

Encyclopedic Entry

climate

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Climate is the long-term pattern of **weather** in a particular area. Weather is the state of the **atmosphere** over short periods of time. Weather can change from hour to hour, day to day, month to month or even year to year. A region's weather patterns, tracked for more than 30 years, are considered its climate.

Climate Features

Different parts of the world have different climates. Some parts of the world are hot and rainy nearly every day. They have a tropical wet climate. Others are cold and snow-covered most of the year. They have a **polar climate**. Between the icy poles and the steamy tropics are many other climates that help make the Earth a **unique** planet.

Average **temperature** and **precipitation** are important features of a climate. So are the day-to-day, day-to-night, and **seasonal** variations in temperature and precipitation. For example, San Francisco, California, and Beijing, China, have similar yearly temperatures and precipitation. However, the daily and seasonal changes make San Francisco and Beijing very different. San Francisco's winters are not much cooler than its summers, while Beijing is hot in summer and cold in winter. San Francisco's summers are dry and its winters are wet. The wet and dry seasons are reversed in Beijing—it has rainy summers and dry winters.

Climate features also include windiness, **humidity**, **cloud cover**, and fogginess.

Climate Conditions

A region's climate is something like a person's personality. It is usually constant, but there may be surprises. Just as someone with a cheerful attitude will sometimes become sad, an area with a generally mild climate will occasionally experience extreme rainfall or **drought**. But because climates are mostly constant, living things can **adapt** to them.

The **enormous** variety of life on Earth is largely due to the variety of climates that exist and the **climate changes** that have occurred in the past.

Climate has **influenced** the development of **cultures** and **civilizations**. People everywhere have adapted in various ways to the climates in which they live.

Clothing, for example, is influenced by climate. The warm clothing developed by **Eskimo** cultures of Asia and North America are necessary for survival in the cold, windy climate near the North Pole. Grass skirts, on the other hand, are part of many cultures in warm, humid climates, such as Tahiti, an island in the South Pacific Ocean.

Climate also influences where and when a civilization constructs [housing](#) or other buildings. The ancient Anasazi people of southern North America built apartments into tall cliffs. The sheltered, shady area kept residents cool in the hot, dry [desert](#) climate.

The development of [agriculture](#) was very dependent on climate. [Ancient](#) agricultural civilizations, such as those in Greece and India, [flourished](#) where the climate was mild. Communities could grow crops every season, and experiment with different types of foods and [farming](#) techniques.

Today, farmers are still in tune with the climate. They plant certain [crops](#) according to the expected amount of rainfall and the length of the growing season. A [growing season](#) is the time between the last [frost](#) of spring and the first frost of autumn. When the weather does not follow the typical climate pattern, it can mean hard times for farmers and higher food costs for [consumers](#).

Of course, no climate is [uniform](#). Small [variations](#), called [microclimates](#), exist in every climate region. Most are caused by [topographic features](#) such as lakes, vegetation, and cities. In large [urban areas](#), for example, streets and buildings absorb heat from the sun, raising the average temperature of the city higher than the average temperatures of more open areas nearby. This is known as the "[urban heat island](#) effect."

Large bodies of water, like the [Great Lakes](#) in the United States and Canada, can also have microclimates. Cities on the southern side of Lake Ontario, for example, are cloudier and receive much more [snow](#) than cities on the northern shore. This "[lake effect](#)" is a result of cold [winds](#) blowing across warmer lake water.

Climate Types

The most widely used system for classifying climates was proposed in 1900 by [Wladimir Koppen](#). Koppen observed that the type of vegetation in a region depended largely on climate. He used this fact as the starting point for his classification [scheme](#). Studying temperature and precipitation data, he and other scientists developed a system for naming climate regions.

