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Boston Harbor
Educators’ Conference
Saturday, October 13, 2007

Celebrating milestones
in the history of Boston
Harbor, the marine
waters off the shores
of Massachusetts and
Stellwagen Bank
National Marine
Sanctuary

Fifteen Years and Moving Forward!
Stellwagen Bank National Marine Sanctuary -- 15th anniversary
Boston Harbor Islands National Park Area -- 10th anniversary
15 years of the Boston Harbor cleanup
at University of Massachusetts, Boston Harbor Campus
Welcome to all teachers, environmental educators, scientists, naturalists, and interested citizens.

This year marks several important milestones in the environmental history of the waters of Boston Harbor and off the coastline of Massachusetts. It was 15 years ago that Congress designated Stellwagen Bank National Marine Sanctuary, one of only 14 sites in a system of special marine protected areas around our nation. Since that time the sanctuary, located some 25 miles east of Boston, three miles north of Cape Cod and three miles south-east of Cape Ann, has matured, becoming an important voice in marine research, education, resource protection and marine policy.

Also 15 years ago, the MWRA made significant strides to curtail sludge dumping into Boston Harbor, resulting in a significantly cleaner and healthier marine environment along the Massachusetts coastline.

And 10 years ago, those green gems scattered along Boston Harbor -- the Boston Harbor Islands -- received additional protection when they were added to the National Park system. Today, the Boston Harbor Islands National Park Area is jointly managed by a partnership of local, state and federal agencies in trust for the American people.

We hope today’s conference will provide you with valuable new insights into these ocean treasures and inspire you to bring these local examples into your lesson plans. In the past 15 years we have made great strides in protecting and learning about our marine environment. As we move into the future, the opportunities for exploration and discovery exist for all levels of learners -- from students to scientists. Enjoy your day and leave with a greater appreciation of the ocean treasures just off our shore.

Massachusetts Marine Educators is a dynamic grassroots organization of teachers (kindergarten through college), representatives from museum, aquaria, government and business, and individuals. Our goal is to create a marine literate society by integrating marine studies into existing curricula. MME develops and shares curriculum materials, holds frequent meetings, and helps provide in-service teacher training. Membership is $20 per year, which includes a subscription to Flotsam & Jetsam, our newsletter, and notices of upcoming events, including the annual meeting in Woods Hole and the High School Science Symposium. You are welcome to explore our Web site at: www.massmarineeducators.org.

CONFERENCE SPECIAL: Individuals registering for the Boston Harbor Educators’ Conference can receive a discounted half-year membership for October 2007–April 2008. The $10 fee provides all membership benefits.

The regular membership year begins May 1.

Please make checks payable to MME and return this form and your payment of $10 to the Boston Harbor Educators’ Conference registrar or mail to:

Massachusetts Marine Educators
Attn: Gail Brookings, Treasurer
184 Highland Street
Taunton, MA 02780

Name: _______________________________________________________
Title: _______________________________________________________
Organization: ________________________________________________
Street: ______________________________________________________
City: ____________________________ State: ______ Zip: ___________
Email Address: _______________________________________________

Notification of publication of Flotsam & Jetsam will be sent electronically. Members can download each issue from the MME Web site. If you are unable to receive electronic messages, please notify Howard Dimmick, F&J Editor, 7015 Avondale Road, Fort Collins, Colorado 80525 or e-mail him at dimmick@esteacher.org and he will mail out a printed copy.
Until recently, field research on marine mammals in New England relied primarily on surface sightings. Ocean waters obscured the animals’ underwater movements, making studies of feeding and social behaviors difficult to ascertain. Traditional tags required piercing the whales’ skin and blubber for attachment. The advent of non-invasive, suction-cup-attachment digital sensor packages has revolutionized whale behavior studies and is now making the ocean transparent for scientists.

Dr. David Wiley has been a major contributor to marine mammal research and conservation in New England for decades. In 2001 he joined the staff of Stellwagen Bank National Marine Sanctuary as research coordinator and began an aggressive whale research program that has provided scientific data to support significant marine policy and management changes to support whale protection. His recent work using the temporary non-invasive tags on humpback and right whales has given researchers a wealth of new insights into marine mammal behavior.
GPS: How to use this hand-held technological marvel
GPS or Geographic Positioning System technologies are invading our lives. New, small hand-held models can become useful tools for field trips, research projects and extracurricular activities like scavenger hunts. Learn how to use a simple GPS unit for data collection. Talk to sanctuary whale researchers who use GPS data in their field studies.

The Educational Whale Watch: Activities to make your whale watch trip an exciting learning experience for your students
A whale watch trip to the Stellwagen Bank sanctuary can be much more than a day away from the classroom. Use this field experience to practice data collection. Bring the information back to class for analysis, mapping and graphing exercises. In addition to whales, students can record information about human uses, birds, marine debris and weather.

Gyotaku: Experience the art of fish printing
During down-time during the trip, try your hand at the ancient art of fish printing or "guotaku." This project can be accomplished with real fish or plastic (non-odoruous) substitutes (our choice for this trip). Learn about fish anatomy through art.

Go to GoMOOS for Hourly Ocean Data
The Gulf of Maine Ocean Observing System has buoys throughout the gulf, including one in the sanctuary. Use on-line hourly updates and years of archived data to study oceanographic and meteorological conditions.

Sanctuary On-Line Resources for Marine Science Case Studies
Many marine textbooks offer case studies, but often those examples are from far distant shores. See how sanctuary data can be used to supplement your texts.

Monitoring the Quality of Our Water
Water quality monitoring is happening throughout Massachusetts Bay. Learn about ways to bring water chemistry into your classroom safely and painlessly. Test for pH, turbidity, salinity and other factors. Find out how MWRA uses this data.

