



Camp SEA Lab

Science, Education & Adventure

Residential Outdoor School

Post-Camp Teacher Resource Guide

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Introduction

Thank you for joining us and we hope you and your students enjoyed your program. As you begin to wind your students down from their Camp SEA Lab program, you may want to glance over the following curriculum guide. We find that it is often helpful for teachers to tie what their students learned with us back into the classroom. This guide has been developed and designed to enhance the students' program. It builds on what your students learned, and utilizes resources more readily available in the classroom.

Our goals at Camp SEA Lab are as follows:

- *Hands-on Education:* We seek to get our campers out, on and in the waters around the central coast.
- *Stewardship & Conservation:* Campers gain knowledge and insight on the issues facing the marine environment and Monterey Bay.
- *Emphasis in Career Development:* Campers are exposed to many avenues that can lead them into a marine science career.
- *Support Diversity:* Our program is designed to serve all youth regardless of ethnic or socio-economic background.

Sand Crab Data Analysis *

http://limpetsmonitoring.org/resources_sb.php

* This unit is available at the link above and includes activities to help students manipulate data, create and interpret graphs, and realize the broader meaning of their monitoring efforts.

CA Science Standards

6th: 5e; 7b, c, e 7th: 7a 8th: 9e

Ocean Literacy Standards

3c; 5d, f, h

CA Math Standards

6th: 2.3 7th: 1.1, 1.2 8th: 8.0

Activity 1: Visualizing Data from a Great Day at the Beach: Grades 6-12

Objectives:

- Students will be able to construct appropriate graphs from their data.
- Students will use critical thinking skills to determine whether their data is consistent with published scientific findings. Students will determine if their data support or refute the claims of the studies.
- Students will understand why long-term monitoring of mole crabs are important.

Background: By conducting some or all of the parts of this activity, students can learn to understand and manipulate data, create and interpret graphs, and can begin to understand the larger meaning of their monitoring efforts.... the “so what?”, “who cares?”, and “what does it all mean?” in a broader context. You may choose to adapt or customize this activity to suit the needs of your class.

This activity can also help you, as a teacher, familiarize yourself with the online data and graphing tools on the LiMPETS website. It can provide you with ideas and options for what kinds of information and questions can be asked of the LiMPETS data.

Note: If your class found less than 20 crabs in total during LiMPETS monitoring, this activity may prove frustrating for students. It is difficult to create graphs and answer questions in this activity without sufficient data from which to draw conclusions.

Activity 2: Exploring Trends in Mole Crab Abundance: Grades 9-12

Objectives:

- Students will be able to read and interpret graphs.
- Students will be able to identify relationships of variables displayed in graphs.
- Students will understand the difference between correlation and causation.
- Students will be able to name different types of abiotic and biotic factors that can affect changes in life history and population size of mole crabs.
- Students will understand why long-term monitoring of mole crabs are important.

Background: When approaching data analysis with students, it is important to understand what the data can and can't tell you about mole crabs and about the condition of the sandy beaches where they live. So what CAN the LiMPETS Sandy Beach data tell you? It can give you an idea about 'how many' crabs are on the beach, the size and gender of the crabs, and their distribution on the beach.

The LiMPETS data CANNOT tell you anything about what may be causing observed trends in your data. For example, an observed decline in abundance of crabs at a city beach over the course of 10 years is certainly cause for concern. If that beach has experienced an increase in pollution over the same time period, it may seem logical that pollution is what is causing the decline in crab abundance. But correlation does not equal causation. In order to prove that pollution is the culprit, you must have evidence that proves it.

This activity focuses specifically on analyzing long-term trends in the abundance of mole crabs using the LiMPETS database.

Squid Dissection Follow-up: Squid Fishery Symposium

From MARE Open Ocean curriculum, 2001

CA Science Standards

5th: 6b, d, e 6th: 5b, c, d; 6a, b, d

Ocean Literacy Standards

1h; 6b, c, e, g

Materials Required:

- 6 Interest Group cards
- Squid Interest Group Chart

Objectives:

Students will look more closely at the socioeconomic side of the squid fishery, as groups represent the viewpoints of different interest groups. They will discover that any people depend on squids for food and to make a living.

Background:

- From **Seafood Watch; a sustainable fisheries advocate:**

http://www.montereybayaquarium.org/cr/SeafoodWatch/web/sfw_factsheet.aspx?fid=102

Today squid, or calamari, is a staple on many restaurant menus. In the U.S. there is a very large squid fishery; however, most of the domestic catch is exported and most of the squid consumed in the U.S. comes from overseas.

