

DIVE INTO EDUCATION



NATIONAL MARINE
SANCTUARIES



**NOAA National Marine Sanctuary Program
Dive into Education Ocean Science Workshop**



NATIONAL MARINE
SANCTUARIES

National Oceanic and Atmospheric Administration

National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touches the lives of all Americans. NOAA manages a system of 13 national marine sanctuaries and one coral reef reserve in the Northwestern Hawaiian Islands. National marine sanctuaries are America's ocean and Great Lakes treasures. Sanctuaries promote conservation while allowing compatible commercial and recreational activities. National marine sanctuaries conduct science and education activities and work with the public to manage and protect these special areas of the marine environment.

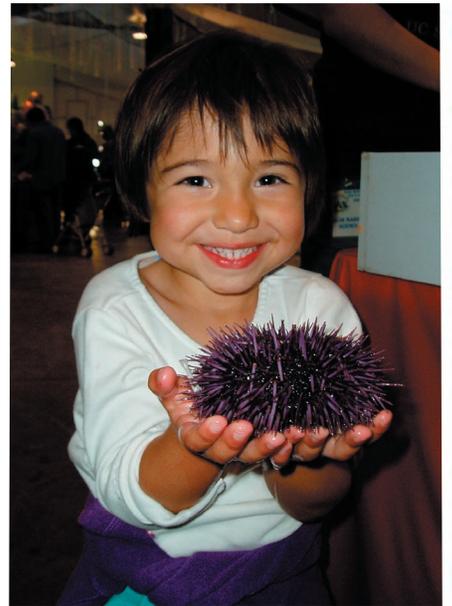
National Marine Sanctuary Program Education Mission

To promote public understanding of our national marine sanctuaries to empower citizens with the necessary knowledge to make informed decisions that lead to the responsible stewardship of marine, natural and cultural resources.

Dive into Education Program Goals

Dive into Education is an marine science education program aimed at providing teachers resources and training to support ocean literacy in America's classrooms. The major goals of the Dive into Education program are to:

- Provide K-12 teachers and informal educators with professional development using hands-on, standards-based, ocean science activities that will excite their students about science and technology.
- Provide K-12 teachers and informal educators an ocean science education network for future partnerships, collaborations and support.
- Promote understanding of National Oceanic and Atmospheric Administration's National Marine Sanctuary Program and its system of national marine sanctuaries.
- Encourage responsible stewardship of marine, natural, and cultural resources, especially national marine sanctuaries.



Friday, May 13, 2005

Ocean Plaza Beach Resort on Tybee Island



2:00 - 6:00 pm Registration Open at Ocean Plaza Beach Resort Harbor Hospitality Room

	Grades K-4	Grades 5-8	Grades 9-12	Open to All
3:00 - 3:50 pm	Tybee Island Marine Science Center Guided Tour	Navigating Change (Garden 1)	Exploring Data using GIS to Experience Sanctuaries (Palmview)	Humpback Whales of the Atlantic & Pacific (Garden 2)
4:00 - 4:50 pm		Each One, Teach One: National Marine Sanctuaries Exploration (Outdoors)		Shark Science (Garden 1)
5:00 - 5:50 pm		Life and Times of Fish (Garden 2)		Gray's Reef Ocean Science Course (Garden 1)

**5:50 - 7:20 pm Exhibit Hall Open in Garden Room 2
Dinner served at the Dolphin Reef Restaurant and Lounge**

**7:30 - 9:00 pm Evening Plenary with Special Guests
Garden Rooms 1 & 2**





Friday, May 13, 2005

Ocean Plaza Beach Resort on Tybee Island

Tybee Island Marine Science Center

Take a guided tour of the facility to learn more about island barrier ecology, charming octopus, feisty blue crabs, fascinating fish, and turtles from the salt marsh and the sea.

Life and Times of Fish

Patty Miller, Hawaiian Islands Humpback Whale National Marine Sanctuary

What are the secrets of fish survival? Participate in hands-on, make-it and take-it activities that explore fish adaptations and relationships. What role do they play in the ecosystem? We take a look at interactions and relationships found in reef ecosystems.

