

RESOURCE LIBRARY

ACTIVITY : 1 HR 30 MINS

Marine Protected Areas: Case Studies

Students compare and contrast two Marine Protected Areas (MPAs) by evaluating case studies. Then they learn how the MPA classification system works in the United States and apply that system to the MPA case studies.

GRADES

9 - 12+

SUBJECTS*Earth Science, Oceanography, Geography, Human Geography, Physical Geography***CONTENTS**

5 PDFs

OVERVIEW

Students compare and contrast two Marine Protected Areas (MPAs) by evaluating case studies. Then they learn how the MPA classification system works in the United States and apply that system to the MPA case studies.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/marine-protected-areas-case-studies/>

DIRECTIONS

1. Activate prior knowledge by reviewing the purpose and importance of Marine Protected Areas.

Have a whole-class discussion. Ask: *What is the purpose of a MPA?* (A MPA is “any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources

therein.”) Ask: *Do you think the establishment of Marine Protected Areas is important? Why or why not?*

2. For homework, have students read two Marine Protected Area case studies.

Give each student a copy of the Point Sur case study, Cocos Island case study, and the Case Studies Comparison worksheet. Briefly review what a case study is. Remind students that case studies are created to establish and manage MPAs. Case studies outline important information about an area’s history, geography, habitats, species, human uses, and management goals. They also describe threats to the area and explain why the area should be protected. Briefly introduce the two MPAs. Then read aloud the directions for the Case Studies Comparison worksheet. Explain that students will first independently read and take notes for each case study as homework. Then they will discuss and take additional notes for each case study in class. Answer any questions. Tell students that they should think about the analysis questions at the bottom of the worksheet while they are reading. They do not have to answer these questions until the class discussion.

3. During the next class period, discuss the MPA case studies reading assignment and worksheet.

Divide students into pairs and have them trade their Case Studies Comparison worksheets with one another. Tell them to compare their notes and add any important information that they may have overlooked. Then lead a whole-class discussion and tell students to continue adding notes to their worksheets. Wrap up the discussion by asking students to answer the worksheet’s analysis questions. Ask: *How are the two MPAs similar? How are they different?* Encourage students to use specific information and examples to support their conclusions. They should be able to identify similarities and differences between the MPA’s stakeholders, environmental issues, human threats, management strategies, and important species.

4. Introduce the U.S. MPA classification system and have students classify their two MPA case studies.

Give each pair of students a copy of the Marine Protected Areas Classification worksheet and the Definition and Classification System for U.S. Marine Protected Areas handout from NOAA. Have volunteers read aloud the first and last paragraphs of the “Toward a Common Language for Marine Protected Areas” section on the NOAA handout. Ask a student volunteer to summarize the two passages for the class. Ask:

- *What are the five functional characteristics common to most MPAs?* (conservation focus, level of protection, permanence of protection, constancy of protection, and ecological scale of protection)
- *Why is this classification system so important in the establishment and management of MPAs?* (This five-level classification system outlines “why the site was established, what it is intended to protect, how it achieves that protection, and how it may affect local ecosystems and local human uses.”)

Have students turn to the “User’s Guide to the Classification System” section of the NOAA handout. Discuss the criteria that comprise each of the five levels of the MPA classification system. Have students follow along using their MPA Classification worksheets and take notes. Address any terms that may be unfamiliar to them. Read aloud the directions on their Marine Protected Areas Classifications worksheets. Tell students that they will use the U.S. MPA Classification criteria to classify the Point Sur and Cocos Island MPAs. Explain that there is no right or wrong set of classifications, but they must support their classification designations. Their task is to work together and make informed decisions about the best management classification option for each case study. Allow students enough time to discuss each case study and assign it a set of classifications.

5. Have a whole-class discussion about students’ classifications.

For each case study, invite students to share their classifications and the reasoning behind them. Have students compare and contrast the different classifications and revise their classifications, as needed. Ask: *Why is it important to classify MPAs using this system? What problems do you think MPA managers might face if these classifications and criteria were not established?*

Modification

Assign ELL or other challenged learners the Galápagos Marine Reserve case study from the Marine Protected Areas activity [Marine Critical Issues: Case Studies](#). Their familiarity with that case study will support their learning in this activity.

Informal Assessment

Choose an appropriate local or regional marine area that is not already designated as a Marine Protected Area and have students make recommendations for classification as an MPA. Make sure students support their recommendations with valid reasoning.

