

Annual Report (2020) to Nunavut Research Institute – Cambridge Bay Observatory
(Scientific research license #: 04 007 17R-M)

Prepared by S. Kim Juniper
Chief Scientist, Ocean Networks Canada,
University of Victoria, Victoria, British Columbia

This document reports on 2020 activity under the above scientific research license and requests renewal for 2021 to support continuing operation of the Cambridge Bay Observatory and related research.

Background – Infrastructure and Research Activities

Ocean Networks Canada (ONC) has been operating an underwater observatory in Cambridge Bay since September 2012. Underwater sensors and a camera provide continuous information on seawater properties, ice thickness and marine organism activity to a shore station on the Cambridge Bay wharf, where a weather station and webcam provide additional data. Data from all instruments and cameras are transmitted by a WIFI link to a server in the Kitikmeot Regional Government building where an antenna receives Automatic Identification System transmissions from ocean going vessels, and sends these signals to the server. All observatory data are relayed via satellite to the ONC data centre at the University of Victoria where they are freely available over the Internet (www.oceannetworks.ca). The five-year (2012-2017) Scientific Research Licence (#04 064 12N-M) for the facility was replaced in 2017 by the new license cited above (#04 007 17R-M). A further proposal for continued engagement work in all three communities has been submitted to Polar Knowledge Canada competition and is currently awaiting decision by the review committee. COVID-19 has delayed the decision process on this grant; the new timeline would have the project starting September 2021, if awarded.

The observatory has been providing valuable data for researchers and for public outreach. Results from the first 7 years of operations have been presented at several high-profile research conferences including the 2013 Arctic Observing Summit in Vancouver, BC, the 2013, 2014 and 2018 annual conferences of the Canadian Meteorological and Oceanographic Society, and ArcticNet Annual Scientific Meetings in 2013, 2015-2020. Five graduate students from three Canadian universities (UQAR, UVic, UCalgary) have used data from the Cambridge Bay Observatory for their research.

2020 Activities in Cambridge Bay

ONC Youth Science Ambassador Program – In May 2016 Ocean Networks Canada hired Cambridge Bay resident Mia Otokiak as an Arctic Youth Science Ambassador to further ONC's community engagement program in the Arctic. Mia conducted regular ocean science activities at Kiilinik High School and also supported youth-led snow depth measurements which were used as inputs to scientific modelling of sea-ice formation. This community engagement experience contributed to Mia being hired by the Nunavut Impact Review Board in Summer 2017. Since 2016, the program has been extended to 12 communities: Kugluktuk, Cambridge Bay, and Gjoa Haven, Iqaluit, Nunatsiavut, and 7 communities on the BC coast. The Youth Science Ambassadors attend yearly in-person

training at Ocean Networks Canada in Victoria, BC and conduct youth activities throughout the year in their communities. Activities of the Youth Science Ambassador program, including training, were interrupted in 2020 due to COVID. Recruitment is currently in progress for a new cohort of youth to start positions in Summer 2021.

Observatory Servicing

Planned 2020 maintenance of instrument platforms in Cambridge Bay by ONC staff was cancelled because of COVID-19 pandemic restrictions on travel. Local contacts in Cambridge Bay were contracted to recover a water sampling device (McLane PPS) that had been collecting samples for eDNA analysis of plankton biodiversity over the past year. The device was successfully recovered in late September, samples were sent for analysis at Laval University in Québec City, and the device (McLane PPS) was stored at the Canadian High Arctic Research Station (CHARS).

Public engagement and community collaboration have continued in a reduced form through online and virtual engagement. Data from the Cambridge Bay Community Observatory have been shared through social media. ONC has kept in contact with the Ekaluktutiak Hunters & Trappers Organization by phone and an annual update to marine traffic data prepared for the HTO is in progress at the time of this writing.

Planned 2021 Activities in Cambridge Bay

Observatory Maintenance – Assuming that pandemic travel restrictions have been lifted, the ONC field team will return to Cambridge Bay in late July-early August 2021. Plans for 2021 include servicing the underwater instrument platform and replacing some of the existing instruments with new or recently calibrated sensors. Water samples will be collected in the area around the sensor platforms for sensor calibration and additional characterization of seawater properties. The eDNA plankton biodiversity sampler (McLane PPS) may be re-deployed in 2021, if refurbishing can be completed in time. Community engagement opportunities, including a public meeting and youth involvement will be planned for the maintenance visit.