

## Ocean Networks Canada 2018 visiting scientist program: Q&A with Warwick Vincent of Université Laval

Submitted by Katie Shoemaker Tue, 2018-05-08 13:24



Visiting scientist Warwick Vincent, a professor from the Université Laval in Quebec City and an international leader in polar research, holds the Canada Research Chair in Aquatic Ecosystem Studies.

Warwick studies marine and freshwater ecosystems in the Arctic and in Antarctica, work for which he was awarded the Polar Medal by the Governor General of Canada in 2017. His research aims to understand how these ecosystems are responding to warming that is resulting in earlier annual thawing and later freezing of ponds and lakes.

At ONC from 1 May until June 2018, Warwick will be exploring technological solutions for the monitoring of high Arctic lakes.

**Ocean Networks Canada:** You hold the Canada Research Chair in aquatic ecosystems at Laval, and study freshwater ecosystems in the Arctic. What interested you in this field?

**Warwick Vincent:** ?I grew up in New Zealand and always lived close to water, both freshwater and the ocean. So I had a natural inclination toward the outdoors and the ?wet sciences.? As part of my marine and freshwater research based out of New Zealand, I worked on ice-capped, salty lakes in the Ross Sea sector of Antarctica. That experience made me wonder whether there were similar lakes at the opposite pole. Eventually I had the chance to move to Canada and work in the Arctic. It was amazing to discover that the Canadian North is

the world's largest wetland packed with lakes and ponds, a paradise for aquatic scientists like me.

**ONC:** You have done extensive science in the Arctic, and are considered an international leader in polar research. Obviously, being awarded the Polar Medal by Canada's Governor General must be a highlight. What was that like? Other than that, what is the biggest highlight from your past studies?

**WV:** The Polar Medal came as a total surprise and was an enormous honour. It was in partial recognition of my research on polar ecosystems, but it was also for my activities as former director/scientific director of the Centre for Northern Studies (CEN), which has around 300 members (professors, graduate students, technical staff) distributed among 10 universities in Quebec, with its main offices at Laval. The focus is on northern geosystems and ecosystems, and all of our accomplishments at CEN are the result of collaboration by many people working together. I see the Polar Medal as honouring our collective efforts in the north. One of the major highlights for me was working with the Cree First Nation and Inuit to build the CEN Community Science Centre on the eastern side of Hudson Bay at Whapmagoostui-Kuujuarapik, where outreach activities with local schools now take place throughout the year. The inauguration ceremony was in the four languages of this northern community (Cree, Inuktitut, French, English), and there was a tremendous spirit of respect and cooperation that laid the foundation for our ongoing learning from each other.

**ONC:** How is warming and earlier annual thawing/ later freezing affecting freshwater ecosystems in the Arctic?

**WV:** The Canadian North is changing dramatically in front of our eyes, and because lakes are such an important feature of the northern landscape they are indicators or sentinels of the rapidly warming Arctic climate. One of our main study sites is along the far northern coastline of the Canadian Arctic. We are based out of a CEN-Parks Canada station at Ward Hunt Island, just off the northern coast of Ellesmere Island. There we have seen lakes retained by ice shelves drain away completely as the thick ancient ice has broken up and collapsed due to warming air and water temperatures. Canada's northernmost lake, Ward Hunt Lake (latitude: 83-degrees north), used to have 4.3 metres of permanent ice but over the last decade it has melted completely. In late summer 2016 our automated camera even detected whitecaps on the lake. This is completely changing the biology of the lakes; for example, there is more opportunity for methane production during winter darkness, with additional feedback effects on climate.

**ONC:** At ONC, you will be studying technological solutions for the monitoring of high Arctic lakes. What sort of technology are you looking at, and how does ONC enable this research?

**WV:** ?We can only work on these remote northern lakes during summer when airplanes and helicopters are available. Yet we realize more and more that we need to understand the full annual cycle, and that the changes we observe and measure in summer are determined by processes over the preceding seasons. We are therefore increasingly instrumenting our lakes to extend the observation period for in-situ environmental measurements, as well as biological observations of the lake floors where biofilms and burrowing invertebrates may control the overall productivity, food webs, and biogeochemistry of these ecosystems. ONC?s experience with a [community observatory in the coastal ocean at Cambridge Bay](#) (another lake-rich region of the Arctic) is of special interest. This visit is also a great opportunity to learn more about ONC research in general.?

**ONC:** Victoria is across the country from Quebec City, and a long way from the polar regions. Have you ever been to B.C., and what are you looking forward to most during your stay here?

**WV:** ?When I left Quebec City, the snow pile on the deck of our house was still melting. Arriving in Victoria after our long, snowy, boreal winter was like arriving in the tropics with all the flowers here and the intense green everywhere. I?m looking forward to plenty of walks and biking in Victoria?s wonderful outdoors.?

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