youth. The document includes additional projects for middle and high school youth, as well as a list of partnering national organizations.
http://epicenter.nationalserviceresources.org/index.taf?_function=abstract&Layout_0_uid1=33334

Seven Essential Principles for Ocean Literacy
Dolphin Quest supports ocean literacy and offers *Seven Essential Principles for Ocean Literacy: An Activity Guide for Educators*. This activity guide is the first in a three volume series that will help teachers and informal educators for grades K-12th embrace the Ocean Literacy Principles and put them into practice in their curriculum. This initial volume includes an introduction to the importance of the principles in curriculum, and each chapter includes the fundamental concepts of that principle and a summary of how to put them into use in classrooms, including highlights from the National Science

Education Standards scope and sequence matrix. This guide has 28 activity-based lessons, one for each grade group for each of the seven principles. Each lesson has fundamental concepts, National Education Standards, Hawaii Content Performance Standards and Bermuda Science Standards identified for the principle. Future volumes will be produced in 2007 and 2008.
http://dolphinquest.org/learningquest/school/school_programs.php?ID=177471150

Shamu TV
Shamu TV is an environmental education series from the SeaWorld and Busch Gardens Worlds of Discovery. Each 30-minute episode features stories about animals and the efforts of people working together to save them. Information includes biology, ecology, and more. The website includes downloadable teacher's guides, classroom activities, podcasts, and more.
http://www.shamutv.com/education-resources/shamu-tv/index.htm

The Shape of Life
Public Broadcasting System (PBS) hosts the Shape of Life website, which features activities, explorations, and experiments for K-12 formal and informal educators, students, and families. The website includes a downloadable activity guide, critter cards, and background material. Activities include "Can snails smell?" and how to make a jellyfish or brittle star.
http://www.pbs.org/kcet/shapeoflife/resources/index.html

Shark Alliance
The Shark Alliance is a global, not-for-profit coalition of non-governmental organizations dedicated to restoring and conserving shark populations by improving shark conservation policies. The website hosts the animated film *Predator Turned Prey*, along with other campaign materials for European Shark Week.
http://www.europeansharkweek.org/

Shark Conservation Blog
Shark Week on the on Discovery Channel has changed over the years, and this year they teamed up with the Ocean Conservancy to get the word out on the plight of sharks. The online blog topics include a look at the weird and wonderful Greenland shark, a campaign by Sherman's Lagoon cartoonist and shark advocate Jim Toomey, and a review of vital rules that can help save some of the hardest hit shark species in the U.S. from overfishing. Check out the related links to a virtual shark dive and more.
http://discovery.blogs.com/shark_conservation/

Shark Tagging Through Project Oceanica
Charleston Bump research conducted in 2003 includes tagging and tracking of oceanic sharks using satellite tags. Tagging results will be transmitted by satellites and posted on the Project Oceanic website. Students e-mailed questions to the shipboard and laboratory researchers and the results are posted on the web. Student activities and other information are also posted.
http://oceanica.cofc.edu/SharkTagging/Home.htm

Shark Week – North Carolina
The North Carolina Aquariums will celebrate Shark Week, July 26-August 1, 2009, at all three facilities: Roanoke Island, Pine Knoll Shores, and Fort Fisher. Activities throughout the week will reveal the mysterious and misunderstood world of sharks.

Contact each site for information about Shark Week activities at their facility.
http://www.ncaquariums.com/

Sharkwater
The film *Sharkwater*, to be released in U.S. theaters this September, takes the viewer into shark waters of the world, exposing not only the direct exploitation of sharks, but also the corruption that surrounds this issue. Filmmaker and biologist Rob Stewart is eager to reach out to the public and speak to groups about the plight of sharks and his filming adventures. He will be making a cross-country promotion/publicity tour and is interested in scheduling outreach opportunities. Check out the website for educational materials, and contact Mike Schram for tour information.
Contact Mike Schram at mike@sharkwater.com
http://www.sharkwater.com/index.html

Sharkwater at the International Fishing Hall of Fame
The documentary *Sharkwater* will be shown daily courtesy of the International Game Fish Association starting October 21, 2007, beginning with a special kick-off event. From October 2007 through March, 2008, an interactive and educational exhibition based around shark conservation will be featured in the museum's changing gallery; a shark adaptations lab will be available for students in kindergarten through high school; and a monthly lecture series will feature local and national shark experts.
http://www.igfa.org/sharkwater.asp

Sharks 3D IMAX Film
Sharks 3D is a new IMAX film that was shot on location in Mexico, Colombia, Egypt, South Africa, Mozambique, USA, and French Polynesia. The website has a trailer and a list of theatres showing the film. There are also downloadable educator and companion guides with background material and activities.
http://www.sharks3D.com

Shedd Aquarium Activity Guides
The Shedd Aquarium offers several Activity Guides as downloadable files. The topics include Coral Reefs, Fishes, Oceans, and more.
http://www.sheddaquarium.org/teacher_resources.html

Shedd Educational Adventures
The online, searchable, Shedd Educational Adventures (SEA) contains aquatic science resources for K-12 teachers and students. SEA brings the Philippines to life with fact sheets and multimedia interactives based on the Wild Reef exhibit at the Shedd Aquarium. Materials include lesson plans, interactives, and explorer guides – fact sheets about plants, animals, people, and places. Many materials are also available in Spanish. Check out the education link (top of the page) and follow it for teachers.
http://www.sheddaquarium.org/sea/

Sheltered Sea
The Baum Foundation and Coyote Films offer the public service film, A Sheltered Sea - The Southern Passage, about the Marine Life Protection Act Initiative along the California coast. The film highlights the activities taking place in the south coast region from Point Conception to Mexico. The Southern Passage features the collective benefits and challenges of creating a network of MPAs. The website offers a 3-minute trailer along with the downloadable 25-minute film.

Contact Jen Melcon at jen@thebaumfoundation.org
http://www.thebaumfoundation.org/ashelteredsea.html

Shifting Baselines
The Ocean Conservancy is partnering with other organizations, scientists, and filmmakers to produce Public Service Announcements, slide shows, and other multimedia resources to communicate some of the issues involved in ocean resources declines and the shifting baseline phenomena. All materials may be downloaded from the website. Both English and Spanish versions are available.
http://www.shiftingbaselines.org/index_site.html#

Ship-2-Shore Education
Join Oceanographic Research Vessel *Algalita* in the Great Pacific Garbage Patch in its 10th year of studying human impacts on marine ecosystems. The website includes daily updates and images from the research vessel; the opportunity to interact with the ship's research team; lessons and activities; and more.
http://ship2shore.blogspot.com/

Ship-2-Shore Education Program
The Ship-2-Shore Education Program links students from around the world with the plastic pollution research being performed at sea aboard research vessels. This program allows students to follow daily updates from the Algalita research crew, as well as to interact directly with the crew by sending questions and comments to the research vessel. Supplementary resources and lesson plans on the topic of plastic pollution are provided for teachers to enhance their student's learning experience.
http://www.algalita.org/ship2shore/index.php

Ships and Ports and the Marine Environment
The Australian Marine Environment Protection Association offers new educational materials for middle school students, *Ships and the Marine Environment* and *Ports and the Marine Environment*. These two education packages are student focused, highly adaptable within current pedagogy, and consist of student research information and activities and teacher notes.
http://www.ausmepa.org.au/other.asp?pageId=13

Shipwreck Montana "Live Dives"
NOAA's Thunder Bay National Marine Sanctuary hosted live webcasts from the shipwreck *Montana* on July 14, 2010. Check out the archived "live dives", lesson plans, and more.
http://thunderbay.noaa.gov/

Shipwreck Trail Photo-Mosaic Mission
The National Marine Sanctuaries posts mission logs from the recent Shipwreck Tail Photo-Mosaic Mission in the Florida Keys National Marine Sanctuary. See how NOAA archaeologists document shipwrecks dating back to 1733. The project is creating photo-mosaics of five shipwrecks that will provide valuable archaeological data, serve as a baseline to gauge the affects of severe weather and human impacts on these historic treasures over time, and provide outreach on the maritime heritage of the Keys.
http://sanctuaries.noaa.gov/missions/2006fknms/

Shipwreck Webcast
Lake Champlain Maritime Museum and partners will host a live webcast of the shipwrecked schooner *Sarah Ellen*, November 5, 2009. This free hour-long broadcast will take participants deep under the cold dark waters of Lake Champlain to the wreck. The program will be archived on the website shortly after the initial broadcast.
http://www.lcmm.org/webcast.html

Shipwrecked
In *Shipwrecked!*, students learn about the causes and results of many different shipwrecks along the west coast of the United States and how these accidents have shaped the maritime activities of today. By plotting shipwrecks on charts, students will be better able to visual the high traffic, and often most dangerous, areas of the coastal U.S.
http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1200.html
http://www.marine-ed.org/bridge

Shorebird Management Listserve
A monitored shorebird management listserve, a cooperative partnership of the U.S. and Canadian Shorebird Conservation Plans and maintained by the U.S. Fish and Wildlife Service, provides users with: a forum to discuss approaches to managing shorebird habitats and discuss regional-scale projects; information on shorebird management resources; answers to specific questions; and technical advice on monitoring shorebirds.
Brad_Andres@fws.gov

Shorebirds of the Pacific Flyway eField Trip
The U.S. Fish and Wildlife Service offers schools nationwide the opportunity to participate in an eFieldTrip titled, "Shorebirds of the Pacific Flyway: Who Are These Olympic Flyers?" The trip is designed to help students learn about what a shorebird is and how to identify shorebirds of the Pacific Flyway.
http://www.efieldtrips.org/Shorebirds/index.htm .

Shorebird Sister Schools Program
The Shorebird Sister Schools Program is an Internet based environmental education program that connects students, educators, biologists, and birding enthusiasts along migratory flyways. The program includes three key components: K-12 curriculum, email network, and web site. A webcast on April 7, 2003 explored shorebirds, their migration, and the Shorebird Sister Schools Program.
http://sssp.fws.gov

Shoreline Trash: Studies at Padre Island National Seashore
For advanced students interested in pursuing more exploration of the problem of marine debris, the National Park Service published a comprehensive study: *Shoreline Trash*: *Studies at Padre Island National Seashore, 1989-1998.*
phyllis.dermer@noaa.gov

Shortcuts Comics
Shortcuts comic pages come out in many newspapers across the country each weekend. Each comic features well-researched information delivered in a kid-friendly style. Older issues are available as posters for sale and include topics of interest such as fish, clouds, and more; some include a short teacher guide. The November 7, 2005

issue was about Humpback Whales and was created with assistance from the Hawaiian Island Humpback Whales National Marine Sanctuary. More to come of interest.
http://www.comics.com/shortcuts/

Skyeye Weather Teacher's Corner
Skyeye Weather is a weather consulting, education, and career development firm. Their Teacher's Corner website has helpful weather information links plus information on weather-related topics for teachers and students. It also includes science experiments and weather education background information. For elementary students, Puffy-Q answers basic weather questions.
http://www.skyeyeweather.com/learn.html .

Siemens STEM Academy
The Siemens STEM Academy is designed to foster STEM achievement through collaboration and sharing of best practices. Educators can share their favorite lesson plans, ideas, presentations, and other related resources. Upcoming free webinars on STEM related topics include Getting Started with Project Based Learning, Layers of Learning with Google Earth, and more. Resources can be browsed by grade and subject, and include the Science of Hurricanes, Ecosystems Lesson Plan, and more.
http://www.siemensstemacademy.com/

Simple Steps
The Natural Resources Defense Council offers *SimpleSteps.org, Green Living by NRDC*, designed to help people who are looking for easy, environmentally friendly actions they can take every day to protect their health, their home, and the planet. Visitors can read topic suggestions that may take a minute, morning, or month to implement. They can also post their experiences and additional tips through a blog that acts as an archive of topics and comments.
http://www.simplesteps.org/

Six Degrees to the Ocean
An Ocean Conservancy website takes the "six degrees of separation" concept and marries it with the ocean. The theory is that any headline appearing in the news can somehow relate back to the ocean within six steps of connection. The activity illustrates just what a small world we live in and how integral the ocean is to our world.
http://www.oceanconservancy.org/site/News2?page=NewsArticle&id=10981

Skeptical Science
SkepticalScience: Examining Global Warming Skepticism tracks, ranks, outlines, and debunks arguments about the science of global warming.
http://www.skepticalscience.com/

SLO Take Back Program
The San Luis Obispo County Integrated Waste Management Authority announces the implementation of the *SLO Take Back Program* for household batteries, fluorescent tubes, and compact fluorescent light bulbs. Nearly every retailer throughout San Luis Obispo County who sells household batteries or fluorescent tubes and compact fluorescent bulbs will now take those items back from the public for free. Consumers who want to shop green can now safely and easily recycle these products.
http://www.iwma.com/directory-aj/fluorescent%20tubes%20and%20bulbs.html

Sloan Career Cornerstone Center
For students wanting a wider view of science careers, the Sloan Career Cornerstone Center can help students explore the fields of science, technology, engineering, mathematics, and computing. This site provides many resources, including an interview database of professionals working in these areas. Some of the career profiles include hydrogeologist, micropaleontologist, weather service administrator, environmental engineers and more.
http://www.careercornerstone.org/forstudents.htm

Smart Consumers Education Module
World Wildlife Fund's latest education module in the Windows on the Wild series, for grades 6-9, is *Smart Consumers: An Educator's Guide to Exploring Consumer Issues and the Environment*. This 300-page toolkit includes an educator's guide with background information, hands-on activities, an annotated list of resources, a Community Action Guide, and more. For more information, check out
http://www.worldwildlife.org/windows/education_guides.cfm#3

Smiling Sea Magazine
Smiling Sea Magazine covers marine science, coastal activities, sports, careers, events, books, music and more, and has articles for younger readers on marine topics. You can download the current issue from the website or request a free copy.
http://smilingsea.squarespace.com/

Smithsonian Education
Smithsonian Education offers more than 1,200 education resources aligned with standards of learning in every state. Lesson plans emphasize inquiry-based learning using primary sources and museum collections. Check out *Ocean Planet: Interdisciplinary Marine Science Activities*, *Contrasts in Blue: Life on the Caribbean Coral Reef and the Rocky Coast of Maine*, and *Decoding the Past: The Work of Archaeologists*. Students can find games, educational materials, and more through the Students pages, including an on-line satellite photo interpretation activity.
http://www.smithsonianeducation.org/

Smithsonian Education
The Smithsonian Education website offers a portal to the institution's educational resources and programs, including the publication *Smithsonian in Your Classroom*, a journal for elementary and middle school educators; research opportunities and resources for the museum community; and professional development programs for educators at all levels. Be sure to check out Prehistoric Climate Change, Ocean Planet, Tale of a Whale, and much more.
http://smithsonianeducation.org/

Smithsonian Folklife Festival
The Smithsonian Folklife Festival, Washington, DC, June 23-27, and June 30-July 4, 2004. One of the festival themes this year is *Water Ways: The Past, Present, and Future of Maritime Communities in the Mid-Atlantic*, celebrating the coastal region stretching from Long Island, New York, through New Jersey, Delaware, Maryland, and Virginia to the Outer Banks of North Carolina. Maritime workers and artisans from 15 communities in these states will come together to demonstrate their skills and share their stories. This year's festival will be held June 24–28 and July 1–5, 2010.
http://www.festival.si.edu/

http://www.folklife.si.edu/CFCH/festival2004/Festival2004.htm .

Smithsonian Lesson Plans
Smithsonian lesson plans emphasize inquiry-based learning using primary sources and museum collections. Each plan is print-friendly and provides you with all the materials you need—photographs, reproductions, handouts, activities, suggested strategies, standards information, and additional online resources. The searchable database allows you to browse lesson plans by subject area or search by grade levels and keywords. Check out Ocean Planet: Marine Science Activities.
http://www.smithsonianeducation.org/educators/lesson_plans/lesson_plans.html .

Smithsonian Photography Initiative
The Smithsonian Photography Initiative is dedicated to promoting the use of Smithsonian photographic resources (roughly 13 million images located in approximately seven hundred collections). This website offers an online repository of images, a gateway to exhibitions, and more. The images are copyright protected, but fair use of copyrighted material includes the use of protected materials for non-commercial educational purposes, such as teaching and scholarship.
http://www.photography.si.edu/

Society for the Conservation and Study of Caribbean Birds
The Society for the Conservation and Study of Caribbean Birds hosts this new website with information about projects, a downloadable newsletter, links to topics of regional interest, and the Bird of the Month.
www.scscb.org

Society for Historical Archaeology
This website highlights the study of the material remains of past societies that also left behind some other form of historical evidence. The education pages include downloadable lessons along with others that can be ordered for a nominal charge, including *History Beneath the Sea: Nautical Archaeology in the Classroom*. Additional website features include helpful information on careers in archaeology and a guide to programs in historical and underwater archaeology, and more.
http://www.sha.org/

Socioeconomic Website
The Office of National Marine Sanctuaries offers this new website focusing on socioeconomics. The focus on socioeconomic in the sanctuary system aims to provide the best possible social science to give all stakeholders a voice in the management of sanctuary resources and foster a more cooperative management process. The website offers background on socioeconomics, links to information for the Channel Islands, the Florida Keys, and economic valuation in national marine sanctuaries.
http://sanctuaries.noaa.gov/science/socioeconomic

SocMon
The Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon) has launched a redesigned website. One of the site's major improvements is the new SocMon database, which has access to completed SocMon site reports searchable by location, author, monitoring purpose, and other fields. The website also includes

interactive maps depicting work done at specific sites around the world and improved access to data, publications, and images.
http://www.socmon.org/

SocMon Global Report
SocMon is an initiative aimed at helping coastal managers better understand and incorporate the socioeconomic context into coastal management programs. The new SocMon Global Report highlights dependence on coral reefs by local communities in developing countries, provides information on perceived threats to coastal resources, and points to the inability of coastal managers to effectively implement decades-old recommendations as a significant barrier to coral reef protection.
http://www.reefbase.org/socmon/

Soil Moisture and Ocean Salinity Mission
The Soil Moisture and Ocean Salinity mission is part of a series of Earth observation missions that focus on the science and research elements of ESA's Living Planet Programme to improve our understanding of how the Earth system works and how human activity is affecting natural Earth processes. SMOS will make global observations of soil moisture over land and sea-surface salinity over the oceans to improve our understanding of the water cycle. The website hosts videos, animations, and more.
http://www.esa.int/SPECIALS/smos/index.html

Solar Eclipse Webcast
NASA's Sun-Earth Day team is partnering with the San Francisco Exploratorium to produce a live total solar eclipse webcast and broadcast from China, on August 1, 2008. The website hosts webcasts from previous eclipses going back to 1998 in Aruba, a world map of future eclipses, and links to more information.
http://www.exploratorium.edu/eclipse/

Solutions
A new journal, *Solutions*, focuses on solutions to environmental, ecological, and socio-economic problems. It includes peer reviewed papers and will be available online and in printed version. Solutions Online is the primary venue of the journal and offers a forum for discussion about how to solve the mounting environmental, social, and economic problems.
http://www.thesolutionsjournal.com/

Solutions to Avoid Red Tide
The Solutions to Avoid Red Tide (START) webpage offers basic information and videos about red tide, effects of red tide, and research being done regarding red tide.
http://www.start1.com/Default.aspx

Somewhere Between Yesterday and Just This Side of Tomorrow
This children's coloring/activity book is a story written from the wildlife perspective, with the focus on awareness of polluting our watershed and the damage of Eurasian water milfoil in waterways. It is geared for K-6 with watershed, watercycle, pollution, and identification activities. Vocabulary, word search, and more are included with the story. The book is self-published; you may ask for a sample or order directly from the author. Contact Sherry Cavanaugh at ewmbook@hotmail.com

Song of the Oceans
Gary Bowman offers the CD, *Song of the Oceans*, a compilation of original songs celebrating the ocean world and the variety of creatures that live there. The project also addresses modern day conservation challenges. Visitors can listen to *The Tidepool Stomp, Plastic Island, Where Whales Sing*, and others, read the lyrics, and more.
http://www.songoftheoceans.com/music.html

Song of the Salish Sea
From Earthwise Media, "Song of the Salish Sea: a Natural History of Northwest Waters" includes a printable teachers' guide and tidal pool curriculum for ages 11-14. The Song of the Salish Sea was produced in partnership with the People For Puget Sound. Additional educational videos from Earthwise Media include *Rainbows in the Sea: a guide to Earth's Coral Reefs*, *Life on the Edge: a guide to Pacific Coastal Habitats*, *World Between the Tides: a guide to Pacific Rocky Shores,* and more.
http://www.earthwisevideos.com/Earthwise-Media-Products.htm

Songs and Stories
Songs and Stories for Kids About Animals and Nature is a blog for teachers and parents from singer/songwriter/storyteller and educator Rosie Emery. The website includes instructive content along with accompanying song and story suggestions, which can provide ideas for lesson plans. Songs and lyrics are posted to her MySpace page.
http://rainbowdolphin-interconnected.blogspot.com/

Sooty Shearwater Tracking
The www.seaturtle.org website posts the results of satellite tracking of the pelagic seabird, the sooty shearwater. The tracks illustrate the trans-Pacific migration of ten (so far) sooty shearwaters from California to the southern hemisphere. The data is updated every even-numbered day as these birds with satellite tags make their way across the Pacific.
http://www.seaturtle.org/tracking/?project_id=46

Sound Science
Sound Science is a "state of the science" document encapsulating what is known about the greater Puget Sound ecosystem and, given present trajectories and trends, what may occur in the future. Reflecting the collaborative expertise and perspectives of over 30 authors, nearly 100 reviewers, and hundreds of workshop participants, the document emphasizes the linkages and dynamic interplay between human and natural ecosystems.
http://www.nwfsc.noaa.gov/research/shared/sound_science/index.cfm

Sounds of the Southern Ocean
This expedition to Antarctica with researchers from Oregon State University's Hatfield Marine Science Center will be the first attempt of deep-water ROV survey of hydrothermal vents and ecosystems in Antarctica. The deployment of deep-water autonomous hydrophones will record sounds generated by moving ice sheets, undersea earthquakes and volcanoes, even vocalizations from large baleen whales.

