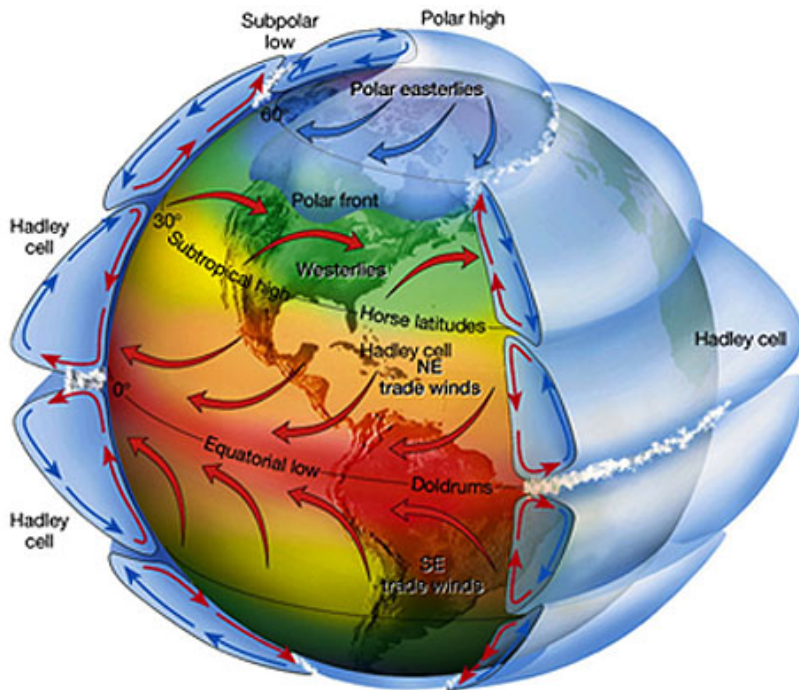


Data Scavenger Hunt

Investigating Water Temperature & Environmental
Phenomena at NERR Reserves

Turn & Talk: Make Predictions



- How do you think air and water temperatures will change as you move northwards along the east or west coast of the U.S.?

NERR Environmental data scavenger hunt

Name: _____

I. Exploring water temperatures at West Coast vs East Coast NERRS

Data Collection: You will be exploring environmental conditions across the country using real-time data collected at estuarine research reserves located throughout the United States. Navigate to the NERR Central Data Management Office (CDMO) webpage at <http://cdmo.baruch.sc.edu/dges/>. Move your mouse over a reserve on the map to see the name and location of the reserve and current conditions. In the spaces below, record the current water temperatures for the six west coast reserves, and six east coast reserves.

West Coast Reserves

Kachemak Bay, AK _____ °C

_____ °C

_____ °C

_____ °C

_____ °C

_____ °C

Tijuana River, CA _____ °C

East Coast Reserves

Wells, ME _____ °C

_____ °C

_____ °C

_____ °C

_____ °C

_____ °C

Jobos Bay, PR _____ °C



What other measurements can you get using the real-time data interface? List them in the space below.

Forensics with Environmental data

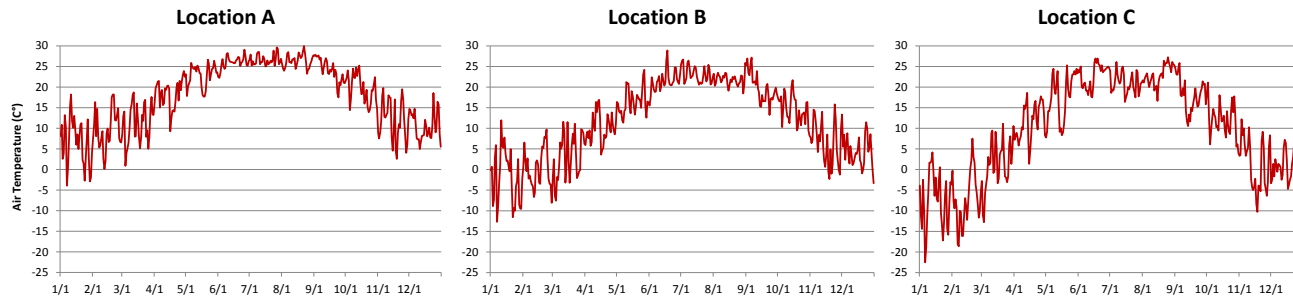
Work with your partner to look up the following data on the NERR data portal and make a prediction about what phenomenon is taking place. Explain your reasoning using data as evidence.

Date(s)	Location	Station	Parameters
8/21/17	Padilla Bay South Slough San Francisco Bay Tijuana River	Any MET station	Total solar radiation (PAR), air temperature

Analyzing surface water data

From Different Coastal Reserves

Revisit Mystery Locations



Map showing the three mystery locations represented by the air temperature data in the graphs at the top of the page.

