

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**  
**INFORMATION EXCHANGE FOR MARINE EDUCATORS**

**NOVEMBER 2012**

This update is funded by the National Marine Sanctuary Foundation in partnership with NOAA's Ocean Exploration and Research Program, with additional support from the National Marine Protected Areas Center, to share information pertinent to the marine educator community. It is intended to encourage exchange of information and programs. We hope that it will also promote collaboration among the different educators addressing similar issues in their programs.

Please share this email with your colleagues and constituents. If you request materials or respond to a request for information, please mention that you learned about it from NOAA's Information Exchange.

The information included here has been compiled from many different sources, including EE-NEWS@NAAEE, EEinGEORGIA, the Scout Report, scuttlebutt, NSTA Express, and others. We have verified web addresses, but make no guarantee that they will remain active. The Department of Commerce/NOAA does not necessarily endorse or promote the views or facts presented on these sites.

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Collected archives and issues of the newsletter, past and present, are available at <http://mpa.gov/resources/education/#exchange>. Contact the editor directly at phyllis.dermer@noaa.gov, or by phone at (865) 932-5074, to discuss further enhancements or to contribute information for future issues.

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## **Notable Reference**

### **Ecosystem Approach to Fisheries**

Kevern Cochran, former Director of the Fisheries and Aquaculture Resource Use and Conservation Division for the U.N. Food and Agriculture Organization, offers a list of ten Must-Be-Read Publications on the Ecosystem Approach to Fisheries, encompassing ecological, human, and governance dimensions.

<http://openchannels.org/literature-library/top-eaf-ebfm>

## **OPPORTUNITY & APP OF THE MONTH**

### **Chasing Ice**

Through the generous donations of various small grants and efforts of small grassroots groups, you are invited to reserve two tickets to the opening weekend of 'Chasing Ice', a film depicting the rapid melting of glaciers through images only the big screen can provide. A limited number of tickets are available on a first come, first served basis. The Furst Access website offers a listing of upcoming showings, along with a link to the trailer and request links for free passes.

<http://furstaccess.com/event-master.aspx?eid=2014&lid=13>

### **Fun eReader Picture Books**

Sylvan Dell offers an iPad app for all of their books. In line with their previous generous offers of free access to their resources, they are giving free access to ALL of their "science and math through literature" books for 30 days from October 9, 2012. Whether using with young children in your personal lives, as a teacher in a classroom, or as an aquarium educator, check out the books on your iPad or computer. Remember –books are available in English and Spanish. Hurry – the deadline for free access is approaching quickly.

<https://itunes.apple.com/us/app/id500641356?mt=8>

<http://www.sylvandellpublishing.com/index.php>

## **COLLECTION OF THE MONTH**

### **How Do We Explore Education Materials**

NOAA's Office of Ocean Exploration and Research offers Volume 2 of the NOAA Ship *Okeanos Explorer* Education Materials Collection - How Do We Explore? This volume complements Volume 1: Why Do We Explore?, and targets the exploration strategy of the *Okeanos Explorer* and the technology used in modern ocean exploration, including telepresence, multibeam sonar, water column investigations, and underwater robots. Each lesson is aligned with the vision of A Framework for K-12 Science Education in preparation for the Next Generation Science Standards, and also with the Ocean Literacy Essential Principles and Fundamental Concepts. All materials are available for free downloading from the website.

<http://oceanexplorer.noaa.gov/okeanos/edu/collection/hdwe.html>

## **REQUESTS**

### **NAAEE Call for Leadership**

The North American Association for Environmental Education is looking for leaders for board positions. The deadline for nomination is November 10, 2012.

<http://www.naaee.net/us/cfn>

## **GRANTS AND OPPORTUNITIES**

### **AmeriCorps State and National Grants**

AmeriCorps awards grants to organizations to implement programs that use AmeriCorps members to engage in evidence-based interventions to strengthen communities.

Funding areas for 2013 include education, environmental stewardship, and more. See the website for more details, including a new opportunity for state and local officials to

work together on public-private partnerships. The deadline for application is January 23, 2013.

[http://www.nationalservice.gov/for\\_organizations/funding/nofa\\_detail.asp?tbl\\_nofa\\_id=98](http://www.nationalservice.gov/for_organizations/funding/nofa_detail.asp?tbl_nofa_id=98)

### **Blue Oval Scholars**

High school seniors and college students who are making a difference in their communities are encouraged to apply to be a Ford Foundation Blue Oval Scholar. Applicants upload a video photo essay describing the work they've done and what they would do with more funding and the ability to promote their entries on social media. The deadline for submission is December 14, 2012.