NOAA's Pacific Marine Environmental Laboratory's VENTS Program website offers a variety of materials complementary to the expedition. The Acoustic Monitoring Project of the VENTS program section offers on-line multimedia about sound. Other sections

provide graphics and information about seafloor geology, bioacoustics, physical modeling, and much more.
Expedition's website: http://hmscblog.blogspot.com/
Vents Program: http://www.pmel.noaa.gov/vents/index.html

South Florida Sponge Guide
Researchers at the National Coral Reef Institute along with an international team of experts, offer the South Florida Sponge Guide website. The website offers an interactive identification guide to the shallow-water marine sponges of South Florida, including illustrated keys and descriptions of organisms, their diagnostic components, habitat, and biological data.
http://www.nova.edu/ncri/sofla_sponge_guide/index.html

Southeast Phytoplankton Monitoring Network
The Southeast Phytoplankton Monitoring Network (SEPMN) is a NOAA-funded harmful algal bloom (HAB) monitoring program based in Charleston, SC. This program is designed to get students and the community involved in science research to help understand HABs and their effects on humans and the environment. Volunteers include elementary, middle, and high school students, colleges and universities, civic groups and environmental organizations, and state and federal research institutions.
http://www.chbr.noaa.gov/CoastalResearch/SEPMN/index.htm

SouthEast Portals to Ocean Research for Teachers
SouthEast Center for Ocean Sciences Education Excellence (SouthEast COSEE), reaches out to the education community with ocean science information in the southeastern region of NC, SC and GA. 12 *SE PORTs* (SouthEast Portals to Ocean Research for Teachers) have been formed in partnerships between SouthEast COSEE, an informal education institution (such as a museum or aquarium), and teachers.
http://www.scseagrant.org/se-cosee

Southwick Associates Reports
Southwick Associates specializes in economic and business statistics related to fish and wildlife. They help natural resource agencies and the outdoor industries understand the retail sales, economic impacts, and other benefits businesses and people receive from wildlife and fisheries. The website offers many downloadable reports and newsletters, including the 2006 Economic Impacts of Hunting and Fishing.
http://www.southwickassociates.com/

Spanish Galleon Trail
The Florida Bureau of Archaeological Research, Underwater Archaeology Program offers their latest website addition, the *1733 Spanish Galleon Trail*, which interprets the sites of thirteen 1733 Spanish shipwrecks along the Florida Keys as destinations for heritage, recreational, and ecological tourism. Descriptions presented here of each shipwreck include its environment, water depth, site plan, photos, and more.
http://dhr.dos.state.fl.us/archaeology/underwater/galleontrail/

Spatial Trends in Coastal Socioeconomics
The Spatial Trends in Coastal Socioeconomics website provides coastal and ocean managers with one-stop shopping for associated demographic and economic information. The website offers dynamic access to national-scale datasets in those geographic units that coastal and ocean managers must work with daily.

http://marineeconomics.noaa.gov/socioeconomics/

Special Days for EE: 2010 Planner
Environmental Education in Georgia offers this listing of special days set aside for Environmental Education, including National Wildlife Week, American Wetlands Month, and World Ocean Day.
http://eeingeorgia.org/core/item/page.aspx?s=16215.0.0.4863

Special Days
Sylvan Dell Publishing offers a running calendar of some fun-to-celebrate events on their website. In addition to World Wetlands Day, there is a Cephalopod Awareness Day and even a Festival of Sleep Day. Daily themes include links to appropriate books, ideas, and free activities.
http://www.sylvandellpublishing.com/SpecialDays.htm

Special Days for EE: 2009 Planner
EE in Georgia offers this 2009 planner, identifying special days set aside for Environmental Education.
http://www.eeingeorgia.org/net/content/go.aspx?s=16215.0.68.4863

Special Days for Environmental Education 2005 Planner
Each year there are special days set aside for environmental education. We all know Earth Day is in April, but when is America Recycles Day, Arbor Day, National Wildlife Week, and American Wetlands Month? This web page from EE in Georgia highlights special environmental days.
http://eeingeorgia.org/net/content/item.aspx?s=16215

Special Days
Check out these events to get your students involved in the world around us. The websites have resources, calendars of events, and more.

- ***Earth Science Week***, October 12-18, 2008, whose theme *No Child Left Inside* encourages young people to learn about the geosciences by getting them away from the television, off the computer, and out of doors. Check out the contests. http://www.earthsciweek.org/
- ***International Coastal Cleanup***, September 20, 2008, offers aquatic and community cleanups of all types organized at your nearby stream, river, lake, beach, reef, or other freshwater or coastal habitat. http://www.oceanconservancy.org/site/PageServer?pagename=press_icc
- ***National Estuaries Day***, September 27, 2008, is an annual celebration of the vibrant coastal areas where rivers meet the sea. http://www.estuaries.gov/estuaries101/GetInvolved/Default.aspx?ID=153
- ***Take a Child Outside Week***, September 24-30, 2008, is an international internet-facilitated program that encourages all citizens, particularly children, to participate in outdoor activities. http://www.takeachildoutside.org/
- ***World Water Monitoring Day***, September 18, 2008, is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. http://www.worldwatermonitoringday.org/

Special Days in June

- **June: National Oceans Month**
- June: American Rivers Month
- June 2-10: National River Cleanup Week http://www.nationalrivercleanup.org/
- June 5: World Environment Day http://www.unep.org/wed/2007/english/About_WED_2007/index.asp
- 8: World Oceans Day http://www.theoceanproject.org/wod/

Special Days in March and April 2005

- March 1: Great American Cleanup from Keep America Beautiful http://www.kab.org/programs.asp?id=291&rid=68
- March 22: World Water Day http://www.worldwaterday.org/
- March 23: World Meteorological Day http://www.wmo.int/wmd/
- April 10-16: National Environmental Education Week http://www.eeweek.org
- April 11-16: Excellence in Science, Technology, Engineering, and Mathematics Education week http://www.esteme.org/
- April 15-17: National Youth Service Day http://www.ysa.org/nysd/
- April 22: Earth Day http://www.earthday.net/

Special May Days, 2007

- May – American Wetlands month - http://www.epa.gov/owow/wetlands/awm/
- May 11 – Endangered Species Day – http://www.stopextinction.org/endangeredspeciesday
- May 12 – International Migratory Bird Day - http://www.birdday.org/
- May 22 – International Day for Biological Diversity - http://www.biodiv.org/programmes/outreach/awareness/biodiv-day-2007.shtml

Special Report on Ocean Literacy Scope and Sequence

The National Marine Educators Association has published the NMEA Special Report #3 on Ocean Literacy featuring the Ocean Literacy Scope & Sequence, intended to provide guidance to teachers, curriculum developers, educational researchers, and the committees developing or revising science standards. Based on the Ocean Literacy Essential Principles and Fundamental Concepts, the report was developed by hundreds of scientists and educators. You can download the report, extracts, and more. http://oceanliteracy.wp.coexploration.org/

Species of the Day

In order to increase awareness of the enormous variety of life and raise the profile of threatened species across the globe, the IUCN Red List of Threatened Species has launched the *Species of the Day*. For each day of 2010 this initiative will highlight a different species being featured on a range of websites and through various other media channels. The 365 species selected will represent the entire range of groups and cover all regions, with daily fact sheets providing information on the threats to their existence. http://www.iucnredlist.org/species-of-the-day

Species - Electronic Newsletter from IUCN

The World Conservation Union (IUCN) Species Survival Commission electronically publishes two newsletters each year. While *Species* does not focus on marine species and habitat, they are included.
http://www.iucn.org/themes/ssc/species/spec-int.htm

Splash of Math
SeaWorld provides teachers with up-to-date information and activities that can motivate students to conserve wildlife, the oceans, and the natural world. The Splash of Math Teacher's Guide for grades 4–8 was developed at SeaWorld with input from the San Diego County Office of Education. The goal is to offer students an active, hands-on tutorial about how mathematical skills relate to real-life situations, specifically marinelife studies and marine zoological park careers.
http://www.seaworld.org/just-for-teachers/guides/pdf/splash-of-math-4-8.pdf?src=2009WODsilverpopWildlifeAugM

Sponge Guide
The Sponge Guide is a web-based, fully searchable pictorial guide to Caribbean sponges, a photographic guide to over 170 species of sponges found on Caribbean coral reefs and associated rocky and lagoon environments. The simple search can be by color, consistency, and/or morphology.
http://www.spongeguide.org/

Springer Publishing
As a global scientific publisher, delivering quality content through innovative information products and services, Springer offers a variety of options for you to publish your research as open access with free use to everyone, everywhere. The open access choices allow you to easily comply with the open access requirements of institutions, governments, and funders. Visitors can sign up for new book alerts on topics of interest. One book in the Aquatic Sciences is *The Comparative Embryology of Sponges*.
http://www.springer.com/?SGWID=0-102-0-0-0

Squids4Kids
Bring a jumbo Humboldt squid into class and engage students of any age in this hands-on activity. Humboldt squid provide an outstanding teaching platform for discussing climate change, ecology, anatomy, physiology, fisheries science, and more. Squids4Kids supplies frozen specimens of Humboldt squid for use in educational activities at any level and the package includes illustrated background material and dissection guides. Check out the program and resources on the website.
http://gilly.stanford.edu/outreach.html

Stabilization Wedges Game
The Carbon Mitigation Initiative is a joint project of Princeton University, BP, and Ford Motor Company to find solutions to the greenhouse gas problem. To emphasize the need for early action, they have created the concept of stabilization wedges – 25 billion ton "wedges" that need to be cut out of predicted future carbon emissions in the next 50 years to avoid a doubling of atmospheric carbon dioxide over pre-industrial levels. This idea is the basis for a new game that can be played by students, teachers, scientists, and others. The website includes background information, descriptions of currently available mitigation tools that have the capacity to reduce future emissions, and materials and instructions for carrying out the game.
http://www.princeton.edu/~cmi/resources/stabwedge.htm

Star Thrower Educational Multimedia
This website from Dr. Bill Bushing includes still images of marine life, archived newspaper columns about marine life with full color images, links to a number of

scientific publications on kelp forest ecology research, and more. The images of marine life on the site may be used by teachers and students in non-commercial educational materials, reports and on web sites if they include a copyright notice.
http://www.starthrower.org/home.htm

State of the Coast
NOAA's State of the Coast website is a source for quick facts and more detailed statistics offered through 14 interactive indicator visualizations, presented across four themes: Communities, Economy, Ecology, and Climate. Collectively, this information highlights connections among a healthy coastal ecosystem, a robust U.S. economy, a safe population, and a sustainable quality of life for coastal residents.
http://stateofthecoast.noaa.gov/

State of Coral Reef Ecosystems
The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005 establishes a quantitative baseline of the conditions of U.S. shallow coral-reef ecosystems. Each chapter provides the geographic extent of reef ecosystems; current monitoring and management activities; information on water quality, benthic habitats, associated biological communities, and key threats to ecosystem health; and recommendations for future research and management actions.
http://ccma.nos.noaa.gov/ecosystems/coralreef/coral_report_2005

State of Deep Coral Ecosystems
The State of Deep Coral Ecosystems of the United States, a peer-reviewed report prepared by NOAA's Coral Reef Conservation Program, documents the biology, distribution, and types of deep-sea corals on the continental shelves and slopes of the U.S. including its U.S. Caribbean and Pacific territories. The report may be downloaded from the website; it is also available in print or on a CD.
http://www.nmfs.noaa.gov/habitat/dce.html

State of the Nation's Ecosystems: Annual Update 2003
The first annual update of the 2002 report *The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States* has been released by The Heinz Center. The report was published in 2002,with a 20-page chapter on Coasts and Oceans, as well as chapters on five other types of ecosystems. The 2003 update provides access to data on ecosystem conditions that have become available since the full report was published.
http://www.heinzctr.org/ecosystems/report.html .

State of the Salmon
The State of the Salmon is an international consortium that is dedicated to improving understanding of salmon status and trends across the North Pacific and building a knowledge network that can inform salmon conservation and management decisions in the future. The materials on the site include monitoring, data and maps, a glossary, and more. The Data & Maps area features interactive maps that document existing salmon populations and their movements.
http://www.stateofthesalmon.org

State Policies and Programs Related to Marine Managed Areas: Issues and Recommendations for a National System
CSO and the National MPA Center conducted research and interviews related to state level marine managed areas (MMAs) and the potential for future federal/state coordination within a national MPA system. This report characterizes existing MMA policies and programs at the state level; presents the potential implications of the proposed national system of MPAs for coastal states; and proposes recommendations toward national MPA system for consideration by both state and federal officials.
http://www2.mpa.gov/mpa/mpaservices/virtual_library/publications.lasso .

State Resources List
The Environmental Literacy Council is developing state-by-state resource lists of local environmental education centers, parks, museums and natural resource agencies. The site can offer teachers a single place to start planning a field trip, contact experts, and more. The pages are still in development, and your suggestions are welcomed. Send them information about training opportunities, environmental education centers, and good sources of information for your local community.
http://www.enviroliteracy.org/category.php?id=15

State Wetland Program Evaluation: Phase I
The Environmental Law Institute has released *State Wetland Program Evaluation: Phase I*, as the first part of a multi-phased study of state wetland programs across a cross-section of states. This study seeks to analyze seven core areas of state wetland programs, including regulatory programs, water quality standards, monitoring and assessment programs, restoration projects and initiatives, public/private partnerships, education and outreach, and coordination with state and federal agencies.
http://www.elistore.org/reports_detail.asp?ID=11079

State of the World's Birds
BirdLife International offers the website and on-line database, State of the world's birds, which outlines why birds and biodiversity are important, examining what we know about the changing state of the world's birds, why birds are declining, and what can be done to improve their status.
http://www.birdlife.org/sowb/

State of the World's Sea Turtles
State of the World's Sea Turtles (SWOT) is a partnership among Conservation International, the IUCN Marine Turtle Specialist Group, Duke University's OBIS-SEAMAP, and other organizations and scientists. The SWOT Team seeks to create a global network of specialists working to conserve sea turtles and their habitats, pooling and synthesizing data, and sharing the information with audiences who can make a difference. The website offers interactive maps, reports, news, and more.
http://seaturtlestatus.org/

StatWeb - A Guide to Basic Statistics for Biologists
StatWeb, designed at the University of Durham, is intended to enable students in the biological sciences to learn the basics of statistics. The examples used are largely from the environmental sciences and have built in multi-choice questions to assess understanding. The authors cover different topics within the disciplines of biology and mathematics and provide links to other useful websites.
http://www.dur.ac.uk/stat.web/

Steal This Picture
StealThisPicture.com is an open source photo archive by Michael L. Baird. You can use any picture for personal or non-commercial purpose, with attribution. Pictures include mostly birds, along with some marine mammals and more. While not yet extensive, check it out; you may find just the picture you're looking for.
http://www.stealthispicture.com/

STEMresources.com
The Tennessee Department of Education and Middle Tennessee State University offer STEMresources.com, where teachers can access standards-based instructional tools, curriculum materials, and Internet materials. Among the many resources available from this website are standards users guides, curriculum frameworks, links to other STEM websites, teacher work samples, and much more.
http://www.stemresources.com/

Stetson Bank Monitoring Activity
The Stetson Bank Monitoring Activity from the Flower Garden Banks National Marine Sanctuary is designed to give students a sense of the real-life science being used to monitor habitats in the sanctuary. By comparing photos from year to year they can evaluate the changes taking place on the reef. The website hosts the downloadable activity and photos.
http://flowergarden.noaa.gov/image_library/stetsonimages.html

Stop Disasters Game
A pilot online game from the U.N.'s International Strategy for Disaster Reduction aims to teach children how to protect cities and villages against natural hazards through disaster risk planning and management. The game includes five natural hazard scenarios (flooding, tsunami, wildfire, hurricane, and earthquake) with different levels of difficulty that require critical decision-making and strategic planning. Players assess risk, build and house the local population, and assign roles.
http://www.stopdisastersgame.org

Stop Faking It! Air, Water, and the Weather
Air, Water, & Weather shares the same goal as the other five titles in his award-winning NSTA Press *Stop Faking It!* series. Its content, style, and tone are designed to help every educator who is intimidated by science but tired of relying on avoidance strategies when teaching—including science teachers, homeschoolers, and parents who want to help with homework. The book includes explanations, drawings, and activities that use easy-to-find materials.
http://store.nsta.org/showItem.asp?product=PB169X6

Strange Days on Planet Earth
Strange Days on Planet Earth is a four-part series from PBS. The segments include Invaders, The One Degree Factor, Predators, and Troubled Waters. Materials available from the website include downloadable classroom activities geared for each segment and a glossary; check out the *For Educators* link.
http://www.pbs.org/strangedays/

STRAW Project
A Project of The Bay Institute and partners, The Students and Teachers Restoring A Watershed (STRAW) Project coordinates and sustains a network of teachers, students, restoration specialists, and other community members as they plan and implement watershed studies and restoration projects in Marin and Sonoma counties. STRAW provides teachers and students with the scientific, educational, and technical resources to prepare them for hands-on watershed studies, including restoration projects.
http://www.bay.org/watershed_education.htm

Stream Of Dreams
Stream Of Dreams©™ is a watershed education program which helps connect students and their community through art. The program and student-generated murals help students to understand their connections to water and to make changes to protect streams, rivers, lakes, and ocean.
http://www.streamofdreams.org/

Stream to Sea
The Canadian Fisheries and Oceans' Stream to Sea program envisions students and educators in the Pacific region that are well-informed on aquatic ecosystems, motivated by a stewardship ethic, and contribute to the health and sustainability of their community. The website offers free lesson plans (including *Salmonids in the Classroom*) along with associated background material and student handouts for primary, intermediate, and secondary grades. Other activities and resources are also listed.
http://www-heb.pac.dfo-mpo.gc.ca/community/education/eduintro_e.htm

Student Biological Monitoring Programs
This document, published in 2004, identified and described environmental monitoring programs that involve K-12 students to monitor plant and animal species in the United States. The list is currently being updated and will be posted on the website when complete.
Contact Lynna Kaucheck at lynnakaucheck@yahoo.com
http://www.extension.iastate.edu/naturemapping/Teacher%20Materials/Monitoring_Programs.pdf

Student Experiments at Sea
Join the Student Experiments At Sea (SEAS) through a virtual cruise to the hydrothermal vents of the East Pacific Rise from April 23 - May 14, 2005. SEAS is a program for middle and high school students interested in learning science by participating alongside deep-sea scientists. Follow along with the cruise through the daily log and learn about science at sea. The website includes a teacher resource guide and much more.
http://www.ridge2000.org/SEAS/

Student Monitoring Project Catalogue
Lynna Kaucheck has compiled a listing of biological monitoring projects that allow students as volunteer monitors. Contact her for a copy of the pdf file.
Contact Lynna Kaucheck at lynnakaucheck@yahoo.com

Student Science Communication Project
The Encyclopedia of Earth's science writing initiative aims to help students develop writing skills through the preparation of articles for publication in the Encyclopedia of Earth. Senior level environmental science students and graduate students at several

universities and colleges around the nation are writing and publishing articles for the website. The website offers a subset of student articles, a Teacher's Guide, and more.
http://www.eoearth.org/article/Student_Science_Communication_Project

Studying Climate Change from Beneath the Ocean
The *R/V Knorr* set sail from the Azores on June 10, 2010, with a crew of researcher scientists and three teachers from Massachusetts. The cruise will take them all the way across the North Atlantic back to the ship's homeport at Woods Hole Oceanographic Institution. Follow along with blogs and more.
http://www.whoi.edu/page.do?pid=45257

Submarine Ring of Fire
NOAA's Ocean Explorer has launched The Submarine Ring of Fire 2006 expedition website. An international team of scientists will explore the submarine volcanoes lying along the Mariana Arc from April 18–May 13, 2006. Located in some of the deepest parts of the Pacific Ring of Fire, explorers aboard the *R/V Melville* will focus on interdisciplinary investigations of hydrothermal and volcanic processes on the submarine volcanoes along the Mariana Arc.
http://oceanexplorer.noaa.gov/explorations/06fire/welcome.html

Submerged Cultural Resource Management on the Last Frontier
Nearly one-half of the United States ocean coastline falls within the boundaries of the state of Alaska. Home for thousands of years to indigenous maritime Aleut, Eskimo, and coastal Indian cultures, Alaska and its people, past and present, have inextricable links with the sea. Discover Alaska's submerged heritage with a report from a scientific expedition to collect information on several historic shipwrecks in Southeast Alaska. The website includes background materials, photos, and a video clip.
http://oceanexplorer.noaa.gov/explorations/06alaska/welcome.html

Successful Partnering Helps Stranded Dolphin
Coastal America facilitated a successful joining of two of their partners for the return a stranded rough-tooth dolphin to the wild. The Texas State Aquarium, a Coastal Ecosystem Learning Center (CELC), spent the past year rehabilitating Noah at its SeaLab facility. Through the Texas CELC partnership with Coastal America, an Air Force AC-130j Hercules crew from Keesler AFB, Mississippi flew Noah safely through a thunderstorm to the pod in Panama City, Florida on July 15, 2005.
Contact Marguerite Duffy at Marguerite.Duffy@usda.gov
www.coastalamerica.gov/

SUNY-ESF Educational Resources
The State University of New York's College of Environmental Science and Forestry offers educational units for middle and high school teachers and students free to educators. Materials include Onondaga Lake Educational Unit, Environmental Analysis of Watersheds, and more.
http://www.esf.edu/outreach/k12/res.htm

Surf It, Save It Festival – North Carolina
The North Carolina Aquarium at Fort Fisher, North Carolina, is hosting the *Surf It, Save It: Aquarium Surf Festival.* The event, June 5-6, 2010 at the aquarium, is designed to encourage environmental stewardship through surfing, as well as educate visitors about the sport's culture and lifestyle.

http://www.ncaquariums.com/surf-it-save-it-aquarium-surf-festival

Survey and Questionnaire Tutorial
The StatPac group offers a tutorial which teaches how to conduct a survey and design a questionnaire. Learn the latest survey research techniques, what works and what doesn't. The tutorial addresses how to maximize survey response rates and design a questionnaire that gets at the true opinions of your sample.
http://www.statpac.com/surveys/

Survey Results on Public Attitudes about Natural Resources
Responsive Management is a public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. The website posts a wide variety of survey results, including studies on how the general population values natural resources and outdoor recreation and their opinions on and attitudes toward an array of natural resource-related issues. Select "Natural Resources & Outdoor Recreation Research" from the left side of the webpage.
http://www.responsivemanagement.com/

Sustainability Education Resources from Facing the Future
Facing the Future: People and the Planet is a non-profit organization providing teachers, students, and the public with global issues education and action opportunities to shape our future. Their programs include curriculum development, teacher workshop, service learning opportunities and more.
http://www.facingthefuture.org/About/index.htm

Sustainability Lesson Plans
The Center for a Sustainable Future website includes lessons on land use patterns, ozone and particulates, fossil fuels and global warming, usable water, along with other topics related to designing sustainable communities.
http://csf.concord.org/esf/index.php?module=curriculum&type=unit&func=view&order=theme

Sustainability in New Zealand
Learn about the *Kaitiakitanga* (safeguarding the future) educational and environmental restoration programs; *Tipu Ake*, self-help resources for leadership development, organizational transformation, and sustainability; and Enviroschools in New Zealand.
http://www.kaitiakitanga.net/
http://www.tipuake.org.nz/
http://www.enviroschools.org.nz/

Sustainable Development Resources
The online PelicanWeb's Journal of Sustainable Development aims to be a research digest on integral human development, education for sustainable development, and related global issues. The January 2010 issue is a directory of selected online resources on sustainable development and related issues, and offers a selective compilation of links previously used in the journal, along with other recently gathered links.
http://www.pelicanweb.org/solisustv06n01page1.html

Sustainable Marine Aquaculture: Fulfilling the Promise; Managing the Risks
Sustainable Marine Aquaculture: Fulfilling the Promise; Managing the Risks is a report of the Marine Aquaculture Task Force, published in January, 2007. The Marine Aquaculture Task Force consisted of scientists, legal scholars, aquaculturists, and policy experts, whose mission was to examine the status and trends in marine aquaculture and to recommend standards and practices for U.S. marine aquaculture to protect the health of marine ecosystems.
http://www.pewtrusts.org/pdf/Sustainable_Marine_Aquaculture_final_1_07.pdf

