



Soil forming and P cycling in Hailuoguo Glacier retreat area since 120 years

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The Hailuoguo Glacier, a typical monsoon temperate glacier located on east slope of Mt. Gongga in Southwestern China, has been retreating Little Ice Age (LIA). On the retreated area, soil quickly developed from the moraine, ecosystem established and primary succession developed from moss to coniferous forest. During the the primary succession developing, nutrients' availability is limited factor. Mineral composition and other geochemical and physical characteristics demonstrated the fast pedogenesis processes, which included five mechanisms: decarbonization, accumulation of humus, acification, brunification and illuviation. Along with the pedogenesis, phosphorus released fast from primary mineral phosphate. The variation of total phosphorus and its fractions revealed that the P loss was rapid along the 120-year soil chronosequence. The P stocks in soils (0–30 cm) started to decrease at the 52 year site. And the P stock depletion reached almost 17.6% at the 120-year site. The loss of P from the soil of the Hailuoguo chronosequence was mainly attributed to weathering, plant uptake, and transport by runoff. About 36% P loss was transported into plant biomass P at the 120 year site.