

Water and Climate

Climate

Climate is the average weather measured over a long period of time. Two cities (one near a large body of water, and the other not) have very different climates.

The Effect Of Large Bodies Of Water On Climate

Large bodies of water, like the ocean and the Great Lakes, influence the weather and the climate in their regions. Water holds the heat longer than most substances and so cities that are close to large bodies of water have warmer climates. The main effect that water has on climate is that extreme temperatures are less likely to occur in cities near large bodies of water, because water heats up and cools down very slowly – whereas in places where there is not very much water, the land heats up quickly and cools down quickly – and that is where the extremes are felt.

Current Events

Ocean currents can also affect climate. Currents are streams of water that move within a larger body of water. They can be caused by:

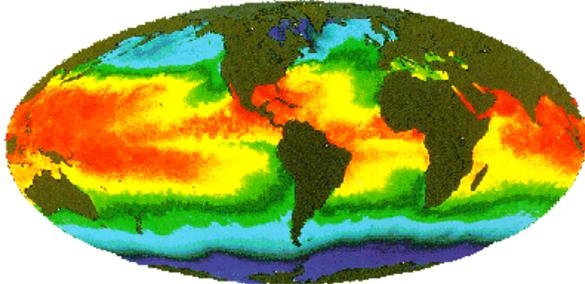
- Wind
- Temperature differences in the water
- Salinity differences in the water
- Earth's rotation

Currents and Climate

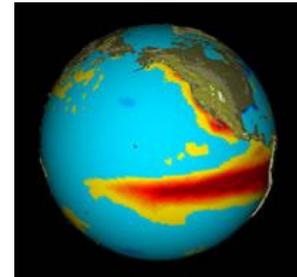
Currents cause water to move from place to place. Surface currents are caused by steady winds. The currents that affect Labrador and Scotland are surface currents. If they start near the equator (like the North Atlantic Current does), they are warm. If they start near the North Pole, they carry very cold water (like the Labrador Current does). When the current flow to their respective shores, they can influence the climate of the land.

Ocean Temperature and Currents

The temperature of the ocean current not only affects the air temperature, but they also affect the amount of precipitation that an area receives. Almost all of the heat in the ocean comes from the Sun. Temperature vary throughout the ocean getting much colder as you go deeper.



El Nino

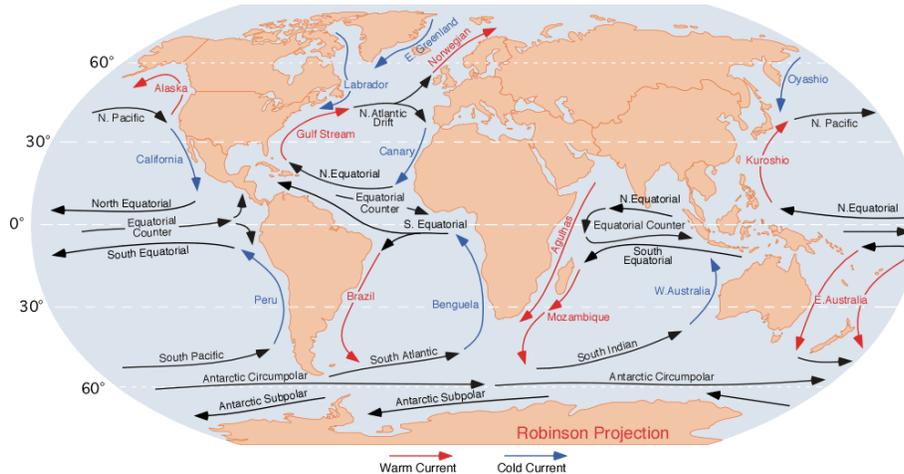


Ocean and Climate

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Warm and Cold Currents

Warm ocean currents transfer heat to the atmosphere. Water has a very high heat capacity – meaning it takes a long time to heat up and a long time to lose heat. Large bodies of water act as heat reservoirs in the winter, remaining relative warmer than the nearby land. This difference in temperature can affect the convection currents producing breezes that can alter the processes of evaporation and condensation near the shoreline. A cold current can do the opposite.

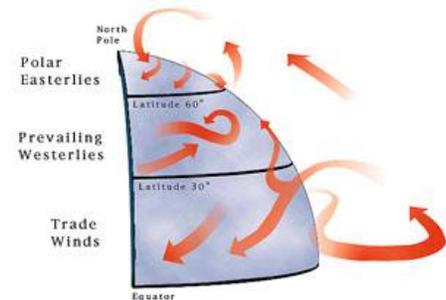


Warm air (warm currents) hold more moisture than cold air (cold currents).

Surface Currents (WINDS)

Currents of water are driven by winds. The steady flow of ocean currents results from major wind patterns. There are three factors that influence the direction of winds and surface currents:

- Uneven heating of the atmosphere (convection)
- Rotation of the Earth (bending)
- The continents (deflecting)



A Chinook is a warm dry wind crossing the mountains from west to east. The **rain shadow** that is created by the Rockies makes the climate very dry on the eastern side.

