

MSc Thesis Seminar

Speaker

**Mr. Evan Kielley,
Memorial University**

**Friday, April 26, 2019
2pm, HH-3017**

Iceberg Drift Ensemble Forecasting

Abstract:

Every year, hundreds of icebergs break off from the glaciers in Greenland and drift along the coast of Newfoundland where they pose a threat to all sea-faring vessels and offshore oil platforms in that region. In order to mitigate this risk, decisions are made on how to best avoid collision based on the forecast of the iceberg's trajectory computed using numerical iceberg drift models. The problem with this approach, historically, has been that these forecasts are often inaccurate and, since they are also often deterministic, it is difficult to make a decision based upon the worst-case scenario. For this reason, this work attempts to better the reliability of these forecasts by using an ensemble approach whereby the ensemble is created through perturbing the wind and current velocities that are used as inputs for the iceberg drift model -- this is done by randomly sampling from distributions of corrections for wind and current velocities. The results show that this approach performs very well in some cases and poorly in others. In the cases it does well, the cone of uncertainty created from the ensemble provides much more information to decision-makers than does a single, deterministic path; however, it is still dangerous to rely on these forecasts since they are often inaccurate. In the end, more work is needed to improve the reliability of these forecasts. One potential way for doing so would be to improve the distributions of corrections such that they include a better representation of the variability in these fields.