National Oceanic and Atmospheric Administration

Information Exchange for Marine Educators

Archive of Educational Programs, Activities, and Websites

A to M

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

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

3D Topographic and Wave Simulations

ForgeFx is an interactive 3D simulation and visualization company. Their website showcases several useful interactive simulations, including a topographic map and 3D wave simulation. Students can see immediate changes online resulting from their variable input.
www.forgefx.com/casestudies/prenticehall/ph/topo/topo.htm

4-H Goes to Sea

4-H Goes to Sea is a pilot curriculum project for 4-H youngsters aged 6 - 13. University of New Hampshire marine docent volunteers partner with 4-H leaders to help with the curriculum. There are six modules: open ocean, Gulf of Maine and watersheds, sandy beaches, rocky shores, salt marshes, and estuaries. Field experiences introduce the module and the leaders are asked to use the curriculum in interim meetings.
Sharon.Meeker@unh.edu

4empowerment

4empowerment is dedicated to making a positive difference in the lives of individuals, communities, and our environment. They offer e-learning programs that provide the means for educators, communities, organizations, and companies to research, learn, collaborate, and take action on issues affecting their world. The *Cyberways and Waterways Program* offers a bi-lingual supplemental science program that integrates technology into the classroom through inquiry-based learning activities and lesson plans.
http://www.4empowerment.com/en/index.jhtml

5K Race for the Planet "Seahorse Sprint"

The Fort Fisher Green Team is out to prove that you can host a sustainable 5K race and fun family-oriented event, April 19, 2009 in Kure Beach, North Carolina. While competing in another area race, Green Team members were disappointed to see

Styrofoam cups and trash cans filled with plastic bottles. Inspired to set an example for the racing community, the Green Team is co-sponsoring the aquarium's first "Seahorse Sprint". Contact Samantha Herbert for information to set up similar events, at Samantha.Herbert@ncmail.net.
http://www.ncaquariums.com/5k-race-for-the-planet-seahorse-sprint

7 Generations
The 7 Generations manual, *Addressing Village Environmental Issues for the Future Generations of Alaska*, is designed for people in rural Alaska who want to accomplish environmental planning and management using a community based approach. This downloadable manual was written to assist communities to be more self reliant, and to take responsibility for their own environmental issues. It includes planning process, surveys, funding sources, and more.
http://www.7generations.us/page2.html

AAAS Atlas of Population and the Environment
The AAAS Atlas of Population and Environment provides maps, text, and graphics that quantify and illustrate the broader links between population dynamics and the environment. Analyses of individual topics bring together what is known about the ways in which people impact the Earth's environment. Lastly, the atlas contains six case studies that look at population-environment relationships in selected areas.
http://atlas.aaas.org/ .

AAAS Launches Public Outreach Initiative Focused on Science Literacy
Science. It's Everywhere is a public outreach initiative by the American Association for the Advancement of Science through the Partnership for Science Literacy. Designed to help parents and families play a more active role in their children's science education, it includes multi-media advertising along with a web site, in English and Spanish, to help motivate parents and families to take action in helping their children learn science.
http://www.tryscience.org/parents/parent.html

Aboriginal Canada Portal
Learning about native peoples in Canada has never been so easy as with this website created by the government of Canada, in partnership with the Assembly of First Nations and other stakeholders. Visitors can search the entire site's contents through a search engine on the homepage, or select thematic areas as education, environment and natural resources, and more. Check out the links to kid-friendly games, traditional ecological knowledge, conservation and protection, and much more.
http://www.aboriginalcanada.gc.ca/acp/site.nsf/en/index.html

Above and Below the Waves: Coastal and Oceanic Treasures Conserved in the National Park System
The National Park Service established the Ocean Park Stewardship Plan, with goals and priorities to restore and maintain the tremendous biological and recreational values of ocean and coastal resources across the National Park System, in collaboration with state and federal agencies and park stakeholders. Examples of successful joint stewardship programs can serve as models for managing marine resources that attract academic interest.
http://www.nps.gov/pub_aff/oceans/conserve.htm

ABCs of Ecology
The ABCs of Ecology®: An Educator's Guide to Learning Outside is useful for those looking for outdoor activities and lesson plans to help children understand the world in which they live, and includes chapters and background information on geology, climate, forest, ABCs of ecology, and watersheds. The lessons are geared for 3rd - 8th grade levels
http://www.fbes.org/store/ABCsoEcologyFlyer.pdf

About Coral Reefs
NOAA's Coral Reef Information System (CoRIS) is designed to be a single point of access to NOAA coral reef information and data products, especially those derived from NOAA's Coral Reef Conservation Program. The website includes introductory material about coral reefs, deep water corals, coral diseases, and more.
http://coris.noaa.gov/about/

Act Green
Scholastic has launched ACT GREEN!, an educational website designed to motivate and empower kids to take action in school, at home, and in their community to preserve the environment. The multi-media website provides kids, parents, and teachers with customized green plans, expert tips, short films provided by Live Earth, and a "Greenroom" to share ideas with other kids.
http://www.scholastic.com/actgreen/

Activities for the Changing Earth System
Ohio State University offers an online version of their Earth Systems Education Program publication, Activities for the Changing Earth System, with information and activities including ice core importance, contributions of volcanoes to climate change, and more. There are ten middle school and ten high school activities.
http://earthsys.ag.ohio-state.edu/project/pubs/ACES.html

Adaptation 2009
Adaptation 2009: Safeguarding Fish, Wildlife and Natural Systems in the Face of Climate Change, was convened by the Wildlife Habitat Policy Research Program and the National Wildlife Federation in February 2009. The conference breakouts were organized around four natural systems: forests, grasslands and shrublands, freshwater ecosystems, and coasts and estuaries. Presentations are available for viewing or via audio from the website, along with summaries and other materials.
http://ncseonline.org/WHPRP/NWF/Adaptation2009/

Adaptations from the Depths
The Flower Garden Banks National Marine Sanctuary offers its *Adaptations from the Depths* curriculum, downloadable from the web. This curriculum introduces elementary students to animal adaptations as they relate to the octopus. The full curriculum text, including reproducibles, or a separate document with just the handout masters are available. Additional materials can be mailed to you upon request, at no charge. Send an email with your mailing address to flowergarden@noaa.gov to request the supplemental materials. Check out the website for other resources.
http://flowergarden.noaa.gov/document_library/ed_documents.html

Adopt-A-Beach School Assembly Program for Los Angeles Watershed
The Malibu Foundation offers a comprehensive environmental program designed to motivate teachers and K-12 students to care about beaches and oceans. The *Adopt-A-Beach School Assembly Program* demonstrates how beaches and oceans get dirty and provides hands-on opportunities to make a difference by recycling, reducing litter, and cleaning up the beaches.
http://www.malibufoundation.org/tmffe004.htm

Adopt a Drifter Program
NOAA's Office of Climate Observation established the Adopt a Drifter Program in December 2004. The program provides teachers with an educational opportunity to infuse ocean observing system data into their curriculum. The website includes lesson plans, background information, and more.
http://www.adp.noaa.gov/index.html

Advanced Field Oceanography
The University of Washington, School of Oceanography's course, Oceanography 444, is a five-credit undergraduate course. This year, their research has been aboard the *R/V Thomas G. Thompson* near the Galapagos Islands. In addition to planning, performing, and writing up their own research, the students were responsible for much of the cruise planning. This is a good site for your students to get a feel for oceanography and research from the students' perspective.
http://courses.washington.edu/ocean444/

Advanced Placement Environmental Science Course – Online
Based on curriculum developed for California schools, the Advanced Placement Environmental Science course developed by the University of California College Prep initiative is now available through the Encyclopedia of Earth website. The online course includes 25 chapters on topics ranging from energy flows to environmental laws and regulations; the chapters may be used independently as a resource for teachers and students or sequentially as a full course.
http://www.eoearth.org/article/AP_Environmental_Science_Online_Course

Adventure Marine
Adventure Marine offers a marine science program at sea aboard the research vessel *Pacific Monarch*, traveling from Long Beach Harbor to the Island of Catalina in California. The ship is equipped with wet lab touch tanks, snorkeling gear, underwater camera, color sonar, and more.
http://www.adventuremarine.org/

Adventures of Ed the Bear
Stephen Savage is currently developing a marine based education project that will introduce U.K. schools to marine habitats around the world, along with global marine conservation issues, through a weblog seen through the eyes of the teddy bear, Ed the Bear. Ed hopes to show how his local coastline fits into the bigger picture and also to create a point of references for local U.K. schools to compare with Ed's global adventures.
http://adventuresofedthebear.blogspot.com/

Adventures of Fred the Monkey
Ron Hirschi and Fred the Monkey want to connect with kids about oceans, marine debris, and especially ridding the sea of plastics. Follow Fred on his journeys, including a recent trip to Pihe Manu (Midway Atoll), his research into micro-plastics in beach sand, and his future adventures, including SOARing with Fred. Keep in touch by way of Postcards from Fred on his website.
http://soaronhirschi.blogspot.com/

Aegean and Black Sea 2006 Expedition
NOAA's Ocean Explorer offers information and educational materials for the 2006 Aegean and Black Sea expedition, the first mission of a multi-year geological and archaeological study in the Sea of Crete. An interdisciplinary research team of archaeologists and oceanographers will pursue major mission goals of finding well-preserved marine archaeological sites, studying ancient maritime trade, and exploring the history of the Thera volcano. The Ocean Explorer Expedition Education Module includes a summary of the purpose of this expedition; lesson plans designed specifically for this expedition; interactive multimedia presentations and Learning Activities on Plate Tectonics, Mid-Ocean Ridges, and Subduction Zones; profiles of scientists representing careers featured during this mission; and a list of other resources and links related to the 2006 Aegean and Black Sea mission. Immersion Presents featured numerous live broadcasts during the expedition; log onto their website and click on "Channel" to view the following:

- Ancient Eruptions; June 3-June 8, 2006; 30-minute shows from the Aegean Sea
- Updates from the Sea of Crete; June 10-June 15, 2006; featuring expedition scientists

www.uri.edu/endeavor
www.uri.edu/endeavor/thera/index
http://www.oceanexplorer.noaa.gov/explorations/06blacksea/welcome.html
http://www.immersionpresents.org

***After the Storm* Television Special about Watersheds**
The Environmental Protection Agency and the Weather Channel co-produced *After the Storm*, a television special about watersheds. *After the Storm* shows the connection between weather and watersheds and the importance of watershed protection. Key scientists, water quality experts, and citizens involved in local and national watershed protection efforts provide insight into the problems as well as solutions to today's water quality crisis. DVD copies of the half-hour television special about watersheds, After the Storm, are now available at no charge. In addition to free DVD copies, the video is available for downloading, complete with on-video text transcript.
http://www.epa.gov/weatherchannel/

Amphibian Alert! Curriculum
This downloadable curriculum aims to teach children what amphibians are and why amphibian population declines are important to scientists and communities throughout the world. The curriculum targets age groups from grades 2-5 but is adaptable to other grades.
http://eeingeorgia.org/net/content/go.aspx?s=67749.0.68.4863

El Agua Es Importante
El Agua Es Importante: guia de maestro sobre recursos de agua, Volumen 3, available free, includes a teacher's guide and posters created by the U.S. Geological Survey's

Water Resources Education Initiative. Designed to help primary and middle school teachers satisfy National Science Education Standards and promote query-based, hands-on learning, topics include oceans and coastal hazards, watersheds, and more.
http://www.epa.gov/ncepihom/ordering.htm

Agua Pura Curriculum
The *Agua Pura: Exploring Salmon and Steelhead in California Communities* curriculum teaches children about salmon and steelhead biology, and the critical relationship these fish have to healthy watersheds. Using real-life investigation and problem solving skills, participants investigate the natural history of their local salmon or steelhead populations, find out how human activities have impacted these populations in local rivers and streams, and work with other community members to enhance salmon and steelhead habitat within the community. The worksheets and the parents' letter are available as English or as side-by-side English/Spanish versions.
http://www.sns.ucdavis.edu/

Aiming for Excellence: An Evaluation Handbook for Interpretive Services in California State Parks
This handbook provides measures and measurement tools for assessing the quality of educational and interpretive services. It includes visitor evaluation, performance appraisals, evaluation forms and a bibliography. It is available for downloading from the website.
http://www.parks.ca.gov/default.asp?page_id=21700

Air – Here, There, Everywhere!
The Chemists in the Library Working Group of the American Chemical Society has compiled electronic and print resources about climate for further exploration of Chemists Celebrate Earth Day: Air - here, there, everywhere! The resources have been classified by grade level and annotated. The website includes basic characteristics of the Atmosphere, Understanding Weather, Climate, and many resources for further information.
http://library.stanford.edu/depts/swain/hosted/earthday/2005/index.html

Air and Waste Management Association Lesson Plans
The Air and Waste Management Association offers Environmental Education Resource Guides on CD, with background information, fact sheets, glossaries, and 50 lesson plans for grades K-5 on several air and water pollution topics. The website offers four of the lesson plans free for downloading, about nonpoint source pollution and air quality.
http://www.awma.org/education/freelessons.asp

Alabama Learning Exchange
The Alabama Learning Exchange is a project of the Alabama Department of Education, designed to index and share many types of educational materials and information through a one-stop resource for educators, parents, and students. The resources include lesson plans, web links, and interactive activities. Be sure to check out the distance education and professional learning sections.
http://alex.state.al.us/index.php

Alaska Coastal Calendar
Explore Alaska's climate—past, present, and future—with Alaska Sea Grant's 2008 Alaska Coastal Calendar. The calendar celebrates the International Polar Year, and

features photos and detailed narratives describing the changing climate and scientific research being done to better understand the effects of change on Alaska's coast, people, and wildlife. Each month is devoted to a different theme around which lessons can be centered.
http://seagrant.uaf.edu/bookstore/pubs/SG-ED-58.html

Alaska CoastWatch Manual
The Center for Alaskan Coastal Studies offers a downloadable Alaska CoastWatch manual and other online resources for identification of Alaskan seaweeds and fishes, in the teacher and community resource sections on their website.
http://www.akcoastalstudies.org/teacherresources.htm

Alaska Department of Fish and Game Website
The Alaska Department of Fish and Game's mission is to manage, protect, maintain, and improve the fish, game and aquatic plant resources of Alaska. The website contains many resources of interest to marine and coastal educators, including the Alaska Wildlife Curriculum, the Wildlife Notebook Series, and links to refuges, critical habitats, and sanctuaries.
http://www.sf.adfg.state.ak.us/region2/ie/Teacher_Resources/html/teachres.stm

Alaska Fisheries Science Center Cold Water Coral Video and Science Resource Guide On-Line
Journey deep beneath the cold waters of the Aleutian Island archipelago from your computer and explore the rich abundance of life on the sea floor. The "Coral Gardens of the Aleutians" streaming video is set up for either Broadband or dial-up connection. Also available from Alaska Fisheries is a down-loadable Science Resource Guide to help students understand the work of NOAA Fisheries.
http://www.afsc.noaa.gov/abl/MarFish/coral_gardens_video.htm
http://www.afsc.noaa.gov/sep/ResGuide_TOC.htm

Alaska Islands & Ocean Visitor Center
The Alaska Islands & Ocean Visitor Center, in Homer, Alaska, recently opened. This interpretive, educational, & research facility is a partnership of the Alaska Maritime National Wildlife Refuge and the Kachemak Bay Research Reserve, dedicated to the understanding and conservation of the marine environment. The facility offers visitors a window into the world of seabirds and other marine animals, as well as their islands and ocean habitats.
http://www.islandsandocean.org/index.html .

Alaska Native Perspectives on Earth and Climate
Teachers' Domain has launched a new collection of media resources that looks at earth sciences from the perspective of the people of Alaska. In this collection, students learn both Native ways of knowing nature, and ongoing scientific research about Alaska's unique geology, and how climate change and development are affecting the region.
http://www.teachersdomain.org/special/ean/

Alaska Seas and Rivers Curriculum
Visit Alaska Sea Grant's website to download the new online Alaska Seas and Rivers marine/aquatic curriculum. Developed by Alaskan teachers, the curriculum offers units for use by teachers and homeschoolers, interpreters, youth groups, and others.
http://seagrant.uaf.edu/marine-ed/curriculum/

Alaska Small Press Catalogue
Wizard Works publishes a variety of titles through the Alaska Small Press Catalogue for the US Fish and Wildlife Service, including *Arctic Nesting Shorebird Guide*, *Wetlands and Wildlife,* and *Teach About Geese*. In addition, they publish the Alaska Wildlife Curricula for the Alaska Department of Fish & Game. This includes *Alaska's Ecology*, *Alaska's Forests & Wildlife*, *Alaska's Tundra & Wildlife*, *Wildlife for the Future*, and the *Alaska Ecology Cards*.
http://www.xyz.net/~wizard/home.htm .

Algae: The Forgotten Treasure of Tidepools
Hosted by the Department of Biology at Sonoma State University, this very informal website introduces browsers to the world of algae through a small collection of different alga images. The website's three galleries feature seaweeds of the Green (Chlorophyta), Red (Rhodophyta), and Brown (Phaeophyta) varieties, accompanied by brief and easily read text. The home page links to more extensive resources for those who have become intrigued by algae and want more information.
http://www.sonoma.edu/biology/algae/algae.html

Algalita Marine Research Foundation Materials
The Algalita Marine Research Foundation is dedicated to the protection of the marine environment and its watersheds through research, education, and restoration. They offer K-12 education programs which include cirriculums and/or DVDs set to California's science standards. In addition, they have downloadable materials on plastic debris, a watershed companion curriculum, research articles, and more. Some materials are available in Spanish.
http://www.algalita.org/education.html

All About Birds
Brought to you by the Cornell Lab of Ornithology, this site includes an on-line guide to birdwatching, sound files of bird songs, a video gallery, and links to a variety of sites where you can report your observations. The conservation section highlights bird conservation success stories. Other information includes habitat management, an educator's guide to bird study, and how to get involved.
http://www.birds.cornell.edu/programs/allaboutbirds/ .

All About Wetlands Newsletter
"All About Wetlands" is a new newsletter published quarterly by Environmental Concern Inc, publishers of the peer-reviewed publication, *Wetland Journal*, from 1993 to 2001. "All About Wetlands" contains articles covering a wide array of wetland topics and issues from around the world. Join Environmental Concern, Inc. to receive a copy of the newsletter.
www.wetland.org .

All in One Place
Educators looking for the latest ocean science news and resources can find them all on the Bridge's front page. From information on on-going ocean research expeditions to our teacher-reviewers' top picks, the homepage is a one-stop shop. There are links to Scuttlebutt, the email discussion list, along with the Bridge-authored Data Analysis Teaching Activities (DATA) series. If you need resources on a particular topic, you will find the Bridge powerful search engine.

http://www.marine-ed.org/bridge

All the Way to the Ocean
All the Way to the Ocean is a children's book about two friends' discovery of the harmful effects of ocean pollution. This story deals specifically with storm drain run-off that travels directly into our natural bodies of water. The book's colorful illustrations and simple text should help educate readers and inspire them to fight pollution.
http://www.allthewaytotheocean.com/

Altered Oceans
Altered Oceans is a five-part series on the crisis in the seas published on-line by the Los Angeles Times on latimes.com. Part one, *A Primeval Tide of Toxins*, discusses cyanobacteria. The second part, *Sentinels Under Attack*, is about toxins affects on marine mammals. The remaining parts discuss marine debris, changing ocean chemistry, and algae blooms. Links are also provided for more in-depth information.
http://www.latimes.com/news/local/oceans/la-oceans-series,0,7842752.special

Alternatives for Coastal Development: One Site, Three Scenarios
This website, *Alternatives for Coastal Development: One Site, Three Scenarios,* illustrates three different development scenarios created for a residential area in coastal Georgia. The website includes maps and details of three different designs; comparisons of environmental, economic, and social indicators; three-dimensional views of each; detailed project methodology; and growth and development-related information.
http://www.csc.noaa.gov/alternatives/ .

America, the Ocean, and Climate Change
New public opinion research, *America, the Ocean, and Climate Change: New Research Insights for Conservation, Awareness, and Action*, commissioned by The Ocean Project in collaboration with Monterey Bay Aquarium and National Aquarium, surveyed over 22,000 Americans on a comprehensive range of ocean- and environment-related topics. The website offers downloadable files, key findings, and more.
http://www.theoceanproject.org/resources/America_the_Ocean_and_Climate_Change.php

America Recycles Day
America Recycles Day is November 15, 2005. The America Recycles Day website offers background information through *Recycling 101*, a contest (entry deadline is America Recycles Day), and an easy-to-use search function for recycling activities in your state. For example, a Trash to Treasure Kid's Fair in Culver City, California on November 19, 2005 includes a recycled art competition (see http://www.ecostation.org/).
http://www.americarecyclesday.org/home.html

America's Underwater Treasures
Jean-Michel Cousteau: Ocean Adventures returns this September with the series finale, a two-part special investigation about the 13 National Marine Sanctuaries. America's Underwater Treasures will air on two consecutive Wednesdays at 8 p.m. on September 20 and 27, 2006 on PBS. Visit the website for more information and downloadable lesson plans.
http://www.pbs.org/oceanadventures

American Field Guild
PBS has collected over 1400 video clips that enable you to experience America's wilderness firsthand. Browse through their selections on animals, ecosystems, plants, and more. Hike the Tijuana Estuary, go on a whale watch, or follow Glacier Bay rangers perform their unique duties in some of the world's most beautiful surroundings. Teacher resources include lesson plans that weave segments of video together into units of inquiry around specific topics.
http://www.pbs.org/americanfieldguide//index.html

American Indian Tribal Portal
The American Indian Environmental Office developed this tribal portal to help American Indian communities and supporters locate tribal related information within EPA and other government agencies. The website offers links to basic information, grants and funding, laws and regulations, programs, and contact. News, maps, education and training, and more are also available.
http://www.epa.gov/tribalportal/

American Museum of Natural History: Climate Change
This online exhibit from the American Museum of Natural History on climate change offers interactive features that mirror the in situ exhibits, complete with charts, informative text, photographs, and graphs. There are resources, the *Signs of Change* blog, and sections for Educators and for Kids.
http://www.amnh.org/exhibitions/climatechange/?src=h_h

American Museum of Natural History Science Bulletins
The American Museum of Natural History's Science Bulletins are online videos which feature the latest developments in the fields of astrophysics, human biology, biodiversity, and evolution. The website offers additional resource links, educator resources, and an educators' guide to help incorporate the materials into classroom work. The bulletins are categorized in sections that include Astro, Earth, Bio, and Human, with further subcategories of features, visualizations, and snapshots.
http://www.amnh.org/sciencebulletins/

American Trails Magazine Online
American Trails Magazine has gone digital. Check out the latest issue in its quick-loading, page-turning format. The format also offers a search feature and the ability to print the issue for those who prefer to pass the paper around.
http://www.myvirtualpaper.com/doc/americantrails/Spr09ATM/2009040801/

American Wetlands Month
May is American Wetlands Month; this year's theme is *It Pays to Save Wetlands*. The Environmental Protection Agency partners with other federal, state, and local agencies and private organizations in celebration. Events are scheduled across the country to educate, involve and engage Americans who want to better understand the value of one of Earth's most important ecosystems.
http://www.epa.gov/owow/wetlands/awm/

American Zoo and Aquarium Association National Awareness Campaign
AZA's National Awareness Campaign will create a unified voice to position the collective member institutions in the minds and hearts of the public as safe and fun family experiences that are also meaningful. They aim to be perceived as trusted experts and a

powerful collective voice on animal care, wildlife conservation, and public education about wildlife and wild habitats.
http://www.aza.org/Publications/2004/03/March04NACTheme.pdf

America's Climate Choices
The National Academies have launched America's Climate Choices, a suite of studies designed to inform and guide responses to climate change across the nation. Experts representing various levels of government, the private sector, nongovernmental organizations, and research and academic institutions have been selected to serve on four panels and an overarching committee.
http://www.americasclimatechoices.org/index.shtml

AmeriCorps Signature Project with Coastal America
AmeriCorps National Civilian Community Corps has selected Coastal America for its Signature Project for 2005/2006. Coastal Ecosystem Learning Centers are developing project proposals that involve AmeriCorps conservation corps volunteers in their Learning Center and community programs. Coastal America's federal partners are also submitting proposals through their regional implementation teams.
Contact Marguerite Duffy at marguerite.duffy@usda.gov

Amphibian Poster
Omaha's Henry Doorly Zoo, together with other zoos and organizations, has launched the Amphibian Conservation Initiative to address amphibian extinctions on a global scale. A downloadable poster includes activities on the back.
http://www.omahazoo.com/exhibits/index.asp?page=/exhibits/amphibiancrisis.htm

AmphibiaWeb
AmphibiaWeb is an online system created in conjunction with the Digital Library Project at the University of California, Berkeley, enabling search and retrieval of information relating to amphibian biology and conservation. Their goal is to establish a "home page" for every species of amphibian in the world; they hope to accomplish this with the help of volunteers and specialists. The website offers general background information about amphibians, species vulnerability, links to additional websites, and more.
http://elib.cs.berkeley.edu/aw/index.html

An Inconvenient Truth DVD for Teachers
50,000 copies of the documentary about global warming, *An Inconvenient Truth*, were donated on a first come, first serve basis to teachers across the country interested in using the film as a teaching tool in classrooms. A free curriculum guide is also available for download on the website. The website also hosts teacher comments about the materials by way of a blog.
http://www.participate.net/educators/

Anatomy of Sea Turtles
The Anatomy of Sea Turtles is available for downloading in English and Spanish. The manual provides background information, reference photos of normal anatomy, and diagrams. Species identification, standard dissection techniques, standard measurements, and basic anatomy are covered with a diverse audience in mind. Hard copies in English are no longer available, and only a limited number of Spanish hard copies remain.
English http://www.sefsc.noaa.gov/PDFdocs/TM_470_Wyneken.pdf

Spanish http://www.sefsc.noaa.gov/PDFdocs/TM_470_Wyneken_spanish.pdf

And the Winners Are...Ocean Art
The Hawaiian Islands Humpback Whale National Marine Sanctuary has posted the winners from the 2009 Humpback Whale Month Ocean Contest. Winning art, poetry, and essays from the K-8 participants can be found on the website. Perhaps these will inspire additional waves of young poetry, story-telling, and artistry?
http://hawaiihumpbackwhale.noaa.gov/news/stories/newsocwinners09.html

Animal Diversity Web
The Animal Diversity Web is an online database of animal natural history, distribution, and classification sponsored by the University of Michigan with thousands of individual species accounts. Each account may include such features as extended descriptions, pictures of each species, and recordings of sounds and short movies. The site has a virtual museum which includes a number of representative photographs of various animal species, and several hundred virtual reality movies of skulls.
http://animaldiversity.ummz.umich.edu/site/index.html

Animal Sounds from the Macaulay Library
The Macaulay Library (formerly the Library of Natural Sounds) is the world's largest archive of animal sounds. The library is a principal source of sound recordings for basic research, education, conservation, habitat assessment, media, and commercial projects. The Library also archives and preserves an exhaustive sampling of the behaviors of each animal species using digital video and audio recordings. Their marine collection includes over 3000 recordings. http://www.birds.cornell.edu/MacaulayLibrary/About/

Animal Welfare Information Center
The USDA's Animal Welfare Information Center website contains everything from current animal issues to workshops for those in industries that utilize animals to licensing forms. Specifically, the center is designed to regulate and improve care of animals in research, testing, teaching, and exhibition.
http://awic.nal.usda.gov/nal_display/index.php?info_center=3&tax_level=1

Animals in Curriculum-based Ecosystem Studies
Animals in Curriculum-based Ecosystem Studies (ACES) is a classroom based curriculum program in which students use Earth imagery to explain the movement of animals that are tracked by NOAA's operational satellites. Follow seabirds, sea turtles, marine mammals, and fish as they migrate. Students study aspects of the animal's life history, conservation status, food web, connections to ocean processes and remote sensing data, environmental issues the animals face, and more.
http://www.signalsofspring.net/aces/

Annenberg Media Interactives
Annenberg Media uses media and telecommunications to advance excellent teaching in American schools. This mandate is carried out chiefly by the funding and broad distribution of educational video programs with coordinated Internet and print materials for the professional development of K-12 teachers, encouraging more effective ways to share ideas and knowledge. The website includes a variety of Interactives, including Dynamic Earth, Garbage, Weather, and more.
http://www.learner.org/interactives/

Antarctic Journal
Allan Miller, Albert Einstein Distinguished Educator Fellow at the National Science Foundation and a NASA Educator Astronaut finalist, has returned from a tour of duty in and around Antarctica. Miller chronicled his experience in an expedition - the first of at least 30 - that allows classroom teachers to travel to field research sites in the Arctic and Antarctic and work with scientists engaged in many different types of polar research throughout the upcoming International Polar Year
http://www.polartrec.com/allanmillerjournal

Antarctic Quest Challenge
NASA Quest Challenges are free, web-based, interactive explorations designed to engage students in authentic scientific and engineering processes related to issues encountered daily by NASA personnel. Students in grades 5-14 will develop a research question and debate the value of studying the chosen Antarctic feature. Students become scientists and propose Antarctic research using a new tool called LIMA, Landsat Image Mosaic of Antarctica. The LIMA web site is designed as part of the International Polar Year to familiarize people with Antarctica, to explore the richness of its features, to learn about why Antarctica matters to us all, and to explain and demonstrate how scientists use satellite imagery to study the continent.
http://quest.nasa.gov/challenges/lima/about.html

Antarctic Summer
Two young scientists spending six months in Antarctica will share their experiences and different perspectives with students and teachers. Alex's blog is focused on the science they're doing (he recently got his Ph.D. in oceanography), while Elizabeth (a registered nurse by training) is blogging more about life in Antarctica. They are also looking for volunteer educators to help develop new activities and lesson plans in whatever subjects or grades that interest you.
http://coseenow.net/forum/?wpforumaction=viewforum&f=4.0
http://rucool.marine.rutgers.edu/antarctica/

Antarctica: Signs of the Great Thaw
The Chicago Tribune offers this portrait of the effects of global warming on and around Antarctica. Visitors can view the ways in which the thawing sea ice is taking its toll on the Adelie penguins, learn about how scientists are attempting to reconstruct the history of various global climate changes, take a 360-degree look around the South Pole, and listen to the voices of people who live and work on Antarctica.
http://www.chicagotribune.com/news/nationworld/chi-antarcticamain-html,1,567386.htmlstory

Applied Environmental Education and Communication
Applied Environmental Education and Communication is an international peer-reviewed quarterly for both academics and practitioners. It features articles, a discussion and editorial section, and books and materials reviews. A special themed issue on environmental education and communication for biodiversity will be published in 2004.
http://www.aeec.org/submission/submission.asp .

Applied Math and Science Education Repository
Internet Scout offers the Applied Math and Science Education Repository (AMSER). AMSER serves up information about applied math and science resources in an easy-to-use format. Users can find a wide assortment of materials, from large web sites

focusing on an individual applied science or math topic to animations that demonstrate specific science or math principles in action.
http://amser.org

Aquakids
The premise of this half-hour TV show is that by using young people, the "Aqua Kids", to teach other young people about the diversity and beauty of the marine environment and its potential destruction by pollution and carelessness of human populations, they can spread the message of ocean preservation to their peers. Each episode presents a lesson on conservation of the water environments of the world.
http://www.aquakids.tv/index2.html

Aquarium of the Pacific Celebrates Halloween
Discover the creepy creatures lurking in the depths of the Pacific at the Scarium of the Pacific, October 23 and 24, 2004, Long Beach, California. Pick up the creepy creature map/scavenger hunt at the aquarium information booth to begin your haunted holiday. The first 4,000 children through the door received a special Scarium of the Pacific souvenir. Check out the Aquarium of the Pacific's many educational programs.
http://www.aquariumofpacific.org/NEWS_EVENTS/10_04/scarium04.htm .

Aquarist Journals Online
Advanced Aquarist and *Reefkeeping* are online magazines for marine aquarists, offering articles for aquarists from beginners to advanced. Check out Reefkeeping's Top Ten.
http://www.advancedaquarist.com/
http://reefkeeping.com/

Aquatic Invasive Species: An Educator's Information and Materials Guide
This guide is a compilation of selected educational materials on aquatic invasive species, including curricula, posters and print materials, videos, books and compact discs, and web sites. The guide is available for down-loading at
http://www.seagrant.umn.edu/exotics/ais_guide.pdf . But for more information, make sure you check out the rest of this extensive website, at
http://www.seagrant.umn.edu/exotics/ .

Aquarium Video Library - Online
The Monterey Bay Aquarium Website Video Library includes over 30 videos about animals, exhibits, and conservation research programs at the aquarium. The videos are in QuickTime© or Windows Media Player©. The site also offers activities, materials for the classroom, and marine science career information.
http://www.mbayaq.org/efc/video_library/video_library.aspx

ARC Centre
The ARC Centre of Excellence for Coral Reef Studies undertakes integrated research for sustainable use and management of coral reefs. This research center is headquartered at James Cook University, in Townsville, Australia. The website includes links to hundreds of coral-related publications, many with full text available. Check out the educational resources links.
http://www.coralcoe.org.au/index.html

Archaeology Channel Video Guide
Based in Oregon, The Archaeological Legacy Institute was founded to bring the benefits of archaeology to a wider constituency. Check out their collection of video programs, which include Queen Anne's Revenge Overview, The River has Many Stories, The Shipwreck at Playa Damas, and many more. In addition to the videos, each offers web links for further information. While on the website, check out the extensive links to teacher resources and lesson plans from the main Archaeology Channel webpage.
http://www.archaeologychannel.org/content/videoguide.asp

Archeology and Ethnography Program
The National Park Service Archeology Program has launched a series of new webpages. "The Public Benefits of Archeology" offers a unique perspective for different segments of the public. Through narrative scenarios, case studies, and additional reading, visitors to the webpage can learn about ways that archeology can benefit them. The website includes links for teachers and kids, lesson plans, distance learning, and career information.
http://www.cr.nps.gov/aad/PUBLIC/INDEX.HTM

Archipelago Exhibit – Hawai'i
"Archipelago: Portraits of Life in the World's Most Remote Island Sanctuary" will be on exhibit at the Maui Ocean Center for the month of February. This photographic exhibit on the flora and fauna of the Northwest Hawaiian Islands and conservation efforts to protect them showcases images from the new book "Archipelago" by photographers David Liittschwager and Susan Middleton.
http://www.mauioceancenter.com/home.html

Arctic and Antarctic
This NSF website looks at research being conducted in the two polar regions of the earth. These inhospitable environments provide natural laboratories for scientists to study basic questions such as, Is earth's climate changing? What are the limits of life in extreme environments? The website includes interactives about ongoing and future research along with links to classroom resources.
http://nsf.gov/news/overviews/arcticantarctic/index.jsp

Arctic and Antarctic Activity Book
NOAA's National Centers for Coastal Ocean Science offers the Arctic and Antarctic Activity Book in their ongoing series of regional children's activity books. This activity book, produced for the International Polar Year of 2007-2008, is for K-5th graders. The 25 page book is filled with information about both poles, along with facts, drawings, mazes, find-a-word puzzles, connect-the-dots, and other activities about organisms and life in the coldest areas of the world.
http://www.coastalscience.noaa.gov/education/welcome.html

Arctic Theme Page
NOAA's Arctic Theme Page provides access to Arctic data and information for scientists, students, teachers, academia, managers, and others. The Gallery links to images of ice, animals, ships, and more. Links to education include an arctic primer, information abuot arctic change, polar ecosystems, glaciers, and much more. Check this site out for FAQs, data, maps, information, and images.
http://www.arctic.noaa.gov/index.shtml

ARKive – Images of Life on Earth
ARKive gathers together into a centralized digital library films, photographs, and audio recordings of the world's species, creating a record of the world's biodiversity. The website features photographs of endangered and protected species worldwide, and includes information on habitat, status, descriptions, threats, and biology. It also features lesson plans (UK standards).
http://www.arkive.org/ .

Armada Project Classroom Activities
The Armada Project, funded by the National Science Foundation, provides K-12 teachers an opportunity to actively participate in ocean, polar, and environmental science research. Their website offers downloadable classroom activities and background information about sea level rise, population ecology, benthic infauna, and more.
http://www.armadaproject.org/downloads.htm

Artist Boat
Artist Boat is dedicated to promoting awareness and preservation of coastal margins and the marine environment through collaborations between marine scientists and artists in order to develop environmental literacy. They utilize tools of the sciences and the arts to bring people to places of awareness and reflection while visiting these habitats. While sections of their website are under development, it includes links to educational materials, a downloadable pdf of upcoming events, and youth program descriptions.
http://www.artistboat.org/

ARTNC (North Carolina Museum of Art)
The North Carolina Museum of Art provides online educational resources featuring nature and science activities that can be used in environmental education. The website includes K-12 lesson plans and activities searchable by region, subject, and grade. While none specifically address the marine environment, concepts include animal behavior and adaptation, weather and climate, ecosystems, and more relevant topics.
http://www.ncmoa.org/artnc/

Ask Dr. Global Change
From the U.S. Global Change Research Information Office, "Dr. Global Change" offers a searchable collection of answers to questions about global warming, ozone depletion, greenhouse gases, and other issues related to climate change. Students can also submit questions of their own and explore related links. This reference service also assists researchers, educators, resource managers, and others in finding information relevant to global environmental change.
http://gcrio.custhelp.com/cgi-bin/gcrio.cfg/php/enduser/home.php .

Assessing and Monitoring Floatable Debris
Assessing and Monitoring Floatable Debris is designed to provide guidance in assessing and monitoring floatable debris as directed by the BEACH Act of 2000. A copy of can be found on EPA's website.
http://www.epa.gov/owow/oceans/debris/floatingdebris/

Astrobiology in the Classroom
While Astrobiology in the Classroom leads students in the exploration of the limits of life on Earth to extend their beliefs about life to include its possibility on other worlds, these

units can easily be adapted for other studies. In this four-part activity, students first explore the environments of several mammals and birds to better understand how living things and their environments interact and depend on each other. In the second part, students match bacterial types with their more extreme environments.
http://btc.montana.edu/ceres/astrobiology/LabActivities/ExtremeEnvironments.doc

At Sea – A Cruise and Virtual Expedition to the Oculina Banks
Scientists and students explored deepwater coral reefs of the Oculina Banks, stretching 30 miles offshore from Ft. Pierce to Cape Canaveral, Florida. This remote MPA is designated a habitat of particular concern, and is a model for efforts underway to create new MPAs throughout southeast U.S. waters and the Gulf of Mexico. The team used a Remotely Operated Vehicle to study the current health of coral on the banks.
http://oceanica.cofc.edu/Oculina2003/home.htm

At Sea Newsletter
The University of Delaware College of Marine Studies and the Delaware Sea Grant College Program have launched a new e-newsletter, At Sea. It provides information on the marine research, education, and outreach activities at the University of Delaware. The website also has links to educational resources.
http://www.mis4.udel.edu/deptnews/deptnews.html?3501 .

At Work in the Ocean
This CD-ROM contains material mapped to science standards created during a series of live interactive Internet events and from education and outreach material developed during the 1999 and 2000 field seasons of the National Geographic Society's Sustainable Seas Expeditions. The three curriculum units on this CD feature clips, web chat questions and answers, labs, activities, and related resource materials. The units are monitoring a habitat, tools for exploring the ocean, and oceanography careers.
http://www.dlese.org/dds/catalog_NASA-ESERevProd374.htm

Atlantic and Gulf Rapid Reef Assessment Database
The Atlantic and Gulf Rapid Reef Assessment (AGRRA) database is now available in Microsoft Access©. The database hosts data for 737 sites that were surveyed during the 35 assessments conducted between 1997 and 2003 in the Caribbean, Gulf of Mexico, Florida and the Bahamas.
http://www.agrra.org/

Atlantic and Gulf Rapid Reef Assessment Program Report
The Atlantic and Gulf Rapid Reef Assessment (AGRRA) Program is a joint program of the University of Miami's Rosenstiel School of Marine and Atmospheric Science and The Ocean Research and Education Foundation. A comprehensive survey of coral reefs in 20 areas of the Western Atlantic can be used to compare the current health of one reef to that of another, and to evaluate future changes.
http://www.coral.noaa.gov/agra/index.html

Atlas of Extratropical Storm Tracks
From the NASA Goddard Institute for Space Studies comes information about midlatitude storm systems, including maps of storm frequency and intensity as well as plots of individual storm paths. Maps are available as monthly and seasonal means for the years 1961 through 1998 in either global or hemispheric projections.
http://www.giss.nasa.gov/data/stormtracks/

Atlas of the Biosphere
The Center for Sustainability and the Global Environment's *Atlas of the Biosphere* contains numerous maps documenting environmental phenomena across the globe, such as water resources, ecosystems, land use patterns, and human impact, at a variety of scales. The Atlas also contains the data sets that were used to generate these different thematic maps.
http://atlas.aos.wisc.edu/maps.php

Atlas of Our Changing Environment
One Planet, Many People: Atlas of Our Changing Environment, from the United Nations Environment Programme (UNEP), provides a comparative picture of our environment 30 years ago with the present day. The atlas contains photographs, satellite images, maps, and narratives that provide insights into the many ways people around the world have changed, and continue to change, the environment.
http://na.unep.net/OnePlanetManyPeople/index.php

Atlas of Science Literacy
The Atlas of Science Literacy is a two-volume collection of conceptual strand maps, and commentary on those maps, that show how students' understanding of the ideas and skills that lead to literacy in science, mathematics, and technology might develop from kindergarten through 12th grade. The atlas is part of a coordinated set of tools developed by the American Association for the Advancement of Science's Project 2061, to help educators understand and use specific goals for student learning.
http://www.project2061.org/publications/atlas/default.htm

Atlas of Wetlands in the St. Lawrence Valley
The *Conservation Atlas of Wetlands in the St. Lawrence Valley* from Environment Canada, an interactive GIS mapping site, pinpoints the location of some 20,000 wetlands. It provides definitions of the various wetlands and their roles, statistical and descriptive data for specific areas, and conservation options. Users can create their own maps from the original database.
http://lavoieverte.qc.ec.gc.ca/faune/AtlasTerresHumides/AtlasTerresHumides.html

Audio Guide to Urban Birds: By Students, For Students
Learn more about common urban birds with this project, written and narrated by high school students from Boston, Massachusetts. The Urban Bird Sounds Project features recordings and descriptions of birds, tips for remembering their songs and calls, and short quizzes to test your skills. The website allows you to download audio and teaching materials, take online quizzes, and more. There is also a step-by-step guide to producing a similar project.
http://www.urbanbirdsounds.org/Site/Welcome.html

Audubon Lesson Plans On-Line
Wild Republic's Learning Adventure features lesson plans about nature, animals and their habitat; this year's focus is on birds. Educators at Audubon provided the necessary content for the 2003-2004 lesson plans, including Puffins, upwelling, coastal food webs, and more. Each unit is designed to enrich students' knowledge and understanding of birds, their characteristics and habitats.
http://www.wildrepublic.com/lessonplans/2003/index.html .

Australian Biological Resources Study
The mission of the Australian Biological Resources Study is to document which plants and animals are found in Australia, map their locations, and provide information this information to the general public. The website includes material on research activities and administration, and offers a series of online databases, including fauna, flora, species bank, and more.
http://www.deh.gov.au/biodiversity/abrs/

Australian Marine Environment Protection Association Educational Materials
The Australian Marine Environment Protection Association offers a variety of educational web pages and materials. Topics include marine stormwater pollution, the effects of climate change on coral bleaching, marine pest and threat, and much more. Check out the flash versions and downloadable teacher resources.
http://www.ausmepa.org.au/home/

Australian Museum Online
The Australian Museum has a long tradition of educational outreach; this website affords users access to materials created for this website and materials culled from *in situ* exhibits. The *Features* section contains exhibits ranging from explorations of the Great Barrier Reef to everything you want to know about sea slugs. *Explore* allows users access to fact sheets and educational materials. *Research and Collections* offers users the ability to learn more about the museum's different departments, including marine ecology, biodiversity, fishes, and much more.
http://www.amonline.net.au/

AUVfest 2008 – Online
AUVfest 2008 took place May 12-23, 2008, hosted by and based at The Naval Undersea Warfare Center in Newport, Rhode Island, co-sponsored by the Office of Naval Research and NOAA's Office of Ocean Exploration and Research. This was a unique opportunity to demonstrate and test the applications of autonomous underwater vehicles for both mine countermeasures and archaeological research. Check the website for lesson plans (Grades 5-12), videos, background information, and more.
http://oceanexplorer.noaa.gov/explorations/08auvfest/welcome.html

Avian Index
Teachers, students, and others can find useful resources through the Avian Index, from Environment for the Americas. Curriculum, workshops, books, speaker's lists, and more, are available through this easy-to-search database.
http://www.birdiq.com/learn/Resource_Dir/index.php#

Avibase – The World Bird Database
Avibase is an extensive database information system about birds of the world, containing over 1.4 million records about 10,000 species and 22,000 subspecies of birds, including distribution information, taxonomy, conservation status, and more. This site is hosted by Bird Studies Canada, an affiliate of Birdlife International.
http://www.bsc-eoc.org/avibase/avibase.jsp .

