

Modeling the transfer of organically bound tritium (OBT) through marine food chains

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Background and Objectives

- Tritiated water (HTO) released to the environment is a significant risk factor when it enters food webs in the form of organically bound tritium (OBT).
- In ecosystems, the transfer of OBT is expected to follow the transfer of key elements in bioenergetics metabolism: carbon (C) and nitrogen (N).
- Carbon and nitrogen stable isotopes track the flow of energy through ecosystems, and have been used extensively to understand trophic relationships in complex marine and freshwater food webs.
- Relationships between carbon and nitrogen stable isotope ratios and OBT have never been explored for their potential value in developing mechanistic models for the transfer of tritium through food webs.
- Risk models for marine ecosystems require an integration of both plume dispersion and ecological factors, such as food web structure and animal life cycles.
- **Project Objective:** To develop a radiological risk model for OBT by integrating ocean circulation and food web models for the Bay of Fundy near Point Lepreau.
 - This is a 3-year project, currently in its first year
 - Stakeholders: CNSC (primary), DFO
 - Anticipated collaboration with DFO for FY 2020
- In FY 2019, we conducted the first field sampling campaign for this project.
- Initial sample processing for stable isotope analysis has begun.
- Sample processing for HTO and OBT analyses depends on progress with method improvements to control HTO background levels.
- Future work will encompass sampling to fill data gaps; anticipated collaboration with DFO.
- Potential engagement of expert ocean circulation modeler (post doc).