



**KILROY  
ACADEMY**

# **EXPLORING MARINE ECOSYSTEMS POSTER PROJECT**

**PROJECT:** You will be designing an informative poster board that will detail vital facts about a specific marine environment.

- First, you will select one marine ecosystem to explore. Using any reference books and the internet, you will research the details of your chosen ecosystem and record the information in your notebook.
- You should research and record information such as:
  - Ecosystem description and locations
  - Various plants and animals living there
  - Biotic and abiotic factors
  - Describe what it is like to live there
  - Anthropogenic impacts (positive and negative)
- Once your research is complete, you will organize the facts to be creatively displayed on a poster board.
- Then, present your poster and research to the class for a discussion.

**\*\*\*Be sure to reference the rubric when designing your poster board.\*\*\***

## Exploring Marine Ecosystems Project Grading Rubric

Criteria/Score	20	15	10	5
<b>Description of Ecosystem</b>	Ecosystem is <u>well defined</u> , including a <u>thorough</u> description with details and a precise map of ecosystem locations.	Ecosystem is defined, including a detailed description and a map of ecosystem locations.	Ecosystem is defined, with some details and a map of the locations where the ecosystem is found.	Ecosystem is not defined and/or map does not define the ecosystem.
<b>Dominant Plants and Animals</b>	Dominant species are described in <u>great detail</u> and carefully chosen images are used to support the description.	Dominant species are described in detail and appropriate images are included.	Dominant species are described and images are included.	Description of dominant species lacks significant content and/or images do not support the description.
<b>Habitat Description</b>	Description of the habitat is <u>thorough</u> , and includes details about the components and the challenges organisms might face in the ecosystem.	Description of the habitat includes details about the components and the challenges organisms might face in the ecosystem.	Description of the habitat includes some details about the components and the challenges organisms might face in the ecosystem.	Description of the habitat lacks details about the components and the challenges organisms might face in the ecosystem.
<b>Human Impacts</b>	Details of current and future human impacts to the ecosystem are described <u>completely and accurately</u> .	Details of current and future human impacts to the ecosystem are well described.	Details of current and future human impacts to the ecosystem are addressed.	Details of current and future human impacts to the ecosystem lack content and/or details.
<b>Organization &amp; Aesthetics</b>	Poster is <u>very well</u> organized and aesthetically pleasing.	Poster is fairly well organized and aesthetically pleasing.	Poster has some organizational problems.	Poster is poorly organized.

## TOPICS

Marine science, marine ecosystems, anthropogenic impacts

**AUDIENCE AND SETTING** Middle school to high school students.

Possible settings include formal or informal classrooms.

## OBJECTIVES

- Explore the different marine ecosystems that exist around the world.
- Identify how marine ecosystems connect and work together to sustain life for plants and animals.
- Investigate what abiotic and biotic features comprise marine ecosystems.

## GUIDING QUESTIONS

- What kind of different marine ecosystems exist around the world?
- What kinds of organisms live in these ecosystems?
- Have these marine ecosystems been impacted by humans?

## KEY TERMS

**Anthropogenic** caused or produced by humans

**Ecosystem** is a community of living and non-living things in an environment which function/work together as a unit.

**Abiotic** non-living factors in an ecosystem; examples include sunlight, oxygen and wind.

**Biotic** living features in an ecosystem; examples include plants and animals.

## KEY CONCEPTS

- A variety of marine ecosystems exist across the planet.
- These ecosystems sustain life for many different ecosystems.
- Humans depend on marine ecosystems for survival just as the organisms living in these ecosystems lives' depend on humans to live sustainably as to not destroy these ecosystems.

## FLORIDA STANDARDS

[SC.912.L.17.4](#) Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

[SS.912.G.3.1](#) Use geographic terms to locate and describe major ecosystems of Earth.

[SS.912.G.5.4](#) Analyze case studies of how humans impact the diversity and productivity of ecosystems.