<https://www.fordscholars.org/>

### **Christopher Columbus Awards**

The Christopher Columbus Awards for Middle School Students is a community-based STEM program. Students work in teams of three to four, with an adult coach, to identify a problem in their community and apply the scientific method to create an innovative solution to that problem. The deadline for submission is February 4, 2013.

<http://www.christophercolumbusawards.com/>

### **GenerationOn Clubs and Start-Up Grants**

GenerationOn Clubs are groups of youth supported by adult facilitators in schools, existing youth development organizations, and others, who implement hands-on service projects locally, nationally, and globally. Resources are age-appropriate, with generationOn Kids Care Clubs for elementary-age kids and generationOn Service Clubs for middle and high school-age teens. Registered clubs have access to free resources around issue education and project planning. Hasbro generationOn Clubs Start-Up Grants support newly registered generationOn clubs as they complete their first service projects. The deadline for registration is November 15, 2012.

<http://www.generationon.org/teens/club-start-grants>

### **Invent It Challenge**

Educational media company ePals and the Smithsonian are sponsoring the second annual Invent It Challenge. Students ages five to 15+ can enter solutions for real-world problems in four age categories. The deadline for entry is January 4, 2012.

[http://en.community.epals.com/smithsonian\\_on\\_epals/p/inventionchallenge2012.aspx](http://en.community.epals.com/smithsonian_on_epals/p/inventionchallenge2012.aspx)

### **Innovative App Challenge**

Verizon Foundation and Technology Student Association have partnered to offer the Verizon Innovative App Challenge, a competition that provides the opportunity for middle school and high school students to use their STEM knowledge to design an original mobile app concept that addresses a need or problem in their school or community. The deadline for submission is January 18, 2013.

<http://appchallenge.tsaweb.org/>

### **Knauss Marine Policy Fellowship**

The Knauss Marine Policy Fellowship provides experience to students who have an interest in ocean, coastal, and Great Lakes resources and in the national policy decisions affecting those resources. The program matches highly qualified graduate students with hosts in the legislative and executive branch of government located in the Washington, D.C. area, for a one year paid fellowship. The deadline for application is February 15, 2013. Contact your state Sea Grant program director.

<http://www.seagrant.noaa.gov/knauss/>

### **Nancy Foster Scholarship Program**

NOAA's Office of National Marine Sanctuaries hosts the Nancy Foster Scholarship Program, designed to support students interested in NOAA mission-related sciences of oceanography, marine biology, or maritime archaeology (including all science, engineering, and resource management of ocean and coastal areas) - particularly by female and minority students. The deadline for application is December 6, 2012.

<http://fosterscholars.noaa.gov/howtoapply.html>

### **Teacher Innovator Awards**

PBS LearningMedia and The Henry Ford sponsor the third annual Teacher Innovator Awards. Educators in pre-K-12 who use digital media to enhance learning are encouraged to submit a short video or pdf of their work. The deadline for submission is December 12, 2012.

<http://www.pbs.org/teachers/innovators/>

## **INTERNSHIPS AND TEMPORARY OPPORTUNITIES**

### **Post-Doctoral Research Positions - Australia**

The Australian Research Council Centre of Excellence for Coral Reef Studies seeks up to 11 early to mid-career postdoctoral research fellows with interests across a broad range of disciplines, including biology, geochemistry, mathematics, economics, and social sciences. Check the website for details, including deadlines for application starting November 9, 2012.

<http://www.coralcoe.org.au/about-us/employment-opportunities>

## **CONFERENCES, WORKSHOPS, AND PROFESSIONAL DEVELOPMENT**

### **Ocean Exploration Workshops – Various**

NOAA's Ocean Exploration Program and partners offer the Okeanos Explorer Education Materials Collection, How Do We Explore? Professional Development Workshop for Educators. Participants will receive curriculum with CD-ROM's, certificates of participation, and more. Contact the noted educator or check out the website for registration and more information.

