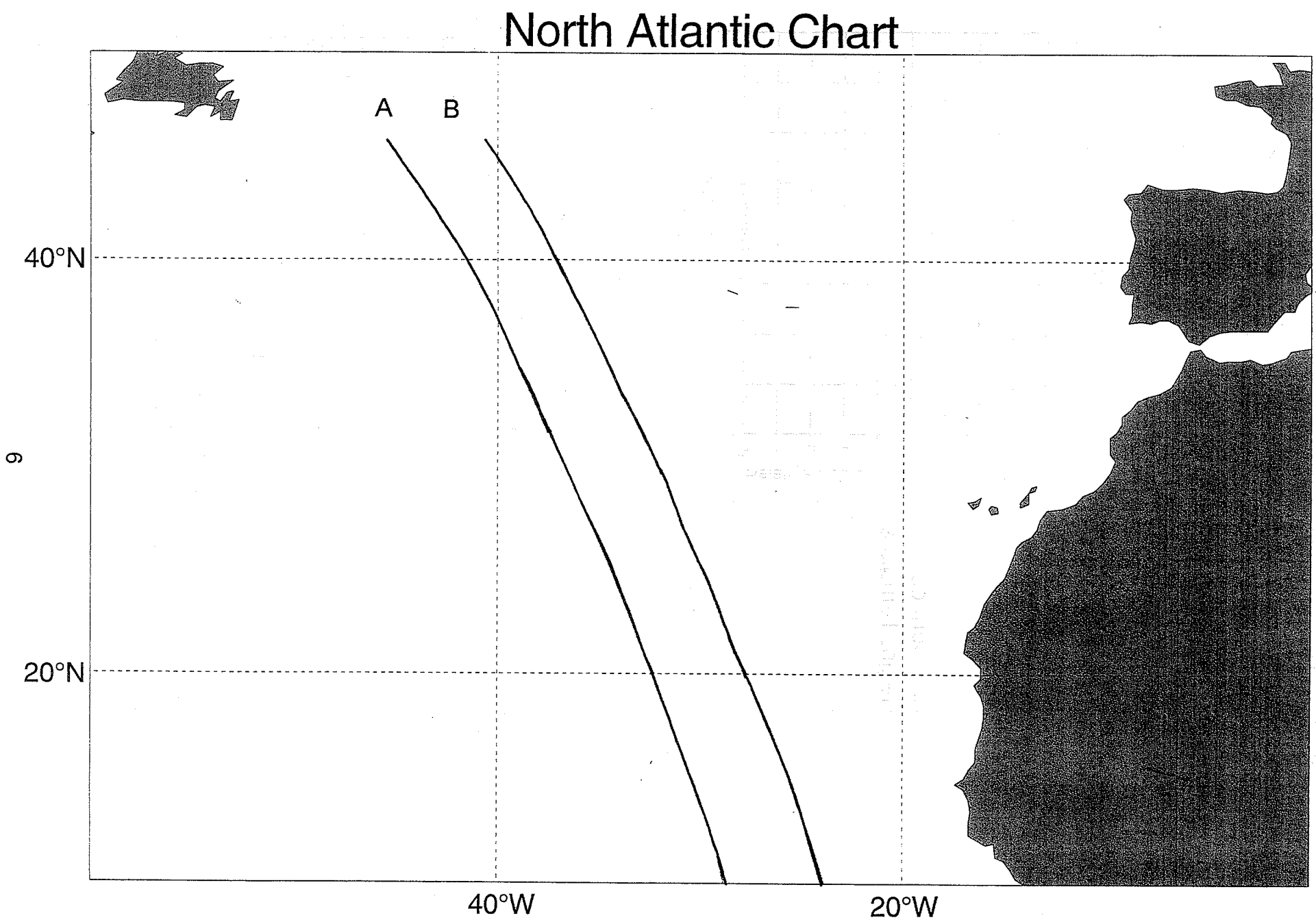

North Atlantic Chart
A
B
40°N
20°N
40°W
20°W

Sea Surface Height Tables

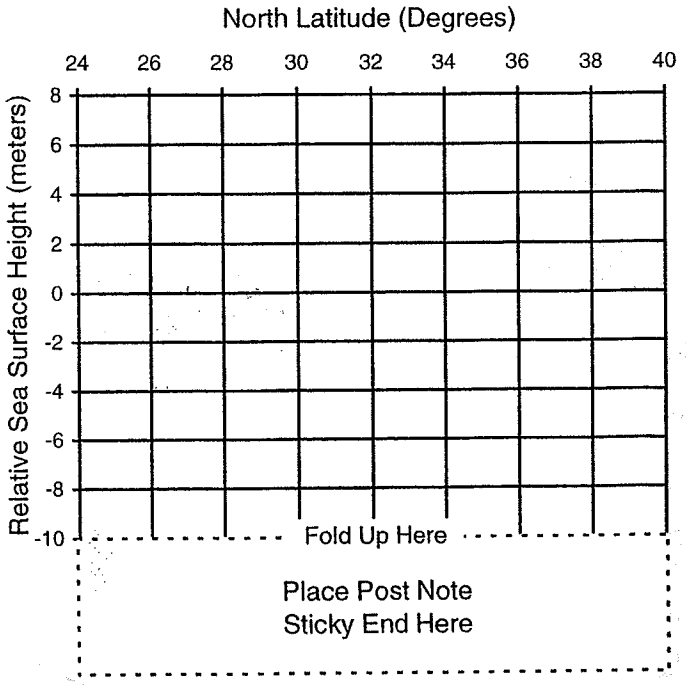
A

Latitude (°N)	24	26	28	30	32	34	36	38	40
Height (m)	-4.1	-3.7	-0.7	+1.5	+3.9	+6.1	+3.3	+1.3	-0.4