Back the Brookie Learning Module
The *Back the Brookie* Learning Module was created by Tennessee educators and includes a DVD and teacher packet for use in grades 7-12. The module helps students learn about clean air and clean water, and their effects on brook trout habitat as well as

on humans. It includes information on brook trout biology, watersheds, acid rain, the water cycle, pH, and how students can help participate in conservation efforts. The teacher packet is complete with a pre/post test, activity suggestions, notes, and more.
http://www.eeintennessee.org/net/content/go.aspx?s=56894.0.0.37935

Back to the Sea of Cortez: Sailing with the Spirits of John Steinbeck and Ed Ricketts
A team of scientists will embarks on a 73-foot fishing boat to retrace the historic expedition that John Steinbeck and Edward F. "Doc" Ricketts made to explore the Sea of Cortez in 1940. Their journey was immortalized in a book they wrote together, *The Log from the Sea of Cortez*. A science writer will travel with the expedition and post a daily log of the journey online. Students and teachers in Baja California will join the expedition for different days of studying life in the tide pools.
www.seaofcortez.org and www.mardecortes.org .

Bad Science
This website identifies some scientific phenomena which are persistently presented incorrectly by teachers and writers, and provides scientifically correct explanations. The author hopes "to sensitize students, teachers, and writers to the horrors of such glib explanations or representations." The website includes Bad Meteorology, Bad Chemistry, and more.
http://www.ems.psu.edu/~fraser/BadScience.html

Barging Down the Mississippi
The Wyland Foundation is traveling down the Mississippi River on its third public education tour. *Barging Down the Mississippi* will take place throughout the month of October, 2006. From the headwaters of the Mississippi River watershed to the Gulf of Mexico, this program of classroom study and live events uses art as a gateway for the promotion of aquatic resource science and environmental education.
http://www.wylandoceanchallenge.org/index.cfm?do=tourabout

Barrier Island EcoTours – South Carolina
Explore South Carolina's Coastal Habitats while meeting national and state science standards. Field trips may be tailored to meet the interests and knowledge levels of students from kindergarten through college. Scientific process and inquiry skills are promoted and reinforced throughout the field trip as students learn about organisms, habitats, communities, and ecosystems, as well as the physical, chemical, geological and historical factors that influence them.
http://nature-tours.com

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

Bay Grasses in Classes
The Bay Grasses in Classes project is a joint partnership with the Maryland Department of Natural Resources and the Chesapeake Bay Foundation. Since its inception in 1998,

over 1,269 classes and 32,000 students have been involved with Bay Grasses in Classes. During this time students have planted over 2.5 acres of bottom surface in the Bay with the 425,000 plants grown in their classrooms. The website includes maps, photos, and classroom activities.
http://www.dnr.state.md.us/bay/sav/bgic/grass_class.html

Bay and River Sojourns
The Alliance for the Chesapeake Bay 2009 River Sojourns are multi-day expeditions down the Patuxent, James, and Susquehanna Rivers of the Chesapeake watershed. Various trips are offered; see the website for details in upcoming days.

- Patuxent River – June 18-22, 2009
- North Branch Susquehanna – June 18-23, 2009
- Lower Susquehanna – June 24-28, 2009
- James River – July 10-14, 2009

http://www.acb-online.org/2008Sojourns.cfm

BBC Science
BBC Radio 4 offers downloadable archives of broadcasts, including a wide variety of science shows. Programs include *Arctic Meltdown*, the *Goldilocks Planet* (a search for an earth-like planet), *Wild Blue Britain* and much more.
http://www.bbc.co.uk/radio4/science/

Be Water Wise!
National Environmental Education Week (EE Week), April 12-18, 2009, promotes the understanding and protection of the natural world by actively engaging students and educators of all subjects in a week of environmental learning and service before Earth Day. This year's EE Week theme is *Be Water Wise!* The website offers a water-themed Nature Journaling blog, lesson plans, and more.
http://www.eeweek.org/

Be Water Wise in School
Presented by The Groundwater Foundation, this newly developed guide brings education and action together. Written as a complete guide ready for implementation in the classroom, it contains background information for teachers, lesson plan instructions, pre- and post-tests, vocabulary lists, website links for further student research and service-learning project ideas. *Be Water Wise in School* is completely hands on and has been correlated to National Science Education Standards.
http://www.groundwater.org/shop/proddetail.asp?prod=1114d

Beach Chair Scientist
The purpose of this website and blog is to bring a simplified perspective to the questions one might have while relaxing on the beach.
http://www.beachchairscientist.com/

Beach Management
Beach Management, Principles & Practice, is a handbook which collects decades of research on integrated beach management. Part One covers beach management principles and theory and addresses practical management tools and guidelines, including how to determine the best management strategy for different beach types as

well as how to include user preferences and priorities in effective management plans. Part Two offers case studies of best and worst practices.
http://www.earthscan.co.uk/?tabid=56717

Beach Water Quality Monitoring System
This partnership effort between Earth 911, Oceana, and participating states and communities provides information regarding the most recent water quality conditions at local beaches. This application is currently being expanded in several communities and will soon be available nationwide. The site also provides links to learn more about beach water monitoring, waste disposal, stormwater, rip currents, and more.
http://southcarolina.earth911.org./usa/WaterQuality/index.asp

Beachcomber's Companion© Cards
Woods Hole Sea Grant has developed Beachcomber's Companion© cards, an alternative to the traditional field guide. The cards feature user-friendly information for 50 Atlantic coast marine invertebrates, perfect for beachcombers of all ages. The cards cover marine invertebrates common to the Atlantic Coast. They help beachcombers identify a specimen by size, shape, features, and coloration; where to look for it; and interesting facts about the creature.
www.beachcomberscompanion.net

Beaked Whale Identification Guide
From the Smithsonian's National Museum of Natural History's Marine Mammal Program comes the Beaked Whale Identification Guide, with detailed identification guides and separate pages for each beaked whale species. The website includes basic morphology, habits, and geographic distribution. In addition to references, there are links to a cetacean stranding database and more.
http://vertebrates.si.edu/mammals/beaked_whales/pages/main_menu.htm

Becoming Whales
From the Evolution and the Nature of Science Institutes, this website contains a 45-minute lesson about evolutionary links between whales and terrestrial mammals. Experience discoveries of whale evolution, or, as the website states, "The thrill of discovery…The loss of de feet." Downloadable materials for the lesson are provided as well. The site also includes a useful collection of extensions and resources.
http://www.indiana.edu/~ensiweb/lessons/whale.ev.html

Before and After Disasters: Federal Funding for Cultural Institutions
This guide is intended to help cultural institutions prepare for emergencies and disasters that may strike their regions. The latest version of the report, prepared by FEMA and the National Endowment for the Arts, provides summary descriptions and contact information for 15 federal grant and loan programs and additional sources of federal assistance for preparedness, mitigation, and response.
http://www.arts.gov/pub/DisasterRecovery.pdf

Bentham Open
Bentham Publishers is launching more than 200 peer-reviewed open access journals during this year, under the banner of Bentham OPEN. The journals will cover all major disciplines and are exclusively open access publications. Browse the subject list for Earth Science, Environmental Science, Geology, and more.
http://www.bentham.org/open/

Benthic Assemblages in the Twilight Zone Expedition
Join scientists aboard the NOAA Ship *Nancy Foster* for the Benthic Assemblages in the Twilight Zone Expedition as they embark on the expedition to characterize mesophotic benthic assemblages 50-200 meters deep in the Gulf of Mexico. They will be using the Phantom II remotely operated vehicle to collect samples on a few banks along the continental shelf break. The expedition was scheduled to start August 25 but was delayed.
http://flowergarden.noaa.gov/science/nancyfoster08.html

Benthic Habitats and the Effects of Fishing
This book from the American Fisheries Society Symposium 41 offers an understanding of the effects of fishing activities on benthic habitats necessary to address the issues of habitat alteration that challenge managers, practitioners, and ocean scientists. Free copies may be available while they last from the National Marine Fisheries Service, Office of Habitat Conservation; contact Dr. James Thomas at james.thomas@noaa.gov. They are available for purchase from the American Fisheries Society.
http://www.fisheries.org/html/publications/catbooks/x54041.shtml

"Best" Lists
Larry Ferlazzo, a high school English Language Learners teacher in California, has compiled lists of "best" websites, including websites to introduce environmental issues into the classroom, science websites for students and teachers, articles about education, and more.
http://larryferlazzo.edublogs.org/2008/07/19/the-best-sites-to-introduce-environmental-issues-into-the-classroom/

Best Practices in Boating, Fishing, and Aquatic Stewardship Education Tools
The Recreational Boating and Fishing Foundation developed Best Practices in Boating, Fishing, and Aquatic Stewardship Education, as well as accompanying tools to facilitate implementation. The document includes guidelines in program development, research, and evaluation and is supported by 11 papers on topics ranging from effective minority outreach to program evaluation.
http://www.rbff.org/educational/bestpractices.cfm .

Beyond the Moon
James Greig McCully, author of *Beyond the Moon: A Conversational, Common Sense Guide to Understanding the Tides*, offers a comprehensive explanation of the tides on earth that is both simple enough for students and solid enough for their professors. This book describes how the cyclical motion of the near solar system acts upon the earth's oceans, and how the hydraulics over the continental shelf and the geography of the coastline orchestrate this rhythm into the variety of tide patterns seen around the globe.
http://www.worldscibooks.com/environsci/6015.html

Beyond Penguins and Polar Bears
Beyond Penguins and Polar Bears, from Ohio State University and partners, is a new online magazine to help elementary school teachers develop their knowledge of the Arctic and Antarctica and organize science and literacy instruction around polar themes. Issues provide lessons and readings on data collection and representation, map skills, comparing the Arctic and Antarctica, paleontology and archaeology, and more. Book recommendations are included.

http://beyondpenguins.nsdl.org/

Blick on Flicks
We love watching movies, but we also love science. And sometimes the two don't mix. To help sort the good science from the bad in movies and other visual media, the NSTA website hosts audio and written reviews, providing expert commentary, pointing out where the physics is twisted, the chemistry fudged, or the biology stretched on behalf of the story, without losing sight of the fact that movies are meant to entertain. Blick helps make "bad science" into teachable science for middle level and high school students.
http://www.nsta.org/publications/blickonflicks.aspx

Big Blue Bus from Fisheries and Oceans Canada
The Big Blue Bus is Fisheries and Oceans Canada's Kids Corner with all kinds of activities, contests, and facts. This site has features such as the Water Wizards Club, the Creature Feature, Small Fry Club, a monthly contest, vocabulary, and much more. Among the many offerings, kids can learn about clean water sources, climate change, invasive species, and marine protected areas.
http://www.dfo-mpo.gc.ca/canwaters-eauxcan/bbb-lgb/index_e.asp .

Big Green Help
The Big Green Help from Nickelodeon is a global kid-led initiative that provides information and tools to help explain climate change to kids, and educates and empowers kids to make a difference by connecting them to earth-friendly activities in their everyday lives.
http://www.biggreenhelp.com/

Bilko
Supported by UNESCO, Bilko is a system for learning and teaching remote sensing image analysis skills. Current lessons teach the application of remote sensing to oceanography and coastal management, but Bilko routines may be applied to the analysis of any image in an appropriate format, and include a wide range of standard image processing functions. Bilko is available to registered users for free. The website offers PC-based software, tutorials, thematic modules, and more.
http://www.noc.soton.ac.uk/bilko/

Billfish Film Documentary
As part of programming around Earth Day in April, a new documentary, *Billfish: A Challenge for Survival,* is being aired and distributed by the Public Broadcasting Service. Copies of the show, on either VHS or DVD, will be available through each PBS station at the conclusion of the broadcast. In the U.S., viewers can call 1-800-533-8321 to purchase a copy. International distribution to foreign television markets will proceed after six months of U.S. telecasts.
http://www.billfishdocumentary.com

Bilingual Publication for Recreational Users of Coral Reefs
The Coral Reef: Precautions for Recreational Users in Puerto Rico and the U.S. Virgin Islands
El Arrecife de Coral: Precauciones para los Usuarios Recreativos en Puerto Rico y las Islas Vírgenes Estadounidenses
NOAA's National Marine Fisheries Service has produced this recreational users guide that explains what coral reefs are and measures that can be taken to protect them. The

guide is distributed through the NMFS Habitat Conservation Division Caribbean Field Office in Puerto Rico.
Contact Dr. Lisamarie Carrubba at 787-851-3700 or lisamarie.carubba@noaa.gov

BioBlitz - California
BioBlitz is a 24-hour event in which teams of scientists, volunteers, and community members join forces to find, identify, and learn about as many local plant and animal species as possible. A BioBlitz will take place in the Santa Monica Mountains National Recreational Area, May 31-32, 2008. Educators are encouraged to have their students participate. National Geographic and the U.S. National Park Service are planning a series of ten annual BioBlitzes around the country – check the website for future sites.
http://www.nationalgeographic.com/field/projects/bioblitz.html

BioBlitz - Indiana
BioBlitz is a 24-hour event in which teams of scientists, volunteers, and community members join forces to find, identify, and learn about as many local plant and animal species as possible. A BioBlitz will take place at Indiana Dunes National Lakeshore on May 15-16, 2009. Educators are encouraged to have their students participate, and educational materials are available for download from the website.
http://www.nationalgeographic.com/field/projects/bioblitz.html

BioBlitz – Rhode Island
Sponsored by the Lincoln Land Trust and the Blackstone River Watershed Council, BioBlitz 2006 will be held June 9-10, 2006 in Cumberland, Rhode Island. The BioBlitz will involve scientists and volunteer naturalists who will tally as many species as possible in a 24-hour period to increase awareness of the variety of life on even the most mundane-looking land.
http://www.uri.edu/ce/rinhs/bioblitz.htm

Biodidac
Biodidac is a bank of digital images, video, and animations that can be used and adapted for teaching biology. They have black and white illustrations that are free for educators; registration is required. Illustrations are included from Eubacteria, Protista, Fungi, Plantae, Animalia, Human Biology, and Histology. The website is available in French and English.
http://biodidac.bio.uottawa.ca/

Biodiversity and Agriculture
The Convention on Biological Diversity supports teachers in guiding students through an exploration of biodiversity issues with the launch of its first educational module for children and teachers on biodiversity and agriculture. The module consists of an online educational web portal for primary school students, and five accompanying lesson plans for educators. The module has been designed to engage students in a variety of exercises reflecting the principles of education for sustainable development.
https://www.cbd.int/ibd/2008/resources/teaching/

Biodiversity and Conservation
This book is by Peter J. Bryant of the School of Biological Sciences, University of California, Irvine. The book covers the origin, nature and value of biological diversity, threats to its continued existence, and approaches to preserving what is left. The book itself is on-line, and most of the links leave the book in order to take advantage of

documents produced and updated elsewhere. Ocean resources are covered, with chapters on whaling and fishing, endangered aquatic habitats, and islands.
http://darwin.bio.uci.edu/~sustain/bio65/Titlpage.htm

Biodiversity Counts
The *Biodiversity Counts* website offers a resource collection for middle school students, which takes students into the field and engages them in life science research - the inventory of plants and arthropods outside their own backdoors. Materials include lesson plans, profiles of scientists and museum staff, essays, and interactives that help students explore, analyze, and apply their field observations.
http://www.amnh.org/education/resources/biocounts/
http://www.amnh.org/nationalcenter/it_takes_all_kinds/

Biodiversity Education Network
The Biodiversity Education Network is a coalition of organizations dedicated to enhancing local, regional, and national efforts to educate people of all ages about biodiversity. It was created to promote networking among those organizations and individuals who are working in biodiversity education. The website provides a searchable database of biodiversity materials, a calendar of events, and an outline for developing an education program along with links to additional resources.
http://www.bioednet.org/

Biodiversity Facts And Figures
The Science and Development Network Biodiversity pages have an updated Biodiversity Facts and Figures Section. Here, you will find the latest data on the extent and the distribution of the world's biodiversity. It also includes the most recent estimates of extinction threats for different groups of species, as well as facts and figures on the value of biodiversity and efforts to conserve it.
http://www.scidev.net/ms/biofacts/

Biodiversity Heritage Library
Ten major natural history museum libraries, botanical libraries, and research institutions have joined to form the Biodiversity Heritage Library Project. The group is developing a strategy to digitize the published literature of biodiversity held in their respective collections and make it available through a global “biodiversity commons.” The participating libraries have over two million volumes of biodiversity literature collected over 200 years; over 1.124 million pages of key taxonomic literature are already on-line.
http://www.biodiversitylibrary.org/

Biodiversity Information Center
The Convention on Biological Diversity offers this website to facilitate access to and exchange of information on biodiversity related publications, bibliographies, and other resources. There are currently over 3000 monographs, reports, and serials available from the website. In addition, there are links to a variety of glossaries, case studies, and information on biosafety.
http://www.biodiv.org/doc/info-centre.shtml

Biodiversity and the Law: Intellectual Property, Biotechnology and Traditional Knowledge
This book offers twenty-eight chapters from dozens of international legal and scientific experts, complete with thorough references. It examines biodiversity, what are we

losing, why, and looks at what is to be done; addresses biotechnology; examines traditional knowledge; and looks at ethnobotany and bioprospecting and offers practical lessons from the diverse experiences of the contributors.
http://styluspub.com/books/BookDetail.aspx?productID=151824

Biodiversity Guide for Developing Countries
SciDev.Net is an organization devoted to providing news and promoting debate on science and technology issues relevant to the needs of developing countries. The online guide to the biodiversity challenges facing developing countries looks at the issues surrounding the need to protect global biodiversity in developing countries and the need to promote social and economic growth.
www.scidev.net/biodiversity

BioEd Online
The Baylor University College of Medicine offers the BioEd Online website for educators, students, and parents. The website includes streaming video presentations, a slide library, science news updates from the journal *Nature*, and virtual workshops. Check out the Ready-to-Go Lesson, The Water Cycle and Global Warming; presentations on the diversity of life; the K-5 Resource, Create a Lasting Water Cycle; and more.
http://www.bioedonline.org/

Bioimages
The Bioimages database has been developed by the Department of Biological Sciences at Vanderbilt University in cooperation with other participating institutions and agencies. The image databases cover a wide range of biogeographical regions and their associated flora.
http://www.cas.vanderbilt.edu/bioimages/

BioLEARN
BioLEARN (Linking Educators As a Resource Network) is an on-line collection of biology education materials created for and by Wisconsin high school and middle school biology teachers, coordinated by the Center for Biology Education at UW-Madison. The website includes teaching activities and resources aligned with Wisconsin Model Academic Standards and incorporating standards-based student performance measures. Sample activities are included in ecology, classification, botany, and more.
http://www.wisc.edu/cbe/biolearn/index.html

Biological ESTEEM
The Biological ESTEEM (Excel Simulations and Tools for Exploratory, Experiential Mathematics) Collection is a project of the BioQUEST Curriculum Consortium. The project offers sample applications of mathematics across the spectrum of activity-based general biology curricula. Particular attention is paid to equations that have significantly transformed contemporary biological practice and that are widely used in classroom, laboratory, and field activities through use of simulations, tools, and databases.
http://mathdl.maa.org/mathDL/3/?pa=content&sa=viewDocument&nodeId=623

Biology Corner
This virtual biology website is maintained and updated by science educator and high school teacher, Shannan Muskopf. The website offers labs, worksheets, and various classroom activities. Lesson plans include Biodiversity of Ponds, Comparing

Ecosystems, and more. There are online quizzes and links to other science education resource websites.
http://www.biologycorner.com/

BiologyBrowser
Biology Browser is a free website offering resources for the life sciences information community. You can browse by organism, subject, and geography. The Guide to the Animal Kingdom offers a simplified (and somewhat abbreviated) classification scheme for the whole animal kingdom. A searchable database offers links to information and resources for educators and students.
http://www.biologybrowser.org/

Biology Classroom Resources
The National Science Digital Library offers links to lessons and resources about biology from one convenient location. Learn about cells, slugs, whales and dolphins, turtles, biodiversity, and more. Find online references, images, and interactive games on evolution and the animal kingdom.
http://www.nsf.gov/news/classroom/biology.jsp

Bioluminescence 2009: Living Light on the Deep Sea Floor Expedition
NOAA's Ocean Exploration and Research Program has launched the *Bioluminescence 2009: Living Light on the Deep Sea Floor Expedition* webpage, following a July 20-30, 2009 expedition. The educators working with scientists from the expedition have developed an Ocean Explorer Expedition Education Module for the mission designed for teachers of students in grades 5-12. Be sure to check out ORCA's Eye-in-the-Sea and other visual media.
http://oceanexplorer.noaa.gov/explorations/09bioluminescence/welcome.html

BioMEDIA Associates
BioMEDIA ASSOCIATES produces multimedia programming for life science instruction for middle school, high school, and college students that captures the diversity of the living world. The website offers a large amount of overview information and vibrant illustrations, including a series of free posters.
http://www.ebiomedia.com/

Biomes of the World
This website from the Missouri Botanical Garden offers an introduction to the biomes of the world, including land, freshwater, and marine ecosystems. It offers insight into wetlands, shorelines, temperate and tropical oceans. One example is the barrier islands website with a simple diagram and basic introductory information. Good links to additional websites allow you to delve deeper into subjects of interest.
http://mbgnet.mobot.org/

BiosciEdNet
BiosciEdNet, the BEN Collaborative is composed of professional societies and coalitions for biology education. BEN Collaborative is the Biological Sciences Pathway for the National Science Digital Library (NSDL), a program of the National Science Foundation. The BEN portal provides searchable access to the digital library collections of its partners to provide users with accurate and reliable biology education resources. Subjects include marine biology, oceanography, and more.
http://www.biosciednet.org/portal/

Bioscience Lesson Directory
ActionBioscience.org provides original peer-edited lessons, written by science educators, to specifically accompany peer-reviewed articles on the ActionBioscience website. Each lesson contains questions related to the article, as well as a variety of student activities that promote active learning and inquiry into current issues in the biosciences. Topics include biodiversity, alien species, ecosystem value, water issues, and more.
http://www.actionbioscience.org/lessondirectory.html

Bioscience Literacy
This educational resource of the American Institute of Biological Sciences is designed to promote bioscience literacy. It highlights articles in English and Spanish by scientists, science educators and science students on issues related to seven bioscience challenges, including the environment, biodiversity, and bioscience education. In addition, the website provides lessons and resources to enhance bioscience teaching.
http://www.actionbioscience.org/

Birch Aquarium at Scripps – Teacher Open House
The Birch Aquarium at Scripps Institution of Oceanography is hosting a free Teacher Appreciation and Open House, October 14, 2008 in La Jolla, California.
http://aquarium.ucsd.edu/Education/For_Schools/For_Teachers/Professional_Development/Appreciation_and_Open_House_Events/

Bird Education Alliance for Conservation
The Bird Education Alliance for Conservation is a coalition of educators representing universities, bird observatories, local, state, and federal agencies, and environmental education and conservation groups. They are working to promote bird conservation education and to develop effective ways to implement bird conservation through education.
http://www.birdedalliance.org/

Birdcinema.com
Birdcinema.com is a website for people to post bird videos, dedicated to the sharing of birding videos, pictures, and resources. They seek both amateurs and professionals willing to share their bird videos and a little about the bird, the video, or whatever else they feel is relevant. The channels section allows for grouping of videos such as inland water birds, education, and more. Education offers background and other information.
http://www.birdcinema.com/

BirdLife International Database
You can find full accounts of all globally threatened birds on this web database. The accounts include a distribution map and an illustration of each bird. There is a concise account and extended report which gives all of the data held in the BirdLife World Bird Database.
http://www.birdlife.org/datazone/search/species_search.html .

BirdNote
BirdNote is a radio series about the intriguing ways of birds. Each show is scheduled to coincide with the time of year when you can see or hear the featured bird, to help you be able to exclaim, “Oh, that’s what that is!” BirdNote shows are two-minute vignettes that

incorporate sounds of birds with stories that illustrate their interesting or intriguing abilities. The radio shows are archived on the website for downloading. Links are also provided to BirdWeb for more information.
http://www.birdnote.org/kplu-archive.cfm

Birds Without Borders
Birds Without Borders - Aves Sin Fronteras® Landowner Recommendations manual, is the result of a research, education, and conservation project that has been studying birds in both Wisconsin and Belize since 1997. It provides information on habitats and plants found to be important to birds, along with many pictures of birds and plants so that the reader can easily identify them. The manual aims to conserve Belize's birds, both resident and Neotropical migratory birds that link Belize and Wisconsin.
http://www.zoosociety.org/Conservation/BWB-ASF/BelizeLandowner.php

Black Sea Shipwreck Expeditions
Dr. Ballard and his team return to the Black Sea from August 18-24, 2007, to document two Byzantine-era shipwrecks. Explore alongside the scientists with live updates from the expedition. Ask questions of the scientists before the broadcasts; they may be answered live at Thunder Bay National Marine Sanctuary's Great Lakes Maritime Heritage Center in Alpena, Michigan.
http://www.immersionpresents.org

Black Smokers WebQuest
This website from the University of Sydney's UniServe Science contains a webquest where student groups investigate one aspect of the science of black smokers. The webquest provides a separate list of links for each research role, including geochemist, biologist, oceanographer, and geologist. The website offers links to current information, animations, and more.
http://science.uniserve.edu.au/school/quests/hydroventwq.html

Blue Planet Run
The book *Blue Planet Run* provides readers with a look at the water problems facing humanity and some of the solutions being pursued by large and small companies, by entrepreneurs and activists, and by nongovernmental organizations and foundations. The book may be purchased or downloaded (beware: large file, 122 pages) from this website. All royalties from the book will be used to provide clean water to people around the world.
http://www.amazon.com/Blue-Planet-Run-Provide-Drinking/dp/160109017X/ref=cm_taf_title_featured?ie=UTF8&tag=tellafriend-20

Blue Whales
National Geographic offers an interactive article on blue whales, derived from a March, 2009 feature in the print edition of National Geographic magazine. The website offers an in-depth look into the recovery of the blue whale population off the coast of Costa Rica in recent years, a quiz on these creatures, and an online video.
http://ngm.nationalgeographic.com/2009/03/blue-whales/brower-text

Blue World
Segments to the Blue World underwater adventure television series can now be viewed online. Each 8-10 minute segment also has a downloadable teacher's guide.
http://www.blueworldtv.com/

Bonaire 2008: Exploring Coral Reef Sustainability with New Technologies Expedition
NOAA Ocean Exploration has launched the *Bonaire 2008: Exploring Coral Reef Sustainability with New Technologies Expedition* web page. The expedition, January 7-30, 2008, presented an opportunity to follow the journey to one of the few coral reefs that seems to have escaped the recent coral reef crisis. The website offers expedition and background information, lesson plans, career connections, multimedia resources, and more.
http://oceanexplorer.noaa.gov/explorations/08bonaire/welcome.html

Bonneville Power Administration's Resources for Teachers
The Bonneville Power Administration offers lessons on energy conservation, water and electricity, stream environments and stream health, aquatic macroinvertebrates, and the life cycle of salmon. High school students can conduct an energy audit of their school. The website must have undergone a recent update – note that some of the links aren't working, but a Google™ search finds the materials.
http://www.bpa.gov/Corporate/KR/ed/page6.htm

BookletChart
NOAA's Office of Coast Survey is testing a potential new product named the BookletChart™. This product will enable recreational boaters to print charts at home for no charge. It has been created to help recreational boaters better navigate and practice safer transportation on the water. The BookletChart™ is a form of nautical chart that has been reduced in scale and divided into a series of pages for convenience, but retains all the information of the full-scale nautical chart.
http://www.nauticalcharts.gov/bookletcharts/

Border-Wide EE Coalition
The Border-Wide EE Coalition Web site is a rich source of environmental education information for the US-Mexico border region. The portal provides a calendar and live search feature on every page, lists bilingual publications, hundreds of organizations, contacts, events, and more.
http://redeafronteriza.net/ (Spanish)
http://bordereeweb.net/ (English)

Boston Harbor Islands Curriculum
The Boston Harbor Islands, part of the National Park System, include 34 islands that lie within Boston Harbor. The national park area extends seaward 11 miles from downtown Boston. The landmass of the Boston Harbor Islands is between 1,600 - 3,100 acres, depending on the tides. In addition to maps and visitor information, the website includes downloadable curriculum for teachers and on-line quizzes for students.
http://www.bostonislands.org/learn/index.html .

Breaking Waves
The World Ocean Observatory offers Breaking Waves, an online ocean news service. Features and articles on ocean and water-related issues are chronologically compiled from daily searches of more than 150 news and information sources around the globe. Don't forget to check out the World Ocean Observatory's education offerings under Ocean Classroom and the information about maritime history and culture under Cultural Ocean.

http://www.thew2o.net/oceanForum.html

Bridge Data Analysis Teaching Activities
Data Analysis Teaching Activities (DATAs) utilize online scientific data from research projects all over the country, presented in an organized, controlled format, which allows for easier analysis and comprehension. By working with real data, students better understand basic scientific concepts and learn about the issues most prevalent in today's lakes, rivers, and oceans. Currently, the DATA series contains over 65 activities in biology, human activities, ecology, physics, chemistry, climate, and geology.
http://www.marine-ed.org/bridge/index_archives.html

The Bridge Facebook Page
The Bridge Facebook page identifies when and where the next Bridge presentations will be, introduces new sites as they are added to the Bridge, posts pictures from sessions and exhibits, and holds discussions concerning resources you all would like to see added to the Bridge and which Data Analysis Teaching Activities (DATAs) you all like the best and how you have modified them.
http://www.facebook.com/pages/Gloucester-Point-VA/The-Bridge/34259244804?ref=s
http://www.marine-ed.org/bridge

The Bridge to Highlight NOAA Education Resources
During 2006-2007, the Bridge will work to bring NOAA education products to the forefront by highlighting them as a special collection of reviewed websites for educators. This collection will be featured on a special gateway page which will include annotated links to NOAA education resources that have been evaluated through the Bridge's Teacher Reviewer of On-Line Learning (TROLL) program.
http://www.marine-ed.org/bridge

Bridge's NOAA Collection
The Bridge now offers a special NOAA collection with more than 145 resources which have been reviewed by our Teacher Reviewers of On-Line Learning (TROLLs). The collection includes a roll-over navigation menu and a search engine. The navigation menu is arranged by topic, including all science disciplines, habitat, virtual expeditions, and more. Each resource in the collection features the link to the resource, a brief description, the grade levels for which the resource is appropriate, and a related image.
http://www2.vims.edu/bridge/noaa/

Bridge Webinars
The Bridge has just completed its first two webinars. The first introduced participants to the Bridge website and all of its many features; the second webinar served as an introduction to ocean observing systems, their uses and components, as well as how educators can use the systems with their students. Both webinars are archived on the Bridge and COSEE-NOW websites, and forums have been set up on the COSEE-NOW site for those that want to discuss the webinars.
Bridge - http://coseenow.net/2009/05/bridge-online-webinars/
COSEE-NOW – http://coseenow.net/2009/05/bridge-online-webinars/

briefCAISE
The premier issue of briefCAISE, the newsletter of the Center for Advancement of Informal Science Education (CAISE), offers news, educational links, information about opportunities, and more. CAISE is devoted to advancing and improving the practice of

informal science education, including film and broadcast media, science centers and museums, zoos and aquariums, botanical gardens and nature centers, digital media and gaming, and youth, community, and after-school programs.
http://insci.org/resources/

Bringing Coastal Issues to the Public Eye
Here are a couple of initiatives that bring ocean and coastal issues closer to the broader public eye:

- Ohio License Plate: Ohio drivers can purchase a new *Fish Lake Erie* license plate. A portion of its sale will support research and education programs of Ohio Sea Grant and Stone Lab. http://bmv.ohio.gov/vehicle_registration/fish_lake_erie.htm
- National Marine Sanctuary Foundation is now included in the upcoming Combined Federal Campaign, number 9255.
- The July 9 issue of the Sunday comic, *Mark Trail*, focused on the threats to coral reef ecosystems. http://coralreefwatch.noaa.gov/marktrail/index.html

The Broad Benefits of Restoring the Great Lakes
The Great Lakes account for 90 percent of the United States' and 20 percent of the world's surface fresh water and represent an enormous economic and cultural resource to the region. The Brookings Institution offers this paper addressing the benefits of restoring the Great Lakes ecosystem from numerous threats, summarizing the major findings of a more in-depth study, *Developing America's North Coast: A Benefit Cost Analysis of a Great Lakes Infrastructure Program*.
http://www3.brookings.edu/metro/pubs/20070904_gleiecosystem.pdf

Broadcasts from Monterey Bay
Dr. Robert Ballard's Immersion Presents will broadcast live from the Monterey Bay National Marine Sanctuary in California from March 2-7, 2008. Live video feeds and educational materials will be available on the OceansLive.org web portal as the expedition team explores many of Monterey Bay's ecosystems, including estuaries, kelp forests, and deep submarine canyons.
http://www.oceanslive.org/portal/

Build a Squid
Nothing but fun! Build your own squid, set it free, and then check out what yours and all the other squids have been up to.
http://squid.tepapa.govt.nz/build-a-squid/interactive

Build Your Own ROV
NOAA scientist Doug Levin has developed a detailed manual to explain how to build a remotely operated vehicle (ROV) for underwater use. The manual lists parts and pieces, where to find them, and photographs of how to assemble them. The Monitor National Marine Sanctuary website publications page offers the downloadable manual, along with ROV lesson plans, origami and other activities, and much more.
http://monitor.noaa.gov/publications/

Building a Presence for Science
The mission of NSTA's *Building a Presence for Science* initiative is to end the isolation of classroom science teachers and to provide them with professional development opportunities and science teaching resources. The goals of the program are to identify a point of contact for standards-based science teaching and learning in every school;

establish an electronic network of science educators, and create an infrastructure of partners who are advocates for effective science teaching and learning.
http://www.cabap.org/
http://ecommerce.nsta.org/bap/mission.asp .

Burning Issues
Burning Issues in Wildhorse Basin is an online interactive wildland fire education curriculum for grades 5-9 addressing fire and ecosystems in the west. This website deals with issues not specific to fire management along the coasts, but includes much pertinent information and easy-loading graphics to teach about the critical role fire plays in ecosystem management. The website includes activities, an educator's guide, vocabulary, and more.
http://www.blm.gov/education/whb/#In

BVI Marine Awareness Guide
The British Virgin Islands Ministry of Natural Resources and Labour and the Conservation and Fisheries Department are encouraging BVI residents to learn more about International Year of the Reef. They have launched a Marine Awareness Guide which includes information about the island's marine habitats, species, laws, and more. An on-line version is available for downloading from the SailDiveBVI website.
http://www.saildivebvi.com/paper/marine-awareness-08.pdf

C-Side
C-Side - Coastal Studies, Information and Data for the Ecosystem is a comprehensive Gulf Coast Storm Information Center, providing direct linkage to local, state and federal information as it pertains to severe weather preparation and monitoring across the Gulf of Mexico coastal region. Find recommendations for home preparation and evacuation as well as time-sensitive data, weather products, and storm surge information. Post-storm assessments on the ecosystem, response and recovery products, environmental data and information, and remotely sensed data and imagery for affected areas will be available for response and recovery efforts.
http://ecowatch.ncddc.noaa.gov/c-side

Calendar of Events from NSTA
The National Science Teachers Association (NSTA) hosts a searchable online calendar of events in the world of science and science education: events, awards and competitions, conferences, exhibits and films, and more. You can search according to your area of interest, by grade level, and by region of the United States or Canada.
http://www.nsta.org/main/calendar/events.php

2006 Calendars
Check out the following calendars for your holiday gift-giving, and support the education and outreach of these organizations. Don't forget to check out other favorite organizations for their holiday offerings.

- Mangrove Action Project: http://www.earthisland.org/map/calendar_2006.html
- Seas the Day: http://seastheday.theoceanproject.org/seastheday/order/
- National Marine Sanctuary Foundation: http://www.ideas4adv.com/nmsf/catalog.cfm
- Watchable Wildlife: http://secure.watchablewildlife.org/tek9.asp?pg=products&specific=jnqmqsd0

California Center for Ocean Science Excellence in Education (CA COSEE)
CA COSEE is dedicated to creating environments in which collaborations among ocean scientists and K-12 educators flourish, with the goal of enhancing the general public's understanding and appreciation of the ocean. The Center marshals the resources of UC San Diego's Scripps Institution of Oceanography, Marine Advanced Technology Education (MATE) Center at the Monterey Penninsula College, the Marine Activities Resources and Education (MARE) Program at UC Berkeley's Lawrence Hall of Science, and California Sea Grant.
http://www.cacosee.net/index.html .

California Climate Change Extension
The California Climate Change Extension website offers scientific information about climate change in California. Interviews with leading climate change researchers are posted as 20-30 minute downloadable audio segments; they are also separated by topic into 2-3 minute short videos under Quick Topics. Transcripts of the interviews are also available for downloading. Additional links are provided to many resources for California climate change information.
http://groups.ucanr.org/CAClimateChangeExt/

California Climate Change Portal
This website combines information on the impacts of climate change on California and the state's policies relating to global warming. The website includes background information, news, and information about policies and initiatives.
http://www.climatechange.ca.gov/index.html

California Coastweeks
Join the California Coastal Commission's Public Education Program in celebrating Coastweeks from September 17 to October 9, 2005. The Commission will feature the events of participating organizations in a special section of their website, and conduct targeted outreach to publicize it. The deadline for submitting information is July 28, 2005. Follow the link on the left side to Coastweeks for more information.
http://www.coastal.ca.gov/publiced/pendx.html

California Coastweeks 2006
Join the California Coastal Commission's Public Education Program in celebrating Coastweeks from September 16-October 8, 2006. The Commission features the events of participating organizations in a special section of their website, and conducts targeted outreach to publicize it with an on-line calendar of events. The kickoff for the celebration is Coastal Cleanup Day.
http://www.coastal.ca.gov/publiced/coastweeks/coastweeks.html

California Current Marine Laws Database
All of the laws pertaining to the management of the California Current ecosystem have been compiled into a single, searchable, online database, publicly accessible through the Governance of the California Current Large Marine Ecosystem website. The data includes state laws from Washington, Oregon, and California, along with federal laws from the United States and Mexico.
http://www.cclme.org/index.php

California Derelict Fishing Gear Removal Project
California Derelict Fishing Gear Removal Project is a partnership between the California State Coastal Conservancy, the Northwest Straits Commission, and the National Fish and Wildlife Foundation. Anyone who loses fishing gear or observes derelict fishing gear underwater is encouraged to report their sighting. This project does not assess fault or blame, but rather encourages ocean users to report the presence of derelict gear, and hires experienced and certified SCUBA divers to remove gear from near-shore waters in a safe and environmentally sensitive manner.
http://www.derelictfishinggear.org

California Ocean Uses Atlas
The California Ocean Uses Atlas Project is a public-private partnership between NOAA's Marine Protected Areas Center and the Marine Conservation Biology Institute. The project maps significant human uses of the ocean in state and federal waters of the coast of California. Data, maps, and analytical products are available. In addition, the aim is to create Ocean Uses Atlases for all U.S. waters and they are actively seeking interested partners in coastal states and regions, and in other public and private entities.
http://mpa.gov/science_analysis/atlas.html

California Regional Environmental Education Community
Find out the latest environmental education news and resources in California with the CREEC (California Regional Environmental Education Community) Networks' electronic newsletters, tailored to the different regions of California. Topics include community events, educational resources, training and professional development opportunities, grants/contests and more. Also, visit the website to access the free resource directory to find out about the other resources provided by local, state and federal agencies.
http://www.creec.org

California Roots & Shoots Festival
The daylong event is designed to increase young people's awareness of their role as the Earth's caretakers. In addition to student exhibits, the program will include live animals, multicultural music and dance, international children's art, craft activities, storytelling and displays by local conservation groups such as TreePeople and Heal the Bay.
http://www.huntington.org/ .

CaMPAM-L List Online
The Caribbean Marine Protected Areas Managers (CaMPAM) forum listserv is for people interested in marine protected areas management, science, policy, and governance in the Caribbean region. The list is supported by the Gulf and Caribbean Fisheries Institute (GCFI), the United Nations Environment Programme Caribbean Environment Programme, and NOAA's National Ocean Service. The CaMPAM list was recently migrated to the GCFI website and management; login is unnecessary.
http://listserv.gcfi.org/SCRIPTS/WA-GCFI.EXE?A0=CAMPAM-L

Canadian Environmental Literacy Project
The Canadian Environmental Literacy Project (CELP) is developing a series of Canadian-focused educational modules, available on their website. The modules, oriented to introductory classes in environmental studies and environmental science in universities, colleges, and senior high-schools, include lectures, calculation exercises, and materials in support of discussion-type seminars. CELP currently has two modules with a marine focus which look at the ecological sustainability of aquaculture.

http://www.celp.ca .

The Canary Project
The Canary Project uses visual media, events, and artwork to visualize global warming in compelling ways, investigate questions about current ecological crises, and cultivate media attention.
http://www.canary-project.org/

Can't Take the Heat?
In the Data Analysis Teaching Activity from the Bridge and COSEE-NOW, *Can't Take the Heat?*, students get a hands-on introduction to heat capacity and its effects on our daily lives. Students use real-time and archived data from two NOAA ocean observing system buoys and two National Climate Data Center weather stations to investigate how water acts as a thermal buffer, and the ecological and practical applications this has.
http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0909.html

Carbonrally
Carbonrally is a web-based activism platform offering individuals and groups a simple and social way to have a measurable impact on climate change. The website is a place where many people can commit to small, positive actions over time. People can propose ideas for reducing carbon dioxide emissions, and the community chooses the best ideas to pursue as a team.
http://www.carbonrally.com/

Career Guides List
This one-page website from the Scripps Institution of Oceanography Library offers a list of resources for those looking for information about careers in oceanography, marine science, and marine biology. The directory is divided into three sections: general guides for oceanography and marine science; guides for marine biology, marine mammals, zoos and aquariums; and other guides covering all of science.
http://scilib.ucsd.edu/sio/guide/career.html

Caribbean Birds Festival
The Caribbean Endemic Bird Festival runs from April 22nd, Earth Day, until May 22nd, International Biodiversity Day, and is coordinated by the Society for the Conservation and Study of Caribbean Birds. Activities range from exhibitions of drawings and paintings by local schoolchildren, public lectures, photographic exhibitions, church services, bird-watching excursions, and theatrical productions in celebration of the region's rich bird life.
http://www.birdlife.org/news/news/2006/04/cebf.html

Caribbean Coral Data Center
The Caribbean Coastal Data Centre is the data archiving and management unit of the Centre for Marine Sciences at the University of the West Indies, Mona. The center provides a variety of monitoring data archives, including Reef Check, fish survey, and the annual Caribbean Coastal Marine Productivity (CARICOMP) monitoring data on coral reef communities, seagrass ecosystems and mangrove ecosystems.
http://www.ccdc.org.jm/mission%20statement.htm .

