

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 estuaries.noaa.gov and click on the "Science & Data" tab near the top of the page.
2. Click on "Graphing Tool" in the red bar beneath the "Science & Data" tab.
3. The graphing tool application will open with a map of the United States. The green pins indicate stations gathering water data within estuaries around the United States.
4. Select "TX>> Mission Aransas>> Copano Bay East" from the list of recording stations.
5. Now you need to select a type of water quality data to graph. Click on the "Add Data" button. A new "Choose Parameters" window will display.
6. Under Step 3: Pick Parameter label, use the pull down list to select "Salinity" from the list of available water quality data parameters gathered at this site.
7. Finally, you will need to choose which range of dates to include in your graph. Under Step 4: Pick Date and Range, specify a start date of January 1, 2007 and an end date of December 31, 2008.
8. Click on the "Add" button to generate your salinity graph. There may be a delay in seeing your graph.
9. Use the minus button below the graph to shrink the graph until you can see the entire date range (January 1, 2007 to December 31, 2008) on your graph. (Date labels on the x-axis are for the first of the month. For example, 2/08 is February 1, 2008.)
10. Right-click inside the graph area and select Print from the popup menu to print your graph. (You may also save the graph as a PDF file for later use.) Be sure to write in missing number labels on the vertical axis (salinity) if they do not print.
11. Use a ruler to draw a horizontal line across your graph equivalent to a salinity value of 17 psu. (A psu. is a "practical salinity unit." One psu. is equal to one part per thousand dissolved solids.) 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.
12. Now you will get the precipitation data for Copano Bay. Beneath the graph, select "Weather." This will reset the tool and you will see the map of the United States again. The blue pins indicate stations gathering weather data within estuaries around the United States.
13. Select "TX>> Mission Aransas>> Copano East" from the list of recording stations.
14. Now you need to select a type of weather data to graph. Click on the "Add Data" button. A new "Choose Parameters" window will display.
15. Under Step 3: Pick Parameter label, use the pull down list to select "Precipitation" from the list of available weather data parameters gathered at this site.
16. Under Step 4: Pick Date and Range, be sure that you still have a start date of January 1, 2007 and an end date of



December 31, 2008.

17. Click on the “Add” button to generate your precipitation graph. When you are asked if you want to add the new data as a second set of labels on your y-axis of your previous graph, select “No” to create a new graph.
18. Right-click inside the graph area and select Print from the popup menu to print your graph. You may also save the graph as a PDF file for later use. Be sure to write in missing number labels on the vertical axis (precipitation) if they do not print.
19. Now create a salinity graph for Aransas Bay. Select “Water” data again. Follow Steps 4 through 10 above, except this time choose the “TX>>Mission Aransas>>Aransas Bay” station. Be sure to print or save your graph.
20. Use a ruler to draw a horizontal line across your graph equivalent to a salinity value of 20 psu. 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.
21. There is no weather station data in Aransas Bay. You will be using the precipitation graph from Copano Bay East as an approximation of data in nearby Aransas Bay.
22. Here is one more piece of information that might be related to precipitation in the estuary during 2007 and 2008. This 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

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