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CORRELATION BETWEEN PHYTOPLANKTON COMMUNITIES AND ENVIRONMENTAL FACTORS IN THE WESTERN ARCTIC OCEAN DURING LATE SUMMER, 2012

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We examined changes in phytoplankton communities in relation to (i) nutrient availability in surface and subsurface waters and (ii) chlorophyll a maximum depths in the Chukchi Sea during summer 2012. Phytoplankton assemblages comprised 53 taxa in seven classes: Dinophyceae, Cryptophyceae, Bacillariophyceae, Chrysophyceae, Dictyochophyceae, Prasinophyceae, and Prymnesiophyceae. The most abundant species were in the nano-/pico particle size category at surface and SCM depths at most stations. Nano- and pico-sized phytoplankton appeared predominant at high latitudes, whereas larger diatoms were predominant at the western and eastern boundaries of the study area. From analyses of multi-dimensional scaling (MDS) ordination plots derived from additive trees clustering procedures, four (surface water) and three (SCM) clusters were identified. The differentiation of these clusters may be related to the water flow circulation in the Arctic Ocean. Multivariate analyses showed that salinity and nutrients (especially nitrate+nitrite) influenced the structure of phytoplankton communities. These results imply that phytoplankton communities are likely differentiated among water bodies (e.g., Pacific Winter Water, East Siberian Water, and Northern Sea Ice Melting Water), salinities, and nutrient concentrations (especially nitrogen) in diverse Arctic water masses.