Following the Mighty Humpback Whales of the Atlantic and Pacific

Anne Smrcina and Jean Souza, Stellwagen Bank and Hawaiian Islands Humpback Whale national marine sanctuaries

Endangered humpback whales are common in two sanctuaries in the Atlantic and Pacific. Try your hand at tracking whales and learn more about their migrations and behaviors.

Each One, Teach One: National Marine Sanctuaries Exploration

Robert Steelquist and Jennifer Stock, Olympic Coast and Cordell Bank national marine sanctuaries

Discover the National Marine Sanctuaries System through Each One Teach One, a high-energy outdoor activity for learners of all ages and learning styles.

Shark Science

Carol Preston and Dawn Hayes, Gulf of the Farallones and Monterey Bay national marine sanctuaries

A shark classification and behavioral study activity, a fossil exploration and natural history of sharks with an emphasis on white sharks will be included in this session.

Exploring Data using Geographic Information Systems (GIS) to Experience Sanctuaries (EDGES)

Laura Francis, Julie Bursek, Mary Tagliareni, Cathy Sakas, and Anne Smrcina, Channel Islands, Florida Keys, Gray's Reef, and Stellwagen Bank national marine sanctuaries

Classroom ready EDGES lessons explore the thirteen national marine sanctuaries, compare the bathymetry and width of continental shelf of the Pacific and Atlantic oceans, examine the impact of bathymetry on the distribution of sediments and marine habitats, and reveal how scientists study oceans using satellites, stationary buoys, and drifting buoys. Participants will receive a copy of the EDGES curriculum.

Navigating Change: Teacher's Guide with Video and Activities

Andy Collins, Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve

Navigating Change is a curriculum designed to inspire students to become better stewards of their marine environments and to "navigate change" in their own communities. The curriculum and video modules are based on Hawai'i examples, but the lessons have interest to teachers and students in any community.

Gray's Reef Ocean Science Course

Cathy J. Sakas, Gray's Reef National Marine Sanctuary

An overview of Gray's Reef Ocean Science Course will be presented. A watershed activity will be demonstrated and highlights of the spectacular underwater footage of Gray's Reef will be shown.

Saturday, May 14, 2005

Ocean Plaza Beach Resort on Tybee Island



7:30 - 8:25 am Continental Breakfast in Dolphin Reef Restaurant at Ocean Plaza Beach Resort

	Grades K-4	Grades 5-8	Grades 9-12	Open to All
8:30 - 9:20 am	Build-a-Bed (Garden 2)	Tybee Island Marine Science Center Guided Tour	Each One, Teach One: National Marine Sanctuaries Exploration (Outdoors)	Satellite Oceanography (Garden 1)
9:35 - 10:25 am	Reef Rendezvous (Garden 2)			Maps for a National Marine Sanctuary Tour (Garden 1)
10:40 - 11:30 am	Each One, Teach One: National Marine Sanctuaries Exploration (Outdoors)	Gray's Reef Ocean Science Course (Garden 1)	Using GPS to Map a Shoreline on Tybee Is. (Garden 2)	Water Quality Monitoring (Outdoors)
11:45 am - 12:35 pm		Shark Science (Garden 1)	Ocean Tides (Garden 2)	

12:45 - 1:50 pm Lunch in Dolphin Reef Restaurant and Exhibits Open in Garden Room 2

2:00 - 2:50 pm	Seagrass...it's alive! (Garden 1)	Using GPS to Map a Shoreline on Tybee Is. (Garden 2)	Tybee Island Marine Science Center Guided Tour	Lego® ROV (Palmview)
3:05 - 3:55 pm	Oh, the Games we Play (Outdoors)	Shipwrecks & Marine Archaeology (Garden 2)		
4:10 - 5:00 pm	Adaptations from the Depths (Garden 2)	Squid Dissection (Palmview)	Every Square Inch Counts (Garden 1)	Mock Shipwreck (Outdoors)

5:15 - 6:00 pm Wrap-up Plenary Session in Garden Rooms 1 & 2

6:00 pm Adjourned

Thank you for your participation in the Dive into Education Program and bringing oceans into America's classrooms.

