Herbert Inlet Clayoquot Sound Phytoplankton and Water Properties 2014-2024 Comparison

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University of Washington Tacoma researchers have monitored the marine ecosystem in Clayoquot Sound on the west coast of Vancouver Island, BC, Canada each fall since 2001 to document estuarine changes associated with large-scale climate variability and potential impacts on phytoplankton and harmful algae blooms (HABs). In 2014, the Northeast Pacific Ocean, including the Pacific Northwest coast, experienced the first of a series of marine heatwaves (MHWs), which may create favorable conditions for HABs. *Alexandrium catenella* is a HAB phytoplankton species that produces a neurotoxin that can accumulate in filter-feeding shellfish and may be fatal to mammals that consume contaminated shellfish. This study examines estuarine conditions in Herbert Inlet, one of five inlets in Clayoquot Sound, and compares water properties and phytoplankton populations in 2024 with data collected in 2014 to investigate the relationship between MHWs and HABs. Continuous profiles of temperature, salinity, density, dissolved oxygen, fluorescence, and transmissivity with depth were recorded using a CTD. Discrete water samples were collected at the surface and pycnocline, along with a 10-meter vertical net tow for phytoplankton identification and enumeration. The Simpson Diversity Index was used to calculate phytoplankton diversity. *A. catenella* was absent in 2014 but detected at high concentrations in 2024. Relative to 2014, Herbert Inlet in 2024 was warmer, saltier, denser, slightly less anoxic, and exhibited greater fluorescence and lower transmissivity. This suggests increased stratification and residence times which may promote HAB occurrence.