Using science to learn more about the air in the Canadian High Arctic

Alert, Nunavut, is the site of a global air pollution monitoring observatory located in Canada's High Arctic.

The science at Alert provides a long-term record of the movement of pollutants to the Arctic, an environmental issue that directly affects people living in the North.

Alert's history

Alert was initially founded in 1950 as part of the Joint Arctic Weather Stations. In 1958, the Canadian military established a station at Alert.

Measurement of a greenhouse gas, carbon dioxide, started at Alert in 1975 as part of the United Nations World Meteorological Organization's (WMO) network of air pollution monitoring stations. This partnership between the Alert observatory and the WMO continues today under the Global Atmosphere Watch program. Environment Canada currently operates all of the air sampling and monitoring activities at Alert.

For more information

Environment Canada
Inquiry Centre
Telephone: **1-800-668-6767**
Email: **enviroinfo@ec.gc.ca**

Indian and Northern Affairs Canada
Public Enquiries Contact Centre
Telephone: **1-800-567-9604**
Email: **infopubs@ainc-inac.gc.ca**

For additional background information, visit the following websites:

Environment Canada's website
www.ec.gc.ca

Northern Contaminants Program
www.ainc-inac.gc.ca/nth/ct/ncp

World Meteorological Organization's website on the Global Atmosphere Watch program
www.wmo.int/pages/prog/arep/gaw/history.html

Arctic Monitoring and Assessment Programme's website
www.amap.no

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Science at
Alert, Nunavut

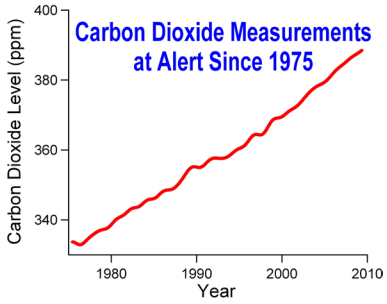
Canada

What science happens at Alert?

A group of international researchers collect over 100 different air measurements at the Alert observatory.

Greenhouse gas measurements

Greenhouse gas measurements at Alert started in 1975. This long measurement record is important to help keep track of changing greenhouse gas levels. Carbon dioxide levels (and other greenhouse gases) at Alert have been going up since the measurements began. These higher greenhouse gas levels contribute to the changing weather patterns observed in the Arctic, caused by climate change.



Contaminant measurements

At Alert, contaminant measurements include persistent organic pollutants (POPs) and mercury.

POPs

POPs represent human-made chemicals such as pesticides and PCBs. These chemicals can build up in the fatty tissue of animals and humans, affecting their health.

POPs have been measured at Alert since 1992. The POPs information collected at Alert has been used in international treaties to ban and control certain chemicals. The measurements at Alert have shown that these POPs levels have gone down since they were banned. Other POPs, which are still in use, show levels that remain unchanged or are increasing.

Mercury

Mercury is a chemical that is released into the air by human activities such as burning coal, and natural sources such as forest fires. Mercury can be toxic to humans in certain forms. Scientific discoveries at Alert have led to significant work across the Arctic to study how mercury moves from the arctic air into the snow, wildlife and, finally, humans.

Measurements of mercury in the air at Alert began in 1995, and in the snow in 1998. Since these measurements started, the mercury levels in the air have not changed.

Particles

Particles are very small bits of dust that can move in the air. Pollution can stick to particles and be transported long distances. Particle measurements started in Alert in 1980. Since then, scientists have seen the number of particles at Alert go down; this has been attributed to better global pollution controls.

Solar radiation measurements

Solar radiation measurements provide information on how much sunlight is reaching the ground. These measurements are an important tool for scientists studying climate change. Alert is part of a network of 40 stations worldwide making solar radiation measurements for scientists to use.

Climate data measurements

Climate data measurements include air temperature, precipitation, wind speed and wind direction. These measurements started in 1953, and all of this data is publicly available on the Environment Canada website:

www.climate.weatheroffice.ec.gc.ca/climatedata/canada_e.html