

CLIMATE CHANGE: THE BASICS

What is climate change?

Climate change is a change in variability in the 'average weather' of a region. This means a change in the temperature, precipitation, winds and/or storms that a given region experiences over a specific period of time. Global climate change refers to these changes over the Earth as a whole.

The Earth's natural thermostat...

The Earth's temperature is regulated by a natural system known as the 'greenhouse effect'. Naturally occurring greenhouse gases, such as water vapour, CO₂, methane, nitrous oxide, and ozone, trap radiation in the atmosphere which helps to keep the Earth warm enough to support life. Problems can arise when the concentrations of these naturally occurring gases are increased and new greenhouse gases like chlorofluorocarbons (CFCs) are added to the system.

Natural carbon in our Earth...

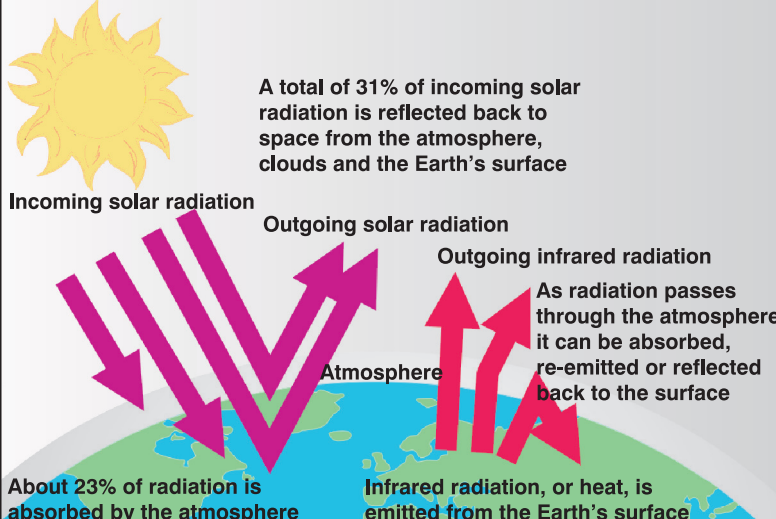
Carbon is a part of the Earth's natural system. Within the Earth, it is present as fossil fuels and in sedimentary rocks. It is also stored at the Earth's surface in vegetation and soil, and in the oceans as inorganic carbon dissolved in the sea water. In the atmosphere, carbon occurs mainly as carbon dioxide (CO₂). Before the Industrial Revolution, CO₂ and other greenhouse gases such as methane (CH₄) that were put into the atmosphere were balanced by processes of natural removal, so atmospheric concentrations of these gases did not vary much.

Climate change factors...

- Natural factors:
 - changes in solar activity
 - changes in Earth's orbit
 - natural greenhouse effect
 - natural atmospheric aerosols
 - volcanic emissions
- Human-induced factors:
 - enhanced greenhouse effect
 - land use change
 - enhanced atmospheric aerosols

Did you know?

Greenhouse gases accumulate in the atmosphere because their molecules have life spans of decades or even centuries.



A total of 31% of incoming solar radiation is reflected back to space from the atmosphere, clouds and the Earth's surface.

Approximately 23% of radiation is absorbed by the atmosphere and the Earth's surface.

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CLIMATE HAS ALWAYS CHANGED

The past preserved...

Ice cores drilled from the tops of Canadian Arctic ice caps provide detailed records of past environments, including temperature changes, precipitation changes, and changes in atmospheric pollutants and gases. On the walls of snow pits dug at the top of the ice cap, the seasonal layers can be seen and sampled. Reconstructed temperature records extend the very short weather station records back to before the last ice age.

Did you know?

1000 years ago the North Atlantic climate was like today. During this period, called the Medieval Warm Period, Vikings sailed in Canada's northern waters.

Climate variability...

Changes in the variability or in the frequency of extremes may be as important to life in Nunavut, as the longer term warming or cooling trends.

Current observations...

Current temperature trends show that over the past 50 years Nunavut has experienced both strong warming and cooling. The warming trend occurs primarily in the west, where as the east has undergone a cooling trend.

Did you know?

200 years ago the climate was colder than today. During this period, called the Little Ice Age, northern explorers were ice-choked and European explorers could not navigate the Northwest Passage.