Caribbean Coral Reef Ecosystem Monitoring Program
This online database from the National Centers for Coastal Ocean Sciences' Biogeography Program presents ecosystem monitoring data gathered over the last five years from field studies in southwestern Puerto Rico and the U.S. Virgin Islands. You can query the database to provide specialized reports on species biomass, richness, abundance, and diversity. In addition to the data products, the website includes monitoring protocols, habitat maps, and links to some audiovisual materials.
http://biogeo.nos.noaa.gov/projects/reef_fish/

Caribbean Coral Videos in Spanish
The NOAA Central Library includes downloadable videos and documents. Three videos from the National Marine Fisheries Service, Office of Habitat Conservation, Caribbean Field Office, have been added to its catalog. They are: (1) Explorando los ecosistemas marinos de Puerto Rico; (2) Los corales y tu comunidad (Corals and your community); and (3) Programa de arrefices de coral (Coral Reef Initiative Program). Access the videos by visiting the library website, clicking on NOAA Library Catalog (NOAALINC).
http://www.lib.noaa.gov/

Caribbean Endemic Bird Festival
The 6th Caribbean Endemic Bird Festival was from April 22-May 22, 2007, with a theme of Global Warming. The purpose of the festival was to increase public awareness of the region's high endemism and rich bird life through activities such as talks, nature and birdwatching walks, the distribution of educational materials about birds, and more. The website offers a downloadable festival poster, suggestions for activities, and links to resources on global warming and impacts on birds and wildlife.
http://www.scscb.org/

Caribbean Natural Resources Institute
The Caribbean Natural Resources Institute seeks to create avenues for the equitable participation and effective collaboration of Caribbean communities and institutions in managing the use of natural resources. *Marine Protected Areas and Sustainable Coastal Livelihoods* is based on research and includes guidelines on developing effective management partnerships that involve local stakeholders; dealing with conflicts between the tourism and fisheries sectors, and sustaining fishery-based livelihoods.
http://www.canari.org/mpa.htm

Caribbean Protected Area Communication Programs
The Trust for Sustainable Livelihoods offers the downloadable publication, *Protected Areas Management in the Caribbean: Core Themes for Education, Awareness, and Communication Programmes*. Information for the preparation of the report was gathered from a literature review and a survey of protected areas professionals in the wider Caribbean region.
http://www.sustrust.org/documents.html

Caribbean Volcano Forecast
The *Holocene Volcanic Activity in the Caribbean Plate Margins: Forecast and Risk Assessment* is available from R.B. Trombley, principal research volcanologist for the Southwest Volcano Research Centre in Apache Junction, Arizona. The website will be will be updated as appropriate. Additional Caribbean plate information is also posted.
http://www.ig.utexas.edu/CaribPlate/forum/volcanoes/

The Case of the Wacky Water Cycle
The NASA SCIence Files™ series is a distance learning initiative to integrate and enhance the teaching of mathematics, science, and technology in grades 3-5. Each episode includes hands-on classroom and home activities, virtual field trips, subject matter experts, a video broadcast, educator's guide and web-based activities and materials. *The Case of the Wacky Water Cycle* began airing October, 2004.
http://scifiles.larc.nasa.gov/

Catalog of Conservation Social Science Tools
The Society for Conservation Biology's Social Science Working Group is a global community of conservation scientists and practitioners. The group is dedicated to strengthening conservation social science and its application to conservation practice. The website offers a catalog designed for conservation practitioners, planners, students and researchers interested in the social dimensions of conservation.
http://www.conbio.org/WorkingGroups/SSWG/catalog/index.cfm

Catch the Science Bug
This educational science website, sponsored by Best Buy Children's Foundation, offers a variety of science activities meant to increase science literacy, raise environmental awareness, and introduce different careers in the sciences. The site also provides the user with video clips from the PBS Rhode Island television series, interactive online activities, and educational activities.
http://www.sciencebug.org/

Catch the SEACOOS Wave!
Visit the Southeast Atlantic Coastal Ocean Observation System (SEACOOS) Virtual Waves Classroom and learn about the properties of waves through the glossary and other resources on this website. The website includes information about research, news, and a *Community and Classrooms* link to the waves classroom and teacher workshop information. The site provides access to real time wave data, lessons plans, and a four-color *Making Waves* poster.
www.seacoos.org

Catchment to Reef
The Catchment to Reef poster and booklet offer an understanding of connections between land, sea, and reef, highlighting ecological and physical connections and impacts affecting the coastal waters of the Great Barrier Reef. It outlines the key freshwater connections and processes and describes the impacts of human activities on the freshwater environments of catchments and the consequences for the marine environment. Materials can be downloaded from the website.
http://www.catchmenttoreef.com.au/Start.html

Cayman Islands Twilight Zone
From May 20-June 10, 2007, a scientific team will study coral reefs of the "twilight zone" in the Caribbean Sea between Jamaica and Cuba. This shore-based mission will employ new diving techniques that allow scientists to personally visit deep-water ecosystems without the need for expensive submersibles. NOAA's Ocean Explorer website coverage for this mission includes Biotechnology, Technical Diving, and Biodiversity content essays written especially for this mission.
http://oceanexplorer.noaa.gov/explorations/07twilightzone/welcome.html

Center for Improved Engineering and Science Education (CIESE)
CIESE at the Stevens Institute of Technology sponsors and designs interdisciplinary projects that teachers throughout the world can use to enhance their curriculum and learn problem-solving through use of the Internet. The *Virtual Gulf Stream Voyage* is a allows students to access real time ocean & atmospheric data and historical primary source materials to explore real world problems, and *The Stowaway Adventure--Adventures on the High Seas,* offers Language Arts and Social Studies activities.
http://www.k12science.org/currichome.html .

Center for International Earth Science Information Network
The Earth Institute at Columbia University hosts The Center for International Earth Science, specializing in on-line data and information management, spatial data integration and training, and interdisciplinary research related to human interactions in the environment. The collection includes climate change resources for the New York metropolitan area, GIS training opportunities, links to educational resources, and, especially, data resources.
http://www.ciesin.columbia.edu/

Center for Remote Sensing of Ice Sheets
The Center for Remote Sensing of Ice Sheets (CReSIS) focuses on topics related to global climate change and remote sensing. The center combines the expertise of researchers from universities and businesses in order to study and conduct research that will result in the technology necessary to achieve a better understanding of the mass balance of the polar ice sheets and its contribution to global climate change. The website includes an extensive section on K-12 education.
http://www.cresis.ku.edu/EducationIndex.htm

Census of Marine Life
The Census of Marine Life is a global network of researchers in more than 80 nations engaged in a 10-year scientific initiative to assess and explain the diversity, distribution, and abundance of life in the oceans. Each Census project has an education and outreach initiative. These include Arctic Ocean Biodiversity, Abyssal Marine Life, Natural Geography In Shore Areas, and more.
http://www.coml.org/

Census of Marine Life
The Census of Marine Life assesses the diversity, distribution, and abundance of ocean life and to explain how it changes over time. The different elements include: Initial Field Projects; History of Marine Animal Populations; Ocean Biogeographic Information System; Future of Marine Animal Populations; Scientific Committee on Oceanic Research Working Group; and Known, Unknown and Unknowable.
www.coml.org

Center for Alaskan Coastal Studies
The Center for Alaskan Coastal Studies (CACS), based in Homer, Alaska, provides spring school field trip programs during April and May to diverse rocky beaches with extreme tides that range from +24 feet to –5 feet, a salt marsh, bog, lake, coastal forest trail system and sites of archaeological and geological interest. CACS has coastal education curriculum units for grades 4-12, along with many other educational programs.
http://www.akcoastalstudies.org

Census of Marine Life
The Census of Marine Life international web portal is constantly growing. This global network of researchers in more than 70 nations is engaged in a ten-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans -- past, present, and future. Active websites include Arctic and Antarctic, abyssal, shore areas, deep-water chemosynthetic ecosystems, and more.
http://www.coml.org/descrip/nagisa.htm

Center for Environmental Education Online
The Center for Environmental Education Online is a dynamic resource for educators and students. The Curriculum Library includes reviewed curriculum and lesson plans on topics ranging from the water cycle to sustainable economics. Additional resources include Educating for Sustainability and an easy-to-read online newsletter which includes environmental education information, upcoming events, and grant opportunities.
http://www.ceeonline.org/default.cfm

Center for International Environmental Law
The Center for International Environmental Law works to solve environmental problems through a variety of advocacy and education programs. The sections, including Biodiversity, Human Rights & Environment, Climate Change, and more, contain links to calendar events, full-text publications, and information about their goals for each topical area. The website also includes information about available fellowships, internships, and potential job opportunities
http://www.ciel.org/

Center for North American Herpetology
The Center for North American Herpetology serves as a data bank for information about North American amphibians, turtles, reptiles, and crocodilians, and promotes their study and conservation. There are links to websites for information, on-line collections, publications, and much more.
http://www.cnah.org/

Center for Ocean Solutions
Stanford University, the Monterey Bay Aquarium, and the Monterey Bay Aquarium Research Institute have joined forces to create the Center for Ocean Solutions. In addition to developing new knowledge to solve ocean challenges, they will reach out to decision-makers to translate the results of marine science and policy research into action; offer educational and research opportunities; highlight these issues in the media; and sponsor outreach programs .
http://www.centerforoceansolutions.org/

Centre for Evidence-Based Conservation
The Centre for Evidence-Based Conservation conducts and widely disseminates systematic reviews of evidence pertaining to questions identified by decision-makers in the conservation and environmental sectors. The Centre aims to investigate the effectiveness of a diverse variety of actions, from practical site management to national and international policy. In addition, the center seeks to provide training in conducting, interpreting, and utilizing the results of systematic reviews.
http://www.cebc.bangor.ac.uk/index.php.en?menu=0&catid=0

CERMES Guides
The mission of the Centre for Resource Management and Environmental Studies at the University of the West Indies is to make a significant contribution to sustainable development. The *Information and Reports* section of the website includes a variety of manuals, including the downloadable *Reef Watchers Under H2O Guides, The Junior Coral Reef Ambassador Training Manual*, and more.
http://www.cavehill.uwi.edu/cermes/folkestone_info.html

Cetacean Curriculum
The American Cetacean Society offers a downloadable teacher's guide to introducing and using whales, dolphins, and porpoises in the classroom. The curriculum contains basic background information on cetaceans and offers ideas for activities to engage students. The website also includes individual cetacean fact sheets.
http://www.acsonline.org/education/curriculum/index.html

Changing Habitats...Vanishing Species
Harvard@Home produces web-based video programs with in-depth exploration of topics of general interest to the Harvard community and the broader public. *Changing Habitats…Vanishing Species* presents video clips and slides from a symposium presented in November 2004 about how environments are changing and why species are being lost. Presentations discuss the root causes, including climate and land use change, and their impact on species' habitats.
http://athome.harvard.edu/dh/chvs.html

Channel Islands Argonauts Program
For the third year in a row, several local organizations are teaming up to provide an opportunity for 20 outstanding middle school students to become members of an elite group—the Channel Islands Argonauts. This group will have a chance to explore the Channel Islands region with researchers and staff from the Channel Islands National Marine Sanctuary and National Park, as well as compare and contrast the islands with the wetlands of the bayou as part of the JASON Expedition: Disappearing Wetlands.
http://channelislands.noaa.gov/edu/shoretosea.html .

Chesapeake Bay Interpretive Buoy System
The NOAA Chesapeake Bay Interpretive Buoy System is a sensor-to-user information delivery system focused on the Chesapeake Bay and its surrounding estuarine environment. "Talking buoys" will serve as interpretive guide posts, linking trail visitors—whether they be right next to the buoy in a kayak or at home on their computer—with information about the buoy location and nearby history and culture via cell phone or Internet-accessible devices.
http://www.buoybay.org/site/public/

Children and Nature
This special edition of Fish & Wildlife News provides a glimpse of what U.S. Fish & Wildlife Service (FWS) employees are doing to connect children with nature. From the Don Edwards San Francisco Bay National Wildlife Refuge, where youngsters sample brine shrimp in the salt ponds or investigate bird and plant life with their parents, to the Chesapeake Bay Field Office, where students create schoolyard habitats outside their classroom door, the FWS is helping people of every age to get outdoors.
http://www.fws.gov/news/pdf/News_SuFall07.pdf

Children in Nature Programs
The National Park Service hosts hundreds of replicable programs for kids in parks. You can search their data base by a variety of criteria, or leave the fields blank to list all programs.
https://pwrcms.nps.gov/customcf/apps/cnps/Bestpractices/index.cfm

Children's Environmental Literature Bibliography
The Children's Environmental Literature Bibliography is available online courtesy of Wisconsin's Project WILD, Project Learning Tree, and Project WET programs. The bibliography contains more than 400 books, over 300 of them new additions. For easy teacher reference, the books are grouped according to topic area (including Aquatic Ecosystems and the Water Cycle and Fish) and age group.
http://www.dnr.state.wi.us/org/caer/ce/eek/teacher/childlit.htm

Christmas Bird Count
The Audubon Christmas Bird Count, December 14, 2005 – January 5, 2006, is part of the oldest and largest citizen science event in the world. For over a hundred years, people have gathered together during the winter holiday season to count birds. Your local count will occur on one day between those inclusive dates. Check out the lesson plans at the North American Bird Project.
http://www.audubon.org/bird/cbc/getinvolved.html
http://birdcentral.net/lessonplans.htm
http://www.audubon.org/bird/cbc/

CIESE Online Classroom Projects
The Center for Improved Engineering and Science Education (CIESE) sponsors and designs interdisciplinary projects that teachers can use to enhance their curriculum through use of the Internet. The focus is on projects that utilize real-time data from the Internet, and collaborative projects that reach peers and experts around the world via the Internet. Each project has a brief description and links to the National Science Standards it supports.
http://www.k12science.org/currichome.html

Cities and Oceans
The World Ocean Observatory offers Cities and Oceans, the latest website in their series of events exploring ocean issues. This site offers multimedia presentations, interviews, and a wide array of information and images.
http://www.thew2o.net/events/cities_oceans/index.html

CITIZENShift
CITIZENShift is a National Film Board of Canada website dedicated to citizen engagement and social change. The website integrates written, audio, and visual media and provides a space where filmmakers and citizens can share knowledge, be entertained, and debate social issues. The focus on biodiversity under the Reel Community link includes *Nomads of the Ocean*, *Reefs: Rainforest of the Ocean*, and *Lords of the Arctic*. The website also includes background information, and photos.
http://citizen.nfb.ca/onf/info?aid=3423

City of Portland Wetlands Education
The City of Portland (Oregon) Environmental Services, in partnership with City of Portland Parks & Recreation, has been working for two years with all the 6th graders in

the David Douglas School District to carry out wetlands investigations and restoration planting. They have two mandatory field trips, and provide several optional classroom programs. All of the programs are free for the students. Pre-field trip classroom options include a *Riparian Restoration* program and *Water Quality Testing in the Classroom*. http://www.cleanrivers-pdx.org/clean_rivers/index.htm .

Civic Education Project
This Earth Day Network program helps teachers to teach students about a selected local environmental problem and take action to improve that issue. The program currently seeks applicants for the spring semester in Los Angeles, New Orleans, Cleveland, Chicago, Cincinnati, Albuquerque, and Washington, DC.
http://www.earthday.net/involved/civic_education/CEP_intro.aspx

CLASS Data Library from NOAA
The Comprehensive Large Array-data Stewardship System (CLASS) is an electronic library of NOAA environmental data. This website provides capabilities for finding and obtaining those data. CLASS is NOAA's premiere on-line facility for the distribution of NOAA and US Department of Defense Polar-orbiting Operational Environmental Satellite (POES) data, NOAA's Geostationary Operational Environmental Satellite (GOES) and derived data. CLASS provides data free of charge.
http://www.class.noaa.gov/nsaa/products/welcome

Classroom Companion
The National Geographic has developed a new online resource called a Classroom Companion series, which includes K-12 lessons, maps, photographs and multimedia resources. While the materials can be listed by category or alphabetically, the keyword search yields the most useful method of finding resources.
http://www.ngsednet.org/community/resources_category.cfm?community_id=168

Classroom Data Activities
The BRIDGE collaborated with the Monterey Bay Aquarium Research Institute to develop two classroom data activities. ***Pumping Iron*** focuses on ocean fertilization, and ***Hold the Anchovies*** focuses on climate phenomena and fish populations. These activities and several others are available as part of the EARTH (Education and Research Testing Hypotheses) program. EARTH allows integration of real-time data with existing educational standards and tests curriculum in an interactive and engaging way.
http://www.marine-ed.org/bridge/index_archive0504.html
http://www.marine-ed.org/bridge/indexarchive0903.html
http://www.mbari.org/education/EARTH/default.htm

Classroom Earth
The National Environmental Education & Training Foundation (NEETF) launched Classroom Earth, a free website to help educators find the best and most usable environmental education programs available. It is a collection of environmental education programs and resources for K-12 teachers, parents, and students. This new site will help educators, after-school providers, and home-schooling parents to get started or improve their skills in environmental education.
www.ClassroomEarth.org .

Classroom Exploration of the Oceans: An Online Virtual Teacher Conference
The National Geographic Society and NOAA's Office of Ocean Exploration (OE) hosted a 9-part virtual teacher workshop series using ocean exploration to enhance learning in the classroom. Teachers were provided with lesson plans and information, with workshop information linking to Geographic's Ocean Atlas Teacher's Guide, OE's lesson plans, and the Oceans Scope and Sequence Matrix for K-12 Teachers.
http://coexploration.org/ceo

Classroom Exploration of Oceans 2005
Three online virtual teacher workshops focus on efforts currently underway to protect and conserve special places in the ocean and explore still unknown areas of the deep ocean. They will focus on new discoveries being made in ocean exploration, delve into historic and physical events newly found or still hidden in the ocean depths, and discuss what we still need to know for effective marine conservation and management.

- Oceans for Life: January 24 - February 6, 2005
- Mysteries and Sirens of the Deep: April 4 - 17, 2005
- Extreme Environments: October 10 - 23, 2005

http://www.coexploration.org/ceo/

Classroom Exploration of Oceans – Maritime Heritage Online
This online virtual teacher workshop focuses on maritime heritage: Mysteries and Sirens of the Deep: April 4-17, 2005. The upcoming keynotes are Maritime Heritage: Resources Revealed in the Hawaiian Islands; The Steamship Portland - Discovering and Managing our Maritime Heritage and the Technologies That Take Us Beneath the Blue Horizon; and Exploring Shipwrecks Together: How one program helps scientists and the public connect with the past.
http://www.coexploration.org/ceo/

Classroom and Field Activity Resources
This website from the University of Florida Sea Grant hosts activities which have been created by or suggested by Florida marine educators. Topics include aquarium maintenance and activities, field sampling, and much more. While you're on the website, check out all the links to other materials and information, including marine debris, sea oats, educator slideshows and activities, and much more.
http://stjohns.ifas.ufl.edu/Sea/activities.html

Clean Air Lesson Plans
The Clean Air Campaign and the Georgia Environmental Protection Division have developed five new air quality curriculum units for grades 4 to 8. Each grade unit includes two to three lesson plans, along with a Teacher Resource Manual and support materials, which educate students about air chemistry, health and human behaviors, as well as the air pollution challenges. The lessons cross several subjects including science, social studies, geography and English.
http://www.cleanaircampaign.com/index.php/cac/for_schools/clean_air_lesson_plans

Clean Beaches Blue Wave Campaign
The Clean Beaches Council is a non-profit organization devoted to sustaining America's beaches. Their flagship program is the *Blue Wave Campaign*—America's first environmental certification program for beaches. The goal of Blue Wave is to promote

public awareness and voluntary participation in beach sustainability, including water quality, habitat conservation, public information and education.
http://www.cleanbeaches.org/bluewave/bluewave.cfm

Clean Sweep U.S.A. - Solid Waste Education
Keep America Beautiful has a new education website geared for middle grades teachers and students -- Clean Sweep U.S.A. There is a wealth of information, activities, lessons, and links about solid waste.
www.kab.org/kids .

Clean Water for the 21st Century
The Wyland Ocean Challenge offers the Clean Water for the 21st Century classroom program, exploring the world of aquatic ecosystems above and below using tools and techniques from science and art. The downloadable materials include a teacher's guide containing detailed art and science activities, background information, tips on using art in your classroom, and standards alignment charts. Eco-Guides offer a full color student supplement with articles, fun facts, people profiles, images, and a set of organism cards.
http://www.wylandoceanchallenge.org/index.cfm?do=part2

Cleaning Water
Cleaning Water, from NASA, is a lesson in which students (Grades 3-5) create and test a system to filter "gray" water. In this lesson, students will design and build their own water filtering system and collect data to compare water before and after filtering. The activity is downloadable from the website, and is available in English and Spanish.
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Cleaning_Water_Activity.html

Clearing Magazine
The quarterly resource magazine, C*learing: Environmental Education Resources for Teachers,* provides the latest news, information, perspectives, teaching ideas, and resources available to teachers of all grade levels and all subject areas with environmental and natural resources education. Published since 1978, Clearing has published over 100 issues.
http://www.clearingmagazine.org/

Climate Action: Energy For A Changing World
The European Union member nations agreed to work on a package of proposals that will help fight climate change and promote renewable energy. This website serves as the clearinghouse for the information related to this ambitious project. Information is available in all of the European Union languages. There are country fact sheets, working documents, reports on emissions trading schemes, and more.
http://ec.europa.eu/energy/climate_actions/

Climate Change
The Climate Change website from the World Bank offers a view of climate change from the perspective of people in the developing world. The website reviews current projects, data sets, research papers, and more.
http://beta.worldbank.org/climatechange/

Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources
The U.S. Government Accountability Office (GAO) obtained experts' views on the effects of climate change on federal resources and the challenges managers face in addressing climate change effects on these resources. GAO recommends developing guidelines incorporating agencies' best practices, advising on how to address climate change effects on the resources they manage and gather the information needed to do so. Links are provided to the report, report summary, and the full downloadable report.
http://www.gao.gov/docsearch/abstract.php?rptno=GAO-07-863

Climate Change Backpack
The New England Science Center Collaborative has developed the Climate Change Backpack®, a teaching tool containing graphs, experiments, a climate change play, an imitation ice core, lesson plans, and more. The lessons are designed to expand or contract according to the audience and available teaching time. All of the activities are downloadable.
http://www.sciencecentercollaborative.org/backpack.php

Climate Change in the Classroom
The Educational Global Climate Model incorporates a 3-D climate model developed at NASA's Goddard Institute for Space Studies. It is free and available for high school and university desktop computers. The climate model allows teachers and students to conduct experiments identical to those scientists run on supercomputers to simulate past and future climate changes.
http://www.nasa.gov/vision/earth/everydaylife/climate_class.html

Climate Change: Connections and Solutions
Facing the Future offers the 2-week curriculum unit, *Climate Change: Connections and* Solutions, free through funding from the Hewlett-Packard Company. The unit is available for grades 6-8 and 9-12. Students are encouraged to think critically about climate change and to collaborate to devise solutions. Students learn about climate change within a systems framework, examining interconnections among environmental, social, and economic issues. Check the website for additional free or for fee curriculum.
http://www.facingthefuture.org/Curriculum/BuyFacingtheFutureCurriculum/tabid/59/Default.aspx#Curriculum%20Unit

Climate Change: Fitting the Pieces Together
The Meteorology Education and Training website provides a wide range of resources pertaining to climate change. The Climate Change module discusses climate change, particularly as it is currently being affected by increasing concentrations of greenhouse gases emitted by human activities. It also covers signs of climate change, how scientists study climate, the current thinking on future changes, and what can be done to minimize the effects. Free registration is required.
http://www.meted.ucar.edu/broadcastmet/climate/

Climate Change Forum
The Frontlines Forum seeks community-based experiences with climate change: impacts, opportunities and adaptation strategies. It provides a platform for sharing observations, concerns, and innovations. They invite contributions from indigenous or rural communities in small islands, high altitudes, the Arctic, desert margins, and other vulnerable environments.

http://www.climatefrontlines.org/

Climate Change From Pole to Pole: Biology Investigations
NSTA offers the text, *Climate Change From Pole to Pole: Biology Investigations*, with case studies and background information on how to teach the science of climate change. The six researched and field-tested activities building on four content chapters, provide students the opportunity to solve real-life scientific problems using guiding questions, graphs and data tables, short reading assignments, and independent research.
http://www.nsta.org/store/product_detail.aspx?id=10.2505/9781933531236&lid=exp

Climate Change Games
Red Redemption Ltd., based in Oxford, England, is an environmental games company producing scientific, educational, and environmental games. The website hosts online games, including Climate Challenge (for older students) and Operation Climate Control (for younger students).
http://red-redemption.com/news/

Climate Change and Human Health
NEEF has created a climate change webpage for health professionals which offers an overview of the potential health effects as well as a list of additional resources. In addition, two new online courses developed by NEEF and the Cooperative Program on Operational Meteorology Education and Training are included among the resources. Both courses are offered at no cost; free registration is required.
http://www.neefusa.org/health/cc_initiative.htm

Climate Change Kids Site
The EPA's Climate Change Kids Site looks at climate change -- what it is, why it matters, and what kids can do about it. The website offers games, animations, quizzes, and more.
http://epa.gov/climatechange/kids/

Climate Change Listservs
The EPA offers several listservs for various audiences that provide information on new climate changes resources and current news and strategies.
http://www.epa.gov/climatechange/news_listservs.html

Climate-Change Town Hall
Communicating and Learning About Global Climate Change, an event for teachers, students, and others, was organized by AAAS in collaboration with the California Science Teachers Association, the National Science Teachers Association, and the United Educators of San Francisco (representing the National Education Association and the American Federation of Teachers). Videos of the program, an Abbreviated Guide for Teaching Climate Change, and additional information, are available online.
http://www.aaas.org/news/press_room/climate_change/mtg_200702/

Climate Change UNEP Portal
Established as part of the United Nations Environment Network, this website serves as a portal for resources that deal specifically with climate change. Navigation is aided by the left-hand side of the homepage, with a Key Issues area offering a set of resources that provide introductions to the topic, along with sections on the overall environmental,

social, and economic implications of climate change. Featured Resources leads to many good resources, including common questions, a student guide, and more.
http://climatechange.unep.net/index.cfm

Climate Change: A Wisconsin Activity Guide
This climate change guide from Wisconsin's Department of Natural Resources is a resource for Wisconsin's teachers (grades 7-12) to help students develop the knowledge and skills needed to become informed and active participants in society's climate change discussions. The guide touches on both the scientific aspects of climate change and social issues. It contains activities applicable to a variety of subjects including sciences, math, language arts, social studies, and art.
http://www.dnr.wi.gov/eek/teacher/climatechangeguide.htm

Climate Change, Wildlife, and Wildlands Toolkit: A Toolkit for Teachers and Interpreters
The U.S. Environmental Protection Agency, in partnership with the National Park Service and with input from the U.S. Fish and Wildlife Service, developed a kit for use when talking with the public about how climate change is affecting our nation's wildlife and public lands. The website includes downloadable introductory materials, case studies, flash cards, and more. Check out the Climate Change Home Page with links to a myriad of useful resources.
http://www.epa.gov/climatechange/wycd/ORWKit.html

Climate Change and World Heritage
The UNESCO World Heritage Centre offers the publication entitled "Case Studies on Climate Change and World Heritage". The report features 26 case studies, including the Tower of London, Kilimanjaro National Park, and the Great Barrier Reef, that are representative of the dangers faced by the 830 sites inscribed on the World Heritage List. Chapters include Glaciers, Marine Biodiversity, Archaeological Sites, and more.
http://whc.unesco.org/documents/publi_climatechange.pdf

Climate, Community and Biodiversity Project Design Standards
The downloadable draft of the Climate, Community & Biodiversity (CCB) Project Design Standards is designed to identify proposed projects likely to deliver measurable climate, biodiversity and community benefits. The standards are primarily designed for land-use carbon markets but can also apply for sustainable development and biodiversity projects more broadly.
www.climate-standards.org
http://www.climate-standards.org/images/pdf/ccb_project_design_standards_v1.0.pdf

Climate Connections
National Public Radio (NPR) and National Geographic host the Climate Connections website with news items, interesting facts, practical ideas, and a daily podcast. An interactive map allows visitors to follow NPR reporting on areas of the world impacted by global warming, and the Wild Chronicles offers videos on a variety of wildlife and global warming issues.
http://www.npr.org/templates/story/story.php?storyId=9657621

Climate Discovery Teacher's Guide
This website from the National Center for Atmospheric Research includes three units with downloadable lessons for grades 5-9 to facilitate student learning about our planet's

climate system. The units review how the sun's magnetism interacts with the earth's magnetic field, how scientists study ancient climates, and understanding how the earth system works. An unit on Investigating Climate Future is expected to be available in 2007.
http://eo.ucar.edu/educators/ClimateDiscovery/

Climate Literacy: Essential Principles and Fundamental Concepts
The Climate Literacy Network offers a climate science literacy guide to serve as a framework for understanding and communicating about climate science. Points in the guide can serve as discussion starters or launching points for scientific inquiry. The guide can also serve educators who teach climate science principles as a way to meet learning standards in their science curriculum. The website offers links to additional student and teacher resources.
http://climateliteracynow.org/

Climate Literacy Guide
The United States Global Change Research Program offers the downloadable report, *The Climate Literacy Guide: The Essential Principles of Climate Science*, an interagency guide providing a framework and essential principles for formal and informal education about climate change. The guide presents information about climate, impacts of climate change, and approaches for adapting and mitigating change.
http://globalchange.gov/resources/educators/climate-literacy

Climate of the Past
Climate of the Past is an interactive open access journal published under the auspices of the European Geosciences Union, dedicated to the publication and discussion of research articles, short communications, and review papers on the climate history of the Earth. In addition to general issues, they offer the possibility of publication of special issues.
http://www.clim-past.net/volumes_and_issues.html
http://www.climate-of-the-past.net/

Climate Post
The Nicholas Institute for Environmental Policy Solutions at Duke University introduces The Climate Post, a weekly narrative overview which aims to provide commentary on the news, trends, and events that shape climate policy.
http://theclimatepost.wordpress.com/

Climate Program
NOAA's Climate Program Office education website offers links to a variety of climate change materials, including presentations; the guide from AAAS, *Communicating and Learning About Global Climate Change: An Abbreviated Guide for Teaching Climate Change*; and more.
http://climate.noaa.gov/index.jsp?pg=/education/edu_index.jsp&edu=literacy

Climate Time Machine
This NASA website offers a series of visualizations which show how some of the key indicators of climate change, such as temperature, sea ice extent, and carbon dioxide concentrations, have changed in Earth's recent history.
http://climate.jpl.nasa.gov/ClimateTimeMachine/climateTimeMachine.cfm

Climate Witness
Climate Witness is an initiative by the World Wildlife Federation to document the direct experiences of people who are witnessing the impacts of climate change on their local environment. WWF is working with climate scientists through their Climate Witness Science Advisory Panel to establish if the impacts reported are consistent with known trends, and if these stories can be placed in the context of current scientific knowledge of human-induced climate change events in a particular region. Subject to time availability these scientists will give their expert opinion on submitted stories.
http://www.panda.org/about_wwf/what_we_do/climate_change/problems/people_at_risk/personal_stories/index.cfm

ClimateBiz
As a partnership between two nonprofit organizations, Business for Social Responsibility and the Green Business Network, the ClimateBiz website offers a place to learn from each other. *ClimateBiz 101* offers an overview of the interactions between the world of business and climate change, and also provides insights into how to best utilize the website. Other sections include background articles, tools and resources, Ask the Climate Expert, and more.
http://www.climatebiz.com/

ClimateClassroom
The National Wildlife Federation's Climate Classroom is designed to help parents and teachers talk to students of differing ages about global warming. Its features include information for parents, proposed educator guidelines, age-adapted sources of useful curricula, a downloadable slide presentation with presenter's guide, and more.
http://www.ClimateClassroom.org

Clue in to Climate Change
Climate change can be examined through a number of lenses, including both rigorous scientific inquiry and through the perspective of persons living in various areas which happen to be undergoing significant climatic transitions. This website examines climate change in the Arctic. The site includes interactive activities, first-hand narratives, and section designed to increase awareness of the rapidly changing situation in the region. Other features of the site include a glossary, three lesson plans, and an online quiz.
http://www.nature.ca/sila/

Coast Day - Delaware
The University of Delaware's Coast Day, October 7, 2007 in Lewes, Delaware, introduces thousands of people each year to the wonders of the sea and the importance of Delaware's marine and coastal resources. Visitors enjoy hands-on exhibits, lectures on popular science topics, and more. Kids have special opportunities to speak with marine scientists and learn firsthand about their discoveries. They can also explore the many fascinating careers available in environmental science fields.
http://www.ocean.udel.edu/coastday/

Coastal Climate Adaptation
The NOAA Coastal Services Center hosts the Coastal Climate Adaptation website, which focuses on adaptation-related resources such as local and state plans, new policies, case studies, risk and vulnerability assessments, and decision-support tools. There is a forum where users can suggest new resources, engage in dialogue on the

issues, and submit comments and questions. Check out the list of tools for adaptation already on the website, along with the initial outreach and education offerings.
http://community.csc.noaa.gov/climateadaptation/

Coastal and Estuarine Science News
The Estuarine Research Federation offers Coastal and Estuarine Science News, funded by the Ocean and Coastal Protection Division of the EPA, to strengthen the link between science and management in coastal systems. Back issues are posted at http://www.erf.org/cesn/ . You can subscribe to the mailing at http://www.erf.org/user-cgi/cesnlist.pl .

Coastal Fisheries Management and Development Project
The National Fisheries Authority of Papua New Guinea offers downloadable files from the Coastal Fisheries Management and Development Project, an initiative to promote sustainable, community-based management of coastal waters and education of communities that are often relatively isolated and home to people with varying degrees of literacy. Materials include posters, comics, and radio plays free of scientific and technical jargon.
http://www.fisheries.gov.pg/publications_coastal_fisheries_management_dev_project.htm

Coastal Heritage
Coastal Heritage is a quarterly publication of the South Carolina Sea Grant Consortium. Each issue is accompanied by Curriculum Connection guides, which offer focus questions, links to in-depth information, educational activities and resources, and more. The latest issue is *Cold-Water Corals: Ancient life in the deep, dark sea*. You can access the latest issue along with complete archives from the website.
http://www.cosee-se.org/teacher/?join=209

Coastal Land Cover and Change Maps
Coastal land cover and change maps, circa 1996-2001, are available for the conterminous U.S. from NOAA's Coastal Services Center. In addition, land cover updates for 2006 and their corresponding change maps are available for the Gulf Coast region and parts of the Northeast.
http://www.csc.noaa.gov/crs/lca/locateftp.html

Coastal Louisiana Activity Book
NOAA's National Centers for Coastal Ocean Science (NCCOS) offers the Coastal Louisiana Activity Book, the sixth in a regional series of children's activity books. The book introduces children (grades K-5) to coastal animals and ecology through regional information, fun facts, drawings to color, games, matching, and more. This series' goal is to begin the process of forming an environmentally aware citizen population, and encourage future careers in marine sciences.
http://www.coastalscience.noaa.gov/education/welcome.html

Coastal Ocean Observing Center
The Coastal Ocean Observing Center at the University of New Hampshire monitors the linked oceanic and estuarine ecosystem in their region. This monitoring system can detect changes in the ecosystem across multiple physical and trophic levels. The web-site includes data, educational materials, news, upcoming workshops, and more.

Lesson plans and activities can help you integrate ocean observing data and tools into your classroom, and includes an image viewer and analysis tool for satellite images.
http://www.cooa.unh.edu/index.jsp

Coastal Population Trends
NOAA's National Ocean Service's Special Projects office has published *Population Trends Along the Coastal United States: 1980-2008*. This report contains useful statistics and highlights the importance of coastal areas. It presents an overview of coastal population trends from 1980 to 2003 and projected change in coastal population by 2008.
http://oceanservice.noaa.gov

Coastal Roots
Coastal Roots: Seedling Nursery Program for Wetland Restoration is a program of the Louisiana State University. Students from 4th grade through high school in south Louisiana are taking part in this project by establishing wetland plant nurseries at their schools. Students grow native plant seedlings that they will plant in a coastal habitat restoration project in south Louisiana.
http://coastalroots.lsu.edu/

Coastal Storm Impacts
The NOAA Ocean Service is working with the Weather Channel on a 30-minute show on the impacts of coastal storms on communities and some of the tools/capabilities that are available to help them. The key issues the show will address include ways that the public can be better informed about coastal storms.
keelin.kuipers@noaa.gov

Coastal Socioeconomics
The Management and Budget Special Projects Office launched a new website highlighting spatial trends in coastal socioeconomics. The site offers time series, geo-referenced data from the U.S. Census Bureau and the Bureau of Economic Analysis, and web based tools to facilitate data analysis. The primary objective of the site is to increase awareness and improve access for the coastal stewardship community to socioeconomic information.
http://stics.noaa.gov

The Coastal Union
EUCC - The Coastal Union is an association with members and member organizations in 40 countries. Founded in 1989 with the aim of promoting coastal conservation by bridging the gap between scientists, environmentalists, site managers, planners and policy makers, it has grown since then into the largest network of coastal practitioners and experts in Europe. Their website includes information about dune management, coastal landscapes and typology, the European Code of Conduct for Coastal Zones, and more. All issues of the EUCC Coastal News can now be accessed from a link on the front page of the website.
http://www.coastalguide.org

Coastal Wildlife – Feeling the Squeeze
University College in Chichester, England hosted a video conference on October 1, 2003, with presentations on climate change, coastal habitats and coastal defense, a field visit, and workshop sessions.

http://www.excitingscience.com/pages/924510/

CoastLines
CoastLines, funded by the National Science Foundation, will introduce fundamental concepts about information technologies to grade 7-12 schools through geographic information systems (GIS) and global positioning systems (GPS), by conducting scientific studies of coastal ecosystems in the Long-Term Ecological Research network.
http://www.coastlines.ws/

Coastwatching by Computer: Water Quality and the System-Wide Monitoring Program (SWMP)
The NERR System-wide Monitoring Program tracks short-term variability and long-term changes in estuarine waters to understand how human activities and natural events can change ecosystems. It provides long-term data on water quality and weather at frequent time intervals. There are lesson plans giving step-by-step instructions for accessing and downloading the data and a graphing exercise to help use the data in your classroom.
http://www.nerrs.noaa.gov/Monitoring/welcome.html .
http://www.waquoitbayreserve.org/education.htm#lp .

COASTWEEKS - California
COASTWEEKS, September 15-October 7, 2007, is a celebration of coastal and water resources. In California, COASTWEEKS is coordinated by the California Coastal Commission. The Commission will feature the events of participating organizations in a special section of their website; submit your event by July 27, 2007.
http://www.coastal.ca.gov/publiced/coastweeks/coastweeks.html

Coastweeks
Coastweeks, September 20-October 11, 2008, is a celebration of coastal and water resources. Each fall, people all over the United States participate in a three-week celebration of our coastal resources that begins on the third Saturday in September. The kick off for the celebration is Coastal Cleanup Day, when tens of thousands of people across the country come together o keep our coasts and inland waterways free of debris. Search the web to found out what's happening around your area.

Coastweeks
Coastweeks, September 19-October 11, 2009, is a celebration of coastal and water resources. Each fall, people participate in a three-week celebration of our coastal resources that begins on the third Saturday in September. The kick off for the celebration is Coastal Cleanup Day, when tens of thousands of people across the country come together o keep our coasts and inland waterways free of debris. Check out California's website.
http://www.coastal.ca.gov/publiced/coastweeks/coastweeks.html

Cold-Water Coral Reefs
This report by the United Nations Environment Program World Conservation Monitoring Center (UNEP-WCMC) examines the biology, ecology, distribution, and conservation of cold-water coral reefs. Far less known than the coral reefs in warm, shallow waters of the tropics and subtropics, these cold-water reefs are found throughout the world's seas: in fjords, along the edge of the continental shelf, and around offshore submarine banks and seamounts.
http://www.ourplanet.com/wcmc/pdfs/Cold-waterCoralReefs.pdf .

Cold Water Corals
The International Coral Reef Initiative website has created a new discussion area, Cold-water coral ad-hoc committee, on the ICRIForum. You can access this new area directly at http://www.icriforum.org/router.cfm?show=List/Postings.cfm?CONFID=80 . In addition, the ICRI website links to two cold-water coral publications and provides additional useful links.
http://www.icriforum.org/ .

The Columbia River Virtual Field Trip
Learn about the Columbia River Watershed, including its history, geology, the headwaters region, First Nations and Native Americans culture, current issues and challenges to the river. Make educational connections and provide glimpses of sustainability about the future of the river with readings on the river from multiple perspectives. The materials are designed for middle and high school students and teachers.
http://cbi.wsu.edu .

Communicating on Climate Change
The Metcalf Institute for Marine & Environmental Reporting has published a book summarizing the discussions and recommendations that arose from a series of workshops on the communication of climate change. *Communicating on Climate Change: An Essential Resource for Journalists, Scientists, and Educators* is a final report of the science communication workshops. The report is downloadable from the website.
http://www.metcalfinstitute.org/Communicating_ClimateChange.htm

Communication Toolkit
A new Communication, Education and Public Awareness toolkit has been developed by the IUCN Commission on Education and Communication. Though aimed at professionals charged with implementing National Biodiversity Strategy and Action Plans, the toolkit offers practical steps that can be used to develop a variety of communication strategies. Tthere is a checklist for organizing an information meeting, a variety of tracking methods, a communication planning checklist, and much more.
http://www.cepatoolkit.org/

Communications Primer
Strategic communications helps create an effective strategy and involves identifying your goals and who you need to enlist to accomplish those goals; learning their motivations and creating a compelling message based on those motivations; and, of course, getting your message to them. The *Communications Primer for Great Lakes Habitat Advocates* is designed for grassroots organizers dedicated to enhancing public education and out-reach efforts. The website has sample press materials, evaluation pointers and more.
http://glhabitat.org/GL_Toolbox_v1/Leave_Alone/primerintro.html

Communications Tactics for Climate Change
Futerra Sustainability Communications Ltd. created this publication, New Rules: New Game – Communications tactics for climate change, as a communications guide to help in delivering the message of behavior change to impact climate change. The publication offers simple and practical communication techniques to help pull together the most effective strategies for motivating behavior change.

http://www.futerra.co.uk/downloads/NewRules:NewGame.pdf

Community Collaborative Rain, Hail, and Snow Network
CoCoRaHS is a grassroots volunteer network of backyard weather observers of all ages and backgrounds working together to measure and map precipitation (rain, hail, and snow) in their local communities. By using low-cost measurement tools, stressing training and education, and utilizing an interactive website, the aim is to provide the highest quality data for natural resource, education, and research applications. The site also includes links to lesson plans and additional educational websites.
http://www.cocorahs.org/

Community Culture and the Environment: Guide to Understanding a Sense of Place
This publication from the EPA addresses the social and cultural aspects of community-based environmental protection. The guide offers a process for defining and understanding the human dimension of an environmental issue and provides tools for more effectively working with the public on environmental protection efforts. The guide is based on the elements of social science theory and methodology most relevant to defining and understanding community life as it relates to environmental issues.
http://www.contextsensitivesolutions.org/content/reading/epa_community/

Community Risk Assessment Toolkit
The Community Risk Assessment Toolkit is part of the Community Risk Assessment and Action Planning project, which aims at strengthening community level risk assessment practices. The toolkit contains resources and a compendium of case studies.
http://www.proventionconsortium.org/CRA_toolkit.htm

Community Tool Box
The National Park Service Rivers, Trails and Conservation Assistance program is always exploring new ways to help communities work together to improve their special places. They offer methods learned in a ToolBox for public participation. These include decision making support, organization, events, outreach, and much more. In addition, check out the online resources for open space conservation and other useful links at the National Center For Recreation & Conservation (NCRC) website.
http://www.nps.gov/phso/rtcatoolbox/index.htm
http://www.nps.gov/ncrc/programs/rtca/helpfultools/ht_publications.html#river

Complete Hawaiian Reef Fish Coloring Book
The Complete Hawaiian Reef Fish Coloring Book complements any marine science, biological science, or other classes that covers topics on local ecosystems. The table of contents and about 30% of the book is viewable on Google books. Check this out.
http://books.google.com/books?id=B0c6dn2w540C&printsec=frontcover

Conch Reef Expedition
This 5-day expedition to map the coral reefs around the Aquarius underwater habitat took place in August, 2009. Using autonomous underwater vehicles (AUVs), the science team used side-scan sonar and underwater video to determine the biodiversity of the coral reefs around the habitat, as well as what species live there. The expedition website features daily blog entries, video, pictures and suggested lesson plans and other education resources. In addition, there are two webinars archived on ustream.
http://www.vims.edu/blogs/conch_reef/index.php

http://www.ustream.tv/channel/conchreef2009

Connecticut Sea Grant Educational Materials
Connecticut Sea Grant offers a variety of free educational materials about Long Island Sound, including The Living Treasures, Long Island Sound Curricular Resources Guide Connecticut River Tidal Marshes CD-Rom, and more. Some materials are downloadable from the website, while others are available for nominal charge.
http://web2.uconn.edu/seagrant/publications/marineed/index.php

Conservation Databases
The World Conservation Monitoring Center (UNEP-WCMC) maintains a large and varied collection of databases concerning nature conservation, developed in collaboration with a range of partners. These include species information, protected areas, forest information service, marine statistics and maps, national biodiversity profiles, and a resource center of formally and informally published information on biodiversity, held at the centre.
http://www.unep-wcmc.org/index.html?http://www.unep-wcmc.org/cis/~main

Conservation and Environmental Education Connections
The Conservation and Environmental Education Connections listserv is a tool from the U.S. Fish & Wildlife Service for listserve moderators from federal and state agencies and nongovernmental organizations to share professional development opportunities with conservation and EE professionals.
https://www.fws.gov/lists/listinfo/ceec

Conservation International: Biodiversity Hotspots
The Biodiversity Hotspots site from Conservation International features profiles of more than 30 ecologically important areas of the world, including island hotspots. In addition to regional profiles, the site offers a number of resources such as a terrestrial vertebrate species database, a glossary, maps, and related references.
http://www.biodiversityhotspots.org/xp/Hotspots/

Conservation International Marine Portal
The Marine Portal from Conservation International provides access to over 1000 marine-related documents and publications, hundreds of websites and related resources, and information for regional and issue-specific experts and contacts. The portal is an interactive web-based tool designed to increase capacity building, bridge information gaps, expand communication networks, and serve as a springboard to other sites and resources of interest.
http://portals.conservation.org/marine

Conservation Resources for the Houston Metro Area
Sounds like a good idea: The Houston Intramet website is designed to introduce private landowners and others to local conservation resources. The website covers the 8-county Houston metro region providing tools and resources to support wildlife habitat, open space, and energy efficiency.
http://www.houtonintrament.org

ConservationEvidence.Com
The ConservationEvidence.com website collates information on the effectiveness of conservation practice. The website provides hundreds of case studies on a range of

subjects including habitat restoration, invasive species management, reintroduction, species management, and habitat management. A separate section summarizes reviews on various aspects of conservation practice, along with a method for adding case studies; additional studies in the marine and aquatic environments could be useful.
http://www.conservationevidence.com/

ConserveOnline
ConserveOnline is an online public library, created and maintained by The Nature Conservancy in partnership with other conservation organizations. The library makes conservation tools, techniques, and experience available to a broad community of conservation practitioners. ConserveOnline offers an open forum for sharing successes and failures, and for connecting scientific research with field-based conservation practice. They welcome anyone with resources to share.
http://conserveonline.org/

Consumers Guide to Afterschool Science Resources
The Consumers Guide to Afterschool Science Resources contains reviews of high-quality, hands-on science content for afterschool programs. It provides a wide range of after school activities, curricula, and more. Reviewed materials include semester- and year-long curricula, activity kits, instructor guides consisting of many related activities, and websites that offer content appropriate for afterschool programs. A brief description of each resource is accompanied by two expert reviewers' detailed commentary.
http://www.sedl.org/afterschool/guide/science/index.html

Contrail Count-A-Thon from GLOBE
The 3rd Annual GLOBE Contrail Count-a-thon will be held on October 13th, 2005, during Earth Science Week. Clouds are among the largest variables controlling Earth's global climate and also a main source of uncertainty for scientists studying the atmosphere. Since contrails are difficult to study using satellite data, student observers are invited to help scientists by observing contrails in their area and reporting on the amount and type of contrails present.
http://asd-www.larc.nasa.gov/GLOBE

Convention on Migratory Species Family Guide
The encyclopedia of the Convention on Migratory Species is now available online. The guide has fact sheets explaining the history and structure of the convention along with some of the species the Convention seeks to conserve. Additional sections cover threats and challenges to migratory species, interagency outreach (e.g. World Migratory Bird Day), and more. The package of facts sheets can be downloaded in pdf format in eight sections.
http://www.cms.int/publications/family_guide.htm

Cool Science
The National Energy Technology Laboratory's Cool Science website offers lessons and experiments on a range of energy-related topics including carbon dioxide sequestration, phytoremediation, environmental management, and more.
http://www.netl.doe.gov/coolscience/teach.html#LESSONPLANS

The C.O.O.L. Classroom Website
The *Coastal Ocean Observation Laboratory Classroom*, from New Jersey's Jacques

Cousteau National Estuarine Research Reserve, is a series of Internet-based instructional modules aimed at middle and high school students, linking classrooms with active oceanographic research investigations. The website includes movie clips, downloadable worksheets and teaching guides, career cards, a glossary, and more.
http://www.coolclassroom.org/home.html

Cooperative Conservation
Cooperative Conservation describes the efforts of landowners, communities, conservation groups, industry, and governmental agencies who join together to conserve our environment. The website provides details about programs which range from professional training opportunities to an online library of documents related to the creation of this initiative.
http://cooperativeconservation.gov/

Copper River Delta Shorebird Festival
The Copper River Delta Shorebird Festival hosts activities, workshops, and community events. The Delta is part of the Western Hemisphere Shorebird Reserve Network and its Shorebird Festival is one of Alaska's premier birding events, with millions of shorebirds and over 30 species of migratory shorebirds resting and feeding there during spring migration. The Delta is the largest continuous wetland on the Pacific coast of North America.
http://www.cordovachamber.com/index.cfm?showsecondarylinks=true&showcontentlinkID=352&primarylinkID=352 .