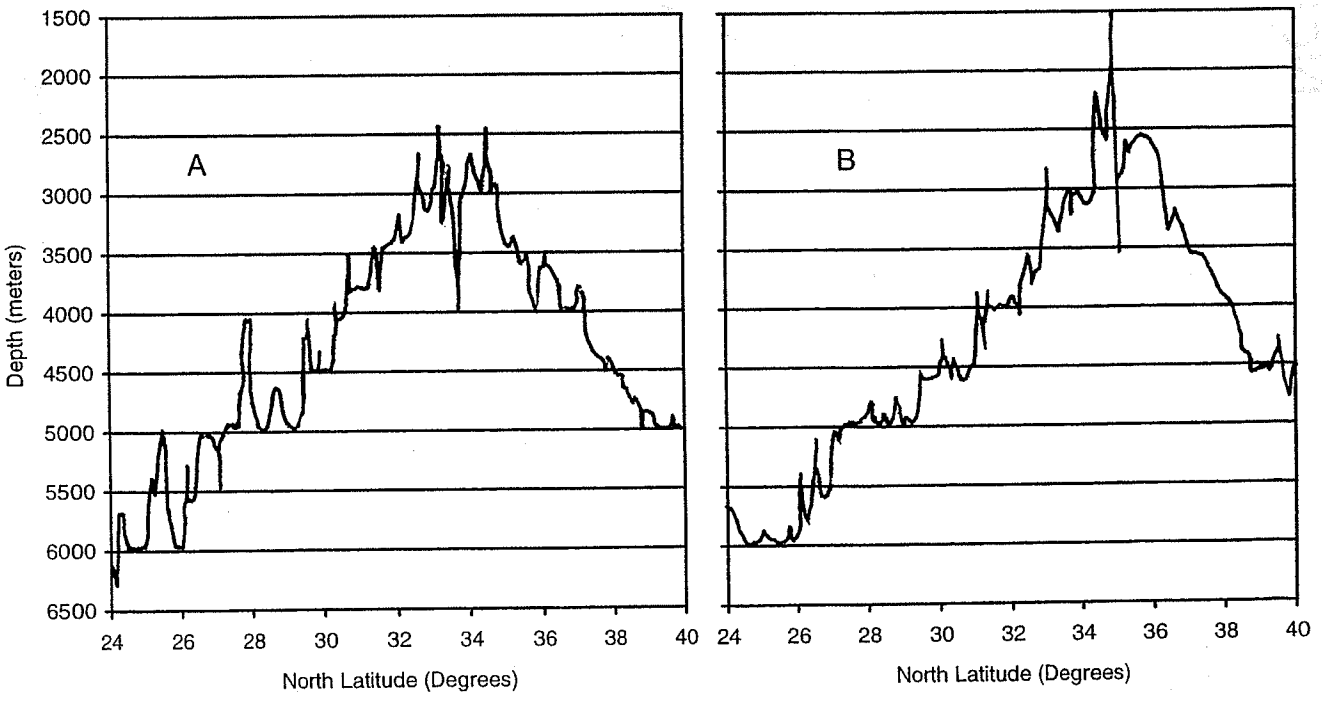
B

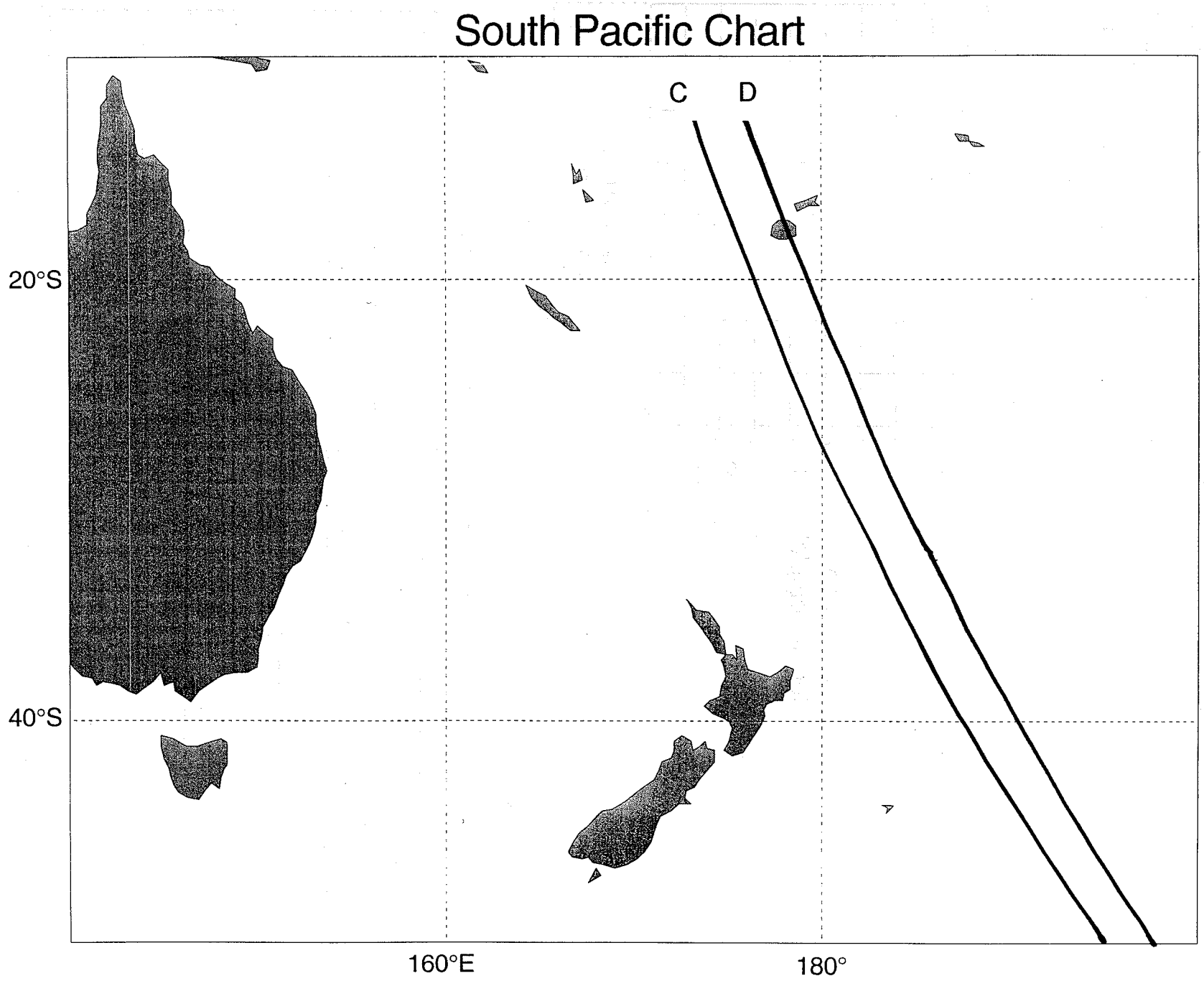
Latitude (°N)	24	26	28	30	32	34	36	38	40
Height (m)	-6.0	-4.4	-1.2	-1.4	+3.5	+6.2	+6.4	+3.0	+0.4