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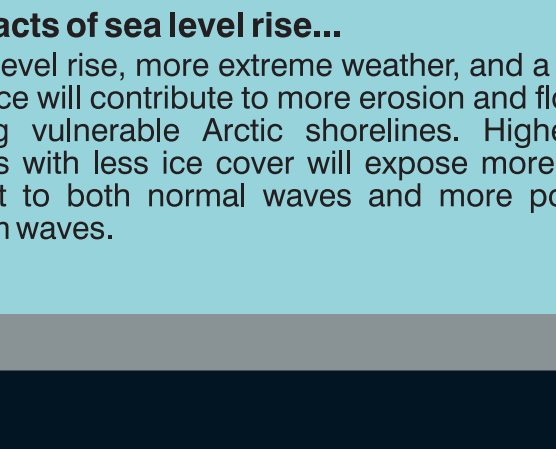
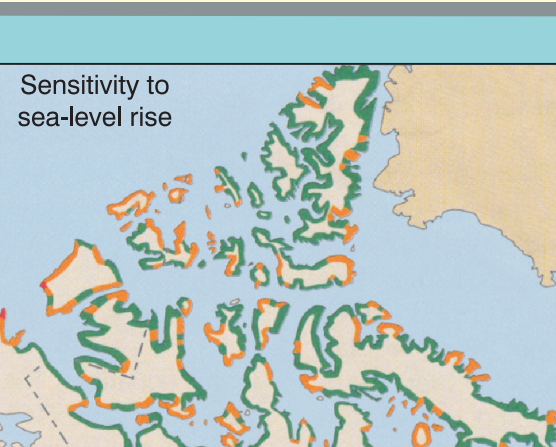
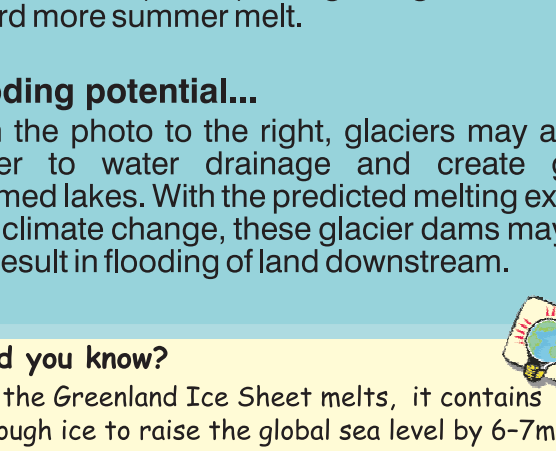
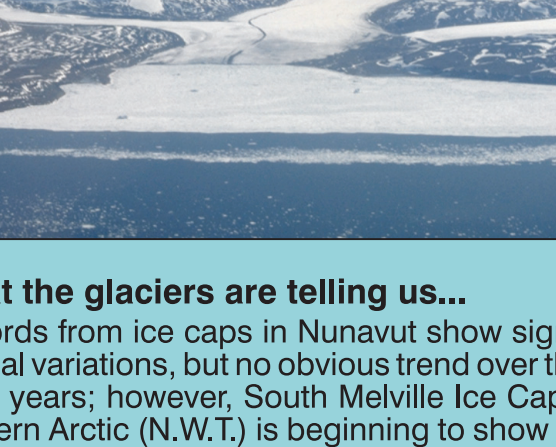
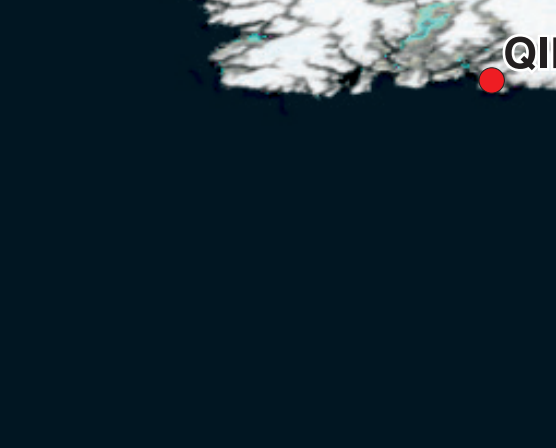