Sustainable Sites Initiative
The Sustainable Sites Initiative is an interdisciplinary effort to create voluntary guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices. Similar to the LEED certification process for buildings, the initiative attempts to create a system to guide and develop sustainable landscapes in concert with sustainable and green buildings. A draft of the Sustainable Sites Initiative Guidelines and Performance Benchmarks is downloadable from the website.
http://www.sustainablesites.org/

Sustainable Sushi Guide
Monterey Bay Aquarium's Seafood Watch program has launched a new guide to sustainable sushi. Check it out online or order a copy.
http://www.montereybayaquarium.org/cr/cr_seafoodwatch/sfw_sushi.aspx

Sustainable Tourism
The Rainforest Alliance provides information about sustainable tourism on their website, including the second edition of the *Guide to Best Practices for Sustainable Tourism* and the *Directory of Best Practices, Certification and Codes of Conduct for Sustainable Tourism.* The guide was developed to help community businesses and small and medium-sized entrepreneurs adopt specific actions to use sustainable tourism practices in their operations. Additional links and information are also provided.
http://www.rainforest-alliance.org/programs/tourism/certification/index.html

Sustainable Tourism Best Practices
The International Coral Reef Action Network (ICRAN) facilitated a stakeholder-led process of standards development for scuba diving, snorkeling, boat operations, and beach front activities. The partners developed comprehensive conservation and safety standards for marine recreation activities. The website hosts sustainable tourism guides and other materials, some also available in Spanish and French.
http://www.icran.org/mar-tourism.html

SustainLane
SustainLane is a website designed for state and local government officials to exchange best practices in sustainability and network among peers. Categories include climate change policy, water/wastewater, parks/open space/habitat, and more. The website offers a secure directory of government officials.
http://www.sustainlane.us/home.jsp

Swimming Fishes Game
COSEE-Networked Ocean World (COSEE-NOW) presents Swimming Fishes, a human-sized board game appropriate for ages 10 to adult that demonstrates how changes in water temperature may affect fisheries distribution. Check this one out.

http://coseenow.net/2009/09/ocean-home-swimming-fishes/

Sylvan Dell Books
Sylvan Dell Publishing creates picture books that excite children's imaginations, are artistically spectacular, and have educational value. Every book contains an educational section, with the website offering extensive book previews and teaching activities. *Ocean Seasons* look sat the differences between undersea seasons. Explore a world of blue crabs, terrapin turtles, river otters, dolphins, oysters and periwinkle snails through *A Day in the Salt Marsh*. Additional books cover turtles, the rain forest, octopus, and more.
http://www.sylvandellpublishing.com/

Tackling Marine Debris in the 21st Century
From the National Research Council comes the book, *Tackling Marine Debris in the 21st Century.* The book identifies ways to reduce waste, improve waste disposal at ports, and strengthen the regulatory framework toward a goal of zero waste discharge into the marine environment. It is available for purchase or download from the website.
http://www.nap.edu/catalog.php?record_id=12486

Tagging of Pacific Predators
Tagging of Pacific Predators is a project that is putting satellite tags on thousands of the Pacific Ocean's top predators. The website features animated maps of migrating species. Additional features include videos; ask-a-researcher; stories about the research, the animals, and the scientists; and more. The site will offer education modules for each species.
http://www.topp.org

Tagging Whales in the Antarctic Seas
From May 4-June 13, 2010, scientists and students will journey to the Antarctic Seas to apply suction cup tags to humpback and minke whales to measure their underwater movements and behaviors, in addition to taking measurements of the distribution, abundance, and behavior of prey and physical features of the water column. Follow along with their web log and photos, and check out the 2009 expedition.
http://www.nicholas.duke.edu/antarctica/2010/

Take a Cloud Walk
Take a Cloud Walk, a Take a Walk book by Jane Kirkland, is available as a free pdf download. In this full-color, 30-page book, readers learn the basic names and shapes of clouds, why they move, why they are white, how they affect climate change, the difference between weather and climate, and weather terms and conditions such as hail, lightning, and fog. Before downloading, browse the rest of the No Student Left Indoors website for other materials.
http://www.nostudentleftindoors.com/

Take Pride in America
The Take Pride in America partnership is dedicated to installing a sense of volunteerism and good stewardship in all public land users, promoting volunteerism and other civic-minded programs through a wide variety of organizations and initiatives. The website includes a volunteer opportunity search engine, upcoming events, information kits, award opportunities, and more.
http://www.takepride.gov/index.cfm

Taking Action on Climate Change
This Government of Canada website has student and teacher resources to learn about the science, impacts, and adaptation to climate change and how you can take action by reducing greenhouse gas emissions. Through maps, graphs, and clear text, users can learn the basics of climate change and the greenhouse gases. The site also includes links to other resources.
http://www.climatechange.gc.ca/english/default.asp

Talking Biodiversity: Getting the Message Across
The Royal Society for the Protection of Birds (RSPB) has recently released a report entitled *Talking Biodiversity: Getting the Message Across*. This publication is part of an RSPB project which has explored different approaches and ideas that could help biodiversity specialists strengthen their communications strategies. Five articles highlight a range of issues, including the historical factors that continue to affect the rights of indigenous peoples, the roles of scientists and journalists, and more.
stella.rumbles@rspb.org.uk

Talking Fire without Getting Burned
The National Interagency Fire Center has posted the recording of Talking Fire without Getting Burned, the webinar presented in February 2010.
http://www.nifc.gov/fire_info/PIO_bb/webinar.html

Tapping America's Potential
Leading business groups have launched a website to promote a math and science education initiative which seeks to make improvements to math and science education a national priority and a key component of U.S. competitiveness. The website provides state-specific information on STEM education, links to key reports, results of public opinion research on competitiveness and innovation, and more.
http://www.tap2015.org

Targeting Outcomes of Programs
Targeting Outcomes of Programs focuses on outcomes in planning, implementing, and evaluating programs. It is based on Bennett's hierarchy, which integrates program evaluation within the program development process. The model uses this framework to target specific outcomes in program development and then to assess the degree to which the outcome targets are reached. This website offers extensive information to help your program planning. It is available in English, Spanish, Russian, and Chinese.
http://citnews.unl.edu/TOP/english/contentsf.html

Teach the Earth
Teach the Earth, from the Science Education Resource Center at Carleton College, offers hundreds of teaching activities, visualizations, and other resources for teaching earth science. Categories include biosphere, climate change, energy/material cycles, hydrosphere and cryosphere, ocean systems, and more. Special sections are provided on using data and teaching quantitative skills.
http://serc.carleton.edu/index.html

Teacher Day at NAAEE
Teacher Day is October 18, 2008 at the NAAEE Annual Conference, with teacher-focused breakouts designed specifically for their needs. Teachers are offered resources and the chance to meet with providers, make new contacts, and find information and

materials to help students learn about the environment in exciting new ways. There will be dozens of other sessions on how to make teaching more effective using the environment as an integrating context for learning.
http://www.naaee.org/conference

Teacher At Sea Program
Join NOAA's *Teacher at Sea Program*, August 26-September 26, 2003, as they crossed the equator while servicing the TAO/TRITON buoy array in the equatorial Pacific Ocean. This array is critical to our understanding of El Niño and for monitoring the dynamics of our oceans. There are webcasts, videos, and opportunities for teachers on future voyages.
http://www.tas.noaa.gov

Teacher at Sea and in the Air Books
NOAA's Teacher at Sea program gives teachers the opportunity to participate in oceanic and atmospheric research with scientists aboard NOAA ships. A book called *Teacher at Sea*, written by an 8th grade teacher and designed for middle school students, is now available, focusing on research conducted during the 2004 Teacher at Sea cruises. The book includes science and math activities as well as terminology. A second book called *Teacher in the Air* is also available. Free single copies of the books are available. Contact noaa-outreach@noaa.gov

Teacher-at-Sea Children's Books
The first book in the Teacher-at-Sea series focuses on oceanographic and atmospheric research, while the second addresses hurricane research. The final book will address fisheries research. The hard-cover books are written at the middle school science level and include science and math activities, glossaries of terms, and full-color images. Daily logs from the 2007 field season voyage are posted on the website, along with questions for both geospatial and environmental science students.
http://teacheratsea.noaa.gov/

Teacher Booklets
The National Aquarium in Baltimore offers downloadable Teacher Booklets containing pre- and post-visit activities on a variety of subjects for students of all grades. While the booklets are designed to complement aquarium programs, they also work as stand-alone pieces in any classroom. Topics include adaptations (grades 2-4), wetland monitoring (grades 9-12), squid (grades 6-12), and many more.
http://www.aqua.org/teachers/booklets.html

Teacher Loan Forgiveness - The Taxpayer-Teacher Protection Act
Teachers who teach math, science, or special education and who have taught for five years in a Title I school may be eligible for new loan forgiveness limits.
http://www.ed.gov/teachers/how/tools/initiative/updates/2005/0124.html

Teacher Tax Deduction for Classroom Expenses
The recent tax legislation signed into law by President Bush includes an extension of the tax deduction for teachers for the first $250 "out-of-pocket" expenses spent on instructional materials and classroom supplies. Remember to keep receipts for classroom materials purchased so that you can take the deduction come tax time.
http://www.nea.org/lac/edtax/index.html

Teacher to Teacher Initiative
The U.S. Department of Education's Teacher-to-Teacher Initiative is helping teachers strengthen their skills by increasing their opportunities to engage in frequent professional development. It provides convenient access to free professional development activities and keeps teachers informed of new policies and best practices vital to their craft. The initiative offers online digital workshops, an e-learning website, and teacher-to-teacher workshops.
http://www.ed.gov/teachers/how/tools/initiative/index.html

TeacherTube
Hoping to fill a need for a more educationally focused, safe venue for teachers, schools, and home learners, TeacherTube provides an online community for sharing instructional videos. It can provide anytime, anywhere professional development with teachers teaching teachers. In addition, teachers can post videos designed for students to view in order to learn a concept or skill. Check out the Mystery of Earth's Tides, Ocean Life images, and more.
http://www.teachertube.com/

Teacher Under the Sea
The Aquarius Reef Base Undersea Laboratory will be conducting a special science mission from November 11-20, 2009. The *Teacher Under the Sea Mission* will feature a classroom science teacher embedded in the mission's undersea crew. The broadcasts events, lesson plans, blogs, and archived media will be available on the website so that teachers may access them at times convenient for their classes. Live webcams are available during all missions.
http://www.uncw.edu/aquarius

Teacher's Aquarium Guide
The Ocean Animal Aquarium: Collection of Intertidal Organisms: Mini-Marine Ecosystem, Teachers' Guide: Lessons and Activities for grades K-6 is a 15-page teachers' guide for using a classroom aquarium. At the end are suggestions for activities and ways to integrate the aquarium into daily classroom activities.
http://neosec.wordpress.com/2009/07/08/teachers-aquarium-guide-grades-k-6/

Teachers Ask the Secretary
The U.S. Department of Education recently launched *Teachers Ask the Secretary*, a new feature of its website (http://www.ed.gov). According to U.S. Education Secretary Margaret Spellings, "This easy-to-use page will help teachers learn answers on a wide range of subjects: teacher quality, professional development, state academic standards, and more. We will share best practices and success stories under the No Child Left Behind Act. And we will listen to your concerns."
http://www.ed.gov/teachersask

Teachers' Corner
The Teachers' Corner website, hosted by the Great Lakes Commission through the Great Lakes Information Network, is a web-based clearinghouse for Great Lakes and fisheries K-12 education resources. All educational materials included on the site have been professionally reviewed, and many provide free lessons correlated to Michigan Science Benchmarks. Other features include a chart to compare materials side-by-side, links to relevant resources and organizations, and a discussion forum.
http://teach.glin.net/teachers

Teachers' Domain Available through netTrekker
Teachers' Domain, from WGBH Educational Foundation offers collections and courses to help teachers enhance their students' learning experiences and their own teaching skills. The collections include classroom-ready multimedia resources for use in lessons or independent study; the professional development courses utilize many of the same resources along with videos of exemplary classroom practice. Thinkronize, developer of the netTrekker suite of safe educational search products, and Teachers' Domain have partnered to provide netTrekker subscribers with access to Teachers' Domain multimedia content for teachers and students.
http://www.teachersdomain.org/
http://www.nettrekker.com/

Teachers' Domain Redesign
The Teachers' Domain website has been redesigned and offers new features, resources, and easier navigation. The website features multimedia, lessons and activities, links to professional development, and more. Users can browse by subject, keyword search, view special collections, and much more.
http://www.teachersdomain.org/

Teachers' Domain Resources
Teachers' Domain introduces Open Education Resources. Download, share, or re-mix video segments, interactive activities, and lesson plans. The materials let you shape and adapt content to meet your teaching needs. Resources include biogeochemical cycles, natural resources, ecosystems, ocean characteristics, climate, and much more.
http://www.teachersdomain.org/

Teachers Network
The Teachers Network is an alliance of education professionals dedicated to disseminating best-practices throughout the world of public school education. Visitors can find lesson plans, essays by current teachers on their own experiences, and also search a list of grants available to those working in a number of disciplines, including social studies, language arts, and the sciences. The lesson plans are searchable by subject, grade level, and through key word searches.
http://www.teachnet.org/

Teaching Boxes
Teaching boxes are instructional units created by collaboration between teachers, scientists, and designers. Each box helps to bridge the gap between educational resources and how to implement them in the classroom. The Teaching Boxes contain materials that model scientific inquiry, allowing teachers to build classroom experiences around data collection and analysis from multiple lines of evidence. Titles include *Essentials of Weather, Feeding Frenzy: Seasonal Upwelling*, and more.
http://www.teachingboxes.org/

Teaching Boxes from the Digital Library for Earth System Education
Two Teaching Boxes are available for downloading: *Evidence for Plate Tectonics*, and *Essentials of Weather*, with interrelated learning concepts, digital resources, and cohesive narration that helps bridge the gap between individual resources and understanding. Additional Teaching Boxes on ocean and earthquake-related topics are currently under development.

http://preview.dlese.org/jsp/teachingboxes/

Teaching Geologic Map Interpretation with Google Earth
The Structural Geology Resources Collection at Carleton College presents an online tutorial, Teaching Geologic Map Interpretation with Google Earth. Resources in this collection include the non-traditional approach for using Google Earth to teach strike, dip, and geologic map interpretation, along with assignments and activities, a geologic map interpretation activity for structural geology using Google Earth, and more.
http://serc.carleton.edu/NAGTWorkshops/structure/teaching_geo_map_interp.html

Teaching Physical Sciences by Ocean Inquiry
Teaching Physical Sciences by Ocean Inquiry, a COSEE-OS supported course at the University of Maine, focuses on educational approaches to help engage students in learning and offers a collection of hands-on/minds-on activities for teaching physical concepts that are fundamental in oceanography. This supplement to *Oceanography* magazine covers density, pressure, heat and temperature, and more. The website offers links to additional activities and videos showing how to run 15 of the lab exercises.
http://tos.org/hands-on/teaching_phys.html

Teaching the Poetry of Rivers
The Colorado Foundation for Water Education offers online lesson plans for teachers that address the interdisciplinary study of watersheds, and assist students with submissions to the River of Words Poetry Contest. These self-paced lesson plans integrate culture, history, poetry, and watershed science.
http://cfwe.org/row.asp .

Teaching with Historic Places
Teaching with Historic Places offers a series of classroom-ready lesson plan which use historic sites to explore American history, downloadable from the website. Each lesson includes maps, readings, and photographs, all of which are accompanied by questions. At the end, activities pull together the ideas students have just covered and require them to initiate their own research. There are twelve lessons included under maritime history.
http://www.cr.nps.gov/nr/twhp/descrip.htm

Teachers' Domain Multimedia Digital Library
WGBH, through funding from NSF, provides a digital library of multimedia for teaching and studying life sciences, including ecology and ecosystems, evolution, adaptation, genetics, and more. It includes broadcast clips and video modules from programs such as NOVA, A Science Odyssey, and ZOOM; interview segments; out-take footage; and interactive web-based activities, along with contextual information for teachers.
http://www.teachersdomain.org

Teachers' Grab Bag
As the school year starts, don't forget that the National Science Teachers Association's Teachers' Grab Bag is available with free access on the Internet. You can find free and almost free items such as videos, publications, CD-ROMs, lab kits and more.
http://www.nsta.org/resourcesgrabbag

Teaching Green: The Middle Years and The Elementary Years
Teaching Green: The Middle Years, Hands-on Learning in Grades 6-8 and the separate *Teaching Green: The Elementary Years, Hands-on Learning in Grades K-5* contain best

teaching strategies and activities contributed to *Green Teacher* magazine during the past decade, updated and revised for these anthologies. They are designed to serve as a complete "green" teaching resource for those working with school-aged youth, inside or outside of schools.
www.greenteacher.com

Teaching Issues and Experiments in Ecology
Teaching Issues and Experiments in Ecology is a peer-reviewed, web-based collection of ecological educational materials by the Ecological Society of America. The website is divided into three sections: Experiments, Issues, and Teaching. All of the materials include background information on the topic addressed, instructions for students, and notes to faculty. Materials cover mimicry, population ecology, foraging and flocking behavior, and more.
http://tiee.ecoed.net/index.html

Teaching Psychology for Sustainability: A Manual of Resources
This site includes an overview with a list of general resources that identify connections between psychology and environmental issues; instructor resources, including lecture and discussion topics, class activities, multimedia resources, and suggested readings for students; a bibliography with links to publisher sites for authored books and tables of contents for edited volumes; and a compendium of syllabi from instructors who currently teach psychology for sustainability.
http://www.teachgreenpsych.com

Team OCEAN – On-Water Ocean Conservation Education Action Network
The Team OCEAN Program promotes public education, including informative brochures as well as one-on-one interpretation; stewardship, by instilling a sense of personal understanding, ownership, and responsibility for the Sanctuary among the general public; and sanctuary presence on the water, emphasizing the importance of the proper use of our resources, now and for future generations.
http://www.fknms.nos.noaa.gov/edu/ocean.html .

TED Talks
TED (Technology, Entertainment, Design) started out as a conference bringing together people from those three fields. The annual conference now brings together thinkers and doers who are challenged to give the talk of their lives (in 18 minutes). The website offers the best talks and performances, with categories including Technology, Global issues, Science, and more. Check out the newer offerings from Peter Tyack, Brian Skerry, Enric Sala, and many more. Check out the offerings from TED Prize winner Sylvia Earle, Richard Pyle, and more. Select "Show talks related to…" for a quick offerings.
http://www.ted.com/

Teens for Planet Earth and Leadership Institute
Teens for Planet Earth was created by the Wildlife Conservation Society at the Bronx Zoo to help teens who are fascinated by wildlife, nature, and the environment put their passion into practice. The website includes links to background information, service learning information, and more. Adult leaders are invited to participate in a Leadership Institute training, to explore effective programs providing young people with the skills and support in community conservation-based service-learning projects.
http://teens4planetearth.com/

Teens for Planet Earth
This program, developed by the Wildlife Conservation Society, supports teens and teen leaders/educators as they carry out environmental service-learning projects. The website provides a resource library, news articles, and a Take Action section. There's also a special section for Girls for Planet Earth.
http://www.teensforplanetearth.org/

Teens for Planet Earth Social Networking Site
Teens for Planet Earth has been transformed into a social networking site, and sports a new look and ways to help teens (and adults who work with teens) carry out environmental service-learning projects. Members can connect with other members, share photos and videos of their projects; post upcoming events related to their projects; find resources to help carry out a successful project; receive advice on conducting service-learning projects; and much more.
http://www.teensforplanetearth.org

Ten Top Tips for Teaching with New Media
Eductopia offers *Ten Top Tips for Teaching with New Media.* It offers succinct and practical advice, covering everything from iChat and Twitter to lesser-known tools like VoiceThread and Wordle. The downloadable document is available for free.
http://www.edutopia.org/ten-top-tips

Tennessee Aquarium WebCam
The Tennessee Aquarium's exhibit, the Secret Reef, offers a virtual dive into an exhibit modeling the Flower Garden Banks through a Secret Reef Cam.
http://www.tnaqua.org/OurAnimals/SecretReefcam.aspx

Tennessee's Watchable Wildlife
Tennessee's Watchable Wildlife website has information on the birds found in Tennessee, and can be easily searched by a bird's habitat, color, use of backyards and feeders, or taxonomic group. Each species has a profile where you can find out about the occurrence of the bird in the state, see pictures, hear songs and calls, and find places to see it. Future watchable wildlife categories will include mammals, amphibians, reptiles, fish, and insects.
http://www.tnwatchablewildlife.org/

TerraCycle
Earn money by recycling. Terracycle buys plastic wraps, candy wrappers, and different plastic containers from groups, schools, and fundraisers, to reuse for their business. They make everything they sell out of trash.
http://www.terracycle.net/

TerraLook
Landsat and other satellite sensors have been collecting images of Earth from space for more than 30 years. For the most part, use of this data has been limited to the scientific and land management communities. TerraLook was developed to broaden the population of satellite image users by providing both ASTER and Landsat data as free, georeferenced, simulated natural-color JPEG images for users that lack prior experience with remote sensing or Geographic Information System (GIS) technology. TerraLook

consists of two parts: collections of images, and free optional software. Interested teachers should contact Gary Geller at Gary.N.Geller@jpl.nasa.gov
http://terralook.cr.usgs.gov/index.php
http://asterweb.jpl.nasa.gov/terralook.asp

Texas Coastal Connection
The Texas Coastal Management Program offers the Texas Coastal Connection website, providing the public with easy access to a wide array of online resources on coastal marine issues. The website highlights hot topics along the Texas coast; assists users in finding answers to questions on coastal issues; and serves as a source for information on the state's rich coastal resources. Check out the extensive links section.
http://www.TexasCoastalConnection.com

Texas Education Agency Best Practices Clearinghouse
The Texas Education Agency has established an online clearinghouse of information related to best practices of high-performing and highly efficient campuses, school districts, and charter schools in instruction, dropout prevention, business/management practices, and public school finance and resource allocation. The goal of the clearinghouse is to provide information about best practices that is specific, actionable, and accessible to schools and interested members of the public.
http://www.tea.state.tx.us/bestprac/

Thank You Ocean
A public awareness and information outreach effort is being launched by the California Resources Agency and NOAA. Empowering Californians to protect the Pacific is the focus of the campaign. The campaign is designed to spur citizen involvement and activity to help protect the ocean's health and resources. The website includes a downloadable public service announcement, links to information and activities about the ocean, ways to make a difference, and more.
http://www.thankyouocean.org/

Thank You Ocean Website Redesign
The *Thank You Ocean* campaign website has been redesigned. The new site discusses four major threats to the ocean, features news reports updated daily, describes actions that people can take to protect the ocean, and more. The site offers dynamic content, contests, videos, and connection to social media.
http://www.thankyouocean.org/

Thank You Ocean Report Podcasts
The California *Thank You Ocean* public awareness campaign has launched a new podcast feature. The podcasts discuss how the public can protect the ocean and highlight issues important in ocean and coastal management. The first podcast focuses on the Thank You Ocean campaign itself, followed by podcasts on marine debris, marine protected areas, and more. A new podcast will be posted approximately every 2 weeks.
http://www.thankyouocean.org/podcast/

The Early Years
Science and Children and the National Science Teachers Association have established a blog devoted to early childhood science. You can find teaching advice, management tips, favorite resources, and activity ideas specifically for teachers of grades pre-K–2. The blog accompanies Science and Children's column *The Early Years*. To view the first

column with teacher's picks about marine and environmental science resources, visit http://www.nsta.org/main/news/stories/science_and_children.php?category_ID=86&news_story_ID=50933.
http://science.nsta.org/earlyyearsblog

Thinkfinity Literacy Network
The Verizon Foundation's Thinkfinity Literacy Network links to free, online educational resources for literacy instruction and lifelong learning for adults along with family literacy programs. The content aims to strengthen literacy development, creativity, and critical thinking skills. The website of literacy resources is meant for teachers, volunteers, adult learners, tutors, parents, and students. A simple search on the "marine" brought a response with more than 900 listings.
http://literacynetwork.verizon.org/tln/

This Land Is Your Land Curriculum
This free, activity-based youth curriculum was developed by Michigan State University Extension. Though developed for grades 3-5, the lessons are easily adaptable to any grade level. *This Land Is Your Land* is a set of land use curriculum materials designed to help students develop into involved citizens who understand the importance and practice of wise land use. It is designed so young people can contribute solutions to current land use issues and participate in making sound decisions now and in the future.
http://web4.msue.msu.edu/msuewc/kent/yourland/

This Week at Hilton Pond – Seagulls
While the focus for this research center is the South Carolina Piedmont, the latest posting on seagulls underscores the fact that you cannot separate "marine" from the greater environment.
http://www.hiltonpond.org/ThisWeek040115.html .