- December 15, 2012 with Seattle Aquarium in Seattle, Washington. The deadline for registration is November 26, 2012. Contact Dan Newburn at [d.newburn@seattleaquarium.org](mailto:d.newburn@seattleaquarium.org)
- January 12, 2013 with Audubon Aquarium of the Americas in New Orleans, Louisiana. The deadline for registration is December 21, 2012. Contact Tricia LeBlanc at [tleblanc@AudubonInstitute.org](mailto:tleblanc@AudubonInstitute.org)
- January 26, 2013 with Old Dominion University in Norfolk, Virginia. The deadline for registration is January 4, 2012. Contact Jennifer Kodolitsch at [jennifer.tabor@norfolk.gov](mailto:jennifer.tabor@norfolk.gov)

<http://oceanexplorer.noaa.gov/edu/development/development.html>

### **NNOCCI Study Circle**

The National Network for Ocean Climate Change Interpretation is a collaborative effort to establish a national network of professionals skilled in communicating climate science

to the American public. The study circle is a cross-disciplinary learning group made up of peers with expertise from fields of professional interpretation, climate and ocean sciences and communications, and cultural sciences. It is intended for pairs of staff members from informal learning centers such as zoos, aquariums, science centers, National Parks, natural preserves, and other institutions that have a focus on coastal or ocean issues. Hurry - the deadline for application is November 4, 2012. See the website for complete details.

<http://www.climateinterpreter.org/features/apply-join-nnocci-study-circle-november-4-2012>

### **SCUTES Workshop – Massachusetts and Online**

The SCUTES (Students Collaborating to Undertake Tracking Efforts for Sturgeon) program is a collaboration between NOAA Fisheries, sturgeon researchers, teachers, and informal educators to bring more awareness about Atlantic and shortnose sturgeon to the classroom. A free workshop, November 7, 2012 in Gloucester, Massachusetts and via webinar, will introduce educators to lesson plans relating to the Endangered Species Act and sturgeon. Check out the website for a list of lesson plans, rubrics, and more.

[http://www.nero.noaa.gov/prot\\_res/scutes/workshop.html](http://www.nero.noaa.gov/prot_res/scutes/workshop.html)

### **Teachers Teaching Teachers GIS - California**

ESRI's Teaching Teachers GIS Institute is seeking 100 educators from all levels, who want to help other educators engage ArcGIS Online in their instruction. GIS experience is useful but not required. The institute will take place June 16-21, 2013 in Redlands, California. The deadline for application is November 30, 2012.

<http://edcommunity.esri.com/community/institute2013/index.cfm>

## **EDUCATIONAL RESOURCES**

### **Ask a Scientist**

The Howard Hughes Medical Institute connects students to top scientists connected to the institute; students can ask scientists about medicine, human biology, animals, biochemistry, microbiology, genetics, or evolution.

<http://www.hhmi.org/askascientist/>

### **Climate Change Curriculum**

Stanford University has developed climate change curriculum units for middle and high school students. The lesson plans include both teacher-centered and student-centered activities with lectures based on provided slideshows, teacher-led demonstrations, student-led investigations, and group analysis of data. Underlying these activities is a philosophy of learning by inquiry as well as justifying claims with evidence.

<https://pangea.stanford.edu/programs/outreach/climatechange/>

### **Encouraging Young Scientists**

NSTA offers a new, free newsletter for preK-2 teachers, *Encouraging Young Scientists*. This monthly newsletter aims to make science accessible to and achievable by young children, and offers classroom resources and ideas.

<http://www.nsta.org/publications/archive-eyas.aspx>

### **European Marine Science Educators Association Resources**

The European Marine Science Educators Association (EMSEA) is a non-profit organization which provides a platform for ocean education and promoting ocean literacy within Europe. The website offers an extensive list of marine education links. They have also organized a Facebook group to provide an informal forum for educators to share marine education ideas and experience in Europe and around the world.

<http://www.emsea.eu/>

<https://www.facebook.com/groups/460137674027494/?fref=ts>

### **From the Top of the World...to the Bottom of the Food Web**

These four teaching units show how NASA satellites measure ocean productivity. Topics cover marine food webs; phytoplankton diversity, classification and adaptations; studying photosynthesis with technology from microscopes to satellites; and biology of algal blooms. The units include background information, lesson plans using on-line data or instructions for classroom and field activities, and web links for further study.

<http://www.bigelow.org/foodweb/>

### **Google Public Alerts**

Google's Public Alerts provide warnings for natural disasters and emergency situations. They appear based on targeted Google searches, or with location-based search queries. In addition to the alert, Google shows relevant response information, such as evacuation routes, crisis maps, or shelter locations.

