

Figure S1. Correlations among environmental variables were tested using Spearman's correlation coefficients. Blue colors indicate a negative correlation and red colors indicate a positive correlation for the Chukchi Sea **(A)** and Beaufort Sea **(B)**.

Figure S2. The full suite of spatial representations for all modalities in both seas. Points represent stations on each shelf and are shaded based on the average density of the community-weighted-mean value for the selected modality.