

Ocean Currents and the Climate

A **current** is the constant movement of water. Ocean currents are similar to large rivers of water flowing through the ocean. Ocean currents can be at the surface (surface currents) or close to the ocean floor (deep ocean currents). Some currents carry cold water, and some carry warm water. Ocean currents move heat around the world.

Surface currents are caused by wind and are affected by the spin of Earth and the shapes of continents, as well as the density of water and the depth and shape of the ocean bed. Surface currents can be warm or cold and can travel up to seventy-five miles a day.

Deep ocean currents form in the Arctic Ocean and Antarctic Ocean, where cold, salty water flows deep along the ocean floor, moving toward the equator. As deep ocean currents approach the equator, the water warms and rises to the surface, and it becomes a warm surface current. From the equator, it flows back toward the poles as a surface current so that in time (about 1,000 years), all the water in the oceans has completely circulated.

Oceans soak up the sun's heat, and the currents carry heat from the equator to the poles. Winds blowing over the oceans grow warmer or cooler depending on the temperature of the ocean water. Those winds then flow over the land, making temperatures on land either higher or lower.

Winds carry warm vapor to cooler areas, so the vapor condenses because it is cool, and the heat is released into the atmosphere. This helps keep Earth's temperatures within a steady range. Oceans also release moisture into the air by evaporation, which can return as rain or snow.

Since the temperature of land grows warmer faster than the temperature of ocean water, the air above land warms faster than the air above sea. Warmer air is less dense, so warmer land air rises because the atmospheric pressure is less. Cooler air above the ocean is denser and has higher pressure than air above land. Early each day, higher-pressure, cooler air that is over the ocean flows toward the warmer air of land and is called a **sea breeze**. Land cools faster than water, so the opposite reaction happens at the end of the day and is called a **land breeze**.

Answer the Following

1. Is the current flowing from a pole to the equator a cold current or warm current? _____
2. How do oceans affect land temperatures? _____

3. What is the difference between a surface current and a deep ocean current? _____

