

OIL SIGNALS FROM THE DEEP

Helping students understand ocean science and oil spill research



This is the third of four specially designed lesson plans intended to help students expand their understanding of ocean science and oil spill research. This lesson gives students hands-on experience working with CTD data from a NOAA research cruise. Students will plot the data in Excel and analyze the plots to explain how levels of dissolved oxygen in the Gulf were affected by the oil spill.

Lesson #3: Analyzing Data

Learning Objectives:

1. Students will be able to plot graphs in Excel and use the graphs to explain how the oil spill affected dissolved oxygen levels near the Deepwater Horizon well-head.
2. Students will be able to analyze scientific data and develop conclusions based on the data.

NGSS: HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

Guiding Questions:

1. What does CTD stand for?
2. How is CTD data collected?
3. How did the oil spill affect dissolved oxygen levels near the spill site?
4. Why is analyzing data such an important step in the scientific process?

Lesson Structure

1. Hook

Video about CTD data and scientists on a research cruise.

- Video shows what the CTD instrument looks like and what it's like to work on a research cruise.
- Ask students follow-up questions about the video.

2. Introduction to CTD Data and How its Collected

Brief presentation on what CTD stands for and how data collected is used.

- Use PowerPoint presentation to discuss CTD data.
- Ask the students, "How can CTD data be used to detect oil?"



3. CTD Dissolved Oxygen Lab

Students will use Excel to plot graphs of dissolved oxygen.

- In pairs or individually, have students get the data from the NOAA website, following the instructions on the handout.
- Students should compare their two graphs and make conclusions on which one was closest to the well-head and explain why.



4. Discussion

Analyze the results from the lab.

- Ask the students “How did dissolved oxygen vary with depth according to your graphs? How were the 2 graphs similar? Different?”
- Probe students to explain why analyzing data is such an important part of the scientific process.



Supplies

Laptops for every student or pair of students

CTD lab worksheet

Additional Resources:

Project GOO Blog:

<http://projectgoo.blogspot.com/>

For additional lesson plans and related activities visit

www.Deep-C.org



Gulf Oil Observers (GOO) is an education and outreach initiative of the Deep-C Consortium. Deep-C is investigating the environmental consequences of petroleum hydrocarbon (oil) on living marine resources and ecosystem health in the Gulf of Mexico. Deep-C seeks to increase understanding of the fundamental physical, chemical, and biological connections between the deep sea, continental slope, and coastal waters and their linkages to critical habitats and ecological functions. Deep-C research is made possible by a grant from BP/The Gulf of Mexico Research Initiative (GoMRI).