

Your National Marine Sanctuaries



Photo: Mark Sullivan/NOAA Permit #10137

Grade Level

6-8

Timeframe

Five 45 Minute Sessions

Materials

Computer, projector, and screen
Student computer access (1:1 or 1:2)

Student science journals or notebooks

Slideshow program (i.e., PowerPoint)

Drawing paper
Colored pencils

Digital Materials (links provided):

- A collection of site links are provided at the end of each section for teacher and student reference

Print Materials:

- National Marine Sanctuary System Overview per student
- National Marine Sanctuaries Comparison
- National Marine Sanctuaries Site Research per student
- Slideshow Criteria Checklist
- Activity Rubric



Photo: Matt McIntosh/NOAA

Activity Summary

This five-part mini-research project introduces students to the National Marine Sanctuary System (NMSS). The activity begins with a teacher-led walkthrough of the digital resources of the NMSS so students can learn how national marine sanctuary sites are designated and why they are important to protect and preserve the ocean and Great Lakes.

Students will then conduct independent or small group research on specific national marine sanctuaries using 360° videos, photos, and print resources. Students will use the information they collected to compare and contrast the four different sites and create a slideshow that will be presented to peers upon completion.

Learning Objectives

Students will be able to:

- Explain and understand the goals and mission of the NMSS
- Discuss different ways scientists monitor the ecosystems throughout the NMSS
- Describe potential challenges scientists may face when monitoring the ecosystems of the sanctuary sites
- Appraise changes in the ecosystems and infer the causes
- Research specific national marine sanctuary sites.
- Synthesize information from multiple resources and organize their thoughts using a graphic organizer
- Communicate their findings to peers via a multimedia presentation Q & A



Photo: Kate Thompson/NOAA

Background Information

The Importance of the Ocean and Great Lakes

“The ocean, our coasts, and the Great Lakes provide jobs, food, energy resources, ecological services, recreation, and tourism opportunities, and play critical roles in our nation's transportation, economy, and trade, as well as the global mobility of our Armed Forces and the **maintenance of international peace and security...**

America's stewardship of the ocean, our coasts, and the Great Lakes is intrinsically linked to environmental sustainability, human health, and well-being, national prosperity, adaptation to climate and other environmental changes, social justice, international diplomacy, and national and **homeland security.**” – July 19, 2010: Excerpt from Executive Order 13547

The role of the ocean on our planet is immense; from the air we breathe to the food we eat, where we vacation, and the transportation of goods and services around the globe. Life as we know it would not exist without the ocean. The estimated value of the global ocean-based economy is between \$3-6 trillion USD annually with more than 3 billion people relying on the ocean for their livelihood. The ocean covers 72% of the planet and, combined with the atmosphere, is the reason Earth is a habitable place to live. Meanwhile, the Great Lakes account for one-fifth (21%) of the surface freshwater on the planet and is an economic powerhouse in its own right with an estimated gross domestic product of \$6 trillion USD annually, impacting more than 107 million people.

National Marine Sanctuaries

Since 1972, NOAA's Office of National Marine Sanctuaries continues to serve as the trustee for a

Key Words

abiotic, biodiversity, biotic, commerce, components, ecosystem, heritage, infer, population, preserve, recreation, sanctuary, stewardship

network of underwater parks encompassing more than 600,000 square miles of marine and Great Lakes waters. The network includes a system of 14 national marine sanctuaries and **Papahānaumokuākea and Rose Atoll marine** national monuments. Few places on the planet can compete with the diversity of the National Marine Sanctuary System, which protects America's most iconic natural and cultural marine resources. The system works with diverse partners and stakeholders to promote responsible, sustainable ocean uses that ensure the health of our most valued ocean places. A healthy ocean is the basis for thriving recreation, tourism, and commercial activities that drive coastal economies.

Below we introduce four of these underwater parks.

Channel Islands National Marine Sanctuary
Twenty-five miles off the coast of Santa Barbara, California, the waters around the Channel Islands host an incredible array of marine life and habitants. Designated in 1980, Channel Islands National Marine Sanctuary protects 1,470 square miles of ocean waters around the Northern Channel Islands: Anacapa, Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara islands extending from mean high tide to six nautical miles offshore around each of these five islands. Here, warm and cold-water currents collide to create unique and diverse marine communities. More than 28 species of marine mammals, including rare blue and humpback whales, come to feast on the bounty, as do more than 60 species of sea birds.

