

Modeling Nitrate Transport and Retention in Arctic Deltas

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Nutrient input to the Arctic Ocean is difficult to establish in part due to the presence of deltas that lie at land and sea interfaces. Arctic deltas limit gauging to hundreds of kilometers upstream of shoreline, but downstream of gauging stations, flow is routed through bifurcating or anastomosing channels, modifying nutrient load and controlling transport to the ocean. In this study, we use morphological properties derived from satellite imagery and a nutrient spiraling framework to estimate nitrate e transport and removal in five Arctic deltas representing 40% of drainage from panarctic watersheds. Our models indicate that Arctic deltas are least efficient at processing nitrate during spring months, coinciding with high loading due to the annual spring freshet. Maps that reveal patterns of nitrate processing hotspots on the five arctic deltas can be used as references to guide field measurements that hone in on active regions of the delta.