In international waters, squid is mostly caught using jigs or trawls, both low *bycatch* methods. Squid grow quickly and reproduce at a young age, making them highly resilient to fishing pressure. Their success, however, is dependent on ocean conditions such as temperature *and* prey availability, and squid abundance varies from year to year and place to place.

Squid fisheries on the high seas are problematic because regulations do not exist or are rarely enforced and squid abundance is largely unknown. In addition, squid play an important role in marine food webs as both *predator* and *prey*, and are an important source of food for marine mammals.

Increasingly, squid are becoming the target in areas where other species have declined due to overfishing. Without effective management and enforcement measures in place we are concerned that squid fisheries are at risk of collapse.

- **Seafood Watch International Squid Report Summary:**

More than 2 million metric tons (mt) of squid are landed annually throughout the world. Although almost a hundred species of squid are fished commercially, two species, the Japanese flying squid (*Todarodes pacificus*) and the Argentine shortfin squid (*Illex argentinus*), account for over half the world's squid harvest. In 2003, 49,654 mt of squid were imported into the U.S. from 30 different countries. Five countries — China, Taiwan, India, South Korea, and Thailand — accounted for 78% of domestic squid imports. With the exception of India, which lands squid solely from the Indian Ocean, these countries simultaneously operate squid fisheries in different regions and ocean basins throughout the world. Despite the availability of some information on regional fishery operations, there are little quantifiable data on regional landings of squid by species. Most countries only report squid catch to the Food and Agriculture Organization of the United Nations (FAO) by region and major taxonomic group, not by species name. This seafood report focuses on the two main regions that produce the majority of squid imported into the U.S.: the Northwest/Western Central Pacific and the Southwest Atlantic. In general, most of the squid landed in these regions is caught in international waters using jigs or trawls. Because squid have short life cycles (6-18 months), little overlap of generations, highly erratic recruitment and show wide fluctuations of abundance, the status of stocks in these regions is currently unknown and extremely unpredictable. The combination of life history characteristics, little or no management, and unreliable fishery data, raises concern regarding possible overfishing of squid stocks.

The Activity

Opening:

1. Have students discuss briefly what they've learned about squids. Do they appreciate the squid more than they did before? Why? Why do people eat squid? Who are the people involved with catching and eating squid? How are squid caught?
2. Tell students that the people who fish for and eat squid are deeply concerned; the demand for squid is going up while we don't know how that is affecting the squid population. What should be done?
3. Explain to students that they'll get to represent the viewpoints of different squid fishery "interest groups" at a Squid Fishery Symposium, and that the main purpose of the conference will be to discuss the problems with the fishery and consider possible solutions.
4. Divide the class into each of the six different "squid fishery interest groups" on the Squid Interest Group Chart. Tape up the chart where everyone can see it, keeping the questions covered for the moment, and show the class the names of all the interest groups. Tell the student groups they'll be given a description of the point of view their "interest group" represents. They'll read the description and then answer questions from that viewpoint.
5. Assign, or allow each group to choose, someone to do each of the following jobs:
 - Reader, who'll read to the group the "interest group viewpoint" given by the teacher
 - Recorder, who'll take notes about the group's viewpoint as they discuss it
 - Presenter, who'll present the interest group's viewpoint at the final symposium
6. Pass out a Squid Interest-group Profile and one sheet of lined paper to each group. Have the Reader read the description out loud to the group, and then they should discuss their point of view as the Recorder takes notes.

The Squid Fishery Symposium

7. After each group has discussed its viewpoint and made notes, have the Presenters from each group tell the rest of the class about their point of view. Rather than just read the card, they should use their own words to paraphrase their viewpoint, or act it out in a mini-drama with help from their group members.
8. Following each presentation, give the rest of the class a few minutes to ask the presenting group any questions they may have.
9. Finally, uncover the Squid Interest-group Chart at the front of the room and lead a class discussion to fill in the blanks. Any of the students in the interest groups may offer suggestions, and the questions don't have to be answered in any particular order. As answers are given, record them in the appropriate place on the class chart.

Symposium Outcome

10. Now that students are familiar with some of the main parties involved in squid fisheries decisions, it is their turn to process some of the information. Have student groups come up with a proposal to address the concerns brought up. This proposal may include a research proposal or simply a regulation proposal.
11. Have students share and debate their proposals.
12. If you'd like to continue the activity, have students research and write their proposals. You may choose to have them create a method for researching how squid populations are affected by different fishing methods.