According to this system, there are five [climate groups](#): tropical, dry, mild, continental, and polar. These climate groups are further divided into [climate types](#). The following list shows the climate groups and their types:

- Tropical
- Wet (or [rain forest](#))
- Monsoon
- Wet and dry (or [savanna](#))
- Dry
- Arid
- Semiarid
- Mild
- Mediterranean
- Humid subtropical
- Marine
- Continental
- Warm summer
- Cool summer
- Subarctic (or boreal)
- Polar
- Tundra
- Ice cap

All climates are the product of many factors, including [latitude](#), [elevation](#), [topography](#), distance from the ocean, and

location on a [continent](#). The rainy tropical climate of West Africa, for example, results from the region's location near the [Equator](#) and its position on the western side of the continent. A constant amount of sunlight keeps temperatures in the area warm and steady. West Africa is also at the site where [moist trade winds](#) meet, an area called the [intertropical convergence zone \(ITCZ\)](#) (pronounced "itch"). As a result, the region's climate is warm and rainy.

Tropical Climates

There are three climate types in the tropical group: tropical wet; tropical monsoon; and tropical wet and dry.

Places with a [tropical wet climate](#) are also known as rain forests. Rain forests have the most predictable weather on Earth, with warm temperatures and regular rainfall. Annual rainfall exceeds 150 centimeters (59 inches), and the temperature varies more during a day than it does over a year. The coolest temperature, about 20-23 degrees Celsius (68-73 degrees Fahrenheit), occurs just before dawn. Afternoon temperatures usually reach 30-33 degrees Celsius (86-91 degrees Fahrenheit). Rain forests experience very little seasonal change, meaning average monthly temperatures remain fairly constant.

Tropical wet climates exist in a band extending about 10 degrees of latitude on either side of the Equator. This part of the globe is always under the influence of the intertropical convergence zone. The zone follows a [pendulum-like](#) path during the course of a year, moving back and forth across the Equator with the seasons. It moves north during summer in the Northern Hemisphere, and south during the northern winter.

Some tropical wet climates are wet throughout the year. Others experience more rainfall during the summer or winter, but they never have especially [dry seasons](#). The U.S. state of Hawaii; Kuala Lumpur, Malaysia; and Belém, Brazil, are examples of areas with tropical wet climates.

[Tropical monsoon climates](#) are most common in southern Asia and West Africa. A [monsoon](#) is a wind system that reverses its direction every six months. They usually flow from sea to land in the summer, and from land to sea in the winter.

Summer monsoons bring large amounts of rainfall to tropical monsoon regions. People living in these regions depend on the seasonal rains to bring water to their crops. India and Bangladesh are famous for their monsoon climate patterns.

The third type of climate, [tropical wet and dry climate](#), has three seasons. These areas are just outside the ITCZ, near the Equator. One season is cool and dry when the warm, moist ITCZ is in the opposite [hemisphere](#). Another season is hot and dry as the ITCZ approaches. The last season is hot and wet as the ITCZ arrives and the region experiences months as a tropical wet climate.

Life in these tropical wet and dry regions depends on the wet season's rains. During years when rains are light, people and animals suffer. Havana, Cuba; Kolkata, India; and Africa's vast Serengeti Plain are in the wet and dry tropics.

Dry Climates

Regions lying within the dry climate group occur where precipitation is low, including cool, high latitudes. There are two dry climate types: arid and semiarid. Most [arid climates](#) receive 10 to 30 centimeters (4-12 inches) of rain each year, and [semiarid climates](#) receive enough to support extensive [grasslands](#). Often, these grasslands are known as savannas or [prairies](#).

Temperatures in both arid and semiarid climates show large daily and seasonal variations. The hottest spots in the world are in arid climates. The temperature in the North African town of El Aziza, Libya, reached 58 degrees Celsius (136 degrees Fahrenheit) on September 13, 1922—the highest weather temperature ever recorded.

Although rainfall is limited in all dry climates, there are few parts of the world where it never rains. One of the driest places on Earth is the Atacama Desert of Chile, on the west coast of South America. There, the town of Arica averages less than 0.05 centimeters (0.02 inches) of rain a year.

Semiarid regions, such as the Australian [Outback](#), usually receive between 25 and 50 centimeters (10-20 inches) of rainfall every year. They are often located between arid and tropical climate regions.

