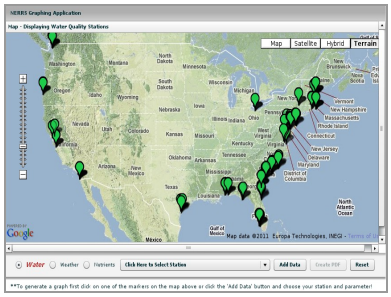
STUDENT MASTER

A Salty Tale of Intrigue

Clearly something affected oyster abundance in Aransas and Copano bays during 2007 and 2008. Perhaps it had something to do with the water in the bays. Let's start by looking at the water's salinity.

In this exercise, you will gather real salinity and precipitation (rainfall) data in both Aransas and Copano bays for 2007 and 2008. Could salinity be the smoking gun?

Procedure



1. Visit http://estuaries.noaa.gov/ScienceData/Graphing.aspx and click on the map where it says "Click here". This will open up the SWMP graphing tool.
2. The graphing tool application will open with a map of the United States. On the left hand side of the page will be Step 1 titled "Which Data". This section lists the various types of stations that gather data within Reserves around the United States.
3. Select the "Water Quality" button.
4. Specify a Date Range under Step 2. Enter a start date of "January 1, 2007" and an end date of "December 31, 2008."
5. Under Step 3 choose "TX>> Mission Aransas> >Copano Bay East" from the list of recording stations.
6. Now you need to select a type of water data to graph. Click on the "Which Parameter" pull-down found under Step 4. Select "Salinity" from the list of water data gathered at this site.
7. Select an output format for the data you want graphed. Click next to the "Graph" button. At the bottom of the page click on the blue "Get Data" button to generate your graph. There may be a delay in seeing your graph.
8. You may have to zoom out to see the whole two year period, but you will notice that some salinity data are missing because water quality data collection did not begin in Copano and Aransas bays until April 24, 2007. Note that date labels on the x-axis are for the first of the month. For example, 2/08 is February 1, 2008.
9. You may want to save the graph image to your local computer as a PDF or print the graph before moving on. (You can print a graph by clicking on the "Print Graph" button found in the bottom right hand corner of the graph.) Be sure to write in missing number labels on the vertical axis (salinity) if they do not print.
10. Use a ruler to draw a horizontal line across your graph equivalent to a salinity value of 17 ppt. Label the line "20-year average salinity." Any salinity value below this line is below average for water in Copano Bay over a 20 year period; any value above this line is above average, if we ignore seasonal effects.
11. Now let's get the precipitation data for Copano Bay. Beneath the graph, under "Second Data Type" select "Weather".
12. Select "TX>> Mission Aransas> >Copano East" from the list of recording stations.
13. Finally select "Precipitation" from the list of available weather data parameters gathered at this site.
14. Click the "Plot Graph" button and your results will appear on the graph in blue.
15. You may want to save the graph image to your local computer as a PDF or print the graph before moving on. (You can print a graph by clicking on the "Print Graph" button found in the bottom right hand corner of the graph.) Be sure to write in missing number labels on the vertical axis (precipitation) if they do not print.
16. Now create a salinity graph for Aransas Bay. Select "Water" data again. Follow Steps 3 through 7 above, except this time choose the "TX>>Mission Aransas>>Aransas Bay" station. Be sure to print or save your graph.

17. Use a ruler to draw a horizontal line across your graph equivalent to a salinity value of 20 ppt. Label the line "20-year average salinity." Any salinity value below this line is below average for water in Aransas Bay over a 20 year period; any value above this line is above average.
18. There is no weather station data for Aransas Bay. You will be using the precipitation graph from Copano Bay East as an approximation of data in nearby Aransas Bay.
19. Here is one more piece of information that might be related to precipitation in the estuary during 2007 and 2008. These data comes from a United States Geological Survey (USGS) water data collection station on the Aransas River, near where the river empties into Copano Bay.

Stream Discharge Data for Aransas River south of Skidmore, Texas
(USGS Station 08189700) Drainage area 247 square miles

Month/Year	**Monthly average river discharge** (cubic feet per second)
January 2007	96
February 2007	9
March 2007	105
April 2007	17
May 2007	10
June 2007	29
July 2007	727
August 2007	17
September 2007	21
October 2007	8
November 2007	7
December 2007	7
January 2008	7
February 2008	6
March 2008	9
April 2008	6
May 2008	4
June 2008	4
July 2008	8
August 2008	58
September 2008	25
October 2008	5
November 2008	3
December 2008	3

Source: USGS Surface-Water Monthly Statistics for the Nation

20. Save your collected data to analyze in Exercise 3: *Cracking the Case with Data.*