2007/2008 Marine Art Contest for K-12 Students
Pick up information about this year's contest and view winners from past years.

ROVs in the Sanctuary/ROVs in the Classroom:
ROVs, remotely operated vehicles, are important research and monitoring tools for the sanctuary. Find information here about annual regional and international competitions for student ROV builders.

NOAA's 200th Anniversary Activity Book
This year marks the 200th anniversary of the founding of the U.S. Coast Survey, one part of NOAA. Review a wide range of activities in "Discover Your World with NOAA: An Activity Book."
PHYSICAL OCEANOGRAPHY

Ocean Investigation: Oxygen in the Water  Workshop 1  Room M-2-428  
Fish and other aquatic animals need a minimum level of dissolved oxygen (D.O.) to survive. D.O. is measured in parts per million (ppm). Any reading of 6 parts of oxygen per million parts of water is considered healthful for most fish. What is the Dissolved Oxygen level of Boston Harbor? Come find out for yourself. Workshop participants will perform a dissolved oxygen test and find out how healthy the harbor is. You will learn some of the factors that affect the amount of oxygen in a body of water, such as the positive impact the Deer Island Treatment Facility has had on Boston Harbor. All workshop participants will receive the MWRA’s Water Quality Manual and learn how to set up a field-based water quality testing program.  
Presented by: Meg Tabacsko, Manager-MWRA School Education Program

Sound in the Sanctuary: An Ocean of Noise  Workshop 2  Room M-2-428  
People and marine animals use sound in the sea to accomplish many tasks. Sometimes those tasks may cause conflicts, especially when man-made sounds such as ship noises mask natural sounds, such as whale communications. We will explore the world of sound in the sanctuary, based on recent studies of the acoustic environment, and look at ways humans are now using sound to protect endangered animals. We will use examples from “Discovery of Sound in the Sea,” a CD from the University of Rhode Island, Office of Marine Programs.  
Presented by Dr. David Wiley, Research Coordinator, Stellwagen Bank National Marine Sanctuary and Dr. Leila Hatch, Ocean Acoustics Specialist, Stellwagen Bank National Marine Sanctuary

Sanctuary Images

Northern Red Anemone and American Lobster. Photo by: USGS

Northern Right Whale. Photo by: David Wiley, SBNMS

Wolfish. Photo by: Peter Auster and Paul Donaldson, NURC-UConn

Northern Right Whale. Photo by: David Wiley, SBNMS

Returning home, sunset over Massachusetts. Photo by: Anne Smrcina, SBNMS

Boat in the sanctuary. Photo by: Peter Auster, NURC-UConn
**GEOLOGY, GEOGRAPHY, GIS and POLICY**

**Mapping the Depths: Yesterday & Today  Workshop 2  Room M-2-423**

Seafloor mapping has changed considerably over the years. Lt. Henry Stellwagen, a U.S. Navy officer on loan to the Coast Survey, mapped the entirety of the bank that now bears his name with a weighted line, taking numerous “soundings” as his ship plied the waters of Massachusetts Bay. From these readings, cartographers were able to draw contour maps of the seafloor’s topography. Today, researchers use side scan sonar and multibeam acoustic systems to develop images of the ocean floor that resemble aerial photographs. We will discuss changes in mapping techniques and take part in a hands-on activity to better understand contour maps while building a 3-D model of the sanctuary region.

*Presented by Jack Crowley, Master Teacher, MME Executive Director, and ECHO Project Consultant*

**Decisions, Decisions, Decisions! Using Science Data for Management  Workshop 1  Room M-2-423**

Ships present a major danger to whales. Collisions between the two often lead to the death of the animal or significant injury. In studies of the sanctuary, researchers determined that the areas with the highest historic concentrations of whales coincided with the Boston shipping lanes. In an effort to reduce the potential for ship strikes, sanctuary staff proposed moving the shipping lanes based on the best scientific information. That change was officially accepted by the International Maritime Organization, and went into effect on July 1, 2007. We will look at how GIS (Geographic Information System) data were used in this conservation effort, and demonstrate how this case study can be used in a class decision-making activity.

*Presented by David Wiley, Research Coordinator, Stellwagen Bank National Marine Sanctuary and Michael Thompson, GIS Analyst, Stellwagen Bank National Marine Sanctuary*

**LANGUAGE ARTS, ART AND MARITIME HISTORY**

**Be a Shipwreck Detective!  Workshop 2  Ryan Lounge**

Shipwrecks are an important part of our nautical heritage. They provide a glimpse of our maritime heritage at specific points in time, serving as virtual time capsules on the seafloor. Some of our nation’s most interesting shipwrecks are found in NOAA’s National Marine Sanctuaries, including the remains of the Civil War ironclad U.S.S. Monitor off the North Carolina coast and the wreck of the passenger steamship Portland in Stellwagen Bank National Marine Sanctuary. NOAA’s underwater archaeologists have been studying this wreck every year since 2001, when its coordinates were confirmed to learn more about what happened to cause the ship to sink. Now it’s your turn to be a Wreck Detective!

*Presented by Bob Rocha, Community Science Programs Manager, New Bedford Whaling Museum*

**Pictures in Words: Poetry of the Ocean  Workshop 2  Room M-2-419**

A picture may be worth a thousand words, but a few carefully chosen words can build a memorable image in the mind. In this workshop we will explore various ways to use sanctuary resources for language arts explorations. We will read several poems, look at various types of poetry that provide ideal formats for describing nature, and creatively use our skills to write our own poems using sanctuary images as inspiration. We will also explore other language arts possibilities, including newswriting, personal journals, and children’s books.

*Presented by Kathleen Jesperson, Falmouth Public Schools and Anne Smrcina, Education Coordinator, Stellwagen Bank National Marine Sanctuary*