Pedologic, historic, and contemporary soil change: a call for a network of long-term soil-ecosystem experiments. (S05-richter064124-Oral)

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Abstract:

Long-formulated questions remain largely unanswered about how soils respond to management and change over decades time. A general absence of long-term soil-ecosystem studies limits this pedologic understanding of sustainability. Models of soil dynamics are useful, but are no substitute for periodic observations of soil made in permanent plots with controlled land-use and archived samplings. An efficiently conducted network of soil-ecosystem studies is proposed that aims to quantify soil dynamics over decades time scales, in which contemporary ecosystems and their management practices control the physics, chemistry, and biology of soil. Sites in the network should be located across a range of production systems, soil taxa and landforms, climates, textures, and mineralogies. Results from these studies will be placed in the context of pedologic processes that operate over time scales of centuries to millennia, in which soil change is driven by natural ecosystem process and the cumulative legacy of past land-use. In two to three decades, observations and models derived from such long-term studies will substantially improve our ability to sustainably manage soils and ecosystems.

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