Thoreau's Legacy: American Stories about Global Warming
Penguin Classics and the Union of Concerned Scientists offered established writers and fresh voices the opportunity to contribute their personal stories in this new anthology, *Thoreau's Legacy: American Stories about Global Warming*. The essays selected represent a variety of perspectives, voices, and experiences. The chapters are organized by theme, including Water and Ice, Tales from Urban America, and more. The book may be purchased, or read online.
http://www.ucsusa.org/americanstories/vbook.html

Thresholds in Education Journal Call for Manuscripts
The Thresholds in Education journal invites manuscripts related to topics addressing school-based programs that get students outside and engaged in educational or recreational activities as part of the planned curriculum. The theme of an upcoming issue is *No Child Left Inside: School-based Responses to Nature-Deficit Disorder*. The overall objective of the issue is to showcase the broad-based application of theory and/or practice in K-12 private and public educational settings.
http://www.cedu.niu.edu/lepf/foundations/thresholds/index.html

Thunder Bay Sinkholes Expedition
NOAA Ocean Exploration and Research Program launched information about the Thunder Bay Sinkholes 2008 Expedition, September 2–12, 2008. Scientist explored shallow and deep coastal sinkholes to more fully understand chemical and physical

properties that contribute to the unique ecology found in these recently-discovered ecosystems in Earth's largest group of freshwater lakes - the Laurentian Great Lakes of the United States and Canada. Check out the web logs, video, and much more.
http://oceanexplorer.noaa.gov/explorations/08thunderbay/welcome.html

Tidal Creek Habitats
This booklet is based on a synthesis of more than 15 years of research in tidal creek systems. The contents include brief reviews of valuing and studying tidal creeks, recommendations for decision-makers, and links to additional resources.
http://hml.noaa.gov/pdf/tidal_creek_booklet.pdf

Tidepool Math
From the Minerals Management Service (MMS) and the Multi-Agency Rocky Intertidal Network (MARINe) comes Tidepool Math, curricula for K-8 and high school. Students use a plot of a mussel bed to better understand sampling, estimating, and the scientific method. The website has downloadable curricula, photographs to use for the sampling exercises, and flash cards of typical tidepool organisms, or order the CD. Check out the MMS Kids' Pages for other information on Ocean Energy, Sand, and more.
http://www.mms.gov/mmskids/ .

Tides of Change
NASA offers Tides of Change, a series of videos focusing on the ocean-climate connection. Each video features a specific component of the connection, such as marine life or the water cycle. Each can be watched online or downloaded from the website. The videos are captioned for the hearing impaired.
http://www.nasa.gov/topics/earth/features/esw09_videos.html
http://climate.nasa.gov/esw/videoseries/

Tides and Currents Web Data Portal
The Center for Operational Oceanographic Products and Services (CO-OPS) offers an Integrated Ocean Observing System (IOOS) oriented web portal to provide access to the National Data Buoy Center's and CO-OPS' observational oceanographic data. Users will find improved methods for observational data retrieval, useful IOOS links, and related information. Navigation is clearly marked with links to products, programs, education, and more.
http://tidesandcurrents.noaa.gov/opendap.html

Tijuana Estuary High School Teacher's Guide
The Tijuana Estuary High School Teachers' Guide is a field-based, inter-disciplinary high school curriculum designed to educate students about the valuable Tijuana River Estuary natural and cultural resources. Chapters include ecology, geology, history, language arts, and more. It has been developed to align to California State Content Standards.
http://www.tijuanaestuary.com/education.asp

Timelapse PlantCam
This outdoor camera takes time lapse photos that can be stitched together to create a video of your project site. It can be used for wetland restoration monitoring, as a teaching tool, and more. The Swamp School website offers two examples of wetland monitoring with the camera.
http://swampschool.org/new/outdoor-nature-cameras/wetland-plantcam/

Timeless Totems: The Carved History of the Alaskan Coast eField Trip
Why did people carve totem poles? How were the totem poles made? What do the designs on the totem poles mean? Take your students on an electronic field trip to Sitka National Historical Park in Alaska to find the answers to these questions. Premiering March 27, 2006, the eFieldTrip has three major components, a virtual visit, a trip journal, and *Ask the Experts*, which also was available February 6-8, 2007.
www.eFieldTrips.org

To the Everglades
The Everglades Eco Tour is a collaboration between the U.S. Army Corps of Engineers and Everglades National Park. Student from Paxon Middle School in Jacksonville Florida took the field trip and wrote and performed in this music video about Everglades restoration.
http://www.evergladesplan.org/get_involved/ecotour_2010.aspx

To Fight or Not to Fight?
In this conflict resolution activity from Facing the Future, students examine a variety of international and intra-national conflicts through a role-playing activity. They learn to identify the roots of conflict, how to separate positions from interests in a conflict, and experience mediating a conflict. Free registration is required.
http://www.facingthefuture.org/Members/documents/35.To.Fight.Or.Not.pdf

Today's Green Minute
Today's Green Minute is a web-based video series which covers green innovation in science, wildlife, conservation, commerce, global warming, gizmos, and more.
http://todaysgreenminute.com/

TogetherGreen
TogetherGreen is a National Audubon Society program with support from Toyota, to build conservation leadership, engage people in conservation action, and achieve lasting conservation results. The program offers grants, featured projects, volunteer opportunities, and more.
http://www.togethergreen.org/

Tom Volk's Fungi
This website offers several years of "fungus of the month" entries, along with background information about fungi and related organisms. Check out the Holiday Fungi, special topics, and more.
http://tomvolkfungi.net/

Tools of Change
Community-based social marketing can be effective for promoting behavior change for social, personal, and environmental benefits. The approach emphasizes the reduction of barriers to taking the desired actions, direct contact among community members, the use of proven tools of change, and continuous program improvement. This website offers specific tools, case studies, and a planning guide for helping people take actions and adopt habits that promote health and/or are more environmentally-friendly.
http://www.toolsofchange.com/

Tools for Monitoring Coastal Habitats
This second volume of the two-volume restoration monitoring manual titled *Science-Based Restoration Monitoring of Coastal Habitats* is now available online, courtesy of scientists from NOAA's National Centers for Coastal Ocean Science. Volume Two provides tools and information for the development and implementation of restoration monitoring plans for 13 types of coastal habitats. The information provided is designed more for practitioners who may not have extensive experience in coastal ecology.
http://coastalscience.noaa.gov/ecosystems/estuaries/restoration_monitoring.html

Topographic Map of Earth
NASA and Japan released a new digital topographic map of Earth. The map was produced with detailed measurements from NASA's Terra spacecraft.
http://www.nasa.gov/topics/earth/features/20090629.html

Tortugas Ecological Reserve Cruise
Scientists from NOAA's National Centers for Coastal Ocean Science conducted their eighth research cruise at the Tortugas Ecological Reserve to determine the ecological and economic consequences of establishing marine protected areas. Scientists aboard the NOAA Ship *Nancy Foster* conducted diver and remote sonar surveys of benthic habitat and fishes from July 25-August 5, 2008. Online mission logs, crewmember information, and background information are posted on this website.
http://www.ccfhr.noaa.gov/ecosystems/sanctuaries/tortugas2008/welcome.html

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http://www.ccfhr.noaa.gov/ecosystems/sanctuaries/tortugas2008/welcome.html

Touch the Invisible Sky
Touch the Invisible Sky is a 60-page book with color images of nebulae, stars, galaxies and some of the telescopes that captured the original pictures. Each image is embossed with lines, bumps, and other textures. These raised patterns translate colors, shapes, and other intricate details of the cosmic objects, allowing visually impaired people to experience them. Braille and large-print descriptions accompany each of the book's 28 photographs.
http://hubblesite.org/newscenter/archive/releases/2008/05/full/

Tour of the Cryosphere 2009
Take a tour of some the coldest places on the planet courtesy NASA's fleet of Earth-observing spacecraft. The text of the video is also available.
http://www.nasa.gov/multimedia/podcasting/TourOfCryosphere09.html
http://www.nowpublic.com/environment/nasa-tour-cryosphere-2009

Tour de Turtles
Tour de Turtles is a fun, educational journey through the science, research, and geography of sea turtle migration using satellite telemetry. Created by the Caribbean Conservation Corporation with help from sponsors and partners, this event follows the

migration of ten sea turtles, representing four different species, from their nesting beaches to their foraging grounds.
http://www.tourdeturtles.org/

Tox Town
Tox Town helps students and teachers learn about environmental health concerns and toxic chemicals, by way of an interactive imaginary town, and includes a port scene with algal blooms, beach impacts, and more. The website links include text versions and some Spanish-language resources.
http://toxtown.nlm.nih.gov/

Track Sea Turtles On-Line
SEATURTLE.ORG provides sea turtle researchers with a tool for collecting, managing and sharing sea turtle satellite tracking data in near real-time. There is a list of tracking projects, links to background information about each program and the turtles they are tracking, and maps that are updated daily. A section for teachers is under development.
http://www.seaturtle.org/tracking/

Tracking Cranes Classroom Program
As a global family of birds, cranes offer an opportunity for teachers to combine the study of cranes with learning about diverse cultures and countries. Tracking Cranes and the International Crane Foundation offer this education project to link classrooms in the United States with students in eastern China and Russia in learning about cranes, their habitats, and their conservation. The website includes information about the birds along with links to educational activities and additional materials.
http://www.trackingcranes.org/en/indexen.htm

Tracking El Nino
This website from NOVA describes the anatomy of El Nino, links to a teacher's guide, and much more. Check out the site index for quick access to the materials.
http://www.pbs.org/wgbh/nova/elnino/

Tracking the Invasive Veined Rapa Whelk
The Bridge features a series of Data Analysis Teaching Activities (DATA) that can be used to supplement curriculum materials. The DATA *River Watch: Tracking the Invasive Veined Rapa Whelk* explores the introduction of a predatory marine snail that hails from Asian waters near Japan and Korea. In this activity, students analyze biotic and abiotic data to determine the risk of a successful rapa whelk invasion for four hypothetical estuaries.
http://www.marine-ed.org/bridge/index_archive0506.html

Tracking Narwhals in Greenland
Tracking Narwhals in Greenland is available on NOAA's Ocean Explorer website. From August 2006 to March 2007, scientists from the University of Washington and the Greenland Institute of Natural Resources will instrument 8-10 narwhals with satellite-linked time-depth-temperature recorders to track whale movements, diving behavior, and ocean temperature structure in Baffin Bay.
http://www.oceanexplorer.noaa.gov/explorations/06arctic/welcome.html

Trail Resources
The American Trails online library has hundreds of articles, studies, and resources on every aspect of trails and greenways. They are also archiving presentations and award documentation from the National Trails Symposium as well as materials from other educational sessions. Topics include Trailbuilding, Planning, Education, and much more.
http://www.americantrails.org/resources/index.html

The Transect Line
The Transect Line is an on-line or print newsletter from the Reef Check global network. Reef Check is an international program that works with communities, governments and businesses to scientifically monitor, restore, and maintain coral reef health. The newsletter features articles about Reef Check team activities, news, events, and more.
http://www.reefcheck.org/news/newsletter.asp

Trash Bash - Texas
The 2007 River, Lakes, Bays 'N Bayous Trash Bash will take place March 31, 2007 in various locations in the Houston, Texas area.
http://www.trashbash.org/

Travel Matters
The Travel Matters website helps students, teachers, and others learn about how their travel habits and vehicular choices affect climate change. TravelMatters offers interactive emissions calculators, on-line emissions maps, and education content that emphasizes the close relationship between more efficient transit systems and lower greenhouse gas emissions. The website includes questions, activities guides, an interactive quiz, resource lists, and more.
http://www.travelmatters.org .

Traveling Wetland Education Trunks for Texas
Twenty-five *Wetland Education Trunks* have been distributed to educators and education centers across Texas and are available for loan to teachers. The trunks contain lesson plans, books, posters, videos, Texas Amphibian Watch materials and field equipment to guide students in their investigations of wetland habitats. The trunks emphasize learning in the classroom and in the field.
http://www.tpwd.state.tx.us/edu/

Tread Lightly! Charity Auction
Tread Lightly! will hold its 2nd Annual Tread Lightly! Charity Auction on eBay, June 1-11, 2009, with more than 175 products donated from companies across the country. All money raised will go to address recreation issues on public recreation sites and off-road trails through education, communication, and restoration/stewardship.
http://www.treadlightly.org/page.php/auction

Tread Lightly Geocaching Recommendations
Tread Lightly!'s strategic educational message, along with its training and restoration initiatives, are designed to instill an ethic of responsibility in outdoor enthusiasts and the industries that serve them. The program is long-term in scope with a goal to balance the needs of the people who enjoy outdoor recreation with the needs of the environment. The program offers recommendations for both users and managers involved in a variety of different recreational activities, including geocaching.

http://www.treadlightly.org/edu.mv?edu=Recreation%20Tips

Tread Lightly Government Resources
The nonprofit organization Tread Lightly! is a nonprofit whose mission is "To empower generations to enjoy the outdoors responsibly through education and restoration." They have developed a new web section specifically for employees of land and water management agencies. It was created to be a clear-cut, effective resource to provide aid to agencies who deal with recreation issues on their land or water.
www.treadlightly.org/govresource.mv .

Tread Lightly! Play Nice Campaign
Tread Lightly! has just completed a revamp of it's *Play Nice* Public Service Announcement Campaign, created to encourage and inspire recreationists to minimize their impact and be responsible in the outdoors. Available PSAs include fishing, personal watercraft use, and more.
http://www.treadlightly.org/edu.mv?edu=Public%20Service%20Announcements .

Tread Lightly! Slogan
In an effort to make their message stronger and clearer, Tread Lightly! has revamped their old slogan from *Leaving a Good Impression* to *Tread Lightly! On Land and Water*. The new tagline not only communicates our message effectively, but also helps reach out better to the water recreation community. In addition, the mission statement has been updated to: To proactively protect recreation access and opportunities in the outdoors through ethics education and stewardship initiatives.
http://www.treadlightly.org/

Treasures of NOAA's Ark: Shipwrecks!
NOAA Heritage Week 2008 highlighted the agency's role in shipwreck exploration, resource protection, safe navigation, marine forecasting, and safety at sea during a special public exhibition. The website offers a companion guide to the exhibition, featuring links to a wide variety of NOAA resources about shipwrecks, navigation, marine forecasting, educational materials, and more.
http://www.preserveamerica.noaa.gov/heritageweek.html

Treasures in the Sea
Treasures in the Sea: Our Bahamian Marine Resources is a new resource book that provides educators with scientific information and hands-on activities. Designed especially for educators in The Bahamas, the book complements curriculum guidelines for grades three to six, though many of the activities may be adapted for younger or older students in formal and nonformal settings. The website includes the downloadable publication, links to resources related to the activities, and more.
http://treasures.amnh.org/index.html

Tree of Life: The Incredible Biodiversity of Life on Earth
This beautifully illustrated and child-friendly introduction to biodiversity, *Tree of Life,* shows how living things are classified into five kingdoms — and how each has much to tell us about all aspects of life on our planet. The book focuses on the idea that if every known species on Earth were a leaf on a tree, that tree would have 1,750,000 leaves. Since humans count for just one leaf on the tree, we have a lot to learn about the millions of other forms of life with which we share the world.

http://www.kidscanpress.com/kidscanpress/KidsCanPress_3/us_version/KCP/f_home.htm

Tribal Directory Assessment Tool
The Tribal Directory Assessment Tool, developed by the Office of Environment and Energy's Environmental Planning Division to assist users with Section 106 compliance and tribal consultation, was designed to help users quickly identify tribes and provide users with appropriate tribal contact information. Two key aspects of the tool are its ability to link tribes' areas of interest down to the county level, and perform a variety of queries related to tribes.
http://www.hud.gov/offices/cpd/environment/tribal/index.cfm

TROLL Top Picks
Each month the Bridge features a new TROLL Top Web Pick. Selected by our Teacher Reviewers of On-Line Learning (TROLLs) as exemplary, these sites are featured on the Bridge front page, complete with a quote from the TROLL. While every site on the Bridge has undergone the rigorous TROLL evaluation process ensuring that visitors are accessing only the top ocean sciences resources on the web, the monthly Top Picks are considered to be the top 10% of educational websites.
http://www.marine-ed.org/bridge

TROLL Top Picks Collection
The Bridge would like to introduce the TROLL (Teacher Reviewer of On-Line Learning) Top Picks Collection. Appended each month, the collection features each TROLL Top Pick dating back to April of 2005, complete with link, TROLL quote, and the month and year it was selected as Top Pick. Take a look at the collection today and if you have a great ocean science website you think could be selected as the next TROLL Top Pick, please nominate it to the Bridge.
TROLL Top Pick Collection: http://www.marine-ed.org/bridge/index_toppicks.html
Bridge TROLL Review Criteria: http://www.marine-ed.org/bridge/indexrevinstr.html
Site Nomination Form: http://www.marine-ed.org/bridge/index_nomination.html

Tsunami Curriculum
These websites are a small sampling of those that host background and curriculum about tsunamis.

- Asia Society K-12 Teacher's Resource Site: http://www.askasia.org/tsunami/
- Gross Point Public School System: http://www.gpschools.org/ci/tsunami.htm
- National Science Teachers Association: http://science.nsta.org/nstaexpress/nstaexpress_2004_01_10_tsunami.htm
- NOAA Intergovernmental Oceanographic Commission: http://www.prh.noaa.gov/itic/library/pubs/curriculum/tsunami_curriculum.html
- U.S. Geological Survey, Coastal and Marine Geology Program: http://temp.water.usgs.gov/tsunami/
- U.N. Atlas of the Oceans – Impact of Tsunamis on Ecosystems: http://www.oceansatlas.org/id/71687

TsunamiReady
Tsunami-ready is a program sponsored by the NOAA and the National Weather Service. It sets minimum guidelines for a community to be awarded tsunami-ready recognition. The requirements include establishing an emergency operations center; having the

capability to provide tsunami warnings using sirens and local media; developing a tsunami hazard plan and community awareness program; and the ability to receive tsunami warnings from the weather service. For an example of a TsunamiReady community workshop, check out the South Slough National Estuarine Research Reserve website. http://egov.oregon.gov/DSL/SSNERR/resourcelibrary.shtml
http://www.tsunamiready.noaa.gov/

Turning the Tide: The Eradication of Invasive Species
The Hawaiian Ecosystems at Risk Project (HEAR) provides technology, methods, and information to decision-makers, resource managers, and the general public to help support effective science-based management of harmful non-native species in Hawaii and the Pacific. These articles from the Proceedings of the 2001 International Conference on Eradication of Island Invasives, Auckland, New Zealand, along with other pertinent articles, have been posted on the website under "Online full-text articles".
http://www.hear.org/index.html .

Turtle Talks Activity Book
Turtle Talks is a youth conservation eco-literacy project. A team member authored a downloadable children's activity book on sea turtles.
http://www.oceana.org/fileadmin/oceana/uploads/reports/TurtleTalks_en.pdf

Twists in the "Name That Jellyfish Contest"
As often happens in science, there has been an unexpected twist in the process of naming the Bonaire Banded Box Jellyfish. While the contest is over, there is more to the process than expected. Check out this website for another example of the scientific process.
http://www.yearofscience2009.org/themes_ocean_water/general/top-seven-jellyfish-names.html

uBio
The Universal Biological Indexer and Organizer (uBio) is a comprehensive database of known scientific and common names of living (and once-living) organisms. The Taxonomic Name Server catalogs names and classifications to enable tools that can help users find information on living things using any of the names that may be related to an organism.
http://www.ubio.org/

Ultimate Squid Dissection
Paul Detwiler offers a 9-minute video that provides marine biology teachers with an overview of a dissection of the market squid, *Loligo opalescens*, along with accompanying materials, including a cephalopod adaptations lab. The video illustrates the squid's external and internal anatomical structures to enable teachers to lead and assist their students in dissecting this species in the classroom.
http://www.nmeaweb.org/gatlinburg2010/0721_215.html
http://www.kendallhunt.com/detwiler/

UN Atlas of the Oceans Newsletter
The UN Atlas of the Oceans newsletter provides a round-up of the latest activity on the website, including most recently added topics, content, and special happenings such as new partnerships or awards. Recent additions include information about arctic ecosystems. To subscribe, click on "join now" under the search function.

http://www.oceansatlas.org/ .

