

## Lesson Plan

# Exploring National Marine Sanctuaries



### Grade Level

- 7-8  
Life Science / Earth Science

### Timeframe

- 20 minutes for teacher to introduce and two 45-minute class periods for presentations

### Materials

- National Marine Sanctuaries Student Project and Further Understanding worksheets (Download at <http://sanctuaries.noaa.gov/education/teachers/features/lpexplore.html>)
- Each student group will need poster board and materials
- Overhead of national marine sanctuaries map, available at <http://sanctuaries.noaa.gov/education/teachers/features/lpexplore.html>
- Internet access



Photo: Greg McFall, NOAA

### Activity Summary

In this lesson, students will learn about the national marine sanctuaries found in the Pacific and Atlantic oceans and off the coast of American Samoa. They include breeding and feeding grounds of whales, sea lions, sharks, and sea turtles; significant coral reefs and kelp forest habitats; and the remains of the U.S.S. *Monitor*, a Civil War ironclad that sank off the coast of North Carolina. By learning about the biodiversity, ecological integrity and cultural legacy of these marine sanctuaries, students can place into context what they are learning about the interdependence of living things on our planet.

### Learning Objectives

Students will be able to:

- use the internet to research national marine sanctuaries—America's ocean and Great Lakes treasures;
- identify major groups of organisms living in and protected by national marine sanctuaries;
- describe various habitats found in national marine sanctuaries;
- list characteristics that define various national marine sanctuaries, including their similarities and differences;
- identify some of the resource issues threatening the ocean, and specifically our national marine sanctuaries;
- describe human interactions with the ocean and will be able to explain the importance of marine protected areas; and

- summarize and communicate their research findings in a written poster presentation and through a five-minute oral presentation.

## Background Information

Science in the middle grades should provide students with opportunities to enrich their growing knowledge of biodiversity. In this lesson, students will learn about the national marine sanctuaries found in the Pacific and Atlantic oceans and off the coast of American Samoa. They include breeding and feeding grounds of whales, sea lions, sharks, and sea turtles; significant coral reefs and kelp forest habitats; and the remains of the U.S.S. *Monitor*, a Civil War ironclad that sank off the coast of North Carolina. By learning about the biodiversity, ecological integrity, and cultural legacy of these marine sanctuaries, students can place into context what they are learning about the interdependence of living things on our planet.

After being introduced to the marine sanctuaries as a class, students will work in small groups to develop posters that highlight key ideas in the benchmarks in the context of the individual marine sanctuaries.

The article “National Marine Sanctuaries: Living Classrooms” in *Current: The Journal of Marine Education* (Volume 21, Number 1, 2005) provides an excellent introduction into the overall purpose and mission of the National Marine Sanctuary System. *Current* is published by the National Marine Educators Association and is available through libraries (ISSN 0889-5546). The relevant article may be copied for non-commercial use as stipulated by the copyright permission.

## Preparation

- Download map of national marine sanctuaries, available at <http://sanctuaries.noaa.gov/education/teachers/features/lpexplore.html>. Make an

overhead transparency of this map, or show on large screen or TV.

- Divide the class into 14 different groups of two or three students. (Smaller classes will be unable to present all 14 sites in the National Marine Sanctuary System, but are still able to achieve the objectives of this activity.) Assign each group one of the 13 national marine sanctuaries and the Papahānaumokuākea Marine National Monument.

## Learning Procedure

**Step 1:** Project the map that depicts the locations of national marine sanctuaries. Ask students if they recognize any of the places highlighted on the map. If any of the students have been to any of the locations, ask them to describe what they are like. Tell students that the map shows federally protected waters called national marine sanctuaries. Ask them to speculate about what the term “marine sanctuaries” might mean. Then tell them that they will find out more about the characteristics of these environments and why they are in need of special protection.

**Step 2:** Inform the class of small group assignments and pass out the “National Marine Sanctuaries” student project worksheet. Instruct them that they will conduct web-based research using the NOAA Office of National Marine Sanctuaries website. (Note: This could provide a good opportunity for the



Photo: Claire Fackler, NOAA

## Key Words

National Marine Sanctuary  
Species  
Marine Protected Area  
Ecosystem

Habitat  
Biodiversity  
Conservation  
Environmental Stewardship

Sustainability  
Natural Resources  
Cultural Resources

teacher to explain the use of approved websites to conduct research.) Instruct the students that they will use the website and its related links to explore their national marine sanctuary. Note that at a minimum, students should read the ‘about’ section for their site. The “Extensions” section of this lesson provides additional links that you may wish to have students explore, such as the “Encyclopedia of the Sanctuaries” found at <http://marinelife.noaa.gov/> that highlights the top 100 species found in each national marine sanctuary through vibrant photographs, videos and natural history information on each species.

