



Priorities for Protection

Grade Level: 6-12
Length: 30-75 Minutes
www.pwsrcac.org/lessons

By Katie Gavenus, Children of the Spills, www.childrenofthespills.org

NGSS Standards

HS-ESS3-4 Evaluate or refine a technological solution that reduces the impacts of human activities on natural systems.

HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Crosscutting Concepts

Energy and Matter Tracking energy and matter flows into, out of, and within systems helps one understand their system's behavior.

Stability and Change For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Related Resources

Pair With Community Meeting Lesson; Incident Command Scenario

Websites

- <http://www.dec.state.ak.us/spar/perp/grs/home.htm>
- <http://www.childrenofthespills.org/index.php/people>

Overview

Many important parts of ecosystems, economies, and communities could be changed by an oil spill.

Objectives

- Students will understand maps used in oil spill response.
- Students will analyze and formulate opinions about the relative importance of protecting various components of local ecosystems.
- Students will discuss different values and priorities in the context of protecting local areas from oil pollution.

Materials

- Maps of Local Area (1 copy for every 3-4 students, plus large master map)
- Geographic Response Strategies Maps
<http://www.dec.state.ak.us/spar/perp/grs/home.htm>
- Pens or Pencils
- Science Notebooks or Paper
- Excerpts from Interviews with Children Affected by Oil Spills
- Computer/Projector/TV/Smartboard to view videos

Background

One of the most challenging aspects of oil spill response is that there are limited resources and people-power to contain and clean a spill. Rarely can all areas be protected; instead, members of the incident response team must make decisions that prioritize certain areas over others. To help with this process, many areas have existing maps that highlight sites that are especially vulnerable or have extraordinary

Notes

ecological, economic, or cultural importance. Geographic Response Strategies have been developed for much of Alaska to identify these areas, with input from local communities. This activity simulates a community meeting in response to an oil spill. Students have to identify and prioritize priorities for protection based on GRS maps and their personal knowledge of local areas.

Preparation

1. Print out the Geographic Response Strategies maps for your area from <http://www.dec.state.ak.us/spar/perp/grs/home.htm>
2. If you can access them, print out or connect digitally with maps showing local resources and time of year they are present. These are especially helpful and may be available from NOAA. PWSRCAC has a few for our region.
3. Visit <http://www.childrenofthespills.org/index.php/people> to choose excerpts of video interviews with children affected by oil spills. A DVD of video excerpts is also available upon request through the Children of the Spills website or by emailing katie.aspen@gmail.com

Introducing the Lesson

Begin by showing brief clips from Children of the Spills about the effects of the Exxon Valdez oil spill and BP Deepwater Horizon oil spill. Discuss the different types of effects: changes to ecology, economy, subsistence, community & family structure, culture, etc.

Ask students, “Could it happen here?”

It could happen here; in many places in Alaska, it already has happened. Explain that oil spill prevention is critical, but it is also crucial to prepare for a spill before it happens. Explain that one way to be able to respond sooner is to prepare ahead of time and outline plans for priority areas. Sometimes oil spill response groups create maps of an area to provide some guidance for areas of ecologic, economic, or cultural importance that are feasible to protect. Scientists rely on local people to add their special knowledge of a place.

If available for your area, show a Geographic Response Strategies map with the class. Discuss the different areas that have been highlighted for protection, and the technologies and methods outlined in the response strategies.

Activity

1. Divide students into small groups of 3-4 people to examine a local map and decide what sites are most important to protect. Have them spend about 20 minutes with the map and use markers, pens, or pencils to draw in where they would want to add protection. Ask each group to think about ways that these areas could be protected during an oil spill.
2. Have students respond in writing to the following prompts:
 - What technologies and methods could be used in these areas?
 - How might weather, geography, tides and currents affect the use of these technologies/methods?
 - How might ecological characteristics or human uses make these technologies/methods more or less effective?
3. Have each group present their map, including both priorities for protection and ideas of technologies, methods, and materials to use. Let other groups ask questions.
4. After all groups have presented, have the class discuss the different areas highlighted. Challenge students to prioritize the list, choosing 3-5 sites for top protection and ranking them from most important to less important. Guide this conversation so that students are supported to build on each other's ideas and respectfully disagree. Draw these sites on a large "master map."
5. After master map is completed, ask, "Is there anything missing?" Ask about things not along the shoreline that might need protection. What about other things important in the community that could be indirectly affected by the spill and clean-up efforts? What about places where community members come together to have fun? What about places that are important to children?
6. Have groups go back and add something new to the map that was overlooked, something that would help the community to recover from the spill and clean-up. Choose a few of these areas to add to the master map.
7. Lead a group discussion on the following prompts. Support students in making arguments based on evidence, including their own personal experiences and observations of the environment as well as additional science ideas.
 - What technologies and methods could be used in these areas?
 - How might weather, geography, tides and currents affect the use of these technologies/methods?
 - How might ecological characteristics or human uses make these technologies/methods more or less effective?

Wrap-up

Look at the places on the map that the class has chosen as priorities for protection. Have students create a list of ways that these areas are already protected or threatened. Have students brainstorm actions they can take to protect these places before an oil spill happens. Implement one (or more) of these ideas. If your class identified important priorities for protection that were not addressed in the GRS map, you may wish to work as a class to draft a professional letter to the workgroup that developed the GRS. They encourage those with local knowledge of the portions of coastal Alaska with developed GRS to contact them at dec.par.grs@alaska.gov

Assessment

Evaluate student collaboration, cooperation, and consideration of their peers' ideas during the mapping process. Listen during discussion and assess their written responses for arguments based on evidence from their own life and other science ideas. Students who successfully meet the performance expectation will evaluate and refine a technological solution from the published GRS or their own priorities for protection that reduces the impacts of human activities on natural systems. The different iterations of their "priorities for protection" maps will demonstrate the process of designing, evaluating, and refining a map-based solution that can reduce the impacts of human activities on the environment and biodiversity.

Pair With

- Community Meeting Lesson Plan
- Incident Command Scenario Lesson Plan