For further background information, the CA Fish & Game fishery management proposal can be found at: <http://www.dfg.ca.gov/licensing/pdffiles/fgl341.pdf>

Squid Interest Group Profiles

Squid Interest Group **Squid Fishery**

I've spent my life fishing for squid along the California coast. My boat used to be one of just a few squid boats in Southern California – now there are hundreds. I'm proud of what I do. I work hard, and my catch helps to feed people. I love being on the ocean. I own my boat and support my family with the money I make fishing. My dad and grandfather were fishers too, but they didn't fish for squid; they fished for salmon and halibut. Those fisheries are now closed to all but a few boats each year because most of the fish are gone. A lot's changed since my dad and grandfather were fishing. I don't know what I'd do if the squid fishery collapsed, because there aren't any open fisheries left in California to go into. Maybe they should limit the number of boats that can fish for squid – as long as they don't limit me! I don't know what else I'd do if I couldn't fish. Don't I have a right to support my family and make an honest living?

Squid Interest Group **Sport Fisher**

I have that bumper sticker on my truck, "A bad day fishing is better than a good day working." I've always loved to fish, especially on the ocean. There's nothing like spending a day on a boat. I don't catch enough of anything to damage any whole populations of fish. Sport fishing doesn't need to be regulated. It's those big commercial boats that do the damage, the ones that catch tons of fish. I've worried about how big the squid fishery is getting. It seems like every time I go out, there are more and more squid boats out there. Some of the fish I like to catch feed on squids – if people over-fish the squid, those fish might go away.

Squid Interest Group **Consumer**

I really like calamari. I order it whenever it's on the menu at a restaurant, and sometimes I even cook it at home. It's not expensive, it's healthy, my kids like it, and you can cook it a thousand different ways. I heard a story on the radio the other day, though, that said the squid-fishing industry was growing so fast that squid were being over-fished, just like salmon, and that dolphins and seals that eat squid could starve if that happens. Another environmental disaster. Now I feel guilty buying squid. I feel like I have to do a research project on my entire shopping list to find out if things are ethical to buy. I wish more foods had clear labels, like the tuna cans that say "Dolphin Safe" on them.

Squid Interest Group **Restaurant Owner**

Listen, running a restaurant is hard work. Not all restaurants make it. If I don't have things on the menu that my customers want to eat, and if my food isn't reasonably priced, my restaurant won't make it either. Fried calamari and calamari steaks are very popular with my customers. I can't keep track of how every fish in the ocean is caught and whether it's being over-harvested. A woman came in the other day and told me I shouldn't serve calamari anymore until the fishery is better regulated. I told her, "yeah, when it's better regulated, it'll cost her three times as much to order it." But, it's not my job to make that decision for everyone who walks in here for dinner.

**Squid Interest Group
Environmentalist**

It's hard to believe that another fishery is on the verge of collapsing. This has happened so many times, but we never seem to learn from our past mistakes. If we put strong limits on the squid fishery now, it's still early enough that we can save it. If we save the squid, we can save all the other animals that depend on squid for food – dolphins, seals, sea lions, birds, salmon, tuna and other fish. If humans eat all the squid, there will be nothing left for those squid predators and their populations will suffer. I know that fishers are trying to make a living, but if the fishery collapses they'll really have trouble making a living. Everyone wants to “study the situation” before we make any decision. But by the time we're finished studying, the squid will all be gone. For once, let's take action before we have a disaster – not after. I think we should have an immediate halt: not let any more boats join the fishery until we know how much can be safely caught each year.

**Squid Interest Group
Biologist**

It seems like the fishers and the companies they sell to are only interested in making money... and that the environmentalists will never be satisfied until everyone is vegetarian... and that the public is mostly unaware that the issues even exist... and that the government agencies are just trying to keep everyone happy without taking a strong stand on anything. It seems no one's interested in the facts. If I just had the funds to put together a team to study squid biology for a couple of years, I could probably figure out a way to allow the fishery to continue without over-fishing it. We still know very little about the biology or population size of the market squid. Right now, we have no idea what squid do in the open ocean, or where they go before they come together to mate at the end of their lives.

I hate to say “I told you so,” but it wasn't hard to predict that the cod, abalone, salmon, and halibut fisheries would collapse. I'm afraid squid are going the same way. The trouble is, if squid are over-fished, it's hard to predict what'll happen to the ecosystem – there are so many animals that depend on squid for prey, it could throw the entire ecosystem out of balance.

