

Weather



Weather and climate describe the same thing—the state of the atmosphere—but at different time scales.

Weather is what you experience when you step outside on any given day. In other words, it is the state of the atmosphere at a particular location over the short-term. Weather includes sunshine, rain, cloud cover, winds, hail, snow, sleet, freezing rain, flooding, blizzards, ice storms, thunderstorms, steady rains from a cold front or warm front, excessive heat, heat waves and more.

Weather can change quickly, from one moment to the next and over short distances. It can be raining one minute, and snowing the next. It can be pouring on one side of town and sunny on the other.

Whether it's a hurricane, a crippling snowstorm, or a multi-year drought, weather and climate affect communities and businesses across the United States. Weather forecasters rely on a network of radars, satellites, ocean buoys, weather balloons, other observations, and supercomputers to provide timely, accurate, and reliable forecasts. They also issue critical watches and warnings before extreme weather strikes.

Climate



Worldwide, scientists observe weather conditions at thousands of stations every day of the year. Some observations are made hourly, others just once a day. Over time, these observations allow us to define what's normal at each location. Climate is the average of the weather patterns in a location over a longer period of time, usually 30 years or more.

When scientists talk about climate, they're talking about the averages of measurable things like land or sea temperature, amount of rainfall, date of the first frost, amount of sea ice melt, or sea level, etc. often over long timespans of 30 years or more. That's why we come to expect, for example, that the Northeast will be cold and snowy in January and that the South will be hot and humid in July. Also, climate generally doesn't vary much over short distances, except in the mountains.

Earth has three main climate zones—tropical, temperate, and polar. These zones can be further divided into smaller zones, each with its own typical climate. A region's climate can determine its plant and animal life. Polar, Tundra, and Boreal Forest are polar zones that have freezing temperatures for the majority of the year. Temperate zones include Temperate Forests and Mediterranean climates have warm, hot, and dry summers with cooler winters, while Deserts are hot year-round. Tropical Grasslands and Tropical Rainforests are hot year-round with rainy and dry seasons.

The reason studying climate is important is that it will affect people around the world. Rising global temperatures are expected to raise sea levels, and change precipitation and other local climate conditions. Changing regional climate could alter forests, crop yields, and water supplies. It could also affect human health, animals, and many types of ecosystems. Deserts may expand into existing rangelands, and features of some of our National Parks and National Forests may be permanently altered.