

Canada's first three-glider mission maps whale habitat

Submitted by Lindsay Wallace Mon, 2017-02-27 11:29

For the first time in Canada, a triple glider project has successfully mapped out critical gray whale habitat off the west coast of Vancouver Island. While previous missions have deployed one or two gliders, this Whales, Habitat, and Listening (WHaLe) project—funded by the Marine Environmental Observation, Prediction, and Response (MEOPAR) and the Department of Fisheries and Oceans—is the first to fly three coordinated gliders.

In late January, the three gliders—provided by Ocean Networks Canada (ONC), the University of British Columbia (UBC), and Dalhousie's Ocean Tracking Network (OTN)—set out to survey the shelf and slope waters west of Clayoquot Sound. All three gliders were successfully recovered, two on 18 February by the CCGS John P. Tully.



Figure 1. ONC Engineer Rowan Fox conducts a glider buoyancy test at the Marine Technology Centre. Rowan's exemplary glider piloting skills makes him ONC's flying ace.

Gliders are mobile underwater sensors that collect water property data (*Figure 1*). These water robots map out the vertical and horizontal structure of the ocean by zig-zagging up and down the water column between pilot directed "way points" (*Figure 2*).

In addition to the common suite of water property sensors—temperature, salinity and oxygen—the gliders on this mission carried a broadband hydrophone to identify and count whale vocalizations, an echo sounder to remotely quantify zooplankton biomass variability, and optical instrumentation identifying phytoplankton to elucidate the major components of the whale food chain. The University of British Columbia glider also carried a specialized Rockland Scientific sensor suite for measuring ocean turbulence, to better understand why submarine canyons create such favorable habitat for the whales.

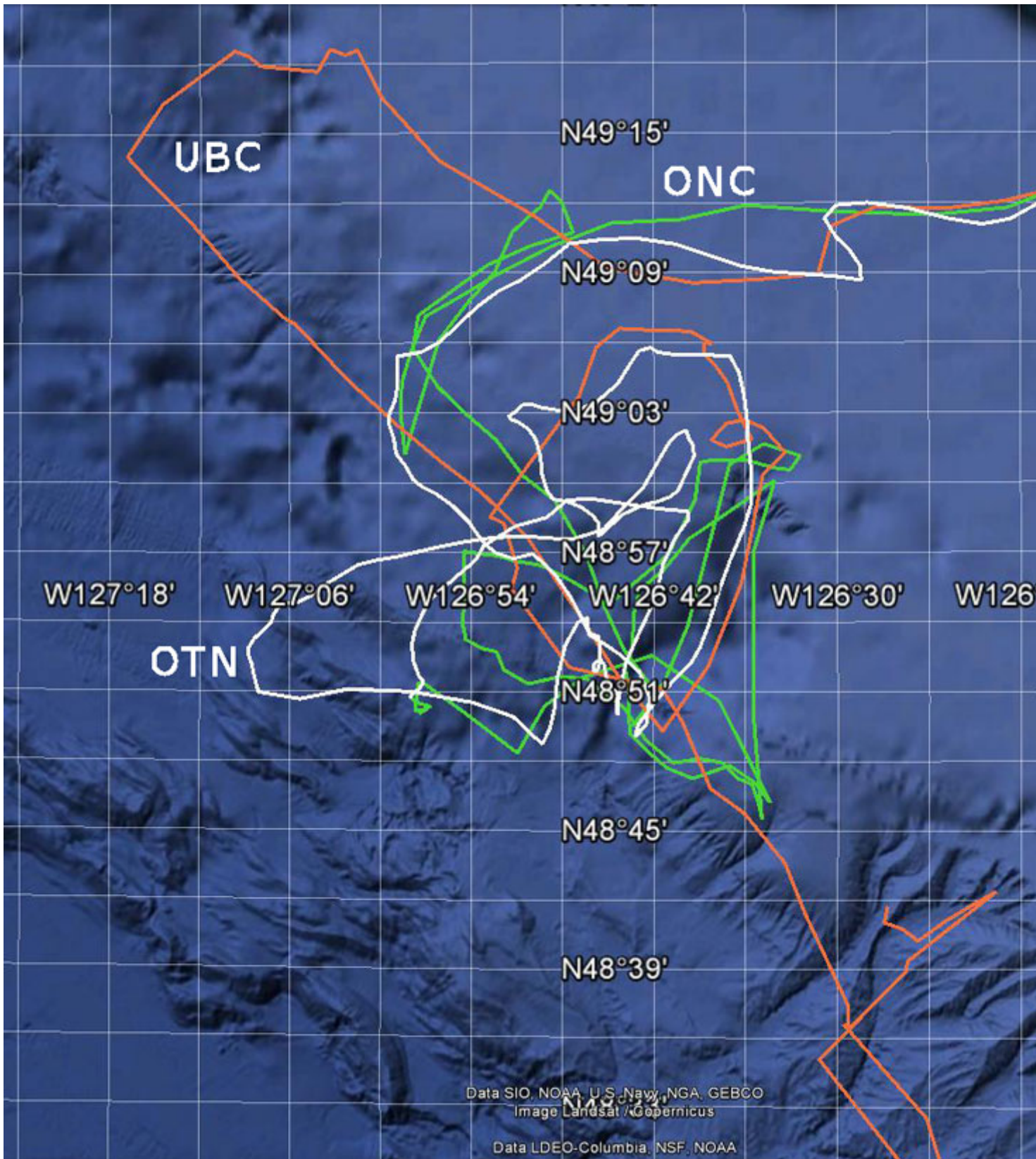


Figure 2. The completed glider tracks off Clayoquot Sound, plotted in Google Earth. The surface track lengths achieved during this mission: ONC, 360km (shown in green); UBC, 375km (shown in red); and OTN, 328km (shown in white).

