

Physical regions are defined by landform (continents and mountain ranges), climate, soil, and natural vegetation. or

Physical regions are defined by having similar landforms or other physical characteristics.

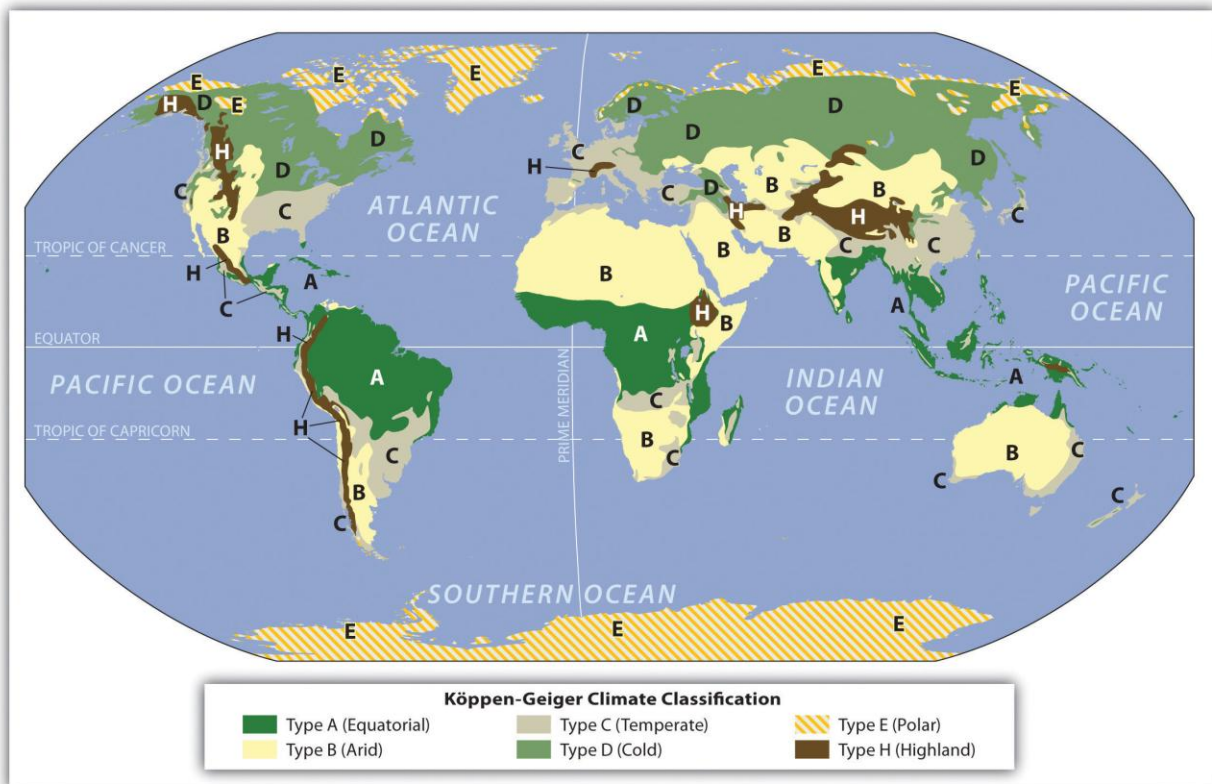
For instance, there are mountainous regions, costal regions, and river valley regions.

There are regions that share a cold, icy climate, and others that are united by a hot, dry climate.

## **Regions Based on Climate**

Several geographers have developed categories to identify climate types Regions. Climate can be defined as a long-term average weather pattern evident in a particular region of the world. Weather is a term usually used to define conditions on a short-term or even daily basis. The two main elements in climate conditions are temperature and precipitation. For the purposes of this overview of world geography, the various climate types have been broken down into six basic types—A, B, C, D, E, and H—after the Köppen-Geiger classification system.