<http://www.google.org/crisisresponse/publicalerts/>

### **How Hurricanes Affect Wildlife and What Happens Underwater**

The National Wildlife Federation's Wildlife Promise blog posted Seven Things to Know About How Hurricanes Affect Wildlife after Hurricane Irene – a quick review including wind dislocation, dune and beach loss, saltwater intrusion, and more. University of Miami's Rosenstiel School of Marine & Atmospheric Science blog posted What Happens Underwater During a Hurricane with information about effects on ocean properties. Teachers can use these as introductions to more in-depth inquiry.

<http://www.rsmas.miami.edu/blog/2012/10/22/what-happens-underwater-during-a-hurricane/>

<http://blog.nwf.org/2011/08/seven-thngs-to-know-about-how-hurricanes-affect-wildlife/>

### **Identification Guide to Marine Organisms of Texas**

The Marine Species Identification Project is an interactive web-based collection of photographs and information on marine species found off the Texas coast. The website provides detailed photos and descriptions to aid in the correct identification of individual organisms. Each species is represented by one or more photographs and brief descriptions of habitat, distinguishing characteristics, differences from similar species, and much more. The website includes interactive identification keys, a glossary, and more.

<http://txmarspecies.tamug.edu/>

### **Marine Sciences**

This website, written by Genevieve Anderson, author of online Marine Science at Santa Barbara City College, offers an introduction to the ocean sciences. The website includes information on habitats, oceanic fauna, oceanographer's tools, and case studies that forecast the future of the ocean.

<http://www.marinebio.net/marinescience/01intro/index.htm>

### **Mobile Coral Reef Conservation Program**

A mobile version of the Coral Reef Conservation Program website is now available. The mobile site features news stories, coral facts, images, a glossary, and acronym lists for smartphone users.

<http://coralreef.noaa.gov/m/>

### **Ocean Today**

This website provides access to current and archived videos of the Ocean Today kiosk. The Ocean Today kiosk was designed to be a dynamic, visitor-friendly experience at the Sant Ocean Hall in the Smithsonian Institution's National Museum of Natural History. Ocean Today illustrates both the ocean's influence on humans and their influence upon the ocean. The website offers an online archive, including a transcript of each video along with links for more information. The main content themes are Ocean News, Ocean Life, Science & Technology, and Discoveries. There are multiple ways to follow along with current updates – check out the subscription methods. In addition to the website and kiosk locations, if you are interested in expanding the Ocean Today network to your institution or venue in kiosk form, please contact them to learn more.

<http://oceantoday.noaa.gov/>

### **Outer Banks Maritime Heritage Trail**

The Outer Banks Maritime Heritage Trail website offers videos highlighting iconic locations along Highway 12 on the Outer Banks of North Carolina, along with videos focusing on the Monitor National Marine Sanctuary, the Cape Hatteras Lighthouse, and much more. Additional materials include oral histories and topical images. The website highlights the culture, history, people, and natural and cultural resources that can be found along the Outer Banks.

<http://monitor.noaa.gov/obxtrail/>

### **Pascagoula River Curriculum**

The Land Trust for the Mississippi Coastal Plain and partners offer the downloadable Pascagoula River Curriculum, designed to provide place-based watershed information to upper elementary and middle school teachers. There are over 80 lessons with corresponding test modules targeted to compliment elementary curricula. You can download the complete Pascagoula River Lesson Plan or select specific lessons or activities through the table of contents.

<http://www.ltmcp.org/teacher-resources/pascagoula-river-watershed/>

### **Phytoplankton Image Gallery**

NCCOS's Center for Coastal Environmental Health and Biomolecular Research's Phytoplankton Monitoring Network offers information about harmful algal blooms and volunteer monitoring. The online Image Gallery offers images, micrographs, and line drawings of diatoms, dinoflagellates, and more. There are also links to a free phytoplankton app for mobile devices.

[http://www.chbr.noaa.gov/pmn/image\\_gallery.aspx](http://www.chbr.noaa.gov/pmn/image_gallery.aspx)

### **Plastics at SEA – North Pacific Expedition**

The research vessel, the *SSV Robert C. Seamans*, set sail on Sea Education Association's second research expedition dedicated to the study of plastic marine debris. The expedition left in October from San Diego on the 2,500-nautical mile voyage to Honolulu, sailing west into the popularly dubbed "Great Pacific Garbage Patch".

