

EAS 100
Homework Assignment #3

Ocean Basin Depth Profile
(Trans-Atlantic Ocean Depth Profile –
Cape Hatteras, North America to Cape Blanc, Africa)

Name: _____

Objective:

Plot a bathymetric (ocean depth) profile across the Atlantic Ocean to examine the typical shape of the ocean basins. This exercise also provides experience with graphing and concepts of scale.

Procedure:

The table given on the attached page contains depth data for a transect across the Atlantic Ocean from Cape Hatteras, North America to Cape Blanc, Africa. Plot the 61 distance and depth points on the attached graph, then connect the dots to form a bathymetric profile or ocean basin topography profile. Note that the distance scale is in **kilometers** and the depth scale is in **meters**. Thus, the depth data are vertically exaggerated (by a factor of 200) which enhances the subtle features of the ocean basin topography. A plot at true (1 to 1) scale will be provided later to show the actual topography. Vertical exaggeration is useful to display profile data when the horizontal extent of the data is very large and when the profile is relatively smooth. The data that are given in the table are sampled at a large interval (100 km between data points) and, thus, the bathymetric profile is only a rough approximation of the true ocean basin topography. However, the main features of the ocean basin are visible on the graph. For additional background information, refer to pages 239-244 of Lutgens and Tarbuck (2002).

Questions:

1. On the graph, label the following features of the ocean basin: continental slope, abyssal plain, mid-Atlantic ridge.
2. What is the approximate ocean depth at the mid-Atlantic ridge and the relief of the ridge (difference in depths, or elevations, between the top of the ridge and the adjacent, relatively flat ocean bottom)?

Ocean depth at mid-Atlantic ridge _____

Relief (difference in ocean depth between the ridge and the abyssal plain)
Of mid-Atlantic ridge _____

3. What is the approximate slope of the west flank of the mid-Atlantic Ridge (measure the difference in ocean depth along the profile between about 2200 km and 3200 km distance and divide by the difference in distance, 3200-2200 or 1000 km. Be sure that both measurements, differences in depth, and distance, are in the same units, either km or m. the resulting number will be the slope expressed as a ratio. (The slope can also be given as a percent or as an angle.)

Approximate slope of the west side of the mid-Atlantic ridge _____.

X (km)	Depth (m)
0	0
100	100
200	3300
300	4000
400	4600
500	4900
600	5200
700	5200
800	5200
900	5200
1000	5000
1100	4900
1200	4700
1300	4900
1400	4500
1500	5000
1600	5200
1700	5600
1800	5500
1900	5500
2000	5600
2100	5800
2200	5900
2300	5200
2400	5500
2500	5100
2600	5000
2700	4700
2800	4200
2900	4000
3000	3700
3100	3100
3200	2500
3300	4100
3400	4000
3500	4400
3600	4900
3700	4900
3800	5400
3900	5800
4000	5500
4100	5900
4200	6100
4300	5900

X (km)	Depth (m)
4400	6000
4500	6200
4600	5900
4700	5800
4800	5800
4900	5700
5000	5400
5100	5300
5200	5100
5300	5000
5400	4900
5500	4800
5600	4200
5700	3200
5800	2000
5900	100
6000	0