Thunder Bay National Marine Sanctuary
Located in northwestern Lake Huron, Thunder Bay is adjacent to one of the most treacherous stretches of water within the Great Lakes system. Unpredictable weather, murky fog banks, sudden gales, and rocky shoals earned the area the name **“Shipwreck Alley.”**

Established in 2000, the 4,300-square-mile Thunder Bay National Marine Sanctuary protects

Vocabulary

Abiotic factors - The nonliving factors in an ecosystem.

Biodiversity - The variety of life on Earth, encompassing variation at all levels, from genes to species to ecosystems.

Biotic factors - The living factors in an ecosystem.

Commerce - The large-scale trade of goods and services.

Ecosystem - A system of interactions between a community of organisms and their environment.

Heritage - A tradition, language, structure, site, or something belonging to a culture or particular society that is passed down.

Stewardship - The careful and responsible management of something entrusted to one's care.

one of America's best-preserved and nationally-significant collections of shipwrecks. Fire, ice, collisions, and storms have claimed over 200 vessels in and around Thunder Bay. To date, nearly 100 shipwrecks have been discovered within the sanctuary. Although the sheer number of shipwrecks is impressive, it is the range of vessel types located in the sanctuary that makes the collection nationally significant. From an 1844 side-wheel steamer to a modern 500-foot-long German freighter, the shipwrecks of Thunder Bay represent a microcosm of maritime commerce and travel on the Great Lakes.

Hawaiian Islands Humpback Whale National Marine Sanctuary
Hawaiian Islands Humpback Whale National Marine Sanctuary was created by Congress in 1992 to protect humpback whales and their habitat in Hawai'i. The sanctuary, which lies within the shallow (less than 600 feet), warm waters surrounding the Hawaiian Islands, constitutes one **of the world's most important humpback whale** habitats. A variety of marine life from humpback whales to green sea turtles migrate through this extraordinary habitat. Nearly two-thirds of the North Pacific humpback whale population breed in Hawaiian Islands Humpback Whale National Marine Sanctuary.

Florida Keys National Marine Sanctuary
Designated in 1990, Florida Keys National Marine Sanctuary protects 2,900 square nautical miles of waters surrounding the Florida Keys, from south of Miami westward to encompass the Dry Tortugas, excluding Dry Tortugas National Park. The shoreward boundary of the sanctuary is the mean high-water mark, essentially meaning that once you set foot in the waters of the Florida Keys, you have entered the sanctuary.

Within the boundaries of the sanctuary lie spectacular, unique, and nationally significant marine resources including the only coral barrier reef in the continental United States, extensive seagrass beds, mangrove-fringed islands, and more than 6,000 species of marine life. The sanctuary **also protects pieces of our nation's history such as** shipwrecks and other archeological treasures.

Preparation

1. Download or open links to all digital materials
2. Prepare teacher and student devices (e.g., laptop, computer/projector, handhelds, VR sets, etc.)
3. Preview videos, photos, and printed materials
4. Identify the national marine sanctuary that students will research
5. Secure student devices and ensure slideshow program (e.g., PowerPoint) is installed
6. Collect drawing paper and colored pencils for students
7. Copy Student Handouts (one per student)
 - a) National Marine Sanctuary System Overview
 - b) National Marine Sanctuaries Comparison
 - c) National Marine Sanctuary Site Research
 - d) Slideshow Criteria Checklist
 - e) Activity Rubric

Procedure

Part 1 – Introduction to NMSS

Time: 45 minutes

1. Explain to students that over the next five days they will be learning more about the National Marine Sanctuary System. Share with them a brief overview of what each lesson will focus on:



Photo: Mojoscoast/NOAA

- a. Day 1: an overview of the National Marine Sanctuary System
 - b. Day 2: independent and group research to compare four marine sanctuaries
 - c. Day 3: independent/group research of one marine sanctuary
 - d. Day 4: build a slideshow presentation that includes text and graphics
 - e. Day 5: present the slideshow to peers
2. Lead a discussion that activates prior knowledge of NOAA and NMSS. Allow students to share their experiences and knowledge.
 - a. Ask students: Have you ever heard of NOAA or the national marine sanctuaries?
 - b. NOAA stands for National Oceanic and Atmospheric Administration. What might you infer is studied or carried out at NOAA?
 - c. What is a marine sanctuary? Why might national marine sanctuaries be important to us?
 3. Project computer screen to show [Earth is Blue: Your National Marine Sanctuary System](#) to give an overview of the National Marine Sanctuary System.
 4. Distribute the National Marine Sanctuary System Overview handout to each student and explain that students will work as a group to use the internet and other digital resources to learn more.
 5. Guide students through the completion of Part 1 of the NMSS Overview handout.
 6. Allow time for students to independently complete Part 2 of the NMSS Overview handout.
 7. Inform students that in the next lesson they will view a 360° video from four different

locations. Tell them they will be comparing the different natural and historical resources that each site protects to gain an understanding of the diversity of the National Marine Sanctuary System.

