Climate Policy Quest
Backgrounder

Global Impacts of Climate Change

Impacts of Climate Change

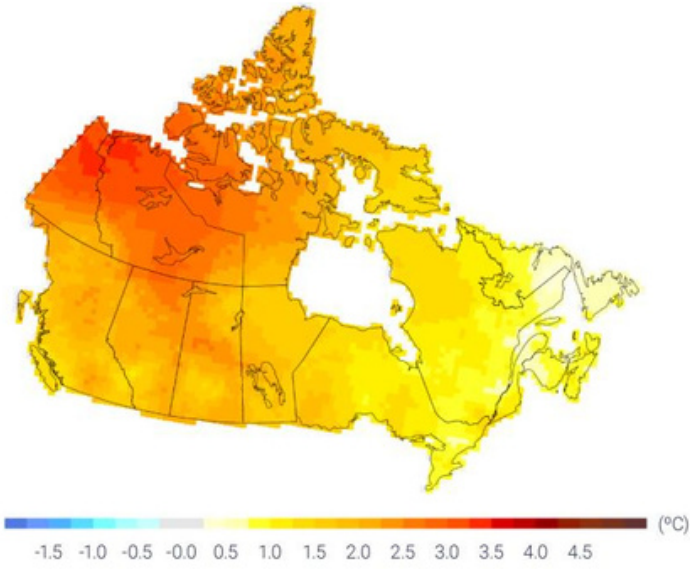
In its recent report, the Intergovernmental Panel on Climate Change (IPCC) predicted severe consequences to our world if global warming increases beyond 1.5°C above the pre-industrial levels. At the time of its release in 2018, the report confirmed an approximate global temperature increase of 1°C above pre-industrial levels caused by human activities and urging policy makers to take "rapid and far-reaching" actions to limit temperature increase to 1.5°C (Intergovernmental Panel on Climate Change, 2018).

The report predicts an increase in the mean temperature of the world, and a rise in extreme weather patterns such as droughts in certain regions and heavy precipitation in other regions (Intergovernmental Panel on Climate Change, 2018). Environment and Climate Change Canada published a report titled Canada's Changing Climate that found that on average Canada has been warming twice the rate of global warming (image to the right). The report further notes Northern Canada to be warming more than double the rate of global warming. This increase in warming has resulted in drastic and negative changes in extreme climate patterns, precipitation, snow and ice cover, freshwater availability and ocean and sea level changes (Government of Canada, 2019).

For more detailed review of the findings, visit the following link to the report:
https://changingclimate.ca/CCCR2019

By posing threatening changes to our oceans, weather, food and health, the effects of climate change "will be felt across ecosystems and human communities and economies" around the globe (National Geographic, 2018). Below are some of the impacts of climate change that are being felt today across our globe.

Annual temperature increase 2016 vs. 1968 based on linear trends

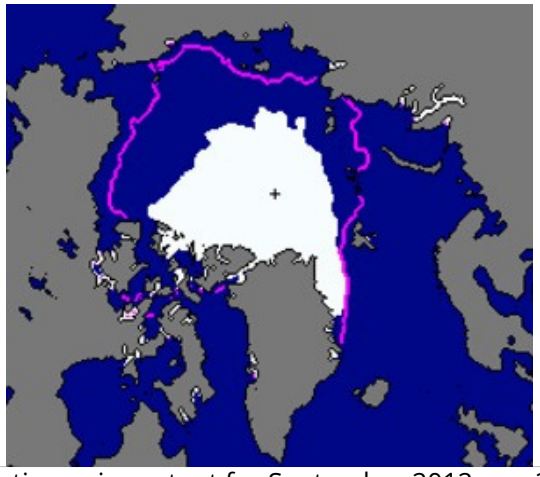


Source – (Environment and Climate Change Canada, 2019)

Glacial Melt

Climate change has led to an increase in glacial melt across the globe, including melting of ice at the Earth's poles. Below is some of the evidence that scientists have documented of glacial melt and its impacts:

- Confirmed melting of ice sheets covering West Antarctica and Greenland and the Arctic Sea ice (National Geographic, 2020). Confirmed melting of
- glaciers in the Montana's Glacier National Park has resulted in a decline of fewer than 30 glaciers compared to more than 150 in 1910 (National Geographic, 2020). Due to the glacial melt, the sea
- levels are rising at the rate of 0.13 inches or 3.2 millimeter per year (National Geographic, 2020). A report from the National Snow and Ice Data
- Center in the US shows that Arctic warming has caused air temperature to rise by 4°C in 2010 compared to the 1968 to 1996 reference period. Additionally, the research conducted by the center shows that the Arctic Sea has declined by at least 30 per cent in 2010 in the last 30 years, and continue to decrease, see image below for reference (National Snow & Ice Data Center, 2020).



"Arctic sea ice extent for September 2012 was 3.61 million square kilometers (1.39 million square miles). The magenta line shows the 1979 to 2000 median extent for that month. The black cross indicates the geographic North Pole"
– Source (National Snow & Ice Data Center, 2020).

- An increase in temperature and the subsequent melting of ice has challenged many species around the world. In particular the populations of Adélie penguin in Antarctica, with some population in western peninsula declining by at least 90 percent. Additionally, some species of "butterflies, foxes and alpine plants have migrated farther north or to higher, cooler areas" (National Geographic, 2020).

Flooding

Climate change has also resulted in an increase in extreme weather events, such as increase in precipitation (rain and snow) and severe droughts across many regions of the world (National Geographic, 2020). Although attributing flooding to climate change may be a difficult task, as there are many factors that lead to the cause of flooding, in its recent assessment report the IPCC concluded that "climate change 'has detectably influenced' several water-related variables that contribute to floods, such as rainfall and snowmelt"— as such by influencing various factors climate change indirectly increases the occurrence of flooding (Natural Resources Defense Council, 2019). Other effects of water-related events beside heavy precipitation include more frequent hurricanes and sea level rises, which make coastal communities increasingly vulnerable to the effects of climate change.

Land

Climate change leads to extreme weather events such as heavy precipitation and severe droughts in many regions of the world. In a recent special report, the IPCC concluded that climate change can be attributed to an increase in global land surface air temperature increase by twice as much compared to pre-industrial times (2019). It continues to state with high confidence that "climate change exacerbates land degradation, particularly in low-lying coastal areas, river deltas, drylands and in permafrost areas" (Intergovernmental Panel on Climate Change, 2019). These extreme weather events of severe droughts and heavy rainfall will lead to concerns around potential loss of habitable land, in addition to

concerns around food security, access to clean drinking water and secure shelter.

Health

An increase in heat waves, forest fires, extreme weather events such as hurricanes, droughts, and flash flooding, are just some of the effects of climate change being felt from human communities around the world. These impacts have a direct consequence on human health—risking access to "clean air, safe drinking water, sufficient food and secure shelter" (World Health Organization, 2018).

The World Health Organization (WHO) (2018) estimates that between 2 to 4 billion USD per year will be spent in direct damage costs to health as a result of the impacts of climate change, where these costs will be spent to improve food security, water and sanitation access to people. The WHO continues to estimate that climate change will cause about 250,000 additional deaths per year from between 2030 and 2050, with malnutrition, malaria, diarrhea, and heat stress being the leading factors leading to the projected mortality (World Health Organization, 2018).

More resources on this topic can be accessed here:

1. NASA – effects of climate change
IPCC Special Report: Global Warming of 1.5°C

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