The gliders fly at oblique angles up and down through the water column, collecting data that provide profiles of information from the ocean surface to the seafloor. Periodic surfacing

allows the gliders to obtain a GPS position fix, receive new instructions, and send back a few vital data records for early assessment (Figure 3).

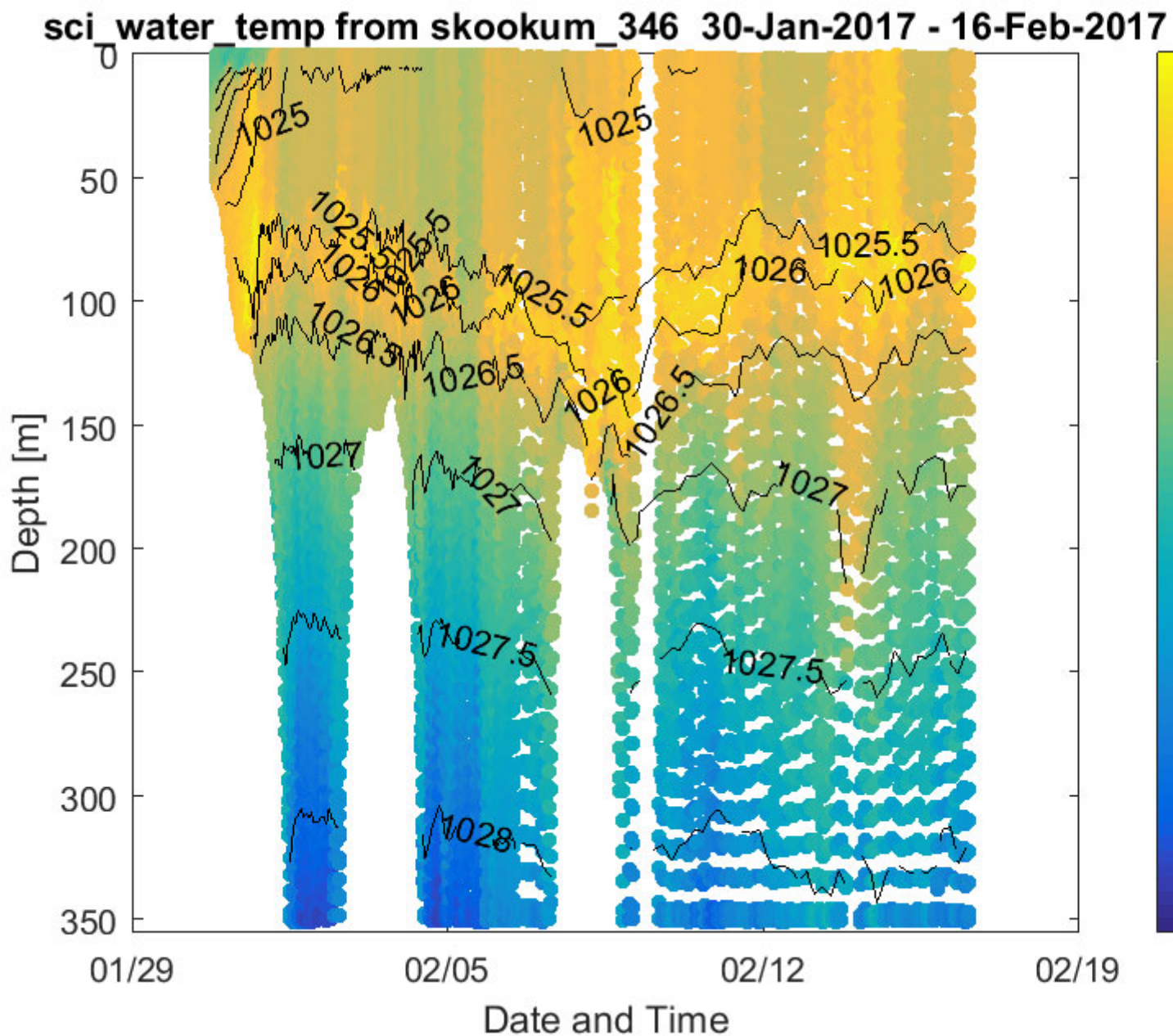


Figure 3. A preliminary plot of seawater temperatures from the ONC glider during the three-glider mission.

Upon recovery, the full resolution data are downloaded and archived to ONC's data management system Oceans 2.0. The project leaders included Tetjana Ross (Institute of Ocean Sciences, DFO), Chris Taggart (Dalhousie University), Richard Davis (Dalhousie University), Dave Duffus (University of Victoria) and Stephanie Waterman (University of British Columbia), supported throughout the mission by a team of students, post-docs, and technicians.

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