Sea Surface Height Template



Ocean Depth Diagrams




South Pacific Chart
C
D
20°S
40°S
160°E
180°

Sea Surface Height Tables

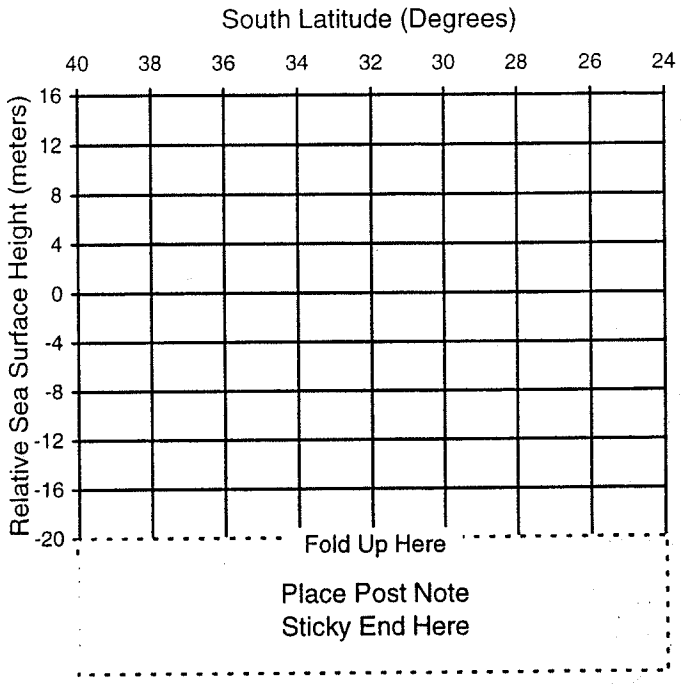
C

Latitude (°S)	40	38	36	34	32	30	28	26	24
Height (m)	-0.2	+0.7	+1.6	-0.2	-16.8	-0.3	+4.3	+2.0	-

