

Activity of the Month – March, 2008

Where in the World?

Summary

In this introductory activity on scientific ocean drilling sites, students expand their knowledge of latitude and longitude in relation to global position. Students record and utilize metadata to find additional information.

Learning Objectives

Students will be able to:

- Use *Google Earth* to locate sites on a world map
- Record metadata
- Use metadata to find more information
- Locate a position on a map of the earth when given the latitude and longitude.

National Science Education Content Standards

- Standard A: Science as Inquiry
- Standard D: Earth and Space Science
- Standard E. Science and Technology

National Geography Standards

- Standard 1: Using Maps
- Standard 10: Characteristics, distributions, and complexity of Earth's cultural mosaics
- Standard 16: Changes that occur in the meaning, use, distribution, and importance of resources

Target Age: Grades 4-8

Time: 15 to 30 minutes

Materials

- *Google Earth* loaded onto computer
- Computers with Internet access
- Large world map
- Index cards (cut in half)
- Database information from the Deep Sea Drilling Project (DSDP), the

Ocean Drilling Program (ODP), and the Integrated Ocean Drilling Program (IODP)

Background

Information gathered by scientific drilling worldwide has revealed the history and evolution of the earth. Each core tells its own story about the location it was recovered and the earth. The coring sites are now easily located on a map through the use of Global Positioning Units and satellites. With the increased popularity of “On Star” and other Global Positioning Systems on the market, students will benefit from learning how these systems work.

Metadata is increasingly available; the Internet allows dissemination of data received from various sources. Students, to be ready for the future, will need to learn how to obtain, record, and use data to solve problems and answer questions.

Before the activity, *Google Earth* will need to be downloaded onto student computers. To download *Google Earth*, go to: <http://earth.google.com> and follow instructions for downloading and installing the program.

In order to access the metadata for the activity, the IODP web-based program needs to be entered into the *Google Earth* program. To load this IODP web-based program, follow these easy steps:

1. Download and Install *Google Earth* onto your computer.
2. Set Google Earth to open in “GL Mode.”
3. Add the IODP web-based program:
 - a. Use *Google Earth*'s top menu to select “Add – Network Link.”
 - b. Customize the “Name” of the link (e.g. “IODP Boreholes”)

- c. Copy and paste the following link:
<http://campanian.iodp-mi-sapporo.org/google/data/iodp.kml> into the "Link" field.
- d. Hit OK.
- e. Under "Places," check the named link you added to become active.
- f. Wait 10 to 15 seconds for *Google Earth* to start loading data.
- g. When the process is complete, the locations of boreholes drilled during DSDP, ODP, and IODP will be shown on the map.

What to do

1. Explain to students that they will be using *Google Earth* to locate scientific ocean drilling sites and information about those sites.
2. Hand out the Student Page and briefly review the instructions.
3. Give students 10 to 15 minutes to work through the activity.
4. When everyone is ready, have students report to the class about their selected site. What did they learn about this specific drill site? Where is it? Have them predict what they might find if they looked at other holes in the same general area.

Extensions

- Have students create a display of three drill sites and show the results using the core sample pictures and data recorded by the scientists.
- Have students research a microfossil that was present in the core sample they chose and present information in a report or presentation.
- Ask students to write a story about what may have occurred at a certain place that they identify in the picture of their core sample.

Differentiation for special learners

- Students work in groups of two or three to complete the lesson.
- Students work in pairs so that one student records the data and the other researches the data.

Suggested activity uses

- Use as a "bell ringer" at the beginning of a class period for students to focus on what you're teaching.
- Use as a learning station.
- Use as an introductory activity for further study into scientific drilling topics.

