



## **The importance of sea ice properties in assessing the risks present in coastal regions of the Arctic**

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In northern Norway, the extent of sea ice varies yearly and is largely contained to fjords where conditions are calmer and a freshwater input is present often throughout the winter season. Given the influence of the latter, the ice that forms can be of lower salinity than sea ice found in the open ocean. Measurements of sea ice properties gathered in Norwegian fjords in the winter of 2017-2018 support this statement, revealing variations in bulk ice salinity and subsequently porosity between fjords despite being located relatively near to one another (<200 km). This finding is of relevance to the larger arctic where coastal areas in regions such as Greenland and Northern Canada may also be subjected to an input of freshwater during the ice growth season thus potentially altering ice properties.

As ship traffic and interest in natural resources (i.e- oil) in the arctic increases, the potential for oil spills grows in parallel. The studies performed examining the interaction between oil and sea ice and relatedly methods of oil spill response in ice covered waters, assume ice of a predictable pore structure however. As the arctic changes in response to a warming climate, it is important to understand where and why ice differs from the predicted structure and implications for operations in the arctic. Here we present our measurements of ice properties across six fjords in northern Norway. We discuss our findings in application to the oil movement through sea ice as well as other areas of science, namely the biological implications of variations in ice properties in coastal areas. Suggestions for future research are lastly provided to assist in assessing the risk associated with variations in ice properties in regions throughout the arctic.