My NASA Data - Mini Lesson/Activity

Analyzing Historic Ocean Chlorophyll Concentration Data with Maps: Student Activity

Chlorophyll Concentrations in Surface Ocean Waters

Student Directions

**Virtual Teachers:** Make a copy of the Google Form of your choice so that you may assign it directly from your Google Drive into your Learning Management System (e.g., Google Classroom, Canvas, Schoology, etc.). Do you need help incorporating these Google Forms into your Learning Management System? If so, read this [Guide to Using Google Forms with My NASA Data](#).

Directions:

1. Analyze the Chlorophyll Concentrations in Surface Ocean Waters mapped image.
The chlorophyll concentration data shown here were obtained from global satellite measurements by the SeaWiFS and MODIS-Aqua projects of the National Aeronautics and Space Administration (NASA). Credit: NASA, NOAA, GlobalChange.gov

2. Identify what living organisms may be observed using chlorophyll data.

Recall that phytoplankton are microscopic, floating, plant-like organisms that live in oceans, lakes, and rivers. They use photosynthetic pigments (like chlorophyll) to convert energy from the Sun into organic matter. For this reason, NASA satellites can observe the amount of phytoplankton present in the ocean by measuring chlorophyll concentrations.

3. Review the color bar scale below. What do the different colors mean as they are related to phytoplankton?

4. After looking at this map, what are the different regions that you see?

5. Compare the Chlorophyll Concentrations in the coastal areas to the open ocean. What do you observe?

6. Compare lower latitudes like those in Florida or Hawaii versus higher latitudes like those in Alaska?

7. Compare the West Coast vs. East Coast concentrations.

Credit: NASA, NOAA, GlobalChange.gov

Note: NASA satellites measure large areas of the world's ocean and have the ability to make these observations frequently, which is useful for evaluating long-term changes. There is one limitation to be made aware of is the trade-off of being only able to measure chlorophyll concentrations near the ocean's surface. This could potentially underestimate the total amount of phytoplankton found in all water depths.
Teachers, these mini lessons/student activities are perfect "warm up" tasks that can be used as a hook, bellringer, exit slip, etc.

Teachers who are interested in receiving the answer key, please contact MND from your school email address at larc-mynasadata@mail.nasa.gov. We verify that requestors are teachers prior to sending access to the answer keys as we’ve had many students try to pass as teachers to gain access. To receive the keys please provide the following:

1. The link to the school/institution’s teacher directory where you are employed so we can verify that you are a teacher
2. Ensure that the school email address is provided in your response as we are unable to send to personal email accounts

Access and Explore Data

- Chlorophyll Concentration (milligrams per cubic meter)