Coral Activity Book
Staff from NOAA's National Centers for Coastal Ocean Science and Coral Reef Conservation Program Headquarters developed a new activity book for children about the importance of coral reefs. It is available for downloading from the website.
http://www.coastalscience.noaa.gov/education/crbook.pdf

Coral Bleaching: a White Hot Problem
This month's featured Data Analysis Teaching Activity, *Coral Bleaching: A White Hot Problem,* is recently updated to include 2008 data. *Coral Bleaching* explores the effects of rising ocean temperatures on the coral in San Juan, Puerto Rico. Using four years of water temperature data from ocean observing system buoys, students will compare these data, evaluate trends, forecast 2009 coral bleaching events and discuss the long term effects of elevated water temperatures and coral loss.
http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0406.html

Coral Data
The Coral Reef Information System (CoRIS) website is designed to be a single point of access to NOAA coral reef information and data products. The data includes a searchable spreadsheet file of over 3,000 scientific names of coral ecosystem biota, reef names and locations, and lots more. Be sure to spend some time looking through the maps, and pull up some of the many aerial photos.
http://www.coris.noaa.gov/welcome.html .

CORAL Discussion Board
The Coral Reef Alliance announces the CORAL Discussion Board to stimulate dialogue on a variety of issues related to coral conservation. The discussion board will allow individuals, organizations, businesses and government agencies within the fields of

marine conservation, park management, science, education, and tourism to seek technical advice and share lessons learned with others in a global network of communication.
http://www.coralreefalliance.org/parks/cdb .

Coral Discovery Kits
NOAA offers downloadable lesson plans to teach about corals at the high school level. These lessons focus on the biology of coral reefs, the benefits they provide to humans, major threats to coral reefs today, and how satellites are used to monitor and maintain the health of reefs. The resources include an online tutorial, an educational roadmap to resources, and formal lesson plans.
http://oceanservice.noaa.gov/education/kits/corals/welcome.html

Coral Ecosystems
The NSTA Learning Center offers the archived NOAA Coral Ecosystems Seminar, focusing on impacts to coral reefs. Materials include the downloadable presentation in PowerPoint or pdf, along with an Elluminate Live! application for those with faster connections.
http://learningcenter.nsta.org/products/symposia_seminars/boston08/Corals/webseminarl.aspx

Coral Ecosystems SciGuide
The Coral Ecosystem SciGuide is a new web-based "science toolbox" for teachers and other educators. The Coral Ecosystem SciGuide pulls together Internet resources on coral science and organizes them into three major theme areas for the classroom: coral reef biology, coral ecosystems, and coral conservation. For more information, contact Bruce Moravchik at Bruce.Moravchik@noaa.gov or Alissa Barron at Alissa.Barron@noaa.gov.
http://www.nsta.org/main/news/stories/nsta_story.php?news_story_ID=53036

Coral Literature, Education and Outreach Program
The Coral Literature, Education and Outreach (CLEO) Program offers educational modules developed primarily for middle school classes. Each module consists of three segments: background information of the science behind the instrument, a classroom experiment, and a teacher's section. Students will be engaged to plot and manipulate the data, and to witness events live on the Internet via a Coral Cam. Links to further reference and educational materials are also available.
http://www.coral.noaa.gov/cleo/education.shtml

Coral Park Buddy Program
As part of Dive In To Earth Day 2004, divers in the U.S. are being asked to team up with dive buddies and park managers around the world in a campaign to support coral reef protected areas. Participating dive operators, clubs, and associations will organize fundraising events leading up to Earth Day (April 22), and the proceeds will pay for conservation projects at some of the world's most spectacular dive sites.
http://www.coralreefalliance.org/divein/parkbuddy/ .

Coral Portal
The Coral Portal website has been launched to serve as a portal for information, discussion and references on all coral-related subjects including scientific techniques,

monitoring methods, and scuba diving locations. It offers links to useful websites, research, and a discussion forum.
http://www.coralportal.com/

Coral Reef Activity Book
The Coral Reef Activity Book is the first in a series of thematic activity books from NOAA's National Centers for Coastal Ocean Science. These books are for grades K-5 and highlight the organisms and issues relevant to coral reefs. The book can be downloaded from website, as can each of a series of regional ocean activity books. Hard copies can be requested by contacting Susan Baker at Susan.Baker@NOAA.gov.
http://www.coastalscience.noaa.gov/education/

Coral Reef Bleaching Module
NOAA's Coral Reef Watch program has developed an interactive lesson for the Bilko software that teaches users how to predict coral bleaching from satellite sea surface temperature data. The lesson and software are both available for free download on the website, along with other modules. The step-by-step lesson follows the operational Coral Reef Watch methodology, so users will gain in-depth knowledge of how the NOAA data are produced.
http://www.noc.soton.ac.uk/bilko/noaa_crw.php

Coral Reef Conservation Program Web Site
The NOAA Coral Reef Conservation Program (CRCP) redesigned and updated its program website. The site contains several key sections including: News and Highlights, Funding Opportunities, and Outreach and Education, as well as background information about the program, subscription information for the program newsletter and contacts for media inquiries. This is a companion site to NOAA's Coral Reef Information System.
http://www.coralreef.noaa.gov
http://www.coris.noaa.gov

Coral Reef Ecosystem Research Plan
The NOAA Coral Reef Ecosystem Research Plan defines the national and regional research essential to addressing the management challenges presented by coral reef decline; providing a national perspective on the research needed to address the range of stresses affecting the health of coral reef ecosystems; summarizing the management and issues that will drive research at the regional level; and focusing on the use of research to guide effective implementation of ecosystem-based management strategies.
http://coris.noaa.gov/activities/coral_research_plan/

Coral Reef Ecosystems
This new website from the National Park Service is a collaboration between Ocean and Coastal Resources Branch and the Office of Outreach and Education. Ten National Parks with coral reefs attract more than 1.5 million visits per year. The National Park Service is working to restore and maintain the biological and recreational values of coral reef parks. The website offers links to the parks, NPS articles about coral reefs, and more.
http://www.nature.nps.gov/water/coralreefs/

Coral Reef Ecosystems: Educating the Masses Blog
This blog has originated as a means to help organize large efforts to educate the public on the plight of coral reef ecosystems. It is intended for use by experts in coral reef

biology and education, and is not meant to be used as a resource on general coral reef biology. It is hoped that contributors would be those who would serve as educators or those managing larger efforts, and that this forum be used to help design and organize one or more major efforts through local, national and global media outlets.
http://coral-educate.blogspot.com/

Coral Reef Education and Outreach Library
This international library is an online catalogue of tools and publications that can be used to increase awareness about coral reefs. Each entry in the library contains a brief description of the publication and information on how to obtain it. Some publications are available to download directly from the library. In the library you will find descriptions of: brochures, books, posters, fact sheets, materials from marine parks, teacher's guides, videos and other coral reef educational materials.
http://library.coralreef.org
http://fmp.coralreef.org/library/home.htm
http://www.coralreef.org/tools/teachers.html

Coral Reef Education and Outreach Materials
NOAA's Coral Reef Conservation Program offers links to education and outreach materials about coral and coral reefs from a variety of sources. The website offers background information, an online glossary, and links to a wide variety of activities and lesson plans. The 2008 Coral Reef Educational Resources CD is available online. These classroom materials cover a wide range of topics related to coral reefs, including basic coral reef biology, ecosystems, human use, threats, and conservation efforts.
http://www.coralreef.noaa.gov/outreach/welcome.html

Coral Reef Educational Resources CD
The 2008 Coral Reef Educational Resources CD is a collection of coral reef education and outreach materials. The resources cover a wide range of topics related to coral reefs, including basic coral biology, coral reef ecosystems, human use, threats, and conservation efforts. The downloadable CD offers background information, lesson plans and activities, posters, videos, and much more.
http://coralreef.noaa.gov/outreach/resourcecd08/welcome.html

Coral Reef Film Materials
The Great Barrier Reef Marine Park Authority (GBRMPA) worked with Disney Pixar© To develop a CD of educational materials related to the film *Finding Nemo*. The CD also contains "Fishy Facts" – short videos presenting basic life history information using clips from the movie. The GBRMPA ReefEd website also has many curricular materials, set to Australian educational standards. The MacGillivray Freeman Films'©*Coral Reef Adventure* Teacher's Guide has other downloadable film-related educational materials.
http://www.FindingNemo.com.au
http://www.coralfilm.com/edu.html
www.reefed.edu.au

Coral Reef Messages
Collaborative efforts resulted in a cohesive and relevant U.S. Messaging Campaign for the International Year of the Reef (IYOR). The website offers free, print-ready downloadable ads, as well as branded products like banners, t-shirts, re-usable cloth bags and water bottles, for use in branding IYOR 2008 campaigns. Free registration is required.

http://www.iyorcreative.com/iyor/index.php

Coral Reef Multimedia Project
The Coral Reef Multimedia Project is an interdisciplinary effort to illustrate and explain coral reef dynamics and threats. The project goal is to make this knowledge accessible by combining the visual arts with a scientific background. The project is divided into two categories, Short Movies and Mini-Documentaries. Short Movies explain a concise subject with documented footage while Mini-Documentaries explore a broader biological theme with cinematography, photography, and visual effects. Check this one out!
http://www.coralreefmultimedia.org/

Coral Reef Park Buddy Program - 2005
The Park Buddy Program aims to support coral park managers in their efforts to protect their biologically diverse and increasingly threatened reefs. The program offers ocean lovers the chance to directly support fundraising efforts for four urgent conservation projects. CORAL is launching its Park Buddy program as part of the annual Dive In To Earth Day event, held each year during the week of Earth Day, April 22nd.
http://www.coralreefalliance.org/divein/parkbuddy/

Coral Reef Photographs
The on-line Coral Reef Ecosystem Database provides public access to new digital photographs from six years of coral reef field studies. Access to images of coral reef species and habitats, taken during studies in Puerto Rico and the U.S. Virgin Islands, facilitates a variety of coral reef research, management and educational opportunities. The searchable database includes images of fishes and invertebrates, hard and soft corals, mangroves, seagrass beds, and other benthic habitats.
http://www8.nos.noaa.gov/biogeo_public/reef_photos.aspx

Coral Reef Photos
Dr. Paddy Ryan has posted coral reef photos to his website in an easy to access set of pages. There are additional categories that may be of interest, so check out this website. School teachers are welcome to use these in their classrooms.
http://www.ryanphotographic.com/coralreef.htm

Coral Reef Report
This new online magazine has been launched to “celebrate the power and mystery of the planet's coral reefs." The Coral Reef Report features articles, personal stories, and audio interviews with scientists and others. The site also features a rotating photo gallery.
http://coralreefreport.info .

Coral Reef Videos
The Hawaii Coral Reef Initiative is committed to educating all types of audiences about the value of coral reefs through a wide range of media. In order to reach a broader audience, HCRI has expanded its use of the video-sharing websites YouTube and TeacherTube, and includes instructional videos for children on coral genetics and coral community connections, animations, and more.
http://www.teachertube.com/uvideos.php?UID=174264
http://www.youtube.com/hcrirp

Coral Reef Watch Website Redesign
NOAA's Coral Reef Watch website has been reorganized and redesigned. The new pages make it easier for users to discover and understand the data products, and new sections highlight research projects and partnerships. Check out the bleaching outlook, datasets, and the outreach and education materials.
http://coralreefwatch.noaa.gov/satellite/index.html

***Coral Reefs: Canaries of the Sea* DVD**
The National Wildlife Foundation's Climate Change and Wildlife Program, with funding support from NOAA, has produced a multi-media DVD entitled *Coral Reefs: Canaries of the Sea*, narrated by Jack Hanna. The DVD will help raise awareness of the effects of global climate change and other serious environmental problems on coral reefs around the world. It also provides ideas about what people can do to help protect reefs.
glick@nwf.org

Coral Science Web Site
The mission of the Coral Science website is to bridge the gap between coral science and society, and to stimulate awareness for our fragile planet and its ecosystems. They offer scientific articles about ocean related research. Current topics include coral calcification, coral immunology, coral bleaching, and more.
http://www.coralscience.org/home/

Coralpedia
Coralpedia is an identification guide to corals, octocorals, and sponges of Caribbean Reefs, developed through the Overseas Territories Environment Programme fund of the UK government, to assist conservation work in the UK Overseas Territories. Version 1 contains images and descriptions of about 64 Caribbean stony corals, 74 reef sponges and 41 octocorals, along with a few other groups; altogether over 1000 images are included. The information is available on the website and on CD.
http://coralpedia.bio.warwick.ac.uk

CoralSee
CoralSee offers an on-line Acropora coral identification program and an introductory guide to these corals. The interactive website includes the sections Explore the Reef, the Acropora key, and links to more information.
http://www.coralsee.org/

CoralWatch
CoralWatch, developed from a research project at the University of Queensland, offers an inexpensive, simple, non-invasive method for the monitoring of coral bleaching and assessment of coral health. The Coral Health Chart is basically a series of sample colors, with variation in brightness representing different stages of bleaching/recovery, based on controlled experiments. The website also includes a description of an education package, educators' workshop registration, and more.
http://www.coralwatch.org/default.aspx

CoRIS Education and Outreach Search Tool
NOAA's Coral Reef Information System (CoRIS) Library offers a new tool to facilitate retrieval of items that are useful for education and/or outreach purposes. Select "Education and Outreach" under "Publication Type," then enter other search terms as needed, and submit. In addition, the materials can be retrieved by clicking on the

"Education and Outreach" link under "Browsable Collections" on the left side of the webpage.
http://coris.noaa.gov/library/search.cgi

CORSACS: Controls on Ross Sea Algal Community Structure
CORSACS is a research cruise to the Ross Sea in Antarctica to study what controls the phytoplankton dynamics. The main research objective was to investigate the relative importance and potential interactive effects of iron, light and CO2 levels in structuring algal assemblages and growth rates in the Ross Sea. The website includes logs, descriptions of life at sea, questions and answers from students, and more.
http://www.whoi.edu/sites/corsacs

COSEE-Florida Web Portal
The Florida Center for Ocean Science Excellence in Education provides access to information and data for those interested in ocean sciences and education. The website allows you to search or browse through a growing collection of data and information in addition to search capabilities linking to numerous other websites and search engines. The Online School allows for the development and delivery of complete online courseware. Access is free for instructors, developers and learners.
http://www.coseeflorida.org/

COSEE NOW
The Centers for Ocean Sciences Education Excellence Networked Ocean World (COSEE NOW) is comprised of institutional partners who are using real time information from ocean observing systems to enhance public understanding of the ocean. Central themes of the website include Ocean Literacy, Virtual Community Collaborations, and Ocean Observing Systems.
http://coseenow.net/

COSEE Website
The Centers for Ocean Science Education Excellence (COSEE) is a network of 12 Centers and a Central Coordinating Office. The newly updated coordinating COSEE website offers news and events, information about the centers, and highlights network activities. Visitors can sign up for the monthly newsletter *COSEE Network News*, search for professional development opportunities, download educational materials, and more. Check out "For Educators" and “For Scientists” sections.
http://www.cosee.net/

COSEE-West Resources
COSEE-West distributes supplemental resources to educators during lectures and workshops, many of which are available electronically on their website. Materials include bibliographies, a video list, lectures, educational activities, and much more. Check out the Marine Science Field Trip Guide for Teachers, Ocean Bibliographies, and Marine Science Video list. Further down that page are resources from lectures and workshops such as Elephant Seals, Grants, Field Trips, and more.
http://www.usc.edu/org/cosee-west/resources.html

COSEE SE
COSEE SE combines efforts with scientists and educators to improve science education, facilitate awareness of ocean sciences careers, increase outreach and understanding of research, and bring ocean sciences to students and the public. The

website offers news and events, along with teacher's and scientist's sections with links to background about the South Atlantic Bight. Check out. the new publication for middle school educators on marine debris.
http://www.cosee-se.org/

COSEE-West Online
The COSEE-West website offers a rich and diverse set of resources for teachers interested in bringing ocean sciences into the classroom.
Online streaming video lectures and Powerpoint presentations. Presentations by scientists during COSEE-West events are taped and made available to educators online through the College of Exploration. These lectures provide background information on a variety of ocean research topics as well as data and discussions on the state of current research projects.
Classroom resources. Lesson plans, activities, and articles featured during COSEE-West education workshops are available for downloading on the Resources page, listed by topic and workshop date. The resources cover a wide range of coastal issues, from the deep sea to the shallow coasts, from policy to seabirds and whales. Also included are a California marine science field trip guide and a long list of commercially available (and rentable) marine science videos. Other marine science lessons and information resources are also available on the Curricula and Ocean Literacy pages.
Archived Online workshops. COSEE-West hosts online workshops for educators on current ocean topics. The forums offer information, discussion topics, ideas for lessons, and classroom resources for teachers of all levels and audiences. All of the material is archived online and accessible through the Online Lectures page (hosted by College of Exploration).
Ocean science animations. Short animations on various ocean science topics are available on the Ocean Tube link from the homepage. Animated shorts appropriate for both secondary and elementary levels are featured (and more are in the planning stages).
http://www.usc.edu/org/cosee-west

Creating Coastal Stewardship Through Science Curriculum Guides
The Point Reyes National Seashore website hosts a wide range of educational materials. Of special note are seven curricular guides created by teachers for teachers to provide middle school students with the opportunity to observe natural processes at Point Reyes National Seashore, to encourage a greater interest in science and environmental stewardship. Pacific gray whales, northern elephant seals, and the San Andreas Fault, are highlighted.
http://www.nps.gov/pore/educate_curriculum.htm .

Creative Conservation E-Learning
This company designs, develops, and teaches professional development e-Learning programs to meet the needs of your organization. Each design is a unique blend of current e-Learning technologies and proven methodologies with an emphasis on learning. Courses include Designing for Distance, Project WILD, and Project Learning Tree professional development workshops.
http://www.creative-conservation.com/index.htm

Creative Gallery on Sustainability Communications
The United Nations Environment Programme (UNEP) has created an online database of corporate and public advertising campaigns specifically dedicated to sustainability issues

and classified by more than a dozen sustainability themes, including *Seas and Oceans*. The campaigns highlighted address sustainability issues through various themes, tones, types of media and strategies.
http://www.unep.fr/pc/sustain/advertising/ad/ad_list.asp?cat=all

CREEC Resource Directory
Search for environmental education news and resources in California with the California Regional Environmental Education Community (CREEC) Networks' resource directory. Topics include community events, educational resources, training and professional development opportunities, grants/contests, and more. The resource directory offers links to over 2500 providers and resources of environmental education in California. Search by county, bilingual availability, grade level, academic focus, and much more.
http://creec.edgateway.net/cs/creecp/search/creec_res

Crittercam: See What the Animals See
What do marine animals do when we're not around? National Geographic's Crittercam allows researchers to follow wildlife through the use of advanced monitoring equipment attached to the animal. The Crittercam website has maps, lesson plans, and activities.
http://www.nationalgeographic.com/crittercam/index.html .

Crocheting a Coral Reef
You may use this for your students under the category *Anything's Possible*. In a woolly celebration of the intersection of higher geometry and feminine handicraft, and in testimony to the disappearing wonders of the marine world, the Institute for Figuring is crocheting a coral reef. Using the techniques of hyperbolic crochet discovered by mathematician Daina Taimina, the Institute has been evolving a wide taxonomy of reef-life forms - loopy "kelps", fringed "anemones", and curlicued "corals."
http://theiff.org/exhibits/reef.html

Cruise to Northwestern Hawaiian Islands Marine National Monument
The NOAA ship *Hi'ialaka*i undertook a 28-day voyage to the farthest reaches of the Northwestern Hawaiian Islands. This multidisciplinary research expedition included a benthic habitat mapping team, maritime archaeologists, and interpretation of this research through education and outreach specialists. The crew of 20 scientists and educators conducted studies at Kure Atoll, Pearl, and Hermes Atoll.
http://sanctuaries.noaa.gov/missions/2006nwhi/

Cruises and Virtual Expeditions to the Charleston Bump
From August 2-13, 2003 scientists explored the Charleston Bump, a complex bottom feature of great topographic relief located southeast of Charleston, South Carolina. The rocky, erosion-resistant rise impedes the flow of the Gulf Stream, deflecting it offshore and creating a zone of gyrating eddies and swift, narrow currents. Background material, daily logs, photodocumentaries, a video gallery, and lesson plans are available.
http://oceanica.cofc.edu/home.htm

Cruising Classroom
The Cruising Classroom, owned by the UCLA Institute of the Environment, introduces 4-12th grade and college students to the Santa Monica Bay. Participants are engaged through hands-on scientific explorations and dialogs with instructors. Students learn about physical oceanography, ocean chemistry, and marine organisms by collecting and

analyzing a variety of physical, biological and chemical data, using the sampling equipment aboard the *R/V Sea World UCLA*.
http://www.ioe.ucla.edu/seaworld/

Crustacea.net
The Australian Museum offers Crustacea.net, an interactive information retrieval system for crustaceans of the world. The website offers interactive keys, glossaries, and more.
http://crustacea.net/

Cultural Resources Program Website
The U.S. Fish and Wildlife Service (USFWS) Cultural Resources Program website offers information on the many facets of the program at USFWS, as well as past issues of the *Historical Happenings* newsletter.
http://historicpreservation.fws.gov

Curious George Educational Materials
Leverage Curious George's appeal to bring earth science learning to young kids. PBS offers downloadable resources for educators. The resources outline how to set up and run hands-on "Curiosity Centers" where children can make their own discoveries about sand, water, soil, wind, and recycling. The resources include simple materials lists, learning goals, leader notes, and tips for success.
http://pbskids.org/curiousgeorge/parentsteachers/activities/

The Cycle
RecycleBank offers The Cycle, an animated interactive look at the process of single stream recycling and materials reprocessing, following theoretical recyclables after they are collected. The Cycle takes viewers through each step of the process.
http://www.explorethecycle.com/

Dangers of Plastic Bags
Mobile Bay National Estuary Program has posted a pdf of a PowerPoint presentation on the dangers of plastic bags. It discusses the problems and costs of plastic bags to the environment and bans on their use.
http://www.mobilebaynep.com/site/Forefront/TheDangersofPlasticBags.pdf

Darwin Initiative
The Darwin Initiative is a small grants program, funded and administered by the UK Department for Environment, Food and Rural Affairs, that aims to promote biodiversity conservation and sustainable use of resources around the world. Project areas include institutional capacity building, training, research, work to implement the Biodiversity Convention, and environmental education or awareness. The website includes links to newsletters, funding initiatives, project information, and much more.
http://www.darwin.gov.uk/

Data in the Classroom
Data in the Classroom is a new online resource for teachers interested in using real scientific data in their teaching. The NOAA Ocean Data Education (NODE) Project is developing curriculum for grades 5-8 designed to help teachers and students use real scientific data to explore dynamic Earth processes and understand the impact of environmental events on a regional or global scale.
http://dataintheclassroom.org/

Data Explorer
Online access to NOAA's National Ocean Service spatial data collections, such as nautical charts, coastal maps, environmental monitoring records, and more, is available through this website. The material can be searched by geographic area, keyword, or topic.
http://nosdataexplorer.noaa.gov/nosdataexplorer/

DataStreme Ocean Website
DataStreme Ocean is a semester-long distance-learning course for precollege teacher enhancement that is partially delivered via the Internet. It is an initiative of the American Meteorological Society/National Oceanic and Atmospheric Administration Cooperative Program for Earth System Education. The course website offers a comprehensive sampling of ocean information especially suitable for learning in an Earth system perspective.
www.ametsoc.org/amsedu/DS-Ocean/home.html .

Davidson Seamount: Exploring Ancient Coral Gardens
NOAA's Ocean Explorer program has launched *Davidson Seamount: Exploring Ancient Coral Gardens*, the website for their first expedition of 2006, which runs from January 26-February 4, 2006. The seamount is a vast underwater mountain 75 miles off the coast of Monterey, California, and more than 4,000 feet below the sea surface, created by volcanic activity. Seamounts are an important habitat for deep-sea corals and demonstrate a high degree of endemism.
http://oceanexplorer.noaa.gov/explorations/06davidson/welcome.html

A Day in the Life of a Drop
A Day in the Life of a Drop, from the EPA, is a set of activities designed to help students in grades 3–5 understand the connections between the source of the water they use and the ways their water use habits affect the environment and human health. Students also learn how to reduce their impacts and engage family members. Materials include a teachers' guide, student worksheets, a spreadsheet to track water use at home, and more.
http://www.epa.gov/watersense/water/drop.htm

Deep ATRIS
The U.S. Geological Survey has developed the Deep Along-Track Reef-Imaging System (Deep ATRIS) to support its mapping activities and the ground-truthing of acoustic, lidar, and satellite imagery of submerged coastal environments. Deep ATRIS is capable of surveying to depths of 30 meters and acquiring 12-bit color digital images at 9 frames per second. They offer Deep ATRIS on a cost-sharing basis to other researchers and resource managers.
http://coastal.er.usgs.gov/remote-sensing/advancedmethods/deepatris.html

Deep Scope 2005
NOAA Ocean Exploration has launched the Deep Scope 2005 website in support of the current exploration, which runs from August 19–September 3, 2005. Utilizing the Johnson-Sea-Link submersible and deploying a unique deep-sea observatory camera system to observe as unobtrusively as possible, scientists aboard the Harbor Branch Oceanographic Institute's research vessel *Seward Johnson* will examine the deep-sea environment in the Gulf of Mexico from the perspective of the animals living there.

http://oceanexplorer.noaa.gov/explorations/05deepscope/welcome.html

Deep Earth Academy Climate Change Resources
The Deep Earth Academy (formerly JOI Learning) facilitates and develops programs and materials based on scientific ocean drilling expeditions and Earth Systems Science to strengthen students' mathematics, science, and analytical skills. The website hosts lessons related to climate change plus a number of resources that can be provided free of charge, including posters, DVDs, drilling globes, and more.
http://www.oceanleadership.org/learning/climate

Deep Sea 3D
Deep Sea 3D is the new underwater adventure from IMAX, transporting audiences deep below the ocean surface in different locations around the globe and offering never-before-seen, up-close encounters with a wide range of undersea life. Moviegoers, with only their 3D glasses for a diving mask, will be able to swim alongside some of the most exotic creatures on the planet, from the bizarre Rainbow Nudibranch to the Giant Pacific Octopus. The website includes a film trailer along with an educator's guide to the film.
http://www.californiasciencecenter.org/Imax/Features/DeepSea3D/DeepSea3D.php

Deep-Sea Creatures Quiz from National Geographic
Dive to the depths to test your knowledge of some of the Earth's most unusual creatures. Try this quiz and read the accompanying background information. And while you're on the website, check out the other games including weather wizard, frogs, and much more in the archives.
http://magma.nationalgeographic.com/ngexplorer/0309/games/game.cgi .

Deep Water Macroalgal Meadows
The 2004 Deep Water Macroalgal Meadows expedition is now online on NOAA's Ocean Explorer website. This expedition studied deepwater meadows of the calcified green alga Udotea sp. in the waters surrounding the Hawaiian Islands. The website includes an essay about the Teacher at Sea experience, a mission summary, an essay on algal meadows in Hawaii, and three major slideshows filled with photos from the expedition.
http://oceanexplorer.noaa.gov/explorations/04algae/welcome.html

Deep-Sea Images and SERPENT
The SERPENT (Scientific and Environmental ROV Partnership using Existing Industrial Technology) project collaborates with the oil and gas industry to carry out deep-sea scientific research on habitat mapping, sea-bed recovery rates from disturbance, and a variety of other experimental approaches to document biodiversity in the deep sea. The website hosts Education pages for teachers with lesson plans and more. The Kids pages include fun facts and interviews with the SERPENT team members and partners. The Gallery pages link to additional video and image galleries, while Publications hosts both SERPENT newsletters and a bibliography with many downloadable articles.
http://www.serpentproject.com/

Delaware Sea Grant Social Networking
Delaware Sea Grant invites you to check their activities out through Facebook, Twitter, and YouTube. They will share photos, news, resources, and more through these sources.
http://www.facebook.com/pages/Delaware-Sea-Grant/40576461700
http://twitter.com/DESeaGrant

http://www.youtube.com/deseagrant

DEM Discovery Portal
For those teaching or using GIS in the classroom, this website can save time and effort. The National Geophysical Data Center has created an ArcIMS map interface for locating digital elevation models (DEMs) that are published on the web. This makes it easier for GIS users to locate, preview, and download DEMs. The DEMS may be bathymetric, topographic, or a merged combination of both, ranging from high-resolution coastal DEMs for local studies, to coarser ones with global coverage.
http://www.ngdc.noaa.gov/mgg/dem/

Derelict Fishing Gear Mission
NOAA scientists complete a 6-day research mission exploring the remote habitats of Cordell Bank National Marine Sanctuary and testing methods of removing derelict fishing gear from the seafloor using a Remotely Operated Vehicle (ROV). The website offers background information and mission logs.
http://sanctuaries.noaa.gov/missions/2008cordellbank/

Design a Planet
In September 2005, Astro-Venture, a multimedia website for grades 5-8 highlighting NASA careers and astrobiology research in the areas of astronomy, geology, biology and atmospheric science, will launch *Design a Planet* through NASA Quest. Students can interact with scientists who are developing a program that can model planets with signs of life. Students will also be introduced to a new simulation on the Astro-Venture website that will challenge them to design a planet that would support human habitation.
http://quest.arc.nasa.gov/

Design in the Classroom
Design can make any subject immediately relevant to students by directly relating to their real-life experience. The Cooper-Hewitt National Design Museum offers interactive modules and learning activities which make it easy to see how architecture, graphic, and media design can enhance the teaching of subjects that include mathematics, language arts, and environmental studies. Check out the lessons on contouring and designing an aquarium ecosystem.
http://www.educatorresourcecenter.org/

Dial-A-Buoy
Dial-A-Buoy gives mariners an easy way to obtain weather reports through a telephone. Buoy reports include wind direction, speed, gust, significant wave height, swell and wind-wave heights and periods, air temperature, water temperature, and sea level pressure. Some buoys report wave directions. Coastal weather stations report the winds, air temperature, and pressure; some also report wave information, water temperature, visibility, and dew point.
http://www.ndbc.noaa.gov/dial.shtml

Digital History: A Guide to Gathering, Preserving, and Presenting the Past on the Web
The Center for History and New Media at George Mason University offers this online resource. It serves as an introduction to the web for those "who wish to produce online historical work, or to build upon and improve the projects they have already started in this important new medium." The work is divided into chapters, including *Becoming*

Digital, Owning the Past?, and *Preserving Digital History*. The work covers everything from copyright law to site design.
http://chnm.gmu.edu/digitalhistory/index.php

Digital Image Library
The USGS-National Biological Information Infrastructure offers a new website for its rapidly growing Digital Image Library. Containing thousands of images donated by photographers and organizations, the library links images to detailed information such as location, scientific and common names, and habitat and behavior descriptions to support research, education, and decision-making. Currently offering 30,000 images, the website allows multiple ways to browse the collections and select images.
http://images.nbii.gov/

Digital Library of the Caribbean
The Digital Library of the Caribbean, administered by Florida International University in partnership with the University of the Virgin Islands and the University of Florida, aims to build a cooperative digital library among partners within the Caribbean and circum-Caribbean, providing scholars, students, and citizens around the world with open on-line access to Caribbean cultural, historical and scientific materials.
http://www.dloc.com/

Digital Library of Earth System Education
The Digital Library of Earth System Education is creating an online library of educational resources and services to support Earth system science education at all levels in both formal and informal settings. A quick search on "marine" came up with 152 entries.
http://www.dlese.org/

Digital Research Tools
Created by the director of the Digital Media Center at Rice University, this collaborative wiki collects information about tools and resources that can help scholars conduct research more efficiently or creatively. Visitors can browse through topical headings that include Authoring, Blogging, and Data Mining, among others. Visitors can search for specific tools that can help collect data, edit images, make a dynamic map, and more.
http://digitalresearchtools.pbwiki.com/

Digital Worlds GIS
Digital Worlds GIS 2 is built from the technology supplied by ESRI. The package is for the education market and gives pupils experience of GIS tools, bridging the gap between education and commercial applications of GIS. Though based in the U.K., the website can offer an introduction to GIS use in the classroom, along with examples of lesson plans. Users have also been able to integrate TerraLook imagery data with the layers using the software.
http://www.digitalworlds.co.uk/

Digging In: A Guide to Community Based Habitat Restoration
This 164-page guide describes how individuals and organizations can become involved in helping to improve and restore coastal wetlands and other coastal habitat in their communities. The guide explains the basic steps of information gathering, site selection, project implementation, monitoring, maintenance, and working with volunteers. The California Coastal Commission will be holding workshops to introduce the guide; see the website for details.

http://www.coastal.ca.gov/publiced/UNBweb/diggingin.html

Dihydrogen Monoxide Website
Explore the many special reports, FAQ, a primer on the subject, plus reports on the environment, current research, and other exposés about this often dangerous chemical. (Recent events have proven just how deadly it can be).
http://www.dhmo.org/

Disaster Resiliency
NOAA's Coastal Services Center publishes *Coastal Services*, a bimonthly magazine for the nation's coastal resource managers. You can read the magazine online or subscribe to this free publication. The January/February 2006 edition reports on what coastal resource managers are doing to increase their communities' disaster resiliency.
http://www.csc.noaa.gov/magazine/

Discover Your World with NOAA: An Activity Book
NOAA is celebrating 200 years of delivering science, service, and stewardship. Making this happen leads the people of NOAA from the edge of space to the bottom of the ocean. *Discover Your World with NOAA: An Activity Book* helps you learn more about the world and how NOAA helps explore, understand, and protect our Earth. The book contains 43 different activities, and can be downloaded in full or by individual activity.
http://celebrating200years.noaa.gov/edufun/book/welcome.html

Discovery Day at the Dauphin Island Sea Lab - Alabama
Discovery Day at the Dauphin Island Sea Lab offers free children's admission to the Estuarium on April 19, 2008, from 10:00am to 2:00pm, on Dauphin Island, Alabama. This family event includes a variety of environmentally-themed children's activities; an Open House at the lab research facilities where the public can meet the scientists; and free kids' admission to the Estuarium, the aquarium at the lab.
http://estuarium.disl.org/

Discovering Antarctica
The Royal Geographical Society and the British Antarctic Survey have created this website which explores life on Antarctica. Visitors can watch a short video clip about the continent, test their existing knowledge with a short quiz, and then participate in a "being there" activity. The site lists all of the resources by format, including audio files, video clips, Word documents, and images. The Teachers' Area offers learning activities for students and teacher notes correlated to each of the main sections of the website.
http://www.discoveringantarctica.org.uk/index.php

Discovering the Living Ocean Manual
Bent Tree Press offers *Discovering the Living Ocean: Laboratory and Field Activities in Marine Biology*, a manual for use in high school and undergraduate marine biology classrooms and suitable for students who have no previous background in biology. The book's 17 chapters of laboratory exercises and 5 chapters of field studies expose students to a broad range of activities in taxonomy, microbiology, invertebrate zoology, ichthyology, oceanography, and more.
http://benttreepress.com/products/labs/marinebio_labs.htm

Discovery Day at the Dauphin Island Sea Lab - Alabama
Celebrating 200 Years of NOAA, the Dauphin Island Sea Lab in Alabama is celebrating with a Discovery Day, April 14, 2007, featuring the groundbreaking of a new building at Sea Lab, special NOAA programs and activities, free children's and reduced adult admission to the Estuarium, discounts, and much more.
http://press.disl.org/1_31_07dday.html

Discovery Kits from NOAA's National Ocean Service
NOAA's National Ocean Service (NOS) Discovery Kits describe the scientific principles underlying NOS's major programs. Each kit includes an on-line tutorial, a roadmap to resources, and a set of lesson plans. Each module of the kit is designed to work together, but comprehensive enough to be used on its own. Currently available kits include *Corals*, *Tides & Water Level*s, and *Geodesy/Global Positioning*. *Estuaries*, *Non-point Source Pollution*, and *Marine Archaeology* are in development.
http://oceanservice.noaa.gov/education .

Discovery of Sound in the Sea
The redesigned Discovery of Sound in the Sea website is an online resource about the science and use of sound in the ocean. A new main section offers a Frequently Asked Questions and a Facts and Myths section. New on-line tutorials on the Science of Sound and the Effects of Sound on Marine Animals, content in the People and Sound section, and entries in the Audio Gallery are also available. Check out updated material under *How do marine animals hear sounds?* under Animals and Sound.
http://www.dosits.org/

Discovery of Sound in the Sea
The Discovery of Sound in the Sea web site has been developed by the University of Rhode Island's Office of Marine Programs in partnership with Marine Acoustics, Inc. This website introduces users to the science and uses of sound in the sea. The audio gallery allows users to listen to underwater sounds created by marine animals, human activities, and natural phenomena such as lightning, earthquakes, and rain. Offerings include video interviews with scientists, scientific investigations, and a section for teachers with resources and classroom activities.
http://www.dosits.org/

Distance Education Clearinghouse
The University of Wisconsin System offers the Distance Education Clearinghouse, a comprehensive website bringing together distance education information from Wisconsin, national, and international sources. The website hosts general information about distance education, research findings on its effectiveness, pedagogical support for teachers, financial aid information, and links to many additional websites and resources.
http://www.uwex.edu/disted/home.html

Dive In To Earth Day
Dive In To Earth Day has been broadening people's knowledge of Earth Day to include the education and conservation of our planet's aquatic ecosystems. It will be celebrated throughout the week of Earth Day, April 22. Visit the website for inspiration, tools, information, and to register your event for a global impact. Activities that make conservation fun and accessible while having a real impact include beach and underwater clean-ups, educational workshops, fish and reef surveys, mooring buoy installations, among many others.

http://www.coralreefalliance.org/divein/

Dive In To Earth Day
Dive In To Earth Day offers you the opportunity to take a stand for the protection of coral reefs, and raise global awareness about pressing conservation issues. Organize a beach or underwater cleanup, host an educational slideshow or film, conduct a fish survey, or raise funds for a marine protected area, by "Diving In" this Earth Day. 2003's event garnered 270 activities, helping protect coral reefs and aquatic ecosystems in 58 countries and territories around the world. Register your event online at http://fmpro.coralreefalliance.org/divein/reg_1.htm.
http://www.coralreefalliance.org/divein/ .

Dive Into Your Sanctuaries
The National Marine Sanctuaries website now includes a section covering diving in the sanctuaries. It features a map with mouseover pop-ups providing sanctuary specific details, information on shipwreck diving, and details covering different sanctuary habitats.
http://sanctuaries.noaa.gov/visit/diving.html

Diversity, Systematics, and Connectivity of Vulnerable Reef Ecosystems (DISCOVRE)
This 4-year multidisciplinary research program will focus on understanding the physical oceanography, biology, ecology, genetic connectivity, and trophodynamics of deep coral environments in the Gulf of Mexico, both within natural and artificial sites. Read the daily logs from the first cruise, review relevant publications, and more. The second cruise, Lophelia II, is featured on a NOAA website.
http://fl.biology.usgs.gov/DISCOVRE/index.html

Diving Deeper Podcasts
NOAA's National Ocean Service offers Diving Deeper, a bi-weekly audio podcast featuring discussions with NOS scientists on a wide variety of ocean topics. Current topics include marine debris, MPAs, and eutrophication.
http://oceanservice.noaa.gov/podcast.html#dd

Do L.A.P.'s for Michigan
The Michigan Department of Natural Resources provides its Millennium Education Project – great state, great parks, great history – L.A.P.'s (Learn from the past, Appreciate the present, and Preserve our outdoor heritage). Michigan fourth grade teachers and students have fun as they learn and explore through the L.A.P.'s characters. The website features a variety of resources, games, links, and a virtual tour of a different park each month.
http://www.dnr.state.mi.us/edu/DNRIntroPages/DNRlaps.html

Dog-Eared Publications and Social Ecology Press
Dog-Eared Publications aims to turn young readers into environmentally aware citizens and foster a love of science and nature in the new generation by capturing their interest and engaging them with interactive games, mysteries, puzzles, and stories. Social Ecology Press publishes accounts of human behavior, natural resources, and the environment. Their goal is to provide affordable books for classroom adoption and the natural resource professional community.
http://www.dog-eared.com

http://www.dog-eared.com/socialecologypress/index.php

Doing Science: The Process of Scientific Inquiry
This website helps students understand the basics of scientific inquiry. This NIH curriculum supplement series for grades 6-8 offers lessons, a teacher's guide, and more to help guide students about scientific inquiry. Activities include distinguishing questions that can be tested by a scientific investigation from those that cannot and participating in a computer-based scientific investigation as members of a fictitious community health department.
http://science.education.nih.gov/supplements/nih6/Inquiry/default.htm

Doing What Works
Doing What Works is a new website from the Department of Education dedicated to helping educators identify and make use of effective teaching practices. Doing What Works contains practice guides developed by the Department's Institute for Education Sciences that evaluate research on the effectiveness of teaching practices described in the guides. Though the website currently only hosts information about English Language Learners, Math and Science will be included at a later date.
http://dww.ed.gov/index.cfm?

