Worksheet: Analyzing Real World CTD Data

Location of CTD

Graph 1

Graph 2
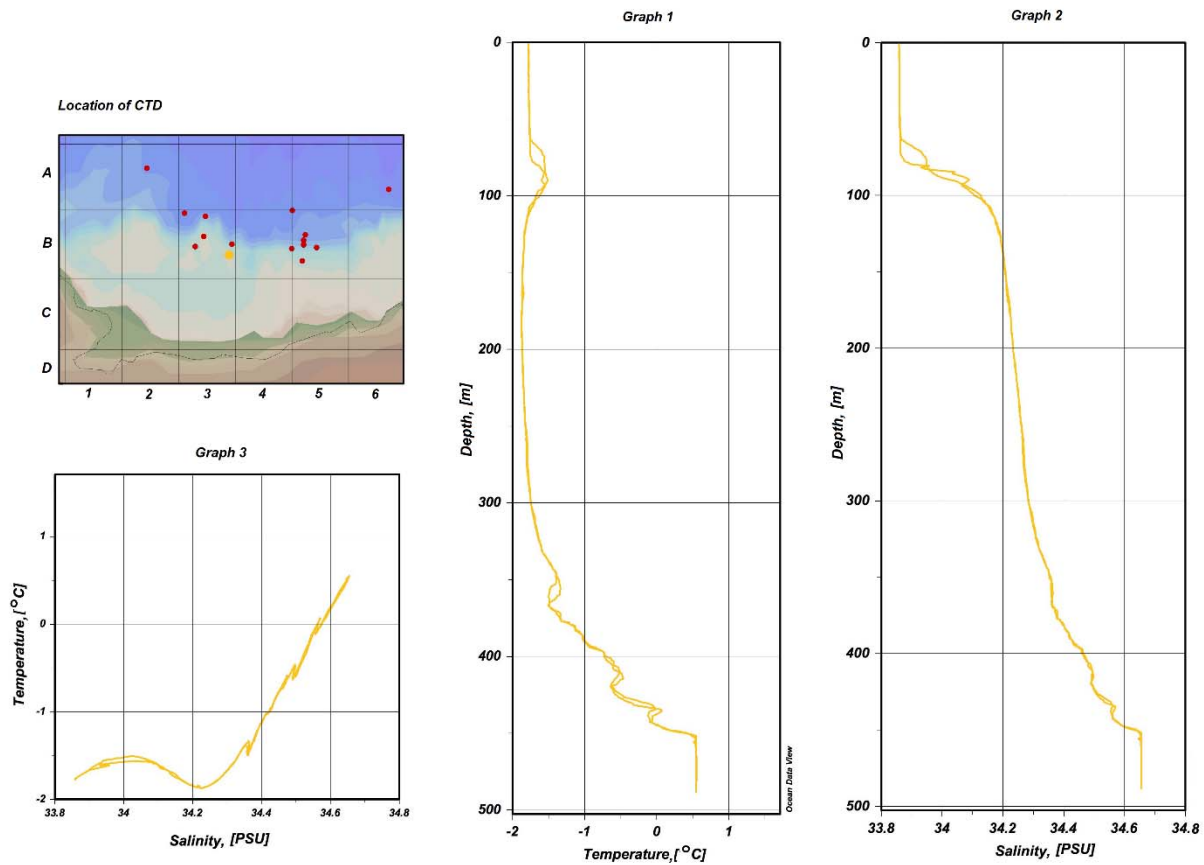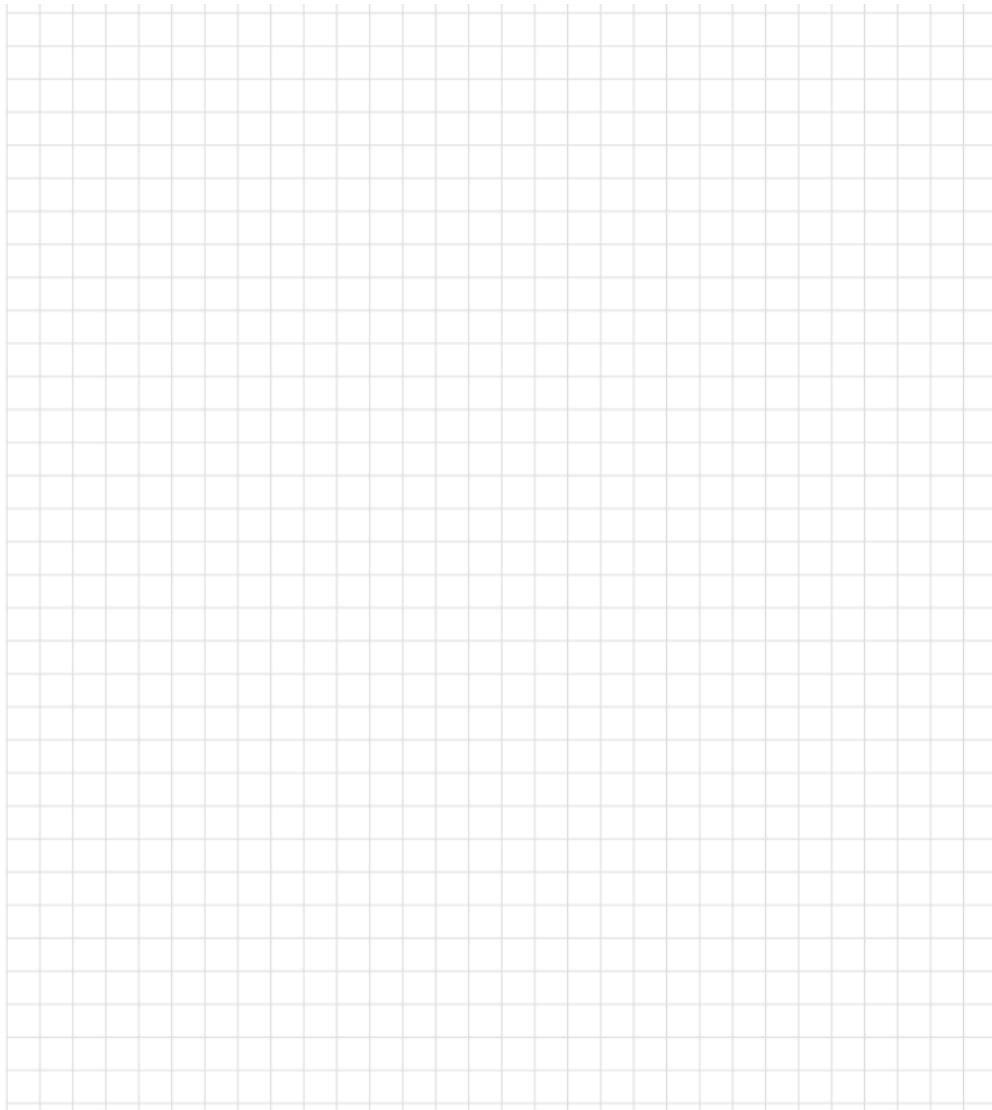
Graph 3

