

Fluvial silica biogeochemistry across a 700 km latitudinal gradient in Northern Alaska

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Objective

This work seeks to understand how shifting vegetation cover and permafrost thaw is altering Si exports to coastal Arctic receiving waters. We investigated the geochemical signatures of ten rivers draining a 700 km north-south gradient across northern Alaska.

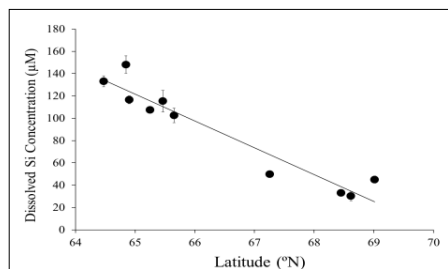


Figure 1. Average (\pm SE) dissolved Si concentration as a function of latitude ($y=0.23.99x+1681$, $R^2=0.92$, $p<0.05$, $n=10$).

Results and Discussion

Contrary to the significant negative relationship observed between average dissolved Si concentration and latitude across all sites (Fig. 1), we find no such pattern with biogenic Si behaviour. We use data on basin lithology, land cover, and river discharge, nutrient concentrations and Ge (Germanium)/Si ratios, to determine the drivers of these patterns. In turn, our results will be used to create the first predictive framework to assess how warming alters fluvial Si exports to Arctic receiving waters.