The persistent cross-shelf bioregionalization of coastal oceans

Patrick Pata\textsuperscript{1,2}, Moira Galbraith\textsuperscript{3}, Kelly Young\textsuperscript{3}, Andrew Margolin\textsuperscript{1}, R. Ian Perry\textsuperscript{4}, and Brian P.V. Hunt\textsuperscript{1,2,5}

\textsuperscript{1}Institute for the Oceans and Fisheries, University of British Columbia \textsuperscript{2}Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia \textsuperscript{3}Institute of Ocean Sciences, Fisheries & Oceans Canada \textsuperscript{4}Pacific Biological Station, Fisheries and Oceans Canada \textsuperscript{5}Hakai Institute

Zooplankton Dataset

- 3,721 net samples collected in the BC coastal ocean and adjacent offshore waters during spring and summer from 1995 to 2014
- 160 most common zooplankton species found in $\geq 3\%$ of samples

Overview of methodology

- Zooplankton abundance
- Oceanography data

Cluster analysis of 20 years of zooplankton observations identified 4 bioregions along the cross-shelf gradient

Dendrogram shows the 5 species association groups. Subgroups are based on the bioregion with the highest indicator value for each species.

Questions for future research

- Can we derive a global zooplankton bioregionalization by aggregating different data types?
- Are bioregions functionally different?
- How does circulation connect bioregions?
- Given the large residual variance, how can we account for dispersal and biotic interactions?