Squid Interest Group Chart

	Squid Fisher	Consumer	Restaurant Owner	Sport Fisher	Biologist	Environmentalist
#1 How would we know if squids were over-fished?						
#2 How can we prevent squids from being over-fished?						

Campfire Follow-up Activity

Ocean Journal

Overview:

Students use creative writing strategies (e.g. story, poem, song) to explore the nature of the ocean or an ocean organism they discovered while at Camp SEA Lab. These creative works can be appended to the ecosystem they constructed as a pre-camp activity, compiled into a class journal, or submitted to one of the contests listed at the bottom of this activity.

Materials:

Paper & Writing Utensils

Ocean Pictures or Posters

Procedure:

Setting the Scene:

1. *Visuals:* Have students bring in pictures that represent the ocean, beach or marine animals to them.
2. *Auditory:* play an ocean sounds CD during the writing period
3. *Word Bank:* To provide some inspiration, have students brainstorm words or phrases that remind them of the ocean, beaches, or marine animals. Write these words on the board or a large piece of paper so that students can reference them throughout the writing process.
4. Here are some questions about the beach or ocean to help prompt the Word Bank process:
 - What do you do there?
 - What do you see there?
 - What animals live there?
 - How are people connected to it?
 - What colors can you see?
 - What sounds do you hear?
 - What textures do you feel?
 - Why do you love the ocean?
 - What things may harm the ocean?
 - What does the ocean make you think of?
 - How does the ocean make you feel?

Writing Structure:

1. Determine which writing formats you would like your students to choose from and post the structure where they can see it. Some examples follow.
2. Creative writing allows students to experience nature and to process information in a different way than they are used to. When beginning a writing activity, gather students around and demonstrate the process for them. Talk them through the activity and/or writing structures you have chosen and let them see you compose something off-the-cuff. They often get caught up in perfection and benefit from seeing an adult working through the sloppy creative process. Some good ground rules are:
 - Don't edit yourself. If you think it, write it
 - Spelling doesn't count
 - Handwriting doesn't count
 - You don't have to share your work if you don't want to
3. Once the first draft is completed, follow your standard revision procedures to get a final product. These can be posted around the classroom, compiled into a class journal, or submitted to one of the contests listed at the end of this activity.

Marine-themed Contests:

- *Coastal Artwork & Poetry Contest:* The California Coastal Commission invites K – 12 students to submit artwork or poetry with a coastal or ocean theme to the annual Coastal Art & Poetry Contest. Entries are due 1/30 of each year. <http://www.coastal.ca.gov/publiced/poster/poster.html>
- *Watershed Artwork & Poetry Contest:* The Library of Congress and River of Words conduct a free international poetry and art contest on the theme of watersheds. The contest helps youth explore the natural and cultural history of the place they live, and to express, through poetry and art, what they discover. Entries are due 12/1 of each year. <http://www.riverofwords.org/contest/index.html>
- *Blue Ocean Institute:* The Sea Stories Project is published quarterly and accepts first-person writings about the sea, coast, and sea-life from writers of all ages. Memoirs, essays, poetry, songs, music, and imaginative nonfiction are all welcome, as are photographs, drawings, or other visual arts. Entries accepted throughout the year. <http://www.seastories.org/>

Song

Many science camp songs were written by taking a common, existing song and changing the lyrics. An example we often use at campfire is “Sam the Snake” sung to the tune of “O Christmas Tree”. Students can work off of this song model, or another they know well, and change the lyrics to sing about something ocean related.

Example:

<i>O Christmas Tree! O Christmas Tree! Thy leaves are so unchanging; Not only green when summer's here, But also when 'tis cold and drear. O Christmas Tree! O Christmas Tree! Thy leaves are so unchanging!</i>	<i>Oh Sam the Snake, Oh Sam the Snake Why did you have to cross the lake? You did not see the motorboat And now your guts are all afloat Oh Sam the Snake, Oh Sam the Snake Why did you have to cross the lake?</i>	<i>Oh Fred the fish, Oh Fred the fish, Why are you lying on the dish? You did not see the hook ahead And now your head is stuffed with bread Oh Fred the fish, Oh Fred the fish Why are you lying on the dish?</i>
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Autobiographical Prose

Prompt: “I am a _____, I feel _____.”

In this structure, students choose something from nature and imagine themselves as that item. The final product is often surprisingly personal. For this to work, it is particularly important to students to adhere to the first rule. At some point, they will come to a stopping point. When that happens, they simply return to the first line and start over; either on a new subject or continuing on the same one.

