

## Global Perspective of Observed Changes in Weather Extremes: Uncertainties and Climate Change Attribution

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### Abstract

Looking out the window to check the weather is probably one of your first morning rituals. You can choose your clothing and perhaps even your day's activities by looking outdoors and listening to the weather report. You might visit the zoo or go on a picnic if there are no classes and it looks sunny. You can consider going to a museum on a rainy day or staying in and reading. We experience several effects of the weather. Weather variations from day to day can affect how we feel and how we perceive the world. Because of the damage that extreme weather events like tornadoes, hurricanes, and blizzards produce, many people's lives can be disrupted..

**Keywords:** *Climate, Environment.*

### Introduction

The transient conditions of the atmosphere, the layer of air that surrounds the Earth, are referred to as "weather." The atmosphere in our own region of the world is typically how we conceive of weather. However, the way that weather operates is similar to how dropping a pebble in water; the ripples eventually affect water far from the original location. The weather occurs similarly everywhere around the world. The weather hundreds or thousands of kilometres away will eventually be impacted by the weather in your area. As it travels southeast across the United States, a snowstorm that is centred around Winnipeg, Manitoba, Canada, may eventually reach Chicago, Illinois.

The weather is always changing. From one hour to the next or day to the next, it moves and changes. Over many years, certain weather patterns become typical in a place. Climate refers to the typical weather patterns in a place as well as their changes and extremes over a long period of time. For instance, Las Vegas, in the American state of Nevada, is typically dry and warm. Although significantly more humid and wet than other parts of Hawaii, Honolulu is the state's capital. Like the weather, the climate varies. However, it may take hundreds or even thousands of years for the climate to alter. The Sahara Desert in northern Africa is currently the biggest desert on earth. However, the Sahara's environment was very different a few thousand years ago. There was a lot of rain in this "Green Sahara." The causes of weather, the six main elements, or parts, of weather are as follows. They are heat, pressure in the atmosphere, wind, humidity, precipitation, and cloudiness. These elements characterize the weather at any particular period when taken as a whole. Scientists who study weather—meteorologists—can predict what the weather will be like in the near future with the help of these evolving factors and their understanding of atmospheric dynamics.

The term "temperature" describes how hot or cold the atmosphere is and is measured with a thermometer. Temperature is reported by meteorologists in both Celsius (C) and Fahrenheit (F). While most countries across the world use the Celsius system, the United States employs the Fahrenheit system. The Celsius scale is almost universally used by scientists to measure temperature.

A related measurement is temperature. For instance, a day at 70 °C might appear warm after several days of temperatures around 32

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°C, but a day at 70°C would seem cool after several days of temperatures around 95°C. The Polar Regions typically experience the coldest weather, while the equator typically has the warmest weather. The weight of the atmosphere above is known as atmospheric pressure. Weather changes are signaled by variations in atmospheric pressure. Typically, a high-pressure system provides bright skies and chilly temperatures. A low-pressure system can bring storms, rain, and warmer weather.

Changes in atmospheric pressure occur with elevation. High altitudes have substantially lower air pressure. At 5,895 m (19,344 feet) height, Mount Kilimanjaro in Tanzania has an air pressure that is 40% that of sea level. It's significantly colder outside. While Mount Kilimanjaro's top is covered with ice and snow, its base experiences balmy temperatures. Air is moving, and this is wind. Differences in temperature and atmospheric pressure between nearby places cause wind to arise. In general, winds move from cooler, high-pressure regions to warmer, low-pressure regions. The amount of water vapour in the air is referred to as humidity. An atmospheric gas called water vapour contributes to the formation of clouds, rain, and snow. Relative humidity, or the percentage of the maximum quantity of water that air can contain at a specific temperature, is the most common way to express humidity. Compared to warm air, cool air holds less water. Air is said to be saturated when the relative humidity reaches 100%, suggesting it is unable to hold any more water vapour. Precipitation will form if there is too much water vapour. As air cools below its saturation point, clouds and precipitation form. This typically occurs as warm, humid air rises and cools.

Islands close to the equator are among the planet's driest locations. For instance, Singapore experiences year-round humidity. Water from the Indian Ocean is constantly infused into the warm air. There are many different kinds of clouds. They don't all result in precipitation. For instance, thin cirrus clouds typically indicate favourable weather. Rain or snow can fall from many types of clouds. Nimbostratus clouds provide a blanket-like cover, causing prolonged, constant precipitation. Huge thunderheads, often known as cumulonimbus clouds, produce torrential downpours. Cumulonimbus clouds can create thunderstorms and tornadoes as well. The amount of sunlight that reaches the Earth's surface can be impacted by clouds. Days with clouds tend to be cooler than days without because more of the sun's radiation is blocked from reaching the Earth's surface. In contrast, throughout the night, clouds serve as a blanket, keeping the Earth warm.