

**Taking the Chill Off:
Climate Change in the Yukon & Northwest Territories**

Group Members: _____

Trivia Challenge: Search the entire poster to find answers for the following: (3)

1. Describe the permafrost in the Whitehorse region. **Sporadic**
2. Who took the picture of the polar bear on the poster? **Ian Stirling**
3. What bird is depicted in the NRC icon? **Canada Goose**

How Has Climate Changed?

1. Examine the graph showing temperature change over the last 10 000 years.
 - a) How many times has the temperature been above average during this time? (1)
4 or 5
 - b) Around what year in time did we see the longest period of above average temperatures? (1) ~ **4000 BC**
2. In Inuvik, how were temperatures of the Little Ice Age collected/derived? (1)
From tree rings (Dendrochronology)
3. Describe the “Mean Annual Temperature in Inuvik” graph. (1)
Significant peaks and dips, with temperatures noticeably increasing since ~1975.

Why Does the Climate Change?

1. What 3 events can alter climate significantly? (3)
 - **Changes in Earth’s position relative to the sun**
 - **Major volcanic eruptions**
 - **Changes in circulation and temperature of oceans (e.g. El Niño)**

What is the Greenhouse Effect?

1. What 2 gases mentioned absorb heat energy in the atmosphere? Do you know of any others? (2)
CO₂ and water vapour
2. What activity contributes to extra CO₂ in our atmosphere? (1)
Burning fossil fuels
3. What does the graph showing CO₂ concentrations display for the last 200 years? (1)
Large increases!
4. What is the current day concentration (parts per million by volume) of CO₂ in our atmosphere? (1)
360 ppm

Permafrost and Climate Change:

1. What might happen to the permafrost if climate warms? (1)
Melt/ become thinner/ perhaps disappear
2. How will people be affected by thawing permafrost? (2)
Infrastructure, travel, etc.
3. Which of the 3 areas measured for summer thaw showed the most significant change in 1998? (1) **Beaufort Coast**

A Greener North:

1. What will happen to the treeline with climate change? (1)
It will shift northward
2. What may happen to insect distribution as climate warms? (1)
Migrate northward, having a potentially adverse effect on plants and animals.
3. What new types of vegetative cover will be found in the Yukon and Northwest Territories as climate warms? (2)
Temperate and grassland

A Tougher Life for Caribou?

1. What insect might increasingly harass caribou with warmer temperatures? (1)
Mosquito
2. What might happen to the reproduction rate of caribou if climate warms? (1)
Decline due to decreased health, less feeding/nutrition.

3. How might caribou changes have an impact on the people in the region? (1)
They rely on caribou for food, and also for the maintenance of traditional lifestyles. A breakdown of the traditional food supply will force adoption of other dietary sources (adverse health effects have already impacted this population as a result e.g. diabetes).

Fire and Ice:

1. Will the risk of forest fires increase or decrease in the north with expected climate changes? (1) **Increase**
2. List 3 effects of excessive thawing of ice: (3)
 - a) **Deeper and larger landslides.**
 - b) **Increased sediment load along riverbanks, which could affect fisheries and destroy spawning beds.**
 - c) **Landslide dams created, affecting transportation routes.**

Rivers and Lakes:

1. What tool/device was utilized to collect the pictures showing the Old Crow Flats in 1990 and 1994? (1) **Satellite (imagery)**
2. Which “group” of fish may not be able to adjust to warmer waters? (1)
Cold water species such as Arctic Char.

Impacts of Climate Change in the Beaufort Sea Region:

1. What specific types of communities are at significant risk with climate warming? (1)
Coastal
2. During what years did Tuktoyaktuk experience severe storms? (1)
1944, 1970, 1993, 2000
3. Examine the air photo taken of Tuktoyaktuk from 1947. What do the green and black lines show has happened over the last 50+ years? (2)
Significant loss of shoreline
4. What has been proposed, and somewhat implemented since 1976? (1)
Shoreline protection measures

Sea Ice and Marine Mammals:

1. What phenomenon extended the melt season in 1997 – 1998? (1) **El Niño**
2. What animal do polar bears heavily rely on for food? (1) **Seals**

3. Describe the general trend of ice concentration in the area over time, comparing the 30-Year Median graph to that of September 1998. (2)
Definitely decreasing!
4. Why do seals suffer when ice melts quicker than usual? (2)
Mothers depend on stable ice for lairs, so that a successful 6-week nursing period can take place. If the ice melts, the seal pups are weaned prematurely, forcing them to fend for themselves at too young an age.

How Are N.W.T. and Yukon Responding to Climate Change?

1. How many tonnes of CO₂ did Canada produce in 1995? Convert this to scientific notation. (2) **619 000 000 tonnes = 6.19 x 10⁸ tonnes**
2. Even though emissions from the region itself are small, do global emissions affect this region with larger impacts? (1) **Yes!!**
3. What are some alternatives to diesel fuel generators? (2)
Solar panels and walls, photovoltaics, waste heat recovery, wind turbines.
4. What can YOU do to reduce greenhouse gas emissions, save energy and money, OTHER THAN what is listed?! (2)
Car pool, minimize air conditioner use, etc...