These graphs depict data from a CTD conducted in East Antarctica. Using the graphs above, answer the following questions.

1. In Graph 1, what variables are represented?
2. In Graph 2, what are the axes? What is the Y axis? Why is this variable on the Y axis?
3. What depth is the warmest?
4. What is the salinity at 150m?
5. How does salinity correlate with depth?
6. What is the highest temperature recorded during this cast?
7. At what depth does temperature decrease the most?
8. If the trend in the relationship between temperature and salinity were to continue as it is now, what would you predict the temperature of water with salinity 34.7 to be?
9. Generally, how does salinity vary with depth in this location?
10. In what location (provide the grid letter and number) was this CTD taken?
11. What is represented by graph 3?
12. Would you expect all of the CTD locations to have the same profile? Why or why not?
13. How many casts were conducted in this general area?
14. What conclusions can you draw from this profile?

Graph the following data collected during another CTD Cast. Label your axes. How many water masses, of different salinities, can you infer from your graph? Do you think your answer would change if you were provided with temperature data as well? Why or why not?

Depth (m)	Salinity (psu)
0	33.9
100	33.9
150	34.2
200	34.2
250	34.3
300	34.4
350	34.4

Depth (m)	Salinity (psu)
400	34.6
450	34.7
500	34.7
1000	34.7
1500	34.7
2000	34.7
2500	34.7

Worksheet: Relative Density

The lab technicians forgot to write down which water samples were collected at what depths during the CTD! All you have are bottles of water, with unknown salinities, and the data from the CTD (below) to sort this out. With what you've learned, do you think you can determine which water sample came from where?

What variable will you use to determine where the water samples were collected? Why?

_____

_____

Using experimentation, determine the relative density of each solution. Rank them from lowest density to highest density.

1) _____

2) _____

3) _____

4) _____

5) _____

Which water was the densest? What does this mean in terms of salinity?

_____

_____

Which water was the least dense? What does the mean in terms of salinity?

_____

_____

Match the water samples to the graph. Which water samples were taken from which section of ocean? What are their true salinities? [NOTE: The colors of your samples may not match the false color graph!]

Salinity, [PSU]