

OCEANS

The Earth is called the *Water Planet* because about 71% of the planet is covered by water. You should be able to name and locate the oceans and the major water bodies including seas, gulfs, bays, straits and lakes (see atlas pages 4-5). In addition, familiarity with the ocean currents will help rationalize the physical, historical, political and economic circumstances found on Earth. See appropriate pages in your atlas.

OCEAN BASIN TOPOGRAPHY

1. The ocean floor is not flat.
2. Continental shelf.
 - a) It is the underwater extension of the continent.
 - b) It is fairly shallow (0-600 ft deep); sunlight penetrates through the water over the shelf.
 - c) "Continental" islands rise from the shelf; ex.: Long Island.
 - d) It is the site of the fishing "banks."
 - e) It is the site of off-shore mineral deposits.
3. Continental slope.

This is the edge of the continental shelf (c. 600-12,000 ft. deep).
4. Ocean floor or abyssal plain.
 - a) It is found from about 12,000-18,000 ft below the surface.
 - b) It is very cold and very dark. Sunlight does not penetrate to these depths.
 - c) There are few fish and even fewer bottom dwelling creatures in this section except near the thermal vents along the rift zones.
 - d) It has the potential as a supplier of important minerals.
 - e) "Pelagic" islands, seamounts and ridges rise from the floor; ex.: Hawaii, Iceland, Mid-Atlantic Ridge.
5. Trenches, deeps, troughs.
 - a) These are the deepest points on the ocean floor extending below 18,000 ft.
 - b) They are located where the Earth's crust is dragged back into the interior of the planet.

MOVEMENTS IN THE OCEAN

The oceans are a very dynamic system. There is much activity and interchanges going on all the time.

- a) Ocean currents are generated by a number of factors including Earth's rotation, temperature differences and salinity differences. Movements are both horizontal and vertical. **Gyres** are the giant circulation cells of the oceans.
- b) Waves are generated by wind and seismic activity and act to change the configuration of a coastline through erosion and deposition.
- c) Most waves are wind generated. Tsunamis or seismic sea waves (falsely called tidal waves) are generated by earthquakes.
- d) Tides are caused by the gravitational pull of the moon and by the Earth's rotation.
- e) The tidal bore or true tidal wave is the leading edge of the incoming tide.
- f) The tidal range is the difference between high and low tide and influences shoreline use and coastal navigation.

OCEANS AND PEOPLE

The oceans play an extremely important role on Earth influencing many aspects of our environment.

- a) They help to equalize the Earth's surface temperatures.
- b) They are the chief source of atmospheric moisture; part of the hydrologic cycle.
- c) They are an important link in the carbon/oxygen cycle; they absorb carbon dioxide.
- d) They are a source of food.
- e) They are a store house of minerals.
- f) They are a means of transportation.
- g) They are a source of drinking water through desalination processes.
- h) They are an area of waste disposal.
- i) They are used for recreation (swimming, boating, fishing).
- k) They are a major barrier to interaction of all living things.