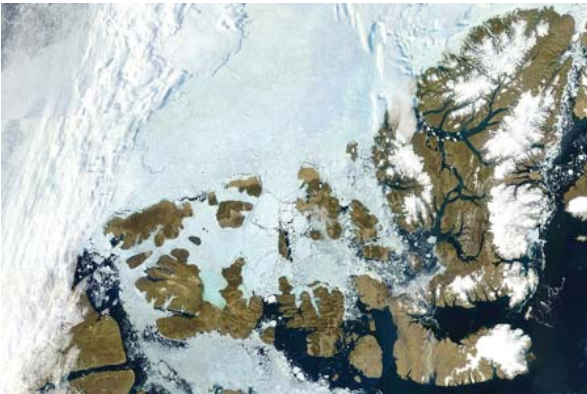


Study finds Canada's Arctic glaciers and ice caps losing water at an alarming rate

By Express News Staff May 3, 2011



The rate of ice loss in Canada's Arctic sharply increased between 2004 and 2009, with ice loss increasing to as much as 93 cubic kilometres a year.

(Edmonton) The work of Faculty of Science PhD graduate Alex Gardner—published in *Nature* magazine in April—has revealed some alarming evidence that Canada's Arctic glaciers and ice caps have lost nearly as much water as there is in Lake Erie.

Gardner, a former student of Earth and atmospheric science professor Martin Sharp (A co-author on the paper), spent six years monitoring Arctic ice and found that in 2009 the ice-loss rate was four times larger than estimated by NASA for the mid- to late-1990s.

The measurements Gardner and his colleagues made on the ice and with satellites show the rate of ice loss “sharply increased” between 2004 and 2009, with ice loss increasing to as much as 93 cubic kilometres a year.

Gardner, who now works at the University of Michigan, conducted most of the research during his time at the U of A and says the ice loss has increased sharply “in direct response to warmer summer temperatures” since 2004. The losses have been so sharp that he and his colleagues believe the Canadian Arctic Archipelago was the single largest contributor to global sea-level rise outside Greenland and Antarctica between 2007 and 2009.

“Even though these Canadian glaciers and ice caps are small compared to the huge ice sheets, they play a significant role in sea level rise,” says Gardner.

The glaciers and ice caps are dwarfed by the colossal Greenland Ice Sheet next door. But the researchers say they are a major player in the climate-change equation because they hold so much water and are “highly sensitive” to rising temperatures.

“The amount of water contained in all of the ice caps and glaciers in the Canadian Arctic are three-and-a-half times larger than all of the water in all of the Great Lakes,” says Gardner.

Add it up and over those six years, Gardner says, and the equivalent of three-quarters of the water in Lake Erie ran off Canada's Arctic glaciers and ice caps and poured into the Arctic Ocean. “If the Great Lakes drained by that much, I think that would really wake people up to the changes that are occurring,” says Gardner.

Ninety-nine per cent of the world's land ice is trapped in the Antarctica and Greenland Ice Sheets. But they account for about only half of the land-ice now melting into the oceans, in part because they are cold enough that ice only melts at their edges.

The other half of the ice melt contributing to sea-level rise comes from smaller mountain glaciers and ice caps in the Canadian Arctic, Alaska, Patagonia and other regions, the researchers say.

The glaciers in the Canadian Arctic only hold 0.3 per cent of the world's land ice but are contributing nearly 10 per cent of all ice loss to the world's oceans. Ice in the Canadian Arctic Archipelago is the focus of growing international attention.

Teams from NASA, Europe and Canada are currently on the Canadian ice cap on Devon Island monitor the changes underway, says Sharp. The team on the ground will measure the characteristics of the ice and snow, while planes from NASA and Europe fly over the ice cap in coming weeks, along with an ice-monitoring satellite, making measurements from the air.

The work will build on the data used in the study, which was gathered by satellites and ground crews between 2004 and 2009. Temperatures were just 1 C to 1.6 C warmer in high-melt summers, says Sharp. That does not sound like much, but he says it was enough to extend the melt season on the ice caps by more than 25 per cent.

Four large glaciers in Canada's High Arctic have been continuously monitored since 1963, and “a third to half” of all the ice mass loss that has occurred since measurements began has happened in the last five years, says Sharp.

He says one of the most significant findings of the study is that Canada's Arctic glaciers are about twice as sensitive to ice loss as temperatures climb as expected, suggesting that models used to predict what could happen in future “may be unduly conservative.”