

CLIMATE CHANGE

• A Primer • The Yukon • Home Energy Use • Transportation • Yukon Research •



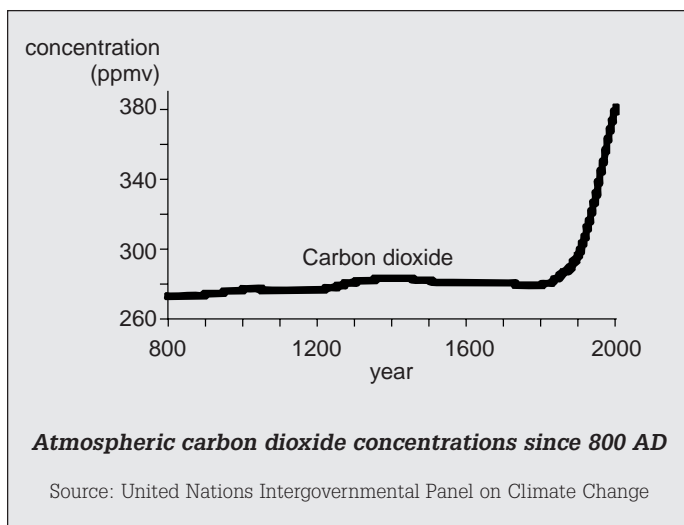
THE REALITY OF CLIMATE CHANGE

The natural greenhouse effect

If our planet had no atmosphere, the sun would reflect directly back into space and the earth would be a cold, lifeless place. But the earth does have an atmosphere; it is composed of several gases that absorb the sun's heat and slow its escape back into space. These gases are water vapour, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and other trace gases that climate-change specialists call greenhouse gases. Without greenhouse gases, the average temperature on the earth would be -18°C instead of the current average of 15°C.

Increased concentration of key greenhouse gases

Since the Industrial Revolution, the concentration of carbon dioxide in the atmosphere has grown by nearly 30%, methane by 145% and nitrous oxide by 15%.



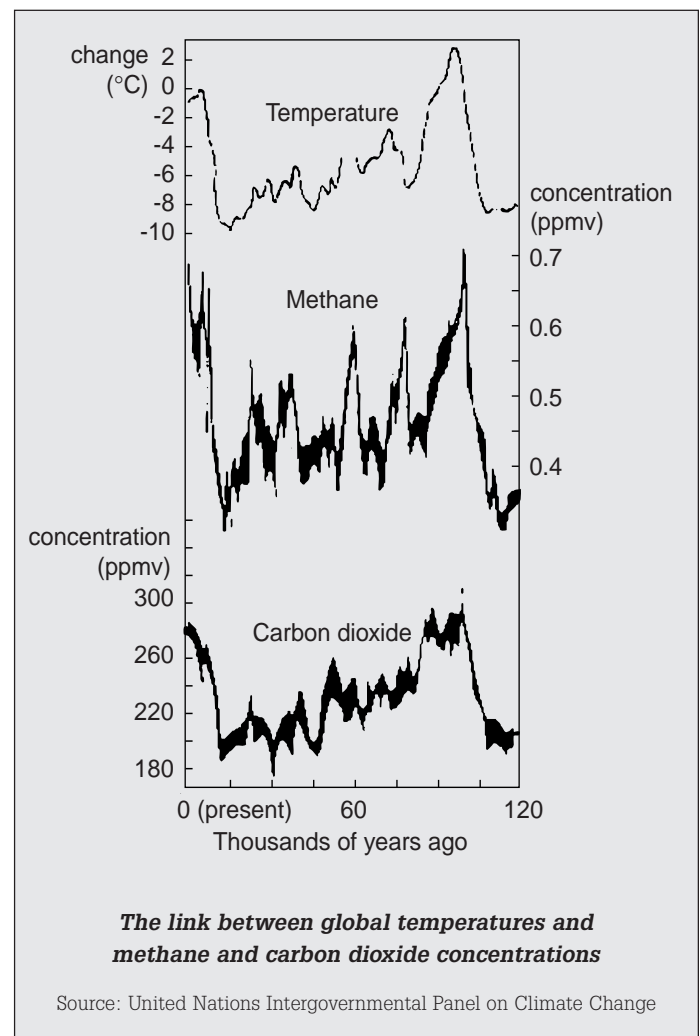
“The balance of evidence suggest that there is a discernible human influence on global climate.”

United Nations Intergovernmental Panel on Climate Change

The link between global temperatures and two greenhouse gases

Records from ice core data, and from direct measurements of modern temperatures and atmospheric gas concentrations, show a close link between greenhouse gases and global temperatures.

As the earth's average temperature rises or falls, carbon dioxide and methane concentrations move in a similar pattern.





THE THEORY OF CLIMATE CHANGE

Global warming

The link between global temperatures and the atmospheric concentration of gases like carbon dioxide, methane and nitrous oxide (the greenhouse gases) has led to the theory of global warming. This theory predicts that the rapid increase in the concentration of greenhouse gases due to human activities will warm the earth at a rate faster than at any time in the thousands of years of human history.

The result of global warming: climate change

Increasing the global temperature may trigger a series of changes within the overall global climate system. For example, global sea levels have risen 10 to 25 centimetres

“Global warming is the most urgent slow-motion catastrophe facing humankind.”

The David Suzuki Foundation

over the past 100 years, and are expected to continue to rise due to increases in global temperature. An increase in the severity and frequency of extreme weather events is also attributed to climate change.

The *Canada Country Study*, produced by Environment Canada, describes some potential effects of global warming in Canada:

- a migration of flora and fauna northward;
- the continued deterioration of summer air quality in urban areas; and
- increases in winter precipitation and summer evaporation.

These events could have far-reaching environmental, social and economic consequences. (The second fact sheet in this series describes how the Yukon may be affected by climate change.)

Further research

The world's top climate scientists agree with the theory of climate change. For example, the 2,600 scientists advising the United Nations Intergovernmental Panel on Climate Change agree that human activities are having an impact on the world's climate.

To better understand climate change, scientists are

...the science is not clear and compelling Instead, scientific uncertainties abound....”

William F. O'Keefe, Chair, Global Climate Coalition

continuing to research the earth's climate systems and the interaction of these systems with greenhouse gases. Many scientists are now focusing their research efforts on how humans can adjust to the changes predicted by the climate change theory. As well,

individuals, environmental organizations, industry and business, policy makers and many others are taking actions to reduce greenhouse gas emissions, thus slowing the onset of climate change. (The fifth fact sheet in this series describes the climate change research that is being conducted in the Yukon.)

“It's real. Within the lifetime of our kids, climate change could really affect our health, our economy...our lives.... Climate change is...about changing rainfall, wind, clouds and extremes such as droughts, heat waves, severe storms and melting permafrost.”

Environment Canada, *A change in our climate: What's going on in our greenhouse?*