



## **Assessment and exploitation of pan-arctic hydrological observation systems and data for monitoring fresh-water flow to the Arctic Ocean and changes in arctic hydrological regimes**

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The Arctic-HYCOS observing system provides daily and monthly gauged river discharge data from a selection of stations operated by the national hydrological services in the Arctic Council member states. The set of stations have been selected to provide a basis for monitoring fresh water flow to the Arctic Ocean and for monitoring changes in the hydrological regime. We have performed an assessment of the observation system with respect to these objectives, focusing on spatial and temporal coverage, as well as metadata and data management aspects. The current list includes 427 stations of which 72 are listed as flow-to-ocean stations, representing the most reliable downstream station in the river basins. The flow-to-ocean network represent about 60% of the drainage basin area of the Arctic Ocean and related northern seas (excluding Greenland) – and about the same fraction of the total flow-to-ocean estimated by the Arctic-HYPE hydrological model (<http://hypeweb.smhi.se/>). The largest gaps in spatial coverage was found in Greenland, Svalbard, and northern coastal areas of Eurasia and North America. Scandinavia was also rather poorly represented in the selected station network mainly due to a spatial limit of the basin area to be included. Metadata on station location were assessed and improved by cross-checking information from several databases and aligning stations to flow accumulation data from the GWD-LR database. A method was developed for estimating effective upstream area using high resolution elevation data and applied using the Arctic-DEM dataset. The impact of the improved hydrological data is assessed using the Arctic-HYPE model. This assessment was carried out under the H2020 project “Integrated Arctic Observation Systems (INTAROS)”.