

## Ocean Water Movements

Category : Delaware

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1) tides 2) density currents and 3) surface currents.

Ocean water movement can be divided into three categories:

1) tides - caused by the gravitational pull of the moon and sun,  
2) density currents - caused by differences in salinity and temperature, and 3) surface currents - caused by winds.

There are three types of tidal patterns.

A diurnal pattern has one high tide and one low tide over a 24-hour period. A semidiurnal pattern has two highs (roughly the same height) and two lows over a 24-hour period. A mixed tidal pattern has two highs (of unequal height) and two lows over a 24-hour period.

The coast of Delaware experiences a \_\_\_\_? tidal pattern.

Following is an example of one week's tidal data for \_\_\_\_? Delaware.

Density currents are vertical movements of ocean water created by differences in salinity or temperature. Water which is colder or saltier is more dense and therefore sinks. Water which is warmer or less salty is less dense and therefore rises. Along some coastal regions a process called upwelling occurs where winds push surface water aside which allows the deep, cold water to rise to replace the warm water. The process of upwelling is important to ecosystems as the deep, cold water contains many nutrients and dissolved gases beneficial for plants and animals.

Surface currents are generated by winds, move water mostly horizontally, and can create waves. All waves can be defined in terms of their waveheight and wavelength. The height of an ocean wave is determined by the velocity, duration, and fetch of the winds. The Gulf Stream is a warm surface current off the east coast of the United States. Warm surface currents move relatively warmer water from the equator and transport it poleward. They flow on the western side of ocean basins (eastern side of continents), and are narrow, deep, and swift.