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# Ocean- vs. land- terminating glacial fjords: a comparison of dissolved trace metal distributions in Southwest Greenland between 2023 and 2024

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Greenlandic fjord systems are notoriously impacted by climate change. Accelerating ice loss profoundly affects marine life by modulating the availability of light and the supply of essential macro- and micro- nutrients. Fjord ecosystems of the future are expected to become less productive as rising temperatures turn glaciers from marine- to land-terminating [1]. While changes in marine physics and macronutrient cycling are quite well investigated, the future of micronutrient cycling and their potential impact on primary production are less well understood. Part of the complexity is due to the numerous overlapping biogeochemical processes and diverse environmental conditions. For example, glacier calving and river sediment plumes supply particulate trace elements (e.g. Fe [2]), but only a small fraction ends up in the pool of dissolved trace metals (dTM) [3]. Further, ice and sediment plumes may counteract the nutrient supply by limiting the light for phytoplankton growth. These are some of the various processes that the GreenFjord project aims to elucidate by studying the marine biogeochemistry of two contrasting fjords near Narsaq in southwest Greenland. Here we report data on dTM concentrations (Fe, Mn, Co, Ni, Cu, Pb and Zn) in seawater samples collected on two transects in 2023 and 2024 - one fjord supplied by multiple marine-terminating glaciers, the other receiving only glacial melt water and sedimentary plumes from a land-terminating glacier. We analyze the trends in dTM distributions along with supporting physical and dissolved and particulate macronutrient data. We discuss sources, sinks and mechanisms driving the spatiotemporal trends in dTMs, their relationship to primary producers, and potential climate feedback related to transitioning from marine- to land-terminating fjord systems.

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