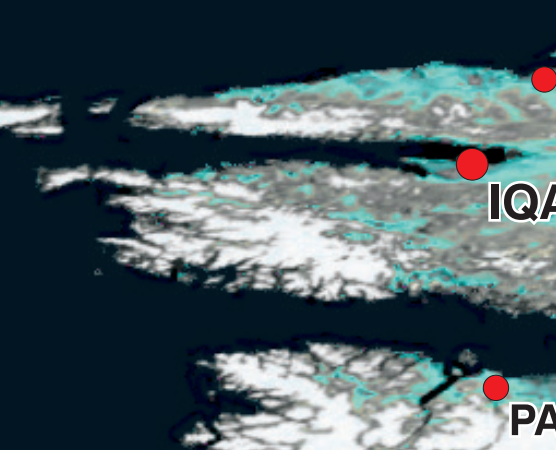
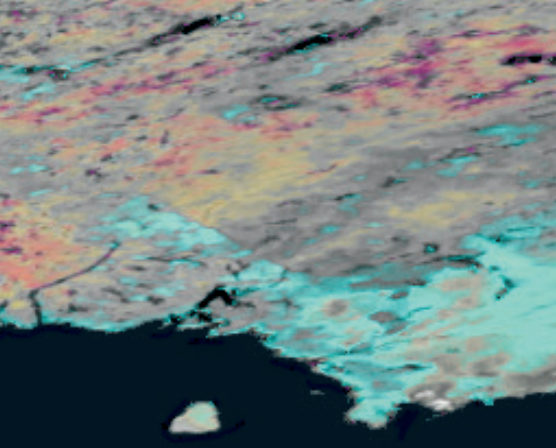
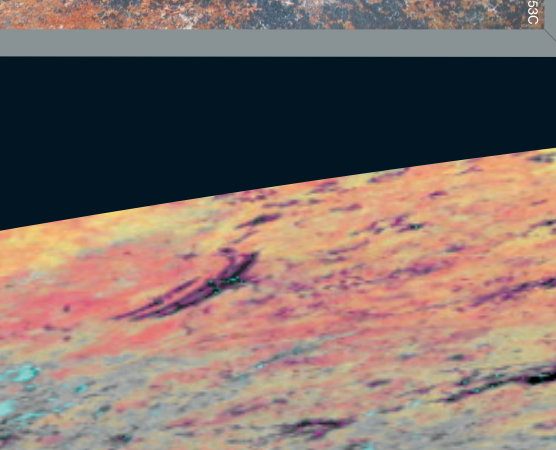
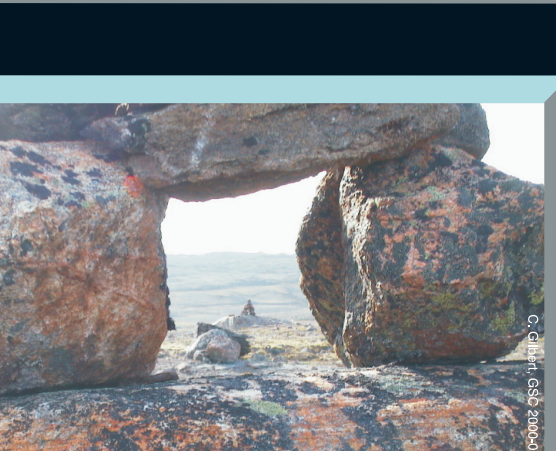
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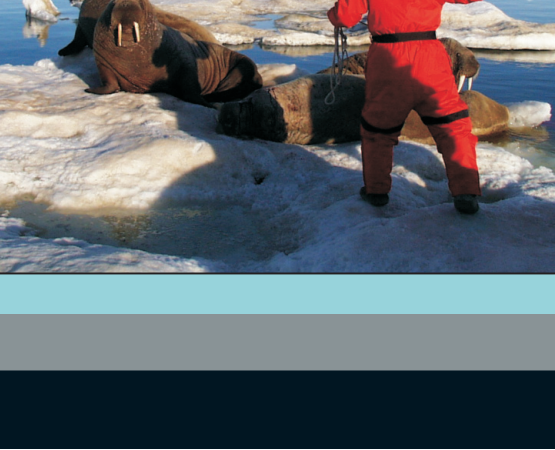