- A. Type A: Tropical or equatorial climates
- B. Type B: Dry or arid climates
- C. Type C: Moderate or temperate climates
- D. Type D: Cold or continental climates
- E. Type E: Polar or extreme climates
- F. Type H: (Unclassified) highland climates



Type A: Tropical or Equatorial Climates

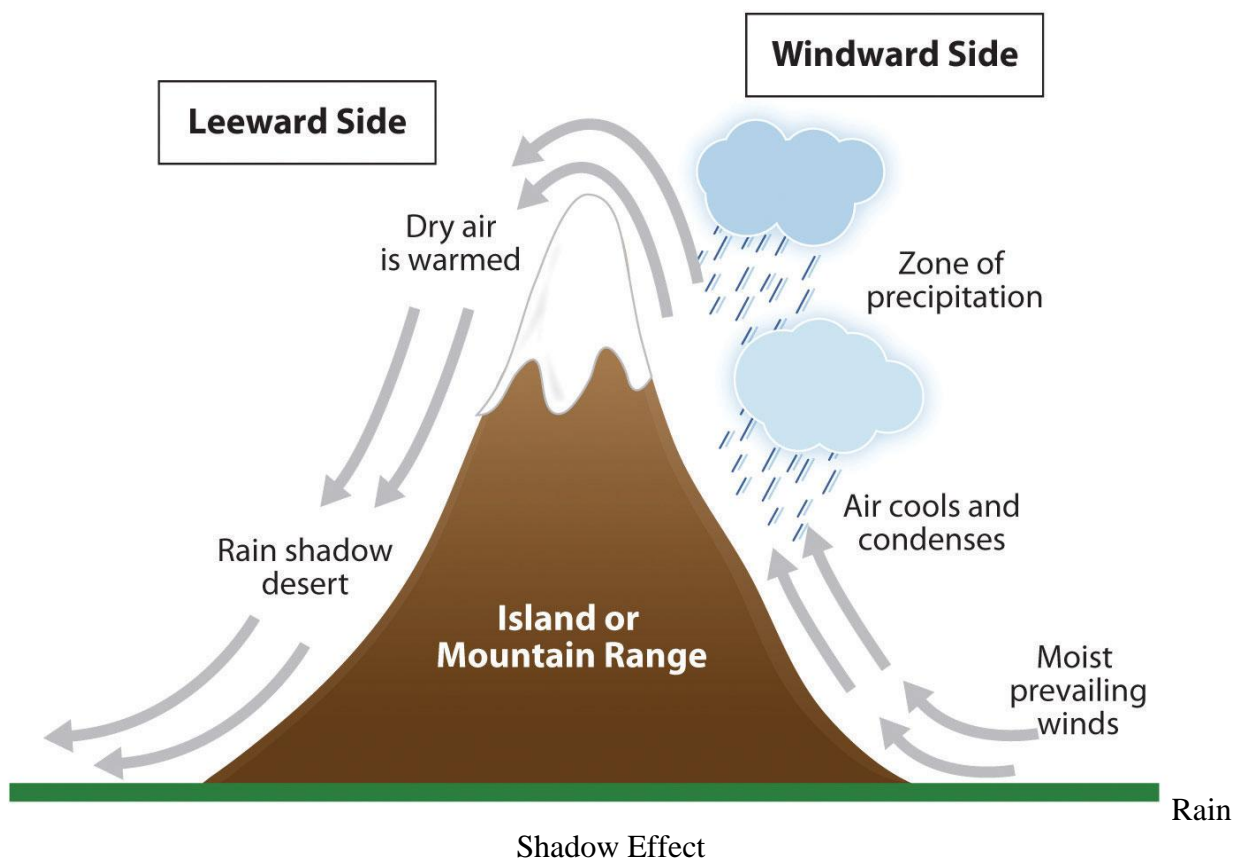


The humid tropical type A climate, usually found in the tropics, has warm temperatures year round with a high level of precipitation, typically in the form of rain. Type A climates have various subgroups that indicate how variably the rainfall is distributed throughout the year. Some type A climates produce a dry season and a wet season (monsoon), while others receive consistent rainfall throughout the year.