Links to Lesson Content

Earth is Blue: Your National Marine Sanctuary System:

<https://sanctuaries.noaa.gov/earthisblue/wk1.html>

Additional Information

National Marine Sanctuary System Fact Sheet:

sanctuaries.noaa.gov/about/national-marine-sanctuary-system.pdf

National Marine Sanctuary FAQs:

<https://sanctuaries.noaa.gov/about/faqs/>

History of the National Marine Sanctuary System:

<https://sanctuaries.noaa.gov/about/history/>

Biodiversity:

<https://sanctuaries.noaa.gov/earthisblue/wk120-biodiversity.html>

Ocean Guardians:

<https://sanctuaries.noaa.gov/earthisblue/wk266-stories-from-the-blue-ocean-guardian.html>

Part 2 – National Marine Sanctuary Site Comparison

Time: 45 minutes

1. Lead a discussion that allows students to share what they remember from the previous lesson about the NMSS. Remind students that national marine sanctuaries are a system of protected places. These locations protect a great diversity of natural and historical resources and include 14 national marine sanctuaries and two marine national monuments that encompass more than 600,000 square miles of ocean and Great Lakes waters.
2. Tell students that they will be viewing 360° videos from four different national marine sanctuaries. They will compare the different attributes of the sites to appreciate the diversity of what is protected within this system.
3. Distribute the National Marine Sanctuaries Comparison handout to each student and discuss the expectations for the assignment.
4. View the first 360° video of [Channel Islands National Marine Sanctuary](#). Show students how

to explore the 360° video by using the keyboard to move the screen to the left, right, up, and down. (Note: If students will be using tablets on Day 3, this is a good time to model how to explore the 360° video by holding the device and moving it around.)

5. After viewing the Channel Islands National Marine Sanctuary 360° video, lead a discussion that allows students to share examples of the different natural and historical resources they observed in the video. On the board, record student examples. Categorize the examples and group similar ones together based on the reason it is significant (historical, cultural, archaeological, educational, scientific, ecological). Students should copy the notes from the board into their National Marine Sanctuaries Comparison handout or record in their science journals.
6. View each subsequent video ([Florida Keys National Marine Sanctuary 360° video](#), [Hawaiian Islands Humpback Whale National Marine Sanctuary 360° video](#), [Thunder Bay National Marine Sanctuary 360° video](#)) pausing after each one to discuss and add to the information on the board. You may want to use a different color marker for each national marine sanctuary. Encourage students to add examples as needed to their handout as you add them to the board.
7. Tell students that they will use the examples they recorded from the videos to draw pictures that compare and contrast the diversity of the resources that are protected within each marine sanctuary. Encourage them to include examples from all four marine sanctuaries in their visual comparison.
8. Distribute drawing paper and colored pencils to students. Circulate and assist as students work independently (or with partners as appropriate).
9. Lead a discussion that allows students to share what they have learned about the diversity of natural and historical resources that are found within the national marine sanctuaries.
10. Remind students that in the next lesson they will be conducting further research on one of the four national marine sanctuaries that they just explored. Let the students know which site they will be researching or tell them to think about which one they would like to research.



Photo: Ed Lyman/NOAA

(Note: At this point, you can choose to have all the students research the same site, assign students to research different sites, or allow students to choose a site.)

Part 3 – National Marine Sanctuary Site Research

Time: 45 minutes

1. Lead a discussion that reviews what was learned in the previous lesson about the National Marine Sanctuary System.
2. Distribute the National Marine Sanctuary Site Research handout to each student and discuss the expectations for the assignment.
3. Distribute the Checklist and Rubric and discuss criteria that will be used to evaluate their final product.
4. Distribute devices to groups or individual students. Remind them how to navigate the 360° video by using the keyboard or by moving the handheld device.
5. Show students how to find the videos, photos, and text resources on their devices. Let them know they should start with the 360° video, and then use any or all of the remaining resources to answer the questions on their handout. Encourage them to watch videos more than once.
6. Circulate as they work collaboratively or independently to complete the student handout.
7. Lead a brief wrap up session that reminds them that in the next lesson, they will use the

information they collected to create a slideshow about their national marine sanctuary site.