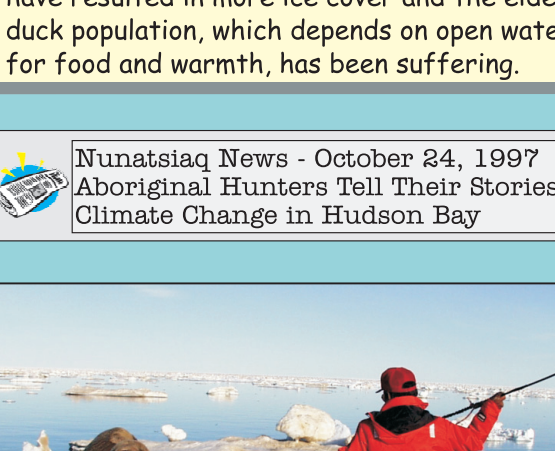
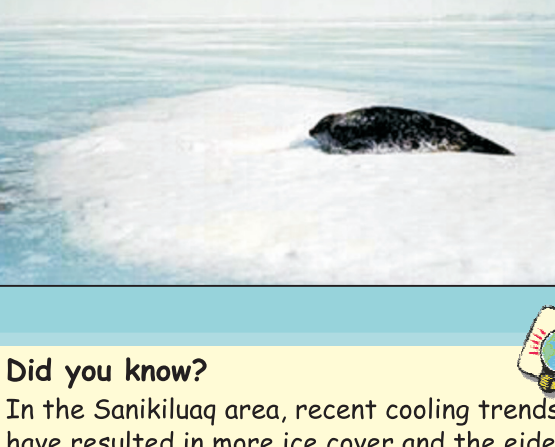
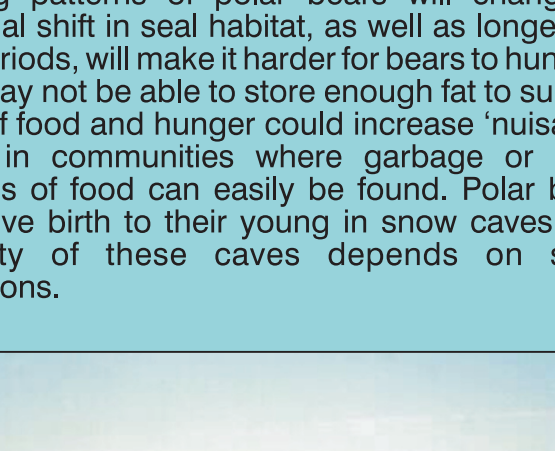
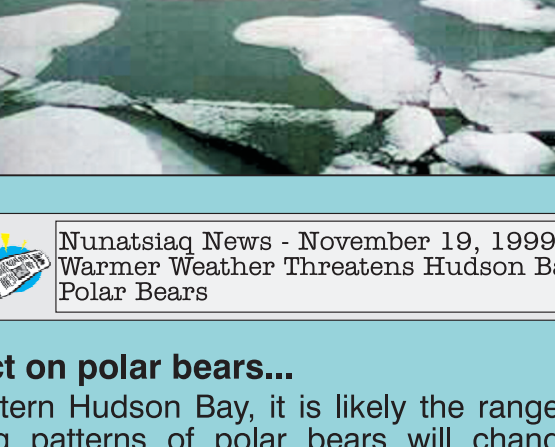
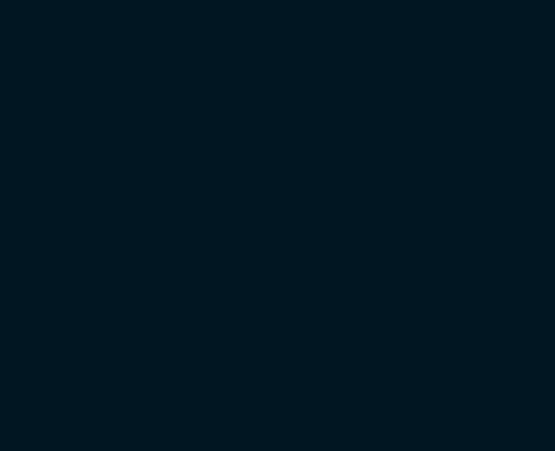
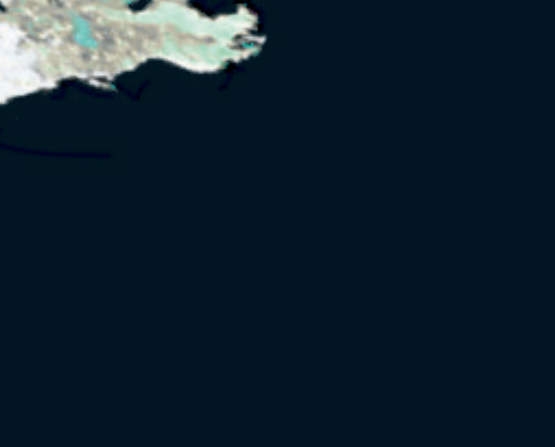
