

### **Activity Title: A Blue-Ribbon Panel on Managing the Gulf of Mexico**

**Subject (Focus/Topic):** This is an interdisciplinary lesson in which students: (1) explore the viewpoints of different stakeholders in the Gulf of Mexico; (2) make connections between scientific, economic, and political considerations in managing common resources; and (3) develop their own plan for managing competing interests in the Gulf.

**Grade Level:** 11-12

**Average Learning Time:** Five 58-minute class periods, after students have already completed basic introductory units on ecosystem function, energy, water pollution, environmental economics, and the politics of environmental issues. This is meant to be a culminating, end-of-year exercise in an AP Environmental Science course.

**Lesson Summary (Overview/Purpose):** Students will research the role of a particular stakeholder group, engage in a roundtable discussion with the other stakeholders, and develop a policy for managing Gulf resources.

#### **Overall Concept (Big Idea/Essential Question):**

1. What are the costs and benefits of energy production in the Gulf?
2. What alternatives are available to producing energy from the Gulf, and what are their costs and benefits?
3. Who benefits the most from the manner in which energy is currently produced in the Gulf? Who is harmed?

#### **Specific Concepts (Key Concepts):**

1. Spilled oil harms aquatic and coastal food webs in the Gulf.
2. Oil production increases atmospheric CO<sub>2</sub> levels and contributes to climate change.
3. Gulf oil production fuels economic development and provides jobs and a domestic energy source.
4. Government regulation may increase the safety of Gulf oil production, but could lead to increased costs of production.
5. Economically, alternative energy cannot currently compete with fossil fuel energy under our current political system.

#### **Focus Questions (Specific Questions):**

1. What is the effect on the Gulf ecosystem of an oil spill?
2. What is the effect on coastal ecosystems from a Gulf oil spill?
3. What is the effect on Gulf fisheries from an oil spill?
4. What is the effect on Gulf coastal economies from an oil spill?
5. What is the benefit to the US economy of Gulf oil production?
6. What is the benefit to coastal communities of Gulf oil production?

7. What is the effect on the atmosphere of Gulf oil production?
8. Should the US government ban oil production from the Gulf of Mexico?
9. If Gulf oil production is banned, what alternative sources of energy can be utilized?
10. What are the costs and benefits of replacing Gulf energy sources with alternative?

**Objectives/Learning Goals:**

1. Students will consider, compare, and evaluate a variety of viewpoints as to how to best manage Gulf resources, reassess their preconceived notions, and formulate their own plan for managing competing interests in the Gulf.

**Background Information:** This lesson is intended to be taught as an end-of-year lesson in an AP Environmental Science course, tying together topics studied such as:

- Ecosystem structure
- Fishing
- Fossil Fuel Resources and Use
- Water Pollution
- Climate Change

See AP Environmental Science Course Description:

<http://apcentral.collegeboard.com/apc/public/repository/ap-environmental-science-course-description.pdf>

**Materials & Technical Requirements:** Library/internet/media resources for research.

Online Resources, providing information and views from each stakeholder group:

- Louisiana Shrimp Association. <http://www.louisianashrimp.org/>
- Waterkeeper Alliance: <http://saveourgulf.org/resources>
- BP: <http://www.bp.com/sectionbodycopy.do?categoryId=41&contentId=7067505>
- NOAA: [http://www.education.noaa.gov/Ocean\\_and\\_Coasts/Oil\\_Spill.html](http://www.education.noaa.gov/Ocean_and_Coasts/Oil_Spill.html)
- USEPA: <http://www.epa.gov/bpspill/>
- Louisiana Governor's Office of Coastal Activities: <http://www.goca.state.la.us/>
- Louisiana Department of Wildlife & Fisheries: <http://www.wlf.louisiana.gov/oilspill>

Other Resources:

- New Orleans Times Picayne: <http://www.nola.com/news/gulf-oil-spill/>
- New Orleans Times Picayne: <http://www.nola.com/news/gulf-oil-spill/>
- National Geographic: <http://news.nationalgeographic.com/news/energy/2011/04/110420-gulf-oil-spill-anniversary/>
- Scientific American: <https://www.scientificamerican.com/report.cfm?id=bp-gulf-of-mexico-oil-spill-anniversary>

- MSNBC: <http://www.msnbc.msn.com/id/33100027?q=Oil%20spill>
- Wall Street Journal: [http://online.wsj.com/article/SB10001424052748704495004576264782861286262.html?mod=WSJ\\_economy\\_RightTopCarousel\\_1](http://online.wsj.com/article/SB10001424052748704495004576264782861286262.html?mod=WSJ_economy_RightTopCarousel_1)

**Teacher Preparation:** Teacher needs to be familiar with AP Environmental Science curriculum.

**Keywords:**

1. Sustainability
2. Environmental resources
3. Natural capital
4. Cost-benefit analysis.
5. True-cost pricing

**Pre-assessment Strategy/Anticipatory Set (Optional):**

1. Students will use online and print resources (see above for suggestions) to read articles aligned with their stakeholder group.
2. Teacher will present pictures, videos and discussion of his Teachers at Sea experience in the Gulf in summer 2010. (Other teachers could use resources suggested above.)