DonorsChoose
Teachers ask. People choose. Students learn. DonorsChoose is a simple way to provide students in need with resources that our public school often lacks. Here, teachers submit ideas for materials or experiences that their students need to learn. Individuals can choose a project and make it a classroom reality.
http://www.donorschoose.org/

Don't Even Sink about It
Don't Even Sink about It utilizes two components of ocean observing systems, AUVs and buoys, to explore density and how it affects the buoyancy of different objects. Don't Even Sink about It also uses the M/V Ocean Hope to discuss ship character. Students will evaluate archived and real-time water depth data from the Chesapeake Bay, as well as density plots of continental shelf water off of New Jersey to determine if commercial cargo ships can safely pass without running aground or other major shipping incidents.
http://www.marine-ed.org/bridge/index_archive1207.html

DoRight Enterprises
DoRight Enterprises™ is a youth-run consulting firm. This interdisciplinary curricular program "employs" students as consultants in a not-for-profit consulting firm run by the teacher. Students acquire environmental and economic knowledge and skills needed to offer their expertise as consultants to help their local businesses, hospitals, schools, and others reduce operating costs, raise profits, and reduce environmental impact.
http://scottbeall.com/dorightsummary.htm

Down Under, Out Yonder Highlights
The 13th annual Down Under, Out Yonder (DUOY) Advanced Educators Cruise brought 18 teachers to the reef for a three-day trip on a live-aboard dive boat. DUOY is a joint venture between the Gulf of Mexico Foundation and the Flower Garden Banks National Marine Sanctuary, with funding from ConocoPhillips. Photographer Franklin Viola documented this year's trip in photos, along with a brief log and links to more information.

http://gulfmex.org/gallery/duoy2007/index.html

Dr. E's Science Page PowerPoints®
From La Canada (California) High School's Dr. Mark Ewoldsen and students in the Advanced Placement Environmental Science class, Dr. E's Science Page provides PowerPoint® presentations on a variety of subjects, including biomes, coral reefs, endangered species, ocean pollution, and more.
http://www.lcusd.net/lchs/mewoldsen/PowerPoint.htm

Drawing from Nature
The *Drawing from Nature* series runs regularly as the lead story in the Sunday edition of the *Los Angeles Times Kids Reading Room Page.* Each article in the series introduces children to a different subject from nature and a related art technique. This project might be able to serve as a blueprint for an ocean-themed related series in a newspaper near you.
http://nrs.ucop.edu/Reserves/stunt/news/LALivingadpic.html

Drink it Up
This online educational environmental project encourages global participation for schools to learn about their local drinking water. Lessons for the project include how to test your drinking water, the water cycle, and what makes up a watershed. Participating classes are encouraged to test their drinking water, and to post their results to the database for others to use as real data. Classes are encouraged to submit a group project as a web page about their research complete with pictures, maps and diagrams.
http://www.millennium.scps.k12.fl.us/staffpages/ShawR/drinkitup/waterover.html

Drought Portal
The U.S. Drought Portal is an interagency portal providing critical and updated information on drought to stakeholders. It was created to provide comprehensive information on emerging and ongoing droughts, and to enhance the nation's drought preparedness. The portal is an integral element of the National Integrated Drought Information System (NIDIS). The education section links to selected resources, including lesson plans in English and Spanish, along with general information.
http://drought.gov/

Ducks in the Flow
Ducks in the Flow: Resources about Surface Ocean Currents for the Upper Elementary Classroom, intended for grades 3-5, includes a storybook and three classroom activities. In the storybook, the three kids work collaboratively to explore and investigate surface currents found in the ocean and the Great Lakes while learning about the journey of a seafaring plastic duck. Three hands-on activities for the classroom further explore the science content and provide instruction in basic science process skills.
http://www.windows.ucar.edu/tour/link=/teacher_resources/ocean_education/currents_main.html

Ducks Unlimited and Project WET Join Forces to Highlight World Wetlands Day
Ducks Unlimited and Project WET (Water Education for Teachers) announce a new education partnership to celebrate World Wetlands Day, to benefit water, wetlands, wildlife, and people across North America. The partnership harnesses the power of both organizations to educate about the importance of wetlands and water resources. The

partnership is also part of Ducks Unlimited's launch of its new wetlands education program, called Project Webfoot.
http://www.ducks.org/News/WET_Partnership.asp

Ducks Unlimited Wetland Curriculum
Ducks Unlimited has developed three units in a wetland ecosystems series. Each unit consists of an educator's guide and accompanying student journal. Teachers guides are also available for grades 4-6. The units include experiments and activities that provide a base to build a complete wetland curriculum. Additional materials and activities for kids are also available.
http://www.greenwing.org/dueducator/noncssdu_educator.html

The Dune Book
North Carolina Sea Grant offers a comprehensive book on sand dunes. This publication describes the benefits of dunes and dune vegetation, as well as the best dune management practices along developed shorelines where people, buildings and roads are already in place. It also describes how to select and plant the best dune grasses for the North Carolina coast and provides tips and colorful illustrations on the most common dune species.
http://www.vims.edu/bridge/index_geology.html .

Dutch Caribbean Nature Alliance
This website from the Dutch Caribbean Nature Alliance offers an Internet resource for both professionals and the general public on issues of biodiversity and conservation within the Dutch Caribbean, including the islands of Aruba, Bonaire, Curaçao, Saba, St Eustatius and St Maarten. The website currently features information on protected areas, habitats, ecosystems, and endemic, endangered and vulnerable species; details about ongoing projects; a sea turtle tracking programme; and more.
www.DCNAnature.org

Dynamic Earth
The Smithsonian Museum of Natural History brings a brief introduction into the physical science of the history of Earth alive in a unique fashion with this website. Sections include Gems and Minerals, Rocks and Mining, Plate Tectonics and Volcanoes, and the Solar System. The website can be viewed either as multimedia or in a print version.
http://www.mnh.si.edu/earth/main_frames.html

Earth Alerts
Earth Alerts is a free, downloadable Windows-based application that provides alert notifications, reports, and imagery on many types of natural phenomenon that are occurring real-time both worldwide as well as in specific locations within the United States, including Guam, Puerto Rico, and the U.S. Virgin Islands. You can specify the activity types and locations of interest for notification.
http://earthalerts.manyjourneys.com/

Earth and Environmental Science: Research Overview
This website from the National Science Foundation examines questions that scientists are pursuing, including: What part do we play in earth's changing climate? What can rock layers tell us about earth's history? How can we understand the forces that lead to earthquakes and volcanoes? How do long-term changes affect earth's ecosystems?

The website includes links to classroom and other resources related to the current research topics.
http://www.nsf.gov/news/overviews/earth-environ/index.jsp

Earth as Art: A Landsat Perspective
This exhibition from the Library of Congress showcases Landsat 7 images, from the collection of Landsat photographs held in the Geography and Map Division, which have been selected for aesthetic rather than scientific value. These images are actual pictures of the Earth, created by printing visible and infrared data in colors visible to the human eye. Band combinations and colors were chosen to optimize their dramatic appearance. Included are striking photos of Aleutian clouds, the Everglades, the Ganges River delta.
http://www.loc.gov/exhibits/earthasart/ .

Earth - The Biography
Earth - The Biography, from the National Geographic channel, examines how the earth was formed, and how carbon dioxide emissions are changing major ecosystems and the possible impacts on the planet. The program segments are Atmosphere, Oceans, Volcanoes, Ice, and Rare planet. A companion book to this series is also available for purchase.
http://channel.nationalgeographic.com/series/earth-the-biography/all/00#tab-Overview
http://shop.nationalgeographic.com/product/1062/4260/114.html

EarthCare
This resource features online stories about conservation, earth and ocean stewardship, ecosystems, and more. It showcases the Earth & Sky radio spots, along with links for more information.
http://www.earthsky.org/shows/earthcare .

Earth Climate Course
NASA's Goddard Institute for Space Studies offers educators and students a website to learn about how a planet's climate is determined, a system of human and natural processes that result in changes over various space and time scales. Students seek answers and consensus by experimenting with physical and computer models, collecting and analyzing their own measurements, and conducting comparisons with real world data from satellites and ground-based observations. The website includes teacher notes, student activities, and data sets.
http://icp.giss.nasa.gov/education/modules/eccm/

Earth Day
Celebrate Earth Day on April 22. Check out happenings around your area or register your program. The website offers "Earth Day in a Box" under the Resources link.
http://ww2.earthday.net/~earthday/
http://www.earthday.net/earthday2009
http://www.earthday.gov/

Earth Day Celebrations
Learn what you can do to help our ocean planet while celebrating Earth Day, April 22. Events will be held throughout the county. Here's a brief sample.

- Aquarium of the Pacific, Long Beach, California, April 23-24, 2005. Join a weekend of family fun while learning simple, everyday tips to protect our

environment. Visit booths from various organizations and participate in hands-on learning demonstrations. http://www.aquriumofpacific.org

- Florida Goliath Grouper Census, Panama City, Florida, March 19-April 22, 2005. Dive teams will be organized and will receive pre-dive briefings. http://www.earthday.net/programs/find/eventView.aspx?ID=3012
- "Earth Today" TV Show, South Carolina Educational TV, April 19, 2005. The student anchors interview adult experts on environmental topics. In addition to the 30-minute show, there are 21 lesson plans that relate to the different segments. http://www.earthday.net/programs/find/eventView.aspx?ID=2531
- EE-Link Earth Day Resources. http://eelink.net/eeactivities-earthday.html
- NSTA Earth Day Resources. http://science.nsta.org/nstaexpress/nstaexpress_2005_02_28_esteme.htm
- Earth Day Network, http://www.earthday.net/default.aspx, with links to the Educators Network and Environmental Jeopardy
- International Earth Day, http://www.earthsite.org/
- U.S. Government Earth Day Events and Information, http://www.earthday.gov/ (with links to taking action in your classroom)
- National Environmental Education Week, http://www.eeweek.org

Earth Exploration Toolbook
The Earth Exploration Toolbook is a collection of computer-based Earth science activities. Each activity, or chapter, introduces one or more data sets and an analysis tool to explore some aspect of the Earth system. Step-by-step instructions in each chapter walk users through a case study in which they access data and use analysis tools to explore issues or concepts in Earth system science. In the course of completing a chapter, users produce and analyze maps or other data products.
http://serc.carleton.edu/eet/index.html

Earth Force
Earth Force engages young people as active citizens who improve the environment and their communities now and in the future. Earth Force trains and supports educators in programs that enable young people to lead community action projects focused on creating sustainable solutions to local environment issues in the community. Visit the website for regional staff and basic activities.
http://www.earthforce.org

Earth: A Graphic Look at the State of the World
The Global Education Project presents "Earth: A Graphic Look at the State of the World." This program includes 15 maps along with 99 charts and graphs. The website offers a graphic look at the contents, along with references. Topics include global ecology, fresh water, food from the oceans, and more.
http://www.theglobaleducationproject.org/index.shtml

Earth From Above on the Web
Sponsored by UNESCO and Fuji Film, the *Earth from Above* project included a traveling exhibition that made its way across the United States. Photographer Yann Arthus-Bertrand documented many of the world's places and examined the effects of humans on the earth. This website allows users to view many of these photographs via an innovative interactive interface. Visit a mangrove forest in New Caledonia, motion

graphics of the Planet Blue, and the Mark of Man. Netscape 6 is not supported.
http://home.fujifilm.com/efa/

Earth Gauge
Earth Gauge is a weekly environmental information service from the National Environmental Education and Training Foundation currently provided to TV meteorologists in seven states (GA, OH, MI, FL, RI, CA, and DC). Earth Gauge is designed to increase the amount of environmental information used on-air and make it easy to explain the environmental implications of weather events.
http://www.earthgauge.net/

Earth Gauge Kids
The Earth Gauge Kids website is designed for students in grades 5-8 and focuses on a different weather/environment theme each month. Students can find an interactive quiz, activity ideas, fun facts, and more.
http://www.earthgauge.net/kids/index

EARTH Lesson Plans
Education and Research: Testing Hypotheses (EARTH), provides teachers with means for integrating real-time data with existing educational standards and tested curriculum in an interactive and engaging way. EARTH uses near-real-time data from ocean observatories to design and test outreach with the Internet as an interface to scientists, teachers, students, and the public. The website offers lesson plans, links to data, standards rubrics, and more.
http://www.mbari.org/earth

Earth Learning Idea
The Earth Learning Idea website offers Earth science instruction ideas. Each activity is designed to maximize student participation, learning, and enjoyment while minimizing cost. Strategies promote interactive teaching and students' investigational and thinking skills. Activities are posted in English, Spanish, and more.
http://www.earthlearningidea.com/

Earth Matters: Studies for Our Global Future
The Population Connection is updating the secondary curriculum, Earth Matters: Studies for Our Global Future, and offers the second edition free for downloading on its website, including all readings and activities. Units include Population Dynamics, Climate Change, Water Resources, and more.
http://www.populationeducation.org/index.php?option=com_content&view=article&id=443&Itemid=2

Earth Partnership for Schools
The Earth Partnership Program, from the University of Wisconsin-Madison Arboretum, focuses on ecological restoration as a way of establishing a positive relationship between people and the land. The program assists teachers in establishing restoration projects on school sites and providing the tools for building a curriculum that incorporates restoration into almost any subject area. Check out the resources under *Tools for Teachers*.
http://uwarboretum.org/eps/

Earth Portal
Earth Portal is a free resource for timely, objective, science-based information about the environment built by a global community of environmental experts: educators, physical, life, and social scientists, scholars, and professionals who have joined together to communicate to the world. The Earth Portal is being created and governed by individuals and organizations, with attribution and expert review for accuracy. Earth Portal includes *Encyclopedia of Earth, Earth News*, *Earth Forum*, and *Environment in Focus*. Check out the Hot Topics for Marine Ecology.
http://www.earthportal.org/

Earth Revealed
Annenberg Media presents *Earth Revealed*, a video instructional series for high school and college which explores earth's continuing evolution, scientific theories, and human impacts. Upcoming broadcasts include weathering and soils; running water; waves, beaches and coasts, and more.
http://www.learner.org/channel/series78.html

Earth Science Education Catalog
NASA's Earth Science Education Program offers a diverse array of programs and resources. The complete listing of earth science education programs, products and resources, along with NASA-wide resources for educators, is provided in this online catalog. The Elementary and Secondary, Higher Education, and Informal Education sections feature regional and national programs. Products and Resources identifies earth science products and resources for these three educational communities.
http://science.hq.nasa.gov/education/catalog/index.html

Earth Science Literacy Initiative
The Earth Science Literacy Initiative, funded by the National Science Foundation, has gathered and codified the underlying understandings of Earth sciences into a succinct document, which establishes the "Big Ideas" and supporting concepts that all Americans should know about Earth sciences. The resulting Earth Science Literacy framework will also become part of the foundation of a larger geoscience Earth Systems Literacy effort, along with similar documents from the Oceans, Atmospheres and Climate communities.
http://www.earthscienceliteracy.org/

Earth Science Visualizations
Created by staff members at the department of earth science at the University of California, Santa Barbara, the Educational Multimedia Visualization Center website contains interactive animations and visualization tools that can be used in the classroom to demonstrate various geological processes. Contents include global tectonics, regional plate tectonics, Ice Age earth, and more.
http://emvc.geol.ucsb.edu/downloads.php

Earth Science Week
Earth Science Week is October 11-17, 2009. The 2009 Earth Science Week Toolkit is now available. The kit includes an activity calendar, posters, resources, activities, a field notebook, and student handouts. Materials cover a range of earth science topics including National Parks, GIS technology, volcanoes and the ecological impacts of climate change.
http://www.earthsciweek.org/materials/index.html

Earth Science Week
The American Geological Institute, in cooperation with NASA, USGS, National Park Service, and many others, supports Earth Science Week 2008, *No Child Left Inside*, October 12-18, 2008. Earth Science Week 2008 encourages young people to learn about the geosciences by getting away from the television, off the computer, and out of doors. Local groups, educators, and interested individuals organize celebratory events.
http://www.earthsciweek.org/

Earth Science Week International Polar Year (IPY) Videoconference
Middle and high school students and teachers are invited to participate in *The Science of IPY*, an interactive one-hour videoconference hosted by local science centers on October 19, 2007. Scientists took participants on a virtual tour of Earth's polar regions and explored some of the key questions that scientists are trying to answer about how the poles are changing. Participants convened at select science centers in the eastern U.S., the United Kingdom, and France.
http://www.earthsciweek.org/newsletter/July2007.html

Earth Science Week Toolkit
Coordinated by the American Geological Institute, Earth Science Week, October 14-20, 2007, promotes an understanding and appreciation of the earth sciences. The institute offers *The Pulse of Earth Science* toolkit with a wide array of resources, including its calendar filled with activities and geoscientific dates, NASA's *Exploring Ice* CD-ROM, and more. The website includes links to downloadable lessons, career information, and Earth Science Week events and contests.
http://www.earthsciweek.org/materials/index.html

Earth and Sky Radio
Earth and Sky radio series offers short daily radio programs about science and nature, available on most National Public Radio (NPR) stations and the Armed Forces radio network. You can also listen to the logged broadcasts on the website. Recent segments focused on coral reefs and climate change.
http://www.earthsky.org/

Earth & Sky International Polar Year Resources
On this website, Earth & Sky editors have compiled radio programs, podcasts, and a photo gallery with content related to polar science to help celebrate the International Polar Year. They will continue to update this website with relevant interviews and sessions with polar scientists.
http://www.earthsky.org/article/international-polar-year

EarthCaching for Teachers
EarthCaching is a variation of geocaching with an educational dimension to the activity. When you visit an EarthCache, you learn something special about Earth science, the geology of the location, or how the Earth's resources and environment are managed there. EarthCaching has been developed by the Geological Society of America and partners in the geocaching community. The website includes a teachers guide, links to lesson plans, and more.
http://www.geosociety.org/Earthcache_Lessons/

Earthman Project
The Earthman Project comes from a nonprofit organization which uses music, the arts, and technology to inspire people to protect the environment. The Climate Crisis Jam online video is a musical message about global warming offered up in easy rap style. Additional music includes the Earthman Blues and River of Grass. The website also links to lesson plans and additional information.
http://www.earthman.tv/2004/index.html

EarthPulse: A Visual Guide to Global Trends
The interactive website, *EarthPulse: A Visual Guide to Global Trends*, from National Geographic Maps, analyzes our connected world with maps, diagrams, and imagery.
http://www.nationalgeographic.com/earthpulse/index.html

earthOCEAN.tv
earthOCEAN.tv is an online channel about the marine environment. They produce educational videos from the field documenting environmental issues, scientific research, and conservation efforts around the globe. All videos programs are 10-20 minutes in duration and are freely distributed online in a number of formats through their website. There are also teacher's guides and fact sheets, including Disappearing Dolphins, Southern Right Whales of Argentina, and more.
http://www.earthocean.tv

EarthTrends
EarthTrends is an online database maintained by the World Resources Institute that focuses on environmental, social, and economic trends. Research topics include Coastal and Marine Ecosystems, Climate and Atmosphere, and more. The website includes maps, information guides, a monthly newsletter, and other resources.
http://earthtrends.wri.org/#

Earthwatch Education Lessons
Earthwatch is a program that connects volunteers with opportunities to participate in field research. More than 50 lesson plans from educators who have participated in expeditions are available on the website. Lesson plan topic classifications include aquatic; terrestrial life and ecosystem; environmental issues; and community, culture, and history.
http://www.earthwatch.org/aboutus/education/edopp/lessonideas

Ebbinghaus
Ebbinghaus allows users the opportunity to create flash cards and then review them at their leisure. The program also allows you to export “boxes” of cards to devices such as an iPod.
http://www.christian-kienle.de/Ebbinghaus/

eBird
The Cornell Lab of Ornithology and the National Audubon Society offer eBird, which provides a simple way for you to keep track of the birds you see anywhere in North America. Users can retrieve information on personal bird observations, access the entire historical database to find out what other eBirders are reporting from across North America, and more. . Scientists can use the cumulative eBird database to know more about the distributions and movement patterns of birds across the continent.
http://www.ebird.org/content/

Eco-Discover Center - Florida
The Eco-Discovery Center is operated by NOAA's Florida Keys National Marine Sanctuary, the National Park Service and the U.S. Fish and Wildlife Service. Located on the Key West, Florida waterfront, the free-admission Eco-Discovery Center showcases the underwater and upland habitats that characterize the Keys. Through interactive and touch-screen exhibits, audio, and video, visitors can explore the Keys' hardwood hammock, mangrove, patch reef, seagrass, deep shelf and Dry Tortugas environments.
http://floridakeys.noaa.gov/eco-discovery.html

Eco-Friendly Holiday Tips
According to Use Less Stuff, Americans throw away 25% more trash during the Thanksgiving to New Year's holiday period than any other time of year. The extra waste amounts to 25 million tons of garbage. Check out this webpage for links to tips for trimming your holiday wasteline.
http://www.eeingeorgia.org/net/content/go.aspx?s=15483.0.68.4863

ECO Journeys Program through Creative Education
Creative Education provides hands-on experiences to teachers and students that focus on the interrelations between people and their natural environment. Their goal is to inspire exploration, conservation, and the integration of broadened perspectives into local communities and daily lives. ECO (**E**xplore the **C**ulture and **O**cean) Journeys are field programs where students snorkel coral reefs and mangroves, assist researchers with fish surveys and aquaculture projects, work with a local fisherman, and much more.
www.creativeed.org/ECOhome/fieldprograms.htm

Eco-Schools
Eco-Schools is an internationally acclaimed program that provides a framework to help educators integrate sustainable principles throughout their schools and curriculum. The National Wildlife Federation is the lead for the initiative in K-12 schools in the United States. Through school-based action teams of students, administrators, educators and community volunteers, Eco-Schools combines effective "green" management of the school grounds, facilities, and the curriculum.
http://www.nwf.org/ecoschools/about.cfm

ECOCEAN Whale Shark Photo-identification Library
The ECOCEAN Whale Shark Photo-identification Library is a visual database of whale shark encounters and of individually catalogued whale sharks. The library is maintained and used by marine biologists to collect and analyze whale shark encounter data to learn more about these fish. Submitters can assist with whale shark research through photos and sighting information. The website also includes background information about whale sharks, an interaction tutorial, and more.
http://www.whaleshark.org/index.jsp?langCode=en

EcoGarbage Board Game
ECOBASURA is a board game to help teach recycling, raw material recovery, profitable reduction of wastes, and the environmental renovation. Created in Colombia and endorsed by its Educational Ministry, it is adaptable to all languages and cultures. The website, along with pricing and ordering information, is available in English or Spanish.
http://www.ecobasura.com/

Ecolibary
The EcoLibrary is a source for free photographs useful for illustrating concepts in ecology, conservation biology, and the environment. The website currently contains several hundred annotated photographs that illustrate key concepts and as the site grows, maps, sounds, panoramas, and interactive exercises will be added. Check out the pictures associated with the themes under the Lessons section.
http://ecolibrary.cs.brandeis.edu/index.php

Ecological Impacts of Climate Change
The National Academies offers a downloadable booklet based on the 2009 report, *Ecological Impacts of Climate Change*. The booklet explains general themes about the ecological consequences of climate change and identifies examples of ecological changes across the United States. The website also offers downloadable and annotated Powerpoint presentation modules on ecological impacts, developed to assist educators in sharing information about the ecological impacts of climate change.
http://dels.nas.edu/climatechange/ecological-impacts.shtml

Ecology by Inquiry
NOAAA's Northwest Fisheries Science Center offers lessons designed to teach fundamental ecological principles using an inquiry-based approach to middle-school students. They cover a wide range of scientific skills and ecological concepts: quantitative versus qualitative observations, food webs, predators and prey, mapping, habitats and adaptations, watershed ecology, and much more.
http://www.nwfsc.noaa.gov/education/

Ecology Connections
Ecology Connections is a Canadian website dedicated to providing educators and public access to primary ecological research and education resources. The research and education connections are relevant to high school biology teachers, educators from non-formal education organizations, and public interested in learning more about the science of ecology. Information, professional development, curriculum, and links to career information are available.
http://www.ecologyconnections.ca/cgi-bin/index.php

Economic Instruments
The United Nations Environment Programme's International Working Group on Economic Instruments for Environmental Policymaking helps identify ways to enhance policy coordination related to the design and use of economic instruments at the national and international level and assists UNEP in defining its work program on economic instruments. The website offers practical tools and manuals to policy makers to help them design economic instruments that fit prevailing local economic, political, social, institutional, and environmental conditions.
http://www.unep.ch/etb/areas/econInst.php

Economic and Market Value of Coasts and Estuaries: What's At Stake?
The book, *The Economic and Market Value of America's Coasts and Estuaries: What's at Stake,* examines the economic value of our coasts and estuaries with an eye to understanding the economic benefits of protecting and restoring America's coasts and estuaries. Coasts and estuaries generate both economic value and economic impact.

Updates to chapters, new chapters, and links to the types of data found in this book are available online at www.estuaries.org and www.coastalvalues.org.
http://www.estuaries.org/assets/documents/FINAL%20ECON%20WITH%20COVER%20PDF%205-20-2008.pdf

Economic Valuation of Coral Reefs in the Caribbean
The World Resources Institute offers reports on economic valuation of coral reefs in the Eastern Caribbean, along with downloadable valuation tools. The valuations focus on the economic contribution of coral reefs through tourism and recreation, fisheries, and shoreline protection services.
http://www.wri.org/project/valuation-caribbean-reefs

Economic Values of the World's Wetlands
This report highlights the high economic value of functioning wetlands. Seventy billion U.S dollars worth of goods and services from freshwater resources could be at risk annually if governments fail to manage their wetlands sustainably.
http://www.panda.org/downloads/freshwater/wetlandsbrochurefinal.pdf

Economics of Ecosystems & Biodiversity
The German Federal Ministry for the Environment and the European Commission, with support of several other partners, have initiated preparatory work for the global study, *The Economics of Ecosystems & Biodiversity*. Preliminary findings from the first phase are available in the form of an interim report, available for download from the European Commission website.
http://ec.europa.eu/environment/nature/biodiversity/economics/

EcoRigs
EcoRigs supports the redeployment of retired oil and gas platforms for use in sustainable fisheries and eco-technology applications such as the production of energy from wind, waves and currents and more. The website hosts videos of marine life on the platforms, pictures, and information.
http://www.ecorigs.org/

Ecosystem-Based Management Tools Network
The Ecosystem-Based Management (EBM) Tools Network is an alliance of EBM tool developers, practitioners, and training providers. The goals of the network include developing a knowledge base of coastal-marine EBM tools, increasing information about, access to, and honest evaluation of EBM tools, and others. Website visitors can search for tools, sign up for updates to the website, check out funding or training opportunities, and more.
http://www.ebmtools.org/

Ecosystem Services Report Series
Duke University's Nicholas Institute has launched a new series of reports examining critical issues in ecosystem services. The first two reports in the series focus on valuation, the first under the Wetland Reserve Program, the second focusing on ecosystem service markets as a possible means to achieve biodiversity conservation goals on private lands.
http://www.nicholas.duke.edu/institute/products.html#

Ecosystems, Livelihoods and Disasters: An integrated approach to disaster risk management
This publication from the IUCN provides recommendations for making disaster risk reduction strategies more effective. In the direct aftermath of a disaster, saving lives and providing for safety and basic needs is clearly the domain of emergency professionals and humanitarian agencies. Existing environmental guidelines, laws, and policies are rarely applied in times of crisis. This downloadable document, under the Publications & Resources link, seeks to help address these problems.
http://www.iucn.org/themes/disaster/

EcoTipping Points Project
The EcoTipping Points website features environmental success stories collected from around the world by a team of scientists and journalists. The stories display a diversity of detail but have in common a community-based process switching environmental decline to a course of restoration and sustainability. Teachers interested in working with project staff to help incorporated the materials into their lessons should contact Gerry Marten through the website.
http://www.ecotippingpoints.org/

Ecoventures: Focus on the Gulf
EcoVentures: Focus on the Gulf is a multimedia CD designed to help middle school students learn about the Gulf of Mexico's aquatic environment and the issues associated with protecting and managing aquatic resources. Students enter the world of a fictional National Park to explore a variety of ecosystems and develop a management plan for the park. There are on-line activities, expert consultants, and a video encyclopedia.
http://eea.freac.fsu.edu .

EcoViz
EcoViz: Ecosystem Science and Visualizaion is a group of projects developing ecosystem science visualization products for research, education, and management applications. The goal is to research and develop landscape-scale visualizations as a means to enhance linkages between complex scientific research data sets, decision makers, and the general public. Recent work offers visualizations of MPAs and the research that is being done in support of them.
http://ecoviz.csumb.edu/home/

EcoZone Green Schools Initiative
NOAA's National Ocean Service recently joined the EcoZone Green Schools Initiative, a public-private environmental outreach and education effort sponsored by EcoMedia and the CBS Corporation. The program's goal is to inspire students to do what they can to help the environment. The Green Schools Initiative will begin as pilot projects in Miami, San Francisco, and Chicago, with the purpose of performing "green" makeovers on area schools.
http://www.ecozonemedia.com/greenmyschool/

Eddies
Eddies: Reflections on Fisheries Conservation is a new quarterly magazine focused on the Fish and Wildlife Service fisheries program. The full-color magazine highlights the aquatic conservation work of the service's fisheries program and its partners. You can read it online or subscribe to email alerts.
http://www.fws.gov/eddies/

EDGES: Using GIS to Experience Sanctuaries
Channel Islands, Florida Keys, Gray's Reef, and Stellwagen Bank National Marine Sanctuaries have teamed up to utilize real scientific data in educational materials for teachers and students to explore America's special ocean areas. **E**xploring **D**ata using **G**eographic Information Systems to **E**xperience **S**anctuaries (EDGES) lessons include underwater treasures, submerged lands, and monitoring from afar.
Contact Sanctuary.Education@noaa.gov .

Edheads Weather
Edheads helps students learn through educational games and activities designed to meet state and national standards. Through one of the on-line activities, students learn how to report and predict the weather. A teacher guide, lesson plans, and weather glossary are included.
http://edheads.org/activities/weather/index.htm

Edmonds Discovery Programs
This website contains information about marine life and local Puget Sound ecosystems, and provides downloadable curriculum. The site features a marine life guide and a Beach Etiquette Pledge.
http://www.ci.edmonds.wa.us/Discovery_Programs%20Website/index.html

EducaPoles
The EducaPoles website from the International Polar Foundation sets out to sensitize young people and the educational world to the importance of the Polar Regions and of climate change. The website offers news and background information along with teacher guides, student activities, animations, and much more. You can also sign up for a newsletter on science and climate change.
http://www.educapoles.org/

Educating Stakeholders about MPAs
MPA News, Vol. 8, No. 7 from February 2007 (MPA82.pdf) published *Educating Stakeholders about MPAs: Practitioners Use an Array of Methods*, offering a discussion of various methods to increase public awareness and community understanding of the benefits that can come from resource protection. The article examines how practitioners have employed a variety of approaches to inform and educate stakeholders.
http://depts.washington.edu/mpanews/issues.html

Educating Young People About Water
The Environmental Resources Center at the University of Wisconsin-Madison offers Educating Young People About Water, guides, and a water curricula database providing assistance for developing a community-based, youth water education program. The resource can help you find and select water education curricula; develop a program appropriate to your situation; train others to design community-based, youth water programs; and more. Search the website from over 150 water-related curricula.
http://www.uwex.edu/erc/eypaw/

Education And Research: Testing Hypotheses
The Education And Research: Testing Hypotheses (EARTH) teacher workshops provide teachers with means for integrating real-time data with existing educational standards and tested curriculum in an interactive way. EARTH uses near-real-time data from

ocean observatories to design and test outreach with the Internet as an interface to scientists, teachers, students, and the public. Teachers can compare ocean observing data collected in different regions of the United States to study how regions can vary and change on a variety of scales. The website offers unit plans, each with an associated group of activities; links to the activities via National Standards, Science Skills, or Ocean Literacy; an overview of each workshop, along with the activities generated by the
http://www.mbari.org/EARTH/

Education at AMNH
The American Museum of natural history has many free online resources useful to those studying marine and coastal environmental issues. Use the search feature to pull up resources using keywords such as ocean, coral, mangrove, and more.
http://education.amnh.org/

Education Center at ICRS
The 11th International Coral Reef Symposium (ICRS) in Fort Lauderdale will have an education center open to the public free of charge. Teachers, naturalists, scientists, and others can enjoy the four days filled with educational programs and demonstrations in the Coral Theater, informative booths hosted by facilities from across the globe, hands-on activities, and more.
http://www.nova.edu/ncri/11icrs/education.html

Education Discovery Classroom
Three new lesson plans have been added to NOAA's Education Discovery Classroom series: Ecological Forecasting/The Dead Zone; Marine Navigation/Do You Need a Map?; and Aerial Photography and Shoreline Mapping/Images of Katrina,. The National Ocean Service (NOS) Education Discovery Center is a collection of lesson plans developed in collaboration with NOS program offices. The 38 existing lesson plans cover 19 topical areas and emphasize hands-on activities using on-line data resources.
http://oceanservice.noaa.gov/education/classroom/welcome.html

Education & the Environment Initiative Units
New draft Education and the Environment Initiative (EEI) curriculum units are available on the California EPA website for review. The posted units are in draft form, have been reviewed by content experts for technical accuracy, and will be field tested by teachers in California. Units will be posted as soon as they are available and will remain on the website for 30 days.
http://www.calepa.ca.gov/Education/EEI/Curriculum/Default.htm#CurriculumUnits

Education in the National Estuarine Research Reserve System
The education section on National Estuarine Research Reserve System website has been updated. The changes include the addition of a new section for K-12 educators, links to an Estuaries Tutorial and curriculum, downloadable presentations for teachers, and much more. Be sure to check out the list of professional development programs offered around the country.
http://nerrs.noaa.gov/Education/welcome.html

Education Evaluation
The National Marine Sanctuary Program has launched a new website focused on the evaluation of environmental and marine education programs. The website includes information on how to create program evaluation plans, plan samples, tools and

techniques for evaluation, an evaluation glossary, and more.
http://sanctuaries.noaa.gov/education/evaluation

Education for a Sustainable and Secure Future Recommendations Online
The final report of the Council for Science and the Environment for recommendations for educational reform for the U.S. can be read online. The recommendations address topics such as sustainability and security curricula for K-12 and undergraduates, community education, and planetary health.
http://www.NCSEonline.org/NCSEconference/2003conference/

Education through Cultural and Historical Organizations (ECHO)
The Education through Cultural and Historical Organizations (ECHO) Act is a federally funded educational and cultural enrichment initiative, serving children, teachers, and adult continuing learners in Alaska, Hawai`i, and Massachusetts. ECHO brings to culturally diverse audiences programs collaboratively produced by five regional cultural institutions: Alaska Native Heritage Center and Iñupiat Heritage Center in Alaska; Bishop Museum in Hawai`i; New Bedford Whaling Museum and New Bedford Oceanarium; and Peabody Essex Museum in Massachusetts.
Contact Bob Rocha at rrocha@whalingmuseum.org or (508) 997-0046 x149
www.echonsb.org and www.echospace.org

EducationAtlas.Com
This website provides links to many educational resources for K-12 teachers, students, higher education, homeschoolers, bilingual education, and more.
http://www.educationatlas.com/

Educational Resources from Busch Gardens and Sea World
SeaWorld, Busch Gardens, and Discovery Cove offer career resources; a Fun Zone with coloring books, song books and more; teacher resources with downloadable classroom activities, teacher guides; and much more. Take time to explore this website.
http://www.swbg-animals.org/index.asp

Educator Resources from the California Department of Fish & Game
The California Department of Fish and Game, Office of Natural Resource Education, has a variety of web-based resources for educators. These include a Project WILD Aquatic online workshop, the first offering from a marine curriculum, and a newsletter with educational materials, kid's activity, and regional and local events.
http://www.dfg.ca.gov/coned/index.html .

Educators' Bridge
The National Center for Atmospheric Research offers the Educators' Bridge website with links to lessons and guides for teaching about earth's climate, atmospheric science, and other earth science topics. The website refers to (and includes links to) The Kids Crossing Guide for Educators with activities for hands-on science exploration.
http://eo.ucar.edu/educators/

Educator's Guide to Nonpoint Source Water Pollution
The Kentucky Waterways Alliance provides a downloadable manual with hands-on lesson plans and activities relating to Kentucky's water and nonpoint source pollution. Students will gain an appreciation of the environmental sensitivity of water quality, explore the relationships of hydrologic components within a watershed, understand how

human activities can affect the watershed, and learn responsible water resource management. Most of the activities are interdisciplinary.
www.kywater.net/KWA/splas01.doc

EDUCAUSE Live!
EDUCAUSE Live! is a series of free, hour-long interactive web seminars on information technology topics in higher education. In the Archives area, visitors can view previous programs; many include slides and other supplementary materials.
http://www.educause.edu/live

EE-Link Website Update
The North American Association of Environmental Education (NAAEE) and EE-Link websites have been updated, with dynamic content, better information organization, and integrated search capabilities to make it easier for you to find what you need. Visit EE-Link with thousands of links to environmental education resources for a preview, and NAAEE for information on new initiatives, association news, conference information, and more.
http://naaee.org

EE in Mexico
The Senderos e-bulletin from the Border-Wide EE Coalition features stories and news from the border region's environmental educators, and information about programs and events taking place in all of the ten US-Mexico Border States. Check out the on-line version in English or Spanish.
http://www.eecc.net/ecostarteng.htm

EETAP Resource Library
The EETAP Resource Library, now moved to EE-Link, makes environmental education resources more accessible. A major component of the Library is Info-Sheets, 1-2 page descriptions that summarize a specific EE topic and identify resources for additional reading.
http://eelink.net/eetapresourcelibrary.html .

Effective Practices Collection
The Corporation for National and Community Service offers the Effective Practices Collection, with over 650 good ideas, replicable strategies, and evidence-based studies to help service programs solve problems they may face. You can search the database by topic area, and submit your own effective program.
http://nationalserviceresources.org/epicenter/submit/index.php

eField Trips for Fall
Take your class on a field trip to Biscayne National Park to participate in an underwater adventure, to the freshwater wetlands of Watsonville, to the volcanoes of Hawai'i, or for a visit with Florida manatees. All trips have four major components: a virtual visit, an interactive multi-media web experience that your students can complete at their own pace anytime; a Trip Journal, a short worksheet that students complete as they complete the Virtual Visit, Ask the Experts, and specific times for a Live Web Chat.
www.eFieldTrips.org .

eField Trips – Glacier Bay
Check out the eField trips available, both upcoming and archived. In general, 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. Don't miss *Glacier Bay: A Living Laboratory for Studying Marine Mammals*, hosted by Glacier Bay National Park and Preserve.
http://www.efieldtrips.org/Schedules/searchResults.cfm?searchType=all

E-Field Trips on Invasive Species, Alaskan Coast Invertebrates, and Shorebirds
During April 2004, the National Wildlife Refuge System is offering the eFieldTrip titled, *Invasive Species: America's Least Wanted!,* geared toward 4-6th grade students. Students will have the opportunity to learn about invasive species and why they are a menace. The eFieldTrip has four interactive components allowing students to complete the program at their own pace. There is no cost for schools or students to participate.
http://www.efieldtrips.org/Schedules/schedule_0404.cfm .

eField Trips – Manatees and Sea Turtles
Check out the eField trips available, both upcoming and archived. In general, 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. Don't miss the highlighted field trips on Manatees and Sea Turtles.
http://www.efieldtrips.org/

Electronic Navigational Charts Direct to GIS Web Portal
The NOAA ENC Direct to GIS web portal provides comprehensive access to display, query, and download all available large-scale NOAA ENC (electronic navigational charts) data in a variety of GIS/CAD formats for non-navigational purposes using Internet mapping service technology. Nautical charts include coastal topography, bathymetry, landmarks, geographic place names, and marine boundaries.
http://nauticalcharts.noaa.gov/csdl/ctp/encdirect_new.htm

Electronic Naturalist
The Electronic Naturalist is an on-line education program providing a weekly environmental education unit. Each unit has artwork, text, activities, additional web sites, plus online access to a professional naturalist. Two reading levels are available for grades K-3 (Quick Read) and 4-8 (Full Read). The units cover insects, fish, amphibians, reptiles, birds, mammals, plants, and environmental issues.
http://www.enaturalist.org/index.htm .

Elephant Seals Homecoming Days
Learn about the female elephant seals' 21,000-mile annual journeys during Elephant Seal Homecoming Days, sponsored by TOPP (Tagging of Pacific Predators), California State Parks, and California State Parks Foundation. The TOPP website features background information about research on the elephant seals at Año Nuevo State Reserve, lesson plans for teachers, links to pertinent parts of the Año Nuevo State Reserve site, and videos.
http://www.topp.org/elephant_seal_homecoming_days

Elliott Wildlife Values Project
The Elliott Wildlife Values Project and its Linking Girls to the Land program at Girl Scouts of the USA develop girls as leaders of environmental stewardship and conservation

efforts who positively impact their communities and the world. They offer the 2007 National Conservation Events Calendar listing over 40 events, web sites, and a conservation history. Girl Scouts can earn the Get with the Land Patch by volunteering in national conservation events in collaboration with natural resource agencies.
http://www.girlscouts.org/program/program_opportunities/environment/elliott_wildlife.asp
http://www.girlscouts.org/program/program_opportunities/environment/2007_conservation_events_calendar.pdf

eNature.com
eNature.com, from the Shearwater Marketing Group, offers information about the wild animals and plants of the United States. The site's core content of wildlife information about almost 6,000 individual species is the same data set used to create the printed Audubon Field Guides. The website offers the ability to keep personal wildlife lists, sign up for newsletters, download mating call ringtones, track migration, and search wildlife guides.
http://wild.enature.com/ringtones/

Encyclopedia of Earth Collections
The Encyclopedia of Earth (EoE) brings together some of the world's leading scientists and organizations and presents the essential knowledge underlying a variety of issues. The EoE, one component of the Earth Portal, is a free, expert-driven, scaleable, online information resource about the environment published online by the National Council for Science and the Environment. Collections include climate change, coral reefs, ecology, environmental and social issues in economics, natural world heritage sites, and more.
http://www.eoearth.org/article/Collections

Encyclopedia of Flora and Fauna of the Northwestern Hawaiian Islands
The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve has an online encyclopedia to showcase the flora and fauna that inhabit the region. The encyclopedia features over 130 plants and animals, complete with imagery and some video. For each organism, a short description is given along with information on status, distribution, habitat, quick facts, and more.
http://noaa.stage.webthink.com/onms/Park/Parks/?pID=12

Encyclopedia of Life
The Encyclopedia of Life is a global effort to document all 1.8 million named species of animals, plants, and other forms of life on Earth. The encyclopedia will be a multimedia Wikipedia-style website offering downloadable information on each species. Scanning and digitization of the biodiversity literature is now underway in London, Boston, and Washington DC. The first 30,000 pages of a massive online Encyclopedia of Life (EOL) are available. The EOL is being developed by a unique collaboration between scientists and the general public. By making it easy to compare and contrast information about life on Earth, the resulting compendium has the potential to provide new insights into many of life's secrets.
http://www.eol.org/

Encyclopedia of the Sanctuaries - On-Line Marine Life Field Guide
NOAA's National Marine Sanctuary Program offers an online resource that highlights the diverse marine life of America's ocean and Great Lakes treasures. The Encyclopedia of the Sanctuaries is available online, providing photos, streaming video and biological information for over 100 marine species from each of the national marine sanctuaries in

the United States. The Encyclopedia of the Sanctuaries allows visitors to search for their favorite species, as well as view streaming video of marine life
http://sanctuaries.noaa.gov/education
http://marinelife.noaa.gov/

Encyclopedia Smithsonian: Science and Technology
The Encyclopedia Smithsonian covers science and technology through materials drawn from different parts of the Smithsonian Institution. Topics include Biodiversity, Ecology, Fishes, and much, much more. Current highlights include Looking at Earth, Arctic: A Friend Acting Strangely, Bird of the Month, and more. Other links bring you to Encyclopedia: History and Culture and Encyclopedia: Art and Design. It's easy to spend hours clicking through interesting and informative web pages through this site.
http://www.si.edu/Encyclopedia_SI/Science_and_Technology/default.htm

End of the Line
The End of the Line is a documentary film highlighting the impact of overfishing on the oceans. It examines the imminent extinction of bluefin tuna, brought on by increasing western demand for sushi; the impact on marine life resulting in huge overpopulation of jellyfish; and implications of a future world with no fish. The website hosts the cinema trailer and links to short episodes that you can view online, expected screening dates, and more.
http://endoftheline.com/

End of Year Ideas from the Bridge
As the school year draws to a close, now is a perfect time to incorporate the oceans into those end-of-year projects. Find science fair-style project ideas in the Bridge's Guiding Students section, or take your students on a virtual ocean expedition to a hydrothermal vent system. Information on local aquaria and research institutions is also available to schedule that last minute field trip. Have your students research a marine habitat and relate it to the biology, chemistry, physics, or geology concepts they learned this year.
http://www.marine-ed.org/bridge

End of Year Ideas from the Bridge
As we end another school year, now is a perfect time to incorporate the oceans into those last minute class projects. Find science fair-style project ideas in the Bridge's Guiding Students section, walk your students through one of our Data Analysis Teaching Activities, or take them on a virtual ocean expedition to the Antarctic. Information on local aquaria and research institutions is also available to schedule that end-of-year field trip.
http://www.marine-ed.org/bridge

Endangered Caribbean Sea Turtles: An Educator's Handbook
This comprehensive handbook offers nearly 40 classroom activities that use sea turtles to teach concepts related to natural science, geography, social studies, team building, statistical analysis, public speaking, and more. By exploring sea turtle diving and feeding, navigation and migration, nesting and hatching, as well as the various factors that threaten sea turtle survival, including pollution, international trade, fisheries, and habitat loss, students gain a greater understanding of contemporary marine science and conservation issues. The Spanish edition will be available in 2008
Contact Karen Eckert at keckert@widecast.org

Endangered Species Day
May 15, 2009 is Endangered Species Day. Events will be held across the country to raise awareness about the threats to endangered species, including global warming, and success stories in species recovery. Register your event, download educational materials, and more from the website.
http://www.stopextinction.org/cgi-bin/giga.cgi?cmd=cause_dir_custom&cause_id=1704&page=day

Endangered Species Day
May 11, 2006, May 18, 2007, is Endangered Species Day. Take this opportunity to educate your students about the importance of protecting endangered species and highlight the everyday actions that individuals and groups can take to help protect our nation's wildlife, fish and plants. The website includes links to websites with background information and lesson plans.
http://www.stopextinction.org/
http://www.stopextinction.org/endangeredspeciesday

Endangered Species Day
National Endangered Species Day, May 16, 2008 provides an opportunity for parks, wildlife refuges, zoos, aquariums, conservation organizations, and others to educate the public about the importance of protecting endangered species. This special day is also an opportunity to highlight the everyday actions that individuals and groups can take to help protect our nation's wildlife, fish, and plants. Check out events in your area, download educational materials, and more.
https://www.givengain.com/cgi-bin/giga.cgi?cmd=cause_dir_custom&cause_id=1704&page=day

Endangered Species Research
Inter-Research produces web-hosted publications, with on-line abstracts and many on-line full text articles. The latest journal is *Endangered Species Research*. Others include *Marine Ecology Progress Series, Climate Research, Ethics in Science and Environmental Politics,* and more.
http://www.int-res.com/home/

Enduring Resources for Earth Sciences Education
Enduring Resources for Earth Sciences Education is a database of materials for teaching earth science concepts. Created by teachers and earth scientists, the database includes maps, documents, and other resources for teaching about earthquakes, oceans, plate tectonics, hyrdrothermal systems, geological time, and more.
http://earthref.org/ERESE/

Energy for Keeps – Electricity From Renewable Energy
Energy for Keeps is a comprehensive renewable energy publication for middle and high school education that covers the history, availability, impacts, technologies, and management of the resources that are used to generate electricity. Activities have been correlated to National Science Standards. It is available as a free download from the producers, Educators for the Environment.
http://www.energyforkeeps.org/ .