**Step 3:** Instruct students that they will use the “National Marine Sanctuaries” student project worksheet to help guide them through discovery of America’s ocean and Great Lakes treasures. Even though students will work in groups, make sure that each student completes the student sheet in his/her own words:

- What kinds of living things can be found in all of the national marine sanctuaries?
- What are some of the similarities and differences among national marine sanctuaries?
- What are some of the problems faced by the various ecosystems described?

Working in groups, and using the worksheet, students will gather information about each of the national marine sanctuaries. Each group will create a poster of its assigned national marine sanctuary and then present its information to the class in a 5-minute oral presentation. Inform the groups of their oral presentation due dates.

**Step 4:** On oral presentation day(s), student groups will present their posters to the class. After all of the presentations have been made, display the posters around the classroom and provide students time to view the posters. Encourage students to take notes during the presentations of the posters and as they view the displayed posters. As they do this, they should individually complete the “Further Understanding” student worksheet, which asks them to compare and contrast their national marine sanctuary with the other marine sanctuaries.

**Step 5:** Students should be able to describe the different goals of the national marine sanctuaries as they relate to the individual needs of the ecosystems they comprise. For example, Greater Farallones National Marine Sanctuary is home to the largest concentration of breeding seabirds in the continental United States. As such, it seeks to preserve these resources by managing human activities that may damage the species and their habitat. They do this by supporting restoration projects to revitalize disturbed areas and by monitoring programs that provide information to assess changes from natural and human disturbance.

## The BRIDGE Connection

<http://www.vims.edu/bridge>

Click on “Ocean Science Topics” in the navigation menu to the left, and then navigate to “Human Activities,” then to “Environmental Issues,” then to “Policy.”

## The “ME” Connection

Have students write an essay on how the ocean, or specifically a national marine sanctuary, directly benefits (or could benefit) their own lives.

## Connections to other Subjects

- English/Language Arts
- Social Studies
- Geography

## Evaluation

Individual project worksheets, group poster and oral project presentations provide opportunities for assessment. Develop a grading rubric that includes performance on the individual research (Step 3), poster presentation (Step 4), oral presentation and individual analysis (Step 5).

## Extensions

Visit <http://marinelife.noaa.gov> to learn about the top 100 species found in each national marine sanctuary.

Visit <http://oceanexplorer.noaa.gov/> to follow ocean explorations in near real-time, many of which are in national marine sanctuary waters. Learn about ocean exploration technologies, observe remote marine flora and fauna in the multimedia gallery and discover additional NOAA resources in a virtual library.

## Resources

<http://sanctuaries.noaa.gov> — Website of the National Marine Sanctuary System

<http://sanctuaries.noaa.gov/education> — National marine sanctuary education and outreach programs with sections specifically designed “For Students” and “For teachers.”

## For More Information

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Photo: Claire Fackler, NOAA

## Education Standards

<b>National Science Education Standards</b>	<ul style="list-style-type: none"><li>• Content Standard C: Life Science (Regulation and Behavior; Populations and Ecosystems; and Diversity and Adaptations of Organisms)</li><li>• Content Standard F: Science in Personal and Social Perspectives (Populations, Resources, and Environments; Natural and Human-induced Hazards; and Risks and Benefits)</li></ul>
<b>National Geography Standards</b>	<ul style="list-style-type: none"><li>• Essential Element 2: Places and Regions (The Physical and Human Characteristics of Places; and That People Create Regions to Interpret Earth's Complexity)</li><li>• Essential Element 3: Physical Systems (The Characteristics and Spatial Distribution of Ecosystems on Earth's Surface)</li><li>• Essential Element 5: Environment and Society (How Human Actions Modify the Physical Environment; How Physical Systems Affect Human Systems; and The Changes That Occur in the Meaning, Use, Distribution, and Importance of Resources)</li></ul>
<b>Ocean Literacy Principles</b>	Principle 1. The Earth has one big ocean with many features. Principle 5. The ocean supports a great diversity of life and ecosystems. Principle 6. The ocean and humans are inextricably interconnected.

## Acknowledgement

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