

# Negligible cycling of terrestrial carbon in many lakes of the arid circumpolar landscape

(Bogard et al. Nature Geoscience. <https://doi.org/10.1038/s41561-019-0299-5>)

**Problem:** Climatic changes may increase export of terrestrial carbon (C) into aquatic networks. The role that circumpolar lakes play in mineralizing this C is unclear for most of the northern circumpolar landscape (see figure depicting existing sampling extent).

**Objective:** Evaluate sources, fate, and regional importance of C cycling in arid, flat circumpolar landscapes, using lakes of the Yukon Flats Basin (YFB, see figure) as model systems.

**Approach:** Surveyed lake metabolism to assess C cycling in YFB lakes. Surveys supported by remote sensing, geochemical techniques (stable, radio-isotopic and biomarker analyses), sensor deployments.

**Outcomes:** **1) Underrepresentation** - The YFB study lakes typify >26% of all lake area in the permafrost region, but <1% of existing samples. **2) Important sites of C production** - Lakes in arid, low-relief YFB commonly have C cycles dominated by production and recycling of internal C. **3) Little terrestrial C mineralization** - Presently, weak hydrologic connection to landscape may render many high-latitude lakes relatively unimportant sites of terrestrial C processing.