Scientific objectives include documenting plastic debris concentrations and investigating the effects of plastic in the ocean ecosystem. Check the website to follow along with the expedition on the website, join the school email exchange, and more.

<http://www.sea.edu/plastics>

### **SCUTES Educational Resources**

The SCUTES program is the collaboration between NOAA Fisheries, sturgeon researchers, teachers, and informal educators to bring more awareness about Atlantic and shortnose sturgeon to the classroom. The website offers information for students and teachers, along with activities and lesson plans, games, and much more.

[http://www.nero.noaa.gov/prot\\_res/scutes/workshop.html](http://www.nero.noaa.gov/prot_res/scutes/workshop.html)

### **SPURS Education and Outreach**

Salinity Processes in the Upper Ocean Regional Study (SPURS) is researching the essential role of the ocean in the global water cycle through a series of cruises to explore the salinity maximum region in the Atlantic Ocean using oceanographic equipment and technology. Researchers are studying salinity changes that span thousands of miles simultaneously with those happening in one centimeter of water. The SPURS research can offer data for computer models to improve our basic understanding of the water cycle over the oceans and its ties to climate. The education and outreach resources offer teaching materials about ocean salinity.

<http://cosee.umaine.edu/coseeos/spurs/why.htm>

### **Surprising Science Blog**

Smithsonian.com expands on *Smithsonian* magazine's coverage of history, science, nature, the arts, travel, world culture, and technology. The Surprising Science Blog posts ideas, news, and discoveries from the world of science.

<http://blogs.smithsonianmag.com/science/>

### **Upwell and the Tide Report**

Upwell is an organization focused on online conversations with the aim to "make the ocean more famous on the internet." They monitor and analyze online conversations, lead data-driven attention campaigns, and share the information gathered with the marine sector. The Tide Report newsletter offers ocean news, analysis of online conversations, upcoming science and ocean communication events, and more. Check out the Vote4theOcean campaign

<http://www.upwell.us/>

### **Water Use: Tragedy in the Owens River Valley**

These high school lessons help students develop a better understanding of the importance of well-managed water use while exploring the concepts of a watershed, land use, aquifers, and water engineering. The material focuses on the historical water use decision affecting the Owens River Valley in California. Materials lists, procedures, assessment recommendations, and extension ideas are provided.

[http://www.pbs.org/weta/thewest/lesson\\_plans/lesson08.htm](http://www.pbs.org/weta/thewest/lesson_plans/lesson08.htm)

### **Weddell Seals in the Antarctica**

Educator Alex Eilers will be posting journals for the Weddell Seal Team while they are in Antarctica, November and December 2012. Follow along and post questions through the PolarTREC website, and check out the links to archived journals.

<http://www.polartrec.com/expeditions/weddell-seals-in-the-ross-sea>

### **Zooplankton of the Atlantic and Gulf Coasts**

This website is an electronic companion to *Zooplankton of the Atlantic and Gulf Coasts: A Guide to their Identification and Ecology* by William S. Johnson and Dennis M. Allen. It's purpose is to share information and new findings among users of the book and others engaged in collecting and observing zooplankton. The website offers a creature of the month, a photo gallery, links to other websites, and more.

<http://www.zooplankton-online.net/>

### **INITIATIVES, JOURNALS, and MORE**

#### **Environmental Film Festival**

The 2013 Environmental Film Festival will take place March 12-24 in Washington, D.C. Films will be shown in many venues, including museum auditoriums, libraries, and more.

<http://www.dcenvironmentalfilmfest.org/>

#### **OceanElders**

OceanElders was created to be a locus of collaboration in the field of ocean conservation. It is an independent group of global leaders who have joined together to use their collective influence and experience, supported by science and data, to promote ocean conservation, pursue the protection of the ocean's habitat and wildlife, and preserve its ecosystems and species biodiversity.

<http://www.oceanelders.org/>

#### **Stars and Fishes – North Carolina**

The North Carolina Aquarium at Fort Fisher offers a Stars and Fishes sleepover event, November 16, 2012 at Fort Fisher, North Carolina. Star-gaze, learn to identify constellations, and discuss the nocturnal behavior of local animals on a guided night hike. The event will include live-animal presentations, crafts, and more.

