

# NATIONAL MARINE PROTECTED AREAS CENTER INFORMATION EXCHANGE FOR MARINE EDUCATORS AUGUST 2005

This update is provided as a service by 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 in the MPA Information Exchange.

The information included here has been compiled from many different sources, including SeaSpan, NSTA Express, edinfo at FREE, EE-NEWS@NAAEE, CREEC, Scuttlebutt, EEinGEORGIA, the Scout Report, 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.

To subscribe to this distribution list, send a blank message to requests@willamette.nos.noaa.gov with "subscribe infoexchange" in the subject field. Similarly, to remove yourself from the list, send the subject "unsubscribe infoexchange".

Collected archives of the information presented in past newsletters are available at <a href="http://www.mpa.gov/information\_tools/education.html#InfoExchange">http://www.mpa.gov/information\_tools/education.html#InfoExchange</a>. Contact the MPA Center's education coordinator directly at phyllis.dermer@noaa.gov, or by phone at (865) 932-5074, to discuss further enhancements or to contribute information for future issues.

# **Notable Literature**

### **New Paradigms for Supporting the Resilience of Marine Ecosystems**

This article discusses recent trends in understanding and moderating human impacts on marine ecosystems. The authors focus on the temporal and spatial scale of ecosystem dynamics and management, as well as the importance of biodiversity to the function and resilience of marine ecosystems.

Terence P. Hughes, David R. Bellwood, Carl Folke, Robert S. Steneck, and James Wilson: New paradigms for supporting the resilience of marine ecosystems. Trends in Ecology and Evolution 20(7):380-386, July 2005.

http://www.sciencedirect.com/science/journal/01695347

#### Main MPA Library URL:

http://www2.mpa.gov/mpa/mpaservices/virtual library/virtual library.lasso

#### WEBSITE OF THE MONTH

#### 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/

#### MESSAGE FROM THE BRIDGE

#### Scuttlebutt

Ocean science educators can talk informally about marine education ideas, issues, and questions on "Scuttlebutt", the Bridge email discussion list. The listserv is monitored by Bridge staff, who also locate expertise for posted questions as needed. All educators and scientists interested in marine science education are invited to subscribe. Scuttlebutt is a unique list, just for marine educators and researchers interested in marine education. The website also links to other lists that support discussions that may be of interest to marine educators.

http://www.vims.edu/bridge/index\_scuttle.html

#### REQUESTS

# Request for Survey Participants for Conservation Careers Diversity Project

The Environmental Careers Organization (ECO) is conducting a national research project on initiatives, activities, and programs which aim to educate, recruit, support, and retain underrepresented groups within the conservation field. The survey results will be used to produce a report of trends and findings and an interactive online directory of activities.

http://pragmatic-research.com/Surveys/10/eco.htm http://www.eco.org/DI/Mapping/backgrnd.html

# Request for Survey Participants for New Scout Project

This Internet Scout Project survey, aimed at educators in community and technical colleges, will provide information on their current use of digital materials. This information will help inform the Applied Mathematics and Science Education Repository, an online math and science resources web portal and service from the National Science Digital Library Scout Project.

http://amser.org/survey

http://nsdl.org/ofinterest/?ctvpe=rss&rss=partner\_libraries

#### **Sea Stories Wanted for New Project**

The Sea Stories Project, an international initiative of the Blue Ocean Institute, is soliciting first-person writing about the sea, coast, and sea-life from writers of all levels, including students. Memoir, essays, poetry, and imaginative nonfiction are all welcome, as are photographs, drawings, or other visual arts. Selected stories and artwork will be published in a new quarterly online journal, *Sea Stories*. The submission deadline for the inaugural issue is October 15, 2005 with quarterly deadlines thereafter. www.blueocean.org

#### **GRANTS AND OPPORTUNITIES**

# **American Geological Institute Contests for Earth Science Week**

The American Geological Institute will host three national contests to encourage students to become involved in the 2005 Earth Science Week, October 9-15, 2005. This year's theme is *Geoscientists Explore the Earth*. The contest categories are visual arts (earth jobs), photography (extreme earth science), and essay (what kind of geoscientist would you like to be, and why?). Entries are due October 7, 2005. http://www.earthsciweek.org/contests

#### Best Buy's Te@ch Program

Best Buy's Te@ch Program rewards schools that are using interactive technology to make learning fun for kids. The awards can help expand or enhance existing programs that use the school's available technology. Te@ch awards are not based on the sophistication of technology in the schools, but rather reward programs that use all levels of interactive technology in ways that genuinely engage students in the process of learning.

