

## Data Analysis Using On-line Data Sets

<http://www.ndbc.noaa.gov/rmd.shtml>

Near-shore Conditions: National Data Buoy Center, Nantucket Sound Buoy

[http://www.ndbc.noaa.gov/station\\_page.php?station=44020](http://www.ndbc.noaa.gov/station_page.php?station=44020)

The NDBC operates and maintains buoys which automatically collect data about wind and sea conditions. The daily data is displayed on the web page, and a five-day graph for each parameter is available. The site also provides a data set from the past 45 days which may be downloaded and used in an Excel spreadsheet.



**Concepts:** Monitoring, data, patterns, analysis

**Method:** Have students work independently or in pairs at computers or use a projector and present the lesson to the class as a group.

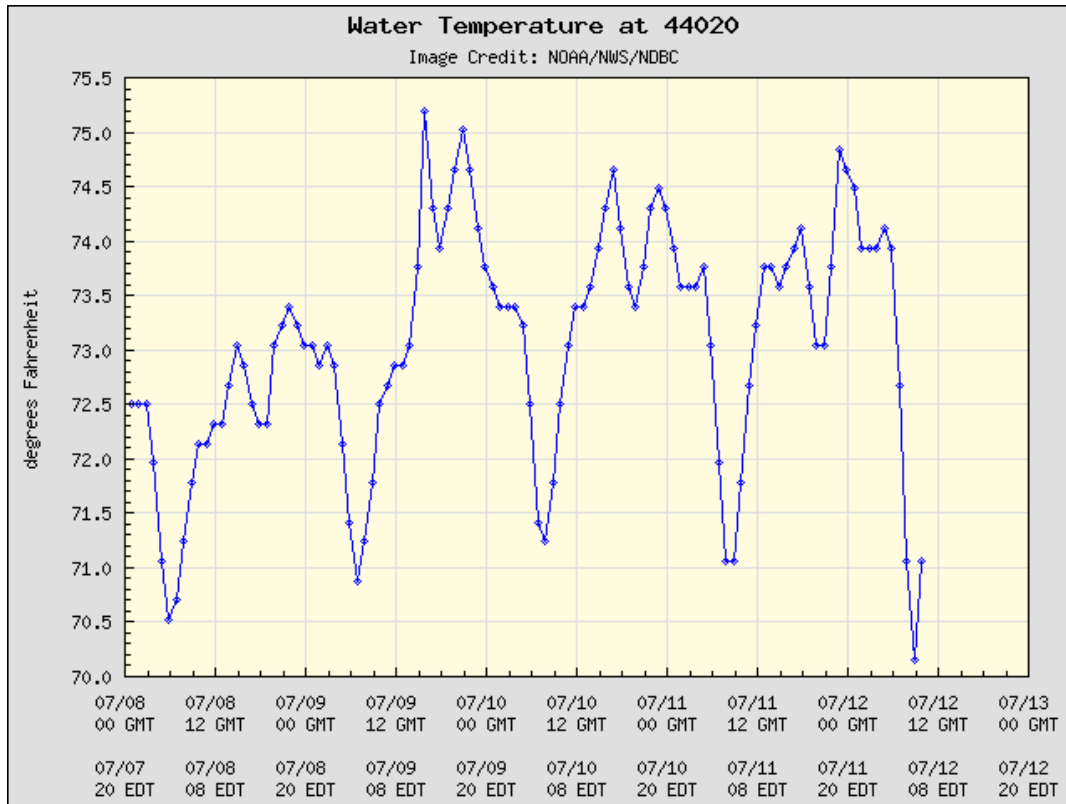
**Background:** Teachers should have a basic knowledge of oceanographic sampling, including what is sampled and why, and should have a basic familiarity with the NDBC web site and data from buoys. Students should know what oceans are on the coasts of the US and basic geography of the coastal areas to be studied.

### Procedure:

1. Introduce ocean monitoring with general questions such as “why are oceans such an important part of earth systems?” and “how do humans use oceans?” Ask students to describe reasons to collect and compare data on near shore and offshore conditions and have them suggest parameters or types of information that would be useful. Ask them to suggest methods for collecting each type of data.
2. Go to web site for Station 44020, the Nantucket Sound Data Buoy. Find the table labeled “Conditions at 44020 as of \*\*\* EDT” Answer the questions:
  - What is being measured? (For example, wind speed)
  - What are the values for each parameter for this hour?
  - What are the units of measurement for each parameter?Note: wind direction is measured as a compass direction, where north=0°, east=90°, south=180°, and west=275°.
3. Next to each parameter is a small icon of a graph. Choose a parameter and click on this icon to see a graph for the past 5 days.
  - What is the range of values for the past 5 days?
  - What patterns do you observe?
  - To save a graph, right click and choose “save picture as...” then name the file in a way you will recognize and save it.
  - Compare the 5-day graphs for air temp and water temp. What similarities and differences to you notice? How could you explain the differences?
  - Compare wind speed and barometric pressure. What patterns do you notice?
  - What questions do you have about these results?

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Graph of water temp in Nantucket Sound automatically generated at NDBC web site



4. To download data files, go to

[http://www.ndbc.noaa.gov/station\\_realtime.php?station=44020](http://www.ndbc.noaa.gov/station_realtime.php?station=44020)

Choose the 5-day or 45-day data sets. Go to the “File” menu on the toolbar, and choose “Save as...” then save it to a file and with a name you’ll remember. To work with the file, open Excel and open the file.