



Using Real-Time Data: Temperature's Impact on Sea Level Rise

1. Go to www.hrecos.org.
2. You are on the main HRECOS website. The map in the left of the page shows the location of all the HRECOS stations. Three HRECOS stations are listed below. Use the HRECOS map to identify which of these stations is closest to your home and circle that station below:

Schodack Island

Norrie Point

George Washington Bridge

3. Now that you have identified your station, select the "Current Conditions" box to go to the live HRECOS data page.



4. An **estuary** is where the river connects to the sea: it has tides twice a day, just like the ocean. Based on what you already know, is the Hudson River near you part of the estuary? Write your idea below.

5. Now let's test your hypothesis using HRECOS data. On the Current Conditions page, set the following parameters:

- a. Station1: YOUR STATION (hydro)
- b. Parameter1: Depth
- c. We will not be using Station2 and Parameter2.
- d. Units: English AND Continuous
- e. Start Date: Yesterday!
- f. End Date: Today!
- g. Time Zone: Eastern Time (EST/EDT)

Hit Plot1 to observe water level changes

6. Now that you have seen the graph, is your answer to question #4 correct? Is the Hudson River near you part of the estuary? Use the graph above to explain your answer.

7. In addition to the daily tidal cycle, Estuaries are also vulnerable to longer term changes in sea level. For example, sea levels rise and fall with the seasons as temperatures change. Based on what you know already, how do seasonal temperature changes impact sea levels?

In the spring and summer, temperatures **increase** causing sea levels to **increase** / **decrease** (circle one).

In the fall and winter, temperatures **decrease** causing sea levels to **increase** / **decrease** (circle one).

8. Now let's test your idea. Plot water depth data from spring to winter to look for a seasonal change:

On the Current Conditions page, set the following parameters:

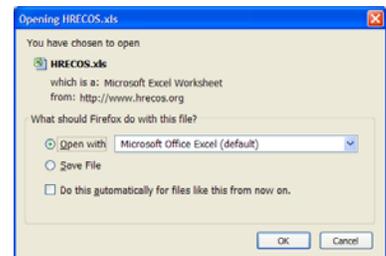
- Station1: YOUR STATION (hydro)
- Parameter1: Depth
- We will not be using Station2 and Parameter2.
- Units: English ****AND**** **Daily Average**
- Start Date: 5/1/2009
- End Date: 2/28/2010
- Time Zone: Eastern Time (EST/EDT)
- Hit Plot1 to graph the data

The screenshot shows the HRECOS web interface with the following settings: Station 1: Schodack Island, NY (hydro); Parameter 1: Depth; Station 2: (empty); Parameter 2: (empty); Units: English and Daily Average; Start Date: 2009-05-01; End Date: 2010-02-28; Time Zone: Eastern Time (EST/EDT). Buttons for Download, Plot 1 - 2, and Plot 1 are visible at the bottom.

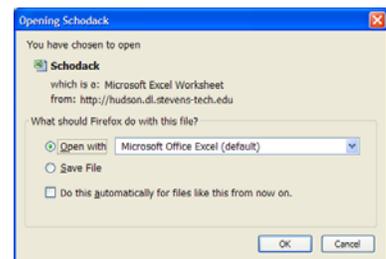
What a mess! You'll probably find it difficult to identify a pattern in this data because of all the "noise" in the water depth data (Scientists say that a data set is "noisy" when there are a lot of data points that aren't really important).

Lucky for you, there's a simple method that can rid us of the noise: plotting monthly averages!

9. At the bottom of the page you will find a hyperlink titled "HRECOS Data Graphing Spreadsheet". Click this link. A box will appear asking if you would like to open the document with Microsoft Office Excel (default); click "OK".

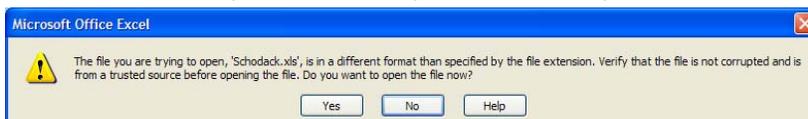


10. Now we need data to play with. Return to the "Current Conditions Page." With the same parameters you entered in #9, click "Download." A box will appear asking if you would like to open the document with Microsoft Office Excel (default); click "OK".



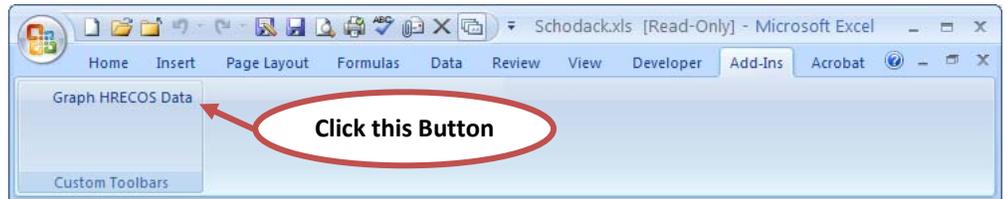
NOTE: You may get the following error message

The file is not corrupt, do not worry. Click "Yes" to proceed.



11. Finally, it's time to graph monthly average water depth:

- While still in Excel, select the menu tab "Add Ins".
- Click the button "Graph HRECOS Data."
- Follow the instructions to plot monthly averages of the water depth data.



12. Use the information provided in the graph to complete the relationship statements below:

In the spring and summer (May – September),
temperatures **increase** causing sea levels to **increase / decrease** (*circle one*).

In the fall and winter (October – February),
temperatures **decrease** causing sea levels to **increase / decrease** (*circle one*).

13. In 2007, more than 3,700 scientific experts from 130 countries (including the U.S.) participated in the Intergovernmental Panel on Climate Change (IPCC) Report, which summarized a lot of research on global climate change. They found that the earth has warmed during the last century, that warming is changing the planet's climate and that much of the warming is caused by human activities. Based on our experiment today, how will rising temperatures impact sea levels? How will rising temperature impact water levels in the Hudson River Estuary?