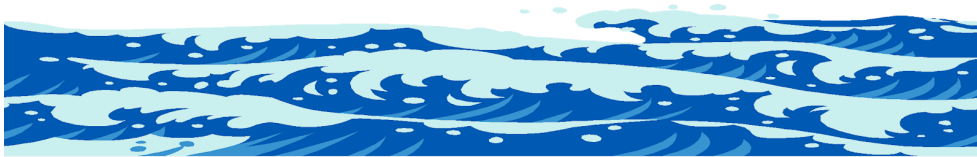


WAVES AND CURRENTS



Background Information

Water in the ocean moves in a number of ways. **Waves** are movements of water that can be caused by wind or underwater earthquakes. In the movement of a wave, the water itself is not carried forward, even though it appears to be. Each particle of water tends to move in a circle. The particles are lifted up, carried forward slightly, dropped, and returned to where they started. The energy in a wave moves forward, but the water does not.

Waves have two basic parts: the crest and trough. The highest part of the wave is the **crest**. The lowest part of the wave is the **trough**. The **wave height** is the distance from the trough to the crest of a wave. The **wavelength** is the distance between the crest of one wave and the crest of another wave (or from trough to trough).

The size of a wave depends on the wind's speed, distance, and length of time over the ocean's surface. Gigantic waves, known as **tsunamis**, are caused by shock waves from earthquakes or volcanic activity at the bottom of the ocean. These waves cause extensive damage to life and property when they hit the shore.

Another way ocean water moves is by currents. A **current** is a strong flow of water, much like rivers in the ocean. Winds add to the water movement in the ocean by causing **surface currents**. If you blow across the surface of a bowl of water, you can make the water move. This is similar to how winds cause currents on the ocean's surface. Surface currents carry cold water along one coast or warm water along another coast. The temperature of the water affects the weather over the ocean and land. Warm currents flow from the equator and cold currents flow from the poles. Surface currents in the Northern hemisphere flow clockwise, while surface currents in the southern hemisphere flow counterclockwise. Two important surface currents affect North America: the Gulf Stream and

the California Current. The **Gulf Stream** carries warm water from the south near the Gulf of Mexico along the East Coast of the U.S. The **California Current** flows from the north to the south bringing cold water off the coast of California.

Differences in temperature and density can also cause ocean water to move. Colder water sinks in the ocean. These movements cause **deep ocean currents**. Deep ocean currents can occur many kilometers below the surface of the ocean and they move very slowly. They usually flow in the direction opposite to surface currents.