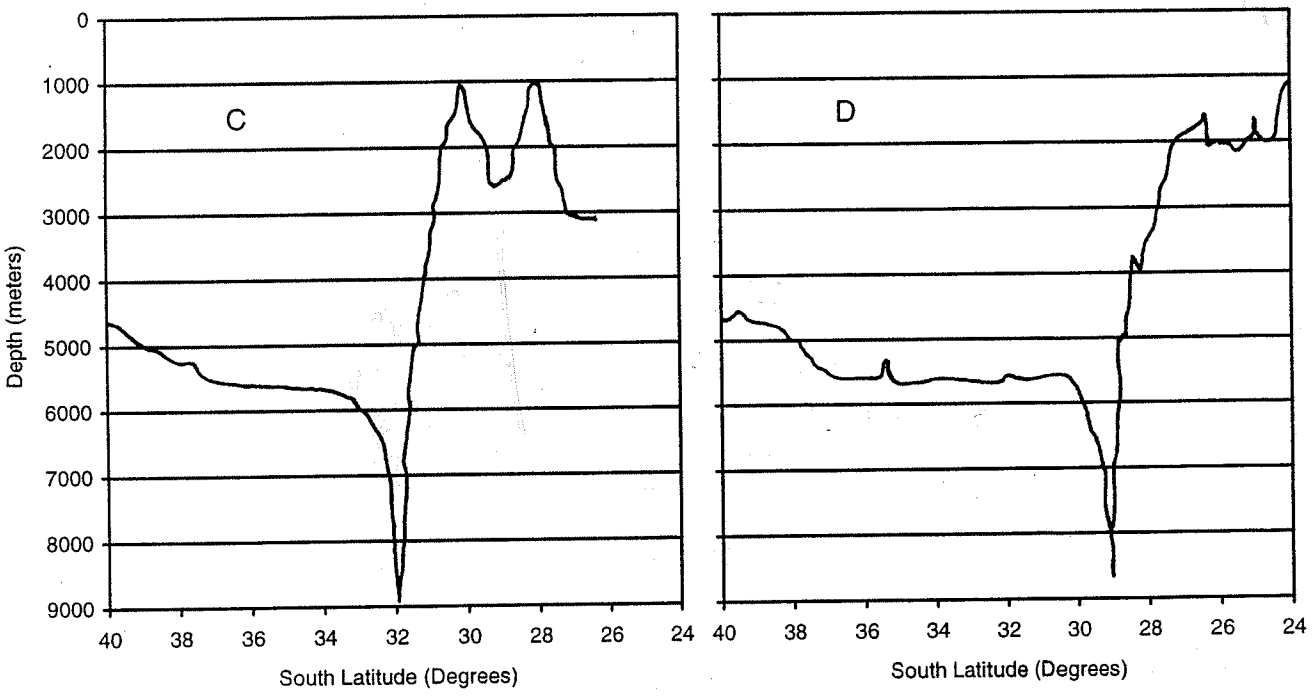
D

Latitude (°S)	40	38	36	34	32	30	28	26	24
Height (m)	+1.2	+3.1	+3.0	+3.2	+2.4	-9.1	-8.2	+9.1	+8.2

Sea Surface Height Template



Ocean Depth Diagrams



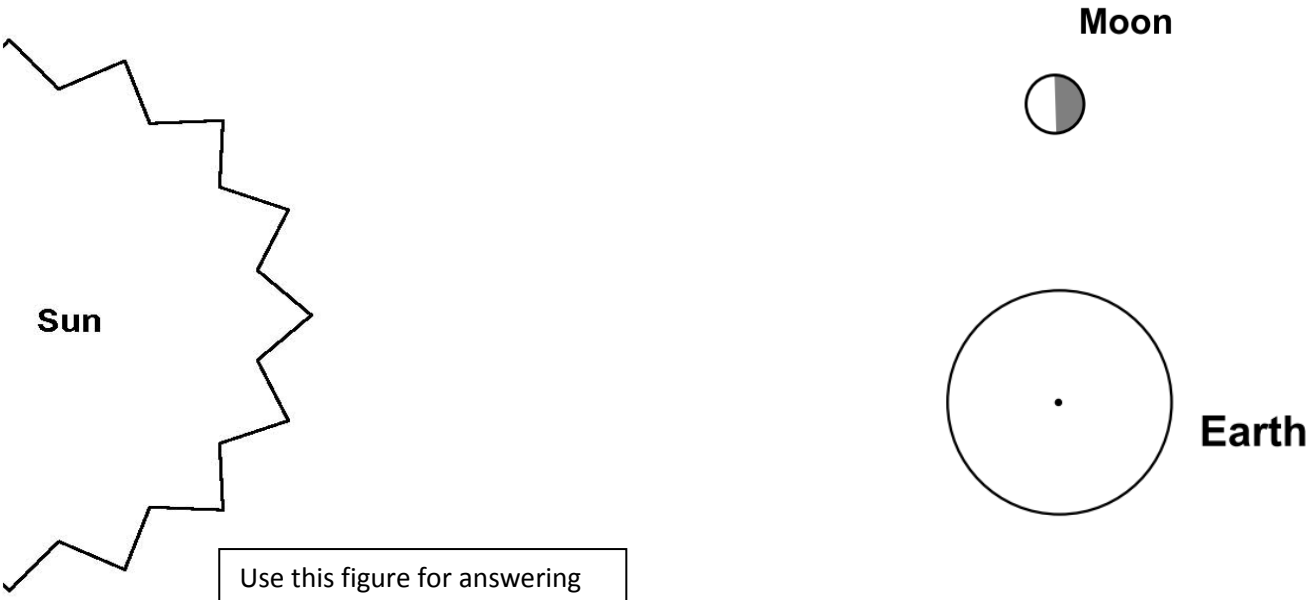
Rules for Class Discussion Activity (Wall Walk)

