



PROJECT OCEANOLOGY



A Changing Sound: Oceanography Data Analysis Teaching Notes

Overview

This lesson is designed to complement Project Oceanology's "Introduction to Oceanography" boat trip, although it can also be used as a stand-alone lesson. It can take place in the Project Oceanology computer lab immediately before or after a trip, or in the classroom after students have returned home.

Materials Needed

Project O historical data files

Student access to graph-making program (instructions are written for MS excel)

Teaching Notes

Engage: Slideshow of Project O students over the years.

- *These students collected the same data as you. Do you think they found the same thing?*
- *How do you think Long Island Sound has changed since then? Specifically, how do you think the data you collected today is likely different from the data they collected so many years ago?*
- *Some students may bring up climate change*

Challenge: How has the physical environment of LIS changed? How has the biological environment changed? How are these two related?

Explore:

1. Small groups of students draw assignments out of a hat:
 - a. Physical Parameters
 - i. Salinity
 - ii. Temperature
 - iii. Dissolved Oxygen
 - iv. pH
 - b. Organisms (go for a mix of cold and warm water)
 - i. Winter Flounder (cold)
 - ii. Windowpane Flounder (cold)
 - iii. Summer Flounder (warm)
 - iv. Porgy/Scup (warm)
 - v. Lobster (cold)
 - vi. Spider Crab (warm)
2. Students look at Project O's dataset for their assigned variable and discuss how their assigned variable has changed over time. They sketch a graphic showing that trend on a large sheet of paper/the board.



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Explain: What is a graph? Discuss how graphs help us understand the relationship between two variables. Have the students identify the two variables they are working with (time and the variable they were assigned). What is the best kind of graph for your assigned variable?

Optional: If they didn't do the 'bar and line graph' pre-lab activity, show the 'cool graphs' slide show

Elaborate: Students use Project O's dataset to make graphs in excel. They work through step by step instructions to make the graph, then print out the graph. Optional: students add their own datapoint with a marker.

Educator circulates and helps with the graph making process

Evaluate: Students present their data to each other. As they listen, students should fill out their data table as a reference point for discussion afterwards. Discuss how the physical environment of Long Island Sound has changed since the time of the students in the pictures from the beginning. Then discuss how the organisms living in Long Island Sound have changed. How are these things connected? Brainstorm hypotheses and write on board.

If the data analysis is taking place BEFORE the boat trip, this step could take place on board after they have collected their own data.