Saturday, May 14, 2005

Ocean Plaza Beach Resort on Tybee Island



Build-A-Bed

Krista Trono, Monitor National Marine Sanctuary

Come help restore seagrass! Build-A-Bed is an interactive activity where participants will “plant” seagrass to create nursery grounds for juvenile fish species and a haven for other coastal creatures.

Reef Rendezvous

Shelley DuPuy, Cathy Sakas and Mary Tagliareni, Flower Garden Banks, Gray’s Reef, and Florida Keys national marine sanctuaries

Compare three reef systems. Examine implications of coral structure, function, adaptations for reef health using life science standards. CD with activities, images, video clips provided.

Each One, Teach One: National Marine Sanctuaries Exploration

Robert Steelquist and Jennifer Stock, Olympic Coast and Cordell Bank national marine sanctuaries

Discover the National Marine Sanctuaries System through Each One Teach One, a high-energy outdoor activity for learners of all ages and learning styles.

Seagrass...it’s Alive!

Mary Tagliareni, Florida Keys National Marine Sanctuary

Seagrass beds are “alive” and play a critical role in the health of the oceans. Come learn seagrass biology, why seagrasses are important both ecologically and economically, and ways to take these messages back to K-4 students. Hands-on activities that have been aligned with the National Science Standards will be conducted during the session and take-home materials will be provided.

Squid Dissection

Patty Miller, Hawaiian Islands Humpback National Marine Sanctuary

Learn how to do a simple squid dissection in your classroom, a great way to compare invertebrates and vertebrates.

Oh, the Games We Play

Greg McCormack, Olympic Coast National Marine Sanctuary

Group Challenges and outdoor games can be adapted to teach just about anything and get your students working together. Come play a few games that have marine themes.

Adaptations from the Depths

Shelley DuPuy, Flower Garden Banks National Marine Sanctuary

Discover the ins and outs of animal adaptations in a coral reef environment. Hands on activities and complete curriculum guide built on the 5E Model.

Tybee Island Marine Science Center

The Tybee Island Marine Science Center promotes appreciation, conservation, and understanding of the marine ecosystem of coastal Georgia through education and service. Take a guided tour of the facility to learn more about island barrier ecology, charming octopus, feisty blue crabs, fascinating fish, and turtles from the salt marsh and the sea.

Gray’s Reef Ocean Science Course

Cathy J. Sakas, Gray’s Reef National Marine Sanctuary

An overview of Gray’s Reef Ocean Science Course will be presented. A watershed activity will be demonstrated and highlights of the spectacular underwater footage of Gray’s Reef will be shown.

Shark Science

Carol Preston and Dawn Hayes, Gulf of the Farallones and Monterey Bay national marine sanctuaries

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Exploring Shipwrecks and Marine Archaeology: Thunder Bay National Marine Sanctuary

Cathy Green, Thunder Bay National Marine Sanctuary and Underwater Preserve

Come along on a voyage of exploration to Thunder Bay National Marine Sanctuary. This overview will introduce you to the amazing shipwrecks beneath the waves of the Great Lakes, and help you bring them into your classroom.

Ocean Tides: Gauging the Moon Tide

Michiko Martin, NOAA National Marine Sanctuary Program

This activity will investigate the role of the moon in generating different types of tides.

Every Square Inch Counts

Jenny Stock, Cordell Bank National Marine Sanctuary

Learn how biologists study tidepool life, and deep reefs, using life sized photos, identification cards, and quadrats. Comparisons and abundance will be made between different benthic habitats in sanctuaries.

Satellite Oceanography: Mapping the Oceans from Space

Michiko Martin, NOAA National Marine Sanctuary Program

This activity explores the role of satellites in understanding the ocean. Participants will use data from satellites to map the ocean floor.

