Diatoms are a major phytoplankton group forming the base of aquatic food webs and dominate the phytoplankton assemblage in aquatic systems. With silica-based cell walls and no flagella, their mobility is limited, and their silica demand is higher than that of dinoflagellates and other groups. As climate change drives rising ocean temperatures and more frequent marine heat waves (MHWs), studies in the Northeastern Pacific show that diatom abundance relative to dinoflagellates declines during such events. Two main published hypotheses that explain this are: 1) Dinoflagellates are more temperature tolerant; and 2) Silicate availability may drop with warming, disadvantaging silica-dependent diatoms. This study will examine the diatom abundance in relation to temperature and silicate changes in Tofino Inlet, Clayoquot Sound, on Vancouver Island's west coast (2013–2023), a period with several MHWs. University of Washington Tacoma researchers have collected annual late-summer/early fall water property data in Clayoquot Sound since 2001 and phytoplankton samples since 2007. This data set includes CTD profiles (temperature, salinity, density, oxygen, fluorescence, transmissivity), discrete water samples (nutrients, phytoplankton), and 10-meter vertical net tows (20 μm mesh). All phytoplankton samples were formalin-fixed and enumerated in the lab with a research-grade compound microscope. As the base of the food web, changes in phytoplankton composition may have drastic impacts on higher trophic levels. Understanding how MHWs impact phytoplankton communities will aid in furthering climate change preparedness for marine resource managers.