Arid and semiarid climates can occur when warm, moist air is blocked by [mountains](#). Denver, Colorado, next to the Rocky Mountains in the U.S., has this type of dry climate.

Mild Climates

Regions with mild and continental climates are also called temperate regions. Both climate types have distinct cold seasons. In these parts of the world, climate is influenced mostly by latitude and by a region's position on the continent.

The mild climate type called [Mediterranean climate](#) has a warm summer and a short, mild, and rainy winter. It is found on the west coasts of continents between 30 and 40 degrees latitude, and along the shores of the Mediterranean Sea. Mediterranean summers feature clear skies, cool nights, and little rain. The city of Jerusalem, Israel, once had no rain in July for more than 100 years.

The type of mild climate known as [humid subtropical climate](#) is usually found on the eastern sides of continents. In cities such as Savannah, Georgia, in the U.S.; Shanghai, China; and Sydney, Australia, summers are hot and humid. Winter can be severely cold. Precipitation is spread evenly through the year and totals 76 to 165 centimeters (30-65 inches). [Hurricanes](#) and other violent storms are common in these regions.

Weather on both sides of a continent generally becomes cooler as latitude increases and areas are closer to the poles. The [marine west coast climate](#), a type of mild climate typical of cities such as Seattle, Washington, in the U.S. and Wellington, New Zealand, has a longer, cooler winter than the Mediterranean climate. Drizzle falls about two-thirds of winter days, and temperatures average about 5 degrees Celsius (41 degrees Fahrenheit).

Continental Climates

Areas with continental climates have colder winters, longer-lasting snow, and shorter growing seasons. They are the [transition zones](#) between mild and polar climates. [Continental climates](#) experience extreme seasonal changes.

There are three types of continental climate—warm summer, cool summer, and subarctic. All these climates exist only in the Northern Hemisphere. Usually, continental climates are found in the interior of continents.

[Warm summer climate](#) regions often have wet summer seasons, similar to monsoon climates. For this reason, this climate type is also called [humid continental](#). Most of Eastern Europe, including Romania and Georgia, has humid continental climates.

[Cool summer climates](#) have winters with low temperatures and snow. Cold winds, sweeping in from the Arctic, [dominate](#) the winter weather. People living in these climates have grown [accustomed](#) to the [harsh](#) weather, but those unprepared for such cold may suffer. Many of Napoleon Bonaparte's soldiers, for example, were used to the

mild Mediterranean climates of France. Thousands died in bitter cold as they [retreated](#) from Russia's cool summer climate in the winter of 1812.

North of regions with cool summer climates are regions with [subarctic climates](#). These regions, including northern [Scandinavia](#) and [Siberia](#), experience very long, cold winters with little precipitation. Subarctic climates are also called [boreal climates](#) or [taiga](#).

The range of weather in continental climate regions makes them among the most [spectacular](#) sites for weather [phenomena](#). In autumn, for instance, vast [forests](#) put on their annual show of brilliant color before shedding their leaves as winter approaches. [Thunderstorms](#) and [tornadoes](#), among the most powerful forces in nature, form mostly in continental climates.

Polar Climates

The two polar climate types, tundra and ice cap, lie within the Arctic and Antarctic Circles near the North and South Poles.

In [tundra climates](#), summers are short, but plants and animals are plentiful. Temperatures can average as high as 10 degrees Celsius (50 degrees Fahrenheit) in July. Wildflowers dot the landscape, and flocks of birds return from their winter [migrations](#) to feed on insects and fish. Whales feed on [microscopic](#) creatures in the region's cold, [nutrient-rich](#) waters. People have adapted to life on the tundra for thousands of years.

Few living things exist in the [ice cap climates](#) of the Arctic and Antarctic. Temperatures rarely rise above freezing, even in summer. The ever-present ice helps keep the weather cold by reflecting most of the sun's energy back into the atmosphere. Skies are mostly clear and precipitation is low all year. In fact, Antarctica, covered by an ice cap a mile thick, is actually one of the largest, driest deserts on Earth.