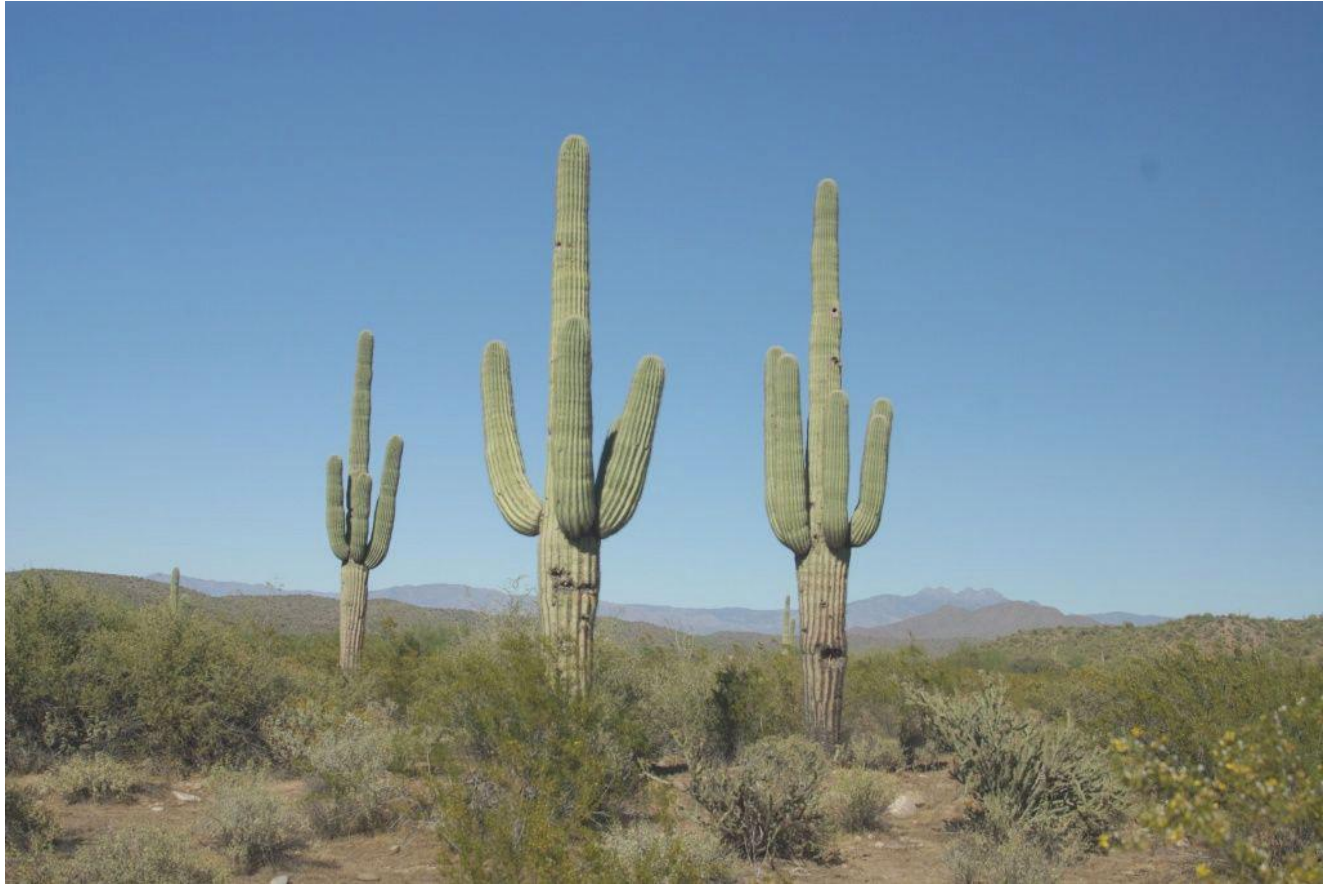
### Type B: Dry or Arid Climates

The dry type B climate is exemplified by the earth's desert regions. Temperatures can be extreme, with little precipitation. Type B climate regions experience low rainfall and high temperatures during the day and cooler temperatures at night or during the winter season. Terrain in type B climates can range from sand deserts to prairie grasslands or steppes. Type B climates have fewer trees than most other climate areas.