- Move to the appropriate location in the room (agree, disagree, strongly agree, or strongly disagree) in response to statements about the issue
- Be prepared to explain why you are standing where you are
- Please stand (*do not sit*)
- Only 1 person can talk at a time (*raise your hand*)
- Be respectful of the opinions of others
- Address the class, not the instructor
- You can change where you are standing at any time
- Do not stand in the middle of the room (*please, take a stand on the issue!*)

Name: **Spring and Neap Tides**

Part 1: Earth, Moon, and Sun Relationships

It takes approximately 4 weeks (1 month) for the moon to travel around Earth. Below is a figure showing the Earth-Sun-Moon system as viewed from the North Pole (dot on Earth). The dark side of the moon is shaded.



Use this figure for answering Questions #1 - 6

1) Label the North Pole on Earth. Draw an arrow on Earth to show Earth's rotation. How long does it take Earth to make one full rotation on its axis?

2) Draw a long arrow starting on the Moon showing the direction of the Moon's orbit around Earth.

How long does it take for the Moon to make one complete orbit around Earth?

Half of the moon is shaded, and the other half is bright; the bright side shows the side that is lit from the Sun.

3) Which diagram and associated moon phase to the right shows what the Moon looks like from Earth? (circle one)

full moon new moon quarter moon

4) Draw in both the lunar and solar tidal bulges. With a thin line (or one color), draw the lunar tidal bulges and with a dashed line (or another color), draw the solar tidal bulges. Remember that the solar tidal bulges and the lunar tidal bulges are not the same height. Note that your drawing should show a total of 4 bulges.

Part 2: Spring and Neap Tides

If the high tides from the Sun and Moon are in the same location, they will add up, making them extreme (spring tides). If they are in different locations, they will subtract from each other (neap tides).

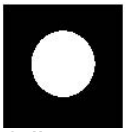
5) In the configuration above, are the tides on Earth extreme or not extreme?

6) What is the name of this kind of tide?

7) Draw an Earth-Sun-Moon alignment below during a spring tide. There is more than one correct answer; however, there are incorrect answers. Remember: the Moon is always closer to Earth than the Sun ever is.

Include all tidal bulges. Also, shade half of the Moon, showing which side is lit by the Sun.

8) For Question #7, which diagram and moon phase to the right shows what the Moon looks like from Earth? (circle one)


full moon


new moon


quarter moon

9) During what two phases of the Moon do spring tides occur?

full moon quarter moon new moon

10) How many spring tides occur in the time it takes the Moon to make one complete orbit around Earth?

Part 3: Applying Your Knowledge

11) Planet Z is discovered. Its day is 10 hours long. Its moon revolves around it in 200 hours. How many hours apart are spring tides on Planet Z? Explain how you determined your answer.

_____ hours

12) Explain why during some weeks tides are higher than during other weeks over the course of a month.

13) Explain why there is a pattern of two high tides and two low tides daily during a spring tide. Your answer must include the terms “tidal bulges” and “Earth’s rotation.”

14) Does Question #7 show **syzygy** or **quadrature**? Explain.