EGU2020-3065
https://doi.org/10.5194/egusphere-egu2020-3065
EGU General Assembly 2020

Accumulation of soil carbon and nutrients along a 127-yr soil chronosequence in the Hailuogou Glacier retreat area

Shouqin Sun, Genxu Wang, and Xinbao Zhang
Institute of Mountain Hazards and Environment, CAS, Chengdu, China (shouqinsun@imde.ac.cn)

Climate change is resulting in accelerated retreat of glaciers worldwide, leaving behind bare soil and succeeding vegetation at ecological sites that share similar attributes but represent different ages across chronosequences of primary succession. These glacial succession chronosequences provide a space for time exchange opportunity to investigate the development of soil and vegetation from the very beginning. In this study we investigated how soil carbon (C), nitrogen (N) and phosphorus (P) nutrients were accumulated along a 127-yr primary successional chronosequence on Hailuogou glacier, China, where the soil samples were collected at 1-cm depth interval from 9 sectioned profiles with ages ranged from 27 yr to 127 yr on the glacial retreated area. Soil organic C (SOC) and TN showed an increasing trend along the chronosequence. The organic C and N accumulation was minimal after 27 yr of succession; with succession the soil had slightly C and N accumulation at the surface 0-1 cm depth after 45 to 53 years, and had obvious accumulation at the 0-2 cm depth after 59-72 years; the SOC and N accumulation extended to the 0-5 cm depth after 87 yr and to the 0-10 cm depth after 102 yrs. In contrast soil total P exhibited a depleting trend along the succession. Results indicated that the C and N accumulation along a glacier retreat chronosequence is not linear, but a slow increase in accumulating rates in the first 72 years, followed by a sharp increase between 72 to 87 years and then slow down with succession proceeded.