

Interactive comment on “A call for international soil experiment networks for studying, predicting, and managing global change impacts” by M. S. Torn et al.

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Received and published: 22 May 2015

We thank the reviewer for their comments and suggestions.

We agree that climate and atmospheric change will affect plant growth in many ways. To keep this Forum focused on soils, we used examples of relatively direct influence of plants on soils, namely changes in the amount, timing, depth, and chemistry of plant inputs to soil. Participants in the network could expand the scope at their sites to include plant manipulations, or other biological considerations.

The reviewer suggests that having additional detail on experimental design would allow

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the proposal to be more widely considered. We omitted such detail from the Forum in part because it was intended to be a more general thought piece, but since we do offer one specific network as an example, the international Soil Experiment Network (iSEN). The iSEN will be posting experimental designs on the website very soon. If space were available, we would be happy to add more detail of our vision for possible experimental designs. The initial proposal for manipulations is that warming and isotopically labeled litter are highest priority, followed by nitrogen additions and/or water manipulations depending on the site and research context. Some research in iSEN will be aimed at agricultural systems, for example. For similar reasons the needed replication also depends on site specific heterogeneity and history.

Manipulation levels could be chosen to match modeled climate scenarios (as was the case for the California sites) or to develop a response curve using many manipulation levels (as was the case for SPRUCE). We submit that having at least one treatment level in common among sites will facilitate synthesis.

The review raises an important point about the importance of linking with “biological and ecosystem research programs more generally.” It makes sense to nest soil experiments within larger ecosystem (or critical zone) studies where conditions permit, as well as to look for opportunities to create new joint initiatives with other programs.

Regarding approaches to handling unmonitored factors and variation among sites, in iSEN we propose to employ two approaches: (1) facilitating synthesis so that site differences are more easily interpreted and (2) process-rich modeling that includes monitored and unmonitored factors and can be used to simulate different histories of land use, climate, and disturbance. A critical component of network success will be having a data management system for primary data and metadata that allows intelligent interpretation and synthesis. For ancillary data, AmeriFlux and FLUXNET have detailed reporting templates for disturbances, land use and management, and vegetation and soil properties that can be modified for the iSEN. As the reviewer is raising basic questions of experimental and network design, there are probably many other productive

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ways to address these questions. We solicit community input on them and especially on how site history and disturbance should be documented.

We thank the reviewers for pointing out places that need references and the spelling mistake. We have added the citations requested. We substituted the term “participant” for PI except where we specifically meant Principal Investigator; in some cases PI is preferred to ‘collaborator’ because it reinforces the concept of a network of autonomous PIs.

Interactive comment on SOIL Discuss., 2, 133, 2015.