



SAR data for river ice monitoring. How to meet requirements?

Helena Łoś, Katarzyna Osińska-Skotak, and Joanna Pluto-Kossakowska

Department of Photogrammetry, Remote Sensing and GIS, Warsaw University of Technology, Warsaw, Poland

Although river ice is a natural element of rivers regime it can lead to severe problems such as winter floods or damages of bridges and bank revetments. Services that monitor river ice condition are still often based on field observation. For several year, however, Earth observation data have become of a great interest, especially SAR images, which allows to observe ice and river condition independently of clouds and sunlight.

One of requirements of an effective monitoring system is frequent and regular data acquisition. To help to meet this requirement we assessed an impact of selected SAR data parameters into automatic ice types identification. Presented work consists of two parts. The first one focuses on comparison of C-band and X-band data in terms of the main ice type detection. The second part contains an analysis of polarisation reduction from quad-pol to dual-pol data.

As the main element of data processing we chose the supervised classification with maximum likelihood algorithm adapted to Wishart distribution. The classification was preceded by statistical analysis of radar signal obtained for selected ice types including separability measures. Two river were selected as areas of interest – the Peace River in Canada and the Vistula in Poland.

The results shows that using data registered in both bands similar accuracy of classification into main ice types can be obtain. Differences appear with details e.g. thin initial ice. Classification results obtained from quad-pol and dual-pol data were similar while four classes were selected. With six classes, however, differences between polarisation types have been noticed.