Objective: Collect water temperature data from four estuaries representing different coastal regions of the US.

You and your group will use the NERR Central Data Management Office (CDMO) web portal to collect and graph one year of water temperature data (2014) from four different reserves representing northern and southern estuaries on the east and west coast of the US. The reserves and sampling stations are:

- 1) Winyah Bay/North Inlet (Oyster Landing water quality station) in South Carolina
- 2) Jacques Cousteau Reserve (Lower Bank water quality station) in New Jersey
- 3) Tijuana River Reserve (Boca Rio water quality station) in southern California
- 4) Elkhorn Slough (Vierra Mouth water quality station) in central California

Data collection: Go to the NERR website (<http://cdmo.baruch.sc.edu/get/export.cfm>) and select the reserve of choice using the interactive map (below left), then select the station indicated in the description above from the scrolling list (below right). Make sure you select a "water quality" station rather than a nutrient or meteorological station.

Select the "graph data" option and generate a graph of temperature data for the 2014 calendar year by entering 1/1/14 and 12/31/14 in the custom date fields.

Click "save this graph as an image". Repeat this for all four reserves listed above. Bring a printed copy of the graph(s) to class and come prepared to share, interpret and discuss the data.

Choose Reserve

Choose Sampling Station

View or Download Data

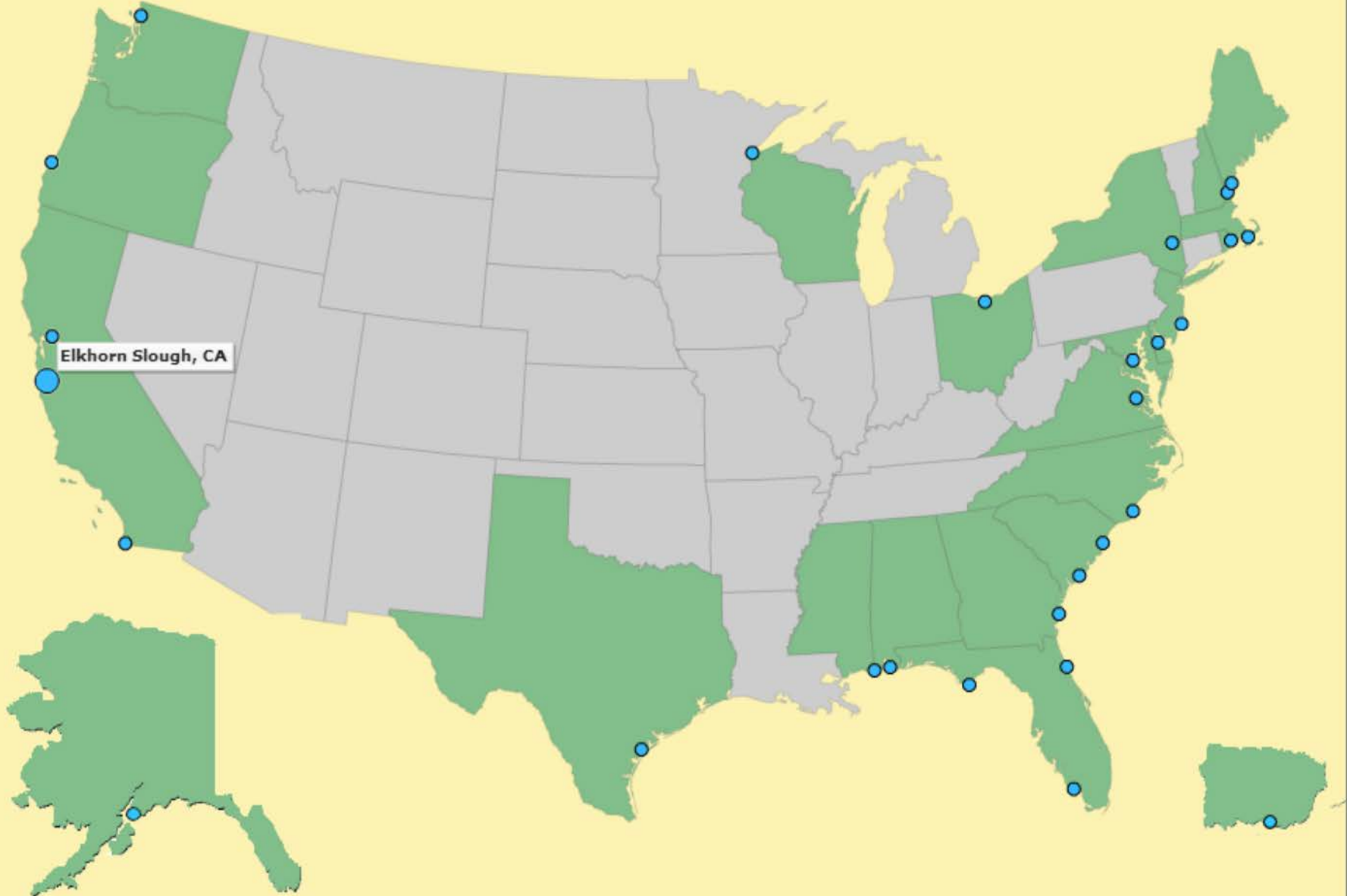
Submit Info

Complete!

Please select a Reserve from the map below:

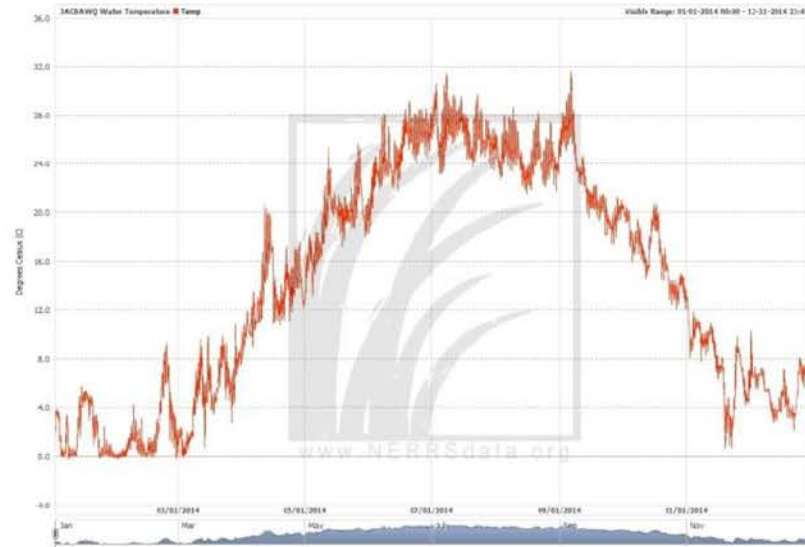
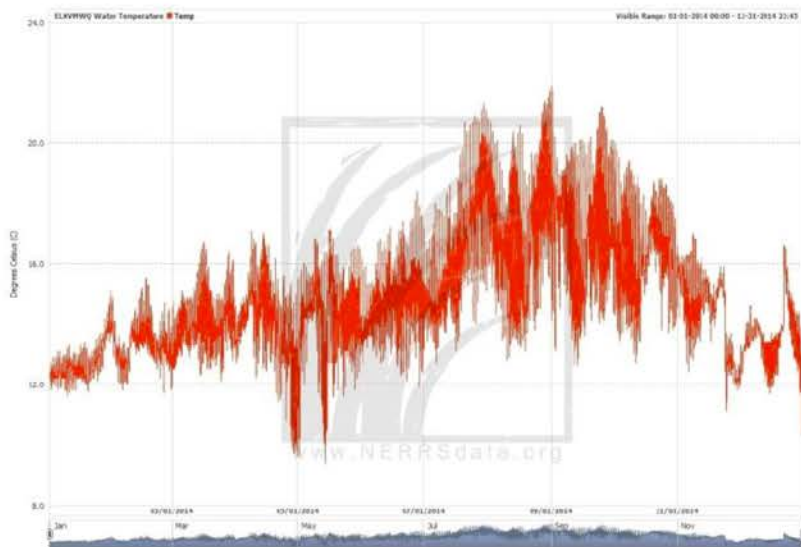
If you already know the station code, enter it here. If not, choose a Reserve from the map below.