There is a direct relationship between highlands and type B climates in various places in the world. This climate condition, known as the rain shadow effect, or more accurately, the precipitation shadow effect, occurs when one side of a mountain range receives abundant rainfall while the region on the other side of the mountain range is a desert or has more arid climate conditions. This phenomenon is evident wherever there is terrain with enough elevation to restrict the movement of precipitation-bearing clouds.



Rain shadows are created when prevailing winds carrying moisture rise quickly in elevation up a mountainside, where the air cools and condenses to precipitate out its moisture in the form of rain or snow. By the time the air mass hits the top of the mountain, its moisture is much reduced. The dried air rushes down the other side of the mountain range, where it increases in temperature. The warm, dry air coming off the mountains continues to pull moisture out of the land, resulting in desert or arid climate conditions.



Dry or arid type B climates such as central Arizona have fewer trees than other climates. The saguaro cactus can withstand long periods with little precipitation.

The Hawaiian island of Kauai has an extreme example of the rain shadow effect. The island's windward side receives more rain than almost any other place on Earth: as much as 460 inches (almost 40 feet) a year. Only a part of the island, however, receives that amount of rain. The height of the mountains causes a rain shadow on the dry leeward side, creating semidesert conditions and type B climates.

Death Valley in California is also a result of the rain shadow effect. Little rain falls on Death Valley because any moisture in the prevailing winds falls on the western side of the bordering mountain ranges. The whole state of Nevada is dry because of the rain shadow effect. All the rain coming off the Pacific Ocean falls on the coastal mountains and the Sierra Nevada in



California. The mountains are high enough to shadow that region of Nevada, and the basin and ranges further the rain shadow effect on a local basis.

On the other side of the earth, the Himalayas are an excellent example of mountains that create the rain shadow effect. Most of western China has type B climates because of the rain shadow effect caused by high mountains that stop rain clouds from ever reaching the region. The southern side of the Himalayas receives extensive rainfall because of monsoon rains arriving from the Indian Ocean, but western China is essentially a desert. It is sparsely inhabited compared with the high-density regions in China Proper to the east, where rainfall is plentiful

### Type C: Moderate or Temperate Climates



Moderate type C climates are good for agriculture. For example, in Appalachia, tobacco and hardwood forests grow well.

Often described as moderate in temperature and precipitation, type C climates are the most favorable to human habitation in that they host the largest human population densities on the

planet. Type C climates are found mostly in the midlatitudes bordering the tropics. Seasonal changes are pronounced, with a distinct winters and summers. Winters are cool to cold and summers are usually warm. Precipitation varies from low to high, depending on location. In the United States, C climates dominate the southeast and the West Coast.

Type C climates are not the most widespread on the planet, but they have attracted the largest human populations. One reason for the attraction has been the abundance of forests, farmland, and fresh water found in type C regions. The main population centers of the planet are in type C climates. With over seven billion people on the planet and growing, humans have populated most of the regions with type C climates and are now filling up the other areas that have A, B, or D climate types.

#### Type D: Cold or Continental Climates



Colder type D climates are prominent in states such as North Dakota, which has the coldest annual winter temperatures of the continental forty-eight states.

Type D climate regions are often found in the interiors of continents away from the moderating influence of large bodies of water. They are often farther north than type C regions, resulting in

colder winters. Seasonal variations exist, with cool to hot summers and cold winters. Precipitation is usually in the form of rain in summer and snow in winter. Regions with type D climates can be found in the Great Lakes region of the United States, much of Canada, and a large portion of Russia.

### Type E: Polar or Extreme Climates

Type E is an extreme climate type found in the polar regions near or to the north of the Arctic Circle and near or to the south of the Antarctic Circle. Regions with type E climates are cold with permanent ice or permafrost year round. Vegetation is minimal, and there are no trees. Temperatures may warm slightly during the short summer months but rarely rise above 50 degrees.

