

NOAA National Ocean Service Education: I'll Stay Here if it Kills Me!

Coastal Decision-Making / Grades 9-12 / Geography, Earth Science , Life Science

Focus Question

How and why should different perspectives be considered when deciding how to use and protect coastal resources?

Learning Objectives

- Students will be able to identify and discuss four components of “human dimensions” involved in coastal decision-making.
- Students will be able to describe a process to build public support for coastal resource protection and will be able to explain why this support is important.
- Students will be able to describe at least three perspectives that exist among different groups of stakeholders regarding a specific coastal resource issue.

Links to Overview Essays and Resources Useful for Student Research

<http://www.oceanservice.noaa.gov/topics/coasts/dmtools>

Materials

(optional) Computers with Internet access; if students do not have access to the Internet, download copies of materials cited under “Learning Procedure” and provide copies of these materials to each student or student group.

Audio/Visual Materials

None.

Teaching Time

Two 45-minute class periods, plus time for student research and preparation.

Seating Arrangement

Classroom style or groups, depending upon the role-playing context selected (see Learning Procedure)

Maximum Number of Students

20

Key Words

Coastal resource management

Stakeholders

Human dimensions

Participatory management

Role-playing

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Background Information

“Coastal Resource Management” refers to activities that are intended to protect the natural and cultural resources associated with coastal areas and to ensure that these resources are used in ways that benefit many different groups of people (these groups are often referred to as “stakeholders”). Natural and cultural resources may include beaches, fisheries, historic sites, and anything else that is used or valued by people who live, work, or are somehow involved in coastal areas. Similarly, stakeholders include anyone who uses, wants to use, or may benefit from one or more of these resources. The concept is very broad and for many years was focused on obtaining information about coastal resources and establishing regulations to control how people use them. More recently, there is a growing recognition that the concept includes a human side that can be quite complicated. This aspect is often called “the human dimensions,” and includes the

- Driving forces behind people’s decisions;
- Human behaviors that lead to change in coastal environments;
- Effects of change in coastal environments; and
- Strategies for responding to change.

Driving Forces are the primary factors that influence people’s decisions, activities, perceptions, and acceptance of change in the social and natural environment. Examples of Driving Forces include psychological, social, spiritual, cultural, and economic factors, as well as customs, traditions, knowledge, experience, social institutions, and laws.

Human Behavior includes passive and active behavior or activities. Four key categories of human behavior related to coastal environments are

- recreation, tourism, and leisure;
- urbanization;
- commerce, transportation, and industry; and
- stewardship and public involvement (“stewardship” is active participation in protecting coastal resources and controlling their use; “public involvement” includes a range of behaviors from being interested in stewardship to active participation in the process).

Effects of Change are the real and perceived impacts that result from a human activity or natural phenomenon (such as a hurricane). These impacts include physical and biological changes to the landscape, physiological changes to individuals, and social and economic changes to society. Specific effects of change depend upon the human values that are the basis for deciding what constitutes a positive or negative impact. The effects of change to an individual or group may vary based on the driving forces that influence their perceptions and values.

Strategies for responding to change include a wide variety of actions such as regulations, restoration projects, education and outreach programs, and volunteer efforts. These strategies have the potential to alter the influence of driving forces, the real or perceived effects of human-induced change, and the level of change and managerial control that people are willing to accept.

Human dimensions can be particularly dramatic in exploring how people respond to sudden changes caused by violent natural events. In 2004, residents of Florida were battered by four major hurricanes within six weeks. Many people living in other locations couldn’t imagine why anyone would rebuild in an area that might experience the same events again in the near future. Yet, many people who had actually been affected by these events said that was exactly what they intended to do: “I’ll stay here if it kills me!”

