

**Lesson Title:** Clams and Oysters and Scallops, Oh My! - The Shellfish Industry on Long Island  
**Grade Level(s):** 9, 10, 11, 12  
**Description:** Students will work in teams to collect information on the shellfish industry on Long Island, its decline, and what is being done to rebuild shellfish stocks.

**NYS Learning Standards:** The Living Environment  
**STANDARD 4-Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.**

- Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.
- Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.

**Physical Setting/Chemistry**

**STANDARD I-Analysis, Inquiry, and Design**

- Mathematical Analysis
- Scientific Inquiry

**STANDARD 6 - Interconnectedness: Common Theme**

- Equilibrium and Stability
- Patterns of Change

**STANDARD 7-Interdisciplinary Problem Solving**

- Connections
- Strategies

**Objectives:**

Students will understand the following:

- Historically, Long Island had a thriving multi-million dollar shellfish industry that supplied much of the nation's demand for hard clams, bay scallops, and oysters, and also employed hundreds of Long Islanders.
- Several natural phenomena and human actions brought about major declines in the industry.
- Many local organizations are conducting aquaculture programs to try to rebuild shellfish stocks in Long Island waters.

**Materials:**

- A History of Oysters and Hard Clams in the Great South Bay, by Jeffrey Kassner - [http://www.longislandtraditions.org/southshore/sights\\_sounds/fishing/pdf/kassner\\_essay.pdf](http://www.longislandtraditions.org/southshore/sights_sounds/fishing/pdf/kassner_essay.pdf)
- NY Sea Grant - About Hard Clams - <http://www.seagrant.sunysb.edu/articles/t/hard-clam-research-initiative-about-hard-clams>
- Atlantic Bay Scallop - <http://www.dec.ny.gov/animals/6946.html>
- Return of the Native - [http://www.edibleeastend.com/online\\_magazine/spring-2013/return-of-the-native/](http://www.edibleeastend.com/online_magazine/spring-2013/return-of-the-native/)
- Scallop Fact Sheet - <http://seagrant.gso.uri.edu/factsheets/scallop.html>
- Hard Clam Fact Sheet - <http://seagrant.gso.uri.edu/factsheets/fsquahog.html>
- New York State Comprehensive Wildlife Conservation Strategy -pages 2-7, 11-15, and 42-45
- Appendix A8 – Species Group Reports for Molluscs – [www.dec.ny.gov/docs/wildlife-pdf/appendixa8.pdf](http://www.dec.ny.gov/docs/wildlife-pdf/appendixa8.pdf)

## Procedures:

1. Discuss with students the fact that Long Island has a rich history tied to the shellfish in our surrounding waters, beginning with the Native Americans who settled here to take advantage of its bounty, to a much more recent multi-million dollar commercial fishery. They will now explore the many facets of this industry -the species, its history, and its demise and hopeful comeback.
2. Have students form into four teams. Using the resources supplied, and further information gleaned from internet searches, have teams present class reports on (1) the hard clam or quahog (*Mercenaria mercenaria*), (2) Atlantic Bay Scallop (*Argopecten irradians*) and (3) Eastern Oyster (*Crassostrea virginica*). Reports should include natural history, history of industry on Long Island, natural and/or human induced causes of species decline, and how the fishery is being managed and restored. Team 4 should report on the brown tide, what it is, its sources, and how it has impacted the shellfish industry. (Some video resources below):
  - "Brown Tide: Blight on the Bays - Extended interview with Bayman Ed Warner"  
<https://www.youtube.com/watch?v=LbVlygkIJIw>
  - "Brown Tide: Blight on the Bays - Extended interview with Kevin McAllister (July 2012)" -  
<https://www.youtube.com/watch?v=PYLFEb4scKE>
  - "Brown Tide: Blight on the Bays - Extended interview with Dr. Chris Gobler (July 2012)" -  
<http://youtu.be/FwjwU618eMY>
  - "Brown Tide: Blight on the Bays (July 2012)" - <https://www.youtube.com/watch?v=dwzaDU8Sak>
3. Download information on the Coastal Steward Shellfish Restoration Project from the website -  
<http://www.coastalsteward.org/programs.html>. If feasible, plan a field trip to a working shellfish hatchery (i.e. Town of Brookhaven -Cedar Beach facility at Mount Sinai) to learn about methods of aquaculture. If possible, a visit with Coastal Steward's Dave Johnson and/or a local bayman would enhance the students understanding of the fishery and the aquaculture industry.
4. Have students view the following on YouTube to gain an understanding of what it is like to be a bayman:
  - "The Scallop Baymen of Long Island" - <http://youtu.be/OZnwWfLZqlw>
  - "Trailer: Filtering Futures: A Story of Long Island Livelihood & Shellfish" - <http://youtu.be/AQil182Xo3k>

## Discussion Questions:

1. Does anyone know a bayman or have a relative(s) who has worked in the commercial fishing industry? What is/was their life like? What are the advantages/disadvantages of making a living on the bay?
2. Which fishery has been impacted most by overfishing, which by pollution, and which one by natural phenomena?
3. How are these problems being mitigated? Can you think of additional efforts that would be helpful?
4. What are some of the advantages of raising shellfish over just allowing populations to recover naturally?
5. Should we be concerned about the decline of the fishery and the decrease in shellfish stocks? What are some of the benefits of restoring/maintaining a healthy shellfish industry on Long Island? Would any students be interested in a career in aquaculture?
6. Can students speculate on the future of the Long Island shellfish industry? Can it be saved?
7. Were students aware of these issues prior to the lesson? After doing this lesson, have students feelings about the Long Island shellfish industry and baymen changed?
8. Do the students have further suggestions for discussion?