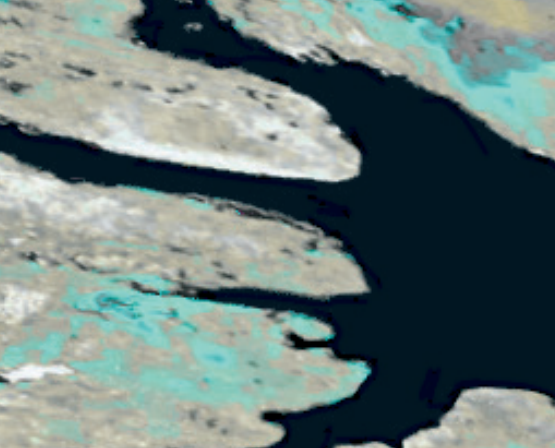
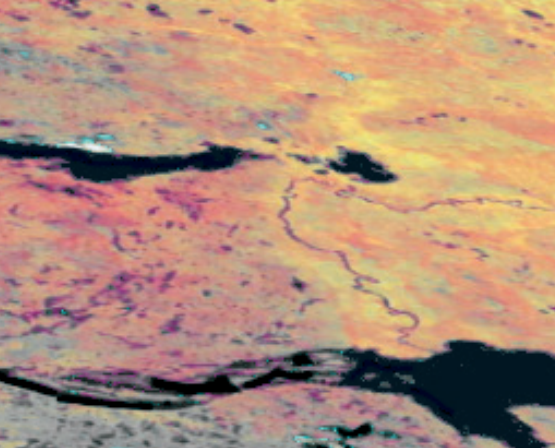
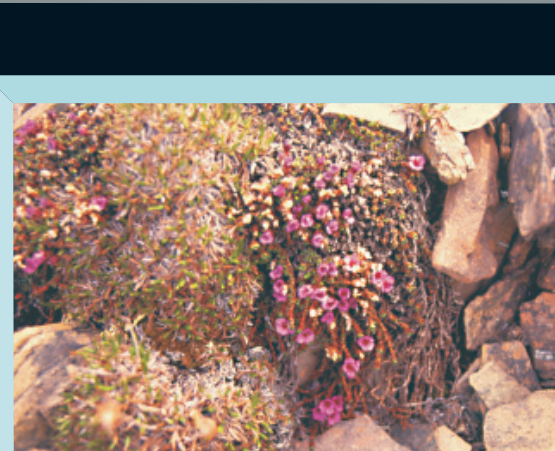
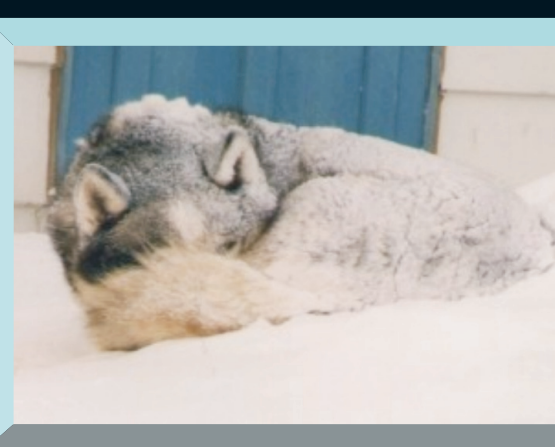
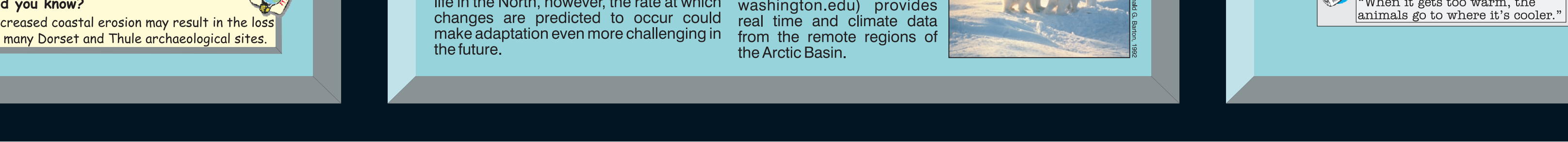
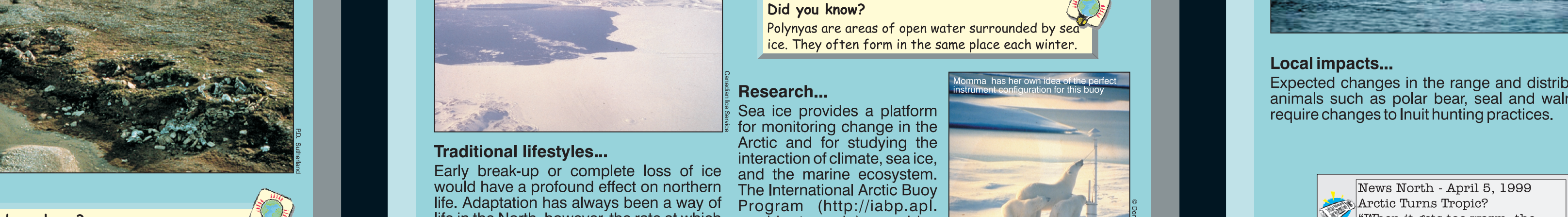
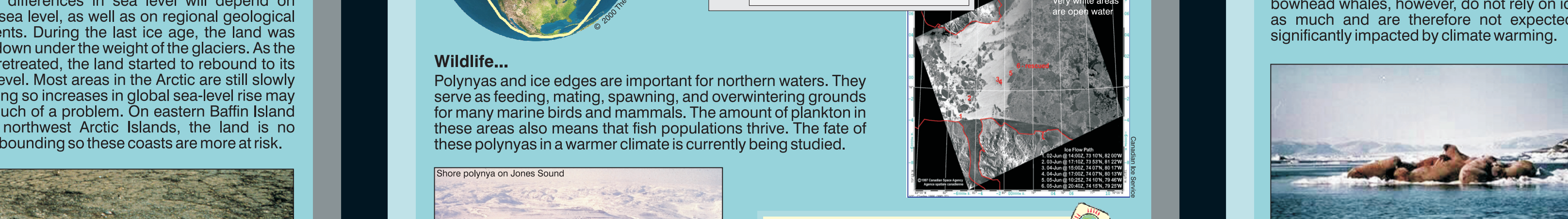
