

RESOURCE LIBRARY

ACTIVITY : 1 HR

Fisheries and Seafood Consumption

Students identify and characterize important fishing regions on a world map. Then they use an online interactive to research the location, sustainability, and level of human consumption for a variety of seafood fisheries.

GRADES

9 - 12+

SUBJECTS*Biology, Earth Science, Oceanography, Geography, Human Geography, Physical Geography***CONTENTS**

3 PDFs, 1 Video, 2 Links

OVERVIEW

Students identify and characterize important fishing regions on a world map. Then they use an online interactive to research the location, sustainability, and level of human consumption for a variety of seafood fisheries.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/fisheries-and-seafood-consumption/>

DIRECTIONS

1. Have students identify important fishing regions and their geographic and ecological features.

Arrange students in pairs and give each pair a copy of the Major Fisheries of the World map and chart. Using the Water Planet Mega Map, included in the World Physical MapMaker Kit, point out the five important fishing regions one at a time. Use the information provided in the Teacher Guide for Marine Fisheries Discussion to discuss the geographic and ecological

features that characterize the different fishing regions. These features are what make the regions such good fishing areas. During the discussion, have one student from each pair use shading and labeling to identify the regions on their map. Have the other student in each pair fill in the chart. Throughout the activity, have students take turns working on the chart and the map.

2. Discuss the relationship between fisheries regions, fish ecology, and human consumption of seafood.

Explain to students that the types of fish found in these regions depend on the habitat and food sources that are available. Some fish are primary consumers, while others are top predators. Some, like salmon, pollock, and cod, live in cold ocean waters; others, like tuna and mackerel, adapt to warmer waters. Groundfish include cod, sole, rockfish, haddock, and flounder, which spend a part or all of their life on or near the bottom. Others, like herring and anchovies, live near the surface. State that numerous factors have contributed to what is being called a “global fisheries crisis.” Ask: *What do you think that means?* Elicit from students that many global fisheries are overfished and threatened by multiple human impacts, including improvements in fishing methods and technology, as well as increases in the number of fishing fleets, coastal human populations, and demand for seafood. Scientists estimate that humans have removed as much as 90 percent of the ocean’s large predatory fish, including sharks, swordfish, and cod. In some countries, up to 70 percent of the protein consumed comes from seafood.

3. Show students the Impact of Seafood interactive and have them complete their worksheets.

Project the National Geographic Impact of Seafood interactive and have students watch the introductory video by Enric Sala. Then click on the Seafood Decision Guide tab and have students select one fish or invertebrate to use in demonstrating how the interactive works. Discuss with them what is meant by the trophic level, sustainability ranking, toxicity level, and omega-3 content. Use the seafood decision guide to research the sustainability of one type of seafood from each of the five major fishing regions. Have student pairs label the location of the fisheries on their maps and fill in the chart with the seafood names and sustainability levels. Examples of seafood by region are listed on the teacher guide. Then have students click on the interactive’s World’s Seafood Footprint tab and record the catch levels and consumption levels for each of the five major fisheries regions. Students should use a scale of low, medium, and high. Move the cursor to compare and contrast levels of catch and consumption between the U.S. and other countries. To help students visualize how fisheries have expanded over the last 60 years, click on the Where Fish Are Caught link located on the

lower left corner of the World's Seafood Footprint page.

4. Have students reflect on what they learned.

On their own paper, have students reflect on what they learned in writing. Ask:

- *How do the locations of the world's fisheries relate to levels of human population and seafood consumption?*
- *Why would raising consumer awareness help to alleviate some of these problems?*
- *Do you think you or your family would change your seafood choices if you knew more about these issues?*

Discuss student responses as a class and explain that raising consumer awareness would prevent overfishing of marine animals whose populations are not sustainable—like some of the seafood species they just researched. Then show them the other educational resources that are available on the Impacts of Seafood website. Be sure to point out the links to the Additional Seafood Guides and explain that these resources are helping educate people all over the world so that they can make more responsible seafood choices.

Modification

Use the Impact of Seafood interactive to research locally fished species.

Informal Assessment

Use student worksheets and free response answers to assess their comprehension of the issue of overfishing.

Extending the Learning

If possible, have students watch the documentary film *The End of the Line: Imagine a World Without Fish*.

OBJECTIVES

Subjects & Disciplines

Biology

Earth Science

- [Oceanography](#)

Geography

- Human Geography
- Physical Geography

Learning Objectives

Students will:

- identify major fishing regions on a world map
- describe key geographic and ecological features that make these areas good fishing regions
- identify the sustainability level and geographic distribution of selected seafood species
- discuss what the global fisheries crisis is and how human populations and consumption impact it
- reflect on how people can make more sustainable seafood choices

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Hands-on learning
- Information organization
- Visual instruction

Skills Summary

This activity targets the following skills:

- 21st Century Themes
 - Global Awareness
- Critical Thinking Skills
 - Analyzing

- Understanding
- Geographic Skills
 - [Acquiring Geographic Information](#)
 - [Analyzing Geographic Information](#)
 - [Answering Geographic Questions](#)
 - [Organizing Geographic Information](#)

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- [Standard 14:](#)

How human actions modify the physical environment

- [Standard 8:](#)

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- [\(9-12\) Standard F-3:](#)

Natural resources

- [\(9-12\) Standard F-4:](#)

Environmental quality

- [\(9-12\) Standard F-5:](#)

Natural and human-induced hazards

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- [Principle 5c:](#)

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.

- [Principle 5i:](#)

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

- [Principle 6b:](#)

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.

- **Principle 6c:**

The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.

- **Principle 6d:**

Much of the world's population lives in coastal areas.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Colored pencils
- Pencils

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector, Speakers
- Plug-Ins: Flash

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

OTHER NOTES

Before starting the activity, queue up and practice using the National Geographic Impact of Seafood interactive.

Using the MapMaker Kit Assembly video as a guide, print, laminate, and assemble the Water Planet Mega Map before starting this activity.

BACKGROUND & VOCABULARY

Background Information

Humans once thought the ocean offered never-ending abundance; however, overfishing is causing extreme imbalances in marine ecosystems. Scientists predict that if fishing rates continue as they have been, all of the world's fisheries will have collapsed by the year 2048. Although fisheries management, law enforcement, and increased use of aquaculture can help prevent such a steep decline, illegal fishing and a lack of awareness on the part of seafood consumers continue to add to the problem.

Prior Knowledge

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Recommended Prior Activities

- [Fisheries Sustainability](#)

Vocabulary

Term	Part of Speech	Definition
fishery	<i>noun</i>	industry or occupation of harvesting fish, either in the wild or through aquaculture.
upwelling	<i>noun</i>	process in which cold, nutrient-rich water from the bottom of an ocean basin or lake is brought to the surface due to atmospheric effects such as the Coriolis force or wind.

For Further Exploration

Websites

- [National Geographic Environment: The Ocean—Photo Gallery: Overfishing](#)
- [National Geographic Magazine: Still Waters, The Global Fish Crisis](#)
- [NOAA: National Marine Fisheries Service—FishWatch: U.S. Seafood Facts](#)
- [The End of the Line: Imagine a World Without Fish](#)
- [National Geographic Education: National Teacher Leadership Academy \(NTLA\)](#)

FUNDER

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