

GLOBAL PRECIPITATION MEASUREMENT MISSION

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What is the difference between weather and climate?

Take a moment and look outside your window. Is it sunny or cloudy? Is it rainy or dry? Is it what you'd expect for this time of year? If it has been cool for the past few days but it is getting warmer today, is that weather or climate? Though they are closely related, weather and climate are NOT the same thing.

Climate is what you expect, as reflected by the clothes in your closet, and **weather is what you get**, like the clothing you chose to wear today.

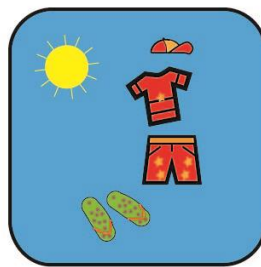
Weather is a specific event—like a rainstorm, blizzard or a hot day—that happens over a short period of time. People generally think of weather as the combination of temperature, humidity, precipitation, cloudiness, visibility, and wind. We talk about weather in terms of the near future: “What will it be like today?” “What is the temperature right now?” and “Will we get rain this week?”



today



tomorrow



what to wear each day

Weather is only temporary and is always changing. Weather is what you look to when you are planning outside activities and what to wear.

Climate on the other hand, describes what an area's typical weather conditions are like over a long period of time—30 years or more. To describe the climate of a place, we might say what the temperatures are like during different seasons, or how much rain or snow typically falls. We talk about climate in terms of years, decades, centuries, even millions of years. So, when scientists talk about climate, they are looking at averages of precipitation, temperature, humidity and other measures of the weather that occur over a long period of time in a particular place. Looking at average weather patterns over a long time helps us describe whether the winters are cold and snowy and whether the summers are hot and humid

How does NASA monitor weather and climate?



NASA satellites are orbiting Earth all the time. They collect many types of information about Earth's land, atmosphere, ocean, and ice. This information not only helps scientists learn more about Earth's weather and its changing climate but is used in forecasts to predict weather and climate.



Did You Know...? NASA has a satellite that measures precipitation from space. The Global Precipitation Measurement mission can help support weather and climate forecasting activities. Go to gpm.nasa.gov to learn more.

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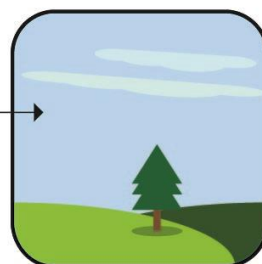
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at a particular place. They can also tell us when we might expect the warmest day and the coldest day at that location. However, while climate can provide an idea of what to expect in an area, climate cannot provide any specific details about what the weather will be on any given day.

Climate is more than just a few warm or cool days. Climate describes the typical conditions in an entire region, often for 30 years or more. With climate change, we may see changes in the typical weather for a region that are long lasting or more permanent— such as high or low temperatures and amount of rainfall. Unlike weather that can tell you what to wear each day, climate can tell you what types of clothes to have in your closet.



Year 1970



Year 2021



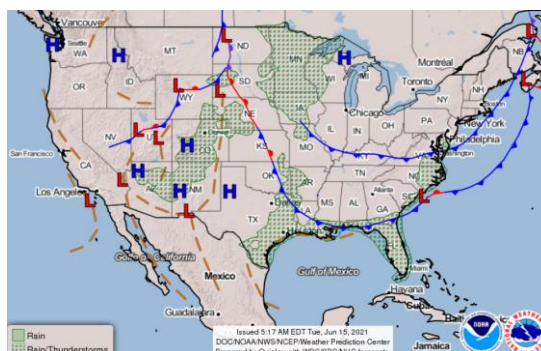
types of clothes to have in your closet

Forecasting Weather and Predicting Climate

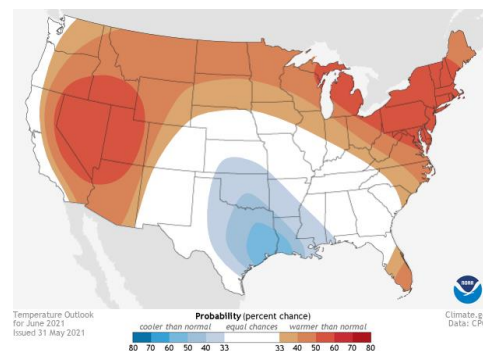
Both weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions determine local weather patterns and influence climate. Understanding these interactions allows scientists to better predict short- and long-term changes so that we can plan ahead and be better prepared. These predictions are called forecasts.

Weather Forecasts can tell you what the weather will be like in your city in an hour, tomorrow, or next week. Weather forecasting involves a combination of computer programs, observations, and a knowledge of trends and patterns. By using these methods, reasonable accurate forecasts can be made up to seven days in advance.

Climate Forecasts take a much longer-term view and predict weather averages. Climate forecasts try to answer questions like “How much warmer will the Earth be next year to 100 years from now?” “How much rainfall will there be?” Being able to predict climate is much harder for us to get a sense of because the timescales involved are much longer, and the impact of climate changes can be less immediate. However, scientists can try and predict what Earth’s climate will be like in the future by using special computer programs called climate models.



Weather Forecast Map: Areas of high and low pressure systems and precipitation



Climate Forecast Map: June Temperature Outlook

Learn more about Climate Change!

References and resources:

- [NASA Climate Kids](#)
- [NOAA NCEI](#)
- [National Forecast Maps](#)
- [Climate Maps](#)