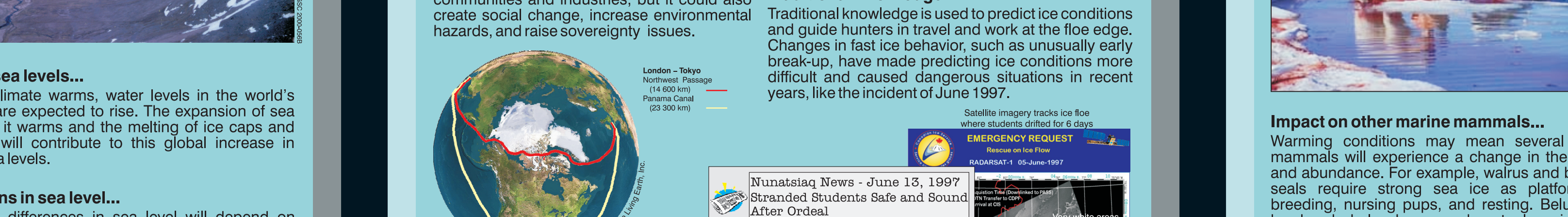
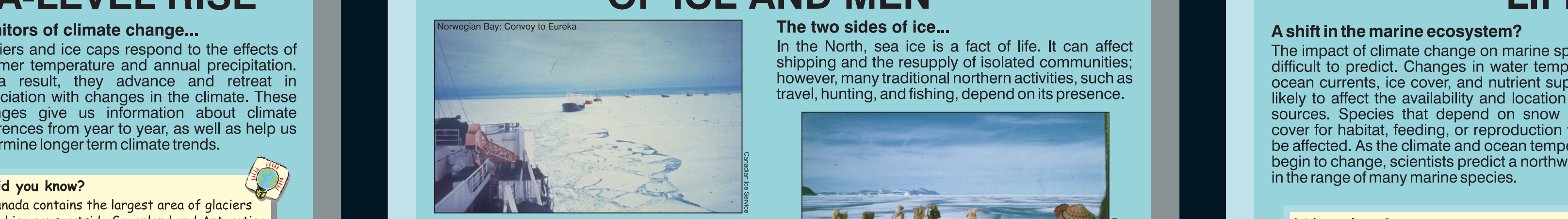
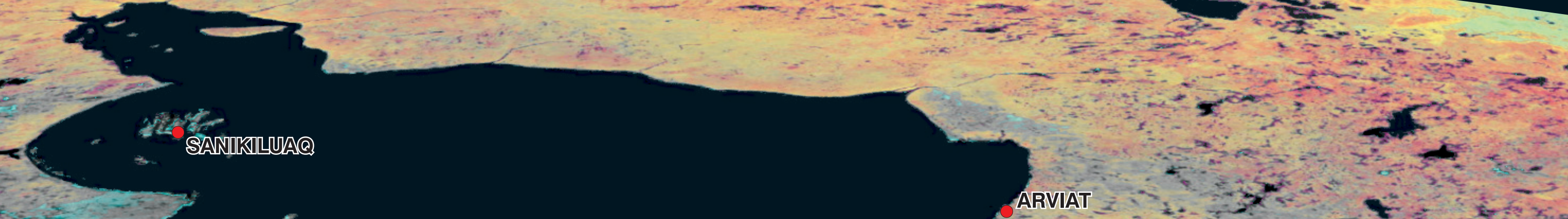
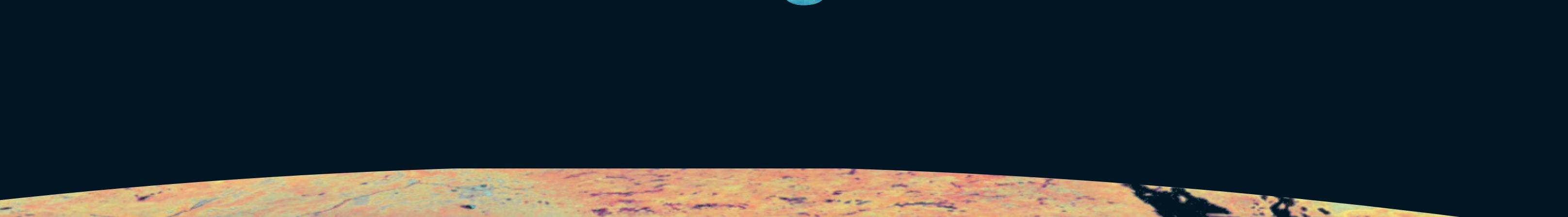
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DEGREES OF VARIATION