Many of the problems and issues related to coastal resources are complicated—and in some cases caused—by differing viewpoints and objectives among several groups of stakeholders. A beach full of clams, for example, may be valued as a recreational resource by people who like to make clam chowder, as an economic resource by commercial clam fishermen, as an aesthetic resource by nature lovers, and as a marketable amenity by a coastal developer. The same beach might be considered a nuisance by someone wanting to excavate the beach and construct a marina. Understanding and resolving differing viewpoints is one of the biggest challenges for individuals and agencies who are responsible for protecting coastal resources and ensuring their wise use. In many cases, the key is to actively involve entire communities through a process known as participatory management. The National Ocean Service’s (NOS) Coastal Services Center has identified three steps in this process:

- Building a foundation for decisions through education and outreach;
- Exploring alternative solutions through collaborative design and planning; and
- Seeking agreement to achieve broad support among stakeholders.

The last step is critical, because without stakeholder “buy-in,” efforts to protect coastal resources and control their use are much less likely to be effective.

In this activity, students will use role-playing to explore the human dimensions of coastal decision-making. In most role-playing exercises, each student assumes the role of a person affected by a particular issue and studies the impacts of this issue on human life and human activities from the perspective of that person. In some cases, students may personify another living organism or process to demonstrate certain principles in an unusual and interesting way (for example, they might personify water drops which appear in various forms to describe the water cycle). Role-playing is a way to directly involve students in the “real-world” side of academic subjects, and it challenges them to deal with complex problems that do not have a single predetermined correct answer. Particularly important, role-playing provides an opportunity to learn course content and explore different human perspectives on this content.

Role-playing exercises may be done on an individual or interactive basis. Individual role-playing may take the form of stories, letters, problem analyses, political position papers, speeches, or reports on findings (e.g., from research activities or explorations). Often, these products will include factual material presented in a fictitious context. Information about prehistoric life, for example, might be presented in the context of a report from an expedition to explore a prehistoric ocean or dinosaur habitat. Or, information about Abraham Lincoln might be included in a letter from one of Lincoln’s neighbors. Interactive role-playing involves multiple participants whose actions depend upon each other. Electronic video games and debates are familiar examples. Visit <http://serc.carleton.edu/introgeo/roleplaying/index.html> for more discussion and examples.

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Learning Procedure

1. You may choose to involve students in the process of selecting a subject (coastal resource issue) and type of role-playing exercise, or you may make these decisions yourself before beginning the lesson. The NOS Office of Ocean and Coastal Resource Management Resource page (<http://coastalmanagement.noaa.gov/issues>) has links to many sources of information about coastal issues. If students do not have access to the Internet, download and provide copies of selected coastal issues materials to each student or student group.
2. Lead a brief introductory discussion about the concept of coastal resource management. Ask students to list coastal resources, who uses them, and what issues might arise concerning the “best” use of these resources. This list should ultimately include natural, cultural, and economic resources, and many different types of users. Introduce the concept of stakeholders - people who have an interest in how resources are used. Students should realize that stakeholders may include people who do not actively “use” resources at all. Many people who have never visited the Arctic, for example, are concerned about the disappearance of polar bear habitat and are among the stakeholders involved with this issue. For more information, see the Ocean Exploration lesson plan, “Polar Bear Panic” at http://oceanexplorer.noaa.gov/explorations/02arctic/background/education/media/arctic_polarbears.pdf

Students should also realize that the interests and perspectives of some stakeholders may conflict with each other, and that this presents particular challenges in making decisions about how to use and protect coastal resources. Introduce the idea of “human dimensions” and its four components (driving forces, behaviors, effects of change, and responses to change).

