Research Needs Committee

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Review research needs on:

Nutrient dynamics. Target focus on national priorities with national interest. One example is the Maumee Basin project with nutrient delivery to Lake Erie. What do tile drained engineered landscapes do to our understanding of soil properties.

Research Need: Focus on fundamental nutrient dynamics and relationship to soil properties and soil system function. This research need would tie soil chemistry with soil physics in the pedological context

Characterization of water movement: Hydraulic conductivity of macropores and the relationship to nutrient and contaminant delivery. Methods for measurement of Infiltration are needed. Methods for modeling infiltration are also needed to populate the database.

Research need: Develop methods to measure infiltration on all landscapes. Also, develop a pedotranfer function that will provide prediction for soils without measurements.

Food security – Primary focus should be on agriculture management. Land degradation related to erosion, organic matter, salinity, sodicity and the effects on food security.

Research need: The impacts of management on soils over time. There is a need to develop relationships to management options and related land degradation processes.

Research Need: Develop methods for incorporating agriculture practices into soil property predictions. Relate soil properties affected by alteration to use and management.

Research Need: Develop new indices related to food security.Note to Interpretation committee; develop specific definition for anthropogenic soils that puts a focus on the degree of pedogenesis that has been destroyed and unrecoverable. Also, revive the leaching Index

Carbon accounting. Landscape redistribution of surficial materials. Develop methods to understand carbon mass balance.

Research Need: Soil erosion has lead to redistribution of mineral and organic particles acroos landscapes. Ways to account for redistribution are necessary. This also relates to the previous research need.

Anthropogenic soil mapping (Difficulty on settling on the terminology)- Urban/Suburban/Exurban/mine altered areas have potential for high visibility and can have a major impact for human use. There are management issues and societal concerns on wastewater, urban runoff, impervious surfaces and urban gardens. There is a need to improve methods for mapping methods. (Use new technology (NOTE to Technology committee – focus on methods for mapping in urban landscapes). Suggested that a

combination of history and landscapes with incorporating proximal sensing (remote sensing and sampling). This may be a new way of thinking more related to soil inventory.

Research need: Methods developed for mapping anthropogenic soils with research related to use and management. Incorporate new technology with proximal sensing equipment (such as XRF, VNIR, gamma radiometrics, remote sensing, predictive soil mapping). Tools can be useful for all areas covered under soil mapping mandate.

Develop methods for incorporating agriculture practices into soil property predictions. Relate soil properties affected by alteration to use and management.

Note to Interpretation committee; develop specific definition for anthropogenic soils that puts a focus on the degree of pedogenesis that has been destroyed and unrecoverable.

Dynamic Soil Properties: Carbon, bulk density, salinity, aggregate stability, infiltration,

Research Need: Develop methods to rapidly assess the DSP's/

SDJR and Digital Mapping:

Research Need: Uncertainty with estimates: Statistical estimates of certainty on mapped unit and soil properties. Additionally, methods are needed to best accomplish SDJR.

Other potential Research Areas:

1. Geothermal research.
2. Albedo.
3. Research on water effects of climate change. Higher temperatures and higher ET. Potential drought regions related to soil climate interactions.