Note: Links to each of the four national marine sanctuaries and their corresponding 360° video are available at the end of the lesson.

Part 4 – Slideshow Development

Time: 45 minutes

1. Lead a discussion that reviews what was learned in the previous lessons about the National Marine Sanctuary System.
2. **Remind students that in today's lesson they** will be using the information from the National Marine Sanctuary Site Research handout (completed previously) to create a slideshow about that national marine sanctuary site. Encourage students to use the checklist and refer to the rubric to ensure that they are meeting all of the criteria for the assignment.
3. Lead a brief wrap up session that reminds them that in the next lesson, they will be presenting their slideshows to the class and that they should be prepared to answer questions from their peers.
 - a) Time permitting, request that your students identify two questions to ask their peers tomorrow during the presentations.

Part 5 – Presentations plus Q&A

Time: 45 minutes

1. Lead a discussion that reviews what was learned in the previous lessons about the National Marine Sanctuary System.
2. Allow time for student presentations and questions from the audience.



Photo: NOAA

3. Lead a brief wrap up session that reviews what was learned. Emphasize the key points for students.
 - a) The national marine sanctuaries are all part of a system of protected places.
 - b) Sanctuary sites are designated for their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic resources.
 - c) Sanctuary sites protect a vast diversity of ecosystems, which include both plants and animals, as well as cultural and historic resources.

Additional Information

- NOAA: <https://www.noaa.gov/about-our-agency>
- History of the National Marine Sanctuary System: <https://sanctuaries.noaa.gov/about/history/>
- NOAA Office of National Marine Sanctuaries: <https://sanctuaries.noaa.gov/>
- Photo and Video Gallery: <https://www.flickr.com/photos/onms/>
- Get Involved: <https://sanctuaries.noaa.gov/involved/>



Photo: Mitchell Tartt/NOAA

Education Standards

<p>Next Generation Science Standards</p>	<p>Supports NGSS Performance Expectation MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.</p> <p>Science and Engineering Practices:</p> <ul style="list-style-type: none"> Engaging in Argument from Evidence <p>Crosscutting Concepts:</p> <ul style="list-style-type: none"> Cause and Effect Patterns Stability and Change <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> ESS3.C: Human Impacts on Earth Systems LS2.C: Ecosystem Dynamics, Functioning, and Resilience
<p>Common Core State Standards</p>	<p>Language Arts:</p> <ul style="list-style-type: none"> Integration of Knowledge and Ideas: <ul style="list-style-type: none"> CCSS.ELA-Literacy.RST.6-8.7 CCSS.ELA-Literacy.RST.6-8.9 CCSS.ELA-Literacy.RI.6-8.7 Production and Distribution of Writing: <ul style="list-style-type: none"> CCSS.ELA-Literacy.WHST.6-8.4 CCSS.ELA-Literacy.WHST.6-8.6 Comprehension and Collaboration: <ul style="list-style-type: none"> CCSS.ELA-Literacy.SL.6-8.1 CCSS.ELA-Literacy.SL.6-8.2 <p>Text Types and Purposes:</p> <ul style="list-style-type: none"> CCSS.ELA-Literacy.WHST.6-8.1 CCSS.ELA-Literacy.WHST.6-8.2 CCSS.ELA-Literacy.W.6-8.7 CCSS.ELA-Literacy.W.6-8.8 CCSS.ELA-Literacy.W.6-8.9
<p>Great Lakes Literacy Principles</p>	<p>8. The Great Lakes are socially, economically, and environmentally significant to the region, the nation and the planet.</p>
<p>Ocean Literacy Principles</p>	<p>5. The ocean supports a great diversity of life and ecosystems. 6. The ocean and humans are inextricably interconnected.</p>