<http://www.ncaquariums.com/archives/14408>

### **HURRICANE RESOURCES**

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

#### **Barrier Islands: To Build or Not to Build?**

This Internet WebQuest Science website offers a task for students along with research resources and a teacher page. Students are tasked with developing an educated opinion as to whether or not people should build permanent structures on barrier islands. They learn about the geological and physical nature of barrier islands, and how barrier islands change over time.

<http://www.glencoe.com/sec/science/webquest/content/barrierisland.shtml>

#### **Coastal Growth Related Publications**

South Carolina Sea Grant offers links to many documents related to coastal growth, including land use, economic development, recreation and tourism, and more.

<http://www.scseagrant.org/content/?cid=156>

### **CoSEE SouthEast Barrier Islands and Estuaries**

CoSEE SouthEast offers links to barrier islands and estuaries lessons, activities, and educational resources.

<http://www.cosee-se.org/ForEducators/EducatorResources/barrierislandsandestuaries/>

### **Estuaries 101 Curriculum**

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

<http://estuaries.noaa.gov/Teachers/Home.aspx>

### **Exploring the Environment – Hurricanes and More**

The Exploring the Environment online series was developed at the NASA Classroom of the Future™ at Wheeling Jesuit University. The problems and activities in the modules ask students to address human activities and their impacts upon the environment.

The Severe Weather: Hurricanes! module is geared to students in grades 5-12. Other modules include water quality, global temperatures, and more.

<http://ete.cet.edu/modules/modules.html>

### **Folly Beach Educator's Guide**

This website, from COASTeam at the Lowcountry Hall of Science and Math in South Carolina, is designed to offer basic information on South Carolina's barrier islands. The site contains introductory images, animation of coastal processes, and beach activities.

<http://oceanica.cofc.edu/An%20Educator%27s%20Guide%20to%20Folly%20Beach/guide/default.htm>

### **Historical Hurricane Tracks**

The Historical Hurricane Tracks tool from the NOAA Coastal Services Center is an interactive mapping application that allows you to search and display more than 150 years of historical Atlantic Basin and East-Central Pacific Basin tropical cyclone data.

This updated version allows you to query and display data by storm name, location, and even zip code.

<http://hurricane.csc.noaa.gov/hurricanes/>

### **Hurricane Digital Memory Bank**

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

<http://hurricanearchive.org/>

### **Hurricane Information for Educators - Miscellaneous**

- Resources from the National Science Teachers Association (NSTA) Grades K-4, Storms:

[http://www.scilinks.org/retrieve\\_outside.asp?sl=566356104410551033](http://www.scilinks.org/retrieve_outside.asp?sl=566356104410551033)

Grades 5-8, Hurricanes:

[http://www.scilinks.org/retrieve\\_outside.asp?sl=4735895674333355\\$741922112222\\$55557766](http://www.scilinks.org/retrieve_outside.asp?sl=4735895674333355$741922112222$55557766)

- EE in Georgia – Hurricane Teaching Resources and Service Learning Opportunities:  
<http://eeingeorgia.org/net/content/item.aspx?s=33997.5356.68.4863>
- Association of State Floodplain Managers white paper on rebuilding the Gulf Coast after Hurricane Katrina:  
[http://www.Floods.org/PDF/ASFPM\\_HurricaneKatrina\\_WhitePaper\\_090905.pdf](http://www.Floods.org/PDF/ASFPM_HurricaneKatrina_WhitePaper_090905.pdf)
- Environmental Literacy Council:  
<http://www.enviroliteracy.org/article.php/258.html>
- Hurricane Andrew Lessons:  
<http://octopus.gma.org/surfing/weather/andyindex.html>
- Hurricane Fran Lessons: <http://octopus.gma.org/surfing/weather/franindex.html>
- National Hurricane Center: <http://www.nhc.noaa.gov/>

### **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 Websites**

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

<http://stormsmartcoasts.org/>

<http://stormsmart.org/>

### **Hurricane Resources from the BRIDGE**

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

- Haunted by Hurricanes - Access National Hurricane Center data to examine long-term hurricane patterns and questions regarding the impact of global climate change [http://www.vims.edu/bridge/index\\_archive1004.html](http://www.vims.edu/bridge/index_archive1004.html)
- Hurricanes! - Background information about hurricane formation is featured in this activity, along with introductory hurricane mapping tips [http://www.vims.edu/bridge/index\\_archive0899.html](http://www.vims.edu/bridge/index_archive0899.html)
- Without an Ark - Learn about some of the short-term and long-term effects of storm flooding on selected freshwater and estuarine organisms using data from the U.S. Geological Survey and plot Hurricane Floyd floods [http://www2.vims.edu/bridge/DATA.cfm?Bridge\\_Location=archive0403.html](http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive0403.html)