High Elevation Climates

Several [geographers](#) and [climatologists](#) have modified the Köppen classification system over the years, including geographer Glen Trewartha, who added a category for highland climates.

There are two high elevation climate types: upland and highland. [Upland climates](#) occur on high [plateaus](#), or flat-topped mountains. The [Patagonian](#) Plateau, in southern South America, has an upland high-elevation climate. [Highland climates](#) occur on mountains.

High-elevation climates are marked by very different temperatures and levels of precipitation. Climbing a lofty mountain or reaching a plateau can be like moving toward the poles. On some mountains, such as Mount Kilimanjaro, Tanzania, the climate is tropical at the base and polar at the summit. Often, high-elevation climate differs from one side of the mountain to the other.

Changes in Climate

Climate does not change from day to day like weather, but it does change over time. Climate changes happen slowly over hundreds or even thousands of years. For example, [periodic ice ages](#) have covered large portions of Earth with ice caps. Some evidence shows that the Sahara Desert was once covered by ocean during a warm "wet age."

Climate change can happen for many reasons. The movement of [tectonic plates](#), [volcanic](#) activity, and the tilt of Earth's [axis](#) all have effects on climate. After the [eruption](#) of the island volcano of Krakatoa, Indonesia, in 1883,

winters and even summers in Asia and Europe were colder and darker. **Volcanic ash** blocked the sun. Farmers had to adjust to shorter, weaker growing seasons. Climates around the world were changed for years.

More recently, human civilizations have begun to affect climate. Human activities that include burning **fossil fuels** and cutting down forests release **greenhouse gases** into the atmosphere. These gases hold in heat, which raises temperature. Scientists believe this "**greenhouse effect**" is increasing global temperatures.

Increasing temperatures can change climate types. Low-lying **islands** may be flooded as sea waters rise from melting **glaciers**. Heat in the atmosphere may increase the interaction of diverse **weather systems**, resulting in more hurricanes and **typhoons**. Organisms that have adapted to one climate may have to **migrate** or adapt to warmer temperatures. **Manatees**, for instance, are **marine mammals** native to tropical waters. As temperatures increase, manatees have been migrating as far north as New York City, New York.

VOCABULARY

Term	Part of Speech	Definition
absorb	<i>verb</i>	to soak up.
accustom	<i>verb</i>	to get used to.
adapt	<i>verb</i>	to adjust to new surroundings or a new situation.
agriculture	<i>noun</i>	the art and science of cultivating the land for growing crops (farming) or raising livestock (ranching).
Anasazi	<i>noun</i>	(1200 BCE-1300 CE) people and culture native to what is now the southwestern United States. Also called Ancestral Puebloans.
ancient	<i>adjective</i>	very old.
Arctic	<i>noun</i>	region at Earth's extreme north, encompassed by the Arctic Circle.
arid climate	<i>noun</i>	(dry climate) region that receives 10 to 30 centimeters (4-12 inches) of rain each year.
atmosphere	<i>noun</i>	layers of gases surrounding a planet or other celestial body.
axis	<i>noun</i>	an invisible line around which an object spins.
bitter	<i>adjective</i>	harsh.
boreal climate	<i>adjective</i>	region that experiences long, cold winters with very little precipitation. Also called a subarctic or tundra climate.
city	<i>noun</i>	large settlement with a high population density.
civilization	<i>noun</i>	complex way of life that developed as humans began to develop urban settlements.
classify	<i>verb</i>	to identify or arrange by specific type or characteristic.
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
climate change	<i>noun</i>	gradual changes in all the interconnected weather elements on our planet.
climate group	<i>noun</i>	one of five classifications of the Earth's climates: tropical, dry, mild, continental, and polar.
climate type	<i>noun</i>	division within a climate group.

