

Soil microbial parameters in Alaskan tundra soil through the winter

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DATA SET OVERVIEW:

This data set contains data on soil biological characteristics at the Toolik Field Station through the year from May 2008 to May 2009, focusing on winter. Soil samples were taken to bracket the winter-to-summer and the summer-to-winter transitions, and then to ensure that at least one full winter was covered. Soil cores were taken and analyzed for inorganic N (NH_4^+ and NO_3^-), extractable organic C and N, and microbial biomass C and N.

DATA COLLECTION AND PROCESSING:

Samples were collected from the Toolik Lake Long Term Ecological Station (Research plots for moist acidic tussock tundra, shrub tundra, and wet meadow tundra sites. Soil samples were taken during the winter by using a SIPRI ice augur. During summer, samples were cut with a knife. Mineral soils were separated from the overlying organic layer. Samples were then returned to the laboratory in the state they were collected (frozen or thawed) and analyzed.

Inorganic N pools: extracted with K_2SO_4 (0.5 M; 1:5 extraction). Analyzed for NH_4^+ and NO_3^- colorimetrically (NH_4^+ by acidification and diffusion into a pH indicator solution; NO_3^- by Cadmium reduction and Griess Ilosvay reaction).

Extractable organic C and N (EOC/EON): the same extracts analyzed on Shimadzu organic C/N analyzer.

Microbial biomass C & N: soil samples extracted with K_2SO_4 as above, but containing 0.5 mL CHCl_3 to lyse cells and release cellular material. The “biomass flush” is calculated as the EOC/N in the fumigated sample minus that in the unfumigated EOC/EON sample.

DATA FORMAT:

Data is in EXCEL spreadsheet.

Page 1: Extractable C & N; Fumigated & extracted C & N; microbial C & N flush

Page 2 Averages by soil type and time

Page 3 Inorganic N pools

Page 4 Averages by soil type and time

Page 5 Seasonal changes including graphs

Page 6 Net mineralization/immobilization of inorganic N: changes over time.

DATA REMARKS:

All values are the output of lab-based chemical analysis and are rigorously established against known standards. Each sheet has a column with flag values to explain any limitations or issues with particular values.