### **Hurricane Webinars**

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

<http://www.hurricanescience.org/resources/webinar2012/>

### **Hurricanes: Science and Society**

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

<http://www.hurricanescience.org/>

### **NASA Hurricane Resources**

NASA has developed educational tools including posters, visualizations and graphics, and classroom activities on hurricanes.

[http://www.nasa.gov/mission\\_pages/hurricanes/features/hurricane\\_educ\\_links.html](http://www.nasa.gov/mission_pages/hurricanes/features/hurricane_educ_links.html)

### **The National Hurricane Survival Initiative**

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

<http://hurricanesafety.org/>

### **NOAA Hurricane Resources**

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

[http://www.education.noaa.gov/Weather\\_and\\_Atmosphere/Hurricanes.html](http://www.education.noaa.gov/Weather_and_Atmosphere/Hurricanes.html)

### **Online Hurricane Tools**

The National Ocean Service offers online tools to monitor hurricanes and deliver relevant data before, during, and after a storm. Tools address water levels, observing systems, imagery, and long-term planning.

<http://oceanservice.noaa.gov/news/features/sep11/hurricanetools.html>

### **Potential Consequences of Climate Variability and Change**

The Gulf of Maine Research Institute website offers materials to teach and learn about aquatic environments. Topics include What Could a Hurricane do to my Home? and includes classroom activities for grades 1-12.

[http://octopus.gma.org/climate\\_change/index.html](http://octopus.gma.org/climate_change/index.html)

### **The Science of Hurricane Sandy**

Scientific American's live blog offers updates on the storm and its aftermath, answers readers' questions, and offers personal observations.

<http://blogs.scientificamerican.com/observations/2012/10/29/the-science-of-hurricane-sandy-liveblog/>

### **Teaching and Learning About Hurricanes**

The Learning Network blog from Teaching & Learning with the New York Times offers links to many resources about Hurricane Sandy, along with many links to additional hurricane resources.

<http://learning.blogs.nytimes.com/2010/09/01/teaching-and-learning-about-hurricanes/>

### **Urban Forest Hurricane Recovery**

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

<http://edis.ifas.ufl.edu/features/series/hurricanerecovery.html>

### **Virtual Barrier Island**

The Bureau of Economic Geology along with the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University Corpus Christi, has developed a 3-D virtual model of the Gulf of Mexico and Texas coastal environments. The model can be used in the classroom and by the general public to explore how relative sea level change rise, caused by climate change and other causes, may impact the coastal zone. The website offers the downloadable 3-D model, a lesson plan, teacher's introduction, and a virtual reality video which explains how to navigate and manipulate the data within the model.

<http://coastal.beg.utexas.edu/thscmp/vbi.htm>

### **Virtual Hurricane Classroom**

This collection of resources on hurricanes from the SouthEast U.S. Atlantic Coastal Ocean Observing System (SEACOOS) includes a selection of activities in which students investigate storm surge, learn hurricane terminology, build and use their own weather instruments, and more.

<http://seacoos.org/Community%20and%20Classroom/hurricane-classroom>

### **Wetlands and Hurricanes**

This instructional guide from the Northwest Center for Sustainable Resources is designed to provide instructors with lecture materials and resources that examine the complex relationship between wetlands and hurricanes, using Hurricane Katrina as a case study. The module describes the vulnerability of the Gulf Coast to damage from hurricanes and the role that wetlands and barrier islands play in coastal protection. Check out the full Wetlands Ecology and Management series. Note that the materials are still available on this website.

<http://www.ncsr.org/materials/WetlandsandHurricanes.html>

### **What Animals Do Before a Hurricane**

Sylvan Dell Books' *Ready, Set... Wait! What Animals Do Before a Hurricane* for the younger student is available for review by pdf, and for downloading through their new iPad app (see above).

<http://www.sylvandellpublishing.com/BookPDFs-Previews/ReadySet-Preview.pdf>