

# Waves as natural phenomena

[Environment](#), [Water](#)



When people think of waves they may think of a nice vacation or maybe a storm. Most people may not think about what causes waves or how waves can get so tall and powerful. In addition, people may not think about how tides are formed. The movement of waves includes information about how waves form, how they move, what happens when waves interact, and some of the effects of waves. When people visit a beach, they might realize the daily rise and fall of the water, or how high and low tides can get. Tides are caused by the moon, sun, and the earth and are almost never the same size or duration.

A tide can spread out to be much bigger than what it was predicted to be (Simon 1990). The easiest tidal sequence is the semidiurnal tide. A semidiurnal tide has two high tides and two low tides of about equal height each day. Semidiurnal tides may have a daily inequity where successive high tides have different heights. Semidiurnal tides are often easy to predict because high or low tides occur a consistent length of time after the moon has passed overhead. Both the Atlantic and the Indian Oceans generally have some semidiurnal tides with two other tides each day.

Spring tides normally occur when there is a full moon and the sun and the earth are in a straight line. When this happens, tides are never the same size or last the same amount of time as the people may expect. There is also neap tides and they occur when the moon is in the first or last quarter, when its gravitational pull on the oceans is at a right angle to the sun. When this happens the tide will not be the same size or last the same amount of time either. (Hawkins 2005). Therefore, the pull of the moon causes tides and these tides produce waves.

Waves are the forward movement of the ocean's water due to the oscillation of water particles by frictional drag. Waves can also vary in size and strength based on wind speed (B. Amanda). When people are considering waves, it is important to know that while it appears that the water is moving forward, only a small amount of water is actually moving. Instead, it is the wave's energy that is moving. When the waves get too tall, relative to the water's deepness, the wave's stability is weakened and the entire wave falls onto the beach, forming a breaker.

Breakers come in all different types. The type of a breaker is determined by the slope of the shoreline. Falling breakers are caused by a steep slope. Spilling breakers occur when the shoreline has a gentle or gradual slope. Crests of waves are formed by a thrust or the forward push of the wave. Which could lead to the development of breakers. Sometimes, huge waves are created by undersea earthquakes or the pointy motions in the seafloor. These huge waves are called tsunamis or tidal waves. They can make really big messes and can kill a lot of people (B, Amanda).

Waves are put into categories and named according to how they are formed and how they appear. Waves that are looped as they reach the shoreline are called ocean currents. These currents are generated in the surf zone when the front end of the wave pushes to the shore and then slows down. Wind also causes waves and these are called surface waves. Regular patterns of smooth, rounded waves in the open are called swells. Swells means that they are mature undulations of water in wave energy that has left the wave generating region (B, Amanda).

When waves meet and interact they form what is called an interference. The interference occurs when the crest and trough are between two waves that are align and then they combine. The action of an interference makes a dramatic increase in wave height. When water molecules get the energy they move forward, and all of the waves are forced closer together because they are now moving a lot slower because of the wind speed. The movement of wind speed over the oceans generates corresponding movements in the water. When the seafloor becomes shallow the waves become flattened(B, Amanda).

An underwater earthquake can trigger a tsunami that creates a long, fault rupture that can get up to or over 800 miles long(B, Amanda). “ In December 2004, an underwater earthquake was triggered a string of tsunamis along the Indian Ocean with overwhelming effects. Scientists have found a break in the sea floor faults which are causing the earthquakes, tsunamis, and waves to be extremely dangerous. ” (B, Amanda) Since waves are so powerful they have a big impact on the shape of the world’s coastlines. Generally, they straighten coastlines.

Sometimes headland’s composed old rocks are very resistant to erosion just into the ocean and force waves to bend around them. When this happens, the waves energy is spread out over multiple areas and different sections of the coastline which receive different amounts of energy and are then shaped differently by waves(B, Amanda). Waves can also cancel out each other through when crest meets a trough or vice versa. The movement of sand, gravel, and concrete with the long shore drift is know as deposition. Coastal

landforms caused by deposition include barrier spits, bay barriers, lagoon, tombolos and even beaches themselves.

Coastal features found today include cliffs, wave cut platforms, sea caves, and arches. These types of features make it clear that ocean waves have a tremendous impact on today shoreline. Erosion also creates many of the coastal features found today. It can also act in taking away sand and sediment from beaches especially on those that have heavy wave action. Erosion also creates many of the coastal waves today(Amanda B). Erosion is a broadly defined group of processes involving the movement of soil and rock. This movement is often the result of flowing agents, whether wind, water, or ice.