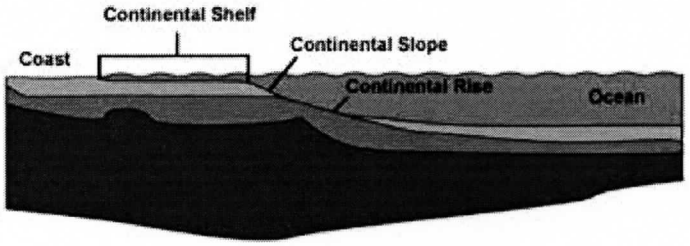


Bathymetric Contouring: North Carolina's Continental Shelf

OBJECTIVES: To make contour and profile maps.
To identify the continental shelf and slope.

Information on ocean depth (bathymetric data) from soundings relates facts on the structure and features of the ocean floor. Water depth is usually measured by a technique of echo sounding called **sonar**. Until the 1800's, soundings were made by dropping a knotted line over the side of the ship and measuring the length of line needed to reach the bottom.

WORDS TO KNOW: fathom- unit of depth measurement- it is equal to 6 ft or about 2m
mean low water- the depth of the water level during the average low tide
contour map (topographic)- contour lines are drawn connecting points of equal depth. Contour lines provide us with an idea of the bottom landscape or "seascape". (Note: When contour lines of equal intervals are drawn, the closer they are, the steeper the slope; the farther they are apart, the gentler the slope.)
profile map- the side view of the seascape- showing the ups and downs
continental shelf- an extension of the coastal plain, i.e., it consists of similar material

MATERIALS: bathymetric chart with depths marked on it
profile graph
yellow, red and blue colors

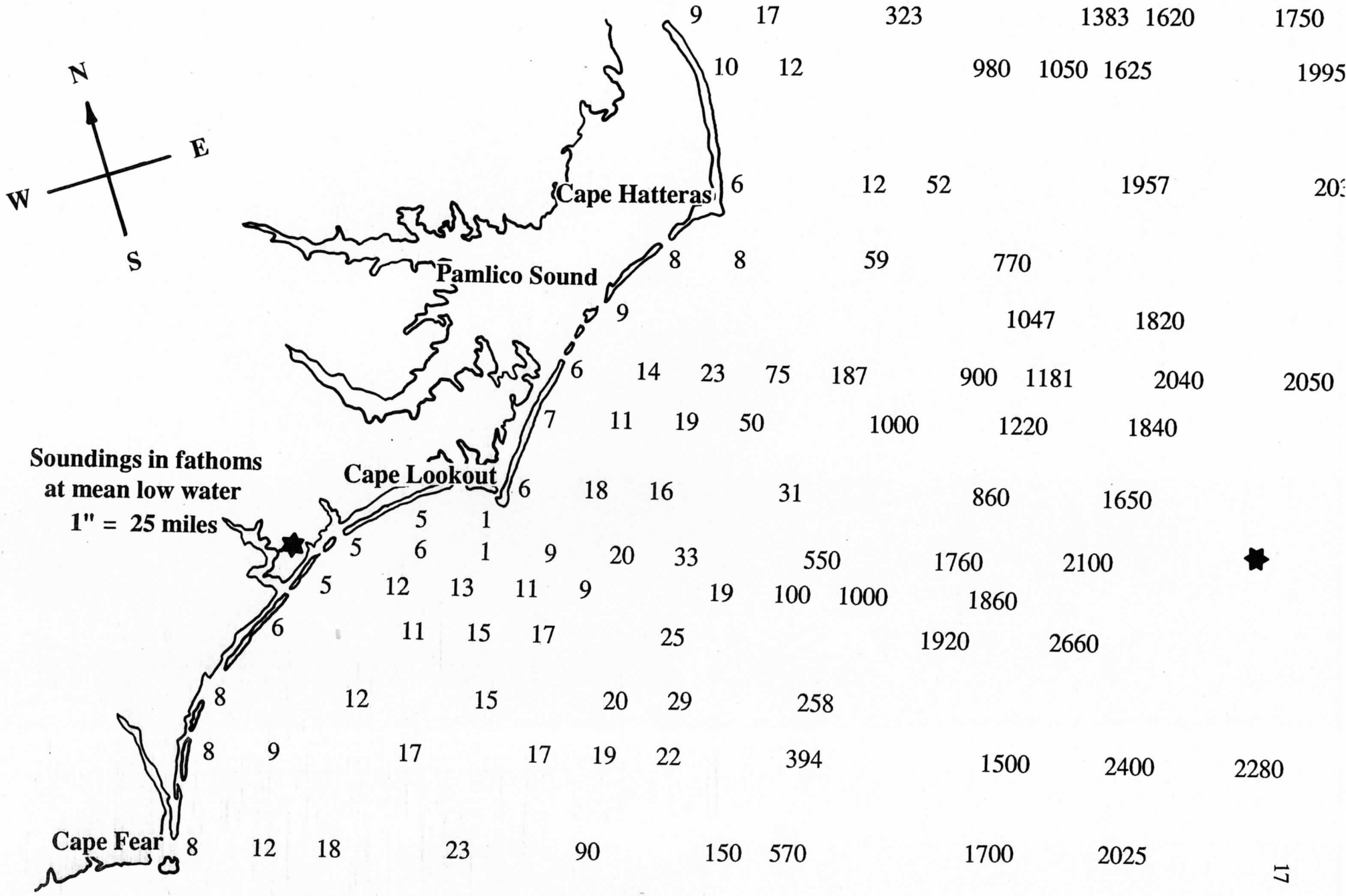
PROCEDURE:

1- Look carefully at the chart of the waters off the coast of North Carolina. The numbers on the chart represent the depth of water in fathoms (1 fathom= 6 ft) at mean low water.
2- Note that the water depth increases from the shoreline. With your finger, trace the 20-fathom depth along the shore from Cape Fear to Cape Hatteras. Notice that it is sometimes near the shore and sometimes further out- marking the presence of shoals and shallow water.
3- With a **PENCIL** (in case you make a mistake), draw a solid line connecting the areas that would be 20 fathoms deep. This line is called a contour line.
4- With a pencil, draw four more contour lines for depths of 50 fathoms, 100 fathoms, 1000 fathoms and 2000 fathoms.
5- The continental shelf is relatively shallow and may be defined by being less than 100 fathoms. Color the continental shelf yellow.
6- The continental slope is steep, and the water depths increase rapidly in a short distance. It gradually becomes the continental rise and ocean basin. Color the area between 100 and 1000 fathoms red. Color the ocean floor blue.

DISCUSSION:

1- What might be a disadvantage to using a knotted rope to take soundings of the depths?
2- What might be a disadvantage to using sonar?
3- What might be the advantages to sonar?
4- Discuss the importance of bathymetric contouring as it relates to navigation and commercial fishing.
5- What relation is there between water depth and the position of the capes?
6- What advantage would accrue to a state with a wide continental shelf?
7- If the depth measure is 1105 fathoms that is equivalent to how many feet?
8- How do the various depths affect the organisms that can live in those areas?
9- Differentiate between topography and bathymetry.
10- It has been said that sound is the "eyes" of the ocean. What might that mean?

Figure


N
W
E
S
Cape Hatteras
Pamlico Sound
Cape Lookout
Cape Fear
Soundings in fathoms
at mean low water
1" = 25 miles
9 17 323 1383 1620 1750
10 12 980 1050 1625 1995
6 12 52 1957 203
8 8 59 770
9 1047 1820
6 14 23 75 187 900 1181 2040 2050
7 11 19 50 1000 1220 1840
6 18 16 31 860 1650
5 1
5 6 1 9 20 33 550 1760 2100
5 12 13 11 9 19 100 1000 1860
6 11 15 17 25 1920 2660
8 12 15 20 29 258
8 9 17 17 19 22 394 1500 2400 2280
8 12 18 23 90 150 570 1700 2025