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Theme -Theme 1: Design, Optimization and Implementation of the Observing System

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Poster title (brief) Sediment oxygen consumption in the Pacific Arctic: Impacts of increased temperature and food supply on the benthic community and individual dominant organisms

Abstract - text box

Observations in the northern Bering and Chukchi Seas have shown recent, accelerated, and significant temperature increases in Pacific Arctic waters. These physical changes have implications for the shallow shelf ecosystem, including seafloor communities where higher trophic organisms such as Pacific walrus, bearded seal and spectacled eiders forage. Some of these higher trophic level organisms are harvested for subsistence by local indigenous hunters; therefore responses of benthic organisms to these environmental changes and the potential impacts to the food web may raise food security issues in remote Alaskan communities. Temperature and food supply influence benthic community structure, with food acting as one of the largest drivers for benthic biomass. Understanding community and system scale biological responses to changing temperatures and food availability is crucial for evaluating ecosystem change. Sediment community oxygen consumption (SCOC) incubation experiments were undertaken shipboard on the US Coast Guard Cutter Healy during the summer of 2019 in order to examine the effects of increased temperatures and food addition to overall community oxygen consumption and nutrient cycling in the northern Bering and Chukchi Seas. These experiments, part of activities associated with the Distributed Biological Observatory (DBO) - Northern Chukchi Integrated Study, were completed at six sites in the DBO1 (northern Bering Sea), DBO3 (SE Chukchi Sea), and DBO4 (NE Chukchi Sea) regions. Our initial findings indicate SCOC is higher in warmer temperatures and usually higher with the addition of food, which is generally consistent with previous experimental results in this region. Respiration rates were also evaluated for individual specimens of dominant benthic organisms at each site, primarily different species of bivalves (*Macoma calcaria* and *Ennucula tenuis*) and the amphipod (*Ampelisca* sp.) at a station in the northeast Chukchi Sea.