THE UNIVERSITY OF BRITISH COLUMBIA

Institute for the Oceans and Fisheries

SEMINAR

Exploring the Impact of Climate Change on the Bioaccumulation of Chemical Pollutants in a Marine Food Web from the Northeastern Pacific: An EwE model approach

Anthropogenic climate change and chemical pollution are amongst the major stressors on marine ecosystems in the 21st century, posing substantial ecological and human health risks. Understanding the combined effect of climate change and pollutant impacts is crucial for those tasked with managing ecological and human health risks in the long-term. However, the combined effects of these two stressors on marine foodwebs are still not clear. Several studies suggest that climate change is already changing pollutant fate and transport in the atmosphere, and affecting exposure and accumulation of pollutants in marine organisms that can subsequently be affected by adverse health effects. Top predators and humans with high rates of seafood consumption such as marine mammals and First Nations communities in the Northeastern Pacific (Canada and US), may be most vulnerable to such impacts. To test this hypothesis, we developed a trophodynamic model (Ecopath with Ecosim, EwE) to examine the impact of climate change and acidification on the bioaccumulation of organic chemical pollutants, including polychlorinated biphenyls (PCBs) and organic mercury (MeHg), in the Salish Sea marine food web in the Northeastern Pacific Ocean. The ecosystem model is driven by projected climate change variables, including temperature, pH, dissolved oxygen and primary production under a 'strong mitigation' (low emission) and 'business-as-usual' (high emission) scenarios (Representative Concentration pathways, or RCP 2.6 and 8.5). The model also tracks and predicts the bioaccumulation of pollutants (PCBs and MeHg) with the Ecotracer module. This study improves our understanding of the interactions of climate and pollution impacts, contributing to a more comprehensive understanding of the risks of multiple human stressors, and highlights key areas for concerted research and potential mitigation policies.

Juan Jose Alava
MITAC postdoctoral fellow
Institute for the Oceans and Fisheries
and Vancouver Aquarium

November 25 ◆ 11:00am ◆ AERL 120