http://communications.bestbuy.com/communityrelations/teach.asp

#### **Community-based Restoration Program Funding Opportunities**

The Community-based Restoration Program's objective is to bring together citizen groups, public and nonprofit organizations, industry, corporations and businesses, youth conservation corps, students, landowners, and local government, state and federal agencies to restore fishery habitat around the coastal U.S. The program funds projects directly, and through partnerships with national and regional organizations. <a href="http://www.nmfs.noaa.gov/habitat/restoration/funding\_opportunities/funding.html">http://www.nmfs.noaa.gov/habitat/restoration/funding\_opportunities/funding.html</a>

#### **Digital Library for Earth System Education Minigrants**

The Cooperative Institute for Research in Environmental Sciences Education and Outreach Program at the University of Colorado-Boulder seeks proposals to conduct evaluation and assessment studies of relevance to the Digital Library for Earth System Education (DLESE). The intent of this grant program is to encourage the DLESE community to participate in the evaluation activities of the library on topics relevant to library development. Educators, home-schoolers, curriculum developers, informal educators, and other DLESE community members are encouraged to apply. The deadline for the proposals is September 30, 2005.

http://www.dlese.org/cms/evalservices/recent\_developments/minigrant

#### Global Spatial Data Infrastructure Association Small Grants Program

The Global Spatial Data Infrastructure Association (GSDI) is an inclusive organization of agencies and organizations promoting international cooperation in support of local,

national, and international spatial data infrastructure developments that will allow nations to better address social, economic, and environmental issues of pressing importance. The GSDI Small Grants Program supports national or sub-national activities that foster partnerships, improve data compatibility and access, and increase political support for spatial data infrastructure development. The deadline for proposals is August 15, 2005. <a href="http://www.gsdi.org/">http://www.gsdi.org/</a>

### **Monterey Bay Watershed Education and Training Grants**

The Monterey B-WET grant program is a competitively based program that supports existing environmental education programs, fosters the growth of new programs, and encourages the development of partnerships among environmental education programs throughout the Monterey Bay watershed. Funded projects provide meaningful watershed experiences for students and professional development opportunities for teachers in the area of environmental education. Proposals are due October 15, 2005 <a href="http://www.sanctuaries.noaa.gov/bwet/">http://www.sanctuaries.noaa.gov/bwet/</a>

# Office of Ocean Exploration Funding Opportunity

Applications for this Announcement of Opportunity will be accepted within three separate categories: general exploration, marine archaeology, and education. Pre-proposals should be received by August 5, 2005.

http://www.explore.noaa.gov/opportunity/welcome.html

#### **Outstanding Young Educator Award**

The Association for Supervision and Curriculum Development (ASCD) offers a yearly Outstanding Young Educator Award. The award recognizes a teacher under the age of 40 who demonstrates excellence in his or her profession. Criteria include a positive impact on students, creativity in the classroom, and leadership in his or her school or district. Nominations are due by October 15, 2005. Follow the OYEA link under "ASCD Community."

www.ascd.org

#### **Refuge Photo Contest**

This photo contest is sponsored by the National Wildlife Refuge Association and Swarovski Optik. Photos must be taken at a National Wildlife Refuge and can be of birds, mammals, insects, fish, other animals, plants, people, or refuge scenery. The deadline for submissions is December 1st, 2005.

http://www.refugenet.org/contest/ContestHome.html

#### **Smart Growth Implementation Assistance**

The National Sea Grant College Program in NOAA's Office of Oceanic and Atmospheric Research is offering small grants to Sea Grant Programs who partner with a local community to help the local community develop in ways that meet environmental and other community goals. In addition, the Development, Community and Environment Division in EPA's Office of Policy Economics and Innovation will provide smart growth implementation assistance to the selected applicants and local community partners. Eligible entities are Sea Grant Programs who have partnered with tribal, local, regional, and state governments, and nonprofit organizations that have a demonstrated partnership with a governmental entity. Development practices that reflect the principles of smart growth support national environmental and public health goals by protecting sensitive watersheds, minimizing water quality impacts from development, reducing air

emissions by increasing transportation choices, and encouraging cleanup and sustainable redevelopment of brownfields.

