

***The Arctic Great Rivers Observatory (Arctic-GRO):
Monitoring Biogeochemical Fluxes from Rivers to the Arctic Ocean***

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Monitoring circumpolar riverine discharge and constituent flux is critical for understanding environmental change in the Arctic. The Arctic Great Rivers Observatory project (Arctic-GRO) measures the flux of water-borne constituents in 6 Great Arctic Rivers: the Ob', Yenisey, Lena, Kolyma, Yukon, and Mackenzie. Together, these rivers deliver the majority of the continental fresh water to the Arctic Ocean, the most landlocked and freshwater-dominated of the Earth's seas. Arctic-GRO measurements are conducted at downstream locations that capture the vast majority of continental runoff from the major arctic watersheds, in the same manner as Arctic-GRO's antecedent, PARTNERS (2002-2007), which was the first comprehensive study of riverine fluxes to the Arctic Ocean. The Arctic-GRO project samples for numerous water-borne constituents, with a sampling schedule specifically designed to capture conditions during peak flow, base flow, and the maximum yearly permafrost melt. Here, we highlight current work with these data, which is producing new estimates of riverine fluxes of dissolved N, P and Si that explicitly incorporate constituent concentrations from the critical high-flow period. Sampling large rivers near their mouth provides one of the most efficient ways to assess changes occurring across vast continental regions that may diagnose environmental change on land and forecast alterations in the circulation and biogeochemistry of the Arctic Ocean.