Links for Individual National Marine Sanctuaries

Option #1: Florida Keys National Marine Sanctuary

- *Explore the Blue: 360° Coral Restoration* video: <https://sanctuaries.noaa.gov/vr/florida-keys/coral-restoration/>
- Divers help rescue flipped corals in Florida Keys:
https://www.youtube.com/watch?v=2POhPjN_GnNo&list=PLb4-cRzbHvBICkxSdUbE2WbwniwY7nrs7&index=1
- Florida Keys Photos:
<https://www.flickr.com/photos/onms/albums/72157657763892082>
- Florida Keys Map:
sanctuaries.noaa.gov/media/docs/20190214-fknms-fy18-accomplishments.pdf

Option #2: Channel Island National Marine Sanctuary

- *Explore the Blue: 360° Sea Lion Encounter* video:
<https://sanctuaries.noaa.gov/vr/channel-islands/sea-lion-encouter/>
- Channel Islands National Marine Sanctuary Overview:
<https://www.youtube.com/watch?v=q2m2rUhrfm8&list=PLb4-cRzbHvBIZuk2GFxJou04y758ZlegD&index=1>
- Channel Islands Photos:
<https://www.flickr.com/photos/onms/albums/72157654010239976>
- Channel Islands Map:
sanctuaries.noaa.gov/media/docs/20190214-cinms-fy18-accomplishments.pdf

Option #3: Hawaiian Islands Humpback Whale National Marine Sanctuary

- *Explore the Blue: 360° Hawaiian Experience* video: <https://sanctuaries.noaa.gov/vr/hawaii-humpback-whale/hawaiian-adventure/>
- Humpback whale cut free from marine debris: <https://www.youtube.com/watch?v=sxxaXOD-7Bc&list=PLb4-cRzbHvBJyBiN4yw4FOXX4yV0dDj7p&index=3>
- Hawaiian Island Humpback Whale NMS Photos: <https://www.flickr.com/photos/onms/albums/72157654509849983>
- Hawaiian Islands Humpback Whale Map: sanctuaries.noaa.gov/media/docs/20190214-ihwnms-fy18-accomplishments.pdf

Option #4: Thunder Bay National Marine Sanctuary

- *Explore the Blue: 360° Shipwreck Alley* video: <https://sanctuaries.noaa.gov/vr/thunder-bay/shipwreck-alley/>



Photo: SeaWiFS Project, NASA/Goddard Space Flight Center and ORBIMAGE

- Get into Your Sanctuary: <https://www.youtube.com/watch?v=OfXsHNZsfCU>
- Lighthouses of Thunder Bay: <https://www.youtube.com/watch?v=hwjCpiNCvXc>
- Thunder Bay NMS Photos: <https://www.flickr.com/photos/onms/albums/72157652416407293>
- Thunder Bay Map: sanctuaries.noaa.gov/media/docs/20190214-tbnms-fy18-accomplishments.pdf

Alternative/Extension Ideas

- Students complete the worksheets in their journal/notebook.
- Students record their research in Google Docs.
- Students write a report comparing two sanctuary sites.
- Students present their work orally, individually, or in small groups.
- Students write and design a newspaper or magazine advertisement for their assigned national marine sanctuary site.
- Students design a poster for one (or all) of the four national marine sanctuary sites.
- **Students create a Google Doodle for NOAA's** Office of National Marine Sanctuaries and/or for their assigned sanctuary site.
- In small groups, students create a tour guide for the site they have been assigned. The guide should include a map, historical facts, points of interest, and key plants and animals to observe. **Then, as a class, put together a "Summer Road Trip" presentation of the four sanctuary sites** including images and videos from each site.

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If you have any further questions or need additional information, email sanctuary.education@noaa.gov.

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National Marine Sanctuary System Overview

Directions:

- Preview the discussion questions below.
- As you research about the national marine sanctuaries, prepare to discuss these questions with your partner and the whole class by recording bullet pointed phrases that address each question. Be as specific and detailed as possible.
- If you finish before the group is ready to discuss, make a list of two to three questions you have about the national marine sanctuaries.

Discussion Questions – Part 1

1. How and when was the National Marine Sanctuary System established?	2. What are the goals of the National Marine Sanctuary System?
3. Where are the national marine sanctuaries located?	4. How many sites are there and how many total square miles do they protect?
5. Why is it important to protect and preserve marine sanctuaries?	

6. In what ways do national marine sanctuaries show how communities can balance protection with recreation and commercial activities?

7. In what ways do national marine sanctuaries support the economies of local communities?

8. Describe the different ways that the biotic components of an ecosystem, including humans, can impact the overall health of the ecosystem.