Energy Lesson Plans and Activities
The Department of Energy offers this K-12 Energy Lesson Plans and Activities website, with 350 lessons on energy efficiency and renewable energy. Organized by grade level and topic, the website allows students and teachers to study biomass, ocean energy, energy efficiency and conservation, and much more
http://www.eere.energy.gov/education/lessonplans/

Energy and Material Cycles Visualizations
Energy and Material Cycles Visualizations, from the Science Education Resource Center at Carleton College, provides animations, images, graphs, and photos on the carbon cycle, greenhouse gases, sea ice, continental drift, and more.
http://serc.carleton.edu/NAGTWorkshops/visualization/collections/Cycles.html

Enforcing U.S. Marine Protected Areas: Synthesis Report
The MPA Center has published *Enforcing U.S. Marine Protected Areas: Synthesis Report*. MPA.gov also hosts a link to the report and a presentation highlighting aspects of the report. The report provides a synthesis of existing information relevant to the enforcement of marine protected areas in the United States, as well as new insights into the current challenges, needs, and suggestions of coastal and marine resource managers, enforcement agencies, education/outreach specialists, and others.
http://www3.mpa.gov/mpa_lib/publications.aspx

Engaging the Public through Communication and Social Science
The Biodiversity Project brings us *Breakthrough Strategies for Engaging the Public: Emerging Trends in Communications and Social Science*. This working draft white paper provides an introduction to some emerging trends in the fields of communications and social science that could benefit public education, engagement, and awareness campaign planners. Drawing from a variety of resources, this paper attempts to address the challenges faced when communicating about biodiversity and our environment.
http://www.biodiversityproject.org/publications.htm

Engineering Disasters: New Orleans
Hurricane Katrina devastated New Orleans, submerging it under a torrent of floodwater. *Engineering Disasters: New Orleans* is a one-hour documentary investigating why the levees and water-pumping system failed in the wake of the hurricane. Follow Geological Detectives as uncover how 80% of the city was left underwater; expose how the levee system was a disaster in the making; and delve deep into the 100-year-old pump system to unearth why it failed and took weeks to drain the city.
http://www.historychannel.com/modernmarvels/?page=home

ENO-Environment Online
ENO-Environment Online is a free, international Internet-based school for teachers and students interested in environmental issues and global education, administrated by the city of Joensuu, Finland. Themes include: local community issues; climate change; ecological footprint; and traditional food. Approximately 250 new English-speaking schools will be selected to become members for the school year 2006 -2007.
http://eno.joensuu.fi/apply/

Environment and Global Climate Change
The University of the Arctic offers an "Introduction to the Circumpolar World" module for students grades 9-12 addressing climate change and potential environmental changes in the Arctic.
http://www.uarctic.org/bcs/BCS100/bcs100_m6.pdf

Environmental Dilemmas in Georgia
This downloadable resource book is intended to serve as a tool for educators who are interested in incorporating problem-solving strategies and contextual teaching/learning into their curriculum. Each contribution provides the background on a specific environmental dilemma found in Georgia and poses a problem for inquiry. Solutions are offered, but the readers should provide more possibilities, and come to a group consensus as to the most viable solution using an evaluation matrix. Covered issues include water, fish, invasive species, urbanization, and much more.
http://www.eeingeorgia.org/net/content/page.aspx?s=49027.0.68.4863

Environmental Education Articles from EETAP
Environmental Education and Training Partnership (EETAP) offers four new articles on key initiatives in environmental education:

- Leading the Way to Environmental Literacy and Quality: National Guidelines for Environmental Education
- EE Certification: Making Best Practice Standard Practice
- Distance Education: A User Friendly Learning Option
- The Roots of Environmental Education: How the Past Supports the Future

http://naaee.org/pages/publications/eetap_newpubs

Environmental Education Capacity Building Publications Survey
The National Environmental Education Advancement Project (NEEAP), funded through Environmental Education and Training Partnership (EETAP), has an online survey that seeks to document the value and use of various EE publications by those involved in EE capacity building efforts at the national, state and local levels. Your time and advice is greatly appreciated.
http://www.uwsp.edu/cnr/neeap/publications/pubsurvey.htm .

Environmental Education Clip Art and Photographs from the EPA
Photos can be worth a thousand words. The Environmental Protection Agency provides links to easily downloadable, environmentally-themed photos and clip art.
http://www.epa.gov/epaoswer/education/photos.htm

Environmental Education Curricula Library
Check out National Environmental Education Week's library of curricular resources. Topics include Amphibians and Reptiles, Birds, Climate Change, and much more. Other resources include green reading, newsletters, funding resources, and more.
http://www.eeweek.org/resources/curricula_library.htm

Environmental Education in Georgia Website
The EEinGEORGIA.org website provides: EE lesson plans based on Georgia's Quality Core Curriculum standards, a searchable directory of Georgia's EE providers and the resources they offer, a statewide calendar of EE events, EE news, and easy-to-access

facts about Georgia's environment. It also hosts an interactive GIS map of EE providers in the state.
http://eeingeorgia.org/net/go/default.aspx?siteid=4863

Environmental Education for Kids
The Wisconsin Department of Natural Resources offers the EEK! website for kids and teachers, grades 4-8. A quick review shows that Nature Notes includes information about habitats and phenology; Our Earth covers water wonders, invasive and endangered species; Career Zones introduces park naturalists and hydrogeologists; and the Teacher Pages have activities and educational resources. The website is formatted for the younger student and includes plenty of useful information.
http://www.dnr.state.wi.us/org/caer/ce/eek/index.htm

Environmental Education in New Zealand Schools
A four-volume report highlighting research on environmental education practice provides lessons for school-based development of New Zealand curriculum for programs in special focus areas, and is meant to serve as a resource for schools who want to develop their own environmental education programs. The report, Environmental Education in New Zealand Schools: Research into Current Practice and Future Possibilities, is from the New Zealand Council for Educational Research and Waikato University.
www.minedu.govt.nz/goto/eereports .

Environmental Education Program, Lee County
Lee County, Florida, stretches from the shell-strewn beaches of Sanibel Island to the deep green of Six Mile Cypress Slough. The long history of the Environmental Education Program includes national recognition and awards from the National Science Teachers Association as one of the ten best Environmental Education programs in the US. Components of the program include the Aquatic Systems/ Mosquito Control program, Estuary Animals and Mudflats field trip, and Six Mile Cypress Slough wet field trip.
www.lee.k12.fl.us/dept/ee/ .

Environmental Education Resources
The National Conservation Training Center's Division of Education Outreach of the U.S. Fish and Wildlife Service (FWS) offers this document online. It 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/resources.html

Environmental Education Works
The EE-works is a service of the National Environmental Education and Training Foundation (NEETF). The website hosts data, studies, and case examples of how environmental education has a measurable impact on environmental protection and improved student learning include better results on standard tests.
http://www.theeeworks.org/ .

Environmental Ethics Curriculum
Environmental Ethics: Examining Your Connection to the Environment and Your Community is a new curriculum geared towards middle and high school. It includes teacher and student guides aligned to national education standards and is organized by

major topics: environmental ethics, air, water, forests, wildlife and minerals. The curriculum guides are free to download. A companion video series is available for a nominal cost.
http://www.envethics.org/

Environmental Film Festival - California
The 2006 Wild and Scenic Environmental Film Festival, *Lights! Cameras! Environmental Action!,* January 13-16, 2006 in Nevada City, California, will feature an array of award-winning films and discussions about restoration projects, climate change, and ocean protection issues.
http://www.wildandscenicfilmfestival.org/

Environmental Film Festival - Washington DC
The 13th annual Environmental Film Festival in the nation's capital, March 10-20, 2005, in Washington, DC, will screen 90 documentary, feature, animated, archival, and children's films. Screenings are enhanced by discussion with scientists and filmmakers, and many are free. The complete film schedule will be posted on the website later this month.
http://www.dcenvironmentalfilmfest.org/index.html

Environmental Health Resources
National Environmental Education Week is continuing to expand their online curricula library and has just added links to lessons on environmental health. Materials range from water and air quality through the spread of infectious diseases to societal issues and much more. While on the website, check out the expanded listing of lessons and other materials in the library, including lessons on climate change and energy, green reading, newsletters, and more.
http://www.eeweek.org/resources/environmental_health_curricula.htm

Environmental History Modules for Teachers
The Environmental Literacy Council, with the support of the National Endowment for the Humanities, has produced a set of professional development modules in environmental history for high school teachers. Their goal is to provide teachers with resources linking fundamental historical concepts to important environmental issues. Modules include War and the Environment; Urbanization; Ordinary Landscapes; and more.
http://www.enviroliteracy.org/subcategory.php/314.html

Environmental History Resources
Professor Jan Oosthoek at the University of Edinburgh maintains this website to provide a range of resources and information on environmental history for the general public and scholars. Resources include bibliographies, essays, annotated guides to other web resources, a news feed, and more.
http://www.eh-resources.org/index.html

Environmental Impacts of Hurricane Katrina
NOAA offers this website with links to some of the projects they are currently working on throughout the region as they assess the marine environmental impacts of Katrina. Projects include assessments of the marine mammal and turtle health, harmful algal blooms monitoring, socioeconomic impact assessment, and more. There is also an interactive GIS mapping link.
http://www.st.nmfs.noaa.gov/hurricane_katrina/

Environmental Inquiry from Cornell University
Environmental Inquiry is a website and curriculum series developed at Cornell University to help students conduct environmental science research and participate in communities of fellow student scientists. Students learn specific research protocols and then conduct interactive research projects. The four-part Cornell Scientific Inquiry Series includes Watershed Dynamics, Assessing Toxic Risk, Invasion Ecology, and Decay and Renewal.
http://www.dnr.cornell.edu/ext/Ext/NATURAL%20RESOURCES%20PUBLICATIONS.pdf
http://ei.cornell.edu/ .

Environmental Literacy Council
The Environmental Literacy Council has assembled top scientists, scholars, economists, and educators to provide direct support to local teachers. Expert advisors provide practical teaching resources in a wide variety of projects, available both in print and online. The website offers the following sections with background information and educational materials: air and climate, land, water, ecosystems, energy, food, environment and society.
http://www.enviroliteracy.org/index.php

Environmental Pathways – Youth Investigating Pollution Issues in Illinois
The Illinois EPA offers *Environmental Pathways – Youth Investigating Pollution Issues in Illinois*, a downloadable teacher's guide for grades 5-6. The guide meets the criteria of NAAEE's Environmental Education Materials: Guidelines for Excellence and is correlated with the Illinois Leaning Standards. The packet is designed to develop critical thinking skills, encourage students to think constructively about environmental issues, and to make informed decisions about our natural resources.
http://www.epa.state.il.us/kids/teachers/environmental-pathways/index.html

Environmental Performance Index
The *Pilot 2006 Environmental Performance Index* provides benchmarks for current national pollution control and natural resource management results. The issue-by-issue and aggregate rankings facilitate cross-country comparisons both globally and within relevant peer groups. It establishes specific targets for environmental performance and measures how close each country comes to these established goals.
http://www.yale.edu/epi/

Environmental Research and Education Needs
The National Council for Science and the Environment has released a new report, Environmental Research and Education Needs: An Agenda for a New Administration. It identifies research needed to improve scientific knowledge, and education needed to improve public understanding, professional capacity, and a strong workforce.
http://ncseonline.org/NCSEconference/

Environmental Science Interactive
Environmental Science Interactive is a set of 14 online laboratories used to complement a traditional lecture course, turning it into a lecture plus lab course. Topics include water resources, atmosphere and climate, policy and decision-making, and much more. For a limited time, they offer free access for instructors.
http://www.webschoolofscience.com/EnvScience.php

Environmental Science Labs and Activities
The Environmental Literacy Council offers labs which have been developed by an experienced team of environmental science educators and subjected to peer review. The content of the collection is varied, and each contains an inquiry-based component. They include a Tragedy of the Commons simulation, air quality monitoring, primary productivity, a coastal resources debate, and more.
http://www.enviroliteracy.org/subcategory.php/243.html

Environmental Science Teacher Exchange
The Environmental Literacy Council's website teacher exchange allows educators to share labs, activities, and ideas with colleagues online. The topics are drawn from the College Board's suggested labs and field investigations for the AP environmental science course. There are lesson plans, classroom curricula, and an AP Environmental Science course outline. Find the marine-oriented offerings under *Teaching Resources*.
http://www.enviroliteracy.org/category.php/17.html

Environmental Science: Understanding Our Changing Earth Curriculum – Request for Pilot Teachers
The American Geological Institute seeks up to 12 experienced science teachers in grades 9 through 12 to pilot test their comprehensive *Environmental Science: Understanding Our Changing Earth* curriculum in the fall semester of the 2004-2005 school year. The draft outline of curriculum and chapter headings are on the website and include watersheds and coastal processes.
http://www.agiweb.org/education/hses/pilottest/index.html .

EPA Kids
The EPA sponsors the Environmental Kids Club to get young children interested in learning more about the environment and to encourage their involvement in environmental projects. The website offers links to many categories, including Air, Water, You & Your Environments, a Game Room, Art Room, and more.
http://www.epa.gov/kids/

EPA Office of Solid Waste Educational Resources
This site provides materials to help develop an increased knowledge of solid waste issues and inspire participation in environmental activities. The site includes activities and project ideas to learn more about waste reduction, reuse, and recycling. Information sources, tools, and data enable student researchers to collect environmental information for use in projects and reports. Curriculum, activities, games, student award and grant information, and career information are also provided.
http://www.epa.gov/epaoswer/education/index.htm

EPA Public Involvement Tools and Techniques Website
The US Environmental Protection Agency's public involvement web pages have been expanded to include new materials and links to useful information about tools and techniques in use all over the world. The site also includes a new feedback section with ready-to-use surveys. In addition, the Public Involvement Resources and Training database, previously on EPA's Intranet, is now publicly available for use.
http://www.epa.gov/publicinvolvement

EPA Science Notebook
The EPA Science Notebook website showcases EPA science and scientists using assorted multi-media, including science blogs, videos, interviews, and more. A scientist's notebook is home to ideas, questions, drawings, and data and offers information about the scientific process. The website aims to make scientists and their research more accessible, understandable, and interesting to the public.
http://www.epa.gov/sciencenotebook/

EPA Water Quality Booklet
The kids' water quality booklet, *What's Up with our Nation's Waters?* (EPA 841-F-02-002), is ready for distribution. Order individual copies from NSCEP at 1-800-490-9198 or request larger quantities by email at ncepiwo@one.net. The website highlights earlier versions.
http://www.epa.gov/owow/monitoring/nationswaters/

EPA Water Webpage for Kids
A new Kids Page has debuted on the Environmental Protection Agency's Office of Water website. The site contains games, activities, and animated classroom experiments, following along with a new character called "Thirstin". Teachers and students can work on-line or download some of the information for classroom use. Check out the interactive water cycle, and the *Aquifer in a Cup* activity.
http://www.epa.gov/safewater/kids/index.html

Erase the Waste Action Kit
From the California State Water Resources Control Boards' comes the Erase the Waste campaign, providing a number of resources and information on simple every day actions steps to stop pollution at the source. It includes tips on creating a trash-free cleanup event, adopting your local park or neighborhood as a trash-free zone. Also included are materials about pollution prevention, sample media materials, and a directory of additional resources. Available in English, Spanish, Chinese, Korean, and Vietnamese.
http://www.erasethewaste.com/ .

ESRI Map Book Offer
ESRI, a GIS software company, offers copies of the ESRI Map Book Volumes 16 and 17 for the cost of shipping only, $3.00 per book. Volume 16, *Geography—Creating Communities*, reproduces color digital maps produced in 2000, including images of seafloor topography and geologic analysis of Mars and Venus. Volume 17, *Geography and GIS--Sustaining Our World* features stories from more than 20 disciplines.
bmanion@esri.com

Essential Science for Teachers from the Annenberg/CPB Channel
Life Science, premiering March 3rd on the Annenberg/CPB Channel, is the first in a three-part course series *Essential Science for Teachers*. These courses help K-6 teachers understand science concepts needed to teach a standards-based curricula. Real-world examples, demonstrations, animations, still graphics, and interviews with scientists enrich content segments. Upcoming modules includes *Variation, Adaptation, and Natural Selection*; *Material Cycles in Ecosystems*; and others.
http://www.learner.org/redirect/february/lifescience1.html .

Essentials of Geology
Designed to complement a geology textbook, this website includes animations, interactive crossword puzzles, and news articles; many of the materials can be used as stand-alone exercises. The animations cover the Earth's magnetic field, the spread of the sea floor, the formation of ocean crust, and more.
http://www.wwnorton.com/college/geo/egeo/welcome.htm

Establishing Marine Protected Area Networks
The IUCN World Commission on Protected Areas (WCPA-Marine) has released a new guidebook summarizing key points in building MPA networks. The 16-page guide, *Establishing Marine Protected Area Networks: Making It Happen*, offers a concise synopsis of factors necessary for effective network design, including ecological criteria, best practices for planning, and other considerations. It is intended to show briefly how to transform policy aspirations into practical action, and is not meant to be exhaustive. A full technical report to flesh out the summary report's framework is expected to be released later in 2007.
http://www.iucn.org/themes/wcpa/biome/marine/mpanetworks/networks.html

Establishing Resilient Marine Protected Area Networks
Establishing Resilient Marine Protected Area Networks - Making It Happen is a new document that provides guidance for designing and implementing effective MPA networks. The guide contains information for MPA planners, managers, and conservation practitioners about the role of MPA networks in achieving marine conservation goals.
http://blog.protectplanetocean.org/2008/10/new-global-best-guidance-released-on.html

Estuaries 101 Curriculum
NOAA's National Estuarine Research Reserve System offers Estuaries 101, an on-line science curriculum designed for grades 9-12 classrooms. Students learn fundamental concepts in science, develop scientific thinking skills, and explore the nation's biologically rich and economically important estuaries. From flying over an estuary with Google Maps to tracking the path and impact of a hurricane, Estuaries 101 modules feature hands-on learning, experiments, field-based activities, and data explorations.
http://www.estuaries.gov/estuaries101/Teachers/Home.aspx

Estuaries and Coasts, Hurricane Edition
Estuaries and Coasts, the Journal of the Estuarine Research Federation, volume 29(6A) is dedicated to papers about the individual and cumulative effects of hurricanes on coastal ecosystems. The special issue is open access. In addition, many other full text articles from other issues are available on the website for free.
http://estuariesandcoasts.org

Estuaries Discovery Kit
NOAA's National Ocean Service Communications and Education Division offers the Estuaries Discovery Kit. The kit explores how estuaries are classified, the various ecosystem services estuaries perform, how organisms have adapted to estuarine environments, human impacts, and the work that the National Estuarine Research Reserve System and its partners conduct to monitor, preserve, and restore estuarine ecosystems throughout the United States.
http://oceanservice.noaa.gov/education/kits/estuaries

Estuaries.Gov
The revamped Estuaries.Gov site is a hub for exploration and discovery of our nation's estuaries. In addition to the Estuaries 101 Curriculum and links to other educational materials, students and educators can access videos; animated interpretations and other easy-to-use visualizations; fact sheets on threatened estuarine species, including a picture of the species, a range map, quick facts, conservation notes, and life history information; scientific and educational reports; and estuarine news.
http://www.estuaries.gov/

Estuarine Geospatial Data
NOAA offers downloadable data sets to help your students study estuaries around the U.S. Check out Estuarine Bathymetry and the Coastal Geospatial Data Project, offering bathymetric data sets, shorelines, salinity, shellfish growing areas, and more.
http://estuarinebathymetry.noaa.gov/
http://coastalgeospatial.noaa.gov/

Estuary Condition Reports
The National Estuary Program Coastal Condition Report presents the condition of 28 estuaries covered by National Estuary Program (NEP) based upon data collected as part of EPA´s National Coastal Assessment program and data collected by individual NEPs or by NEPs in partnership with interested stakeholders, including state environmental agencies, universities, or volunteer groups. The National Coastal Condition Report series describe the condition of 100% of all estuaries in the contiguous 48 states.
http://www.epa.gov/owow/oceans/nepccr/index.html

EstuaryLive! 2009
EstuaryLive! will take place May 1 and May 15, 2009 with an annual, free, live, interactive, field trip through our nation's estuaries. This year's program will feature six 30-minute segments broadcasting live from three of NOAA's National Estuarine Research Reserves. The broadcasts will include a discussion of the impacts of global climate change on our coastal ecosystems. For those who can't watch the live broadcasts, check out the archives. Share your projects on the estuary wiki, and check out the extensive archives and video collection. Make sure to check your technology connections beforehand, to make sure you can join the full broadcast.
http://estuarylive.pbworks.com/
http://www.estuaries.gov/

EstuaryLive 2006
Preparations have begun for the September 29, 2006 EstuaryLive Internet broadcast, and educators are invited to sign up for this year's event. EstuaryLive is hosted by the National Estuarine Research Reserve (NERR) System in collaboration with the National Estuary Programs. This year four field trips will be offered:

- New York - New Jersey Harbor Estuary Program, New Jersey
- Padilla Bay NERR, Washington State
- Peconic National Estuary Program, Long Island, New York
- South Slough NERR and Tillamook Bay National Estuary Program, Oregon

www.estuaries.gov

Estuary Live: 2004
National Estuaries Day is a Coast Week celebration to promote the importance of estuaries and the need to protect them. This year's program will include field trips to seven estuaries: Puget Sound, Slough Slough, Weeks Bay, Rachel Carson Reserve, Great Bay, Peconic Estuary, and Waquoit Bay. Visit the website for the education topics and standards; additional information and teaching materials will be posted soon.
www.estuaries.gov .

Estuary Live! 2003
National Estuaries Day, an interagency campaign to promote the value of estuaries and the need to protect them, was celebrated September 27, 2003. The feature event for National Estuaries Day is *EstuaryLive*, an interactive Internet journey through estuaries for students of all ages. Naturalists and students tour different estuaries, and web participants interact with the tour guides by emailing questions during the field trips.
www.estuaries.gov and http://www.estuarylive.org/

Estuary Live - Celebrate National Estuaries Day 2004
Take your students on a tour of estuaries of the United States by participating in the EstuaryLive interactive webcast. National Estuaries Day, September 25, 2004, is an annual celebration of the magical places where fresh water from rivers mix with salt water from the ocean. EstuaryLive kicked off the celebration on September 23 and 24 by bringing free, live, interactive, Internet field trips in seven different estuaries around the country right to your classroom.
www.estuaries.gov

Estuary Live! 2005
Take a live, interactive virtual field trip to the Rachel Carson Site of the North Carolina National Estuarine Research Reserve with a trained naturalist as your guide via a live Internet connection. Visit four uninhabited islands and salt marshes located off Beaufort, North Carolina, May 3-5, 2005. The broadcast will feature topics including blue crabs, oysters, water quality, coastal geology, weather, decoy carving, and sand sculpture. Lesson plans and images are available on-line.
http://www.estuarylive.org/

EstuaryLive 2005
Celebrate National Estuaries Day by taking a free, interactive field trip over the Internet on September 22 and 23, 2005. Naturalists from the National Estuarine Research Reserve System and the National Estuary Programs will take participants on guided tours through:

- Tillamook Bay National Estuary Program, Oregon
- New York-New Jersey Harbor Estuary Program, New Jersey
- Grand Bay National Estuarine Research Reserve and Mobile Bay National Estuary Program, Alabama
- Jacques Cousteau National Estuarine Research Reserve and Barnegat Bay National Estuary Program, New Jersey
- San Francisco Bay National Estuarine Research Reserve, California

http://www.estuaries.gov/elive.html

EstuaryLive 2006
Tune into EstuaryLive on September 29, 2006. This year's field trips will feature segments on crabs, salmon, turtles, birds, salt marshes, habitat restoration and much more. The broadcast schedule for this year's field trips will be as follows (all times are EST); archives will also be available for these and previous field trips:

- Peconic National Estuary Program, New York, 11:00 am-12:05 pm
- New York - New Jersey Harbor Estuary Program, New York, 12:10-1:15 pm
- South Slough NERR and Tillamook Bay National Estuary Program, Oregon, 1:20-2:25 pm
- Padilla Bay NERR, Washington State, 2:30-3:35 pm

http://www.estuaries.gov

Estuaries Discovery Kit and Tutorial
The Estuaries Discovery Kit, from NOAA's National Ocean Service and National Estuarine Research Reserve System educators, contains a 12-page tutorial on estuarine habitats, the threats facing them, and efforts to monitor and protect estuaries nationwide. The tutorial includes photographs, videos, illustrations and interactive graphics to enhance the text and bring understanding to concepts that may be difficult to visualize. A roadmap provides additional links to online data resources and formal lesson plans.
http://oceanservice.noaa.gov/education/kits/estuaries/

Estuaries SciGuide
The Estuaries SciGuide is an on-line resource which can help your students discover why estuarine environments are so unique; how they interact with the surrounding environment; the effects humans and estuaries have on each other; and more. The SciGuide can save you time by providing resources that have been pre-evaluated and aligned to the National Science Education Standards. The Estuaries SciGuide is free; registration is required.
http://learningcenter.nsta.org/product_detail.aspx?id=10.2505/5/SG-21

EurekaAlert! Marine Science Portal
The American Association for the Advancement of Science (AAAS) has an online news service called EurekAlert! The online Marine Science Portal includes a calendar of events, links to marine science resources, press releases, and more. It offers marine science information from universities, research institutes, and other organizations engaged in all aspects of marine science research.
http://www.eurekalert.org/marinescience/ .

Every Drop Counts
Facing the Future presents *Every Drop Counts*, a series of water-related lessons beginning with a water trivia game and a short demonstration of how much of Earth's water is available for human and other species' needs. The series includes a "water walk" and a personal water-use audit. It is designed for use in middle and high school classrooms and is available as a free download. Check out the other free materials on the website.
http://www.facingthefuture.org/Curriculum/DownloadFreeCurriculum/tabid/114/Default.aspx

Excellence in Environmental Education – Guidelines for Learning
NAAEE has revised and reprinted Excellence in Environmental Education – Guidelines for Learning (Pre K-12) and its companion publications, Excellence in Environmental Education – Guidelines for Learning (Pre K-12) Executive Summary and Self Assessment Tool. The guidelines provide a common framework for promoting environmental literacy and support state and local environmental education efforts by setting expectations for performance and achievement in grades 4, 8, and 12.
http://naaee.org/pages/npeee/

Expedition: Blue Planet
Expedition: Blue Planet highlights a journey across 5 continents to explore critical water issues, focusing both on water itself and our connection to water issues around the world. The website includes blogs, photos, and more.
http://www.alexandracousteau.org/

Expedition Chesapeake
On June 24, 2005, a group of students from Rockingham County, Virginia, embarked on a unique, educational, 30-day journey with the Chesapeake Bay Foundation. Sixteen upcoming juniors and seniors from Turner Ashby High School are paddling 355 miles, from their home town at the beginning of the South Fork of the Shenandoah River to Tangier Island, Virginia. Follow the journey online through the students' own journal entries and photographs, posted and updated regularly on the website.
www.baybound.org

Expedition to the Deep Slope
Now available on NOAA's Ocean Explorer website is the *Expedition to the Deep Slope* mission, the first systematic exploration of hydrocarbon seep communities deeper than 1000 meters in the Gulf of Mexico. The scientific team includes geologists and geochemists working alongside microbiologists, physiologists, and ecologists to maximize what can be learned about the deep Gulf of Mexico cold seeps and coral communities.
http://www.oceanexplorer.noaa.gov/explorations/06mexico/welcome.html

Expedition to the Deep Slope 2007
The 2007 Expedition to the Deep Slope expedition, June 4-July 6, 2007, continues the exploration and study of hydrocarbon seep communities deeper than 1000 meters in the Gulf of Mexico. Funded by the Minerals Management Service, a leader in supporting the scientific characterization of seep communities in the Gulf of Mexico, and the NOAA Ocean Exploration program, a diverse team of scientists will be using the ROV Jason II and the NOAA ship *Ronald Brown*.
http://www.oceanexplorer.noaa.gov/explorations/07mexico/welcome.html

Expedition to the Remote Northwestern Hawaiian Islands
Scientists conducted an expedition to the Papahanaumokuakea Marine National Monument from July 7-31, 2007. Researchers tagged apex predators such as jacks, sharks, and grey snapper, conducting movement studies. The research will help inform management of this marine national monument, by studying the health of the coral reef and inhabitants in this remote ocean wilderness. Check out the educational resources.
http://www.hawaiianatolls.org/research/July2007/index.php

Expedition Susquehanna
The month-long journey by canoe highlighted the role that the vast Susquehanna River, the largest tributary of the Chesapeake Bay, plays in the health of the nation's largest estuary. The Chesapeake Bay Foundation offers the on-line WebQuest, Expedition Susquehanna, where students can virtually paddle alongside the expedition crew on a journey 444 miles from the Susquehanna River's headwaters in Cooperstown, New York to the Chesapeake Bay in Maryland to investigate water quality and land use.
http://www.cbf.org/site/PageServer?pagename=back_pa_expsuskie_expedition

Expert Voices Weblog
The National Science Digital Library Expert Voices site provides the latest science news straight from the source: scientists. Expert Voices is a weblog site for experts in STEM and a forum for educational discussion about the latest STEM news. Moderated conversations are designed to tie NSDL resources to science news and add context for resources that enhance discovery, selection, and use.
http://expertvoices.nsdl.org/

Exploration through Navigation Challenge
In the Fall 2008 NASA Quest Challenge, students will first be tasked to chart a course from the Big Island of Hawai'i to Rapa Nui (Easter Island) using ocean navigation skills that were used in early Polynesian exploration. In Part II of the Challenge, students will be tasked to chart a course from Kennedy Space Center at Cape Canaveral, Florida to one of the lunar poles using navigation skills appropriate for outer space. See the website for an educator guide and much more.
http://quest.nasa.gov/challenges/lcross2/index.html

Explorations Into Water Teaching Curriculum
Rain Bird's Explorations Into Water Teaching Curriculum is an educational tool providing teachers and parents with lesson plans and related course work geared to students in grades 3-6. This downloadable elementary curriculum motivates students to think about the part each person plays and the actions they can take in using and conserving water, through hands-on outdoor activities and classroom demonstrations.
http://www.rainbird.com/iuow/community/curriculum.htm

Explorations@Scripps
The Scripps Institution of Oceanography offers a monthly e-newsletter with multimedia, archives of ocean and earth science information, feature articles, and more.
http://explorations.ucsd.edu/@Scripps/

Exploratorium Webcast from the South Pole
The Exploratorium will host a series of webcasts from the South Pole where astrophysicists and engineers are installing a new 10-meter telescope. The webcasts begin November 25, 2006 and continue through the end of December. They also offer an e-newsletter to stay informed of Exploratorium webcasts and other events. The Digital Assets Archive offers digitized museum materials related to exhibits and scientific phenomena, including images, educational activities, QuickTime movies, and more.
http://exploratorium.edu/index.html

Explore! Ice Worlds
Developed by the Lunar and Planetary Institute and funded by NASA, *Explore! Ice Worlds* is a suite of activities designed for children ages 8-13 in celebration of the

International Polar Year. All activities are tied to National Science Education Standards and use inexpensive, easy-to-find materials. Free webcast training in using these activities will be available in February and March 2009 for 4 hours.
Contact Katy Buckaloo at buckaloo@lpi.usra.edu to register for the training.
http://www.lpi.usra.edu/education/explore/ice/activities/

Explore the World with Shorebirds
Explore the World with Shorebirds educators' guide is the curriculum for the Shorebird Sister Schools Program, an internet-based conservation education program designed for educators and their students. The content of *Explore the World with Shorebirds* includes chapters on connecting cultures, a shorebird primer, classroom activities, and field trip planning. Activities found within the guide are correlated with the National Education Standards in the United States. The *Explore the World with Shorebirds* CD-ROM is free.
http://sssp.fws.gov

Exploring Biodiversity: A Guide for Educators around the World
Conservation International provides *Exploring Biodiversity: A Guide for Educators around the World,* developed to introduce basic concepts of biodiversity conservation, support educator training, and inspire and guide the development of local biodiversity education materials. Adapted from the World Wildlife Fund curriculum Biodiversity Basics, this guide offers background information on biodiversity conservation as well as hands-on activities for teachers and non-formal educators to implement with students.
http://www.conservation.org/xp/CIWEB/programs/awareness/education/

Exploring Climate Change Impacts Curriculum Guide
The Union of Concerned Scientists has produced a *Global Warming: Early Warning Signs* map and teaching materials geared towards students and teachers in grades 9-12, exploring the local and regional consequences of global climate change.. Individual exercises are adaptable to different grade levels and engage students in an exploration of the impacts of global climate change on ecosystems and natural resources.
http://www.climatehotmap.org/ .

Exploratorium: Microscope Imaging Station
The Microscope Imaging Station from the Exploratorium offers a door to the wonder of the microscopic world. Visitors can view images from sea urchins, zebrafish, and more. Each feature includes images of the cells, along with complete background material on the work that is being done through the use of these high-powered images. The Gallery offers high-resolution images and movies created with research-grade microscopes. The website also includes classroom activities, printable flipbooks, and more.
http://www.exploratorium.edu/imaging_station/index.php

Exploring Data
The Exploring Data website makes understanding statistics a bit easier for students, teachers, and researchers needing a review. The site is easy to navigate, with an index of topics and materials on the home page ranging from linear regression to sampling. Each of these sections includes activities, worksheets, and datasets that can be used in a variety of ways. The site includes both introductory and advanced materials.
http://exploringdata.cqu.edu.au/

Exploring the Environment
The Exploring the Environment online series, featuring an integrated approach to environmental earth science through modules and activities promotes science-literate and reflective students who are knowledgeable of the earth's processes and their responsibilities for stewardship. The series provides students with tools to investigate scientific, social, political, and cultural aspects of controversial, authentic environmental problems. Standard problem-solving models, online resources that include relevant satellite imagery, and recommendations for extended inquiry are available. Modules include Severe Weather: Hurricanes!, Coral Reefs, Florida Everglades, Earth on Fire, and much more. The teacher pages include teacher support, module notes, information about planning and assessment, software, and links to additional websites.
http://www.cotf.edu/ete/

Exploring Environmental Issues: Biodiversity
Exploring Environmental Issues: Biodiversity was developed by Project Learning Tree in partnership with the World Wildlife Fund. This module uses biodiversity as a window through which secondary students investigate the environment. It permits educators and students to step back from specific issues and species and instead, examine broader concepts and larger connections - not just biological, but political, cultural, ethical, and economic as well.
http://plt.org/cms/pages/21_21_16.html

Exploring the Inner Space of the Celebes Sea
NOAA's Ocean Explorer traveled to the Inner Space of the Celebes Sea, unexplored waters south of the Philippine Islands, September 27-October 16, 2007. Lying just north of the equator, the Celebes Sea is the center of the most biologically diverse area of the world's ocean. Internet coverage includes Speciation, Midwater Technology, Bluewater Diving, Marine Conservation, and Sea Surface Temperature content essays written especially for this mission.
http://oceanexplorer.noaa.gov/explorations/07philippines/welcome.html

Exploring the Northwestern Hawaiian Islands
Explore the Northwestern Hawaiian Islands through the eyes of graduate students as they study marine conservation in the remote, restricted Papahānaumokuākea Marine National Monument of the Northwestern Hawaiian Islands and spend three days learning about environmental issues on Oahu. The students offer blogs, photos, and videos from their trip, which took place January 13-25, 2008.
http://www.nicholas.duke.edu/hawaii

EXPLO.TV
This website is the video component of the Exploratorium: Museum of Science, Art and Human Perception in San Francisco. This site offers webcasts, podcasts, and video clips, with many in the Ice Stories series - dispatches from polar scientists. You can browse by subject, category, and much more.
http://www.exploratorium.edu/webcasts/index.php

Extreme 2004: Expedition to the Deep Frontier
University of Delaware marine scientists will lead *Extreme 2004: Expedition to the Deep Frontier*, from November 30-December 20, 2004, a National Science Foundation expedition to hydrothermal vents in the Pacific Ocean. Middle- and high-school classrooms are invited to join via a virtual field trip. The University of Delaware will offer

participating teachers free classroom materials about the deep sea, including student resource guides, curricula, a video, and more.
http://www.ocean.udel.edu/expeditions .

Extreme 2003: To the Depths of Discovery
This website from Delaware Sea Grant highlights an expedition from November 29 - December 21, 2003. Expanded curricula have been developed for both middle and high school, and a new evaluation is in place.
http://www.ocean.udel.edu/extreme2003

Extreme Virtual Expeditions
Explore foreign and domestic seas or the deep ocean with a virtual expedition linked from the Bridge. In the past few weeks, we have seen teachers working with researchers in and around the Aquarius underwater habitat and an extreme deep sea adventure to the hydrothermal vents on the floor of the Pacific Ocean. Most of these virtual expeditions have daily blogs from the scientists, researcher profiles, video and pictures, lesson plans, and more.
http://www2.vims.edu/bridge/search/bridge1output_menu.cfm?q=expedition
http://www.marine-ed.org/bridge

The Eyes of Nye
This new series from Bill Nye (the science guy), *The Eyes of Nye*, is geared toward older children and adult viewers. It provides a more in in-depth look at science topics that are making news, changing lives, and impacting policy. Episodes began airing on public TV in April, and include population and climate change. The website offers links to additional content, information about scientists featured in the episodes, and more
www.eyesofnye.org

Facing the Future Activities
Facing the Future's new lesson book for middle and high school teachers, *Engaging Students through Global Issues: Activity-Based Lessons and Action Projects*, is a companion to Facing the Future's student texts. Designed to help students understand complex global issues and sustainable solutions, the lessons cover a range of topics including biodiversity and global health. Many of the lessons are available to download from the website, including water-related lessons, Fishing for the Future, games, and more.
www.teacherscorner.org/activities

Factbook of Economic, Environmental, and Social Indicators
The online version of the Organization for Economic Co-operation and Development (OECD) Factbook 2005 of economic, environmental and social indicators for the world's core economies is available. The chapters include environment, science and technology, and education.
http://new.SourceOECD.org/factbook

The Failure of Environmental Education (and How We Can Fix It)
In this article, authors Daniel T. Blumstein and Charlie Saylan argue that it is time for the environmental education community to take stock of itself. They suggest ways that an "evidence-based" approach can improve environmental education and that to create environmentally aware citizens, some difficult lessons must be taught.
http://biology.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pbio.0050120

Farming the Seas
Habitat Media, the California-based non-profit media production house, creators of *Empty Oceans, Empty Nets*, is offering *Farming the Seas* to marine and environmental educators, zoos and aquariums for screening at upcoming events during the summer and fall of 2004. *Farming the Seas* explores what's at stake as the aquaculture industry spreads across the globe. The film highlights ground-breaking efforts by scientists, communities and industry to develop viable, sustainable operations.
www.habitatmedia.org .
rivkahbeth@habitatmedia.org .

Federal Education Digital Resources Library
The Federal Education Digital Resources Library (FEDRL) features a collection of free science and mathematics education resources. The site provides descriptions of a range of online materials that were developed with U.S. Department of Education or National Science Foundation funding. These materials include lesson plans, magazine articles, student resources, and materials for teachers' professional development.
http://encdl.org/search/simple/0,5046,,00.shtm .

