

# Unit 3: Fisheries Management Aquaculture and Resource Management

20 Classes

*Rev. June 2019*

## Essential Questions

- What is the best way to manage our worlds fish stocks?

## Essential Understandings with Unit Goals

**EU 1:** There are various species that are harvested for consumption using various methods.

- Identify the aquatic species harvested for consumption
- Evaluate the various methods used to harvest benthic & pelagic species

**EU 2:** Fish stocks need to be harvested and or produced sustainably.

- Define sustainability in fisheries
- Evaluate management practices that are in place for fisheries management
- Analyze solutions to problems facing specific fisheries

## Standards

### Common Core State Standards

- **CCSS.ELA-Literacy.RST.11-12.7** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- **CCSS.ELA-Literacy.RST.11-12.9** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

### Next Generation Science Standards

- **HS-ESS3-1.** Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- **HS-ESS3-4.** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
- **HS-ETS1-2.** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

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### MSMHS Academic, Civic, and Social Competencies

**Competency 1:** Read and write effectively for a variety of purposes

**Competency 2:** Speak effectively with a variety of audiences in an accountable manner

**Competency 3:** Make decisions and solve problems independently and collaboratively

**Competency 5.** Contribute to a positive learning environment with respect and responsibility

### Unit Content Overview

- Benthic Fish
- Pelagic Fish
- Trawl
- Longline
- Sustainability
- Fisheries Management
- Bycatch
- Regulations
- Project O Trawl Data
- Data Collection
- Data Synthesis
- Water Quality

#### Interdisciplinary Connections

- Marine Science
- World Maritime History- EEZ, Whaling

### Learning Objectives with *TWPS Activities*

**Students will be able to...**

- Identify sustainability and how it applies to natural resources
  - *Do you consider commercial fishing a sustainable practice? Why or why not?*
- Compare and contrast the significance of recreational and commercial fisheries
  - *How do recreational fisheries affect local businesses?*
- Relate the “Tragedy of the Commons” to fisheries management
  - *What is the main goal of fisheries management?*
- Analyze the fisheries management practices employed in the past
  - *What barriers exist in the way of accurately monitoring the population status of a fishery?*

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- Research the population crisis faced by Atlantic Cod in the 1990's
  - *How does overfishing change the ecology and predator/prey relationships of an ecosystem?*
- Identify benthic fisheries found in various parts of the world.
  - *How does the fishing gear commonly used in benthic fisheries affect the ecosystem?*
- Compare and contrast various benthic fisheries for sustainability.
  - *Which benthic fishery do you consider the most sustainable? Which would you consider the least sustainable?*
- Analyze the current population status of the Bluefin Tuna
  - *How might food trends affect the management of a certain fish species?*
- Identify Pelagic Fisheries that exist in various parts of the world.
  - *How are pelagic fisheries different from benthic fisheries?*
- Compare and contrast various pelagic fisheries for sustainability.
  - *Which pelagic fishery do you consider the most sustainable? Which would you consider the least sustainable?*
- Propose a modification to current fishing techniques
  - *What actions can be done to improve the sustainability of a fishery?*
- Analyze the sustainability of local fisheries.
  - *Which fishery within the Long Island Sound would you consider the most economically important?*
- Collect data on species in the Long Island Sound.
  - *How has the environment of LIS changed since the 1950's?*
- Analyze data gathered from the Long Island Sound.
  - *What is the process involved with monitoring fish stocks in the ocean? Do you believe these practices give a fair assessment of a populations status?*
- Evaluate fisheries management issues
  - *What is the significance of the EEZ and why was it created?*
- Investigate fisheries case studies
  - *What issues can arise when attempting to monitor fish populations?*
- Research regulations that manage fisheries.
  - *What types of regulations can be implemented to improve the sustainability of fisheries?*
- Create regulations that will improve management of fisheries.
  - *Which regulation seemed to most feasible to implement?*

### Instructional Strategies/Differentiated Instruction

- **HLP** Academically Productive Talk
- **HLP** Writing to Learn (TWPS)
- **HLP** Effective Feedback
- Warm up

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- Teacher Modeling
- Student self-assessment
- Flexible Grouping
- Field Trip to Project O
- Trawls
- YouTube/videos
- Small Group Discussions
- Independent reading
- Collaborative group activities
- Lectures and Note-taking

### Assessments

#### **FORMATIVE ASSESSMENTS:**

- Warm Up Activities
- Exit Slips
- Summarizing relevant texts
- Homework Checks
- Daily Check-Ins
- Improvements in Regulations
  - MSMHS Rubric 3: Problem Solving
- Gear Modification Project
  - MSMHS Rubric 3: Problem Solving

#### **SUMMATIVE ASSESSMENTS:**

- Quiz on EU 1
- Quiz on EU 2
- Gear Modifications Project
- Regulation improvement case study
- Unit Exam

## **Unit 3: Fisheries Management Aquaculture and Resource Management**

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<b>Unit Task</b>
<p><b>Unit Task Name:</b> Fisheries Management Case Study</p> <p><b>Description:</b> Studies will identify a specific issue affecting commercial fisheries management. They will compile sources, analyze data and draw conclusions on fisheries management practices (EU2) Suggestions will be made to increase the sustainability of the fishery by analyzing the animal's lifestyle and ecology</p> <p><b>Evaluation:</b> MSMHS Rubric 3: Problem Solving</p>

<b>Unit Resources</b>
<ul style="list-style-type: none"><li>• Internet databases</li><li>• Laptops</li><li>• Project O</li><li>• MSMHS Aquaculture Lab</li></ul>