Example:

I am a rock, I feel quiet. I feel the sun warming my skin and the cold waves playing across my face. A hermit crab scuttles across my surface. It tickles. I see feet walking past me. A hand reaches down and picks me up. I am a rock. I feel strangely calm. The hand throws me and I splash down safely in the water. I fall gently down onto the soft sand. I am a rock, I feel safe.

Adaptation Fable

Students study fables in 4th grade and should be familiar with the concept. It is helpful to the students to read or ad-lib an example. In this case, review adaptations and brainstorm a list of living organisms and key survival adaptations they possess. Students will write their own story, detailing how that adaptation came to be.

Example:

How the Shrimp got his Antennae

One day, Jose the shrimp was out on the ocean floor with his friends. They were exploring and causing trouble, as usual. Earlier that morning, his mother had begged him to stay close to the rocks in case an octopus came around hunting. And as usual, he ignored her. As they explored, Jose spotted a hole in the sand. He stuck his head in and was surprised by a crab. The crab was equally surprised, and a little hungry. She immediately reached out and pinched Jose right on the forehead. Jose jerked back with such force that her claw came off her arm, still stuck to his forehead. At that moment, an octopus grabbed him from behind with her suction-cupped arm. Jose whipped around, stabbing her with the claw of the crab. In pain, the octopus retreated. Jose realized the usefulness of this new contraption and soon convinced the rest of his family to get their own. And that is how the shrimp got its antennae.

Riddles

1. Choose something from nature you've seen that will be the answer to your riddle.
Example: Fish
2. Make a list of characteristics and adaptations about your answer.
Example: has gills to breathe, cold-blooded, slippery, scaly, lives in water
3. Try and rephrase the characteristics so that they sound weird
Example: Breathes with gills = alive without breath, Lives in water = ever drinking, Scaly = all in mail
4. Add odd or unexpected details to further confuse things.
*Example: Lives in water, cold-blooded = alive without breath, as cold as death
Lives in water = never thirsty, ever drinking Scaly = all in mail, never clinking*
5. Phrase it in riddle form: "What is... ?" or "I am..."
Example: What is alive without breath, as cold as death; never thirsty, ever drinking, all in mail never clinking?

*I am warm and gentle
I hang in the sky like a drop of gold.
I am reliable and trustworthy
A friend counted on to return-
Even on the darkest days.
I am the light of your world,
Calm, gentle, brilliant
What am I?*

*I am a world upon a world
I am a giant, reflecting only
What the eye can see.
I flow gracefully up
Then scramble back down.
I am seemingly ominous,
gently a protector of our aliens.
What am I?*

Poetry (Any poetry form can be used and your students will probably be familiar with some already)

Haiku is a Japanese lyric verse form having three unrhymed lines of five, seven, and five syllables, traditionally invoking an aspect of nature or the seasons. Ideally, a haiku presents a pair of contrasting images: one suggestive of time and place, the other a vivid but fleeting observation. Working together, they evoke mood and emotion.

Examples:

*The hawk soared over
Spirit bird in my living
Guide to harmony.*

*The beaches waves hit
Sounding of flooding water
Soothes aches all over*

*Rain falls, seeds sprout
Continues life from something
Small but strong, it grows.*

Cinquain is an American poetry form comprising five non-rhyming lines of, respectively, two, four, six, eight, and two syllables [or words]. Each line has a mandatory purpose and number of syllables [or words]. These are 1) the title in two syllables [or words] 2) a description of the title in four syllables [or words] 3) a description of action in six syllables [or words] 4) a description of a feeling in eight syllables [or words] and 5) another word for the title in two syllables [or words].

*Panther
Vital, quiet
Moving swiftly to live
Endangered by human patterns
Near lost*

*Sea Otter
Mammal of living waters
Swimming, sleeping, eating, diving, basking, playing
Sensitive indicator of the quality of continuing life here
Still here*

Diamonte is a poem shaped in the form of a diamond. It can be used to show that words are related through shades of meaning from one extreme to another, following a pattern of parts of speech:

*Noun
Adjective Adjective
Participle, Participle, Participle
Noun, noun, noun, noun
Participle, Participle, Participle
Adjective, adjective
Noun*

*Egg
Light bright
Living stretching growing
Bird beak wing flight
Soaring seeing seeking
Feathered fluid
Raven*

Threats to Ocean Life: Can Marine Sanctuaries Help?

