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Novel comprehensive field-based monitoring dataset of largest Siberian river particulate flux into Arctic ocean

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Northern rivers transport huge quantities of water and constituents from the continents to the Arctic Ocean. Characteristics of the transport mode of chemical flow are poorly monitored, and the existing estimates of river flux are characterized by high uncertainty. Since 2018, the monitoring campaign ArcticFlux has been sampling the 4 largest Siberian rivers (Ob, Enisey, Lena and Kolyma) multiple times per year at the most downstream river crossection selected as unaffected by river mouth processes (tides, surges etc). Using Acoustic Doppler Current Profiler (ADCP) acquisitions with sediment depth profile sampling we build a simple model to derive the bed and suspended seasonal fluxes, grain size and particulate heavy metals distributions. Study demonstrates the significance of the hydraulic control for the metal partitioning within river as well as explains spatial (inter-basin) variations in particulate flux due to local hydrology, erosion rates and catchment lithology. Using (ADCP) acquisitions with sediment depth profile sampling of the Ob, Enisey, Lena and Kolyma, we aim to build a model to derive the annual flux of the sediments and particulate flux of the selected metals. The datasets is also used to assess the uncertainties in selected sediment quantity and quality data, including contributions from vertical and crossectional variations into fluxes estimates including requirements for sampling strategy. Based on the modeling techniques and application of erosion models for all four Arctic catchments the project will also focus on the novel quantitative assessment of bank and catchment erosion contribution into chemical flux.