## OCEAN LITERACY PRINCIPLES

### [Principle #5](#)

#### **The ocean supports a great diversity of life and ecosystems.**

- a. Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale.
- b. Most life in the ocean exists as microbes. Microbes are the most important primary producers in the ocean. Not only are they the most abundant life form in the ocean, they have extremely fast growth rates and life cycles.
- c. Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.
- d. Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (such as symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.
- e. The ocean is three-dimensional, offering vast living space and diverse habitats from the surface through the water column to the seafloor. Most of the living space on Earth is in the ocean.
- f. Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or spatially, i.e., it is "patchy". Some regions of the ocean support more diverse and abundant life than anywhere on Earth, while much of the ocean is considered a desert.
- g. There are deep ocean ecosystems that are independent of energy from sunlight and photosynthetic organisms. Hydrothermal vents, submarine hot springs, and methane cold seeps rely only on chemical energy and chemosynthetic organisms to support life.
- h. Tides, waves and predation cause vertical zonation patterns along the shore, influencing the distribution and diversity of organisms.

- i. Estuaries provide important and productive nursery areas for many marine and aquatic species.

### Principle #6

#### **The oceans and humans are inextricably interconnected.**

- 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.
- 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.
- c. The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.
- d. Much of the world's population lives in coastal areas.
- 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.
- f. Coastal regions are susceptible to natural hazards (such as tsunamis, hurricanes, cyclones, sea level change, and storm surges).
- 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.

## **EXTENSIONS**

### **Indian River Lagoon Ecosystem Connection Game**

Intro and Description:

This game demonstrates how ecosystems like the Indian River Lagoon have many connections and rely on many factors to thrive.

An ecosystem is community of living things and its environment, which function as unit. Ecosystems are made up of both biotic and abiotic things. The living things like plants and animals need non-living things like sunlight and oxygen to survive. The most important element of an ecosystem is that everything in it relies/depends on everything else, nothing can exist alone. For example, without

clean and clear water there isn't seagrass for manatees to eat or healthy fish dolphins to eat. Without manatees and dolphins to eat smaller organisms like seagrass and fish, the ecosystem becomes unbalanced and can fall apart. People are part of ecosystems too. Many of us rely on the Indian River Lagoon for food, fun and jobs.

Materials:

1. Whiteboard, poster board or paper
2. Markers
3. Printer & ink (if printing pictures)

Procedure:

1. Give a brief introduction of the Indian River Lagoon and define what an ecosystem is. Share the following John Muir quote: "When we try to pick anything out by itself, we find it hitched to the rest of the universe."
2. Have students brainstorm and list abiotic and biotic features of the Indian River Lagoon.
3. Have students/players draw or print pictures of biotic and abiotic features of the Indian River Lagoon. Include plants and animals (seagrass, mangroves, dolphins, manatees, etc.), abiotic features (sunlight, rain, etc.) and human actions and behaviors (waterway cleanups, safe boating, picking up pet waste, following fertilizer ordinances, etc.). (Note: To save time – the instructor may prepare pictures in advance).
4. Arrange the pictures in a circular formation on a whiteboard or poster board.
5. Ask players to choose the element they care about the most, or the element they feel is the most important to maintain a healthy Indian River Lagoon ecosystem.
6. Players then draw a line to another element they feel it relates or connects to (have players make at least two other connections within the ecosystem circle).
7. After multiple players have drawn connections, a web of connections will be visible, thus demonstrating how everything is connected in an ecosystem. (Note: using different color markers will create a more visually appealing web).
8. Have players discuss the connections that were made and why they are important to the Indian River Lagoon.

## ADDITIONAL RESOURCES

### **Ecosystem Valuation**

This website from NOAA and U.S. Department of Agriculture describes how economists value ecosystem benefits to people. It is designed for non-economists who need answers to questions about the benefits of ecosystem conservation, preservation, or restoration. It provides non-technical explanations of ecosystem valuation concepts, methods, and applications.

<http://www.ecosystemvaluation.org/>

### **NOAA Marine Life Education Resources**

This collection provides links and resources to understand marine life, the pressures that threaten their existence, and the role humans play in sustaining marine ecosystems.

[http://www.education.noaa.gov/Marine\\_Life/](http://www.education.noaa.gov/Marine_Life/)

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