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Abstract

Marine fishes in the Canadian Beaufort Sea have complex interactions with habitats and prey, and occupy a pivotal position in the foodweb by transferring energy between lower- and upper-trophic levels, and also within and among habitats (e.g., benthic-pelagic coupling). The distributions, habitat associations, and community structure of most Beaufort Sea marine fishes, however, are unknown thus precluding effective regulatory management of emerging offshore industries in the region (e.g., hydrocarbon development, shipping, and fisheries). Between 2012 and 2014, Fisheries and Oceans Canada conducted the first baseline survey of offshore marine fishes, their habitats, and ecological relationships in the Canadian Beaufort Sea. Benthic trawling was conducted at 45 stations spanning 18-1001 m depths across shelf and slope habitats. Physical oceanographic variables (depth, salinity, temperature, oxygen), biological variables (benthic chlorophyll and integrated water-column chlorophyll) and sediment composition (grain size) were assessed as potential explanatory variables for fish community structure using a non-parametric statistical approach. Selected stations were re-sampled in 2013 and 2014 for a preliminary assessment of inter-annual variability in the fish community. Four distinct fish assemblages were delineated on the Canadian Beaufort Shelf and slope: 1) Nearshore-shelf: <50 m depth, 2) Offshore-shelf: >50 and ≤200 m depths, 3) Upper-slope: ≥200 and ≤500 m depths, and 4) Lower-slope: ≥500m depths. Depth was the environmental variable that best explained fish community structure, and each species assemblage was spatially associated with distinct aspects of the vertical water mass profile. Significant differences in the fish community from east