



The STSE North Hydrology Project - Basin scale river ice characterization

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Abstract

In response to the increasing recognition of the importance of freshwater ice, scientific concern has been expressed regarding climate change impacts on future freshwater-ice regimes. There is a need for coherent long-term geo-information datasets over the northern latitudes. The STSE North Hydrology project (Support To Science Element - European Space Agency) is a contribution to the better understanding of lake and river ice dynamics in the northern hydrology and climate system. The global objective of the project is to exploit earth observation technology, models and in situ data to improve the characterization of river and lake ice processes and their contribution to the Northern Hydrology system. The project is carried out by an international consortium of experts led by the University of Waterloo (Canada). One specific aspect being investigated is basin scale river ice characterization. In recent years, a number of river ice services for flood forecasting and early warning has been developed and delivered operationally to a number of users. However, there is still a need to further improve these services enhancing the river ice characterizations and classification. North Hydrology will contribute to address the scientific requirements derived from the current operational services in view of transferring the project scientific results to the existing operational activities. This work package will build on the expertise of the FRAZIL system, developed at INRS. Specific objectives include: 1) improvements to the algorithm for dual polarization ASAR data, 2) development of new tools to automatically derive added-value information, 3) support of breakup date forecasting models and 4) development of a portfolio of images, ice maps, derived products and validation datasets. The primary testing site is the Tornionjoki/Torne älv River, a river at the border between Finland and Sweden. Other sites include the Koksoak and Chaudiere Rivers (Quebec) and the Peace River (Alberta).