

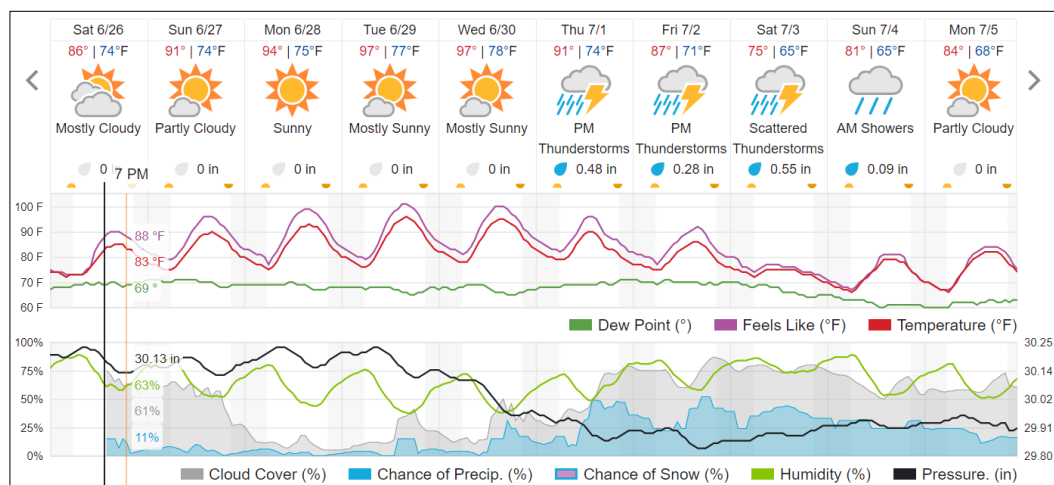
GLOBAL PRECIPITATION MEASUREMENT MISSION

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? Though they are closely related, weather and climate are NOT the same thing. The difference between weather and climate is time. Weather is what is happening right now, and climate is what you typically expect the weather in a specific location to be like for this time of year.

- *Climate is what you expect and Weather is what you get* -

Weather is the condition of Earth's atmosphere at a particular time and place. We 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?"



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

Climate 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. When scientists talk about climate, they are looking at averages of precipitation, temperature, humidity, and other weather variables that occur over a long period of time in a particular place. Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature that are influencing changes in climate.

How does NASA monitor weather and climate?



NASA satellites are orbiting Earth all the time. They collect data 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.

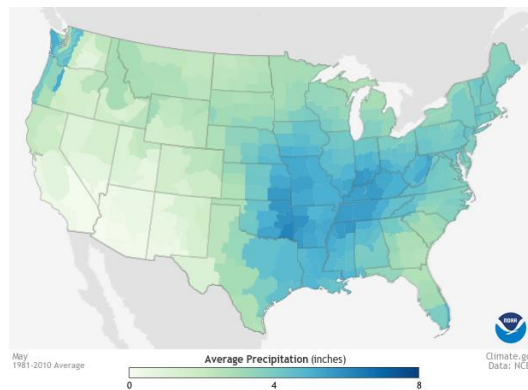


Did You Know...? NASA has a satellite that measures precipitation from space. The Global Precipitation Measurement mission can help support weather and climate forecasting activities. Go to gpm.nasa.gov to learn more.

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GPM.NASA.GOV / EDUCATION TWITTER.COM / NASAATMOSPHERE FACEBOOK.COM / NASAATMOSPHERE

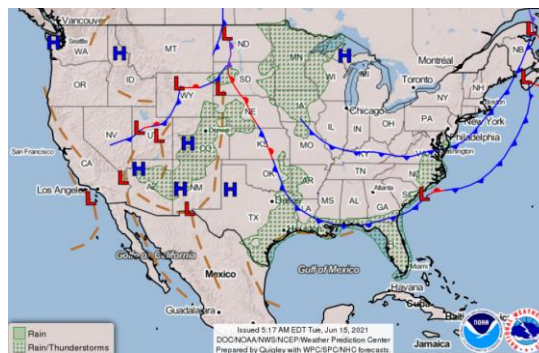
Climate describes the typical conditions in an entire region, often for 30 years or more. This image shows average precipitation from 1981- 2010 (Credit: climate.gov). With climate change, we may see changes in the typical weather for a region that are long lasting or more permanent— such as high or low temperatures and amount of rainfall. Climate can tell you what types of clothes to have in your closet.



Forecasting Weather and Predicting Climate

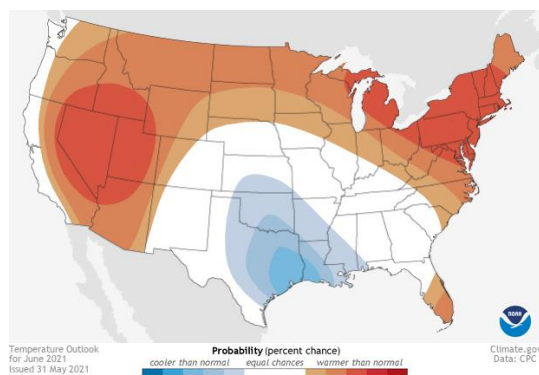
Both weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. Human behavior and actions can also affect our weather, and therefore also affect our climate when we look at how our weather patterns are changing over longer periods of time. 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 and be better prepared. These predictions are called forecasts.

Weather Forecasts help predict 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, reasonably accurate forecasts can be made up to seven days in advance. Because these predictions are using probabilities to create the forecasts, it is harder to accurately predict the weather beyond seven days. This means that forecasts must use estimates and assumptions to predict future weather. The atmosphere is changing all the time, so those estimates are less reliable the further you get into the future.



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

Climate Forecasts take a much longer-term view and predict weather averages for various locations. 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. Scientists can try and predict what Earth’s climate will be like in the future by using special computer programs called climate models.



Climate Forecast Map:
June Temperature Outlook

References and resources:

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

Learn more about Climate Change!

