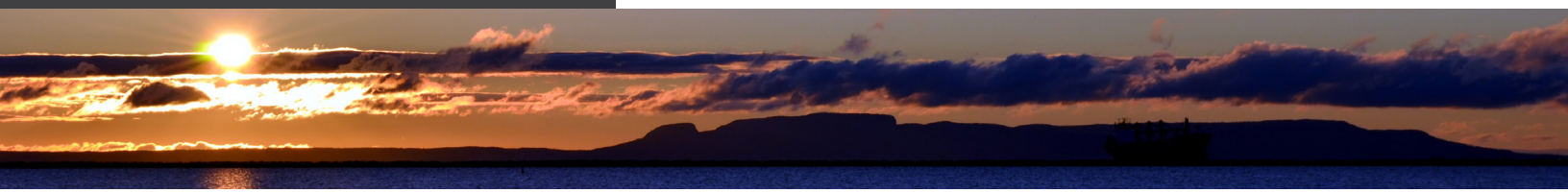
THUNDER BAY
CLIMATE CHANGE CONNECTION

SCIENCE OF CLIMATE CHANGE



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DID YOU KNOW?

What is climate change?
Climate change has been called the biggest challenge of our time, but what is it? How is it happening?

Climate change is the global changes caused by extra heat being trapped by greenhouse gases (GHGs) in earth's atmosphere. These are all gases in the air that let light from the sun enter earth's atmosphere, but prevent heat from leaving the earth's atmosphere. This process can be compared to how glass or plastic let light into a greenhouse but stop heat from leaving. [3] Some amounts of GHGs in the atmosphere are natural (and make our planet a place where life can survive) but the burning of fossil fuels, like coal, gas, and oil, is releasing huge amounts of these gases quicker than they can be removed, causing more and more heat to be trapped. [3] Also, since these gases can stay in the atmosphere a long time,[3] they keep warming the planet for a long time after they're released.

Is climate change the same as global warming?
Global warming describes the average temperature of the earth getting hotter. This warmer temperature means extra energy in the atmosphere, causing more intense weather. Depending on when and where you are, this climate change doesn't just mean warmer temperatures, but a warmer, more energetic atmosphere that holds more water, which can mean more rain or more drought, more storms, and sometimes even more cold air masses pushed into an area from somewhere else. Global warming is the earth's increase in temperature, and climate change is the warmer, wetter, and wilder weather changes that come with it. [1]

What is a GHG? Why do small amounts make such a big difference?
Greenhouse gases (GHG) are certain parts of the air that trap heat, including carbon dioxide, methane, and even water vapour! Their molecules absorb broad wavelengths of infrared light, and convert the energy to heat, whereas most of that light will pass right by other air molecules. [3] So it is the total amount of GHGs that matter, even when it is a small percentage of the total gases! [3]

How do we know it's caused by human released greenhouse gases, and not something else?
The where and when warming is experienced point towards the greenhouse effect causing warming. There is more warming at night, and at lower levels of the atmosphere. If the change were due to the sun, most of the extra heat would be during the day and at all levels of the atmosphere! [3] We're also in a period in our sun's natural cycle where we receive less solar energy than usual, but we've kept warming up! Models of our global climate over time have been unable to account for the amount of global warming we've experienced without including the impact of human released greenhouse gases. [3]

Climate vs weather

Weather is what is currently happening in the atmosphere, and can change over minutes or days. Climate is the pattern of weather in an area over many years, and describes normal weather conditions for an area during a given time of year. Weather can change in minutes, but climate changes much, much more slowly. However, with global warming, changes in climates are happening much faster than usual!

Has the climate changed before?

Yes, the climate has warmed (and cooled) this amount before, due to natural greenhouse gas and solar fluctuations, but this time the speed is much, much faster than would happen naturally. [3] Ecosystems, plants, and animals (including humans) aren't able to adjust fast enough, and this causes huge problems.

Has Thunder Bay been impacted by climate change?

Thunder Bay has already been impacted by climate change, with an increase in intensity and duration of extreme storms, shorter winters, new species (including Lyme disease carrying ticks), and heat waves. These changes are expected to get worse in the years to come, leading to risks to our health, infrastructure, and environment.

WHAT CAN WE DO?

Here is what you can do to help:

- Talk about climate change with your friends and family
- Pressure politicians for strong action on climate change
- Reduce your family's carbon footprint.
- Keep learning about climate change!

TAKE ACTION NOW!

- *Communicate about climate change*
- *Encourage decision makers to take action*
- *Get involved with community initiatives*

REFERENCES:

1– https://climate.nasa.gov/resources/global-warming-vs-climate-change/

2– https://climateatlas.ca/climate-vs-weather

3– https://climate.nasa.gov/causes/

THIS RESOURCE IS BROUGHT TO YOU BY:

- *CITIZENS UNITED FOR A SUSTAINABLE PLANET*
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