UN Report on Mangroves and Coral Reefs
The United Nations Environment Programme (UNEP) recently released its report on corals and mangroves, *In the Front Line: Shoreline Protection and other Ecosystem Services from Mangroves and Coral Reefs*. The report was produced by UNEP's World Conservation Monitoring Centre in collaboration with the International Coral Reef Action Network and the World Conservation Union. Among the report highlights are environmental and estimated economic value of coral reefs.
http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=466&ArticleID=5112&l=en

Underground Rivers
Professor Emeritus Richard J. Heggen of the University of New Mexico has written the book*, Underground Rivers from the River Styx to the Rio San Buenaventura with occasional diversions*, and offers it free for downloading online. Chapters include The Concept of Circulation, Lava Tubes, The Biology of Underground Rivers, and much more. The book includes chapters on underground rivers from the point of view of mythology, literature, and science.
http://www.unm.edu/~rheggen/UndergroundRivers.html

Understanding Climate Toolkit
The American Geological Institute, in conjunction with Earth Science Week 2009 (October 11–17), released a new toolkit that enables students, educators and the general public to explore this year's theme, *Understanding Climate*. The 2009 Earth Science Week Toolkit features a variety of educational climate resources from the USGS, NASA, and NOAA. The toolkit is available for the cost of shipping and handling.
http://www.earthsciweek.org/materials/

Understanding Plate Motions
This website, from the U.S. Geological Survey, provides an introduction to the motions of tectonic plates. Descriptions and examples of each of the four types of plate boundaries are presented along with illustrations of the motions associated with each.
http://pubs.usgs.gov/gip/dynamic/understanding.html

Understanding and Responding to Climate Change
This downloadable National Academy of Sciences booklet presents recommendations from the National Academies' many expert reports on climate change, in an easy-to-read format. The 2008 edition of *Understanding and Responding to Climate Change* includes an expanded section on impacts and updated figures and graphics.
http://dels.nas.edu/dels/rpt_briefs/climate_change_2008_final.pdf

Understanding Science
The Understanding Science website aims to communicate what science is and how it works. The site, intended for both the general public and K-16 teachers, draws visitors into real-life examples and looks at the social side of science, science and society.
http://undsci.berkeley.edu/

Understanding Sustainability
Understanding Sustainability is a flexible, self-contained 1-2 week curriculum unit aligned with national science standards for middle school educators to teach sustainability issues from Facing the Future. This curriculum features hands-on activities that explore sustainability issues, such as energy, consumption, water scarcity, along with potential solutions. Free versions may be available for Washington and Alaska.
http://www.facingthefuture.org/Home/CurriculumDetails/tabid/131/Default.aspx?ItemID=NATUS

Underwater Universe
The History Channel offers Underwater Universe. Throughout history, tidal waves, storm surges, hurricanes and cyclones – fueled by the ocean – have wreaked great destruction on the cities and people in their path. *Underwater Universe* tracks the history and evolution of the ocean's seven deadliest zones. This program helps explain to viewers the how and floods, tsunamis, hurricanes, whirlpools, and underwater volcanoes develop.
http://www.history.com/schedule.do?action=daily

Underwater Videos Available On-Line
The Perry Institute for Marine Science / Caribbean Marine Research Center posts three educational videos to provide a glimpse at our underwater environments, including MPAs, coral reefs, and Nassau Grouper.
http://www.cmrc.org/pubs.htm

Unearthing Tse-whit-zen
The Seattle Times published a special report, May 22-25, 2005, about the Tse-whit-zen archaeological site uncovered by the Washington Department of Transportation on the Port Angeles waterfront in August 2003. Working side by side, archaeologists and tribal members have uncovered burials, the remains of many structures, and signs of human activity dating back at least 2,700 years. The website includes background information, a narrated slideshow, and a study guide.
http://seattletimes.nwsource.com/news/local/klallam/index.html

UNEP Publications on Water & Waste Management and Tourism & Biodiversity
A Manual for Water and Waste Management: What the Tourism Industry Can Do to Improve Its Performance looks at solid waste and water management and provides guidelines and examples of how tourism operations can achieve positive results. *Tourism and Biodiversity: Mapping Tourism's Global Footprint*, illustrates the overlap between tourism development and biodiversity hotspots.
http://www.uneptie.org/pc/tourism/library/mapping_tourism.htm
http://www.uneptie.org/pc/tourism/library/waste_manual.htm

UNEP Portal
The United Nations Environmental Programme Network provides a global portal to authoritative environmental information based on themes and regions. Some thematic portals include climate change, freshwater, and a geo-data portal with many marine data sets. Information includes announcements and news, initiatives, and resources.
http://www.unep.net/

UNEP Year Book 2008
The UNEP Year Book 2008 highlights the increasing complexity and interconnections of climate change, ecosystem integrity, human well-being, and economic development. It examines the emergence and influence of economic mechanisms and market-driven approaches for addressing environmental degradation, and it describes recent research findings and policy decisions that affect our awareness of and response to changes in our global climate and environment. It is available in English, Spanish, and French.
http://www.unep.org/publications/search/pub_details_s.asp?ID=3980
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United Nations Atlas of the Oceans
The Atlas is an information system designed for use by policy makers, scientists, and students who need access to underlying data bases and approaches to sustainability. The information includes history, biology, climatology, food security, fishing, and more.
http://www.oceansatlas.org/

Universcale
Created by Nikon, this website provides insight into the subject of scale and comparing and understanding things which cannot be physically compared.
http://www.nikon.co.jp/main/eng/feelnikon/discovery/universcale/index.htmv

University of Wisconsin-Madison Zoology Museum Collection
From the University of Wisconsin-Madison digital collections, the Zoology Museum Collection includes digitized versions of heavily illustrated biological journals, a few dated as early as 1859 with the majority from the first half of the 20th century. In addition to searching, journals can be displayed in a gallery view, allowing users to jump quickly to pages of interest. The Galápagos Collection includes skeletons, slides, pictures, books, and research papers collected and produced by UW-Madison scientists and researchers during ten expeditions to the Galápagos since 1969.
http://digicoll.library.wisc.edu/Zoology/

The Unnatural History of the Sea.
Callum Roberts' book, *The Unnatural History of the Sea*, relates a history of ocean life in words and pictures. Using accounts of sea adventures from explorers, fishermen, pirates, merchants, and travelers, he explores hundreds of years of exploration and exploitation of the sea. Check out previews of the book on the website and through Internet search engines.
http://www.historyofthesea.org/

Upcoming BRIDGE Changes
Throughout the fall, the Bridge's website technology will be improved to make the site more useful for ocean science teachers. The Bridge will be database-driven; use a more productive search engine; have enhanced navigation featuring a rollover menu include an updated color scheme, and highlight sections spotlighting a bridge data lesson plan, teacher top pick of the month, and breaking ocean science education news. Visit the website to see the changes over the coming months.
http://www.marine-ed.org/bridge

Upwelling Zones
Upwelling Zones is a resource to help learners understand the importance of marine upwelling systems, including ties to fisheries, El Nino, and La Nina events. Users can interactively track and analyze temperature, wind, salinity and chlorophyll data. Other

features include a user guide, movies, links to published research, and summaries of relevant background topics. Worksheets and accompanying rubrics are designed to help educators assess student understanding of various topics.
http://www.bigelow.org/upwelling

U.S. Antarctic Program
This website from the National Science Foundation offers information about the world's coldest, windiest, driest, and harshest continent - its ecosystems and its effects on global processes such as climate. Read breaking news from a newspaper written in McMurdo Station, Antarctica. See articles about a killer crater found under the ice, the melting of polar ice sheets, video clips, maps, images, and much more.
http://www.usap.gov/scienceAndEducation.cfm

USA Science and Engineering Festival
The inaugural USA Science and Engineering Festival, October 10-24, 2010 in Washington, D.C., is the country's first national science festival, a grassroots collaboration of over 500 of the nation's leading science organizations. A number of events are scheduled to take place in Washington and around the nation, culminating with a free, two-day Expo on the National Mall.
http://www.usasciencefestival.org/

U.S. Geological Survey Educational Resources
The U.S. Geological Survey (USGS) provides scientific information intended to help educate the public about natural resources, natural hazards, geospatial data, and issues that affect our quality of life. The website includes links to selected online resources, including lessons, data, maps, and more, to support teaching, learning, education, and research. The educational resources are broken up by grade level for easier selection by teachers, with materials for teaching about GIS, links to publications, links to popular USGS websites about volcanoes, water resources, coastal storms, and much more.
http://education.usgs.gov/index.html

USGS Global Visualization Viewer
GloVis is an interactive viewer providing access to satellite imagery for virtually any point on the Earth. Users can select a satellite and sensor and either type in latitude and longitude or click on a point on the index map. The viewer will show a mosaic of the most recent cloud-free satellite browse images around the point selected, along with metadata. Users can also navigate to adjacent images, create and modify scene lists, and more. A user's guide is included.
http://glovis.usgs.gov/

U.S. Geological Survey Photographic Library
Employees with the U.S. Geological Survey have taken many, many, photographs in the course of their various geological studies and explorations, documenting volcanic explosions, national parks, and more. This website contains 30,000 photographs from 1868 to the present, and offers free downloading of the images. The thumbnails load quickly and each is accompanied by a brief description.
http://libraryphoto.cr.usgs.gov/

U.S. Global Change Research Information Office
The US Global Change Research Information Office provides access to data and information on climate change research, adaptation/mitigation strategies and

technologies, and global change-related educational resources on behalf of the various US Federal Agencies that are involved in the US Global Change Research Program. The website offers downloadable documents, *Ask Dr. Global Change* with links to useful information, and more.
http://www.gcrio.org/

U.S. Ocean Policy Report Card
The Joint Ocean Commission Initiative released its third annual U.S. Ocean Policy Report Card, which assesses the nation's progress in 2007 toward implementing the recommendations of the U.S. Commission on Ocean Policy and the Pew Oceans Commission, as well as the actions described in the Administration's U.S. Ocean Action Plan. The objective of the Report Card is to inform policy makers and the public of the challenges facing our ocean while identifying the many opportunities ripe for action.
http://www.jointoceancommission.org/

USGS CoreCast
The United States Geological Survey has launched a podcast series, *It's natural science from the inside out*. The podcasts range in length from two to fifteen minutes and cover a wide range of topics, including geologic maps, polar bear research, hazards, and more. The transcription of each episode is also available on the website.
http://www.usgs.gov/corecast/

USGS Data Delivery and Mapping Over the Web
The National Water-Quality Assessment Program offers a downloadable fact sheet, *Data Delivery and Mapping Over the Web – National Water-Quality Assessment Data Warehouse*. The warehouse integrates data on water quality, ecology, and hydrology across the nation, providing consistent, online collections of water-quality data and associated information. Included are chemical concentrations in water, sediment, and aquatic-organism tissues; biological community data for algae, fish, and invertebrates; daily streamflow and temperature information for selected sampling sites; and more.
http://pubs.usgs.gov/fs/2006/3101/

USGS Learning Web
As the Nation's largest water, earth, biological science, and civilian mapping agency, the U.S. Geological Survey (USGS) provides some of this science information as educational material. The product line includes a variety of teaching packets, booklets, posters, fact sheets, and CD-ROMs. There are also materials for students, including trivia games, clip art, homework help, and much more. Lesson plan and activity topics currently include mud fossils, global change, geological age, and more.
http://interactive2.usgs.gov/learningweb/textonly/index.htm

Use Sea Turtles in Your Next Lesson
Sea turtles can be used to demonstrate concepts in many facets of the ocean sciences. For an activity in ecology, explore the Bridge DATA: See Turtles Nest, See Turtles Hatch, which evaluates nesting and hatching data from a community organization in Kenya. Or, if you would like to incorporate bycatch in your next unit, see Off the Hook!, where students use National Marine Fisheries Service data to examine the use of J-hooks versus circle hooks. For physical and biological oceanography, see our Scientist Spotlight on Kate Mansfield, a sea turtle biologist, which contains a sea turtle tracking activity. The Bridge also has sea turtle links to teacher-reviewed external resources for even more information.

See Turtles Nest, See Turtles Hatch http://www.marine-ed.org/bridge/index_archive0700.html
Off the Hook! http://www.marine-ed.org/bridge/index_archive0404.html
Scientist Spotlight: Kate Mansfield http://www.marine-ed.org/bridge/index_mansfield.html

Using Fish Population Data
This guide in the NSDL, *Exploring Marine Conservation in the Classroom: Using Fish Population Data*, introduces teachers to the use of data on fish species diversity and relative abundance in the classroom. Students learn to interpret the data to understand diversity and abundance; understand the interpretation and use of parameters derived from population data such as density and sighting frequency; and use the data to make and test predictions about relationships between habitats and species.
http://serc.carleton.edu/usingdata/datasheets/REEF.html

USS *Arizona* Preservation Project – Daily Project Updates
Archeologists from the Submerged Resources Center of the U.S. National Park Service conducted a three-week investigation of the wreck of USS ARIZONA. Using nondestructive techniques, the team conducted tests to determine the structural integrity of the ship, record in detail its current state for comparison with earlier surveys, and collect environmental data in the interior of the ship using remotely-operated vehicles. Daily updates on the team's activities will be posted to the project website.
http://www.pastfoundation.org/Arizona/,
http://www.nps.gov/submerged .

USS Monitor Center
The USS Monitor Center illuminates the individual human stories of those who designed and built the *Monitor* and the *CSS Virginia* and sailed them into battle on March 8 and 9, 1862. The Center will also highlight NOAA archaeologists, scientists and U.S. Navy divers who worked on the project. The website offers information about the history, life aboard the ship, and museum preservation efforts. Bibliography, links, and educational resource pages provide jumping off points for learning more about the USS Monitor, the CSS Virginia, the Civil War and the men and women who lived through it.
http://www.monitorcenter.org/

Vadlo Search Engine
The Vadlo search engine caters to all branches of life sciences. This beta offering allows users to search within five categories: Protocols, Online Tools, Seminars, Databases, and Software. Seminars are essentially PowerPoint files for presentations, lectures, and talks. Databases will take you to databases, resources, compilations, and more.
http://www.vadlo.com/

Vailulu'u: Eel City and the Moat of Death
NOAA's Ocean Explorer has posted information from recent expeditions to the waters around American Samoa. Vailulu'u is an underwater volcano that lies approximately 20 miles east of Ta'u Island in American Samoa. The crevices of the volcano are occupied by thriving aggregations of cutthroat (synaphobranchid) eels which had never before been studied in their natural habitat. Find a summary of this expedition, a slideshow of marine life around Vailulu'u, and video of swarming underwater eels on the website.
http://oceanexplorer.noaa.gov/explorations/05vailuluu/welcome.html

Valoración Socioeconómica de los Humedales en América Latina y el Caribe
Wetlands International wishes to join the celebration of World's Wetlands Day by launching its recently published booklet, *The Socio-economics of Wetlands Valuation in Latin America and the Caribbean,* in Spanish. This publication explains in a simple way the fundamentals of the socioeconomic valuation of wetlands and its role in the decision making processes, highlighted by five case studies from Peru, Venezuela, Cuba, Brazil, Argentina, and Guatemala. This publication can be downloaded for free.
http://www.wetlands.org/publications.aspx

Valuing the Environment in Small Islands - An Environmental Economics Toolkit
The purpose of this toolkit from the Joint Nature Conservation Committee is to demonstrate how to estimate the economic value of the benefits that the environment provides to people in small islands, and incorporate these values into decisions. It has been designed primarily for government officials and NGOs, but is also useful for others wanting to estimate the value of ecosystems and ecosystem services.
http://www.jncc.gov.uk/page-4065

Venomous & Poisonous Creatures
Sea World Busch Gardens offers a variety of educational activities on its website. In honor of Halloween, it is highlighting activities and information about venomous and poisonous creatures.
http://www.swbg-animals.org/just-for-teachers/lsa/2009/oct/index.htm?src=animalssilverpoplsaoct09-animalactivities

VentureDeepOcean
VentureDeepOcean shares mid-ocean ridge and hydrothermal vent exploration with audiences around the world. Designed as an information portal, the site features current scientific research and cruises, deep-sea news, background information, images, and more. Ridge 2000 is an interdisciplinary program focused on integrated studies of Earth's oceanic spreading centers. The program provides national coordination for studies of deep-sea hydrothermal vents and rifting of volcanic crust.
http://www.venturedeepocean.org/

The Video Project
The Video Project offers educational media and documentary programming on global and social issues, science and health. Subjects include Aquatic Life, Arctic Studies, Coral Reefs, and much more. The new release, Climate Change: Coral Reefs on the Edge, can be viewed in its entirety online; the purchased DVD classroom version includes four learning modules, a teacher's guide, student activities, and more.
http://www.videoproject.com/index.html

Virginia Seaside Heritage Program
The Virginia Seaside Heritage Program is a public-private partnership, initiated and funded by the Virginia Coastal Program to address management of the aquatic resources of the barrier islands, bays, and salt marshes along Virginia's Eastern Shore. The program will build on the momentum of recent restoration successes, like those witnessed in the Virginia Oyster Heritage Program.
http://www.deq.virginia.gov/coastal/vshp/homepage.html

Virtual Barrier Island
Partners have 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 a virtual reality video which explains how to navigate and manipulate the data within the model.
http://coastal.beg.utexas.edu/thscmp/vbi.htm

Virtual Courseware
As part of a collaborative project between faculty members at the California State University-Los Angeles and the National Science Foundation, the Virtual Courseware website brings together a number of thematic instructional resources for science educators. Activities teach about earthquakes (in English and Spanish), rivers, global warming, and more. The website offers a mix of activities, assessment exercises, and instructor materials.
http://www.sciencecourseware.org/eecindex.php

Virtual Cruise to Fagatele Bay
These pictures and videos detail a research cruise and Pisces V submersible dives to the coral reefs of Taema Bank and Fagatele Bay and Canyon, Tutuila, American Samoa, on the Hawai'i Undersea Research Lab Cruise in July, 2005.
http://dusk2.geo.orst.edu/djl/samoa/hurl/

Virtual Field Trips Database
The University of Texas Library hosts links to a collection of virtual field trips and guides throughout the United States and Canada. The sites contain local geological or earth science information and include links to downloadable versions of published paper texts. One selection takes you to the Carolina Coastal Science website, an inquiry-based science resource that explores science in coastal Carolina. Visit barrier islands, the Channel Islands, Hawaii, and more through the database.
http://www.lib.utexas.edu/geo/onlineguides.html

Virtual Museum of Nautical Archaeology
Texas A&M University's Institute of Nautical Archaeology brings you the Virtual Museum of Nautical Archaeology. It includes images, history, and site reports from three decades of projects around the world, along with links to other sites.
http://ina.tamu.edu/vm.htm

Virtual Presentation Assistant
The Virtual Presentation Assistant is an online tutorial dedicated to the art and skill of public speaking, and the website is maintained by the staff of the communication studies department at the University of Kansas. The site covers such topics as selecting an appropriate theme for a speech, how to research said speech, supporting your primary points, and links to other sites that deal with the subject at hand.
http://www2.ku.edu/~coms/virtual_assistant/vpa/vpa.htm

Virtual Take Our Daughters and Sons to Work Day
The OceanAGE Virtual Take Our Daughters and Sons to Work Day, April 28, 2005, offers students the opportunity to discuss and celebrate oceanography career options. Students will be able to interact with inspiring mentors throughout the day in live

webchats and online forums. The complete profiles, video interviews of the scientists, and live event instructions will be available on the website.
http://oceanexplorer.noaa.gov/edu/oceanage/welcome.html

Virtual Team Challenge – Spill!
The Virtual Team Challenge from Deloitte is a Virtual World 3D simulation-based learning curriculum for high school teachers and students for Fall 2009. The Virtual Team Challenge will give participants a taste of the different aspects of working as an employee of a fictional professional services firm. Every participant will fulfill one of several roles on a simulated professional services team and compete against other teams to clean up an oil spill in the river of New City.
http://www.virtualteamchallenge.com

Virtual Tour of NOAA's Ark
Treasures of NOAA's Ark: Journey Through Time can be visited via a virtual tour to learn more about NOAA's 200 years of science, service and stewardship.
http://www.preserveamerica.noaa.gov/hw07_photo1.html

Virtual Urchin
Sea urchin gametes are easy to use, developmental stages are readily seen with the microscope. The goal of this website is to make these remarkable embryos readily accessible through development of inquiry based lessons, including larval development and metamorphosis, community ecology, pollution in the marine environment, and more. Check out the microscope tutorial and the latest virtual lab, on ocean acidification.
http://virtualurchin.stanford.edu/

Virtual Volcano
The Discovery Channel offers this virtual volcano website with interactive features. Visitors build their own volcano and watch it erupt, or read brief overviews of different features.
http://dsc.discovery.com/convergence/pompeii/interactive/interactive.html

Virtual Voyage to the Marianas
The research vessel Oscar Sette will be on an expedition in the Marianas Archipelago from September 1 until October 1, 2005, to study marine organisms and habitats. Log on daily to join a virtual exploration of the underwater world of the Northern Islands, as well as the more familiar southern neighbors. The website will feature photos, reports from the field, interviews with scientists and crew, and feature articles. Sign your class up as a "Classroom at Sea" and receive a free package of educational materials.
http://www.crm.gov.mp/maramp/

Virtual Whale Watch
Bring a whale to school. Landlocked pre-K-6 students in Mid-Atlantic states can participate in a simulated whale watch and activities to stimulate their interest in marine science and endangered species. The website features a Kid's Page with whale sounds, "Ask a Scientist," resources, and information appropriate for pre-K-6.
http://members.aol.com/passintime .

