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Multiparameter Gas Hydrate Observations from NEPTUNE Canada's Seafloor Cable

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Cabled seafloor observatories can acquire long high-resolution time series of a large variety of data that provide us with a new look on the highly dynamic gas hydrate zones. At the northern Cascadia margin, over two years of continuous seafloor data have now been collected with NEPTUNE Canada, the North-East Pacific Time-series Undersea Networked Experiments, under the umbrella of Ocean Networks Canada of the University of Victoria. Two of NEPTUNE Canada's instrumented nodes are located atop the gas hydrate fields, one site called Barkley Hydrates near Barkley Canyon, and one site called ODP 889, also known as Bullseye Vent and Bubbly Gulch. From simple to complex data products, researchers around the world can access and download ocean observations from the many instrument types or conduct their experiments on the ocean floor via the internet. The diversity of available data ranges from simple instrumentations such as conductivity-temperature-pressure (CTD) meters, over current meters, to a CORK borehole, a controlled source electromagnetic (CSEM) system, a multibeam sonar that detects rising methane bubbles, or a seafloor crawler equipped with sediment profiler and methane sensor, among many others. Cameras and lights provide constant visual access to parts of the seafloor, and NEPTUNE Canada's infrastructure installation and maintenance cruises allow regular inspection of larger parts of the hydrated seafloor. We present some results on the observed gas plume activity, potential hydrate growth inferred from seafloor compliance, changes in bacterial communities, and some electromagnetic inferences on the deeper gas hydrate structures.