Red Tide Activity 1: Where could they be?

Purpose:

To learn how scientists might predict an outbreak of certain types of phytoplankton.

Time Required:

- 1 class period (40 to 50 minutes)
- 20 for evaluation (a good film on ocean currents would complement this activity well)

Safety issues:

None

Materials:

- Enough sets of phytoplankton cards for each group.
- Colored pencils/crayons to represent the plankton groups
- Copy of map for each student group (see web site below)
- Access to this web site: http://seaboard.ndbc.noaa.gov/Maps/wrldmap.shtml (choose only the yellow moored buoys for current water temperatures), or the ability to print out the current readings from at least 4 buoy stations. You will want 1 group of buoy data for each group of students.

Procedure:

- Provide each group of students with the phytoplankton cards, a copy of the map, and the readings from a specific buoy area. (4 stations is more than enough)
- Assign each of the types of plankton a specific color that each group must use to represent that plankton on the map. (example, gold=*G. breve*)
- Have the students read the cards and decide which phytoplankton would be most likely to thrive in their particular area.
- Students then color in their maps to show which plankton they think would grow in that area.
- After approximately 7 minutes, have the groups rotate their buoy data so each group has a new set of data. Repeat the process.
- Continue until each group has evaluated each set of buoy data and then compare maps to see how each group came up with their ideas.

Assessment:

Ask each group to evaluate how accurate their predictions were. Did their maps match the rest of the groups or other classes? Did they put plankton in geographic areas where they have never been found?

Extensions:

1. **Ask students to determine or research why some species have a global distribution (they are spread out around the world), and others do not.**
2. http://seaboard.ndbc.noaa.gov/educate/educate.shtml **- Answer questions about how ocean currents work.**
3. **If you have a world map in your classroom, you may wish to post the student predictions throughout the day.**
4. **Factors other than salinity and temperature (such as light, nutrients, vitamins, winds, and currents) all play a role in plankton blooms. Students can research these other factors on the internet to see how much of a role they play.**

Internet Links:

http://athena.wednet.edu/curric/oceans/ocolor/index.html **- Contains map**
http://paria.marine.usf.edu/full/czcs.html **- Coastal zone maps of plankton blooms**
http://paria.marine.usf.edu/full/seawifs.html **- Maps of current chlorophyll levels**
http://marine.rutgers.edu/mrs/ **- Contains real-time data from various New England areas.**
http://www.fmri.usf.edu/ecohab/fhab.html **- Up-to-date look at the dinoflagellates in this activity. Use this page as a reference for students to find out more about the various dinoflagellates.**

Background:

You need to be familiar with looking up sites on the internet. The students will be modeling what types of plankton they might expect to find in a region. Predictions will vary based on the current temperature readings at each buoy station. (Also be sure to read the article in *InterActive Teacher* magazine on Harmful Algal Blooms!).

Key Words

- **Moored buoy - one that is attached and not moving**
- **Dinoflagellates - one of several types of single-celled phytoplankton**