climatologist	<i>noun</i>	person who studies long-term patterns in weather.
cloud cover	<i>noun</i>	amount of sky covered with clouds.
construct	<i>verb</i>	to build or erect.
consumer	<i>noun</i>	person who uses a good or service.
continent	<i>noun</i>	one of the seven main land masses on Earth.
continental climate	<i>noun</i>	climate group that experiences extreme seasonal change. Continental climates are only found in the Northern Hemisphere.
cool summer climate	<i>noun</i>	region that experience cool summers and snowy winters.
crop	<i>noun</i>	agricultural produce.
culture	<i>noun</i>	learned behavior of people, including their languages, belief systems, social structures, institutions, and material goods.
data	<i>plural noun</i>	(singular: datum) information collected during a scientific study.
dependent	<i>adjective</i>	relying on or needing something.
desert	<i>noun</i>	area of land that receives no more than 25 centimeters (10 inches) of precipitation a year.
development	<i>noun</i>	construction or preparation of land for housing, industry, or agriculture.
diverse	<i>adjective</i>	varied or having many different types.
dominate	<i>verb</i>	to overpower or control.
drought	<i>noun</i>	period of greatly reduced precipitation.
dry season	<i>noun</i>	time of year with little precipitation.
elevation	<i>noun</i>	height above or below sea level.
enormous	<i>adjective</i>	very large.
Equator	<i>noun</i>	imaginary line around the Earth, another planet, or star running east-west, 0 degrees latitude.
eruption	<i>noun</i>	release of material from an opening in the Earth's crust.
Eskimo	<i>noun</i>	people and culture native to the Arctic region of eastern Russia, the U.S. state of Alaska, Canada, and Greenland.
experiment	<i>verb</i>	to try or test an idea.
extensive	<i>adjective</i>	very large.
farming	<i>noun</i>	the art, science, and business of cultivating the land for growing crops.
flourish	<i>verb</i>	to thrive or be successful.
fog	<i>noun</i>	clouds at ground level.
forest	<i>noun</i>	ecosystem filled with trees and underbrush.
fossil fuel	<i>noun</i>	coal, oil, or natural gas. Fossil fuels formed from the remains of ancient plants and animals.
frigid	<i>adjective</i>	very cold.

frost	<i>noun</i>	thin coat of ice covering objects when the dew point is below freezing.
geographer	<i>noun</i>	person who studies places and the relationships between people and their environments.
glacier	<i>noun</i>	mass of ice that moves slowly over land.
grassland	<i>noun</i>	ecosystem with large, flat areas of grasses.
Great Lakes	<i>noun</i>	largest freshwater bodies in the world, located in the United States and Canada. Lake Huron, Lake Ontario, Lake Michigan, Lake Erie, and Lake Superior make up the Great Lakes.
greenhouse effect	<i>noun</i>	phenomenon where gases allow sunlight to enter Earth's atmosphere but make it difficult for heat to escape.
greenhouse gas	<i>noun</i>	gas in the atmosphere, such as carbon dioxide, methane, water vapor, and ozone, that absorbs solar heat reflected by the surface of the Earth, warming the atmosphere.
growing season	<i>noun</i>	period in the year when crops and other plants grow rapidly.
harsh	<i>adjective</i>	extreme.
hemisphere	<i>noun</i>	half of a sphere, or ball-shaped object.
high-elevation climate	<i>noun</i>	climate group found in mountains and plateaus.
highland climate	<i>noun</i>	(high-elevation climate) region found on and around mountains.
housing	<i>noun</i>	shelters where people live.
humid continental	<i>noun</i>	(continental climate) region that experiences cold winters and warm, wet summers. Also called a warm summer climate.
humidity	<i>noun</i>	amount of water vapor in the air.
humid subtropical climate	<i>noun</i>	region that experiences cool winters and hot humid summers.
hurricane	<i>noun</i>	tropical storm with wind speeds of at least 119 kilometers (74 miles) per hour. Hurricanes are the same thing as typhoons, but usually located in the Atlantic Ocean region.
ice age	<i>noun</i>	long period of cold climate where glaciers cover large parts of the Earth. The last ice age peaked about 20,000 years ago. Also called glacial age.
ice cap climate	<i>noun</i>	region where temperatures rarely rise above freezing.
influence	<i>verb</i>	to encourage or persuade a person or organization to act a certain way.
interaction	<i>noun</i>	relationship between two or more forces, objects, or organisms.
Intertropical Convergence Zone (ITCZ)	<i>noun</i>	belt of low-pressure air currents that circle the Earth at the Equator. Also known as the Monsoon Zone.
island	<i>noun</i>	body of land surrounded by water.
lake	<i>noun</i>	body of water surrounded by land.