Extending the Learning

Have students select one of the two case study areas to research in greater depth. Ask them to identify the industries, such as fishing or tourism, that are affected by the MPA designation and describe how the existing management plan directly affects those particular industries.

OBJECTIVES

Subjects & Disciplines

Earth Science

- [Oceanography](#)

Geography

- [Human Geography](#)
- [Physical Geography](#)

Learning Objectives

Students will:

- compare and contrast two different Marine Protected Areas
- identify characteristics for classifying Marine Protected Areas
- explain the importance of classifying Marine Protected Areas
- describe different management practices based on the type of Marine Protected Area

Teaching Approach

- Learning-for-use

Teaching Methods

- Cooperative learning
- Discussions
- Information organization
- Reading

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Learning and Innovation Skills
 - Communication and Collaboration
 - Critical Thinking and Problem Solving
- 21st Century Themes
 - Global Awareness
- Critical Thinking Skills
 - Analyzing
 - Applying
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information
 - Analyzing Geographic Information

National Standards, Principles, and Practices

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

- Theme 3:

People, Places, and Environments

NATIONAL GEOGRAPHY STANDARDS

- **Standard 14:**

How human actions modify the physical environment

- **Standard 16:**

The changes that occur in the meaning, use, distribution, and importance of resources

- **Standard 4:**

The physical and human characteristics of places

NATIONAL SCIENCE EDUCATION STANDARDS

- **(9-12) Standard F-3:**

Natural resources

- **(9-12) Standard F-4:**

Environmental quality

- **(9-12) Standard F-6:**

Science and technology in local, national, and global challenges

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- **Principle 5c:**

Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.

- **Principle 5d:**

Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (such as symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

- **Principle 5e:**

The ocean is three-dimensional, offering vast living space and diverse habitats from the surface through the water column to the seafloor. Most of the living space on Earth is in the ocean.

- **Principle 5f:**

Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or spatially, i.e., it is “patchy”. Some regions of the ocean support more diverse and abundant life than anywhere on Earth, while much of the ocean is considered a desert.

- **Principle 5h:**

Tides, waves and predation cause vertical zonation patterns along the shore, influencing the distribution and diversity of organisms.

- **Principle 6b:**

From the ocean we get foods, medicines, and mineral and energy resources. In addition, it provides jobs, supports our nation's economy, serves as a highway for transportation of goods and people, and plays a role in national security.

- **Principle 6c:**

The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.

- **Principle 6d:**

Much of the world's population lives in coastal areas.

- **Principle 6e:**

Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (such as point source, non-point source, and noise pollution) and physical modifications (such as changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

- **Principle 6g:**

Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction
- Small-group instruction

BACKGROUND & VOCABULARY

Background Information

Marine Protected Areas (MPAs) can have a strict management structure, such as protecting an area for science or wilderness reasons and excluding extractive activities like mining and fishing. They can have a more broad management focus, such as protecting an area for sustainable use of natural resources. Or they can fall somewhere in between. Comprehensive classification systems for MPA networks have been created to distinguish between the different management levels. These systems ensure ecosystem diversity and viability and address the full range of human activities and stakeholders.

Prior Knowledge

["An understanding of the types of Marine Protected Areas as well as human impacts on the ocean addressed throughout this unit."]

Recommended Prior Activities

- [Marine Critical Issues: Case Studies](#)
- [Marine Protected Areas](#)
- [Marine Protected Area: Stakeholder Debate](#)
- [MPA Designation and Management](#)
- [Protecting the Ocean](#)

Vocabulary

| Term | Part of Speech | Definition |
|------|-------------------|------------|
|------|-------------------|------------|

| Term | Part of Speech | Definition |
|-----------------------------|----------------|--|
| case study | noun | form of problem-based learning, where the teacher presents a situation that needs a resolution. The learner is given details about the situation, often in a historical context. The stakeholders are introduced. Objectives and challenges are outlined. This is followed by specific examples and data, which the learner then uses to analyze the situation, determine what happened, and make recommendations. |
| marine protected area (MPA) | noun | area of the ocean where a government has placed limits on human activity. |
| stakeholder | noun | person or organization that has an interest or investment in a place, situation, or company. |

For Further Exploration

Websites

- [World Database on Marine Protected Areas](#)
- [NOAA: National Marine Protected Areas Center](#)
- [National Geographic Education: National Teacher Leadership Academy \(NTLA\)](#)
- [NOAA: Marine Protected Areas of the United States](#)

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