Vision Fire Lessons Learned
A research publication on the 1995 Vision Fire has recently been completed. The fire burned more than 12,000 acres of federal, state, and private land in California, most

within Point Reyes National Seashore. The downloadable publication documents lessons learned from the fire, including flora, fauna, and geomorphic response.
http://www.nps.gov/pore/fire_visionfire.htm

Visions of Undersea Alaska: 2005 Engagement Calendar
Alaska's pristine seas teem with life beyond imagination. With more than 50 colorful underwater photos, this calendar from Sea Grant provides an up-close look at Alaska's amazing sea life, ranging from tiny space-alien-like plankton to invertebrates, fish, marine mammals, and seaweeds. Photos were taken by scientists, scuba divers, and professional photographers in Southeast Alaska, the Aleutians, and other Alaska locations. Captions provide fascinating facts about each subject.
http://www.uaf.edu/seagrant/Pubs_Videos/pubs/SG-ED-45.html

Visit the Bridge at NMEA
As the NMEA annual conference draws near, July 23-27, 2007 in Portland, Maine, the Bridge educators are preparing some great new resources and activities to present. One presentation to look out for is "Lobster: The Price of Deliciousness," which will walk educators through a brand new Bridge DATA (Data Analysis Teaching Activity) that explores Maine lobster catch data and evaluates fluctuations in price and landings. For those looking for a more physical oceanography-based session, look for "Ocean Observing Systems: What are they and how can I use 'em?" This session will give participants an overview of ocean observing and several strategies for integration into existing curricula.
http://www.marine-ed.org/bridge

Visiting Geoscientists: An Outreach Guide for Geoscience Professionals
This American Geological Institute guide is written to provide Earth science enrichment for students. The guide includes a discussion of what effective modern enrichment can be like, how K-12 students learn science best, a review of the current state of Earth science in K-12 education, Classroom Tips to provide ideas to help get into (and out of) the classroom, and how to make the most of the time spent there; and sample activities, material lists, and other resources.
http://www.agiweb.org/education/aapg/index.html

Visual Dictionary
The Visual Dictionary website offers annotated images that identify each part of a given item, such as a turtle or starfish. Visitors can search the site by using the embedded search engine, by list of topics, or by picture thumbnail. There is also a link to Wikipedia for more information on the topic, and a catalog of images. An image-share feature allows the use of an image on a webpage, and classroom use is allowed, subject to conditions.
http://www.infovisual.info/

Visualizing Dock Growth
Permitting of residential docks and piers is a contentious issue in many coastal areas. The NOAA Coastal Services Center's new website, Visualizing Dock Growth, will help coastal communities better understand, visualize, and manage the cumulative impacts of dock and pier growth in waterways. The website features 3-D visualizations of various scenarios at a real-life study area, outreach materials, and more.
http://www.csc.noaa.gov/dock_growth/index.html

Vocalizations of Georgia's Frogs CD
Presenting the unique calls of all 31 species of Georgia's frogs, the Calls of the Wild CD is produced by the Georgia Department of Natural Resources, Wildlife Resources Division to introduce the wonderful and often bizarre calls of Georgia's frogs and toads. The CD has separate recordings of every native species. Narration is provided for each of the individual species' recordings, along with a 15-page booklet.
http://eeingeorgia.org/page.asp?itemid=13156

Voices from the Fisheries Handbook
NOAA's Fisheries Service offers the website, Voices from the Fisheries, a central repository for consolidating, archiving, and disseminating oral history interviews related to commercial, recreational, and subsistence fishing in the U.S. and its territories. The downloadable book, *Voices from the Fisheries Handbook: Preserving Local Fisheries Knowledge, Linking Generations, and Improving Environmental Literacy*, provides a roadmap for designing and conducting oral history projects.
http://www.voices.nmfs.noaa.gov/

Voices in the Sea
The Whale Acoustics Lab at the Scripps Institute of Oceanography is continuing to support and update the Voices in the Sea website. Teaching resources include a student journal and grading rubric for each of the lessons, while the Kids Page offers interactive games. There are videos, interviews with experts, and a special edition section for IPY and commercial vs subsistence whaling.
http://cetus.ucsd.edu/voicesinthesea_org/Flash/

Volunteer Liability
The National Sea Grant Law Center at the University of Mississippi offers a downloadable Volunteer Liability pamphlet. This publication reviews volunteer liability laws nationally and state by state, and can help those that are planning and organizing efforts involving volunteers. The document offers an overview of the federal and state volunteer liability laws, as well as additional issues and doctrines that may apply to volunteer and volunteer organizers.
http://www.olemiss.edu/orgs/SGLC/National/Volunteer.pdf

Volunteer and Service Programs Resource Center
The Corporation for National and Community Service Resource Center offers the Resource Center website as an online "one-stop shop" for tools to strengthen volunteer and service programs. Quickly and easily find more than 2,500 free downloadable tools, e-courses, and other useful resources and materials on hundreds of topics of interest to nonprofit and volunteer leaders.
http://www.nationalserviceresources.org/

Voyage of the Lonely Turtle
PBS/Nature aired the program, Voyage of the Lonely Turtle, based on one Loggerhead turtle's 9000 mile trip across the Pacific. The website offers information about turtle anatomy, navigation, a link to an interactive game, lesson plans, and more.
http://www.pbs.org/wnet/nature/turtles/index.html

Waikiki Aquarium - August Programs
The Waikiki Aquarium, founded in 1904, is the third oldest public aquarium in the United States. A part of the University of Hawaii since 1919, the Aquarium is located next to a

living reef on the Waikiki shoreline. Some of the outreach and education programs for August include a shark overnight, in which participants build their own sharks and race them across a tank; an afternoon investigating hermit crabs and their housemates through storytelling, art and up-close encounters;; and much more.
http://waquarium.otted.hawaii.edu/

Walden Media Educator Guides
Walden Media brings books to life on the movie screen and offers downloadable lesson plans you can use with your students. The lesson plans are interdisciplinary, written by educators for educators, and comply with national standards in content areas and in character education as well. Check out Ghosts of the Abyss (exploration of the Titanic), the White Giraffe (wildlife, nature, and character motivation), and Nim's Island (ways to protect the ocean and how sanctuaries preserve these underwater treasures).
http://www.walden.com/walden/walden/guide_matrix.php

Walt Disney's Sacred Planet
Walt Disney's new film, Sacred Planet has been released in IMAX theaters. Some of the film locations include old growth forests of British Columbia, underwater Borneo, New Zealand beaches. The images include the landscape, the people, and the animals indigenous to the land. There is also a downloadable Educator's Guide.
www.sacredplanet.com .

Wandering Wetland Travelling Trunk
The Wandering Wetland Travelling Trunk from Environmental Concern in St. Michaels, Maryland, contains artifacts and activities designed to introduce elementary students to wetland ecology. Filled with skulls, rubber track molds, numerous curricular resources, and more, the trunk provides teachers with materials for experiential learning and structured lessons about the environment. Included in each trunk is a free copy of the national curriculum guide WOW! The Wonders of Wetlands.
http://www.wetland.org/education_travelingtrunk.htm

Warming World
NASA's Warming World website hosts a series of articles, data visualizations, space-based imagery, and interactives that explore the recent winter weather that gripped the United States, Europe and Asia, and how El Nino and other longer-term ocean-atmosphere phenomena may affect global temperatures this year and in the future.
http://climate.nasa.gov/warmingworld/

Washing Away
Washing Away: Losing Louisiana will air nationally on TV on September 7, 2006 at 9:00 p.m. EST. This story of Louisiana's disappearing coastline and how this unfolding crisis affects all of America is told through the eyes of people affected by hurricanes Katrina and Rita. You can see a trailer of *Washing Away* and download lesson plans on the website.
http://www.lpb.org/programs/washingaway/

Washington State Department of Natural Resources: Geology & Earth Sciences
The Washington State Department of Natural Resources website offers how-to guides for the Geology and Earth Sciences. Topics include Geologic Hazards & Mapping, Earth Resources, and more. Publications include maps, reports, and more.
http://www.dnr.wa.gov/ResearchScience/GeologyEarthSciences/Pages/Home.aspx

Waste In Place Curriculum
Keep America Beautiful's educational resources for teachers and students includes this K-6 classroom curriculum supplement, *Waste in Place*, which helps build critical thinking, processing, and problem-solving skills through hands-on lessons that can be taught individually or in sequence.
https://secure2.convio.net/kab/site/SPageServer?pagename=waste_in_place&JServSessionIdr004=3meecn6tb3.app209b

Watchable Wildlife Program
The *Watchable Wildlife Program* is a cooperative, nationwide effort made up of state and federal agencies to support the public's interest in viewing wildlife and conserving wildlife habitat. NOAA Fisheries' Office of Protected Resources and the National Ocean Service's National Marine Sanctuary Program ensure that marine species and habitats are included in the program, and develop appropriate marine viewing guidelines.
jill.lewandowski@noaa.gov

Water Basics
The Water Basics website from Environment Canada includes the hydrologic cycle; rivers; lakes; snowfall; and measuring, storing, and controlling water. Check out the interesting Quick Facts along with the more detailed Water Sources.
http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=A6A15B0B-1

Water Education Posters
This U.S. Geological Survey series offers six educational posters, on Wetlands, Water Use, Wastewater, Navigation, Ground Water, and Water Quality. Each poster is available in two versions, one for elementary students and one for middle-school students.
http://water.usgs.gov/outreach/OutReach.html

Water-Energy Connection
EE Week offers numerous educational materials, including curricula, quizzes, and more. The Water-Energy Connection explores the interrelated use of water and energy in the U.S. and provides an opportunity to get students thinking about the interrelatedness of other ecological and environmental concerns. The website offers links to background information, videos, and more.
http://www.eeweek.org/water_and_energy_wise/connection

Water and Energy Use in California
Water and Energy Use in California is a new middle school curriculum produced by the California Department of Water Resources and is available for a free download. There is a student book and teacher guide, along with additional information and links.
http://www.owue.water.ca.gov/

Water Facts and Fun
The California Department of Water Resources offers water education materials at no charge. The materials are limited in quantity, so please review a sample copy before ordering classroom sets. Non-California residents may receive one free copy of each of the materials, sent to United States addresses only.
http://www.publicaffairs.water.ca.gov/education/catalog.cfm

Water for Life: UN Proclaims International Water Decade 2005-2015
At its 58th session, the United Nations General Assembly adopted a draft resolution proclaiming the period from 2005 to 2015 as the International Decade for Action, "Water for Life", starting on World Water Day, 22 Mar 2005. The goal of the Decade is "a greater focus on water-related issues, with emphasis on women as managers of water to help to achieve internationally agreed water-related goals".
http://www.unesco.org/water/ .

Water in Focus
Water in Focus is a global photography project that calls youth to action as they document the use, waste, conservation, and pollution of water through words and images. Students are invited to submit photos for the online virtual mural.
http://www.outsidethelens.org/wif.aspx

Water Information Center
The National Academies announces the launch of its Water Information Center, a portal with peer-reviewed reports on water-related issues, independent and objective consensus among experts from academia, industry, and others. The website's major topics: water supply and sanitation; water and soil remediation; hydrologic hazards; water quality in the natural environment; river basin systems management; environmental assessment, management, and restoration; and water science and research
http://water.nationalacademies.org

Water Issue Resources from Annenberg Media
With wildfires raging throughout California and drought affecting large areas of the southeast, check out these programs from Annenberg Media.

- *Water Resources*, Unit 8 of The Habitable Planet - The first case study in the program deals with dwindling water resources in the Southwest. Unit 5, Human Population Dynamics, explores the issue of population growth in areas where basic resources, such as water, are in short supply; http://learner.org/redirect/november/hab12.html
- *Water is for Fighting Over*, Program 7 of Human Geography: People, Places, and Change, deals with the fight over scarce water resources along the California-Nevada border; http://learner.org/redirect/november/hum13.html
- *Global Forces/Local Impact*, the eighth workshop of Teaching Geography - one of the case studies examines the conflict over water rights in Oregon; http://learner.org/redirect/november/tgeo14.html

Water Neutrality
This concept paper on "Water Neutrality" was produced by a small group from NGO, academic, and business backgrounds. It was conceived through a common interest in investigating whether neutrality can be (or become) a meaningful tool that helps water stakeholders in their efforts to achieve and promote good stewardship of this critical resource.
http://www.ramsar.org/forum/forum_wwf_water_neutrality2007.pdf

Water on the Web
Water on the Web helps high school and college students understand and solve real-world environmental problems using advanced technology. It is a package which contains two sets of curricula, data from lakes and rivers nationwide, online primers,

data interpretation and Geographic Information System tools, and additional supporting materials.
http://waterontheweb.org/

Water Quality Curriculum
This curriculum guide for grades 6-8 contains five activities that incorporate data from NOAA's National Estuarine Research Reserve System. Students learn how to access and interpret water quality data, and how to look for patterns and changes over time. The goal is for students to experience different kinds of data and data accessing tools, so that, by the end of the module, they can continue to explore data sets driven by their own inquiry.
http://apps.dataintheclassroom.org/water-quality/

Water Quality and Dissolved Oxygen<
This website from Science Junction features general information and three lesson plans about dissolved oxygen, geared toward middle and high school students. Lessons cover topics such as what dissolved oxygen is, why it is important, and more, including an activity in which students are instructed to design an experiment to test effects of changes in dissolved oxygen concentration.
http://www.ncsu.edu/sciencejunction/depot/experiments/water/lessons/do/

Water Resources of the Caribbean Countries & Territories
The CD *Water Resources of the Caribbean Countries & Territories* is now ready for distribution (for a nominal cost). The CD has information for 35 countries, islands and/or territories, including maps; size, population, climate, economy; water availability, supply, and demand; vulnerability of coastal aquifers; coastal zone issues; and legal setup and institutions.
jasminko.karanjac@uwimona.edu.jm .

Water Safety
The U.S. Army Corps of Engineers is the leading provider of outdoor recreation on all federally-managed public lands in the United States. With a recreation base that is primarily built around water, the Corps has a dedicated focus on water safety. The pages of the National Water Safety Program website let you view current water safety materials available through the Corps program, download *Safe Passage* program information, and more. The Water Safety Fun Book can be downloaded at http://www.lacoast.gov/education/kids/coloringbooks/watersafety/.
The National Water Safety Program homepage is at http://watersafety.usace.army.mil/.

Water Science for Schools
The U.S. Geological Survey's *Water Science for Schools* website offers a broad range of information about water. Topics include basic background information, a breakdown of water use in the U.S., a glossary of terms, and much more. The website includes activities, graphics, data tables and more.
http://ga.water.usgs.gov/edu/sitemap.html

Water Science for Schools
This site from the U.S. Geological Survey explores many aspects of water. This website includes pictures, data, maps, and an interactive center where you can test your water knowledge. A glossary and related links are also included.
http://ga.water.usgs.gov/edu/

Water Sourcebooks
The EPA offers the downloadable Water Sourcebooks, with activities for grades K-12 divided into four sections: K-2, 3-5, 5-8, and 9-12. Each section is divided into five chapters: Introduction to Water, Drinking Water and Wastewater Treatment, Surface Water Resources, Ground Water Resources, and Wetlands and Coastal Waters.
All activities contain hands-on investigations, fact sheets, reference materials, and a glossary of terms.
http://www.epa.gov/safewater/kids/wsb/

Water Wonders
The Wisconsin Department of Natural Resources offers *Water Wonders,* environmental education for young kids (K-3) and their teachers. Topics include the water cycle, groundwater and water facts, and conservation tips. There are also word searches and quizzes.
http://www.dnr.state.wi.us/org/caer/ce/eek/earth/groundwater/index.htm

Water's Journey Everglades
This website offers a wealth of information about the history and contemporary situation in and around the Everglades. It helps users understand the complicated ecological history and operation of the Everglades, including the role that humans play in its transformation. The website includes interactive maps, management information, history, lesson plans and other educational resources, and links to other materials and further background information.
http://theevergladesstory.org/

Waterbird Population Estimates
This publication sets the global standard in presenting estimates of the numbers and trends of waterbird populations throughout the world. This fourth edition provides a comprehensive update on information last provided in 2002 and summarizes population data on 878 waterbird species. The data are downloadable in spreadsheet format.
http://www.wetlands.org/event.aspx?id=318e62d4-b171-4f99-b77f-fda289041f6a

WaterFest – California
The San Luis Obispo County is holding WaterFest 2007, May 5, 2007 in San Luis Obispo, California. There will be games, hands-on educational activities, a water challenge contest, and more.
http://www.special-places.org/ecm/News_and_Events/WaterFest/Home.html

WaterLife
The NOAA Games website offers *WaterLife: Where Rivers Meet the Sea*, an interactive online game about estuaries. Set in California's Elkhorn Slough National Estuarine Research Reserve, the game explains what an estuary is and describes diverse ecosystems in estuaries and the influence of tides on the ecosystems. The game also addresses restoration efforts, marine debris, and emphasizes personal responsibility in caring for the environment. Check out the accompanying Field Guide.
http://games.noaa.gov

WaterLife: Sea Turtles and the Quest to Nest
NOAA's National Ocean Service and Fisheries Service launched the second online educational game in the WaterLife series, *Sea Turtles and the Quest to Nest*. The web-

based game encourages and explains loggerhead sea turtle conservation through a series of games and animations aimed at grade 4-7 students.
http://games.noaa.gov/seaturtle/welcome.html

WaterNews
WaterNews is a weekly on-line publication of the U.S. Environmental Protection Agency's Office of Water that announces publications, policies, and activities.
http://www.epa.gov/water/waternews/ .

Watershed Academy Webcast Seminars
EPA's Watershed Academy sponsors free webcast seminars. Webcasts are typically conducted on a monthly basis. Archived versions available from the website include topics such as climate change, lakes, wetlands, outreach and education, and more.
http://www.epa.gov/watershedwebcasts/

Watershed Action: Educate the Public
The Center for Global Environmental Education website offers information for teachers, grades 6-12, to plan educational activities for students to protect and clean up watersheds. Projects include trash cleanup, stenciling storm drains, testing soil nutrients, composting, planting to prevent erosion, and water quality monitoring. Instructions are provided, and links to related information are provided for teachers and students.
http://cgee.hamline.edu/watershed/action/projects/public_ed.htm

Watershed Handbook
EPA's Office of Water has published *Draft Handbook for Developing Watershed Plans to Restore and Protect Our Waters*, a guide to watershed management as a tool in developing and implementing watershed plans. The handbook is aimed toward communities, watershed groups, and local, state, tribal, and federal environmental agencies. The handbook is designed to take the user through each step of the watershed planning process, including monitoring, outreach, BMPs, and more. Comments should be addressed to watershedhandbook@epa.gov by June 30, 2006.
http://www.epa.gov/owow/nps/watershed_handbook/

Watershed Patch Project
The EPA‘s Watershed Patch Project teaches students what watersheds are and motivates them to get involved in local watershed protection activities. The booklet includes step-by-step instructions for community-based watershed protection activities, including stream walks, monitoring projects, and stream cleanups. The project, with certificate awards, is modeled after a similar project with the Girl Scouts of the USA.
http://www.epa.gov/adopt/patch/certificates/

Watershed Wonders
The Algalita Marine Research Foundation website offers educational materials available for downloading along with other initiatives. *Watershed Wonders* is an educational video series exploring issues in marine conservation, watershed management, and plastic debris. The series includes standard-based activities and information about water and watersheds for middle and high school classrooms.
http://www.algalita.org/education.html

Watersheds: Connecting Weather to the Environment - Online
National Environmental Education and Training Foundation, in partnership with the Cooperative Program for Operational Meteorology, Education and Training, has released the first in a series of free online courses relating weather to the environment. *Watersheds: Connecting Weather to the Environment* is a primer on how weather events relate to the health of a watershed, and how the public can take simple actions to protect watershed health. The website includes downloadable resources, images, and more.
http://www.meted.ucar.edu/broadcastmet/watershed

WaterWatch
The United States Geological Survey offers WaterWatch, with a map of real-time streamflow on the homepage. The data is organized into seven percentile classes that draw on historical data to illustrate how the current streamflow activity compares to activity in the past. Using a series of drop-down menus on the top allows users to look for current flood and drought watches and also access historical maps and graphs that offer some perspective on monthly streamflow.
http://water.usgs.gov/waterwatch/

WaterWorks!
WaterWorks! is a public education and outreach program implemented through the Middle Tennessee State University Center for Environmental Education and designed to promote clean water in Tennessee. The program offers a series of public service announcements promoting water quality through responsible individual action. Brochures, a Stream Saver awards program, and more. To obtain the materials or for more information, please check out the website or contact them at (615) 898-2660.
http://www.tennesseewaterworks.com/

Watery Ring of Life: Saving our Estuaries, a PBS Broadcast
The Teaching Learning Network has produced a documentary featuring four National Estuary Programs: Maryland Coastal Bays, Narragansett Bay, Mobile Bay, and Puget Sound. The documentary presents information about estuaries, including their social and economic importance, and highlights steps the four estuaries are taking to protect and restore their valuable resources.
drvolk@erols.com

Wave that Shook the World
This website from PBS is based on the NOVA TV program which originally aired on March 29, 2005 and tells the story of the 2004 tsunami, featuring video footage and scientific analysis of the onrushing waves that spread for 3,000 miles around the Indian Ocean basin. The website offers interactive features, questions and answers, a downloadable teacher's guide, and more.
www.pbs.org/wgbh/nova/tsunami/

Wavebreaking News
NOAA's National Ocean Service (NOS) presents the fall edition of Wavebreaking News, a multimedia presentation of developments in NOS science and technology. Available in Quicktime or Windows Media for different connection speeds, this brief news report features the Hunt for the Alligator, Navigation Safety, and Dolphin Health Exams. Links to information and contacts allow in-depth research into these topics. And while you're on the website, check out the links to the NOS data explorer, publications, and other topics. http://oceanservice.noaa.gov/news/wbnews/welcome.html .

Waves, Wetlands, and Watershed, and Coastal Bluffs
The California Coastal Commission presents *Waves, Wetlands, and Watersheds,* an activity guide that addresses issues such as endangered species, coastal geology, and water use. A four-page primer on *Coastal bluff erosion* further investigates coastal processes. A Marine, Coastal & Watershed Resource Directory contains information on organizations working on issues related to the coast, including educational resources. www.coastforyou.com, click on "For Educators."

Wayfinders: A Pacific Odyssey
This website is the companion for a PBS film that features a community of Pacific Islanders as they build sailing canoes & follow the stars on a 2,000-mile voyage across the ocean. The site includes a wayfinder game, an essay on navigating "blind," an interview with a wayfinding expert, links to related websites, and more.
http://www.pbs.org/wayfinders/

WCPA Best Practice Guidelines
The IUCN WCPA offers a variety of guidelines for protected area managers, available for download from their website. These include *Guidelines for applying Protected Area Management Categories, Sacred Natural Sites - Guidelines for Protected Area Managers; Evaluating Effectiveness - A Framework for Assessing Management Effectiveness of Protected Areas 2nd Edition, Sustainable Financing of Protected Areas,* and more.
http://www.iucn.org/about/union/commissions/wcpa/wcpa_resources/wcpa_bpg/index.cfm

Weather and Climate Data at the National Climatic Data Center (NCDC)
The National Climatic Data Center operates the World Data Center-A for Meteorology, in Asheville, North Carolina, and the World Data Center for Paleoclimatology, in Boulder, Colorado. NCDC provides access to all of the on-line data at no cost to users with .k12.xx.us or .edu domains. Free products include, but are not limited to monthly weather data summaries for a range of sites, historical weather maps, hourly precipitation data for a range of sites, and more.
http://ols.ncdc.noaa.gov/phase3/freeaccess.html .
http://www.ncdc.noaa.gov/oa/ncdc.html .