### Type H: Highland Climates

Type H highland climates are usually listed as a subcategory of type E climates. Mountain ranges can create a variety of climate types because of the change in elevation from the base of the range to the summit. Different climate types can be found on the same mountain at different elevations. Type H climates designate highlands or mountain terrain. Variations in climate exist on most mountain ranges. Climates at the base of mountains will vary depending on whether the mountains are found in the tropics or in the higher latitudes. For example, high mountains near the equator may have a type A climate at their base and a type E climate at their summit with various type C and type D climates between them. Type H climates are found where elevation differences are profound enough to provide different climate zones. Higher elevation relief can reach above the tree line and have permanent snow cover at the summit. The term *relief* is used in geography to indicate elevations of a land surface. Elevation zones with permanent ice or snow can resemble a type E polar climate.

### Deforestation

The planet's growing population has increased demands on natural resources, including forest products. Humans have been using trees for firewood, building homes, and making tools for millennia. Trees are a renewable resource, but deforestation occurs when they are removed faster than they can be replenished. Most people in rural areas in developing countries rely on firewood to cook their food. Many of these areas are experiencing a fast decline in the number of trees available. People living in mainly type B climates may not have access to a lot of trees to start with; therefore, when trees are cut down for firewood or for building materials, deforestation occurs. In the tropical areas, it is common for hardwood trees to be cut down for lumber to gain income or to clear the land for other agricultural purposes, such as cattle ranching. Countries that lack opportunities and advantages look to exploit their natural resources—in this case, trees—for either subsistence agriculture or economic gain. Deforestation has increased across the globe with the rapid rise in worldwide population.

During the Industrial Revolution, European countries chopped down their forests at a rapid rate. Much of the British Isles was forested at one point, but today few forests remain on the British



Isles, and they are typically protected. Colonialism brought the Europeans to the Americas. The United States, in its early development, pushed west from the original thirteen colonies, and many old growth forests were cut down in the process. As railroad tracks were laid down and pioneer development pushed west into the Great Plains, where there were few trees, the great cutover occurred in the eastern and central forests—*cutover* is a term indicating the systematic deforestation of the eastern and central forests. Michigan and Wisconsin saw their trees removed in a systematic deforestation.



Forests are removed for timber, and burning the excess then clears the land for other purposes.

Some areas were allowed to grow back, but many other areas were turned into farmland. Few old-growth forests remain in the United States. Today there are conflicts over how the timber industry is handling the forests in places such as the Pacific Northwest region of the United States.

Countries that are better off economically no longer have to cut down their own trees but can afford to substitute other resources or import lumber from other places. Developing regions of the world in Latin America, Africa, and parts of Asia are experiencing serious problems with deforestation. Deforestation is widespread: Residents of Haiti have cut down about 99 percent of the country's forests; most of the wood has been used as fuel to cook food. People in Afghanistan have cut down about 70 percent of their forests. Nigeria has lost about 80 percent of its old-growth forests since 1990. Ethiopia has lost up to 98 percent of its forested acreage, and the Philippines has lost about 80 percent of its forests.

Brazil's Amazon basin has undergone many projects that have driven deforestation. For example, about half the state of Rondônia in western Brazil has been deforested since 1990. The countries of Central America have lost about half their original forests, and deforestation continues on a systematic basis. Tropical regions of Southeast Asia and Africa are being exploited for their timber at unsustainable rates, causing deforestation that the next generation will have to deal with. India, with over a billion people, still has a high demand for firewood and building materials; their forests are declining faster than they can be replanted. China, with its



billion plus population, has been attempting to address its deforestation problems by implementing a massive replanting program and conservation measures. Other countries are starting to adopt similar measures.



A man in Malawi carries firewood for cooking and heating purposes.

Tropical rain forests only make up about 5 percent of the earth's surface but contain up to 50 percent of the earth's biodiversity. These forests are cut down for a variety of reasons. Norman Meyers, a British environmentalist, estimated that about 5 percent of deforestation in tropical regions is caused by the push for cattle production. Nineteen percent of these forests are cut down by the timber industry, 22 percent are cut down for the expansion of plantation agriculture, and 54 percent are removed due to slash-and-burn farming. Most tropical rain forests are located in the Amazon basin of South America, in central Africa, and in Southeast Asia. All these areas are looking for advantages and opportunities to boost their economies; unfortunately, they often target their tropical rain forests as a revenue source.