

# Presentation Series Abstracts

## PRESENTATION SERIES 1 POLLUTION OF THE MARINE ENVIRONMENT

### **Haibo Niu (Dalhousie University)**

Predicting the Fate/Behaviors of Oil Spills in Canadian Waters: Recent Modeling Efforts

The oil and gas industry in Canada is continuously growing and several major oil exploration and transportation projects from coast to coast have been announced recently. Increased oil and gas activity raises the risk of marine oil spills, which is of significant concern because of the potentially devastating environmental effects it is vital that a reliable oil spill model be available to predict the trajectory of oil and help allocate the limited response resources. A number of modeling activities are in progress within the Marine Environmental Observation, Prediction and Response (MEOPAR) academic Network of Centres of Excellence. The main goal of these activities is build and test a state-of-the-art oil spill system which can be coupled with relocatable or fixed atmosphere-ocean forecast system to provide short-term forecasts (hours to days) of fate and trajectories of marine oil spills within hours of emergency. It is the objective of this presentation to give an overview of these model development and application activities for East and West Coast of Canada.

### **Max Liboiron (Memorial University of Newfoundland & Labrador)**

Monitoring Marine Plastic Pollution in the North

While marine plastics are a global problem, their local distribution, origins, and effects vary greatly. Little research has been done on the phenomenon in Canada's far north, partly due to issues of accessibility, but also because many standard monitoring methods are developed for the south and do not work in icy, rocky conditions. Dr. Liboiron's research team has invented a set of scientific instruments suited to these conditions, and have begun to establish plastic contamination baselines in Newfoundland. This presentation will cover some of these inventions, including the LADI trawl, a passive sampler called PED ROC, and biomonitoring protocols for food fish, all of which can be used by both accredited and citizen scientists for monitoring marine plastics in northern environments.

### **Jay Cullen (University of Victoria)**

The Integrated Fukushima Ocean Radionuclide Monitoring (InFORM) Project: Tracking Fukushima Derived Contamination in Canada's Oceans

The Integrated Fukushima Ocean Radionuclide Monitoring (InFORM) project is a partnership between academic, government, non-governmental organizations, and citizen scientists to monitor the arrival of Fukushima-derived contamination, cesium-134 ( $t_{1/2} = \sim 2$  years), cesium-137 ( $t_{1/2} = \sim 30$  years), and iodine-129 ( $t_{1/2} = 15.7$  million years) in the open Pacific and Arctic Oceans and Canadian coastal waters. In response to public demand, monitoring began in the fall of 2014, when models predicted the arrival of radionuclide contamination from the 2011 Fukushima nuclear accident. Monitoring efforts will capture the peak of the radionuclide contamination, predicted to

occur in our waters, utilizing our network to collect coastal, oceanic, and marine biota samples. Seawater samples are collected monthly by dedicated citizen scientists in 16 of British Columbia's coastal communities. Oceanic contamination is monitored by biannual research cruises into the NE Pacific, and annual expeditions to the Arctic Ocean. In addition, salmon from each of British Columbia's major salmon runs are sampled each summer to assess human and ecosystem health risks due to bioaccumulation of Fukushima derived contamination. Thus far InFORM has collected and analyzed over 275 coastal and 450 oceanic seawater samples and over 300 Pacific salmon since the projects inception in August 2014. To date, monitoring has shown levels of radionuclide activity (~10 Bq m<sup>-3</sup> in the central NE Pacific) are well below Canadian safe drinking water standards (10,000 Bq m<sup>-3</sup>). Similarly, radionuclide levels in salmon are well normally below the minimum detectable concentration for <sup>134</sup>Cs and on average ~0.2 Bq kg<sup>-1</sup> compared to safety standards (1,000 Bq kg<sup>-1</sup>). Through an active, and multi-faceted, outreach campaign these results are providing quality information to the public regarding the accident's environmental impact here in North America. Contamination levels continue to be below levels that are known to represent a significant threat to human or ecosystem health. These data will assist in refining models and our understanding of upper-ocean mixing and mass transport.

### **Denis Lefavre, (Fisheries and Oceans Canada)**

Oil Spill Trajectory Forecasts on the Canadian Coastline

In support to Canadian Coast Guard mandate on oil spill management and to DFO-Science needs, surface trajectory modelling capacity has been set up for the St. Lawrence River, Estuary and Gulf. On-going development aims at using operational ocean model outputs from the NEMO model, implemented at Environment and Climate Change Canada through CONCEPTS, to extend this capacity to other coastline of Canada.

### **Aldona Wiacek (Saint Mary's University)**

Atmospheric Pollution in Coastal Environments

A very brief review of our understanding of the effects of shipping on air quality in coastal environments will be presented, along with air quality indicators, measurement capabilities and recent field work results for Halifax, Canada.