The Biogeochemistry of Silica in Terrestrial Ecosystems. (S07-kelly185447-Oral)

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Abstract:

The global biogeochemistry of silica involves a coupling between terrestrial and oceanic systems. We will focus our discussion on terrestrial ecosystems and summarize approaches and research to further quantify the role of terrestrial systems in the global biogeochemical cycling of silica. Weathering processes influence atmospheric CO2 content and global climate because the net effect of silicate weathering is the transfer of atmospheric CO2 to HCO3 and the addition of dissolved silica to the oceans which promotes diatom production. Plants may transform dissolved silica into stable or labile forms thus acting as potential sinks or sources. We are conducting research that investigates the changes in the biogeochemistry of silica along bioclimatic and age gradients in temperate and tropical systems. We identify the possible effects of plant type and production on the losses, gains and compartmentalization of silica during soil development. To quantify biological cycling of silica we present the initial results of studies in which we utilized state factor analyses, constituent mass balance analyses, and mineralogical and geochemical characterization of soil and biogenic silica to quantify the role of plants in regulating the biogeochemistry of silica in terrestrial ecosystems.

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