



Award Details

BaySys - Contributions of climate change and hydro-electric regulation to the variability and change of freshwater-marine coupling in the Hudson Bay system

Research Details

Competition Year:	2014	Fiscal Year:	2020-2021
Project Lead Name:	Barber, David	Institution:	University of Manitoba
Department:	Environment and Geography	Province:	Manitoba
Award Amount:	142,500	Installment:	1 - 4
Program:	Collaborative Research and Development Grants	Selection Committee:	University/Industry
Research Subject:	Earth-systems science	Area of Application:	Environmental impact of economic activities (including agriculture)
Co-Researchers:	Ali, Geneviève Archambault, Philippe Bélanger, Simon Dery, Stephen Dmitrenko, Igor Ehn, Jens Else, Brent Fortier, Louis Guéguen, Céline Kuzyk, Zou Zou Lobb, David Lovejoy, Connie Maps, Frédéric Mundy, Christopher Myers, Paul Owens, Philip Papakyriakou, Timothy Petticrew, Ellen Stadnyk, Tricia Stern, Gary Tremblay, Jean-Éric Wang, Feiyue	Partners:	Hydro-Quebec Manitoba Hydro Ouranos Consortium

Award Summary

This project will study the role that freshwater plays in the Hudson Bay marine and coastal systems. It will provide a scientific basis to separate the relative effects of climate change from those of hydroelectric regulation of freshwater on changing physical, biological and biogeochemical conditions in Hudson Bay. This research will inform decision-making by Manitoba Hydro with respect to existing infrastructure operations and planning for future development on the lower Nelson River in Northern Manitoba. The project includes two core fieldwork components. 'Bay-wide' work will be conducted aboard the CCGS Amundsen, a research icebreaker that provides a safe platform from which to conduct scientific studies. Work from the Amundsen will focus on collecting data from a large spatial area during the spring melt season. 'Estuary' work will focus on contrasting the Churchill (low) and Nelson (high) outflows into estuaries. This will be done in late winter using a logistics base in Gillam, Manitoba, and a field camp on the edge of Hudson Bay. Both field components will be supported by remotely-sensed data, ocean and atmospheric observatories and numerical modeling studies. Manitoba Hydro has a vested interest in research on impacts and adaptation strategies for climate change on northern

ecosystems as it may affect system operations and future generation developments. Results from this project will help Manitoba Hydro investigate ways to enhance the quality and capacity of environmental science in the regions in which it operates, produce reliable assessments of impacts of climate change on water supply, and increase our understanding of the effects of climate change on northern ecosystems. More broadly, Nunavut and Canada will benefit from a better understanding of how seasonal shifts in freshwater, sediment and nutrient delivery and climate change may affect primary and fisheries productivity, and transportation in Hudson Bay and how this may change under a future climate.