lake effect	<i>noun</i>	process where cold winds blowing over a relatively warm lake cause rapid cloud formation and precipitation.
latitude	<i>noun</i>	distance north or south of the Equator, measured in degrees.
manatee	<i>noun</i>	threatened marine mammal native to the Caribbean Sea and Atlantic Ocean.
marine mammal	<i>noun</i>	an animal that lives most of its life in the ocean but breathes air and gives birth to live young, such as whales and seals.
marine west coast climate	<i>noun</i>	(mild climate) region that experiences rain and long, cool winters.
Mark Twain	<i>noun</i>	(1835-1910, born Samuel Langhorne Clemens) American writer.
Mediterranean climate	<i>noun</i>	(mild climate) region that experiences mild winters and warm summers.
microclimate	<i>noun</i>	small area where the climate differs within a larger climate region, such as "heat islands" in a city.
microscopic	<i>adjective</i>	very small.
migrate	<i>verb</i>	to move from one place or activity to another.
migration	<i>noun</i>	movement of a group of people or animals from one place to another.
mild climate	<i>noun</i>	climate group that experiences seasonal temperature changes. Also called a temperate climate.
moist	<i>adjective</i>	damp or slightly wet.
monsoon	<i>noun</i>	seasonal change in the direction of the prevailing winds of a region. Monsoon usually refers to the winds of the Indian Ocean and South Asia, which often bring heavy rains.
mountain	<i>noun</i>	landmass that forms as tectonic plates interact with each other.
Northern Hemisphere	<i>noun</i>	half of the Earth between the North Pole and the Equator.
North Pole	<i>noun</i>	fixed point that, along with the South Pole, forms the axis on which the Earth spins.
nutrient	<i>noun</i>	substance an organism needs for energy, growth, and life.
occasionally	<i>adverb</i>	sometimes.
Outback	<i>noun</i>	remote, sparsely populated interior region of Australia.
Patagonia	<i>noun</i>	large plateau in southern South America, stretching from the Andes Mountains to the Atlantic Ocean.
pendulum	<i>noun</i>	object suspended from a point, able to swing back and forth.
periodic	<i>adjective</i>	occasional.
phenomena	<i>plural noun</i>	(singular: phenomenon) any observable occurrence or feature.
plateau	<i>noun</i>	large region that is higher than the surrounding area and relatively flat.
polar	<i>adjective</i>	having to do with the North and/or South Pole.
polar climate	<i>noun</i>	climate group found within the Arctic and Antarctic Circles.