9. Describe the different ways that the abiotic components of an ecosystem, such as weather, climate, water, and sunlight, can impact the overall health of the ecosystem.

10. How are the ecosystems within the national marine sanctuaries monitored for health?



National Marine Sanctuary Comparison

The national marine sanctuaries are a system of protected places. These four national marine sanctuaries have been designated due to their significant natural and cultural features. Within the boundaries of each national marine sanctuary you will find habitats with special ecological significance; maritime heritage resources with special historical, cultural, archaeological significance; opportunities for important economic uses like tourism, fishing, diving, and other recreational activities; and opportunities for education, stewardship, and scientific research.

Directions:

Preview the format and information provided.

As you watch each 360° video, record the following information.

1. Describe what is significant or unique about the national marine sanctuary.
2. Identify why each location was designated to be part of the National Marine Sanctuary System, include three specific examples that support the inclusion of that site as a national marine sanctuary.
3. Sketch pictures and take notes that will help you to remember each national marine sanctuary location and why it is significant.

Channel Islands National Marine Sanctuary

What makes it significant or unique?	Interesting facts and notes to remember.
Why was it designated part of the National Marine Sanctuary System?	

Florida Key National Marine Sanctuary

What makes it significant or unique?	Interesting facts and notes to remember.
Why was it designated part of the National Marine Sanctuary System?	

Hawaiian Islands Humpback Whale National Marine Sanctuary

What makes it significant or unique?	Interesting facts and notes to remember.
Why was it designated part of the National Marine Sanctuary System?	



Thunder Bay National Marine Sanctuary

What makes it significant or unique?	Interesting facts and notes to remember.
Why was it designated part of the National Marine Sanctuary System?	

1. Which of the four national marine sanctuaries is the closest to you?

2. Have you visited any of the four national marine sanctuaries? If so, where did you go?

3. Which of the four national marine sanctuaries would you like to visit and why?

National Marine Sanctuary Site Research

Directions:

- Preview the information and questions below.
- Use the digital and printed materials available to conduct research about your assigned sanctuary site.
- Independently, complete the fields below. Be as specific and detailed as possible.

National Marine Sanctuary Name		Location	
Why was this ecosystem chosen to be a national marine sanctuary?			
What are the biotic and abiotic components of the ecosystem that interact?			
Biotic components		Abiotic components	
Why is it important to protect this national marine sanctuary?			

How is this marine sanctuary influenced by outside factors?

How are the populations of living things impacted by the biotic components in this ecosystem?

How are the populations of living things impacted by abiotic factors in this ecosystem?

What actions can people take to help the National Marine Sanctuary System meet its goal of protecting and preserving the ocean and Great Lakes?

Example 1

Example 2

Fun Fact

Slideshow Criteria Checklist

Use this checklist to be sure you include all of the required information in your slideshow.

Component	Got it!
Title of sanctuary site	
Location of site (including a map)	
Reason it was chosen as a sanctuary site	
Examples of invertebrates (2)	
Examples of mammals (2)	
Examples of fish (2)	
Examples of birds (2)	
Example of heritage protected by the site (1)	
Example of a recreational use of the site (1)	
Example of a commercial benefit to the local economy (1)	
Example that demonstrates the biodiversity protected by the site (1)	
Example of a biotic component of the ecosystem impacting the site (1)	
Example of an abiotic factor impacting the site (1)	
Examples of actions that can be taken to protect and preserve the site (2)	

Activity Rubric

	5 - Students Exceeds Assignment Expectations	3 - Students meet assignment expectations	1 - Students approach assignment expectations	Points Earned
Written explanation of ideas	Student produces clear and coherent writing which is appropriate to task and effectively communicates relevant ideas.	Student produces writing which is appropriate to task and mostly communicates relevant ideas.	Student produces writing which is appropriate to task and attempts to communicate relevant ideas.	
Meets the criteria set for information to include.	Student work includes all required information from research outline.	Student work includes some required information from research outline.	Student work includes very little required information from research outline.	
Quality of graphics to support text.	Student work includes multiple graphic aids including maps, photos, tables, or graphs.	Student work includes some graphic aids including maps, photos, tables, or graphs.	Student work includes a graphic aid such as a map, photo, table, or graph.	
Presentation of ideas	Student clearly expresses ideas and answers questions knowledgeably.	Student expresses ideas and answers most questions knowledgeably.	Student expresses ideas and answers some questions knowledgeably.	
Comments				Total /20