

The Influence of Wind on Climate

Atmospheric circulation influences climate by producing winds that distribute heat and moisture. Six belts of wind encircle the earth, three north of the equator and three south of the equator:

- (1) trade winds that blow between 30° north latitude and the equator, and trade winds that blow between the equator and 30° south latitude
- (2) westerlies (winds from the west) that blow between 30° and 60° north of the equator, and westerlies blowing between 30° and 60° south of the equator,
- (3) polar winds north of 60° north latitude and polar winds south of 60° south latitude.

Trade winds north of the equator blow from the northeast. South of the equator, they blow from the southeast. The trade winds of the two hemispheres meet near the equator, causing air to rise. As the rising air cools, clouds and rain develop. The resulting band of cloudy and rainy weather near the equator is called the doldrums.

Westerlies blow from the southwest in the Northern Hemisphere and from the northwest in the Southern Hemisphere. Westerlies steer storms from west to east across middle latitudes. (30° to 60°)

Westerlies and trade winds blow away from the 30 degrees latitude belt. Over broad regions centered at 30 degrees latitude, surface winds are light or calm. Air slowly descends to replace the air that blows away. Descending air warms and is dry. The tropical deserts, such as the Sahara of Africa and the Sonoran of Mexico, occur under these regions of descending air.

Polar winds blow from the northeast in the Arctic and from the southeast in the Antarctic. In the Northern Hemisphere, the boundary between the cold polar easterly winds and the mild westerly winds is known as the polar front. A front is a narrow zone of transition, usually between a mass of cold air and a mass of warm air. Where the air masses overlap, storms can develop and move along the polar front, bringing cloudy weather, rain, or snow.

As the seasons change, the global wind belts shift north and south. In the spring, they move toward the poles. In the fall, they shift toward the equator. These shifts help explain why some areas have distinct rainy seasons and dry seasons. Parts of Central America, North Africa, India, and Southeast Asia have wet summers and dry winters. Southern California and the Mediterranean coast have dry summers and wet winters.

Focus Questions:

1. Name the six belts of wind that encircle the globe.
2. From which way do the prevailing winds in Council Grove come? Why?
3. Why do you suppose the winds from the equator to 30° were given the name “Trade Winds”?
4. What are the doldrums?
5. What is a front?