prairie	<i>noun</i>	large grassland; usually associated with the Mississippi River Valley in the United States.
precipitation	<i>noun</i>	all forms in which water falls to Earth from the atmosphere.
predictable	<i>adjective</i>	regular or able to be forecasted.
rain forest	<i>noun</i>	area of tall, mostly evergreen trees and a high amount of rainfall.
rainy season	<i>noun</i>	time of year when most of the rain in a region falls.
region	<i>noun</i>	any area on the Earth with one or more common characteristics. Regions are the basic units of geography.
retreat	<i>verb</i>	to go back to a familiar or safe place.
savanna	<i>noun</i>	type of tropical grassland with scattered trees.
Scandinavia	<i>noun</i>	region and name for some countries in Northern Europe: Iceland, Norway, Sweden, Finland, and Denmark.
scheme	<i>noun</i>	structure or diagram of the way information is studied, documented, and understood.
seasonal	<i>adjective</i>	likely to change with the seasons.
semiarid climate	<i>noun</i>	(dry climate) region that receives between 25 and 50 centimeters (10-20 inches) of rainfall every year.
shore	<i>noun</i>	coast.
Siberia	<i>noun</i>	region of land stretching across Russia from the Ural Mountains to the Pacific Ocean.
snow	<i>noun</i>	precipitation made of ice crystals.
spectacular	<i>adjective</i>	dramatic and impressive.
subarctic climate	<i>noun</i>	region that experiences long, cold winters with very little precipitation. Also called a boreal or tundra climate.
sunlight	<i>noun</i>	visible radiation from the sun.
taiga	<i>noun</i>	evergreen forest in cool, northern latitudes. Also called boreal forest.
technique	<i>noun</i>	method of doing something.
tectonic plate	<i>noun</i>	large, moveable segment of the Earth's crust.
temperature	<i>noun</i>	degree of hotness or coldness measured by a thermometer with a numerical scale.
thunderstorm	<i>noun</i>	cloud that produces thunder and lightning, often accompanied by heavy rains.
topographic feature	<i>noun</i>	map representation of the Earth's surface showing elevation.
topography	<i>noun</i>	study of the shape of the surface features of an area.
tornado	<i>noun</i>	a violently rotating column of air that forms at the bottom of a cloud and touches the ground.
trade wind	<i>noun</i>	winds that blow toward the Equator, from northeast to southwest in the Northern Hemisphere and from southeast to northwest in the Southern Hemisphere.

transition zone	<i>noun</i>	area between two natural or artificial regions.
tropical climate	<i>noun</i>	climate group that experiences hot, wet summers.
tropical monsoon climate	<i>noun</i>	region that experiences the monsoon winds, which bring heavy rain.
tropical wet and dry climate	<i>noun</i>	region that experiences three seasons: cool, hot, and wet.
tropical wet climate	<i>noun</i>	region that experiences hot temperatures and heavy rainfall all year. Also called a rain forest climate.
tundra climate	<i>noun</i>	region that experiences short summers and long winters.
typhoon	<i>noun</i>	tropical storm with wind speeds of at least 74 miles (119 kilometers) per hour. Typhoons are the same thing as hurricanes, but usually located in the Pacific or Indian Ocean region.
typical	<i>adjective</i>	ordinary.
uniform	<i>adjective</i>	exactly the same in some way.
unique	<i>adjective</i>	one of a kind.
upland climate	<i>noun</i>	(high-elevation climate) region found on and around large plateaus.
urban area	<i>noun</i>	developed, densely populated area where most inhabitants have nonagricultural jobs.
urban heat island	<i>noun</i>	city area that is always warmer than the surrounding area.
variation	<i>noun</i>	difference.
vegetation	<i>noun</i>	all the plant life of a specific place.
volcanic	<i>adjective</i>	having to do with volcanoes.
volcanic ash	<i>noun</i>	fragments of lava less than 2 millimeters across.
warm summer climate	<i>noun</i>	region that experiences cool winters and warm, wet summers. Also called a humid continental climate.
weather	<i>noun</i>	state of the atmosphere, including temperature, atmospheric pressure, wind, humidity, precipitation, and cloudiness.
weather system	<i>noun</i>	movement of warm or cold air.
wind	<i>noun</i>	movement of air (from a high pressure zone to a low pressure zone) caused by the uneven heating of the Earth by the sun.
winter	<i>noun</i>	time of year when part of the Earth receives the least daylight: December, January, and February in the Northern Hemisphere and June, July, and August in the Southern Hemisphere.
Wladimir Koppen	<i>noun</i>	(1846-1940) Russian-German geographer and climatologist.

For Further Exploration

Articles & Profiles

- National Geographic Magazine: Climate Connections

Audio & Video

- National Geographic Kids: Climate and Weather Video

Worksheets & Handouts

- NOAA: Climate Program Office—Climate Literacy Guide

Websites

- Arizona State University and the World Meteorological Organization: Climate Extremes Archive
- National Geographic Science: Climate



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