Project title: Glacier monitoring and assessment, Penny Ice Cap, Nunavut (Auyuittuq National Park)

Summary: Higher than normal summer temperatures over the past few decades have resulted in increased melt of glaciers and ice caps in the Canadian Arctic, particularly since 2005. In order to better understand past and future changes of glaciers in the southern Canadian Arctic, the Geological Survey of Canada, Parks Canada and University of Ottawa have been studying Penny Ice Cap on southern Baffin Island since 2007. It is the largest ice mass in the southern Canadian Arctic, covering ~6400 km^2. Every year a research team flies to the ice cap from Pangnirtung to take measurements of how much ice is melting versus how much snow is accumulating. The Higher thanteam also measures changes in ice volume, how fast the ice moves, what the ice cap looks like many meters below the surface and the temperature. Ice cores from Penny Ice Cap show that the rate of melt we see today has not been observed for over 3,000 years.

Meltwater from the ice cap along with increased rain has contributed to severe flooding events in Akshayuk Pass, a hiking and travel route adjacent to the ice cap and close to Pangnirtung. Understanding how the ice cap will respond to changes in climate in the future will help provide more realistic prediction of future flooding events in the area.

Studying Penny Ice Cap also helps answer a question many scientists around the globe are asking. How much will glaciers melt over the next century and how will this contribute to global sea level rise? We know that glaciers in the Canadian Arctic are now the largest contributor of water to global sea level rise outside of Greenland and Antarctica and that these glaciers will continue to lose ice over the next century from models, but much more work is required to improve estimates of ice loss, and therefore sea level rise, over the next century.

Study Site Locations: Penny Ice Cap, Baffin Island, Nunavut (67°N, 66°W). Stays in Pangnirtung for a few days to weeks occurred while carrying out the glacier monitoring program between 2007-2014. Starting in 2015, Parks Canada staff from Pangnirtung and Iqaluit took over the glacier monitoring program.

Local Collaborations: Parks Canada, Auyuittuq National Park and Iqaluit. Students from the Environmental Technology Program in Iqaluit have also helped with fieldwork in some previous years.

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Photos/Images

Please see attached images

Summary documents

Please see attached paper (Zdanowicz et al., 2012)