



Towards automated mapping of lake ice using RADARSAT-2 and simulated RCM compact polarimetric data

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The Canadian Ice Service (CIS) produces a weekly ice fraction product (a text file with a single lake-wide ice fraction value, in tenth, estimated for about 140 large lakes across Canada and northern United States) created from the visual interpretation of RADARSAT-2 ScanSAR dual-polarization (HH and HV) imagery, complemented by optical satellite imagery (AVHRR, MODIS and VIIRS). The weekly ice product is generated in support of the Canadian Meteorological Centre (CMC) needs for lake ice coverage in their operational numerical weather prediction model. CIS is interested in moving from its current (manual) way of generating the ice fraction product to a largely automated process.

With support from the Canadian Space Agency, a project was recently initiated to assess the potential of polarimetric SAR data for lake ice cover mapping in light of the upcoming RADARSAT Constellation Mission (to be launched in 2018). The main objectives of the project are to evaluate: 1) state-of-the-art image segmentation algorithms and 2) RADARSAT-2 polarimetric and simulated RADARSAT Constellation Mission (RCM) compact polarimetric SAR data for ice/open water discrimination. The goal is to identify the best segmentation algorithm and non-polarimetric/polarimetric parameters for automated lake ice monitoring at CIS. In this talk, we will present the background and context of the study as well as initial results from the analysis of RADARSAT-2 Standard Quad-Pol data acquired during the break-up and freeze-up periods of 2015 on Great Bear Lake, Northwest Territories.