

# Weather and Climate –

## What is the difference and why does it matter?

It's easy to confuse the concepts of "weather" and "climate." Both terms refer to the environment around us and both involve measures such as temperature, wind, and precipitation. The difference between weather and climate is one of scale.

### What is weather?

Weather refers to the day-to-day conditions that a given place experiences. When you ask, "How warm is it today?" or "Is it raining out?" you're asking about the weather. Weather fluctuates from day to day, or even hour to hour. Take a look at the weather forecast below. In Kitchenuhmaykoosib Inninuwig (KI), over this 7-day period, the temperature fluctuates by 10°C. Some days are likely to have cloud while others are likely to have sun. One day is expected to have snow.

Next 7 Days						
<b>Tue</b> 11/26	<b>Wed</b> 11/27	<b>Thu</b> 11/28	<b>Fri</b> 11/29	<b>Sat</b> 11/30	<b>Sun</b> 12/01	<b>Mon</b> 12/02
Cloudy with sunny breaks	A mix of sun and clouds	Cloudy	Mainly cloudy	Mainly sunny	A few flurries	Mainly cloudy
						
-7°	-9°	-10°	-11°	-12°	-11°	-17°

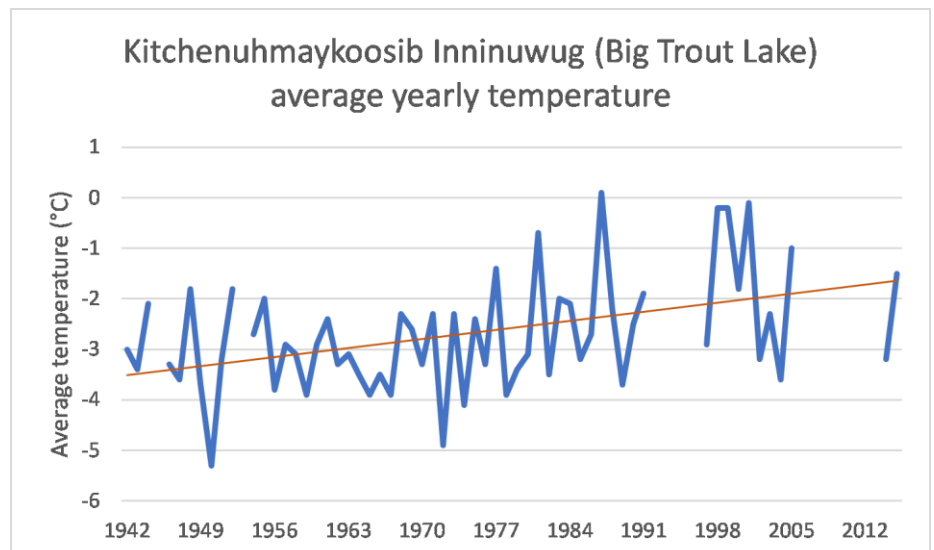


*This automated weather station, located in Neskantaga, Ontario, measures temperature, dew point, humidity, wind, precipitation, and snow depth.*

### What is climate?

Climate is the average weather a place experiences over a long period of time, like decades, or a lifetime, or a century. For example, take the graph to the right.

This graph shows the average yearly temperature in KI from 1942 through to 2015. The single temperature value given for a year is an average of all the temperature readings from the weather station in KI throughout all days of the year, from the coldest winter nights to the hottest summer days. The spikey blue line connects these dots and illustrates the variations in temperature that can happen from year to year.