Submit



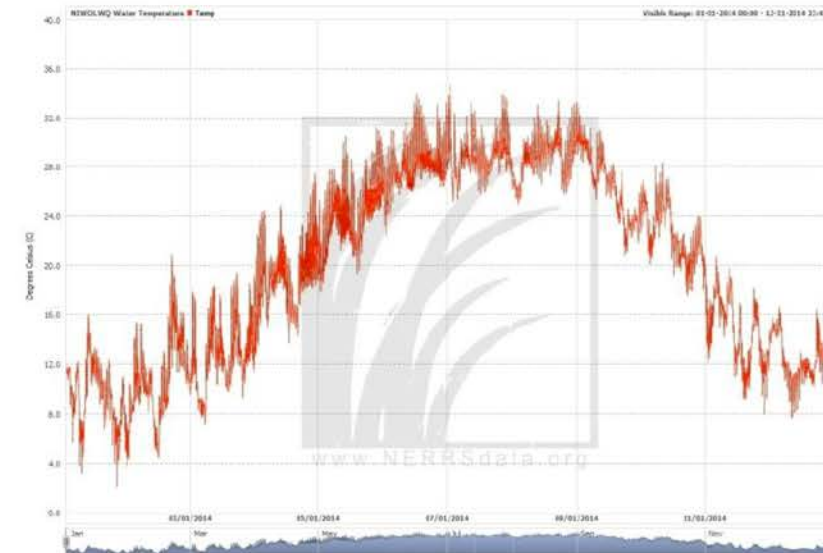
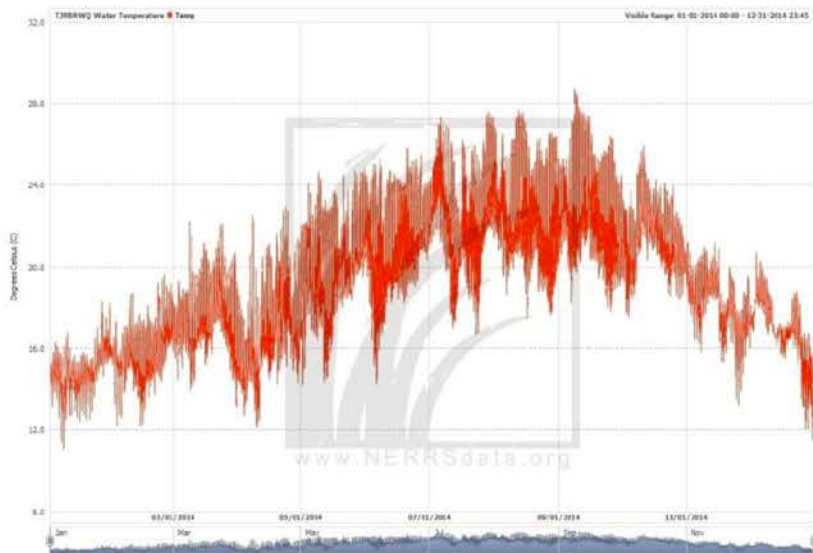
Data Visualizations – Northern estuaries:

Below is a comparison of annual variability in temperature at Elkhorn Slough (CA) vs. Jacques Cousteau Reserve (NJ)



Data Visualizations – Southern estuaries:

Below is a comparison of annual variability in temperature at Tijuana River (CA) vs. North Inlet/Winyah Bay (SC)



Student Data Sheet
Exploring Water Temperatures at four National Estuarine Research Reserves

Step 1: Use the four graphs of water temperature generated online to complete the data table below.

Reserve Name:	Elkhorn Slough (CA)	Jacques Cousteau (NJ)	Tijuana River (CA)	North Inlet (SC)
Station Name: <i>Where were data collected?</i>				
Location: <i>East vs West Coast?</i>				
Nearest ocean				
Highest and lowest value on the y-axis?				
Highest temperature recorded in dataset?				
Lowest temperature recorded in dataset?				
Annual temperature range (high–low)				
Other observations?				

What other observations did you make when working with the temperature data from the four Reserves?

Student Data Sheet - Exploring Water Temperatures at four National Estuarine Research Reserves

- **Data Orientation Questions:**

- a. What kind of graph is being used to display the data? What type of data are represented by the x- and y-axis of the figures?
- b. How do you think water temperature data were measured and recorded?

- **Data Interpretation Question:**

- a. Did the timing of periods of warm and cold water differ among the four reserves? Explain.

- **Data Synthesis Questions:**

- a. Warming of surface waters occurs later in Oregon than the other east coast reserves. What do you think might explain this pattern?
- b. Compare the different temperature scales (i.e. y-axis) on the four graphs. How did this influence your interpretation of patterns and making comparisons among the Reserves?

Exploring patterns in the graphs

How do you think the following factors might explain differences in annual water temperatures at the four reserves?

Discuss two of the following factors:

- Location on the east vs. west coast
- Latitude of the reserve
- Season
- Surface or deep ocean currents

Think back to Mystery Locations – air temperature data

- Does the water temperature data from Jacques Cousteau Reserve and North Inlet Winyah Bay provide additional evidence in support of your claims regarding the location where air temperature data from Location A and Location B were collected?



Turn & Talk about data activity

- What skills did you use to compare the air and water temperature data to look for relationships?
- Did these comparisons provide further evidence for the importance of the ocean in regulating air temperature? Explain.
- What additional information about these two reserves did you learn from looking at the air temperature data for a second time (e.g., what did you see/understand this time that you didn't last time)?