Contact Lynn Richards at Richards.lynn@epa.gov

#### **Vernier Technology Awards**

Vernier Software and Technology, in conjunction with the National Science Teachers Association, is offering seven awards to teachers for the innovative use of data-collection technology in the science classroom. The deadline for application is October 15, 2005.

http://vernier.com/grants/nsta.html

# CONFERENCES, WORKSHOPS, AND PROFESSIONAL DEVELOPMENT

# **Coalition for Education in the Outdoors Symposium**

Abstracts are being accepted for the 8th Biennial Research Symposium of the Coalition for Education in the Outdoors, to be held January 13-15, 2006, in Martinsville, Indiana. Researchers will explore current and future trends in using the outdoors for educational and therapeutic purposes, advancing the bases of outdoor education. The abstract submission deadline is September 12, 2005.

# **Environmental Affairs - Global Issue, Local Action - Online**

This free community-based online course aims to lead students to resources on threats to the environment, and to information on approaches to understand and manage these threats. The resources include case studies, online exercises, and interactive sessions. <a href="http://www.suite101.com/course.cfm/17295/overview">http://www.suite101.com/course.cfm/17295/overview</a>

#### **Plastic Debris Rivers to Sea Conference**

http://www.outdooredcoalition.org/research.htm

The Plastic Debris Rivers to Sea Conference will take place September 7-9, 2005, in Redondo Beach, California. The Algalita Marine Research Foundation, California Coastal Commission, the H. John Heinz III Center for Science, Economics and the Environment and others are collaborating to produce this conference addressing research about land-based discharges of anthropogenic debris. Presentations and facilitated dialogues will focus on marine debris in terms of sources, impacts and solutions, and include a session on Education and Outreach to Reduce Trash in Urban Runoff.

http://conference.plasticdebris.org/index.html

#### The Coastal Society – Call for Papers

The Coastal Society announces a call for papers for its 20th International Conference, May 14-17, 2006 in St. Pete Beach, Florida. The theme of the conference is *Charting a New Course: Shaping Solutions for the Coasts*. Tracks during the conference will cover land use challenges, governing ocean use conflicts, effective integration of science, mitigating coastal natural hazards, and solutions for changing behaviors. www.thecoastalsociety.org/conference/tcs20/pdfs/TCS20 Call for Papers.pdf

#### **Volunteer Monitoring in the Mid-Atlantic - West Virginia**

This conference, Volunteer Monitoring in the Mid-Atlantic: Citizen Scientists Involved in the Watershed, November 4-5, 2005 in Davis, West Virginia, is sponsored by the US

EPA Nonpoint Source Pollution Program. Share monitoring skills, technical advances, organizational and program ideas, and network with volunteer colleagues. Scholarships are available for a limited time. The deadline for registration is September 30, 2005. http://www.wvca.us/workshops/vmc/

#### Watershed Protection in Developing Areas - Online

The EPA's Watershed Academy sponsored the webcast, *The Eight Tools of Watershed Protection in Developing Areas*, attracting more than 550 participants via streaming audio or phone lines, and viewing the PowerPoint presentation on the Internet. The entire presentation, complete with audio, can be viewed along with other archived seminars on-line. Links to this and other information, including future webcasts, webbased training, and other opportunities on watershed management topics, can be viewed on the Watershed Academy website.

http://www.epa.gov/owow/watershed/wacademy/

### **EDUCATIONAL RESOURCES**

#### **COSEE-Florida Web Portal**

This newly redesigned website from 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. This provides access to thousands of categorized resources. The Online School allows for the development and delivery of complete online courseware. Access is free for instructors, developers and learners. Registered users have access to numerous communications areas, including discussion boards, chat rooms, live interactive conferences, and webcasts. News, webcams links, software and more are available from the site.

http://www.coseeflorida.org/

# **Design a Planet**

Astro-Venture is an educational, interactive, multimedia website for grades 5-8 that highlights NASA careers and astrobiology research in the areas of astronomy, geology, biology and atmospheric science. In September 2005, Astro-Venture will launch *Design a Planet* through NASA Quest. In this live webcast, students will have the opportunity to 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/

#### **EE-Link Website Update**

The North American Association of Environmental Education (NAAEE) and EE-Link websites have been updated, making the content even more accessible. Dynamic content, better information organization, and integrated search capabilities are some of the new features launched with the newly designed site 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

#### **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. Introductions are expected to be provided by film producer and photographer Stan Waterman, producer/director Frank Capra, Jr., and others. 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.

