

Annual Report to Nunavut Research Institute – Cambridge Bay Observatory
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*Prepared by S. Kim Juniper
Chief Scientist, Ocean Networks Canada,
University of Victoria, Victoria, British Columbia*

Results of 2015 Research Activities

Ocean Networks Canada (ONC) has been operating an underwater observatory in Cambridge Bay since September 2012. Underwater, various 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. On the wharf, a weather station and webcam are also connected to the shore station. Data from all instruments and cameras are transmitted by a WIFI link to a server in the Kitikmeot Regional Government building. An antenna on the government building 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 observatory has been providing valuable data for researchers and for public outreach. Results from the first years of operations have been presented at several high profile research conferences including the 2013 Arctic Observing Summit in Vancouver, BC, the 2013 and 2014 Canadian Meteorological and Oceanographic Society Annual Conferences, the ArcticNet 2013 Annual Scientific Meeting in Halifax, Nova Scotia and the 2014 Arctic Change conference in Ottawa, Ontario, and the 2015 ArcticNet Annual Scientific Meeting in Vancouver, BC. ONC held science user workshops during the 2013 ArcticNet meeting and the 2014 CMOS conference, to teach scientists and graduate students how to access data from the Cambridge Bay Observatory, using online tools available on the Ocean Networks Canada website.

2015 Activities in Cambridge Bay

Trade Show - Two ONC members participated in the Cambridge Bay Trade Show in February 2015. This provided an opportunity to continue working with teachers from Kiilinik High School and Ulllik Ilihakvik (elementary school) on ONC's Ocean Sense educational program (<http://www.oceannetworks.ca/learning/ocean-sense>).

Observatory Servicing - A three-member team from Ocean Networks Canada was in Cambridge Bay from August 15-31, 2015, to upgrade and move the underwater observatory, service the shore-based weather station, and conduct an underwater video survey of the marine benthic fauna.

Observatory Upgrades – ONC's scientific dive team and engineers recovered the main underwater instrument platform together with its two 'satellite' platforms that host a hydrophone and an acoustic fish tag receiver. The main platform was replaced with a new, better-adapted structure, with an expanded suite of sensors, and it and a single satellite platform (hosting both the hydrophone and fish tag receiver) were re-deployed at

a new underwater location 200 metres to the west of the wharf. The goal of this relocation was to move the sensitive underwater instruments and camera away from the barge and tug boat traffic at the wharf.

Fauna Survey – Julie-Anne Dorval, a Master’s student in Oceanography at the Université du Québec à Rimouski, worked with Ocean Networks Canada team in Cambridge Bay to undertake a survey of the seafloor fauna in the subtidal zone near the observatory platform in 2014. ONC divers repeated the underwater video survey in 2015, along the same 200 metre transect at a depth of approximately 7 metres. Water samples were collected from a small boat in the bay near where the new primary instrument platform is deployed and sample gear was delivered to a community member to support ongoing sampling throughout the year. The dive team also took the opportunity to remove several large pieces of refuse from the seafloor.

Planned 2016 Activities in Cambridge Bay

Observatory Maintenance - The field team will return to Cambridge Bay in mid August 2016. Plans for 2016 include servicing the underwater instrument platform and replacing some of the existing instruments with new, freshly calibrated and serviced, sensors.

School Program - The ONC Learning team will also return to Cambridge Bay to continue the development of the Ocean Sense program, in collaboration with Kiilnik High School.

Plankton Surveys – Now that the seafloor fauna project has been completed, ONC Staff Scientist Dr. Akash Sastri will be coordinating a survey of phytoplankton in Cambridge Bay, to calibrate data from sensors on the underwater instrument platform. Lucianne Marshall, a graduate student from the University of Victoria, will be doing the plankton survey in July and August 2016, collecting water samples from a small boat to identify plankton species and measure growth rates and nutrient concentrations in seawater. ONC is currently exploring local options in Cambridge Bay for hiring a small boat and operator to support the sampling work.