

Weather or Climate?

By Cindy Grigg

1 What is the difference between climate and weather? The simple answer is "time."

2 Weather is what is happening in the atmosphere, the mixture of gases around the Earth, at a certain time and place. Weather changes constantly. Air masses move. Fronts form when two air masses of different temperatures with different moisture contents meet. Then the weather will change. Often a front brings thunderstorms.

Warm air rises. Cooler air sinks. It rains. It's sunny. Weather changes from day to day or from hour to hour.

3 Climate is the **average** weather in a place over a long time. Weather data is recorded for a number of years. Climate is the average weather that has been recorded. Earth has many different climate zones. Tropical climate zones lie on either side of the equator. Polar zones are found near the North and the South Poles. Temperate climates are not too hot or too cold. Desert climates don't receive much rainfall. *Climate change* is a trend of change in climate averages of the past.

4 Many things affect the climate of a place. One thing is latitude. *Latitude* is a measure of the distance from the equator. Higher latitudes are closer to the North or South Pole. There, the sun's rays are less direct than at the equator. The sun's energy is spread out over a larger area. There the land and ocean don't get as much of the sun's heat, so they have lower temperatures. At the equator, the sun's rays are nearly at a right angle to Earth's surface. The sun's energy is concentrated. Land and ocean waters receive more heat than those near the poles.

5 *Wind* patterns affect the climate. If the wind starts out over water, it carries more water. If winds begin over land, the air mass is dryer. If the winds begin at high latitudes, the air masses are colder. Winds that start out in the tropics carry warmer air.

6 *Mountains* affect the climate of a place. Along the mountains of the western coast of the U.S., for one example, it is common to have lush green forests on the windward side. Moist air over the Pacific holds lots of water. The wind blows the moist air toward the mountains. The mountain is a barrier that pushes the air upward, and this causes it to cool. Cool air holds less moisture, so it rains on the

Climate Zones of the Continental United States



side of the mountain facing the coast. The air that passes over the other side is dry. This is called the rain shadow effect. Because of this effect, deserts often are found on the leeward side (the side away from the wind) of mountains.

⁷ *Ocean currents* also shape the climate of a place. A current is a steady flow of water moving in one direction, like a river in the ocean. Warm ocean currents like the Gulf Stream move heat from near the equator to the colder north. This makes the climate warmer along the coast of Great Britain, for instance. Currents in the ocean help distribute the uneven heat of the sun. Warmer water moves from the equator toward the poles. Cold water around the poles moves toward the equator.

⁸ Weather changes from day to day. Climate is the average weather over a number of years in a particular area. Different patterns of temperature and rainfall are found in different climates. Many different factors affect the climate of a certain place.