#### **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/

#### **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, reproducible student worksheets, graphs, and more.

http://www.learner.org/channel/series127.html

#### Marine Aquarium Council

The Marine Aquarium Council is an international, not-for-profit organization that brings marine aquarium animal collectors, exporters, importers, and retailers together with aquarium keepers, public aquariums, conservation organizations, and government agencies. The organization has created standards and certification for those engaged in the collection and care of ornamental marine life from reef to aquarium. Recent progress has been made with new certifications and re-certifications in the Philippines and Fiji and first certifications in Indonesia. You can sign up for the newsletter, read about certification and standards, and more on the website. http://macweb.inets.com/default.asp

#### **National Library for the Environment**

The National Council for Science and the Environment hosts the online National Library for the Environment. Visitors can view Congressional Research Service reports, environmental news, and more. The reports can be searched by topic (such as biodiversity or climate change), or through a keyword search engine. Additional offerings include links to foundations providing environmental grants and educational resources.

http://www.ncseonline.org/NLE/

# North Atlantic Stepping Stones 2005 Expedition

This expedition from NOAA's Ocean Explorer education program will run August 7— September 3, 2005. This is the fourth signature expedition for NOAA's Office of Exploration 2005 field season, with four additional signature expeditions to follow. Scientists will explore the very old New England and Corner Stone seamount chains which range in age from 75 to 100 million years and are part of a volcanic chain extending from Canada to the African tectonic plate. The website contains content essays and lesson plans directly tied to this exploration. These inquiry-based lessons have been developed for students in Grades 5-12 and are tied to the National Science Education Standards. Once the expedition begins, web logs will be written by scientists and educators which capture daily activities and discoveries. An "Ask an Explorer" feature will also be available for students to submit questions to, and receive answers from, the explorers while at sea.

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

# NOS Data Explorer

The National Ocean Service Data Explorer website allows users to search NOS data holdings, view metadata, and link to and/or download specific data sets. The data explorer offers interactive mapping tools that allow users to locate NOS products in any area in the United States and its territories through a metadata catalog. Search results provide users with metadata records and links to websites with additional information. <a href="http://oceanservice.noaa.gov/dataexplorer/">http://oceanservice.noaa.gov/dataexplorer/</a>

#### Ocean Challenge Puzzle

Visitors to NOAA's redesigned Ocean Explorer Web site can team up with other players around the globe to answer ocean science questions to reveal pieces of a puzzle. The redesigned website also includes a new section, 'For Fun.' Improved navigation and more awaits your ocean explorations.

http://www.oceanexplorer.noaa.gov

#### Ology

OLogy, the American Museum of Natural History's science website for kids ages seven through twelve, is designed as a place for kids to explore, ask questions, get answers, and more. With age-appropriate content in archaeology, astronomy, biodiversity, genetics, marine biology, paleontology, and physical science, OLogy makes science learning rich and engaging. Educators can find suggestions and tips on how to use the OLogy Web site in the Educator's Guides. They can also sort by grade, title, type, and topic.

http://www.ology.amnh.org

#### PicturePosts: Using Cameras to See Change at Local Parks

Our landscape changes every day. The Friends of Menotomy Rocks Park and Friends of Fresh Pond Reservation have created a system to help see and measure changes in local parks. They have installed two PicturePosts in each park that help visitors take pictures of the same landscape each time. The accumulated sequences of images will be used in a variety of ways: to document the encroachment of invasive species as well as see growth and natural changes of plants, shared with scientists using satellite imagery to monitor landcover change over regional, national, and global scales, and used by local classrooms prior to or after visits to the parks. The PicturePost is a secure post anchored in the ground, with a round disk and an octagonal plate attached to the top. It allows a digital camera to rest on a steady surface with the back edge of the

camera supported by one edge of the octagon. Each post has specific information inscribed on it, so with the click of the camera, the location of the set of images is automatically marked.

http://www.picturepost.smugmug.com

#### Remote Sensing Lesson Plans from IMaRS

The Institute for Marine Remote Sensing (IMaRS) provides education outreach through a number of venues. IMaRS has presented teacher workshops to local county middle and high school classroom teachers, with hands-on tools for the manipulation of satellite data as well as background information necessary to provide the correct information to their students. Currently, IMaRS brings remote sensing education outreach to the Internet by the introduction of on-line lesson plans and background information. The lesson plans include both broad marine science concepts as well as specific remote sensing lab work.

http://education.imars.usf.edu/index.html

### **Sea Grant Reporter**

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

www.ocean.udel.edu/publications/Newsletter/reporter/2005/

#### **Sustainable Tourism**

The Rainforest Alliance provides information about sustainable tourism on their website, including the second edition of the *Guide to Best Practices for Sustainable Tourism* and the *Directory of Best Practices, Certification and Codes of Conduct for Sustainable Tourism.* The guide was developed to help community businesses and small and medium-sized entrepreneurs adopt specific actions to use sustainable tourism practices in their operations. Information is grouped in three categories: environment, social-cultural and economic. The updated version is now available in Spanish; the English update will be posted soon. The directory offers a catalogue of information about best practices for sustainable tourism and how to adopt them. Additional links and information are also provided.