Maps for a National Marine Sanctuary Tour

Claire Johnson, NOAA National Marine Sanctuary Program

What is latitude and longitude and how can they be used to locate the nation's network of ocean and Great Lakes treasures? This activity provides an excellent review of principles that engage students in how to use geography to read maps that ties in the ocean connection.

Mock Shipwreck: An Exercise in Maritime Archaeology

Kate Thompson, NOAA National Marine Sanctuary Program and Cathy Green, Thunder Bay National Marine Sanctuary and Underwater Preserve

Come and explore the world beneath the waves by learning what techniques archaeologists use to develop site plans of shipwrecks. Participants will take a "dive" on our mock shipwreck to learn more about how to use this unique method in the classroom to teach students observation, data gathering, geometry, and history to better appreciate our nation's rich collection of maritime heritage resources.

Water Quality Monitoring

Dawn Hayes and Carol Preston, Monterey Bay and Gulf of the Farallones national marine sanctuaries

This hands-on session will expose participants to several common water quality measurements, and the importance of water quality monitoring to healthy ecosystems. Free kit included.

LEGO® ROV's: A Lesson in Ocean Engineering the Fun Way!

Michiko Martin and Kate Thompson, NOAA National Marine Sanctuary Program and Shelley DuPuy, Flower Garden Banks National Marine Sanctuary

Tap into your childhood memory and join us in learning how to build remotely operated vehicles with LEGOs®. As part of this short course, participants will learn how to design and build ROV's, and how ROV's are used in real life sanctuary settings. Teachers will also learn techniques and lessons to take back to their classrooms to teach students engineering, physics, and oceanography in a fun new way!

National Marine Sanctuaries

Southeastern and Gulf of Mexico Region



Gray's Reef National Marine Sanctuary is one of the largest near-shore sandstone reefs in the southeastern United States. Located just off the coast of Georgia in waters 70 feet deep, the area earned sanctuary designation in 1981 and was recognized as part of the international network of Biosphere Reserves by UNESCO in 1986. Gray's Reef consists of sandstone outcroppings and ledges up to 10 feet in height, with sandy, flat-bottomed troughs between. Because of the diversity of marine life, Gray's Reef is one of the most popular sport fishing and diving destinations along the Georgia coast.

Florida Keys National Marine Sanctuary supports one of the most diverse assemblages of underwater plants and animals in North America. Although best known for its coral reefs, the shallow nearshore waters contain interdependent marine habitats that include fringing mangroves, seagrass meadows, hardbottom regions, as well as patch and bank reefs. This complex marine ecosystem is the foundation for tourism and commercial fishing based economies that are so important to Florida.

Flower Garden Banks National Marine Sanctuary lies one hundred miles off the coasts of Texas and Louisiana where three underwater gardens emerge from the depths of the Gulf of Mexico. The Flower Garden and Stetson Banks are surface expressions of salt domes beneath the sea floor. These premier diving destinations harbor the northernmost coral reefs in the continental United States and serve as regional reservoirs of shallow-water Caribbean reef fishes and invertebrates.

Sanctuary Education

National marine sanctuaries are living classrooms where people can see, touch and learn about our nation's ocean and Great Lakes treasures.

Visit <http://sanctuaries.noaa.gov/education> to find out more about ways to bring oceans into your classroom through field studies, online lesson plans, curricula, multicultural programs and high tech learning.

Workshop Sponsors

Special thanks to the Georgia Association of Marine Educators (GAME) for their contribution to the Dive into Education scholarship fund and the Tybee Island Marine Science Center for offering tours of their facility for Dive into Education participants.



Acknowledgements

Dan Basta, Director of the NOAA National Marine Sanctuary Program also wishes to thank Michiko Martin, Claire Johnson and Cathy Sakas, the planning committee, whose hard work and dedication helped make the second annual Dive into Education workshop possible. Photos courtesy of Gray's Reef National Marine Sanctuary, Robert Schwemmer and Claire Johnson.