<http://www.nationalgeographic.com/xpeditions/lessons/14/g68/seathreats.html>

OVERVIEW:

This lesson provides an opportunity for students to learn about environmental problems in the oceans and how marine sanctuaries can help protect ocean habitats. Students will use National Geographic's Wild World Global 200 feature (<http://www.nationalgeographic.com/wildworld/global.html>) to learn about marine ecoregions and the environmental problems they are facing. They will read about the National Marine Sanctuary Program. Students will conclude by writing proposals to establish new marine sanctuaries.

Time: 2 hours

Materials Required:

- Computer with Internet access
- Writing materials

Objectives:

Students will...

- read about marine ecoregions and list environmental problems these ecoregions are facing;
- read and answer questions about the National Marine Sanctuary Program; and
- write proposals for new marine sanctuaries in one of the marine ecoregions they have studied.

SUGGESTED PROCEDURE

Opening:

Hold a brief class discussion on environmental problems related to the oceans. Ask students to describe issues they're familiar with.

Development:

Have students go to National Geographic's Wild World Global 200 feature (<http://www.nationalgeographic.com/wildworld/global.html>). There they will see a map showing regions of the world that the World Wildlife Fund has designated as the most critical areas for conservation.

Ask students to click on three of the marine regions, one at a time. To do this, they should click the water that has a darker shade of blue. For each ecoregion they select, a new browser window will open, providing a picture and information about that ecoregion. Ask them to look at the pictures and read the text.

Once students are finished reading the text for an ecoregion, ask them to list that ecoregion's "causes for concern," which are described at the bottom of the page. [Note: If computer access for your students is limited, print out several of the Wild World marine ecoregion pages, make several copies of each, and have students take turns reading these copies to get the information they need.]

Discuss the "causes for concern" that students have found, and list them on the board. Do they notice any patterns? They will probably notice that different parts of the earth's oceans face similar problems, although there are regional variations.

Have students read the text on the "Welcome page for NOAA's National Marine Sanctuary Program" (<http://sanctuaries.noaa.gov/about/faqs/welcome.html>). Make sure they understand that this page talks about marine sanctuaries in the waters of the United States, not in other countries. Ask them to answer these questions as they read:

- What is the purpose of marine sanctuaries?

- Are all marine sanctuaries alike? What are some differences?
- Why was the National Marine Sanctuary Program created? What event occurred just before Congress began this program?
- Why are marine sanctuaries particularly important?

Have students look at this marine sanctuaries map (<http://sanctuaries.noaa.gov/images/main/nmsmap2.jpg>) to see where established and proposed national marine sanctuaries are located.

Closing:

Ask the class to think about the environmental issues they learned about while exploring the National Geographic Wild World map. Do they think any of these problems could be made better by the creation of more marine sanctuaries? Could marine sanctuaries around the world help all the problems they've read about? Why or why not? What might be their limitations? Are marine sanctuaries isolated or are they affected by environmental contamination and other problems that occur outside their boundaries? What difficulties might arise from trying to set up marine sanctuaries off the coasts of different countries? Would all countries want to cooperate in the same way?

Suggested Student Assessment:

Ask each student to focus on one region they learned about from the Wild World map and write a proposal for a marine sanctuary in that area. Their proposals should cover the following topics:

- Where the sanctuary will be located, and which country or countries would be involved
- How a sanctuary might benefit this area
- Who might be in favor of a sanctuary
- Who might be opposed to a sanctuary
- What the limitations of this sanctuary in protecting the marine species that live there might be
- What problems that begin outside the sanctuary might be difficult to control

Extending the Lesson:

Have students conduct further research to find out about the human uses of marine sanctuaries. They should go to NOAA's marine sanctuaries photo gallery, and click on individual sanctuaries. They should then scroll down and click on "People and the Sanctuary" to see a photo collection showing human uses of the sanctuary. Have them do this for at least two sanctuaries and create posters, multimedia presentations, or written reports illustrating the ways that people use the sanctuaries. This lesson is made possible by a generous grant from the National Oceanic and Atmospheric Administration National Marine Sanctuary Program.

Related Links:

NOAA: Marine Sanctuaries Photo Gallery:	http://sanctuaries.noaa.gov/pgallery/allpics.html
NOAA: National Marine Sanctuaries Map:	http://sanctuaries.noaa.gov/images/main/nmsmap2.jpg
NOAA: National Marine Sanctuaries Program:	http://sanctuaries.noaa.gov/about/faqs/welcome.html
National Geographic: Wild World—Global 200:	http://www.nationalgeographic.com/wildworld/global.html