



Insights into the Lake Superior Carbon Cycle from Preliminary Radiocarbon Analyses of Water Column Carbon Pools

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Lake Superior, the largest of the Laurentian Great Lakes along the border between the United States and Canada, acts as a regional carbon source to the atmosphere through net respiration and as a sequesterer of organic carbon through burial in lake sediments. Carbon budgets show that the known inputs of carbon to the lake are considerably lower than the known outputs of carbon, indicating that either the budgets are incomplete or there must be a temporal subsidy to the lake carbon cycle (e.g., the lake is not at steady state). This poster presents preliminary data from radiocarbon dating of carbon pools in the lake's water column and discusses their constraints on the carbon cycle of Lake Superior. The water-column radiocarbon profiles for bulk carbon pools (particulate organic carbon, dissolved organic carbon, and dissolved inorganic carbon) provide an interesting comparison with similar profiles from the open ocean, which appears similar in biogeochemistry (in terms of oligotrophy and food web structure) but varies significantly in physical characteristics (e.g., water-column mixing).