Climate Change in Nunavut



NORTHERN LANDSCAPES

Permafrost and climate change...

Changes in the permafrost will depend on the type of subsurface material and its temperature, as well as on local ground ice contents. Warming will likely cause a deepening of the summer thaw layer (active layer), resulting in unstable soils and settlement of the ground surface. In the southern regions, large areas of permafrost may actually disappear. The greatest impacts from these changes will probably be increased slope movement and changes to soil properties.

Did you know?

The permafrost boundary is expected to move north by several hundred kilometers.

Permafrost...

In the North, permafrost or frozen ground is one of the most important features controlling physical changes on the land. Permafrost is found beneath the ground surface in nearly all of Nunavut and some of the permafrost, especially in lowland areas, contains high amounts of ground-ice.

Impacts on infrastructure...

Melting of permafrost would have a major impact on infrastructure. Warmer temperatures would reduce the stability and strength of the land. Sinking of the ground surface from permafrost thaw could become severe. This could threaten the structural integrity of older buildings, water supplies and waste disposal structures.

Impact on industry...

In warmer areas, placer and open-pit mining would be easier because permafrost would be reduced. Warmer temperatures would also mean the strength of soil would be reduced and underground mines would see an increased risk of rock falls and flooding.

Did you know?

New houses are built on pilings or bedrock to minimize permafrost impacts.

Impacts on transportation...

Increased shoreline erosion may lead to more sediment along the coast, creating navigational hazards for shipping. Reduced ground stability may also affect roads and run