

'Weather' and 'climate' are used interchangeably. They shouldn't be

22 January 2019, by Jennifer Fitchett



Heavy snow in Washington, DC, is an example of "weather" - not "climate". Credit: Erik S. Lesser/EPA-EFE

As January 2019 entered its third week, huge swathes of the US are blanketed with snow, and [winter storm warnings](#) were in place across several states. US President Donald Trump, who has made it clear that [he believes](#) climate change is an overblown hoax, took to Twitter to suggest that "a little of that good old fashioned Global Warming" would be welcome.

Trump has fallen into the same trap that many people around the world do: conflating "[climate](#)" and "[weather](#)". The US's current snow storms and cold snap are an example of weather—they will persist for a couple of days to a few weeks at maximum, but will eventually stop and make way for clear skies and inevitably a warm summer for much of the US.

This confusion is common. So, what is the difference between "weather" and "climate"?

At a very simple level, "weather" refers to day-to-day conditions of the atmosphere—the maximum

temperature, the amount of cloud cover, the speed and direction of wind and any precipitation that might occur. "Climate" describes the average atmospheric conditions over many years—the average annual rainfall, the predominant wind direction, or the season in which rain is likely to occur. The World Meteorological Organisation [states](#) that calculating a "climate" record requires a minimum of 30 years of data.

But does that mean the rain, sun, wind, hot days and cold nights over the last 29 years is just "weather"? Not really.

Clothing provides a useful analogy in understanding this.

Your weather wardrobe

Weather, in this analogy, can be considered by the clothes that we choose to wear on a given day. I'm writing from South Africa, where January and February are the peak of summer. At this time of year, South Africans are likely to wear shorts, t-shirts, sundresses, sandals or flip-flops and perhaps a sunhat. We are very unlikely to wear a warm winter coat, boots, a scarf or a beanie today.

However, in South Africa's wintertime those clothes would be a good choice – paired with warm trousers, a long-sleeved shirt and in mid-July perhaps even some thermals.

If it is a bit cooler tomorrow, with a chance of rain, we may wear closed shoes and a thin jersey. If it is even hotter we may head to the beach or the swimming pool, in which case our clothing choice for the day would involve a swimming costume and towel. So, what we wear changes day-to-day.

Climate, on the other hand, can be understood as the contents of our wardrobe. This consists of a variety of clothing: both that which suits summer weather and those items which are best worn in

winter. Our wardrobe, then, represents all the weather conditions one is likely to face throughout the year, for every year that we live in a particular place.

Place is important. The wardrobe of someone living in Johannesburg, South Africa, is very different to the collection of clothes owned by a resident of Helsinki, Finland. South Africans certainly don't need thermal clothing for sub -20°C temperatures, and Finns have little use for sundresses and shorts (unless, of course, people are heading off on holiday).

The same is true of weather and climate. The conditions experienced at one location necessarily different to those experienced at differing distance to the poles.

Improved understanding

What does this knowledge mean for our understanding of [climate projections](#) and [climate forecasts](#)?

A forecast is what you will see on the televised weather report each night, or on your phone's weather app. It will tell you the minimum and maximum temperatures likely to occur, and the chance of rainfall. It will also include any alerts for extreme events likely to occur in the next 24 to 72 hours. The weather forecast is helping you choose what to wear.

Climate projections, whether derived from regional and global climate models or from statistical trend analysis of fluctuations over past decades, tell us about the anticipated climate in the next few decades to 100 years. These are letting us know, well in advance, that we may need to think about changing the contents of our wardrobe. We perhaps should invest in fewer thermals and thick coats, and more sundresses and shorts.

We might need to buy a more hardy umbrella or raincoat for more frequent use, or perhaps a water tank for our backyard depending on where we live. But, we do not need to spend the contents of our most recent salary on a whole new wardrobe and throw out everything we have overnight – just

slowly, over years to decades, plan and adapt.

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