Weather, Climate, and Energy
Hurricane season in the Atlantic is June 1-November 30, 2006. Scientists are predicting another difficult season. Annenberg Media offers online programs that can help your students better understand the forces that influence our weather
Weather - http://learner.org/redirect/june/weather32.html
Planet Earth Program 3, The Climate Puzzle -
http://learner.org/redirect/june/planet33.html
Science in Focus: Energy, Workshop 6, Energy and Systems -
http://learner.org/redirect/june/energy34.html

Weather Puzzle
These weather picture "Slyder" puzzles on The Space Place website are fun to try. Users can pick easy, medium, or hard levels of difficulty to challenge logical- and spatial-reasoning muscles and to reveal dramatic ground-and space-based images of Earth and space weather phenomena.

http://spaceplace.nasa.gov/en/kids/goes/slyder

WeatherFest
WeatherFest, January 29, 2006 in Atlanta, Georgia, is an interactive science and weather fair designed to promote the field of meteorology, oceanography, and related sciences to Atlanta and surrounding area families, students and teachers. WeatherFest will feature more than 50 science exhibits including hands-on experiments, educational information, career guides, and more. WeatherFest is part of the American Meteorological Society's 86th Annual Meeting.
http://www.ametsoc.org/meet/annual/weatherfest.html

Web Resources for Environmental Educators
The Web Resources for Environmental Educators from the U.S. Fish and Wildlife Service is a link from the National Conservation Training Center's Conservation Library home page. It has links to a variety of sites that are helpful for educators, including general environmental education links, education standards and terms, resources, and electronic field trips.
http://training.fws.gov/library/

Web Site Resources for Environmental Education
The National Conservation Training Center's Division of Education Outreach of the U.S. Fish and Wildlife Service has updated their list of Web Site Resources for Environmental Education. The document provides listings and links to general environmental education resources, education standards and terms, newswires and FWS listservs, lists of FWS environmental educators and resources, and much more.
http://library.fws.gov/DEO/resource.list.pdf

Webbing the Islands
The aim of this website from the University of Tasmania is to provide to people with a passion for islands, especially teachers, students, and community workers, a range of exciting and interesting island studies, activities, and resources, and to offer this space online to share work on islands with others around the world. Each year, the website will focus on one theme related to islands; this year that theme is Sense of Place. The website includes downloadable learning units.
http://www.webbingtheislands.com/index.html

Webcast.Berkeley
Berkeley offers a number of webcasts and podcasts of select courses and campus events on this website. Visitors can learn about each event in the information section, and for some, users have the option to download the audio portion of the event. The course section provides webcasts, and users can also download podcasts. The selection of courses includes lectures on wildlife ecology, natural resources and population, animal behavior, and more.
http://webcast.berkeley.edu/

Webcams in Marine Protected Areas
MPA NEWS, Vol. 8, No. 5 from November 2006 published *Bringing MPAs Online: The Use of Webcams for Education, Monitoring, and Other Purposes*, offering a discussion of the use of webcams in marine protected areas for education, monitoring, and other purposes. In offers min-case studies of some of the ongoing projects, successes, and problems associated with this technology.

http://depts.washington.edu/mpanews/issues.html#Nov%202006

WebRangers Website
The National Park Service hosts an interactive WebRangers website for kids age 6 and up. They can earn achievement certificates by completing different activities and earning passwords. Along the way they learn about the Park Service, as well as different National Parks, cultural artifacts, wildlife, and more. The activity list includes Protect the Harbor, Turtle Hurdles, Water Quality, and more. This site is strictly for fun.
http://nps.gov/webrangers/

Weddell Seal Expedition
This website offers insights into a current 2009 Antarctica expedition studying the Weddell seal. The website offers general information, multimedia, and more.
http://antarctica.ucsc.edu/home.html

Weird & Wonderful Wildlife Poster
The U.S. Fish & Wildlife Service offer this new endangered species poster, Weird & Wonderful Wildlife, aimed at kids and the young at heart, highlighting 14 species with odd-sounding names. The artist imagined what they might look like based on their names, and one side of the poster is a collage of fanciful illustrations; the other side features photos of the plants and animals, accompanied by a few fun facts. The poster is available for free.
http://www.fws.gov/endangered/kidsposter.html

WeirdFins
WeirdFins is a NOAA Fisheries Service website and weekly podcast about strange or bizarre creatures that inhabit the sea. Each podcast is only two minutes long and is packed with interesting information. The website also invites visitors that have heard of or seen a weird sea creature that they would like to see featured, to contact WeirdFins. The website includes a text of the podcast in addition to the audio. Note: some of the links may not work properly at the moment, but this website is worth looking at.
http://www.nmfs.noaa.gov/rss/podcasts/weirdfins/

West Indian Whistling Duck and Wetlands Conservation Project
The West Indian Whistling Duck and Wetlands Conservation Project works to reverse the decline of this endemic endangered duck, and to prevent the further loss and degradation of wetlands in the West Indies. Through the educational materials and workshops, local working groups have been working to raise awareness of and appreciation for the value of local wetlands and their responsible use, while pointing out the consequences of species and wetland loss.
http://whistlingduck.org/

Western Hemisphere Migratory Species Initiative Pathway
The Western Hemisphere Migratory Species Initiative Pathway website offers a myriad of information and useful links for those interested in studying migratory species. The website links to projects, resources and date, stories from the field, lessons learned, funding sources, and more. It is available through the Rainforest Alliance and is offered in English and Spanish.
http://www.eco-index.org/migratory/

Western Pacific Regional Fishery Management Council Education Resources
The Western Pacific Regional Fishery Management Council is one of eight regional fishery management councils. Their Education Corner offers student activities, video episodes from *Fishing in Old Hawaii*, and much more. Use the search feature to find many useful resources, and check out the Media Center for downloadable posters, and the Library for additional items.
http://www.wpcouncil.org/education.html

Western Regional Climate Center
One of six regional climate centers in the United States, the Western Regional Climate Center is administered by the NOAA, and is overseen by the National Climatic Data Center. Covering the area from Colorado to the boundary of the continental U.S., and including Hawaii and Alaska, this website hosts historical climate information and current atmospheric observations and frequently updated forecasts. In addition to the scientific information, the site also has a number of educational pages.
http://www.wrcc.dri.edu/

Western Soundscape Archive
This aural database is housed at the University of Utah's J. Willard Marriott Library and features recordings contributed by state and federal agencies, conservation groups, and volunteers. The collection currently offers representative sounds from approximately 80% of the West's bird species and 90% of the region's frog and toad species. The website also has weekly podcasts and a number of thematic sound collections, including the Sounds of the Arctic National Wildlife Refuge. Check this one out.
http://westernsoundscape.org/

Western Waters Digital Library
The vast reserves of water within the Western United States have been the cause of both great excitement and concern. This digital library brings together a wide range of documents, including legal transcripts, water project records, video collections, and personal papers documenting the Columbia, Colorado, Platte, and Rio Grande river basins.
http://harvester.lib.utah.edu/wwdl/

WET in the City
WET in the City engages K-12 youth in hands-on activities that find creative ways to explore the science of water, its cultural context, and the complex issues surrounding its management and stewardship. The program is delivered at the local level, city by city, and targets urban educators with relevant, localized water education through a network of city partners. Sample activities can be downloaded from the website.
http://www.wetcity.org/index.htm

WET in the City and Team WET Schools
WET (Water Education for Teachers) in the City, an urban environmental education program of the Council for Environmental Education, engages K-12 youth in hands-on activities that creatively explore the science of water, its cultural context, and complex issues surrounding its management and stewardship. Team WET Schools is a companion program to WET in the City, bringing urban water issues to the forefront of environmental education in school buildings.
http://www.wetcity.org/

Wetland 101 CD
The educators of Environmental Concern, Inc. have created an educational resource CD for primary school teachers to use as a supplement for their water related curriculum, helping teach students about the wonderful world of wetlands. The Wetland 101 PowerPoint presents the basics of wetland ecology, functions, and values in a kid-friendly format. The accompanying notes pages provide recommended extensions on each topic.
https://sslserver.com/wetland.org/shop/main_publications.shtml?id=pub88

Wetland Ecosystem Services
The Ramsar Convention on Wetlands offers a variety of downloadable publications and information packs that can be useful for studying wetlands. Wetland Ecosystem Services fact sheets are available, with topics such as Reservoirs of biodiversity, Wetland products, Cultural values, Climate change mitigation and adaptation, and more. The information is also available in French and Spanish.
http://www.ramsar.org/cda/en/ramsar-pubs-info-ecosystem-services/main/ramsar/1-30-103%5E24258_4000_0__

Wetland Plants of the Northeast
This downloadable list compiled by the Swamp School lists plants by their common and scientific names and identifies their wetland indicator status, useful for delineation.
http://swampschool.org/whitepapers/SwampSchoolRegion1PlantList.pdf

Wetland Plants of the Southeast
This downloadable list compiled by the Swamp School lists plants by their common and scientific names and identifies their wetland indicator status, useful for delineation.
http://swampschool.org/whitepapers/Wetland_Plant_Guide_Region_2.pdf

Wetland User's Guide
An Introduction and User's Guide to Wetland Restoration, Creation and Enhancement, produced by EPA and NOAA, introduces non-technical readers to the basics of wetland projects, including planning, implementing and monitoring, and provides other references. To request a free copy, key EPA843B03001 into the search engine.
http://www.epa.gov/ncepihom/index.htm

Wetlands Documents
A variety of publications are available for downloading at the Wetlands International website, including *The Socio-Economics of Wetlands* and T*he 7th Directory of Wetlands of International Importance*.
http://www.wetlands.org/pubs&/nwdnloads.htm

Wetlands International
Wetlands International, a non-governmental organization, promotes the conservation and wise use of wetlands on the global, regional, and national levels. The website offers a brief introduction to wetlands, publications, a newsletter, and information about projects around the world.
http://www.wetlands.org/

Wetlands on Wheels – Eastern Shore
Environmental Concern Inc. offers its new Mobile Classroom, available to cruise to a schoolyard, library, or event near you. The classroom includes 25 learning stations, offering hands on activities which teach students the importance of wetlands in a unique learning environment. The classroom travels to Eastern Shore schools in Maryland, Delaware, and Virginia.
http://www.wetland.org/wetlandsonwheels.htm

Wetlands & Wonder Video: Reconnecting Children with Nearby Nature
This 14-minute video was produced by the U.S. Environmental Protection Agency discusses the loss of wetlands and the effect that the loss of natural areas closest to us has on our connection to the natural world. The video includes streaming text for the hearing impaired.
http://www.epa.gov/owow/wetlands/education/wetlandsvideo/

Wetlands Training and Curricular Guides
POW! Planning of Wetlands guides educators through the creation, restoration or enhancement of a wetland on school grounds or within the community. *Wow! The Wonders of Wetlands* includes activities in lesson plan format, background information on wetlands, ideas for student action projects, and a wetlands resource guide. An online wetlands course covers basic wetland ecology, types, functions and management.
http://www.wetland.org/educa.htm

Wetlands are Wonderful Scavenger Hunts - Georgia
Reed Creek Park in Martinez, Georgia, will be holding a series of scavenger hunts in November and December. The events will be tailored for school-aged children but all are welcome to explore their neighborhood to learn about the plants and creatures that live in a wetland habitat.
http://www.eeingeorgia.org/net/calendar/details.aspx?s=57828.0.68.4863

Wetpixel.com – Digital Imaging for Divers
Wetpixel is dedicated to providing the latest information on digital underwater photography and imaging, allowing photographers to stay current with the technology and techniques that are changing the way we view the underwater world. The website offers equipment reviews, photography news, a beginner forum, and more.
http://www.wetpixel.com/

WET-WASH Initiative for Coastal Sewage Contamination
Globally, sewage is the largest source of marine contamination by volume. To address this, the United Nations launched a new campaign to clean up the seas by ensuring that people have access to toilets and safe drinking water. The partnership combines the Wastewater Emission Targets initiative with the Water, Sanitation and Hygiene for all campaign. The WET-WASH website has downloadable resources, including a training manual and 10 keys for sustainable municipal wastewater management.
http://www.gpa.unep.org/pollute/sewage.htm .

Whale Rider Family Guide
The award-winning New Zealand film, *The Whale Rider*, premiered July 24,2005 on PBS. *Whale Rider* re-interprets a 1,000-year-old legend about Paikea, the founder of the native New Zealand tribe *Ngati Konohi*, whose members believe their leader arrived in their village on the back of a whale after his canoe capsized. The family viewers

guide is a collaboration to create a national outreach campaign and interactive web experience around *The Whale Rider*.
http://www.piccom.org/whalerider/home.html

A Whale of a Story
Electronic Field Trips from Ball State University are interactive, multi-media educational resources, selecting hard-to access places, national parks, and species for their focus. *A Whale of a Story* is a collaboration between Ball State University, Aquatic Adventures, and Scripps Institution of Oceanography, following the migration of the eastern Pacific gray whale. Designed for 3-8 graders, the website offers games, webisodes, and more.
http://www.bsu.edu/eft/home/00front.htm

Whale Trackers
Whale Trackers is a series of documentary programs that explore the lives of whales, dolphins, and porpoises. The videographers join international scientists and conservationists on expedition to investigate species and the diverse habitats they depend on. They examine the threats the animals face with a focus on how we can make a difference through a better understanding of our oceans. The website offers educational materials, videos, a photo gallery, and more.
http://www.whaletrackers.com/

Whale Watch
Through May 31, 2008, the public is invited to embark on a whale watch adventure through the Aquarium of the Pacific's educational whale cruise, in Long Beach, California. Explore the nearby seas to seek out the gray whale, bottlenose dolphin, sea lion, and a host of migratory waterfowl. The ocean adventure includes an educational multimedia presentation by a marine naturalist as well as various hands-on learning activities for all ages. The cost includes aquarium admission.
http://www.aquariumofpacific.org/education/programdetails/whale_watch/

Whale Watch Weekend and Intertidal Life Festival
The National Park Service hosted the 21st Annual Whale Watch Weekend and Intertidal Life Festival at Cabrillo National Monument, January 19-20, 2008. Participants explored tidepools and observe sea anemones, sea hares, and more; witnessed the return migration of Pacific gray whales en route from Alaskan feeding waters to their Baja California breeding lagoons; and listened as authors, researchers, and educators discuss the latest information concerning Pacific gray whales and intertidal life.
http://www.nps.gov/cabr/

WhaleNet
Wheelock College's WhaleNet Interactive Education website focuses on whales and marine research. Visitors can track marine mammals in real-time or used archived data to research the movements of various species or genders of satellite tagged marine mammals and sea turtles. There is also a program following the track of Erden Eruc as he rows across the Pacific Ocean and circumnavigates the world using only human-powered transportation. A variety of educational units and resources are available.
http://whale.wheelock.edu/Welcome.html

Whales of the Mediterranean Sea
Whales of the Mediterranean Sea, a five-part documentary film series, is now available for download and use by teachers, with subtitles in six languages. The documentaries

were produced to raise awareness, address challenges, create opportunities, and offer potential solutions to the problems facing this semi-enclosed sea in one of the most populous regions in the world. All documentaries are accompanied by complimentary education materials.
http://www.whaletrackers.com/whales-mediterranean-sea/

Whales: Voices in the Sea
This website from the Scripps Institution of Oceanography at the University of California, San Diego offers information about whales using Flash graphics, video, and more. Listen to the audio files and view the spectrograms of calls of humpback, beaked, gray, right, sperm and blue whales. The graphics show whale range and short video features offer information about each of the whales, current research on their sounds, and conservation efforts. A major expansion of the website will be unveiled in May 2006.
http://voicesinthesea.org

What Bird
This online bird guide for identifying birds of North America offers users a visual search engine to identify birds, the ability to create your own bird field guides, and consult with experts. You can browse by location, body shape, size, color, and field marks.
http://www.whatbird.com/

What's an Estuary, Now You Know
The Association of National Estuary Programs, in partnership with the National Estuarine Research Reserves, launched the *What's An Estuary? Now You Know* campaign to make the word "estuary" a household word by 2005. A multimedia presentation is available for viewing and downloading from the website. In 2004, the campaign will launch a media campaign featuring television, radio, and print ads.
www.whatsanestuary.com

What's an Estuary? Now You Know CD-ROMs Available
4900 copies of the Association for National Estuary Program's *What's an Estuary? Now You Know* CD-ROMs are available to order from the US EPA's National Service Center for Environmental Publications. There will be a limit of 25 CDs per order, though requests for larger quantities will be considered for special events or estuary education and outreach needs.
http://www.epa.gov/ncepihom/ .

What's in your Watershed?
In the Bridge DATA, *What's in your Watershed?*, students will learn what a watershed is and how it is affected by all its residents, no matter how distant they are from the primary waterway. Students explore Chesapeake Bay Program data to evaluate land use and riparian buffer statistics, along with water quality data from the Bay's various ocean observing systems.
http://www.marine-ed.org/bridge/index_archive0203.html

What's New in the New Year?
Stay current by joining Scuttlebutt, the Bridge website's marine science education email discussion list. This no cost, international listserv provides a forum for educators and scientists to informally discuss marine education ideas, issues, and questions, and allows ocean science programs from across the globe to advertise summer and year-

round opportunities for educators and students, as well as countless new classroom resources.
http://www2.vims.edu/bridge/search/scuttle.cfm
http://www.marine-ed.org/bridge

What's the *Scuttlebutt*?
An excellent way to stay current with all the latest news in the world of marine science education is *Scuttlebutt*, the Bridge email discussion list, an international listserv for educators and scientists to informally discuss marine education ideas, issues, and questions, allowing ocean science programs from across the globe to advertise summer and year-round opportunities for educators and students. *Scuttlebutt* is monitored by the Bridge staff, which assists in locating experts to answer posted questions when needed.
http://www.marine-ed.org/bridge/index_scuttle.html

Wheels of Time and Place
Wheels of Time and Place is a set of blank circular journals that can be used to explore the details of a place, cycles of day and night, passing of the seasons, or other phenomenon. The website offers a gallery of examples, resources, and more.
http://partnersinplace.com/wheels-of-time-and-place/

Where on Earth?
Embark upon a geographical adventure with NASA Jet Propulsion Laboratory's Multi-angle Imaging SpectroRadiometer (MISR) Mystery Image Quizzes. These puzzles are designed to inspire understanding of the physical, biological, and human processes that influence our home planet and cover topics from archaeology to zoology. Several available resources for discovering and revealing the meaning of image features help new geographical detectives to solve the challenging quiz questions.
http://www-misr.jpl.nasa.gov/education/whereonearth.html

Where Words Touch the Earth
In this new digital media collection for grades 3-12, students from American Indian Tribal Colleges interview Elders, students, and community members to provide a Native American perspective on climate change and its effects on their communities. Downloadable videos touch on key environmental science issues and indigenous knowledge of the depleted salmon population in Washington State, the ecological function and spiritual role of wetlands, and the relationship between humans and nature.
http://www.teachersdomain.org/special/nasawords/

Whooping Cranes Migration
This educational website was developed through a partnership of Annenberg/CPB, Journey North, and the Whooping Crane Eastern Partnership. This site connects to an extensive selection of lessons, activities and information, facts about Whooping Cranes in question/answer format, and background information about the Whooping Crane Reintroduction Study. Users can also connect to highlights from the Year 3 Reintroduction and Migration including maps, video clips, and photos
http://www.learner.org/jnorth/fall2003/crane/index.html .

The Why Files
Science touches our lives in countless ways. Yet people often think science is relevant only to a white-coated, lab-dwelling elite. The Why Files portray science as a critical human endeavor conducted by ordinary people. They use news and current events as

springboards to explore science, health, environment, and technology, with plenty of focus on the ocean. Their real-life approach to science writing, and correlation to science teaching standards, can help you bring the news and science into the classroom.
http://whyfiles.org/index.html .

WIDECAST – Sea Turtle Resources
WIDECAST is an expert network of biologists, managers, community leaders, and educators in more than 40 nations and territories, committed to an integrated, regional capacity that ensures the recovery and sustainable management of depleted sea turtle populations. The website hosts myriad resources, from basic biology of Caribbean Sea Turtles to educators' guides to ecotourism guides to marine turtle trauma response procedures.
http://www.widecast.org/

Wider Caribbean Sea Turtle Conservation Network
The Wider Caribbean Sea Turtle Conservation Network (WIDECAST) is an international scientific network comprised of volunteer Country Coordinators (mainly sea turtle experts, natural resource professionals, and community-based conservationists), an international Board of Scientific Advisors, and Partner Organizations in more than 30 Caribbean States and territories. The program offers an educator's handbook and a teacher's activity manual to help teachers bring the study of sea turtles into classrooms. Contact Karen Eckert at keckert@widecast.org

WikiEducator
The Commonwealth of Learning is an intergovernmental organization created by Commonwealth Heads of Government, Canada, to encourage the development and sharing of open learning and distance education knowledge, resources, and technologies. They support WikiEducator, an online community resource for the development of free educational content. Check out the Virtual University for Small States links (VUSSC Node).
http://www.wikieducator.org/Main_Page

Wild Classroom and Explore Biodiversity
This non-profit organization from Washington offers Explore Biodiversity, founded as an educator's resource, and The Wild Classroom, an outreach portal, to provide teachers with quality videos for use in their classrooms. The websites include video podcasts on a wide range of subjects.
http://www.explorebiodiversity.com/main/videopodcast.html
http://www.thewildclassroom.com/

Wild Oceans
The IMAX film, *Wild Oceans*, follows the struggle for sea life off the coast of South Africa. A downloadable teacher's guide is available.
http://wildoceanfilm.com/admin/mod_documents/view_file.php?id=5

Wild Republic's Learning Adventure
Wild Republic's Learning Adventure features lesson plans about nature, animals and their habitat. The 2004-2005 lesson plans are provided by Audubon Adventures and include marine mammals, animal talk, ponds, and more. There is also a special purchase program for discounted plush animals, including water birds and birds of prey.
http://www.wildrepublic.com/lessonplans/2004/index.html

Wild Things 2003 - Habitat is Home Sweet Home
The U.S. Fish and Wildlife Service and its partners sponsor a *Wild Things* Electronic Field Trip yearly. This year they broadcasted a free, live, interactive satellite learning adventure geared towards Grades 5-7. *Wild Things* helps students and teachers explore and learn about National Wildlife Refuges and the fascinating critters that inhabit them.
www.nationalgeographic.com/geographyaction, http://www.wildthingsfws.org/

WildFinder
The World Wildlife Fund has created the WildFinder database, which allows users to find out where various species live around the world. The information in the database is based on 825 ecoregions and currently includes information for four large taxa: birds, reptiles, mammals, and amphibians. Visitors can search by country, U.S. ZIP code, or city; search by species name; and also view a map gallery that contains some pre-selected themes.
http://www.worldwildlife.org/wildfinder/

Wildfowl and Wetlands Trust Education Website
The Wildfowl and Wetlands Trust presents WWTlearn – Learn from the world's wetlands. This education site includes downloadable lesson plans, data sets, background materials and images about water, wetlands and wetland life. Designed to the English National Curriculum, it is adaptable to U.S. standards. There is also a quarterly e-newsletter.
http://www.wwtlearn.org.uk/index0.html

Wildland Fire Lessons Learned Center
The purpose of this website is to improve safe work performance through organizational learning in interagency wildland fire. The website offers resource documents, newsletters, lessons learned, and more.
http://www.wildfirelessons.net/Home.aspx

Wildlife and Whale Cruises
The Aquarium of the Pacific invites the public on whale watch cruises through their educational "Wildlife and Whale Cruise," Saturdays and Sundays in February and March, 2006. Cruises include an educational multimedia presentation by a marine naturalist as they search for migrating animals along with hands-on learning activities for children of all ages, including *Whale Biofact Discovery* and the *Plankton Tow.*
http://www.aquariumofpacific.org/EDUCATION/OUTDOOR/whale.htm

Wildlife Forever
The mission of Wildlife Forever is to conserve America's wildlife heritage through conservation education, preservation of habitat and management of fish and wildlife. The Wildlife Forever CD-ROM Curriculum is a conservation education supplement that teaches students about a variety of wildlife species, natural resources, ecological concepts, and conservation. The curriculum includes 14 lesson plans designed to cultivate a feeling of personal responsibility for the wonders of nature.
http://www.wildlifeforever.org/

Wildlife-Friendly Yard Program
The AZA is spearheading a wildlife-friendly yard program. This new program will focus attention on some important issues surrounding the health of our waterways and provide

people with a tangible way to take action. By encouraging people of all ages to help make their own yards friendlier for wildlife, habitats "downstream" from these lawns will be healthier for animals like otters, salmon, whales, manatees, and catfish. For additional information about how your organization can participate in this project, contact Dot Siegfried at dsiegfried@aza.org, or call (301) 562-0777, ext. 254.
http://www.riverbanks.org/s04education/wildlifefriendly.shtml

Wilkes Land Expedition Videos
Check out the videos from the *Joides Resolution* expeditions through Penguin TV, PEAT News Network, and more at this website. Each video update includes an interview with a scientist aboard the 470' *JOIDES Resolution* during a seafloor coring expedition off the Antarctic coast earlier this year. The videos tie paleoclimate research to modern climate change discussions and allow students to get an idea of what it's like to live and work at sea, with a little comic relief thrown in.
http://joidesresolution.org/node/52

Wilkes Land Glacial History
The *JOIDES Resolution* scientific ocean drilling vessel has left New Zealand and is heading to the coast of Antarctica on an expedition centered on climate change questions. Students, teachers, and the public can follow the expedition through ship scientists and staff blogs, videos, Ask the Scientist opportunities, and more.
http://joidesresolution.org/

Windows to the Universe
Windows to the Universe is a website covering earth and space sciences for use by the general public. It includes documents, animations, data sets, and much more, exploring the historical and cultural ties between science, exploration, and the human experience. The site is written in three reading levels approximating elementary, middle school, and high school reading levels. Topics include the hydrosphere, climate and global change, and more.
www.windows.ucar.edu/cgi-bin/tour_def/earth/earth.html

Windows to the Universe Website Update
Windows to the Universe has moved to a new home with the National Earth Science Teachers Association, offering new capabilities and opportunities for partnership. The shift is designed to help make the site an open educational resource and to allow scientists, university faculty, K-12 educators, and others to contribute content more readily in support of the geoscience education community. The website offers Earth and space science content, professional development, and much more.
http://windows2universe.org/

Wings Over Water Festival
Wings Over Water, on North Carolina's Outer Banks, celebrates the wildlife and wildlands in eastern North Carolina, drawing visitors from all over the country to experience the unique landscape, dunes, marshes, and inland forests of the Outer Banks while participating in birding, natural history, outdoor recreation, and paddling programs. The festival is a partnership between the Fish and Wildlife Service, the National Park Service, the Outer Banks Chamber of Commerce, and more.
www.wingsoverwater.org

Wings of Slumber
The Banana Slug String Band offered a free download of a wonderful collection of lullabies from their digital album, Wings of Slumber. Check this out when your day is just not going right.
http://bananaslugs.bandcamp.com/album/wings-of-slumber

Winter Wonderland
The Bridge features a series of Data Analysis Teaching Activities (DATA) that can be used to supplement curriculum material with timely and seasonal resources. Winter Wonderland focuses on how snow is formed and explores the idea that no two snowflakes are the same. The activity also discusses the water cycle and how water in the ocean can become snow in the mountains. Students will evaluate archived snowfall data and forecast snowfall at home and at the 2006 Olympic Games.
http://www.marine-ed.org/bridge/index_archive0102.html

Wisconsin's Great Lakes Shipwrecks
This website includes underwater videos and photos of shipwrecks in Lakes Superior and Michigan, information on individual vessels, a map of the shipwrecks, a searchable database, and much more. Check out the Explorer's Tools for educational materials, video and more.
http://www.wisconsinshipwrecks.org

Wonderful World of Weather
This standards-based Real Time Data Module for elementary students, developed by the Center for Improved Engineering and Science Education (CIESE) at the Stevens Institute of Technology, allows students to investigate weather phenomena locally and in other places around the world. By using hands-on activities and real-time data investigations, the students develop an understanding of how weather can be described in measurable quantities, such as temperature, wind and precipitation.
http://www.k12science.org/curriculum/weatherproj/index_NEW.html .