Federal Resources for Educational Excellence
Federal Resources for Educational Excellence (FREE) has been redesigned with improved navigation. The site links to over 1500 teaching and learning resources available from the federal government. The Earth Sciences section offers quick links to resources on oceanography, climate change, and the environment, while Life Sciences offers zoology, botany, and more.
http://free.ed.gov

Federal Science Website
A federal website makes scientific information gathered by different agencies accessible to the public. The site is an offshoot of Firstgov.gov, housing information under one roof from the multiple agencies that perform scientific research.
www.science.gov

Feet Wet, Hands Dirty
The book *Feet Wet, Hands Dirty: Environmental Projects in Maryland Public Schools,* highlights 15 different elementary school student-developed environmental projects. Maryland's EE program provides students with the opportunity to investigate environmental issues and take action to preserve or restore the environment. The website offers a preview of the first 15 pages of the book.
http://www.blurb.com/bookstore/detail/111841

FEMA for Kids Website
For younger kids, check out this website for games, challenges, quizzes, and information on dealing with disasters. It also has resources for parents and teachers.
www.fema.gov/kids

FerryMon
The FerryMon (ferry monitoring) project installed oceanographic instruments on ferries traversing Pamlico Sound in North Carolina. Ship-board instruments allow ferries to take water samples every three minutes, monitoring changes in environmental conditions as they happen and providing the continuous environmental information about the surface

waters of the sound. Information is sent from ferries to a laboratory via cell phone line, and then converted to graphs for a wide range of users, including educators.
http://www.unc.edu/ims/paerllab/research/ferrymon/index.html

FGBNMS Mapping Tool
Flower Garden Banks National Marine Sanctuary (FGBNMS) offers an online GIS-based mapping tool of the sanctuary through a Google-based map. The interactive page includes information about a number of reefs and banks of the northwestern Gulf of Mexico. One notable feature is the incorporation of ROV (Remotely Operated Vehicle) tracks with associated photos. While only one dive track has been uploaded to date, others will be added in the future.
http://flowergarden.noaa.gov/news_events/gismaparticle.html

Field Guide to the Future
Field Guide to the Future is a practical, step-by-step manual describing methods that can help communities think ahead and prepare for changes in their environment and natural resources. The authors have collaborated with communities in the management of forests, land, and water in many parts of the world, but particularly in tropical forest margins. In this manual they share their experiences and lessons learned about methods that can help communities prepare for the future. Spanish and French translations will be available late 2006 or 2007.
Contact Sandra Velarde at s.velarde@cgiar.org

Field Guide to the Monterey Bay National Marine Sanctuary
The Monterey Bay National Marine Sanctuary offers the downloadable *Field Guide to the Monterey Bay National Marine Sanctuary*. The guide was designed for use by both visitors to and residents of communities adjacent to the marine sanctuary as a travel guide or for educational purposes. The guide includes information on each sanctuary habitat, as well as descriptions and photographs of the some of the sanctuary's most commonly seen marine wildlife and the best times of the year to view them.
http://montereybay.noaa.gov/reports/2006/fieldguide/welcome.html

Field Guide to Tidal Wetland Plants
The University of Massachusetts Press offers "Field Guide to Tidal Wetland Plants of the Northeastern US and Neighboring Canada". The book emphasizes plant identification and provides simple, easy-to-use keys and descriptions for identifying over 700 species found in the region's salt and brackish marshes, tidal freshwater marshes and swamps, tidal flats, rocky shores (including dominant algae), beaches, and coastal ponds.
http://www.umass.edu/umpress/spr_08/tiner.htm

Field Trip Earth
Field Trip Earth focuses on field-based wildlife conservation research projects ongoing around the world. All of the projects provide classrooms and others around the world the opportunity to interact meaningfully with wildlife researchers and other conservation experts. Students can read researchers' field diary entries, direct questions to the researchers, watch video taken in the field, and more. Information is available for sea turtles, waterfowl, and more.
http://www.fieldtripearth.org/

Fifty Facts about Wider Caribbean Coral Reefs
Compiled for the International Year of the Reef, *Fifty facts about Wider Caribbean Coral Reefs* offers interesting facts about coral reefs and human impacts in the wider Caribbean. There are also links to additional resources, news, events, and more.
http://www.iyor.org/focalpoints/orgs/unep-car/Caribbean_Coral_Reefs.asp

Financing Protected Area Publications
The World Conservation Union (IUCN) World Commission on Protected Areas website offers several publications on the financing of protected areas. Downloadable documents include *Sustainable Financing of Protected Areas: A global review of challenges and options; Financing Protected Areas - Guidelines for Protected Area Managers;* and *Guidelines for Tourism in Parks and Protected Areas of East Asia.*
http://www.iucn.org/themes/wcpa/pubs/subject/financing.html

Find-a-Photo Website
USDA Forest Service's Find-a-Photo website offers the NatureWatch, Wildlife, Fish, and Threatened and Endangered Species Program's Photograph Library. Find-a-Photo allows you to access thousands of copyright free wildlife, fish, wildflower, and environmental education photographs. Check back often since new photographs are being added quite frequently. These copyright-free photographs are available for non-profit use; please credit the photographer.
http://wwwnotes.fs.fed.us:81/wo/wfrp/find_a_photo.nsf/

Finding Coral Expedition
A team of scientists took part in a two-week-long expedition funded by the Living Oceans Society, June 9-23, 2009, designed to study deep sea corals in the North Pacific off the west coast of Canada and document threats to their well being. The interactive website includes background information, expedition logs, video, maps, and much more.
http://findingcoral.com/

Fire Education Resources
The National Wildfire Coordinating Group Wildland Fire Education Working Team has recently completed a reference document to fire education products which are available on the web or through the symbols cache.
http://www.myfirecommunity.net/NeighborhoodPosts.aspx?ID=468&Topic=1820&Category=1

Fire eFieldTrip
The Bureau of Land Management has sponsored an eFieldTrip on Fire's Role in Ecosystems: A Hot Topic! The trip takes place from the National Interagency Fire Center in Boise, Idaho. The program has four major components: a virtual visit, a trip journal worksheet, ask the experts, and a live webchat. Archives of the questions and answers are posted on the website.
www.eFieldTrips.org

Fire Information and Education
The Wildland Fire Lessons Learned Center on-line Advances in Fire Practice has posted a Special Issue, *Fire Information and Education: A New Message for New Challenges*. Articles illustrate the value of innovative approaches to communicating with the public: using different communication styles, using windows of opportunity, and providing

information in terms people can understand; and much more about fire education and outreach.
http://www.wildfirelessons.net/AFP.aspx?Page=AFPOverview

Fire Management - Learning From the Experts
Fire Management - Learning From the Experts captures the experience of seasoned employees who are acknowledged by their peers to have high expertise in planning and implementing fire programs. Topics include fire behavior prediction, high reliability organizing, stories, and more.
http://www.wildfirelessons.net/Additional.aspx?Page=124

Fire & Smoke
A new NASA Fire and Smoke website shows latest fire views and research. Satellites, aircraft, and research know-how have created numerous cutting-edge tools to help firefighters battle wildfires and scientists understand the impact of fires and smoke on Earth's climate and ecosystems. This website brings the latest information to the public. The site is includes images of fires and their associated smoke plumes in the United States and around the world as well as articles and multimedia resources.
http://www.nasa.gov/mission_pages/fires/main/index.html

FIRESafe Marin
Firesafe Marin is a non-profit organization dedicated to reducing wildland fire hazard and improving fire safety awareness in Marin County. They foster community involvement by building partnerships and providing resources for mitigating fire danger. The website includes a survival guide, firewise plant list, a teacher's guide, and additional information.
http://www.firesafemarin.org/index.html

Firestorm!
The Environmental Literacy Council offers teaching materials to help high-school and middle-school educators teach about forest fire management. The modules, *Firestorm: Thinking Critically about Environmental Issues*, use a fictionalized controversy about the role of prescribed burning in forest management to teach the process of making important decisions about the environment through a role-play exercise. Acting as community stakeholders, students learn to gather and analyze information.
http://www.enviroliteracy.org/article.php/1279.html

Fish of the Great Lakes
The University of Wisconsin Sea Grant Institute has developed this website for the Fish of the Great Lakes. The website includes a downloadable version of George C. Becker's text *Fishes of Wisconsin*, profiles of the major fish species in the Great Lakes, information about fish anatomy, and even tips for safe cooking and eating. The Kids' Page includes a fish quiz, glossary, and more.
http://www.seagrant.wisc.edu/greatlakesfish/

Fish and Habitat Photos
NOAA's National Center for Coastal Monitoring and Assessment hosts on-line photos of reef fish, reef habitat, and aerial images from Hawai'i and the U.S. Virgin Islands. The fish photo website offers the ability to select by location, date, and type of fish.
http://www8.nos.noaa.gov/biogeo_public/

Fish Kids
EPA's National Fish Advisory Program has released this new Fish Kids website, using interactive stories and games to teach students ages 8-12 about contaminants in fish and fish advisories. Whether they catch their own fish or buy it at a store, kids and their families can use this site to learn how to choose fish wisely.
http://www.epa.gov/fishadvisories/kids/

Fish Olympics
This interactive website allows kids to learn about different species of fish and their areas of expertise. It's up to the students to guess who the winners will be in each of 4 categories, based on what they learn as they go.
http://www.liverpoolmuseums.org.uk/nof/fish/index.html

Fish Research of Interest to Students
Use the article at this website when you want to show your students you can be on the same "wav"-length as they are. Scientists studying underwater fish acoustics have identified another possible mechanism herring use to communicate.
http://www.newscientist.com/news/news.jsp?id=ns99994343

Fish Species Identification and Data Programme
The UN's Food And Agriculture Organization (FAO) website for [fish] Species Identification and Data Programme is set up to improve the identification of marine organisms of actual and potential interest to fisheries, provide tools, and improve fisheries data quality. The website has species identification publications, regional guides, fact sheets, species distribution maps, and more. Many of the publications are downloadable.
http://www.fao.org/fi/SIDP>http://www.fao.org/fi/SIDP .

FishBase
FishBase, developed by the WorldFish Center in collaboration with the UN Food and Agriculture Organization (FAO), is a global source for research on living aquatic resources. The site contains information on 28,400 fish species, as well as 35,900 pictures and 32,800 references. Check out the quiz section.
http://www.fishbase.org/home.htm .

Fisheries and Aquatic Resources
The National Biological Information Infrastructure Fisheries and Aquatic Resources website provides information about managed fish populations throughout the U.S., as well as watershed-based data and state-by-state fishing resources. Learn about freshwater and marine fishes, aquatic invertebrates, water quality and habitats, and dams and fish passage. Make sure to check the teacher resources.
http://far.nbii.gov/

Fisheries Law Enforcement and National Bio-Fact Loan Program
NOAA Fisheries Service's Office for Law Enforcement has redesigned it website to provide one location for information about the office and its protection and conservation of our nation's living marine resources. The site has useful information about marine conservation laws, public awareness campaigns, and enforcement activities. Of special note for educators is the National Bio-Fact Loan Program, which can be found under the COPPS (Community Oriented Policing and Problem-Solving) link.
http://www.nmfs.noaa.gov/ole/ole_about.html

Fisheries Learning on the Web
Project FLOW is a Great Lakes curriculum series developed by Michigan Sea Grant with support from the Great Lakes Fishery Trust. The online lessons are designed to help educators teach students about the Great Lakes through hands-on activities. The 15 downloadable lessons cover the aquatic food web and invasive species, water quantity and quality, and Great Lakes fisheries. Each lesson is aligned with state and national curriculum standards for science and social studies.
www.projectflow.us

Fisheries Legal Instruments
The International Collective in Support of Fishworkers offers Fisheries Legal Instruments, a website providing detailed information for a wide range of instruments relevant to fisheries and fishworkers. It covers 124 documents, categorized by Human Rights, Food Security, Environment and Sustainable Development, Oceans and Fisheries Management, Environmental Pollution, and more.
http://legal.icsf.net/icsflegal/home.jsp

Fishery Regulations in the Wider Caribbean
This project summary report from the United Nations Environment Programme World Conservation Monitoring Centre provides information on fisheries regulations throughout the wider Caribbean region. Details of fishery regulations for each country are presented in terms of national restrictions, national zoning, and MPA-level restrictions. In addition, the website (http://gipping.unep-wcmc.org/wdbpa/caribPa/maps.cfm) has an interactive map of the fishing regulations.
http://gipping.unep-wcmc.org/wdbpa/caribPa/Fishery_Regulations_in_the_Wider_Caribbean_Region.pdf

Fishing for Answers: Making Sense of the Global Fish Crisis
The goal of *Fishing for Answers* is to provide easily digestible but comprehensive fisheries information for consumers and policymakers. This report will allow consumers to make links between what they eat and the effect on the ecosystem and fishers globally, as well as to stimulate dialogues among environmentalists, the fishing industry, and consumers. The executive summary is currently available, and the full print version will be made available soon.
http://water.wri.org/pubs_pdf.cfm?PubID=3866

FishWatch
NOAA's FishWatch is an online consumer seafood guide designed to facilitate informed seafood- buying decisions for consumers who are increasingly more sophisticated in their requirements for sound, accurate, and reliable information about the health and sustainability of seafood. The site has information on popular seafood species, with more species to be added shortly. The information includes population strength and status, nutritional content, and more.
http://www.fishwatch.noaa.gov

Fishy Newsletter
The May/June 2009 issue of the Long Island Sound Study newsletter, *Sound UPDATE*, focuses on fish populations in the Long Island Sound watershed, the methods for managing these populations, programs that encourage watershed residents to go fishing, and simple ways people can help keep Long Island Sound and its fisheries

healthy. The newsletter can serve as a good introduction to many issues surrounding fisheries, including outreach, management, monitoring, and more.
http://www.longislandsoundstudy.net/pubs/news/spr09.pdf

Floating Classroom for Educators and Students - Texas
On the R.V. Karma, a 57-foot teaching and research vessel, students can use otter trawls, plankton nets, water samplers and test kits, bottom corers and video-enhanced microscopes to investigate topics such as marine biology, ecology, fisheries and environmental impact. Additional initiatives include Elderhostels, youth development camps and courses, marine education workshops and professional development, and short courses for informal educators.
http://extensioneducation.tamu.edu/karma.htm .

Florida Circumnavigational Saltwater Paddling Trail
Beginning at Big Lagoon State Park near Pensacola, extending around the Florida peninsula and Keys, and ending at Fort Clinch State Park near the Georgia border, the Florida Circumnavigational Saltwater Paddling Trail is a 1,515-mile sea kayaking trail. The trail includes every Florida coastal habitat type, from barrier island dune systems to salt marsh to mangroves. A non-profit statewide support group, the Florida Paddling Trails Association, is the steward of the Circumnavigational Trail.
http://www.floridapaddlingtrails.com/
http://www.dep.state.fl.us/gwt/paddling/saltwater.htm

Florida Keys and Field Guides
The Florida Department of Environmental Protection, Bureau of Laboratories offers an online list of downloadable identification keys and field guides to a wide variety of organisms found in the state. These include amphipods, clams, leeches, snails, ferns, venomous snakes, and more. The web page also links to checklists of amphibians and reptiles and to a checklist of vascular plants of north central Florida.
http://www.dep.state.fl.us/labs/cgi-bin/sbio/keys.asp

Florida Oceans Day
The 11th annual Florida Oceans Day, March 25, 2009 in Tallahassee, Florida, will feature exhibits on ocean economics and climate change reports of the Florida Oceans and Coastal Council, along with a roundtable discussion of ocean management.
http://www.floridaoceanalliance.org/

Florida Office of Coastal and Aquatic Managed Areas Interactive Map
The Florida Department of Environmental Protection's Coastal and Aquatic Managed Areas manages nearly five million acres of submerged lands. These include Aquatic Preserves, National Estuarine Research Reserves, and the Florida Keys National Marine Sanctuary. The website includes an interactive map of the entire state, broken down into regions.
http://www.dep.state.fl.us/coastal/sites/default.htm .

Florida Shipwrecks
The National Register of Historic Places has launched a virtual travel itinerary, Florida Shipwrecks: 300 Years of Maritime History. This itinerary is currently the main feature on their homepage and highlights 13 historic shipwrecks listed in the National Register of Historic Places that are accessible to divers. The website includes an interactive map,

background information about the wrecks, and an introduction to Florida's maritime history.
http://www.cr.nps.gov/nr/travel/flshipwrecks/

Florida's Springs
Rising up from deep within the aquifer, cool clear water flows from hundreds of springs that dot the Florida landscape. This website hosts virtual explorations of some springs, information about threats to the quality and quantity of water in the Florida aquifers, and educational resources, including "Build Your Own Aquifer".
http://www.floridasprings.org/

Flotsam and Jetsam
Flotsam and Jetsam, the Journal of the Massachusetts Marine Educators, is an online quarterly. Each issue has a central theme, such as Ocean Floor Geology, National Marine Sanctuaries, and more, and includes at least one curriculum activity. Previous years' editions are available for general view.
http://massmarineeducators.org/journal.shtml

Flow: The Essentials of Environmental Flows
IUCN and its *Water and Nature Initiative* published a new guide to "environmental flows" –the water regimes provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated. *Flow* includes chapters on international legal instruments, defining water requirements, covering costs, and building capacity.
http://www.waterandnature.org/flowlaunch.html

Flower Garden Banks National Marine Sanctuary
The updated Flower Garden Banks National Marine Sanctuary Website is live. Sanctuary education materials can be downloaded directly from the site's document library. Included are downloadable coloring pages, games, an educational activity, and more. Teachers can sign up for an Education List Serve, request educational materials, and stay abreast of the various workshops and seminars offered by the sanctuary.
http://flowergarden.noaa.gov/education/education.html

Flying WILD
Flying WILD is a new initiative from the Council for Environmental Education that extends upon Project WILD by providing resources and guides for School Bird Festivals in conjunction with International Migratory Bird Day. The program allows students the opportunity to get involved in learning through researching, planning, and hosting a bird festival at their school. Flying WILD is sponsored by the National Fish and Wildlife Foundation and Phillips Petroleum Company.
http://www.projectwild.org/flying_wild/overview.htm

Focus The Nation "Teach-in"
Focus the Nation, a national teach-in on January 31, 2008, is designed to engage faculty and students across the country, with a focus on global warming solutions, for participants to get educated, organize, engage civic leaders, vote on solutions, and act. The website includes links to educational materials and more.
http://www.focusthenation.org/nationalteachin.php

Folly Beach Educator's Guide
This website, from COASTeam at the Lowcountry Hall of Science and Math in South Carolina, is designed to offer basic information on South Carolina's barrier islands. It offers background content and images for educators to use in teaching marine science. Most of the information contained in these sections is general and can be applied to any local barrier island. The site contains introductory images, animation of coastal processes, and beach activities.
http://oceanica.cofc.edu/An%20Educator%27sl%20Guide%20to%20Folly%20Beach/guide/default.htm

Forces of Change
This website from the Smithsonian's National Museum of Natural History explores climate change, ecological change, and cultural change. Drawing on a wide range of research, the site looks at how different types of changes are affecting life on earth. Some of the processes covered include El Nino, volcanic eruptions, and changes in the atmosphere. The website includes interviews, interactive features, research reports, and more, and includes a special educators' section.
http://forces.si.edu/index.html

Forest Encyclopedia Network
Jointly developed by the USDA Forest Service Southern Research Station and Southern Regional Extension Forestry, this website has multiple online encyclopedias about the forests of the Southern United States, as well as one that covers the environmental threats facing all North American forests. The menu allows the visitor to view the site through a thematic lens, or through a global one.
http://www.forestencyclopedia.net/

Forest Service Partnership Resource Center
The Partnership Resource Center is a centralized website from the Forest Service to provide information and tools to promote partnerships. The website includes resource documents, links to training opportunities and funding sources, tools and templates, and lists of organizations and agencies which work collaboratively and in partnerships to manage natural resources.
http://www.partnershipresourcecenter.org/index.shtml .

Forming Hurricanes Poster – FL, GA, NC, SC
Help your students learn to define and describe the nature of hurricanes, as well as their regional significance in the Atlantic. This poster supports the upcoming SEACOOS Virtual Hurricane Classroom that will soon be found on the SEACOOS website. On this website you will be able to find classroom activities, locate real time hurricane information on the web, learn hurricane vocabulary, and more.
http://seacoos.org/Community%20and%20Classroom/

For Sea
The FOR SEA marine science curriculum and teacher training program offers materials and teaching strategies with middle school/junior high school curriculum, a career awareness in science curriculum, and environmental education curriculum. The website offers tables of contents and examples of available materials.
http://www.forsea.org/Default.htm

For The Sea
For The Sea Productions was created to promote marine environmental protection via visual experience. The website offers video and photos to engage, entertain, and raise awareness of the critical need for conservation of the oceans. The Hawaii Reef Etiquette PSA is available for downloading in English and Japanese.
http://www.forthesea.com/

The Fragile Fringe
The USGS National Wetlands Research Center offers The Fragile Fringe, a Guide for Teaching about Coastal Wetlands, a downloadable teaching guide. The intent of this material is to provide a basis from which a comprehensive study of coastal wetlands can be developed by the teacher on the basis of individual needs. The site includes background information, suggested activities, glossary, references, and a reading list. Activities can be demonstrated by the teacher or performed by students.
http://www.nwrc.usgs.gov/fringe/ff_index.html

Framework for Evaluating Impacts from Informal Science Education Projects
The report, *Framework for Evaluating Impacts from Informal Science Education Projects,* is available for downloading from the Center for Advancement of Informal Science Education. It provides the results from a National Science Foundation-sponsored workshop on evaluating informal education.
http://insci.org/

Framework for a National System of Marine Protected Areas
The United States has developed a national system of marine protected areas to advance the conservation and sustainable use of the nation's vital natural and cultural marine resources. The national system is described in detail in the downloadable *Framework for a National System of Marine Protected Areas for the United States America*.
http://mpa.gov/national_system/national_system.html

Free Copy of Green Teacher
To celebrate the launch of an electronic edition of their non-profit quarterly EE magazine, Green Teacher invites you to download a copy of the Winter 2006-2007 edition, through July 1, 2007. The electronic issue is searchable and the hot-links provide readers with quick access to additional information about a topic or new educational resources mentioned in that issue. Check out the article, *Discovering Lake Management: Getting Students' Feet Wet*.
http://www.greenteacher.com/freeIssue80.html

Free Use of Camping Equipment Through The REI Gear Bank
The REI Gear Bank is a program designed to facilitate a positive introduction to the outdoors for kids who have not yet had a wilderness experience. In order to ensure that their first experience in the outdoors is a positive one, REI has set up a program to provide kids with quality gear so they are comfortable and can focus on having fun. The Gear Bank offers camping essentials free of charge.
relion@rei.com

Free Science "Stuff" for Teachers
This wiki-style page from Science Inquirer offers free teaching resources from listservs, podcasts, videos, posters, and more.

http://scienceinquirer.wikispaces.com/freestuff

French Frigate Shoals Expedition Archive
The Census of Marine Life, Census of Coral Reefs Expedition to French Frigate Shoals from October 2006 can be viewed on the Northwestern Hawaiian Islands Multi-Agency Education Project website. . Read the ship logs, journals, and scientist interviews. There's plenty of other information, including maps, photos and more.
http://www.hawaiiatolls.org/research/CoML/index.php
http://www.creefs.org/

Freshwater Ecoregions of the World
Freshwater Ecoregions of the World provides a global biogeographic regionalization of the Earth's freshwater biodiversity. This ecoregion map, together with associated species data, can be a useful tool for underpinning global and regional conservation planning efforts, particularly to identify outstanding and imperiled freshwater systems; for serving as a logical framework for large-scale conservation strategies; and for providing a global-scale knowledge base for increasing freshwater biogeographic literacy.
http://www.feow.org/index.php

Freshwater and Marine Image Bank
The University of Washington Libraries offers 21,000 digitized images of freshwater and marine life taken from 1735-1924 from various publications. Visitors can browse by collection and subject, or enter search criteria. There are also links to other sources for digital images.
http://content.lib.washington.edu/fishweb/index.html

Frog Calls
This website, sponsored by the Chicago Herpetological Society, offers frog calls and documentary video clips of scientists discussing frog issues, including declining amphibians and malformed frogs.
http://www.midwestfrogs.com/

Frogwatch USA
Frogwatch USA is a long-term frog and toad monitoring program that gives volunteers the opportunity to help scientists conserve amphibians, managed by the National Wildlife Federation in partnership with the United States Geological Survey. The website offers frogwatching tips, field guides, and much more. The website offers very easy-to-access frog call identification for your state through links to the eNature website.
http://www.nwf.org/frogwatchUSA/

From the Serengeti to Austin Texas - Watching Wildlife is Bringing in the Bucks
Wildlife Watching and Tourism: A study on the benefits and risks of a fast growing tourism activity and its impacts on species was launched at the meeting of the Convention on Biological Diversity in Curitiba, Brazil. The report focuses on 12 case studies to highlight the growing economic importance of wildlife watching while flagging some of the pitfalls that may arise through poor or insensitive management. Concrete recommendations are made on how best to promote environmentally, economically, and socially sound wildlife watching, including advice to visitors, drivers and divers.
http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=471&ArticleID=5238&l=en

From Sea to Shining Sea
The National Geographic Society and NOAA's Office of Ocean Exploration have collaborated to create an ocean focused map, *From Sea to Shining Sea, Exploring America's Ocean Realms*, along with three new online lesson plans. In addition, there a limited number of paper versions of the map. If you would like to receive a copy of this map, please send an email to fcava@ngs.org with "Request a copy of the Sea to Shining Sea map" in the subject line.
http://nationalgeographic.com/xpeditions/lessons/15/g68/seatoshiningsea1.html
http://nationalgeographic.com/xpeditions/lessons/08/g68/seatoshiningsea2.html
http://nationalgeographic.com/xpeditions/lessons/15/g68/seatoshiningsea3.html
http://nationalgeographic.com/xpeditions/lessons/15/g68/s2ssmap.pdf

From Shore to Sea: Exploring California's Channel Islands
The JASON Project combines scientific expeditions, standards-based classroom curriculum, and accredited professional development for teachers to engage students in science, math, and technology, and to deliver measurable gains in student achievement. *From Shore to Sea* focuses on the Channel Islands and the surrounding sea. Monitor change with standards-based lesson plans covering geography, natural history, culture, watersheds, kelp forests, marine conservation and much more.
http://channelislands.noaa.gov/edu/shoretosea.html .

From Shore to Sea Lecture Series - California
Channel Islands National Marine Sanctuary and National Park celebrate their 25- year anniversaries with this year's lecture series by featuring speakers who have made significant contributions to the park and sanctuary. The programs, free and open to the public, will take place on the second Tuesday and Wednesday of the month.
http://channelislands.noaa.gov/edu/shoretosea.html

Fueling the Future
Help your students understand energy issues using the new Facing the Future activity, Fueling the Future. Students compare energy use and CO2 emissions by sector in the United States and China (and optionally in another country). They research and discuss energy impacts and sustainable energy solutions and present their findings at a "World Energy Summit." Additional materials available from Facing the Future include water trivia, Got Water? and more.
http://www.teacherscorner.org/activities.html#

Fusion Tables
Google has launched a new online tool enabling free data-sharing that could aid with international scientific research collaborations. The tool, Fusion Tables, allows tables of data to be visualized as charts, graphs, and maps, which can help identify patterns and trends. Users are able upload their data and make the information freely available to anyone, opening up possibilities for collaboration.
http://www.scidev.net/en/news/online-tool-could-aid-global-collaboration.html

The Future of Sustainability
The World Conservation Union (IUCN) is hosting *The Future of Sustainability: Have Your Say!.* an e-discussion forum between August 21-September 15, 2006. The four themes are global challenges to sustainability, human wellbeing and sustainability, the new economy and biodiversity, and shaping the future. A summary of the e-Discussion Forum will made available on the website later this year.

http://www.iucn.org/members/future_sustainability/

GalAPAGoS: Where Ridge Meets Hotspot
The *GalAPAGoS* (Galapagos Acoustical, Plumes, and Geobiological Surveys)*: Where Ridge Meets Hotspot 2005* Expedition, from December 3 through January 10, 2006 sponsored by NOAA's Office of Ocean Exploration, offers education opportunities for teachers, students, and the general public to virtually join a team of scientist, explorers, and educators as ocean explorers investigate a 400 km-long section of the Galapagos Spreading Center which is part of the global mid-ocean ridge system.
http://oceanexplorer.noaa.gov/explorations/05galapagos/welcome.html

Galveston Bay Information Center Resources
The Galveston Bay Information Center and the Galveston Bay Estuary Program have teamed up to provide resources you can use to teach the science of the bay area in your classroom. The website offers curriculum focusing on oceans, estuaries, and bays. The Resources for Teachers webpage contains free resource materials for use in your classroom including links to locally designed curriculum, classroom presentations, links to local field trip opportunities, and more.
http://gbic.tamug.edu/

Games Planet Arcade
This arcade from NOAA is a portal to games and interactive activities focused on ocean and air themes. It highlights the science and the activities of NOAA and other agencies and organizations promoting environmental stewardship. There are puzzles, interactives, and links to in-depth learning games.

Games@NOAA
This arcade hosted by NOAA is a portal to games and interactive activities focused on ocean and air themes. It highlights the science and the activities of NOAA and other agencies and organizations promoting environmental stewardship.
http://games.noaa.gov/

Gateway to Educational Materials
The Gateway to Educational Materials offers a database of more than 24,000 education resources, including marine resource education, across more than 400 web sites.
http://thegateway.org/

GEF Lessons Learned E-Group
The Knowledgebase for Lessons Learned and Best Practices in the Management of Coral Reefs project aims to formalize the experiences, outcomes, and lessons learned from previous Global Environment Facility projects, as well as major initiatives involving coral reefs and associated ecosystems. This e-group creates a forum where experiences in Caribbean coral reef management can be exchanged, facilitating information sharing and discussions regarding coral reef management in the Caribbean.
http://tech.groups.yahoo.com/group/gefll/

GEF Lessons Learned Project
The GEF-funded project *Knowledgebase for Lessons Learned and Best Practices in the Management of Coral Reefs* seeks to formalize the experiences and lessons learned from previous GEF projects, as well as major non-GEF initiatives, involving coral reefs and associated ecosystems. The downloadable *GEF Lessons Learned and Best*

Practices Toolkit is a place to find information about how to design and implement coral reef management strategies; it will be updated quarterly.
http://www.reefbase.org/gefll/

GEO Year Book 2003
The United Nation's Environment Programme (UNEP) presents its first annual Global Environment Outlook (GEO) statement to highlight significant environmental events and achievements during the year and raise awareness of emerging issues from scientific research and other sources. Based upon a collaborative/comprehensive tracking and stocktaking process established with many partners, it includes an overview of major global and regional environmental issues, a focus on freshwater, indicators and more.
http://www.unep.org/geo/yearbook/ .

GeoBirds
Geobirds is meant to be an online birding community. The "BirdBrain" interface allows users the opportunity to navigate around the United States to begin determining which type of bird may have been spotted. Web visitors can also add bird-watching data to an interactive map of North America. The website includes an online field guide, complete with photographs and descriptions.
http://geobirds.com/

Geographic Data in Education (GEODE)
The Geographic Data in Education (GEODE) Initiative, for middle school through college, uses data visualization and analysis tools to support inquiry-based learning. An integrated program of research and development, the GEODE Initiative provides curriculum, educational software, and teacher professional development. Software includes *WorldWatcher* and *My World*. Curriculum includes *Looking at the Environment* and *Planetary Forecaster Project*.
http://www.worldwatcher.northwestern.edu/ .

Geographic Names Information System
The Geographic Names Information System, developed by the USGS in cooperation with the U.S. Board on Geographic Names, contains information for almost 2 million physical and cultural geographic features in the United States, its territories, and the Antarctica. The federally recognized name of each feature described in the data base is identified, and references are made to a feature's location by state, county, and geographic coordinates.
http://geonames.usgs.gov/

Geology of National Parks
This website from the U.S. Geological Survey draws on thousands of historic and contemporary photographs, views, documents, and other items, creating 3D and photographic tours of dozens of national parks. Visitors will find an alphabetical list of the parks, along with links to the 3D image galleries, standard image galleries, and selected online field guides. Dig out your 3D glasses and check out Puuhonua o Honaunau National Historic Park and Point Reyes National Seashore, among others.
http://3dparks.wr.usgs.gov/

Georgia Standards Website
The Georgia Department of Education offers the GeorgiaStandards.Org website, a gateway to education and professional resources to support teaching and learning in

Georgia. It offers access to curriculum frameworks by subject and grade along with resources, tools, and web links commonly used by teachers. A variety of environmental education lessons are posted, including *A whale of a movement*, *Water cycle skit*, and much more.
http://www.georgiastandards.org/

Georgia's Amazing Coast
Fun and learning come together in *Georgia's Amazing Coast*, a collection of one hundred short, self-contained features about the flora, fauna, and natural history of Georgia's coast. Each page includes a full-color illustration and fact-filled commentary on coastal wildlife, from fifty-foot-long northern right whales to single-cell plankton. Contact Allison Reid at areid@ugapress.uga.edu for details.

Georgia Encyclopedia
The New Georgia Encyclopedia provides an accessible, authoritative source of information about people, places, events, historical themes, institutions, and many other topics relating to the state. It includes a section on Land and Resources, including articles and information on ecological functions of the environment, environmental regions of Georgia, and more.
www.georgiaencyclopedia.org .

Georgia High School Envirothon
The Envirothon is a hands-on, high school academic competition on the environment. Teams exercise their training and problem-solving skills in a competition centered around five topics: soils/land use, aquatic ecology, forestry, wildlife, and a current environmental issue. There are three levels of competition. The regional competition is a one day event, while the state competition is a 2-day event. There is also Eco-Meet, a middle grades academic competition on the environment modeled after the Envirothon.
www.georgiaenvirothon.org .

Georgia River Posters
Brown's Guide to Georgia now offers the popular Georgia river posters online. Each of the 14 posters may be viewed in detail on the computer in pdf format, printed in small format on a desktop printer, or sent to a local print shop and reproduced in full 24-inch X 36-inch format. The posters tell the story of each river basin through illustrations, graphics, and text.
http://brownsguides.com/srl/georgia-river-posters/

Geospatial One-Stop Portal
The Geospatial One-Stop portal helps the public and government agencies access geospatial data and other information from one centralized location. NOAA manages the *Oceans and Estuaries* and *Locations and Geodetic Networks* channels on the portal, and co-manages the *Atmospheric and Climate* channel.
http://www.geodata.gov/gos

Geotagger 1.1
Photographers with a keen interest in spatial analysis (and appropriate photographs) might find this freeware useful. With Geotagger 1.1 and Google Earth, users can take their digital photographs, insert GPS coordinates into the images, and place them online.
http://craig.stanton.net.nz/software/Geotagger.html

Getting in Step: a Guide to Effective Outreach in Your Watershed
The *Getting in Step* guidebook or on-line web-based training module provides some of the tools needed to develop and implement an effective watershed outreach plan. It helps watershed practitioners trained in the sciences address public perceptions, promote management activities, and inform or motivate stakeholders.
http://www.epa.gov/owow/watershed/outreach/documents/

Ghost Crab Trap Removal Program
The Barataria-Terrebonne National Estuary Program is supporting this Department of Wildlife and Fisheries' program through a ghost trap "sweep" within the Barataria-Terrebonne National Estuary, planned for February 28 through March 14, 2004. A ghost crab trap may be an old, bent, barnacle-encrusted trap without a buoy or float, or even be a relatively new trap with a line and buoy still attached (sometimes referred to as "derelict" traps).
http://www.blue-crab.net/derelict.html .

Giant Squid Curriculum Module
The Smithsonian Institution's National Museum of Natural History, Mississippi State University, and partners offer this on-line Giant Squid Curriculum Module. Lessons in the module are related to information in the web pages of the Smithsonian Institution's National Museum of Natural History. Educators are encouraged to visit three websites prior to considering the lessons; two of the links are old but newer ones are below.
http://giantsquid.msstate.edu/index2.html
http://www.mnh.si.edu/natural_partners/squid4/
http://www.mnh.si.edu/cephs/

GIS Day 2003
GIS Day, Nov. 19, 2003, is part of the National Geographic Society's initiative, Geography Action, a year-long initiative encompassing key educational achievements. The theme of this year's Geography Awareness Week, November 16-22, 2003, is "Habitats."
http://www.gisday.com/index.html

GIS Day 2006 – New Hampshire
The University of New Hampshire hosts GIS Day on November 1, 2006 with a geo-spatial science career and educational presentations, professional mapping exhibitions, hands-on activities, and more. This year's featured GIS Day map exhibition is the NOAA Ocean Mapping and Ocean Exploration cartographic exhibition.
http://gisday.sr.unh.edu

Global Amphibian Assessment
The Global Amphibian Assessment is a comprehensive assessment of the conservation status of the world's 5,743 known species of frogs, toads, salamanders, and caecilians. This website presents results of the assessments, including IUCN Red List threat category, range map, ecology information, and other data for every amphibian species.
http://www.globalamphibians.org/

Global Biodiversity Information Portal
The Global Biodiversity Information Facility (GBIF) is an international non-profit organization devoted to providing free and universal access to data regarding the world's biodiversity. Check out the GBIF Communications Portal at www.gbif.org . Many

countries and organizations participate in GBIF and have made their data available at the GBIF Data Portal.
www.gbif.net .

Global Challenges
Earth Day Network offers a new curriculum called *Global Challenges, an Introductory Climate Change Curriculum* that provides four lesson plans suitable for middle school classrooms. The lesson plans are activity driven and work together to cover the broad topic of climate and climate change. These resources are available for free to members of the Teacher's Corner.
http://www.earthday.net/

Global Climate Change
NASA offers this new website, Global Climate Change, NASA's Eyes on the Earth. The site, managed by the Jet Propulsion Laboratory, is a one-stop-shop for all of the latest climate information from NASA's Earth-monitoring missions and research. The website offers background information, interactives, and much more. Categories include key indicators, uncertainties, solutions, and news.
http://climate.jpl.nasa.gov/

Global Climate Change
Global Climate Change, from the Exploratorium website, offers a window into the world of scientific research on climate change. Learn about physical processes underlying the earth's climate, data on how the climate is changing and the role of human activity, and questions and uncertainties that researchers continue to explore. The site is organized in five parts: the atmosphere, hydrosphere (oceans and water), cryosphere (snow and ice), biosphere (living organisms), and global effects.
http://www.exploratorium.edu/climate/index.html

Global Climate Change: Economics, Science, and Policy
MIT's Sloan School of Management, through the OpenCourseWare initiative, offers materials for the course on climate change, including a syllabus, reading suggestions, lecture notes, and several assignments. The class introduces scientific, economic, and ecological issues underlying the threat of global climate change and the institutions engaged in negotiating an international response. Some of the reading materials are available on-line.
http://ocw.mit.edu/OcwWeb/Sloan-School-of-Management/15-023JSpring-2007/CourseHome/index.htm

Global Climate Change Impacts in the United States
The U.S. Global Change Research Program offers the downloadable report, *Global Climate Change Impacts in the United States*. In plain language, the report summarizes the science and the impacts of climate change on the United States, now and in the future. It focuses on climate change impacts in different regions of the U.S. and on various aspects of society and the economy such as energy, water, agriculture, and health.
http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts

Global Change Research Program
The U.S. Global Change Research Program coordinates and integrates federal research on changes in the global environment and their implications for society. The website

includes links to regional and sectoral climate information, along with reports and other material. The downloadable scientific study, *Climate Change Impacts*, is written in plain language so that its findings are readily accessible. Check out the Resources section, and the Climate Change Wildlife and Wildlands Toolkit for educators.
http://www.globalchange.gov/

Global, Environmental, and Outdoor Education Council Lesson Plans
The Global, Environmental, and Outdoor Education Council is one of 23 specialist councils of the Alberta, Canada Teachers' Association. They promote quality professional development for teachers. The website offers lesson plans covering a variety of subjects, for grades 1-9. Some of the topics include stewardship, endangered species, water, and more.
http://www.geoec.org/lessons/

Global Map of Human Impacts to Marine Ecosystems
This analysis of human impacts to marine ecosystems, posted on the website for the National Center for Ecological Analysis and Synthesis, shows that over 40% of the world's oceans are heavily affected by human activities and few if any areas remain untouched. The goal of the research was to estimate and visualize the global impact humans are having on the ocean's ecosystems. While on the website, check out the link to ***Kids Do Ecology***, an educational, participatory, bilingual website, supporting an inquiry-based approach to science for 5th grade classes to design and conduct scientific experiments in ecology.
http://www.nceas.ucsb.edu/GlobalMarine

Global Positioning System Guide
The NOAA Pacific Services Center offers an informational guide, Where Am *I Going? A Manager's Guide to GPS*. Meant for the coastal and marine resource management community, it provides a good introduction to the Global Positioning System (GPS), illustrates the benefits of GPS, and discusses considerations for purchasing GPS equipment.
http://www.csc.noaa.gov/psc/prodsvc.html

Global Systems Science
Global Systems Science is an integrated, interdisciplinary course for high school, consisting of nine student books, teacher guides, and software dealing with a societal issue that requires science for full understanding. Teacher guides are downloadable free online; student texts can be downloaded for review, but not printed. Texts are available on a number of different topics, including Climate Change, Losing Biodiversity, and Ecosystem Change, and can be used as a set or individually with other coursework.
http://www.lawrencehallofscience.org/gss

Global Ultraviolet Index
EPA and NOAA adopted a new Global Ultraviolet Index to help reduce overexposure to dangerous UV rays. The index, developed by the World Health Organization and other international organizations, replaces existing reporting methods. The index is designed to foster understanding of which precautions to take in protecting ourselves from different levels of UV radiation.
http://www.cpc.ncep.noaa.gov/products/stratosphere/uv_index/uv_current.html or http://www.epa.gov/sunwise/uvilaunch.html .

Global Water Supply School Curriculum
Water.org launched school curriculum materials for World Water Day, March 22. Aligned with national standards, the lesson plans and mini-units include elementary, middle, and high school levels. Stand-alone lesson plans are part of larger units that cover a broad scope of subjects including English, science and technology, and social sciences like geography, civics and economics. Classroom activities cover everything from poetry seminars and vocabulary-building worksheets to science and math lessons.
http://water.org/lessonplan/

Global Warming
NASA's Earth Observatory features an article on global warming, explaining what global warming is, how scientists know it's happening, and how they predict future climate.
http://earthobservatory.nasa.gov/Library/GlobalWarmingUpdate/

Global Warming 101
The Will Steger Foundation is dedicated to creating programs that foster international leadership and cooperation through environmental education and policy. An on-line initiative, Global Warming 101, promotes change through education and advocacy, hoping to raise broad public awareness about global warming as witnessed through Will Steger's polar expeditions. The website includes educational information and materials, a discussion forum, and more.
http://www.globalwarming101.com/

Global Warming 101 Begins New Expedition
The Global Warming 101 expedition team of Inuit hunters, explorers, and educators, will embark on a four-month expedition to get a first-hand look at how global warming is impacting the Arctic landscape, wildlife, and human communities.
http://www.globalwarming101.com/content/view/32/88888907/

Global Warming 101 Expedition with Will Steger - Online
National Geographic Explorer Will Steger and a team of young adventurers from Norway, Great Britain, Canada, and the U.S. will bring their High Arctic dogsled expedition to educators and learners through multimedia dispatches. The website includes standards-linked multidisciplinary lesson plans appropriate for middle school and older students that explore how climate shapes the past, present, and future for members of the High Arctic community.
http://www.globalwarming101.com/

Global Warming Debate
The Online NewsHour Science Reports from PBS, funded by the National Science Foundation, discusses global warming, policy struggles to address it, international efforts, the cap-and-trade system, and more. The website offers interactive features, background information, a lesson plan, and more.
http://www.pbs.org/newshour/indepth_coverage/science/globalwarming/index.html

Global Warming Facts and Our Future
The Marian Koshland Science Museum explores the latest scientific information from the National Academy of Sciences about global warming. Learn about the greenhouse effect, the carbon cycle, and past changes in our climate. See predicted changes and how they could affect sea levels, agriculture, and ecosystems. The website also presents options for reducing CO2 emissions.

http://www.koshlandscience.org/exhibitgcc/index.jsp

Global Warming Web Resources
The National Association of Biology Teachers offers a number of instructional materials designed for use in the classroom along with grants, awards, and professional development opportunities. Their list of instructional materials includes a short listing of some global warming websites.
http://www.nabt.org/sites/S1/index.php?p=83

Global Wildlife Disease News Map
The Global Wildlife Disease News Map displays news articles from the Wildlife Disease News Digest that have been posted within the last 45 days and have a geographical reference. On it, users can see wildlife disease headlines both locally and globally.
http://wildlifedisease.nbii.gov/wdinNewsDigestMap.jsp

Global Youth Service Day
Global Youth Service Day April 24-26, 2009, highlights and celebrates the difference youth make in their communities year-round through community service and service-learning.
http://www.gysd.org/

GLOBE at Night Campaign
GLOBE at Night, February 25-March 8, 2008, is designed to aid teaching about the impact of artificial lighting on local environments and the ongoing loss of a dark night sky as a natural resource for much of the world's population. The website will include instruction guides, one-page flyers, and more.
http://www.globe.gov/GaN/

GLOBE moves to Boulder, CO
The GLOBE Program now resides at the University Corporation for Atmospheric Research, in Boulder, Colorado. GLOBE is a worldwide hands-on, primary and secondary school-based education and science program. Internationally, GLOBE is a partnership between the United States and 100 other countries.
http://www.gsfc.nasa.gov/news-release/releases/2003/h03-087.htm

GLOBE Student Research Campaign on Climate Change 2011-2013
Planning for the GLOBE Student Research Campaign on Climate Change will begin in January 2009, and will enlist the support of climate change scientists, science educators and educational outreach experts, as well as businesses, foundations, and policy makers. The campaign will culminate with an international student research conference in 2013.
http://globe.gov/r/html/climatechange

GLOBIO - Mapping Human Impacts on the Biosphere
This UNEP program, Global Methodology for Mapping Human Impacts on the Biosphere (GLOBIO), uses models and analysis to assess human impact on the biosphere. The website features maps, videos, and documents, as well as a description of the model and scenarios. Analyses of coastal regions using the GLOBIO methodology are featured in the downloadable report, *Our Precious Coasts: Marine Pollution, Climate Change and Resilience of Coastal Ecosystems*.
http://www.globio.info/

Glossopedia
Glossopedia is an online multimedia science encyclopedia that students can use to learn more about animals, habitats, science, technology, and more. Founded by a core team from the publishing, technology, business, and education communities, it is dedicated to offer safe and quality content that kids of all ages can enjoy.
http://www.globio.org/glossopedia/

Go Fish! Hawai'i and Great White Card Games
Educational, marine-themed card games, *Go Fish! Hawai'i* and *Great White,* have been received with minor errors, and are being made available at a special price ($2.50 each, plus shipping) to classroom teachers only, for distribution to their students. The minimum quantity is 24 decks and the maximum allowed is the number of students in their class. For more details, and if you have any other ideas about what might be done with these cards, please contact Elaine de Man at elainede@sbcglobal.net.
http://www.cardsharkpress.com/wst_page2.html

Go Green Database
Edutopia offers the Go Green Database, an environmental-resources directory for educators. Users can search by topic, grade level, cost, or location. Topics include water, air/climate, habitat/ecosystem, and more, while resources can be searched for lesson plans, information/statistics, field trips, and more. Be sure to supplement the entries with your contributions and comments.
http://www.edutopia.org/go-green

Goliath Grouper Video
A new video has been posted on You Tube titled Guasas bajo proteccion [goliath grouper under protection]. The video is a rough cut of what will be aired eventually on Telemundo. The audio is in Spanish, and they are working on subtitles or dubbing in English.
http://www.youtube.com/watch?v=FHRa26y-Ypk

GoNorth!
This free K-12 online classroom expedition in the arctic sets out to explore the prospects of oil exploration, document the realities of Arctic climate change, and the value of traditional ecological knowledge. Team GoNorth! will dogsled the land of Alaska to learn from the Gwiich'n and Inupiat Eskimo (Inuit) people along the trail while gathering scientific data from the field in collaboration with NASA and the Office of Polar Programs at National Science Foundation.
http://www.polarhusky.com/te2005.asp?menuID=121

Google Earth
Google Earth combines satellite imagery, maps, and the power of Google Search to put the world's geographic information at your fingertips. The free download allows users to zoom into any part of the Earth. It brings across the point that approaching from space, one sees first the oceans, then land, and then coral reefs. Many of the world's large reef systems are clearly visible in low-resolution imagery from as close as about a virtual mile up, while some areas are available in higher resolution.
http://earth.google.com/

Google Scholar - Free Search for Online Academic Documents
The Internet search organization Google has released a new tool called "Google Scholar" that allows you to look up any author, publication, or technical topic and find all of the other articles or websites that cite that work. Google Scholar enables you to search specifically for scholarly literature, including peer-reviewed papers, theses, books, preprints, abstracts, and technical reports from all broad areas of research.
http://scholar.google.com

Go Visit an Aquarium
The Bridge can help you find an aquarium or ocean science-related museum for your spring field trip or summer vacation. In the Resource Center section, you will find a listing of aquariums and ocean science museums. Studies show that many of students' most memorable and effective learning experiences occur outside the classroom, where they can see and touch marine science concepts first hand. The Bridge also features information on field trips to research institutions and other outdoor education centers.
http://www.marine-ed.org/bridge/index_aquarium.html

GPA Marine Email Newsletter
The GPA is the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, for which the United Nations Environment Programme (UNEP) provides the secretariat. Monthly GPA Outreach newsletters and weekly GPA News Updates are a new source of information about related events and information relevant to the wider marine and freshwater sector. To subscribe to GPA Outreach, send an e-mail to join-gpa-outreach@lists.healthdev.org .

