by studying material emitted downwind from coal-fired power stations. This information helps determine compliance with environmental guidelines.

Geological information is also used to assess the potential for acid rain damage in different regions of the country. In the early 1980s, Canadian geoscientists initiated a pilot project, based on the interpretation of geological maps, to identify areas that lack the natural ability to absorb and neutralize acid precipitation. The result is a series of acid rain sensitivity maps that characterize broad areas with respect to their sensitivity to acid precipitation.

Climate Change

It is anticipated that climate change will impact the availability and quality of land resources. Land use patterns may be affected by slope stability, which is climate-dependent. The potential for sea level rise caused by higher temperatures raises concerns about increased flooding, coastal erosion, and sediment movement along Canada's extensive coastlines. Warmer temperatures may lead to permafrost thaw, which could jeopardize roadways, utilities, pipelines, and railroads in Canada's northern regions. Increases in frost heave and thaw settlement, also due to warmer temperatures, threaten the structural integrity of buildings.

The earth sciences are contributing to the improvement of the understanding and monitoring of the relationships between the climate, earth systems, and human activity. This knowledge is critical in assessing the potential impacts of climate change and adaptation options.

With a view to analyzing climate system history and dynamics, Canadian geoscientists have been monitoring the High Arctic ice caps for more than 30 years, producing the world's longest polar glacier records (see *http://sts.gsc.nrcan.gc.ca/page1/clim/new/e-uic-es.htm*). As part of an international project, ice cores are now being studied to evaluate the scale of climate change on a circumpolar basis. Geoscientists are also using data collected from the examination of tree rings to reconstruct moisture regime and temperature variations during the past centuries and to evaluate the response of ecosystems to natural disturbances. The capabilities of Canadian satellite technology (RADARSAT-1) are being harnessed to estimate the velocity of glacier ice motion in the Antarctic. This is linked to the study of changes in the area and volume of ice sheets in the Antarctic and Greenland, which could result in sea level increases.