Wonders of Water – American Zoo and Aquarium Association National Awareness Campaign
American Zoo and Aquarium Association (AZA) members are providers of animal care, conservation, and public education about wildlife, providing the highest standard of animal care while offering enjoyable educational experiences for families. This year, AZA zoos and aquariums embark on a public education campaign, *Wonders of Water,* to let the world know that everyone can make a real difference to help animals and our planet. It focuses on water-themed educational messages and family fun.
www.azasweb.com

Wordle
Wordle visitors provide text, and the free online application will generate word clouds, giving greater prominence to words that appear more frequently. Users can tweak the clouds with different fonts, layouts, and color schemes. You can spend lots of playtime on this website.
http://www.wordle.net/

Worksheet Library
This website features printable worksheets for teachers of grades K-6. The worksheets are aligned to National Standards and can be searched by grade level, subject, or

standards. Some worksheets are free for downloading; others are available to members.
http://www.worksheetlibrary.com/

World Atlas of Panoramic Aerial Images
Created by Dr. William A. Bowen, these panoramas look like photographs, but are mathematical simulations created from satellite data that have been interpreted by computer calculations.
http://geogdata.csun.edu/world_atlas/

World Atlas of Seagrasses
UNEP/World Conservation Monitoring Center released the World Atlas of Seagrasses. The Atlas is the first book to summarize the global status of seagrasses. The book is a collaboration of leading experts in the field.
http://www.unep-wcmc.org/marine/seagrassatlas/

World of Change
Inspired by their 10th anniversary, NASA's Earth Observatory has pulled together a special series of satellite images documenting how the world has changed during the previous decade. Images are include Amazonian deforestation, evaporation of the Aral Sea, Arctic and Antarctic sea ice, and more.
http://earthobservatory.nasa.gov/Features/WorldOfChange/

World Conservation Monitoring Center Interactive Map Service (IMAPS)
UNEP-WCMC has been pioneering the delivery of interactive map-based conservation data on the Internet. Current GIS data sets that UNEP-WCMC maintain include Coral reefs, Seagrasses, Mangroves, and Protected Areas. The web GIS maps are easy to use and offer a basis for scientific inquiry and exploration in the classroom.
http://www.unep-wcmc.org/index.html?http://www.unepwcmc.org/reception/ims.htm~main .

World Conservation Monitoring Center Publications and Information
The United Nations Environment Program – World Conservation Monitoring Center maintains a large number of reports on different aspects of the environment, including biodiversity, ecosystems, and climate change. The website has a list of reports, many downloadable.
http://www.unep-wcmc.org/index.html

World Database on Marine Protected Areas
The World Database on Marine Protected Areas (WDPA-Marine) is dedicated to providing the most comprehensive set of marine protected areas data available. This website allows users to view information on marine protected areas in their web browser, to visualize them in Google Earth, to download data, and more.
http://www.wdpa-marine.org/

World Database on Protected Areas
The newly redeveloped World Database on Protected Areas includes features to increase access to maps, spatial files, metadata, and other information on the world's terrestrial and marine protected areas, including viewing in Google Earth or downloading data in various formats. Additional features aid the updating of data and quality control.

It incorporates The MPA Global Database, created as part of the *Sea Around Us Project* at the University of British Columbia.
http://www.wdpa.org/

World Database on the Protected Areas of the World
The World Database on Protected Areas (WDPA) Consortium website contains information about the 2004 World Database on the Protected Areas of the World, a CD-ROM product. It was part of the WDPA Consortium efforts to share conservation information for the Fifth World Parks Congress. The Consortium welcomes contributions to the database by experts on protected areas.
http://www.biodiversity.org/wcpa/ev.php?URL_ID=1697&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1099533914 .

World Ecosystems Beyond Borders
World Ecosystems Beyond Borders engages students in a dynamic study of local and global environmental issues. The units compare issues faced by Wisconsin communities and communities abroad. Each unit contains background information, activities, and a list of additional resources. The materials were prepared with a middle school audience in mind and can be easily adapted and used in the high school classroom. Topics include aquifer depletion, dams, and more.
http://global.wisc.edu/outreach/k-12/webb/

World Environment Day
World Environment Day, commemorated each year on June 5, is a principal vehicle through which the United Nations stimulates worldwide awareness of the environment and enhances political attention and action. This year's theme is *Wanted! Seas and Oceans – Dead or Alive?,* and the host nation will be Spain. A down-loadable poster is available in six languages. Learn more about this year's theme, *Many Species. One Planet. One Future*, download posters, and more.
http://www.unep.org/wed/2010/english/theme.asp
http://www.unep.org/wed/2004/ .

World Heritage in Young Hands
This educational toolkit developed by the World Heritage Organization is designed to teach about the importance of the preservation of cultural and natural heritage around the world. The toolkit proposes classroom and extra-curricular activities, offers student activity sheets, and provides a series of enlarged photographs of World Heritage sites, a poster, a World Heritage map, stickers and thematic overhead projection sheets to be used for classroom discussions. It is available in English, French, and Spanish.
http://whc.unesco.org/education/sindex.htm

World Heritage Sites
The United Nations Educational, Scientific and Cultural Organization (UNESCO) encourages the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. The World Heritage List has 754 properties - 582 cultural, 149 natural and 23 mixed properties in 129 States. The natural site datasheets provide plenty of information for comparisons. The *World Heritage Information Kit* is a downloadable document that provides a program overview.
http://whc.unesco.org/pg.cfm?cid=1 .

World Maths Day
March 3, 2010 is World Maths Day, an opportunity for your students to compete with students around the world in solving fun math challenges. All ages and ability levels are encouraged to participate in this free program, which also awards prizes to the winners.
http://www.worldmathsday.com/2010/Default.aspx?

World Meteorological Organization
The U.N.'s World Meteorological Organization website offers information on weather, climate, and water. The Topics section contains links to thematic pages on over four dozen areas of interest, including women in meteorology, Antarctic activities, disasters, and much more. The website also offers information on weather conditions and links to the Severe Weather Information Centre with a real-time interactive map of the world.
http://www.wmo.int/

World Ocean Census
World Ocean Census: A Global Survey of Marine Life is the only officially sanctioned book to bring the Census of Marine Life (CoML) and its discoveries to the general reader. Written by this team of CoML scientists, the book offers a view into the ocean depths, enabling readers to go behind-the-scenes of the landmark study's findings and adventures. The website offers sample pages, the Table of Contents, and more.
http://www.fireflybooks.com/bookdetail&ean=9781554074341

World Ocean Database
NOAA has released the World Ocean Database 2009, the largest, most comprehensive collection of scientific information about the oceans, with records dating as far back as 1800. The database provides approximately 9.1 million temperature profiles and 3.5 million salinity reports. The 2009 database also captures 29 categories of scientific information, including oxygen levels and chemical tracers, plus information on gases and isotopes that can be used to trace the movement of ocean currents.
http://www.nodc.noaa.gov/OC5/indprod.html

World Ocean Day
World Ocean Day, observed yearly on June 8, is an opportunity to celebrate our world ocean and our personal connection to the sea. The Ocean Project helps to coordinate events and activities worldwide with aquariums, zoos, museums, and the World Ocean Network. The website includes activity ideas and helpful hints to get you started. A list of some of last year's celebrations is posted, and this year's list will be up on the website by June 1, 2005.
http://www.theoceanproject.org/news/oceanday.html
www.worldoceanday.org
http://theoceanproject.org/wod/index.php

World Ocean Day
The World Ocean Day website offers inspiration for planning World Ocean Day (June 8, 2008) events, along with a global event map with everything from ocean excursions and watershed cleanups to community projects to stitch together a fluffy underwater display. List your event on the website to help get the word out. Download the resources in the media and outreach kit and additional offers, including Seas the Day bookmarks, Monterey Bay Aquarium National Seafood Wallet Guides, and 41pounds.org postcards.
http://www.theoceanproject.org/wod/

World Ocean Day
World Ocean Day, every June 8th, provides an opportunity to join with people around the world to celebrate our world's ocean. The theme for 2009, *One climate, one ocean, one future*, will help bring local and global attention to the impact climate change is having on the ocean, what that impact will mean for human life, and how we can all make important changes to reduce our $C0_2$ emissions. Enter your event, check out what's happening in your area, download the media and outreach kit, and more.
http://theoceanproject.org/wod/index.php

World Ocean Observatory
The World Ocean Observatory is dedicated to information, education and public discourse about the ocean defined as an integrated global social system. The intent is to communicate the full spectrum of ocean issues — climate, fresh water, food, energy, trade, transportation, public health, finance, governance, recreation and culture. The website contains links to ocean science, human uses, maps, databases, and more. The education section links to online curriculum and resources.
http://thew2o.net/

World Ocean Observatory Online Events
The World Ocean Observatory is dedicated to information, education, and public discourse about the ocean defined as an integrated global social system. Upcoming online events include explorations about the International Polar Year, Sea Turtles, Marine Education, Underwater Exploration, Ocean Energy, Coral Reefs, and more. Subscribe to the newsletter for reminders and essays about these events.
http://www.thew2o.net/events/index.php

World Ocean Passport
The World Ocean Network's mission is to inspire and foster a change in individual behavior towards a sustainable management of the global ocean, and its task is to coordinate communication to the public about ocean issues and marine resource management. The World Ocean Passport is an educational tool for its member organizations to promote ocean awareness and conservation with their visitors.
www.nausicaa.fr/reseau/ .

World Oceans Day – June 8
World Oceans Day, celebrated yearly on June 8, was created in 1992 at the UN Earth Summit in Rio de Janeiro. The Ocean Project has established a North American World Ocean Day planning committee in an effort to coordinate efforts, develop and suggest awareness-raising tools, resources, and activities, and establish an annual theme. Please let them know what you are planning so they can highlight your organization on their WOD website. Visit the website periodically as people send in their activities.
http://www.theoceanproject.org/news/oceanday.html .
www.worldoceanday.org

World Water Day
The theme for this year's World Water Day, March 22, 2006, is *Water and Culture*. Check out the UNESCO website for examples of past celebrations and downloadable booklets to help celebrate water for life. Annenberg Media offers lessons about water in many of their free Video on Demand offerings, including:

- Water properties, The World of Chemistry, http://learner.org/redirect/march/wchem67.html

- Role of water in formation of landscapes and threats from pollution, Earth Revealed, http://learner.org/redirect/march/earth68.html
- Water is for Fighting Over, Human Geography: People, Places, and Change, http://learner.org/redirect/march/hgeog69.html
- Egypt: Gift of the Nile and Oil and Water, The Power of Place: Geography for the 21st Century, http://learner.org/redirect/march/place70.html

http://www.unesco.org/water/water_celebrations/index.shtml

World Water Day 2004
The UN International Strategy for Disaster Reduction and the World Meteorological Organization have been charged with coordinating World Water Day 2004 on March 22, 2004. This year's theme is *Water and Disasters*.
http://www.unesco.org/water/water_celebrations/index.shtml .

World of Water Films
The New England Aquarium has numerous free copies of World of Water films, good for folks outside of the United States who use VHS PAL format for viewing. Films include Keepers of the Reef, Surviving Sharks, and In Hot Water.
http://www.neaq.org/education_and_activities/teacher_resources/classroom_resources/educational_films/world_of_water_films.php
Contact Heather Tausig at htausig@neaq.org

World Water Monitoring Day
America's Clean Water Foundation and the International Water Association invite your participation. On October 18, 2004 citizens of the global community will join in World Water Monitoring Day, a worldwide opportunity to positively impact the health of rivers, lakes, estuaries and other waterbodies. Volunteer monitoring groups, water quality agencies, students, and the general public are invited to test four key indicators of water quality: temperature, pH, dissolved oxygen, and turbidity. Register your activities on this website or check out links to some of the information and monitoring going on in your area.
http://www.worldwatermonitoringday.org/ .

World Water Monitoring Day
World Water Monitoring Day, September 18, 2010, is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. Participants are encouraged to register their site and report their data before December 31 to be included in the Year in Review report. Test kits can be ordered online and resources are available as free downloads.
http://wwmd.org/index.html

World Water Monitoring Day
World Water Monitoring Day is September 18, 2008. World Water Monitoring Day offers communities around the world a chance to positively impact the health of rivers, lakes, estuaries, and other waterbodies. Register your activities on this website or check out links to some of the information and monitoring going on in your area. Check out the water monitoring kits available through the website.
http://www.worldwatermonitoringday.org/index.html

World Water Monitoring Day
America's Clean Water Foundation and the International Water Association invite citizens and organizations to share in the experience of water quality monitoring. World Water Monitoring Day, October 18, 2003, serves as a global educational platform for watershed leaders, educators, and trained volunteers to help the public better understand how the actions of individuals in a watershed can impact many others.
http://www.worldwatermonitoringday.org/

World Wetlands Day, Yearly on February 2
World Wetlands Day takes place yearly on the 2nd of February and offers an opportunity "to undertake actions aimed at raising public awareness of wetland values and benefits in general and the Ramsar Convention in particular." The Ramsar Bureau hosts a central website for the use of everyone organizing World Wetlands Day activities. The theme for 2004 is "From the Mountains to the Sea - Wetlands at Work for Us", 2005 is *Cultural and biological diversity of wetlands*, and 2006 is *Her Future at Risk*. Information is also available in Spanish and French. The 2007 theme is *Fish for tomorrow?*
http://www.ramsar.org/wwd/wwd_index.htm

World Wide Biome Project
The World Wide Biome Project is designed to encourage students to learn about ecosystems in their locale and share their findings with students from around the world through the Internet. Students or classes do an evaluation of a habitat in their biome according to a standard method of investigation, and then send the data in to the World Wide Biome Project. Their data is then converted into a series of web pages. This allows students to learn from other projects and compare and contrast the information.
http://www2.kpr.edu.on.ca/cdciw/biomes/

WorldWideScience
The WorldWideScience site is a global science gateway that is meant to help connect a worldwide audience to various national and international scientific databases. The site is maintained by the Office of Science and Technical Information with the U.S. Department of Energy. Visitors to the site's homepage can click on an interactive map of the world's countries to locate participants and their websites. There is an advanced search option, along with contact information.
http://worldwidescience.org/

World Wildlife Fund PSA Campaign
The World Wildlife Fund has launched a new Public Service Announcement (PSA) campaign to help the public make the connections between issues such as climate change, overfishing, and scarcity of freshwater as covered in the news, and how these trends can affect their lives.
http://www.worldwildlife.org/sites/videos/2009psas.html

Wreck of the Portland
Partners from the National Undersea Research Center (NURC) and Stellwagen Bank National Marine Sanctuary conducted two live video broadcasts from the R/V Connecticut back to shore to the Pilgrim Monument and Provincetown Museum. The broadcasts are archived on the Internet, along with a slide show and additional materials.
http://www.nurc.uconn.edu/livedive/index.htm

Writing Center
The University of Kansas offers this website to provide writing support for students who might be having trouble getting started with their own assignments or term papers, through writing tutorials and guide sheets. The website offers sections specifically designed for undergraduate or graduate students, including guides to crafting an effective thesis statement and working on pre-writing strategies. The Writing Guides section includes a sample writing gallery and an assignment planner.
http://www.writing.ku.edu/

Writing Guidelines for Engineering and Science Students
The University of Vermont offers this helpful website for both students and educators alike. These guidelines for scientific writing are designed to help students communicate their technical work and contain advice, models, and exercises for common writing and speaking assignments in engineering and science. Some of the specific resources include how to write for different audiences and how to design both presentation slides and scientific posters; also included are sample memos, letters, and resumes.
http://www.writing.eng.vt.edu/

Writing Guidelines for Engineering and Science Students
Penn State University provides this web resource for engineering and science students with the models, exercises, and advice. These guidelines are designed to help students communicate their technical work. The website examples include many types of documents students will likely encounter in their schooling and eventual professions. The homepage offers links to both Student and Instructor Resources. Document types include formal reports, presentations, correspondence, and more.
http://writing.engr.psu.edu/

Writing Resource Center
Effective strategies for becoming a better writer are useful resources for all of us, and this website from Empire State College was developed specially for adult learners and faculty use. The website offers sections such as Grammar & Punctuation, ESL Resources, and Documenting Resources. The site contains specific resources that include worksheets for faculty on how to conduct informal writing activities, to a writing exercise on developing a research question and much more.
http://www.esc.edu/ESConline/Across_ESC/WritingResourceCenter.nsf/homepageForm?OpenForm

Wyland Ocean Challenge, "Clean Water for the 21st Century"
The Wyland Ocean Challenge promotes student understanding of the complex and interrelated issues that affect our water systems through art. The program is a marine life art and science educational curriculum available free to every K-6 classroom. The program meets national standards for science and art, and includes art activities, case studies, and science experiments to teach students about the water on our planet.
http://www.wylandoceanchallenge.org

Wyland Ocean Challenge Cleanup
The Wyland Foundation, PADI, and Project AWARE have joined together for a 15-state, 16-city Wyland Ocean Challenge Coastal Celebration and clean-up tour, to inspire over 1 million people to promote, protect and preserve the nation's marine habitats. The campaign will be conducting a 1,700-mile series of cleanups and festivals along the east coast of the United States. The campaign will be feature music, celebrity speakers,

family activities, prize giveaways, and community clean-up events.
http://www.wylandoceanchallenge.org/index.cfm?do=costalcleanindex .

Xeno-Canto
Xeno-Canto is a community database of shared bird sounds from the Americas and around the world. The website also offers bird songs of almost 4500 species, which can be searched by map, collection, and randomly.
http://www.xeno-canto.org/

Yale Project on Climate Change
The Yale School of Forestry and Environmental Studies' Project on Climate Change offers resources and information to promote action on climate change. The resources are organized by category, including Business & Finance, News Media, Environmentalists & Civil Society, and more.
http://www.environment.yale.edu/climate/

Year of Clean Water Outreach Materials – Nonpoint Source and Stormwater
The EPA website highlights different monthly topics to celebrate the Year of Clean Water and 30 years of the Clean Water Act. Materials include information brochures, posters, and even crossword puzzle placemats that can be customized for your organization. The Watershed Events newsletter highlights several education and outreach campaigns.
http://www.epa.gov/water/yearofcleanwater/month.html
http://www.epa.gov/owow/watershed/eventspring03.pdf

Year of Science
The Year of Science 2009 website offers many reasons to celebrate science. Monthly celebrations include weather and climate, biodiversity and conservation, and more. For June's Ocean and Water theme, the website will feature a slide show entitled *A Day Without the Ocean*. They are collecting digital images (photos or scanned drawings) from the ocean education community, scientists, teachers, students, and anyone else interested, that illustrate what the world would be like if we lost this resource for a day.
http://www.yearofscience2009.org/

Year of Science Education Sampler
NOAA Education celebrates the 2009 Year of Science with a website and companion DVD, offering background materials, multimedia resources, informal activities, lesson plans, and curricula from across NOAA. The materials are geared for educators and students of grades 3-12. The resources from the DVD can be individually downloaded from the website.
http://oceanservice.noaa.gov/education/yos/

Year of Science June Theme: Ocean and Water
The Year of Science 2009 is a chance to celebrate science. Throughout the year, participating groups from around the world will engage the public in science and work to improve public understanding about how science works, why it matters, and who scientists are. The website includes educational activities, online games, and other resources.
http://www.yearofscience2009.org/themes_ocean_water/celebrate/

B Yellowstone Fires Interview Montage
Voices from the Past – Lessons for the Future is a video montage of lessons learned from the Yellowstone fires of 1988. The clip is about 12 minutes and is a sampling from 23 interviews and over 60 hours of video.
http://www.wildfirelessons.net/Home.aspx

Young Voices on Climate Change
Young Voices on Climate Change is a film series featuring young people who are making a difference by shrinking the carbon footprint of their homes, schools, and communities. Check out the movies and follow the project on facebook.
http://youngvoicesonclimatechange.com/

Your Local Ecosystem
What rivers and streams flow through your neighborhood? What wildlife is local to where you live? Foxes, deer, and rabbits use utility right of ways as corridors to cross even busy urban and suburban areas. This website from the Environmental Literacy Council offers links to information about your area, often by just inputting your zipcode.
http://www.enviroliteracy.org/article.php?id=287

Youth in the Great Outdoors
The Department of the Interior has created the Office of Youth in the Great Outdoors to help coordinate efforts to employ, educate, and engage young people from all backgrounds in exploring, connecting with, and preserving America's natural and cultural heritage. Check out the Student Internship Opportunities, and watch this website as more information is added.
http://www.doi.gov/whatwedo/youth/