Activity submitted by

Eileen Poling, West Virginia, School of Rock 2007

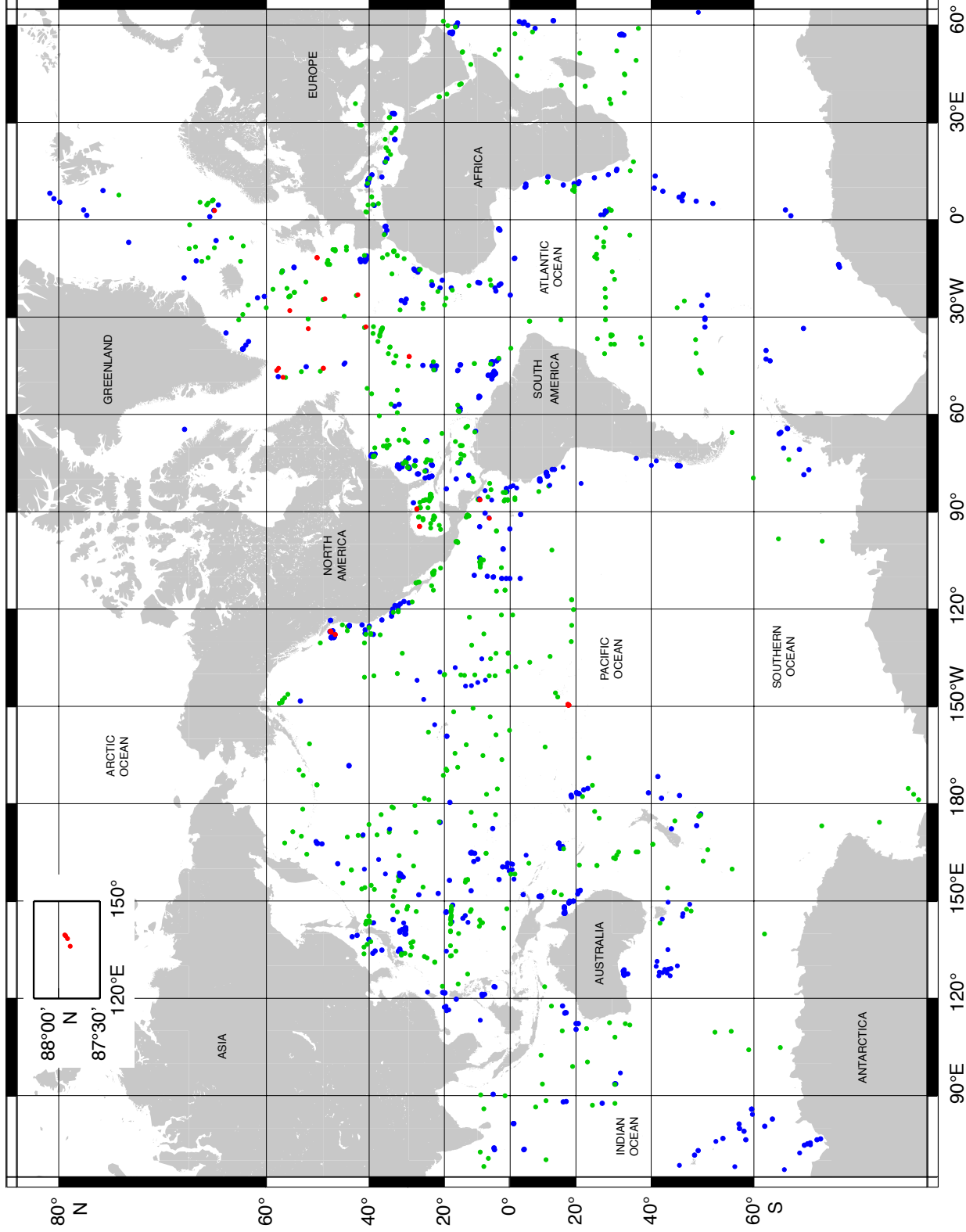
Student Page

Instructions:

1. Go to *Google Earth*.
2. Click on the IODP link in the “Places” section.
3. Go down to the IODP link and make sure that there are checked boxes next to the line that says “DSDP, ODP, IODP Drilled Holes” and “DSDP Holes,” “ODP Holes” and “IODP Holes.” You can ignore the rest of the links below that.
4. Click on one of the GREEN circles on the Google map and a chart will pop up with metadata on it.
5. Record the following metadata on your card:
 - a. **Expedition number:**
 - b. **Site:**
 - c. **Hole:**
 - d. **Program:**
 - e. **Latitude:**
 - f. **Longitude:**
 - g. **Water Depth:**
 - h. **Core recovered:**
6. Click on the “Core Data” link below the metadata chart. Use the data from the Core Data section to record at least one interesting finding from this drill hole including, for example, the age of the sediments or type of crust or description of the rocks. Write this information on your card.
7. Now partner with another student. Read the latitude and longitude coordinates of your drill site to your partner and ask him/her to find the approximate location of your site on the small map on the back of this page. Mark both sites on your map.
8. Take a few minutes to tell your partner what you learned about your site. What kind of data and information would you expect to find at holes near each of your sites?
9. Go to the world map in the front of the classroom and post your metadata cards in the correct place.



The scientific drilling vessel, JOIDES Resolution, is a floating laboratory which has collected cores worldwide.



DSDP Legs 1–96 (●), IODP Legs 100–210 (●), IODP Expeditions 301–312 (●)