GPA Outreach Online Debate
The Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) hosted an interactive online debate as part of GPA Outreach, March 8-17, 2004. The debate focused on *Water Management and Governance* and *Perspectives on Water and Poverty Reduction*.
http://www.unedforum.org/debate/ .

Graduation Pledge of Social and Environmental Responsibility
The Graduation Pledge of Social and Environmental Responsibility states, "I pledge to explore and take into account the social and environmental consequences of any job I consider and will try to improve these aspects of any organizations for which I work." Students at over a hundred colleges and universities, ranging in size from Whitman to Harvard, have used the pledge at some level.
http://www.graduationpledge.org/ .

Grand Bay National Estuarine Research Reserve
Mississippi Department of Marine Resources' Grand Bay National Estuarine Research Reserve (NERR) offers this site for educators, researchers, students, and others. This website features several sections of interest including a short video showing the reserve before and after Hurricane Katrina and a species profile generator. The website includes downloadable field journals, books for students, slide shows, and more.
http://www.grandbaynerr.org

Graveyard of the Pacific: The Shipwrecks of Vancouver Island
The Virtual Museum of Canada explores the various shipwrecks that have taken place around Vancouver Island, off the mainland of British Columbia, from the year 1803 to the

present day. Read tales of survival from these vessels, view an interactive map of the shipwrecks, and learn about the various hazards associated with the waters off Vancouver Island. Check out the interactive game called "Wrecks."
http://www.pacificshipwrecks.ca/english/index.html

Gray's Reef Brought to Atlanta Through Distance Learning
Through Georgia's distance learning program, Gray's Reef National Marine Sanctuary educators teach and interact live with typically three and as many as seven classes across the state and nation simultaneously. With slides and video footage, they bring Gray's Reef to students from downtown Atlanta and the peanut farming communities of Plains to the mountains of New York and desert of Arizona.
http://www.graysreef.nos.noaa.gov/education.html

Gray's Reef National Marine Sanctuary Ocean Film Festival
The Gray's Reef National Marine Sanctuary will host the 2007 Ocean Film Festival September 21-23, 2007 in Savannah, Georgia. The films explore the beauty of the sea, the complexity of the marine ecosystem, the creatures that inhabit it, our maritime heritage, and humankind's relationship with the oceans in a family-oriented format. The festival is free.
http://www.graysreefoceanfilmfestival.com/

Gray's Reef Ocean Film Festival
Attend the Gray's Reef Ocean Film Festival, September 23-25, 2005 in Savannah and Tybee Island, Georgia. More than 20 free films about the ocean will be shown, sponsored by Gray's Reef National Marine Sanctuary and the National Marine Sanctuary Foundation. All films are free; tickets will be available at the Trustees Theater box office (912 525 5050) starting September 1, 2005. For more information, call (912) 598-2345.
www.graysreef.noaa.gov

Great Annual Fish Count
The event registration and planning for the upcoming Great Annual Fish Count has begun. 2006 marks the 15th year for this annual marine conservation citizen science event. All events must be registered online in order to guarantee inclusion on the website calendar, media releases, and other publicity. All Fish ID classes must be offered free. The website includes inclusive information for organizers, links to learning resources, a fundraising challenge, and more.
http://www.fishcount.org/index.html

Great Backyard Bird Count
The National Audubon Society and the Cornell Laboratory of Ornithology encourage everyone to count birds with a buddy for the ninth annual Great Backyard Bird Count, February 17-20, 2006. The Mississippi Classroom Activity Kit can help you bring the birds into your classroom at http://www.msaudubon.org/GBBC/classroom.php. Count in a backyard, on a high-rise balcony, in a park, or on any of the 730 million acres of public lands.
www.birdsource.org/gbbc

Great Explorations in Math and Science
Great Explorations in Math and Science (GEMS) offers specialized professional development workshops, an international support network, and science and math

curriculum for teachers of grades pre-K thru 8. They have teacher's guides, a series of home activity kits, online activities and videos, an email newsletter, and more in a broad range of earth and ocean science related science units, including *On Sandy Shores, Only One Ocean*, and *Ocean Currents*. GEMS is also introducing a line of integrated science and literacy curricula entitled *Seeds of Science/Roots of Reading* which will launch Fall 2007 with the title *Shoreline Science*.
http://www.lhsgems.org/
http://seedsofscience.org/

Great Lakes Areas of Concern Program
This website, from the Great Lakes Commission under a grant from the EPA, provides a variety of information on the Great Lakes Areas of Concern program and associated Remedial Action Plans, highlighting actions taken to identify and clean up polluted areas in the Great Lakes.
http://www.glc.org/rap/resources/

Great Lakes BeachCast
The Great Lakes Information Network developed this website with funding from the EA in an effort to provide better beach information to the Great Lakes community. It will broadcast information about beach closings and educational content on human health concerns. The website provides news about erosion control projects, contamination and cleanup efforts, beach testing efforts, and more. There are also links to monitoring data.
http://www.great-lakes.net/beachcast/index.html

Great Lakes Ice
For the past 30 years, NOAA has been recording ice data in Great Lakes. Researchers at the NOAA Great Lakes Environmental Research Laboratory in Ann Arbor, Michigan, have tracked ice cover in this region searching for signs of climate change and gathering data to help them better understand ice and its impacts on the Great Lakes and other regions of the world. Students will enjoy the animations, while teachers will appreciate the background information and data.
http://www.magazine.noaa.gov/stories/mag172.htm

Great Lakes Invasive Species Information, Activities, and Curriculum Guide
Illinois-Indiana Sea Grant provides a wealth of Great Lakes environmental education on their website, with a focus on invasive species. The Biological Resources page links to aquatic invasives activities and resources, while Water Quality links to many useful classroom resources and information. Down-load *The Great Lakes Invasive Species Curriculum Guide* to provide students an introduction to aquatic invasive species.
http://www.iisgcp.org/edu/br/grlksinv.pdf. http://www.iisgcp.org/edu/ .

Great Turtle Race
Eleven critically endangered leatherback turtles were tagged with a satellite tracking device, and followed through the Great Turtle Race from a Costa Rican beach across the Pacific towards the Galapagos Islands. This public awareness and educational campaign was sponsored by three schools—an elementary school, a high school and a university. Teachers can use the curriculum and background information provided on this website and/or create their own lesson plans around the event.
http://www.greatturtlerace.com/

The Great Warming
Narrated by Alanis Morissette and Keanu Reeves, *The Great Warming* is a film about climate change which reveals how a changing climate affects the lives of people in a variety of places around the world. The website includes a trailer, links to books, and background information.
http://www.thegreatwarming.com

Great Whales Curricula
Oregon State University's Marine Mammal Institute offers The Great Whales curricula for grades 6-9. The materials address research efforts to expand our knowledge about marine mammals and explore whale biology, ecology topics, and more. The nominal cost covers shipping and handling.
Contact Vicki Osis at vjosis@peak.org

Greedy Goblins' Global Warming
Join the folks at Dauphin Island Sea Lab for a spooky evening of kid-friendly games, activities and education as you learn how to battle the warming forces of the Greedy Goblins, October 26, 2007 in Dauphin Island, Alabama. Games for children of all ages will be held and admission to the event is free. Exhibits, games, and contests will be designed to teach visitors about the causes and effects of global warming, and what we can do to combat those effects to be good stewards of our environment.
For more information on Spooktacular, call 251-861-8710

Green Careers Resource Guide
The Green Careers Resource Guide is designed to assist career development professionals, but is also of use to self-directed students, career explorers, job seekers, and career changers.
http://www.cassio.com/FreeResourceGuides.htm

Green Conference Guide from EECOM
From the Canadian Network for Environmental Education and Communication (EECOM), this online guide can help make your next conference or meeting greener.
http://www.eecom.org/english/greenconf.html .

Green Guide to the Mexican Caribbean
Mexiconservación launched the Green Guide to the Mexican Caribbean, a manual available in English and Spanish designed to educate both individuals and businesses as to the value of the region's biodiversity and the threats it faces. The downloadable guide includes conservation guidelines relating to sea turtles, coral reefs, mangroves, seagrasses, cenotes, lagoons and beaches. It offers good practices recommendations for sport fishing, recreational boating, and hotel and restaurant management.
http://www.mexiconservacion.org/MC_GreenGuide.html

Green Media Toolshed
Green Media Toolshed is a nonprofit organization that works with the environmental community to provide online media and communications tools. Tools include an online media database, email and fax outreach abilities, and tips to help groups build relationships with reporters. Other assets include photos that members can use, a fully branded online press room, and more. Yearly membership fees are a sliding scale based on budget and scope of outreach.
http://www.greenmediatoolshed.org/aboutus/goalsandstratigies.acs

Green TV
Green TV, from UNEP, is the world's first broadband TV channel dedicated to environmental issues. Covering everything from climate change to children's stories on wildlife, it will carry films from around the world. It will have seven channels covering: air, land, water, climate change, people, species and technologies. Each channel will include a feature, a news item, and a children's story.
http://www.green.tv/

Greenhouse Gas Equivalencies Calculator
The greenhouse gas equivalency calculator can help us understand just what reducing carbon dioxide emissions by 1 million metric tons means in everyday terms. This equivalency calculator may be useful in communicating your greenhouse gas reduction strategy, reduction targets, or other initiatives aimed at reducing greenhouse gas emissions.
http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Greening of the Great Lakes
Michigan State University and Detroit's radio station WJR offer this website as an online resource for those interested in learning about the Great Lakes region, related environmental issues, and ways that they can protect the environment.
http://www.greeningofthegreatlakes.com/

Guide to Building Effective Education Initiatives
The SAI (STEM Accelerator Initiative) Guide to Building Effective STEM Education Programs is available from the National Alliance of State Science and Mathematics Coalitions. The guide can be a useful resource for anyone designing a new education program or conducting a strategic review of an existing program.
http://www.dehavillandassociates.com/SAIGuide_NASSMC.pdf

Guide to the Exotic Species of San Francisco Bay
The bays and estuaries of the Pacific Coast contain some of the most invaded marine habitats in the world, with additional species arriving every year. The Species Gallery of this guide to the exotic species of San Francisco Bay helps you identify and learn more about some of the most common invaders in this area. Clicking on an image in the gallery takes you to a web page with information about the species, native range, distribution, and more.
http://www.exoticsguide.org/

Guide to Good Environmental Management Practices for Marinas in Mexico
The Guide to Good Environmental Management Practices for Marinas in Mexico is the result of an open collaboration among a diverse group of people, organizations, and institutions who are committed to the idea that environmental protection is a key function of marina operations. This initiative identifies and supports the voluntary adoption of good marina management practices through preparing codes of conduct, technical manuals, pilot projects, and training. The guidelines are in English and Spanish.
http://www.crc.uri.edu/mxgmp/

Guide to Responsible Travel Options in the Americas
The Rainforest Alliance and their partners have produced a user-friendly guide to help you select reputable hotels and tour operators practicing sustainable tourism principles.

The Sustainable Tourism Certification Network of the Americas offers *Certified Tourism Products in the Americas* with descriptions of 138 hotels, restaurants and other types of tourism businesses in Guatemala, Costa Rica, Ecuador and the Caribbean.
http://www.rainforest-alliance.org/news/2005/travel_guide.html

Guides to the Species of the ACE Basin, South Carolina, and Coastal Habitats of Rhode Island
The Ashepoo-Combahee-Edisto (ACE) Basin of South Carolina has a largely undeveloped landscape with diverse habitats, with more than 1500 different plant and animal species that interact with the physical environment to create the ACE Basin ecosystem. The Internet-based Species Gallery highlights birds, fish, invertebrates, mammals, plants, and reptiles that make their home in the ACE Basin.
http://www.dnr.state.sc.us/marine/mrri/acechar/specgal/birds.htm .

Rhode Island is home to an array of coastal habitats, including salt marshes, seagrass beds, and river systems which contribute greatly to the state's biological integrity and diversity and help support the state's economy. Rhode Island's Habitat Restoration Portal hosts an Internet-based Species Gallery of anadromous fish, seagrass, and salt marsh habitats highlighting invertebrates, birds, fish, and plants found there.
http://www.edc.uri.edu/restoration/html/gallery/seagrass.htm

Guide to Understanding a Sense of Place
The free *Guide to Understanding a Sense of Place* (publication number EPA 842-B-01-003) explores the concepts of community and culture and provides tools for identifying, assessing, and working cooperatively within the social dynamics and local values connected to environmental protection. The guide is designed for people involved in community-based initiatives.
http://www.epa.gov/ncepihom/index.htm

Guidelines to Prevent Species from becoming Endangered or Threatened
This 56-page draft guideline was produced for a consortium of NGOs, bringing together current international and small island conservation planning information which can be used by national planners to build a pro-active plan for protecting island species and habitats from current and projected hazards and threats. It is available for downloading under Information Documents on the website. Check out the many other useful documents on the SPAW COP IV website.
http://cep.unep.org/meetings/2006/spaw-cop-iv/meeting_documents_view

Gulf Facts
Visit the Gulf of Mexico Foundation website for information about the Gulf of Mexico. Representing a wide range of interests (agriculture, business, fisheries, industry, tourism, and the environment), the Foundation promotes and funds research, education, and conservation programs. The focus area encompasses all areas bordering the Gulf. The website covers geography, resources, history, environmental concerns, education, and more.
http://gulfmex.org/facts.htm .

Gulf of Alaska with NOAA Ocean Exploration
The Gulf of Alaska 2004 Expedition from NOAA's Ocean Exploration, July 30-August 23, 2004, explored five large seamounts located approximately 200 miles off the Alaska coast. Scientists will focus their investigations on seafloor aging and characterization,

deep-sea coral genetics, and community ecology. The website hosts essays and lesson plans that tie directly to the expedition, developed for students in Grades 5-12. Logs, Ask an Explorer, videos, and more were added during the expedition.
http://oceanexplorer.noaa.gov/explorations/04alaska/welcome.html .

Gulf of Maine Primer of Marine Habitat Types
The Gulf of Maine Council on the Marine Environment has recently released The Gulf of Maine Primer of Marine Habitat Types, which details the types of habitats found in the Gulf of Maine region. The primer provides scientific data and descriptive characterizations to assist with evaluating and safeguarding marine habitats.
http://www.gulfofmaine.org/habitatprimer/

Gulf of Maine Monitor
Access cutting edge research and issues about coastal ocean observing in the Gulf of Maine by subscribing to the *Gulf of Maine Monitor*. Each issue explores timely issues surrounding the western Gulf of Maine, such as the effects of spring storms on the spring bloom. The Monitor is published quarterly and is free of charge.
http://www.cooa.unh.edu/publications.jsp

Gulf of Maine Research Institute
The Gulf of Maine Research Institute website offers materials to teach and learn about aquatic environments. Topics range from how satellites image the Earth to detailed examinations of species and habitats including lobsters, turtles, herring, marine mammals, and aquatic environments from Katahdin to the sea. Working with NASA, the site offers materials that describe global climate change, hurricanes, and over a hundred classroom-tested activities.
http://www.gma.org/educate/default.asp

Gulf of Mexico Alliance
The Gulf of Mexico Alliance, a partnership between Alabama, Florida, Louisiana, Mississippi and Texas, is intent on increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. Current focus is on five issues: water quality for healthy beaches and shellfish beds; wetland and coastal conservation and restoration; environmental education; identification and characterization of Gulf habitats; and reductions in nutrient inputs to coastal ecosystems.
http://www.dep.state.fl.us/gulf/default.htm

Gulf of Mexico Alliance Environmental Education Network Clearinghouse
The U.S. Geological Survey, National Wetlands Research Center in Lafayette, Louisiana, offers the Gulf of Mexico Alliance Environmental Education Network Clearinghouse. The site is searchable by issue and state. Information is included on reducing nutrient inputs, restoration, water quality, habitats, and much more. Check out the image galleries and links to science careers.
http://www.nbii.gov/gomaeen

The Gulf of Mexico at a Glance Report
One objective of the Gulf of Mexico Alliance is to build public awareness about the linkages between the Gulf region's ecological health, the quality of residents' everyday lives, and the economic vitality of the region. To this end, The Gulf of Mexico at a Glance presents regional aggregations of selected economic activities that are focused in

coastal and ocean areas, as well as selected social and environmental attributes of the region.
http://gulfofmexicoalliance.org/pdfs/gulf_glance_1008.pdf

Gulf of Mexico Marine Debris Mapping Website
The NOAA Gulf of Mexico Marine Debris Project recently launched this website. Nearshore waters of Mississippi, Alabama, and Louisiana are being surveyed for the purpose of locating and mapping marine debris, identifying risks to commercial fishing and shrimping activities in the Northern Gulf of Mexico coastal zone and providing users with critical information and maps of debris laden survey areas.
http://gulfofmexico.marinedebris.noaa.gov/

Gulfbase
GulfBase is a database of resources about the Gulf of Mexico. The goal of this website is to regroup, synthesize, and make freely available Gulf of Mexico research information. GulfBase can help researchers, policy makers, and the general public work together to insure long-term sustainable use and conservation of the Gulf of Mexico. The website hosts a comprehensive listing of upcoming events, background information about regional ecosystems, a history of exploration, and more.
http://www.gulfbase.org/

GulfBase InfoHub
GulfBase InfoHub is a public information resource for the Gulf of Mexico from the Harte Research Institute for Gulf of Mexico Studies and the National Sea Grant Law Center at the University of Mississippi. Users can search for articles on the laws, the science, and socioeconomic issues relevant to management and use of the Gulf of Mexico.
http://www.gulfbase.org/infohub/

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

H2OUSE
This website was developed by the California Urban Water Conservation Council under a cooperative agreement with the EPA. The website offers water-wise resources, including actions you can take around your house to conserve water, an extensive resources links section, water budget calculator, garden lists, and more.
http://www.h2ouse.org/

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

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

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

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

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

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

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

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

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

- Bigelow Lab for Ocean Science has an interactive CD-ROM available titled "Phytopia-Discovery of the Marine Ecosystem." Phytopia has three learning modules Phyto Factors, Phyto Files and the Bloom Activation tool. The website also includes many other HAB materials. http://www.bigelow.org/hab/
- The following monograph on brevetoxins can be a good primer for teachers http://ehp.niehs.nih.gov/members/2005/7501/7501.pdf
- The Bridge's April 2002 Data Tip entitled "In Full Bloom" is a classroom activity that uses HAB data from the NOAA Coastal Services Center. To access this activity, go to the Bridge's home page and type in Full Bloom in the search box. The Data Tip will be the first resource to come up. http://www.vims.edu/bridge
- While not all phytoplankton blooms are harmful, teachers can also refer to "When is Dinner Served? Predicting the Spring Phytoplankton Bloom in the Gulf of Maine, through the Earth Exploration Toolbook. http://serc.carleton.edu/eet/index.html
- The Southeast Phytoplankton Monitoring Network provides information and activities. http://www.chbr.noaa.gov/CoastalResearch/SEPMN/index.htm
- NOAA's Discovery Classroom includes an HAB lesson plan. http://www.nos.noaa.gov/education/classroom/07_algal.html

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

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

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

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

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

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

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

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

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

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

http://www.coquipr.com/herppr/

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

High School Environmental Center Website from EPA
This EPA website helps high school students explore and learn about their environment and ways to protect it. The website helps high school students find reliable environmental information, not just on EPA's website, but through other links as well. It links to air and water issues, waste and recycling, conservation, health and safety, ecosystems, and community environmental conditions.
www.epa.gov/highschool/

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

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

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

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

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

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

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

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

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

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

Hot Science - Cool Talks
The Hot Science - Cool Talks outreach lecture series is presented by the Environmental Science Institute and the Jackson School of Geosciences in Austin, Texas. Programs include pre-lecture activities, discussions following the lectures, and an Internet

broadcast for those who cannot attend. For every lecture there is a CD-ROM that includes the PowerPoint presentation used during the lecture, detailed notes for each slide, links to web and other additional resources on the subject material, and more.
http://www.esi.utexas.edu/outreach/lectures.html

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

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

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

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

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

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

Humpback Whale Awareness Month and Whale Count – Hawai'i
February is Humpback Whale Awareness Month in Hawai'i, an effort that includes distributing information to libraries throughout the state, lunchtime whale watches, a lecture series, and other events. Because whale population numbers are still relatively unknown, Hawaiian Islands Humpback Whale National Marine Sanctuary, the University

of Hawaii's Marine Option Program, and the Kaho`olawe Island Reserve Commission engage the community in an annual census count.
http://hawaiihumpbackwhale.noaa.gov/

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

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

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

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

- Resources from the National Science Teachers Association (NSTA)
  - Severe Weather SciGuide: http://sciguides.nsta.org
  - NSTA's SciLinks
    - Grades K-4, Storms:
      http://www.scilinks.org/retrieve_outside.asp?sl=566356104410551033
    - Grades 5-8, Hurricanes:
      http://www.scilinks.org/retrieve_outside.asp?sl=4735895674333355$741922112222$55557766
    - Grades 9-12
      Hurricane Fundamentals:
      http://www.scilinks.org/retrieve_outside.asp?sl=818144108888
      Hurricane Preparation:
      http://www.scilinks.org/retrieve_outside.asp?sl=818144109910
    - NSTA's Katrina Job Bank to help teachers forced to leave their communities. http://careers.nsta.org/katrina.asp
  - NSTA's relief efforts and new programs: http://www.nsta.org/katrina
- EE in Georgia – Hurricane Teaching Resources and Service Learning Opportunities:
  http://eeingeorgia.org/net/content/item.aspx?s=33997.5356.68.4863

- ED.gov Hurricane Help for Schools, for schools serving displaced students http://www.hurricanehelpforschools.gov/
- Association of State Floodplain Managers white paper on rebuilding the Gulf Coast after Hurricane Katrina: http://www.Floods.org/PDF/ASFPM_HurricaneKatrina_WhitePaper_090905.pdf
- Incident News, with information about spill response actions: http://www.incidentnews.gov/
- Environmental Literacy Council http://www.enviroliteracy.org/article.php/258.html
- Forming Hurricanes poster (see educational resources, below)

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

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

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

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

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

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

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

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

Additional websites with images following Katrina:

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

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

Hurricane Resources

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

HyperStat Online

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

Ice Planet Earth

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

Ice Stories: Dispatches from Polar Scientists

The Exploratorium celebrates the International Polar Year 2007-2008 by giving cameras to a group of penguin biologists, glaciologists, cosmologists, geologists, and marine

scientists working in Antarctica and the Arctic. Visitors can learn about the thoughts and experiences of the scientists working in these two regions. Check out the archived materials, upcoming webcasts, and more.
http://www.exploratorium.edu/poles/index.php

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

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

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

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

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

ide@s
The Interactive Dialogue With Educators Across the State (ide@s) website offers educator resources that have been aligned to the state education standards and are readily available on the Internet. The website brings together teacher-reviewed and tested lessons, interactive tools, video, and other resources which can be used in the

classroom or for curriculum development purposes. The subject list includes environmental education, science, service-learning, and more.
http://www.ideas.wisconsin.edu/

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

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

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

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

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

Immersion Presents: Secrets of the Gulf
Starting with live broadcasts March 4-9, 2007, Dr. Robert Ballard and a team of researchers will launch a virtual expedition to the Gulf of Mexico paralleling the actual research expedition. An important theme of the expedition will be connectivity. For the virtual expedition, Immersion Presents will develop an interdisciplinary multimedia curriculum that will include an Adventure Series with hands-on activities exploring the region's geography, geological history, human history, biology, ecology, conservation

and careers; Curriculum Extensions to meet the needs of upper elementary and middle school classrooms; interactive content for the website; live broadcasts; and more.
http://www.mysticaquarium.org/index.cgi/1290
http://www.immersionpresents.org/

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

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

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

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

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

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

Contact Kristen Hoss at voneresearch@bellsouth.net

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

International Coastal Cleanup
The International Coastal Cleanup, September 18, 2004, September 16, 2006, sponsored by the Ocean Conservancy, is the world's largest one-day volunteer effort on behalf of the marine environment. Youth participation is a major key to success. Each year, groups such as schools, scouts, and churches take advantage of the unique opportunity offered by the cleanup. This website offers teacher resources along with activities and games.
http://www.coastalcleanup.org/pub1/index.cfm

International Coastal Cleanup Day
In partnership with organizations and individuals across the globe, Ocean Conservancy's International Coastal Cleanup engages people to remove trash and debris from the world's beaches and waterways, identify the sources of debris, and change the behaviors that cause marine debris in the first place. Join them this September, and join in a local cleanup effort.
http://www.signuptocleanup.org/index.cfm?fuseaction=Projects.Main&CFID=5699226&CFTOKEN=39878856

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

http://www.coralreef.org

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

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

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

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

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

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

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

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

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

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

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

International Year of the Reef
The International Coral Reef Initiative designated 2008 as the International Year of the Reef (IYOR 2008). The initiative hopes to strengthen awareness about the ecological, economic, social, and cultural value of coral reefs and associated ecosystems; improve understanding ofl threats to coral reefs and generate practical and innovative solutions to reduce these threats; and generate action to develop and implement effective management strategies for conservation and sustainable use of these ecosystems.
http://www.iyor.org/

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Jean-Michel Cousteau: Ocean Adventures
The six-part TV series premiering on PBS stations this April, *Jean-Michel Cousteau: Ocean Adventures*, is produced by KQED Public Broadcasting and the Ocean Futures Society. The series illuminates the need for better understanding and sustainable management of the oceans' natural treasures. The website includes standards-based lesson plans, informal activities, on-line games, and more, designed for middle school but easily adaptable for other grades.
http://www.pbs.org/kqed/oceanadventures/

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

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

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

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

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

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

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

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

Journal of Coastal Research
The Coastal Education and Research Foundation has released a special summer 2008 issue of its on-line journal, *The Journal of Coastal Research*, devoted entirely to research conducted in the National Estuarine Research Reserve System. The special issue, *Research and Monitoring of NERRS Aquatic Ecosystems*, focuses on biological

monitoring and studies of the linkages between physical and biological components of estuarine ecosystems.
http://www.jcronline.org/perlserv/?request=get-toc&issn=1551-5036&volume=55&issue=sp1&ct=1

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

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

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

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

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

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

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

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

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

Juan de Fuca Ridge Expedition
REVEL expedition, June 14-July 13, 2004, explored the deep ocean off the Pacific Northwest coast on the research vessel Atlantis. During this expedition to the Juan de Fuca Ridge, 200 miles west of Washington and British Columbia, scientists, engineers and educators used an Autonomous Underwater Vehicle to study the transfer of heat from hydrothermal vents plumes into the ocean.
www.ocean.washington.edu/outreach/revel .

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

K-12 Teaching Resources from Delaware Sea Grant
The University of Delaware, Graduate College of Marine Studies and the Sea Grant College Program offer a variety of free or low-cost resources to K–12 teachers seeking marine science information and curriculum materials. Check out the Neat Stuff with the

Interactive Habitat, quick-loading on-line videos and presentations, and the Catch of the Day.
http://www.ocean.udel.edu/public/teacher.html

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

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

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

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

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

Key to the Sea
Key to the Sea is Heal the Bay's free marine environmental education program for teachers and elementary school children (K-5) throughout Los Angeles County. Students learn about watershed stewardship, stormwater pollution prevention, and marine conservation, accomplished through hands-on educational activities culminating in a field trip to the beach. Teachers receive professional development training before the field trip along with standards-based curriculum.
http://www.healthebay.org/key2sea/

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

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

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

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

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

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

La Fete d'Ecologie: Barataria-Terrebonne - Louisiana
The Barataria-Terrebonne National Estuary Program and Foundation offered "La Fete d'Ecologie: Barataria-Terrebonne," on September 30, 2006 in Thibodaux, Louisiana. This educational festival highlights the natural, cultural, and historical resources of the

Barataria-Terrebonne National Estuary with food, music, educational kids' activities, and more. La Fete d'Ecologie educates people about the environment that they live in, the history of the region, and the unique blend of cultures found in the estuary.
http://www.btnep.org/client_files/nl_files/fete%2006%20crablines(1).pdf

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

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

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

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

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

LandScope America
LandScope America is a collaborative project of NatureServe and the National Geographic Society. This website is meant to be an online resource for the land-protection community and the public. The site brings together maps, data, photography, and information about the environment from a variety of sources and presents them in

dynamic and accessible formats. The goal is to inspire and inform collaborative place-based conservation in the U.S..
http://www.landscope.org/

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

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

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

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

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

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

ocean literature for those teachers that work cross-curriculum with language arts and English teachers.
http://www.marine-ed.org/bridge

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

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

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

Learning from the Sea
Learning from the Sea: Reading and Math Exercises for Young Turks and Caicos Students, is a marine education series that consists of a workbook and an interactive DVD that will be distributed to schools in the Turks and Caicos Islands in an effort to incorporate more marine education and awareness into the school curriculum. This website contains many features of the DVD, a virtual dive and snorkel, and other material. Additional features include videos, news, and links to other material.
http://www.learningfromthesea.com/

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

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

http://www.royalbcmuseum.bc.ca/programs/index_programs.html

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

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

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

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

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

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

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

Lessons Learned About Collaboration
The Eisenhower Mathematics and Science Consortia and Clearinghouse Network is producing a series of Lessons Learned reports from its 12 years of work in mathematics and science reform. The first publication, *What Experience Has Taught Us About Collaboration*, looks at how collaboration is characterized in the literature, presents strategies and steps for building effective collaborative relationships, and explores several "deep structure" issues that represent barriers to collaborative work.
http://www.mathsciencenetwork.org/collaboration.pdf .

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

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

Library of Congress Nature and the Environment
The Library of Congress has compiled a collection of resources supporting education on nature and the environment. The multimedia resources include presentations, exhibitions, webcasts, news, and classroom materials. Selections include The Everglades: Exploitation and Conservation, Global Warming and Climate Change, and more.
http://www.loc.gov/teachers/classroommaterials/themes/nature/exhibitions.html

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

http://pubs.usgs.gov/gip/2005/17/

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

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

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

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

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

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

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

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

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

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

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

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

Listen: Making Sense of Sound
The Exploratorium, a hands-on museum in San Francisco, offers a set of online activities giving users the opportunity to listen closely to the particular sounds of the natural world.

Listening Guides include suggestions about listening to wildlife, urban environments, and more. The Online Activities sections lets users practice new ways of listening and test their skills.
http://www.exploratorium.edu/listen/index.php

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

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

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

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

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

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

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

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

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

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

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

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

Long Island Sound Curricular Resource Guide
Connecticut Sea Grant offers the *Long Island Sound Curricular Resource Guide*. Funded by the EPA – Long Island Sound Study, the 148 page guide is a resource for educators teaching about Long Island Sound. The sections include background information about the sound, activities, lesson plans, science lessons at a field site, and resources. Print copies are free (except shipping), and electronic copies should be available by September 2009.
Contact Karen Massaro at Karen.Massaro@uconn.edu

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

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

Lophelia II 2009: Deepwater Coral Expedition: Reefs, Rigs, and Wrecks
NOAA Ocean Exploration and Research Program has launched the *Lophelia II 2009: Deepwater Coral Expedition: Reefs, Rigs, and Wrecks Web* page, complete with archives of the mission. A basic goal of the study was to be able to predict deep-water coral distribution in the Gulf of Mexico. Educators working with scientists from the cruise developed an Ocean Explorer Expedition Education Module for the mission, and the website also includes logs, video, OceanAGE Career Connections, and other resources.
http://oceanexplorer.noaa.gov/explorations/09lophelia/welcome.html

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

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

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

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

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

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

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

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

Making Connections for Bird Conservation
Partners in Flight has published *Making Connections for Bird Conservation: Linking States, Provinces & Territories to Important Wintering and Breeding Grounds*. This document offers maps which summarize migratory connections between individual U.S. states, Canadian provinces and territories, and the regions that support the same birds at the other end of migration. The document includes maps of migratory connections for each state, province and territory, and a series of appendices.
http://www.partnersinflight.org/pubs/ts/04-Connections

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

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

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

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

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

Mapping Human Activity in the Marine Environment: GIS Tools and Participatory Methods
This report summarizes a workshop convened by the National MPA Center focused on mapping human activity in the marine environment using GIS tools and participatory methods. The goal of the workshop was to develop general design criteria for practical

participatory methods to collect spatial data on human use patterns to inform local and regional MPA planning processes. The report identifies the types of data needed and includes recommendations for collecting the data types both at regional and local levels.
http://www.mpa.gov/information_tools/social_science.html

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

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

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

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

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

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

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

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

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

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

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

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

Marine Debris CDs
Marine Debris of the Northwestern Hawaiian Islands: Ghost Net Identification is an effort to increase public awareness of the Northwestern Hawaiian Islands derelict fishing gear problem. This 2-disc set includes a CD document on marine debris in the Northwestern

Hawaiian Islands and a narrated DVD slide show presentation that illustrates the magnitude of the marine debris problem in the NWHI and focuses on the removal process through the eyes of a marine debris diver.
Contact Kerry Irish irish@hawaii.edu or Molly Timmers at molly.timmers@noaa.gov
http://www.nmfs.hawaii.edu/cred/mdr.php

Marine Debris to Energy Project
The New Hampshire Marine Debris to Energy Project studies marine debris at sea and on the shore, incorporating waste-to-energy and recycling as part of cleanup efforts. The website includes individual beach debris breakdowns, a reporting form, and more. Individual beach maps will be available in the future.
http://www.nhmarinedebris.org/

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

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

Marine Debris Video and Slidepacks
The Offshore Operators Committee offers information about marine debris in both English and Spanish. The website has pdf, PowerPoint, and downloadable videos about marine debris. While geared toward people who work offshore on oil and gas production platforms, they offer good information and demonstrate how even simple actions can help.
http://www.offshoreoperators.com/marinedebris/

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

Marine Ecosystems and Management
The first issue of *Marine Ecosystems and Management*, a new quarterly newsletter on marine ecosystem-based management worldwide, has been produced by the same

team as *MPA News*, and is funded in part by the David and Lucile Packard Foundation. To subscribe, send an email to meam@u.washington.edu. Type "subscribe" on the subject line and include your name, mailing address, and daytime phone in the text of the message.
http://depts.washington.edu/meam/

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

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

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

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

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

Marine Highlights from World Conservation Union Congress
The 3rd IUCN World Conservation Congress was held from November 17-25, 2004 in Bangkok, Thailand. The IUCN Global Marine Programme has brought together the

marine highlights from this event that include information on adopted resolutions, recommendations, and news on the main themes discussed, including the high seas, marine protected areas, coral reefs, and marine invasives.
http://www.iucn.org/themes/marine/pdf/PostWCC_KeyMarineMsgs.pdf

Marine Job Postings
If you have a job related to marine or coastal environmental issues for any career background (e.g. educators, oceanographers, marine biologists, anthropologists, lawyers, engineers), please email it to: oar.sg.knauss.joblist@noaa.gov. This listserv is distributed to over 300 people in these fields (many who are Knauss Sea Grant Fellowship alumni) and numerous marine and coastal societies and universities. Contact Nikola Garber at Nikola.Garber@noaa.gov

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MarineNZ
MarineNZ is a conservation and education website from the Mountains to Sea Conservation Trust. The site features underwater photos, videos, and information. There are resources for teachers and students, along with interviews with people working in marine conservation. The aim of the website is to inform, to educate, and to inspire marine conservation projects around New Zealand. The website includes news from New Zealand and around the world; feature stories on New Zealand's marine reserves, people in marine conservation, and more; science, resources, and more.
http://www.marinenz.org.nz/

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

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

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

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

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

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

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

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

Massachusetts Ocean Education Guide Website
The Massachusetts Coastal Zone Management Ocean Education Program has developed a dynamic directory of state ocean education resources. The directory includes field trips, speakers, curricula, after school programs, workshops, films/videos, newsletters/periodicals, library/resource centers, volunteer opportunities, and other programs designed to assist K-12 educators in teaching about the Massachusetts' ocean resources.
http://www.mass.gov/czm/oceanmanagement/education/guide/index.htm

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

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

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

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

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

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

Media College
MediaCollege.com is an educational and resource website about all forms of electronic media. Topics include video and television production, audio work, photography, graphics, web design, and more. The website offers hundreds of tutorials with supporting illustrations, videos, sound bytes, and interactive features. You'll also find reference material, utilities, and other useful tools, as well as a helpful forum.
http://www.mediacollege.com/

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

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

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

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

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

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

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

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

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

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

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

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

The Microbe Zoo
This virtual zoo, part of the Digital Learning Center for Microbial Ecology at Michigan State University, is filled with exotic specimens from the microscopic worlds around, inside of, and on us. The zoo includes pictures of microbes; data about their size,

scientific classification, feeding habitats, and more; and descriptions of how the microbes fit into and interact with their environment and other microorganisms. Zoo specimens are arranged in habitat pavilions, including Water World.
http://commtechlab.msu.edu/sites/dlc-me/index.html .

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

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

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

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

Migration Science and Mystery – A Distance Learning Adventure
Students in grades 5-8 are invited to join millions of shorebirds as they migrate, through webcasts, web chats with experts, videos, and more. The Migration Science and Mystery distance learning adventure takes participants on a journey totaling more than 6,500 miles from Panama to Alaska with stopovers in between. The programs will be broadcast live, and wildlife biologists will be on site to talk about migration and answer questions. Migration is underway, so register now to participate in the journey.

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

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

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

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

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

Millennium Ecosystem Assessment
The new Millennium Ecosystem Assessment collates research from many specific locales to create the first global snapshot of ecosystems. The report was assembled by the U.N. Environment Program and includes contributions by 1,300 authors from 95 countries. The Millennium Ecosystem Assessment Synthesis Report presents a synthesis and integration of the findings of the four working groups, condition and trends, scenarios, responses, and sub-global assessments.
http://wdc.nbii.gov/ma.
www.MAweb.org

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

Millennium Coral Reefs Landsat Archive
NASA announces the availability of 1,490 Landsat 7 images of coral reefs in an Internet-based library for the Millennium Coral Reef Project. The collection was created in a partnership which includes NASA, international agencies, universities, and other organizations to provide natural resource managers a comprehensive world data

resource on coral reefs and adjacent land areas. This archive contains standardized data that is tiled, zoomable, and downloadable via FTP.
http://seawifs.gsfc.nasa.gov/cgi/landsat.pl

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Museum of Comparative Zoology: Entomology Primary Type Specimen Database
The Museum of Comparative Zoology at Harvard University has an incredible collection of insects on their website. This online database contains records for primary types in the entomology collections of the Museum of Comparative Zoology (MCZ). In addition to type label data, type stage and status, the database includes high-resolution images of

the type specimens. Check out the other department databases (e.g.ichthyology), too.
http://mcz-28168.oeb.harvard.edu/mcztypedb.htm

Museums in the Sea
The Florida Coastal Management Program and partners are developing Museums in the Sea, offering a virtual tour of Florida's Underwater Archaeological Preserves. Learn about Florida's underwater heritage, ecological, and recreational tourism opportunities at eleven shipwreck locations around the state. Through the website, visitors can choose a shipwreck, take a guided underwater tour of the wreck site, watch a narrated history of the vessel, and observe the marine life that lives in the wreckage.
http://www.museumsinthesea.com/

Museum of New Zealand Te Papa Tongarewa
The website of the Museum of New Zealand Te Papa Tongarewa offers visitors the opportunity to navigate the site in English or Maori. First-time users will want to take a look at Tai Awatea, or Knowledge Net, which offers interactive modules that offer insight into the peoples of the Pacific Islands along with other materials. The website also allows visitors to explore some of the hazards that happen in New Zealand - earthquakes, volcanic eruptions, and tsunami.
http://www.tepapa.govt.nz/TePapa/English/

Museum of Underwater Archaeology
The Museum of Underwater Archaeology introduces students to the work of underwater archaeologists and maritime historians. Explore shipwrecks, lost colonies, and underwater archaeological projects around the world. Learn about the six steps in conducting an underwater archaeology project. Resources include a teaching kit, a worldwide site map, and more.
http://www.uri.edu/artsci/his/mua/MUA.htm

Musical Plates Project
Musical Plates, from the Center for Innovation in Engineering and Science Education, is a multidisciplinary project that challenges students to tap into real-time earthquake data, interact with experts online, and publish their investigative work on a special website. Four core activities teach students how to access and interpret online earthquake and volcano data and use this information to solve real-world problems. The website offers a teacher guide, reference material, projects, ask an expert, and more.
http://www.k12science.org/curriculum/musicalplates3/en/index.shtml

My Environmental Education Evaluation Resource Assistant
The website, My Environmental Education Evaluation Resource Assistant (MEERA), provides evaluation resources for formal and non-formal environmental educators. Current offerings include professionally selected and reviewed how-to guides and other resources for evaluating environmental education programs as well as a discussion forum. Future offerings will include searchable examples of evaluations of environmental education programs.
http://meera.snre.umich.edu/

My Green Job
KABC-TV's *Green Right Now* offers this series, profiling people who working in the emerging green economy. Read the stories of how they started working in these

sometimes-new fields, learn about their training, and get their advice on how you can move into the green-collar workforce.
http://www.greenrightnow.com/kabc/2009/04/10/special-report-my-green-job/

My NASA Data Lesson Plans
Each lesson on MY NASA DATA provides students an in-depth opportunity for learning to access and use authentic satellite data. Each unit plan provides an implementation guide including at least three lessons, related activities, and resources. The datasets provide information on the atmosphere, ocean, and land surface and are available online along with lesson plans, teacher-friendly documentation, computer tools, and an Earth science glossary. Science project starter ideas are also available.
http://mynasadata.larc.nasa.gov/unit_lessons.html

My Wonderful World
The GLOBE Program has joined a coalition in a public-engagement campaign designed to give students tools, improving the geographic literacy of young people ages 8-17 by motivating parents and educators to expand geographic learning in school, at home and in their communities. The website provides a variety of resources, including suggestions for family activities, links to geography games and online adventures for kids and teens, classroom materials for educators, and more.
http://www.mywonderfulworld.org/

Myrtle's Coastal Adventure
Myrtle's Coastal Adventure 5th Grade Activity Booklet explores Georgia's coastal world. The booklet provides information on Georgia's islands, an offshore word find puzzle, fish identification, word banks, flora and fauna comparisons, and more.
http://www.knowtheconnection.com/pdf/Myrtles%20Coastal%20Adventure.pdf

Mystery Class – Exploring Sunlight and the Seasons
Teachers and students in grades 4-12 classrooms are invited to participate this winter and spring in Journey North's Mystery Class project, February 2-May 15, 2009, in which students try to find ten secret classes hiding around the globe, using the changing sunlight at each site as the clue.
http://www.learner.org/jnorth/tm/mclass/About.html

Mystery of the Megaflood
The dusty scablands of eastern Washington are the result of a massive flood that moved across the region. This website, created by the NOVA program on PBS, provides a number of complementary online materials. These include an interview with an expert and interactive features.
http://www.pbs.org/wgbh/nova/megaflood/