http://www.rainforest-alliance.org/programs/tourism/certification/index.html

#### **Teaching Boxes from the Digital Library for Earth System Education**

Two Teaching Boxes are available for downloading: Evidence for Plate Tectonics, and Essentials of Weather. A Teaching Box is an online assembly of interrelated learning concepts, digital resources, and cohesive narration that helps bridge the gap between individual resources and understanding. Instructors and students can pick a topic, view the concepts that build an understanding of that topic, explore online resources that support learning of those concepts, and benefit from the narration (the glue) that weaves concepts, activities, and background information together into a complete teaching/learning story. Additional Teaching Boxes on ocean and earthquake-related topics are currently under development.

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

# **Waikiki Aquarium - August Programs**

The Waikiki Aquarium, founded in 1904, is the third oldest public aquarium in the United States. A part of the University of Hawaii since 1919, the Aquarium is located next to a living reef on the Waikiki shoreline. Exhibits, programs, and research focus on the aquatic life of Hawaii and the tropical Pacific. The aquarium is a Coastal Ecosystem Learning Center for the Pacific Island Region, a partner with Coastal America. Some of the outreach and education programs for August include a shark overnight, in which participants build their own sharks and race them across a tank; an afternoon investigating hermit crabs and their housemates through storytelling, art and up-close encounters; a morning exploring shoreline, reef flat, and tidepool habitats with Waikiki Aquarium naturalists; and much more.

http://waquarium.otted.hawaii.edu/

#### Whale Rider Family Guide

The award-winning New Zealand film, *The Whale Rider*, premiered July 24,2005 on PBS. *Whale Rider* re-interprets a 1,000-year-old legend about Paikea, the founder of the native New Zealand tribe *Ngati Konohi*, whose members believe their leader arrived in their village on the back of a whale after his canoe capsized. The family viewers guide is a collaboration between Pacific Islanders in Communications and the Girl Scouts of the USA, who have joined together to create a national outreach campaign and interactive web experience around *The Whale Rider*. http://www.piccom.org/whalerider/home.html

#### Where on Earth?

Embark upon a geographical adventure with NASA Jet Propulsion Laboratory's Multiangle Imaging SpectroRadiometer (MISR) Mystery Image Quizzes. These puzzles are designed to inspire understanding of the physical, biological, and human processes that influence our home planet and cover topics from archaeology to zoology. Several available resources for discovering and revealing the meaning of image features help new geographical detectives to solve the challenging quiz questions. Past quizzes have included coral atolls, island ecology, lagoons, and more. A new mystery image appears on the website approximately every two months.

http://www-misr.jpl.nasa.gov/education/whereonearth.html

#### Wreck of the Portland

Partners from the National Undersea Research Center (NURC) and Stellwagen Bank National Marine Sanctuary conducted two live video broadcasts from the R/V Connecticut back to shore to the Pilgrim Monument and Provincetown Museum. The broadcast featured live footage from NURC's remotely operated vehicle diving on the wreck of the steamship *Portland* accompanied by a detailed description of the condition and features of the wreck conducted by marine archaeologists from the sanctuary. The broadcasts are archived on the Internet, along with a slide show and additional materials.

http://www.nurc.uconn.edu/livedive/index.htm

### **INITIATIVES and JOURNALS**

#### **AmeriCorps Signature Project with Coastal America**

AmeriCorps National Civilian Community Corps has selected Coastal America for its Signature Project for 2005/2006. Most AmeriCorps projects are of 6-8 weeks duration,

but as a Signature Project, a longer service of availability is being extended to Coastal America throughout the country for a period of one year. 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 <a href="marguerite.duffy@usda.gov">marguerite.duffy@usda.gov</a>

### Virginia Seaside Heritage Program

The Virginia Seaside Heritage Program is a public-private partnership, initiated and funded by the Virginia Coastal Program to address management of the aquatic resources of the barrier islands, bays, and salt marshes along Virginia's Eastern Shore. This area holds tremendous potential to demonstrate appropriate management of economic development and habitat restoration within a rare and fragile ecosystem. The program will build on the momentum of recent restoration successes, like those witnessed in the Virginia Oyster Heritage Program. http://www.deg.virginia.gov/coastal/vshp/homepage.html