Mame:	• •	76	N	a	\bigcap	1
-------	--------	----	---	---	-----------	---

Law: Making a Salinity profile

Some of the most important data scientists collect when studying the ocean are salinity values of the ocean water. Why would such data be useful? Salinity values at the surface of the ocean help scientists understand how climate affects the oceans. Salinity values at different depths provide clues about ocean currents and circulation patterns. In this activity, you will construct a salinity profile with data collected during a research cruise in the Atlantic Ocean. Six stops are listed during which water was sampled to a depth of 2400 meters. You will use this profile to explore the effects of climate and ocean currents on salinity at different ocean depths.

Lab Skills and Objectives

- To construct an ocean water salinity profile
- To interpret the salinity pro-

Materials

- graph paper
- colored pencils
- Earth's Climate map,

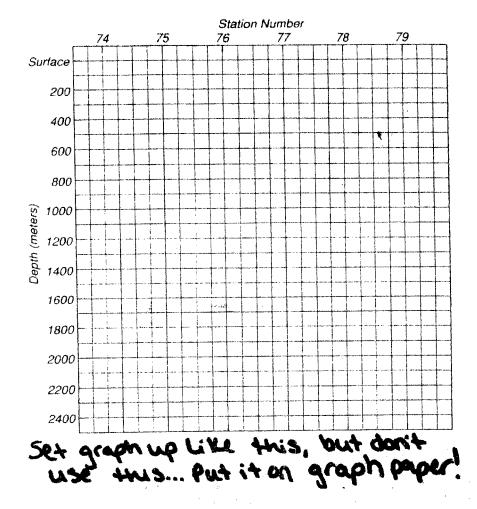
Approved by page 1

Procedure

- 1. The data table shows values for salinity obtained during a cruise in the North Atlantic. Look at the table.
- 2. On graph paper, set up a grid with depth in meters on the vertical axis and sta-

- tion numbers on the horizontal axis. (Figure 18.15).
- 3. Copy the data from the data table to the profile grid. For each station record the salinity for all depths listed.
- 4. On the profile, draw lines to separate the different salinity values. Do not connect the data points. Instead draw the line between the data points. Each line should begin and end at a margin of the graph.
- 5. Use colored pencils to color the area between the lines for each profile. Use a different color for each salinity value. Use the same color for areas with the same salinity values. Make a key showing the salinity value that each color represents.
- 6. Answer the questions in Analysis and Conclusions.

		Data	Table				
STATION				,			
NUMBER	74	75	76	77	78	79	
LATITUDE	36°N	36°N	36°N	36°N	36°N	36°N	
LONGITUDE	20°W	18°W	16°W	14°W	12°W	10°W	
DEPTH (m)	SALINITY (0/00)						
Surface	36.2	36.2	36.2	36.3	36.3	36.4	
200	35.9	36.0	35.9	36.0	36.0	35.9	
400	35.7	35.7	35.7	35.7	35.7	35.7	
600	35.6	35.6	35.6	35.6	35.7	35.8	
800	35.7	35.7	36.0	35.8	35.9	36.1	
1000	35.8	35.8	36.1	36.2	36.2	36.4	
1200	35.7	35.8	36.1	36.1	36.1	36.1	
1400	35.5	35.7	35.7	35.8	35.8	35.8	
1600	35.3	35.5	35.5	35.5	35.4	35.5	
1800	.35.1	35.3	35. 2	35.3	35.2	35.3	
2000	~;35.1	35.1	-35 :1	35.2	35.1	35.2	
2200	35.0	35.0	35.1	35.1	35.1	35.1	
2400	35.0	35.0	35.0	35.0	35.0	35.1	



Analysis and Conclusions

- 1. What is the average salinity of ocean water? In what area of your profile is this average value found?
- 2. At which stations and depths are salinity values on your profile highest? At which stations and depths are salinity values lowest?
- 3. The cruise area from which these salinity values were taken is 36° N and 10°-20° W. Turn to the Earth's Climates map on page 664 and locate the cruise area. Describe the climate of the land area nearest to the cruise area.
- 4. How would you expect the climate in the cruise area to affect the salinity at the ocean surface? How would you expect the climate to affect the deeper ocean levels? Does your salinity profile support your answer?
- 5. Describe the salinity profile at depths of 800-1200 meters. Can the characteristics of the profile be explained by the climate of the area?
- 6. Explain how the presence of the Mediterranean Sea

- east of the cruise area accounts for the salinity profile at 800-1200 meters.
- 7. Based on your answer for question 6, explain the likely depth and direction of ocean currents in the cruise area.
- 8. In some parts of the world, ocean water with above average salinity values sinks to deeper levels. Is there any evidence for such vertical movements of water in your salinity profile? Explain your answer.