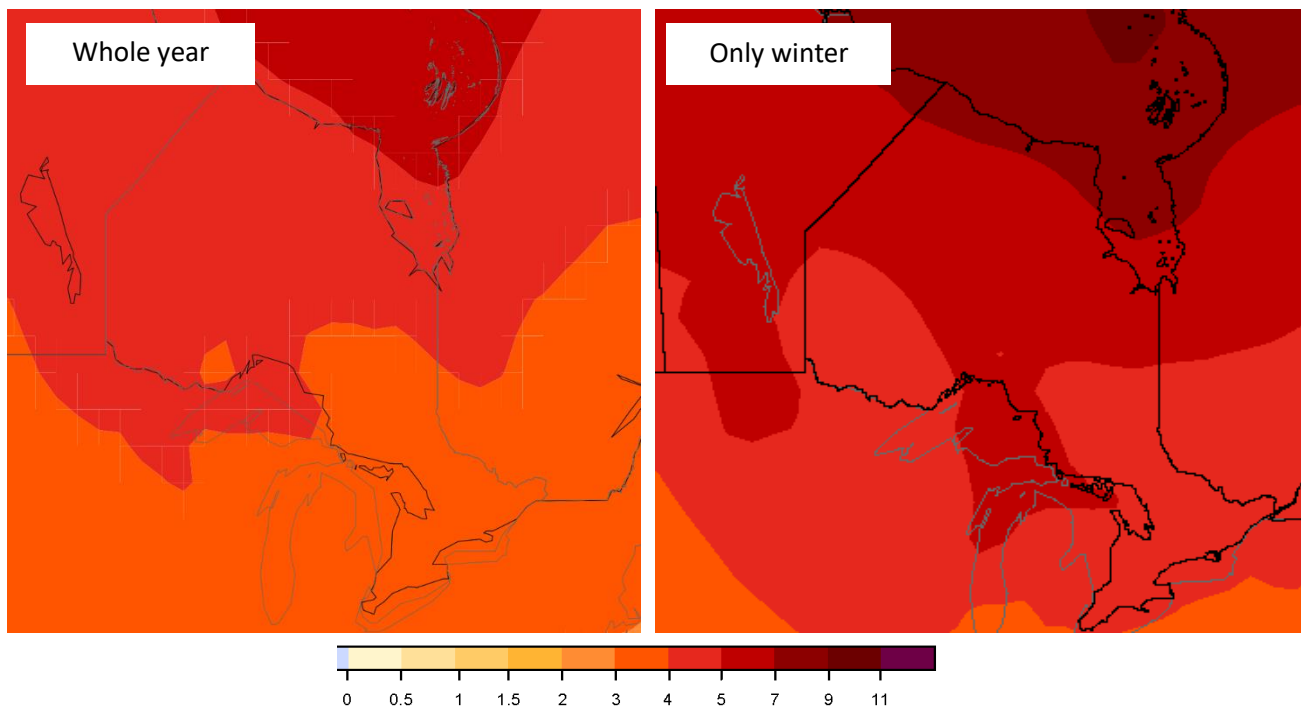
The orange line, on the other hand, is showing us the long-term trend in yearly average temperature in KI over the entire 73-year period. It's taking the temperatures that occurred each year and showing us how those temperatures have changed over more than 7 decades. The orange line is showing us a change in the climate.

## Why is climate important?

Just like how knowing the weather forecast can help us prepare for our day or our week, knowing how the climate is changing can help us plan for our present and our future. How much rain a given place can expect throughout the summer, or what temperatures are likely to be seen in January, are based on our knowledge of the region's climate. Climate models, which are used to predict what conditions might be like by the 2050s or even the end of the century, can help us determine how we should design communities and buildings, so they endure into the future. Monitoring climate can help us see how things are changing.

## How is climate changing?

All across the globe, temperatures are on the rise. In northern Ontario, the change is expected to be the most extreme in winter, with average temperatures increasing by as much as 9°C by the 2050s. In KI, the average temperature for the entire year is predicted to increase from -2°C experienced between 1986-2005 up to +3°C in the year 2050.



*Predicted increase in temperature in Ontario by the 2050s relative to the 1986-2005 period, if greenhouse gas emissions continue to rise (RCP 8.5, 75<sup>th</sup> percentile). Map from <http://climate-scenarios.canada.ca/?page=cmip5-intro>*

## What about cold days?

On November 15, 2019, the temperature in Kitchenuhmaykoosib Inninuwug was -22°C, unusually cold weather for a fall day. But just because a given day is cold, it doesn't mean that the conditions over the last few decades (the climate) haven't gotten warmer. The normal ups and downs in weather can make it harder to see the long-term trend of the climate. It's important we remember to take a step back from the weather outside our front door and notice the bigger picture.