Teaching Environmental Justice Using OOI Datasets

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Impacts of Ocean Acidification on Shellfish and the Communities That Rely on Them in the Pacific Northwest

This lesson was developed to motivate students to explore the impact of ocean acidification in local waters and on Pacific Northwest (PNW) coastal communities using Ocean Observatories Initiatives (OOI) datasets and visualization tools.

In this activity, students:

- Learn about the importance of shellfish aquaculture in the PNW
- Develop an understanding of changing ocean conditions
- Use OOI datasets and visualization tools
- Gain an understanding of the connections between societal and environmental issues driven by climate change

**ENVIRONMENTAL JUSTICE**

Authentic datasets can be used to spotlight how social justice and the environment are connected and can provide students with a tangible understanding of the societal and environmental disparities driven by climate change. Through hands-on engagement with data, students can gain the tools necessary to explain scientific concepts and processes and make informed decisions in the face of climate-related challenges.

**LESSON OVERVIEW**

**Environmental Justice Issue**

Threats to shellfish, like ocean acidification, not only reduce the prevalence of a key resource, but also endanger an important part of the heritage, culture, and economy of many communities in the Pacific Northwest

**Target Audience:**
Advanced high school and Introductory level college students

**Lesson Length:**
3-5 class periods (50 minutes each) with prior preparation

**Technology Requirement:**
Parts of this activity require internet access on computers or tablets

**LEARNING OUTCOMES**

After completing the activity, students can:

- Describe and interpret patterns in OOI datasets and correlations between different data types
- Explain the relationship between wind direction and pH on the WA/OR coast using OOI data
- Identify oceanographic conditions that negatively impact shellfish populations and determine when those conditions are occurring
- Identify the communities that rely on shellfish as a resource
- Advocate for equitable solutions for communities that rely on shellfish harvest

**LEARNING CYCLE**

The activity takes students through the entire learning cycle. The environmental justice component is integrated into several phases. The activities can be modified for the targeted student audience.

**OOI DATA EXPLORATIONS**

**Exploration**

How do changing weather conditions and ocean circulation patterns affect ocean pH? How does each plotted variable change during the periods of N or S winds? Describe the relationship.

**Application**

How does ocean pH affect survival of shellfish in hatcheries? Predict when coastal waters become harmful to shellfish.

**ENVIRONMENTAL JUSTICE**

Shellfish are an important resource and part of our heritage, culture and economy in the PNW. Reflection

Asses the value of shellfish to different communities. Asses the impact of climate change on resource and community group.