3. Tell students that they are going to use role-playing to explore the human dimensions of an issue concerning coastal resources. If you have not already selected a subject and type of role-playing, involve students in these decisions at this point. Review the seven steps (a-g below) in a role-playing exercise (see <http://serc.carleton.edu/introgeo/roleplaying/howto.html> for additional discussion and examples):
 - a. Define Objectives – In this case, the primary objective is for students to investigate the human dimensions of a coastal resource issue and to identify and describe the four human dimension components of this issue from a variety of perspectives.
 - b. Choose Context and Roles – Define the topic, setting, and characters that will be involved. The topic should be real, but the setting can be hypothetical. Fictional settings have the advantage of giving students more opportunity for creativity, but are obviously inappropriate if the topic is an actual event. Assign specific roles to individual students. If students have problems with their assigned role, this is the time for them to say so. Many students have difficulty with roles with perspectives very different from their own, unless they have acting or debating skills.
 - c. Discuss Expectations – Identify what each student is expected to do and how much time will be available for preparation and presentation.
 - d. Student Preparation and Research – Provide students with background materials (see Step 1 above) or direct them to research these individually. Discovering the individual perspective, including views and motives, of assigned roles is an important part of this research. Web sites may be useful sources of this information for some roles, but other roles may require students to read newspaper or magazine interviews, reports of public meetings, etc.
 - e. The Role-Play – This could be individual reports, a debate, a town meeting, or other context selected in Step (b).
 - f. Concluding Discussion – Students discuss what they have learned in class, or in individual essays.
 - g. Assessment – Explain the grading rubric, which may include quality of written assignments, consistency in presenting a particular role (“staying in character”), and ability to recognize and consider other viewpoints.
4. Complete the process described in Step 3. Discuss why it is important to achieve maximum public support (“buy-in”) for actions to protect coastal resources and control the ways in which these resources are used. Often, “management actions” that do not have broad public support are difficult or impossible to implement, even if they have the force of law. Discuss what actions would be likely to produce the maximum buy-in from stakeholders, and what problems might arise from stakeholders who do not buy in. Be sure students consider the objectives of protecting resources as well as using resources in ways that produce the greatest benefits.

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The Bridge Connection

The Bridge is a growing collection online marine education resources. It provides educators with a convenient source of useful information on global, national, and regional marine science topics. Educators and scientists review sites selected for the Bridge to insure that they are accurate and current.

<http://www.vims.edu/bridge/> – In the navigation menu on the left, click “Ocean Science Topics,” then “Human Activities,” then “Environmental Issues,” then “Policy” for links to resources about coastal decision-making.

The “Me” Connection

Have students write a brief essay on a coastal resource issue that affects them personally, including why the issue is important, citing at least three different stakeholder groups and what perspectives are held by each of these groups.

Extensions

Visit <http://serc.carleton.edu/introgeo/roleplaying/index.html> for more about role-playing, including many suggested scenarios dealing with earth science topics.

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Resources

<http://serc.carleton.edu/introgeo/roleplaying/index.html> – Web site from the Science Education Resource Center at Carleton College (Northfield, Minnesota) on using role-playing to teach entry level geoscience

National Science Education Standards

Content Standard A: Science as Inquiry

- Understandings about scientific inquiry

Content Standard C: Life Science

- Interdependence of organisms
- Behavior of organisms

Content Standard D: Earth and Space Science

- Energy in the Earth system
- Geochemical cycles

Content Standard E: Science and Technology

- Understandings about science and technology

Content Standard F: Science in Personal and Social Perspectives

- Personal and community health
- Population growth
- Natural resources
- Environmental quality
- Natural and human-induced hazards
- Science and technology in local, national, and global challenges

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Ocean Literacy Essential Principles and Fundamental Concepts

Essential Principle 3. The ocean is a major influence on weather and climate.

- Fundamental Concept a. The ocean controls weather and climate by dominating the Earth's energy, water and carbon systems.<
- Fundamental Concept b. The ocean absorbs much of the solar radiation reaching Earth. The ocean loses heat by evaporation. This heat loss drives atmospheric circulation when, after it is released into the atmosphere as water vapor, it condenses and forms rain. Condensation of water evaporated from warm seas provides the energy for hurricanes and cyclones.

Essential Principle 6. The ocean and humans are inextricably interconnected.

- Fundamental Concept a. The ocean affects every human life. It supplies freshwater (most rain comes from the ocean) and nearly all Earth's oxygen. It moderates the Earth's climate, influences our weather, and affects human health.
- Fundamental Concept b. 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.
- Fundamental Concept c. The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.
- Fundamental Concept d. Much of the world's population lives in coastal areas.

- Fundamental Concept e. 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.
- Fundamental Concept f. Coastal regions are susceptible to natural hazards (such as tsunamis, hurricanes, cyclones, sea level change, and storm surges).
- Fundamental Concept g. 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.

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