# Abstracts

# Copenhagen 2001
# Dynamics and Challenges of Cryosols
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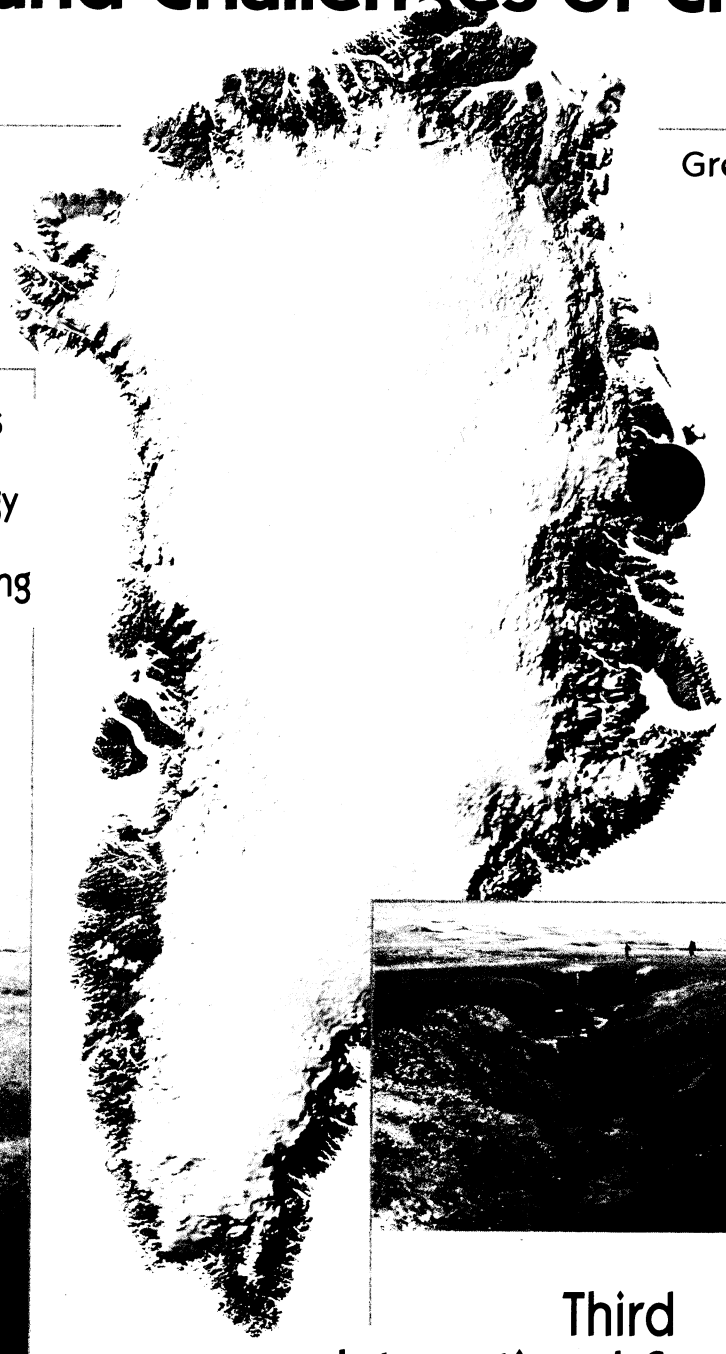

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# The main controls of soil organic carbon in Russian cryolithozone

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Correct estimates of soil organic carbon reserves are very important in construction of the global and regional carbon budgets. The present work is devoted to carbon pool assessment of Russian cryolithozone. We included into cryolithozone all Russian tundra and forest tundra landscapes, northern taiga zone of Siberia and middle taiga zone of the east Siberia. The original database "Soils of the Northern Eurasia" with descriptions of more then 1000 soil pits was used. The cryolithozone data set was selected to determine the most valuable controls of the distribution of soil carbon reserves. Geographical latitude and longitude, soil type, bedrock type, natural subzone and vegetation type were amongst the analyzed factors.

The reserves of soil organic matter were calculated for each soil pit. Horizon thicknesses, bulk weights of horizons, soil organic matter content (%) in horizons were taken into account. All these data were summarized by horizons to characterize a particular soil pit. The reserves of soil organic carbon were estimated by humus content. Empirical data were grouped by selected factors and averaged with standard errors.

The most evident was a latitudinal trend. Soil carbon reserves linearly decreased with latitude increase from 162.3 tC $ha^{-1}$ at 56° N to 49.7 tC $ha^{-1}$ at 76°N (the step in latitude was 4°). The longitudinal trend within the range of 60-150° E and 30° step wasn't found to be apparent.

Amongst bedrocks the least carbon reserves were found on sands (106.8 tC $ha^{-1}$), with intermediate reserves on loams and maximal on clay (193 tC $ha^{-1}$). We found a decrease of carbon reserves in the sequence of the following soil types: "sod – peat – brown – podzolic – gleic - grey" within the range from 184.8 tC $ha^{-1}$ to 100.0 tC $ha^{-1}$.

Soil carbon reserves in tundra subzones (arctic, typical, south) varied in the range of 95-105 tC $ha^{-1}$, whereas in forest tundra and taiga subzones at 141-163 tC $ha^{-1}$.

Soil carbon storage decreased within the following sequence of the main ecosystem types of criolithozone: meadows, forests, bogs, tundra (165.8, 142.1, 130.2 and 112.6 tC $ha^{-1}$, respectively).

We consider the empirical range of a particular factor as a characteristic of its relative importance. These ranges in the order of descending importance were the following: latitude (113 tC $ha^{-1}$), bedrocks type (86 tC $ha^{-1}$), soil type (85 tC $ha^{-1}$), ecosystem type (53 tC $ha^{-1}$), natural subzone (39 tC $ha^{-1}$) and longitude (21 tC $ha^{-1}$).

It is widely accepted by Russian soil scientists that for proper estimation of soil carbon reserves it is necessary and sufficient to consider soil or landscape type maps. Our basic point is to add into consideration other important factors and to create the specific map, summarizing information on bedrock and soil type with additional latitudinal subdivision.