**Lesson Procedure:**

1. Class 1. Introduction. Map exercise and reflection
  - a. Teacher presents a brief lecture on the Gulf, identifying physical features, coastal and pelagic ecosystems, and locations of economic resources (energy, fishing, and recreation).
  - b. Students follow along with printout of map, working alone or in pairs to identify where various features are located.   
[http://oceanexplorer.noaa.gov/technology/tools/mapping/media/gis\\_gulf.html](http://oceanexplorer.noaa.gov/technology/tools/mapping/media/gis_gulf.html)
  - c. Teacher introduces the concept of stakeholder groups.
  - d. Students write a 1 – 3 paragraph Initial Reflection describing which of the Gulf values are more important, and why.
  - e. Homework: students read articles from two different points of view on the spill. Suggested reading:
    - i. For Many In Louisiana, The Real Disaster Of 2010 Wasn't The Oil Spill But The Drilling Moratorium, New Orleans Times-Picayune.   
[http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/04/for\\_many\\_in\\_louisiana\\_the\\_real.html](http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/04/for_many_in_louisiana_the_real.html)
    - ii. Oil From BP Spill Remains a Threat to Birds, Audubon Official Says, Times-Picayune.   
[http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/04/oil\\_from\\_bp\\_spill\\_remains\\_thre.html](http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/04/oil_from_bp_spill_remains_thre.html)
2. Class 2. Stakeholder groups.

- a. Teacher leads class discussion to identify the different stakeholder groups who have interests in the Gulf. Obvious stakeholder groups are as follows, but students may identify additional or fewer groups.
      - i. Commercial fishermen
      - ii. Energy industry
      - iii. Environmentalists
      - iv. State government
      - v. Federal government
    - b. Teacher divides students into teams representing different stakeholder groups.
  3. Independent Research. (In class or homework).
    - a. Each student “stakeholder” team conducts independent research to develop their position on how to manage Gulf Resources.
    - b. Each team completes a stakeholder group worksheet, with citations. Worksheet requires students to address the following:
      - i. Outline a plan to manage competing Gulf interests. (For instance, should energy production be banned? Should commercial fishing be the primary resource? Should recreation take priority? Should wildlife be protected at all costs? Can all of these competing interests coexist?)
      - ii. Identify specific facts and policies supporting the team’s plan.
      - iii. Each group should identify weaknesses in their own plan, and anticipate counterarguments from the competing stakeholder groups.
  4. Class 3. Panel Discussion.
    - a. Team representatives participate in a panel discussion in which each team presents its plan for managing the Gulf. Suggested format:
      - i. Bring in other faculty or outside experts to serve as audience members for the panel discussion.
      - ii. Round 1: Each team has 5 minute to explain its plan and present supporting facts and policies.
      - iii. Break – Teams have an opportunity to confer among themselves to develop criticisms of opposing plans
      - iv. Round 2: Each team has 5 minutes to criticize/respond to opposing plans.
      - v. Break – Teams have another opportunity to confer and develop responses to criticisms.
      - vi. Round 3: Open Question & Answer. Members of the audience can offer comments and ask questions of the panel.
  5. Summative Reflection. Each student writes a reflection that reconsiders both his/her team’s plan and his/her Initial Reflection. The student should reflect on how his/her views did or did not change based on the research process and the panel discussion.

**Assessment and Evaluation:**

The effectiveness of the exercise, and student evaluation, will be accomplished through two means:

1. Observation: Teacher will observe performance of students during panel discussion.
2. Summative Reflection.

**Standards:**

• **National Science Education Standard(s) Addressed:** This lesson primarily addresses National Science Education Standard F – Science in Personal & Social Perspectives, for grades 9-12. In particular, this lesson focuses on the following aspects of Standard F:

- Natural Resources
- Environmental Quality
- Natural and Human-Induced Hazards
- Science & Technology in Local, National, and Global Challenges

• **Ocean Literacy Principles Addressed:** Principle 6: The Ocean and Humans are Inextricably Interconnected. In particular, this lesson focuses on principles 6(b), 6(e), and 6(g):

• **State Science Standard(s) Addressed:** This lesson primarily addresses New Jersey Core Curriculum Content Standards for Science 5.1 – Science Practices, and 5.3.c – Interconnectedness.

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**Creation date:** November 2010.

## BP/Deepwater Horizon Oil Spill 2010

**Stakeholder Groups:** (list student names in each box)

Fishermen	Environmental Groups	BP	State Governments	Federal Government

1. Prepare an outline describing your stakeholder group's plan for managing Gulf resources. Be sure to explain the limits, if any, on commercial fishing, energy extraction, and recreation.

2. What are the facts and policies that support your position?

3. What are the main arguments against your position?

4. How do you respond to those arguments?

5. What questions do you have for the other stakeholder groups?