

Research Agenda Committee

National Cooperative Soil Survey Conference

**June 16-20, 2013
Annapolis, MD**

- Candiss O. Williams, Research Soil Scientist, KNSSL
- Nancy Cavallaro, National Program Leader, NIFA
- Cameron Loerch, Acting National Leader for Laboratory & Research

Charges

1. Review reports and recommendations from 2013 NCSS Regional Conferences
2. Rapid Soil Carbon Assessment – Data analysis and application; where do we go from here?
3. Soil health: Identify research needs, opportunities, and contributions for NCSS; Data, measurement, and modeling

Charges

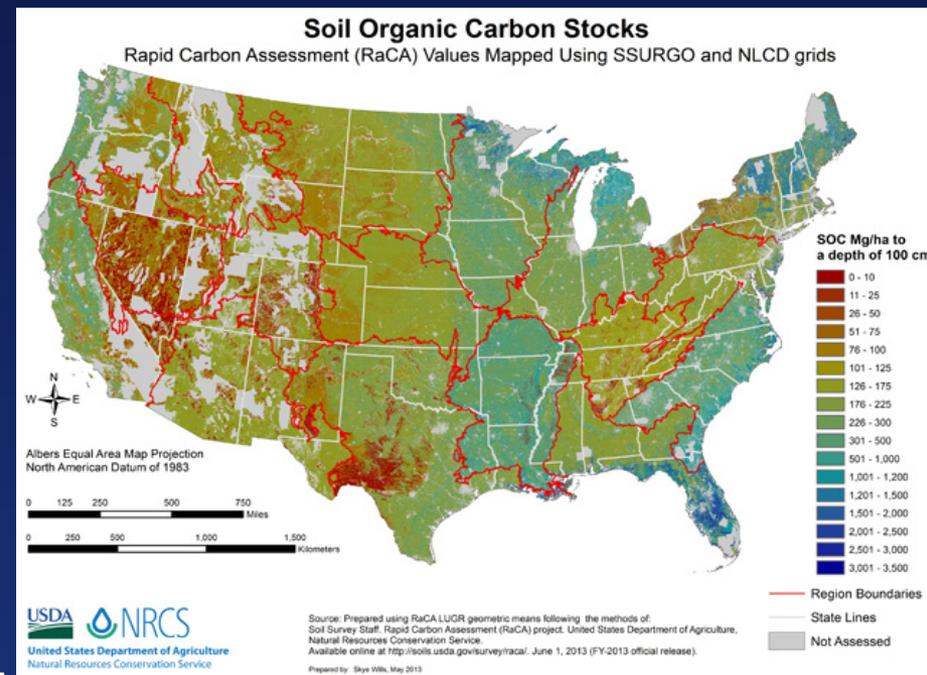
4. Climate change and drought mitigation: Identify research needs, opportunities, and contributions for NCSS; Data, measurement, and modeling
5. Identify and document other research needs within the NCSS; regional, national, and beyond
6. Identify opportunities for funding priority research needs

Charge I: Recommendations

- Recommendations from the 2013 Regional Meetings reflect regional issues with recurring themes
 - Rapid Carbon Assessment
 - Landscape soil water relationships -Hydropedology
 - Urban Soils
 - Dynamic Soil Properties

Charge 2: RaCA-Data Analysis & Application

- Making the data & samples available
 - Full spectra from VNIR(?)
 - Satellite samples - MO
- Scaling up to landscape
- Distribution of C across landscapes
- Models and decision support tools—development



<http://soils.usda.gov/survey/raca/>

Charge 2: RaCA

Recommendations Cont'd

- Validate and relate VNIR data
 - Other methods of SOC
 - Other soil properties
- Adding other analyses to compliment the C data
 - Enzyme analyses and other biological assessments
 - Humic acid quantification

Charge 3: Soil Health Recommendations

- Relation to human health?? Strokes, obesity
- Including soil microbial communities and other soil biological properties in NASIS—metagenomics, respiration quick test, enzymes
- Drainage—subsurface drainage effect on soil health
- Soil management—benefits/costs of practices to improve soil health—cover crops, no-till, rotations, fallow, irrigation management, etc.
- Developing index to assess and define soil health

Charge 3: Soil & Ecosystem Dynamics

- Support standardization of properties and procedures for ESs and DSP data collection
- Explore the intersection of ESs and DSPs, especially DSPs as drivers of state changes
- Explore the adaptation of ESs for use on croplands
- Discuss how dynamic soil properties can be effectively integrated into all ESs

Charge 4: Climate Change & Drought Mitigation Recommendations

- Models depend on maps and soil moisture
 - Improve maps on which models are based
- Soil temperature and moisture regimes
 - Evaluating tools that incorporate soil physical properties—related to soil horizons and rooting depth

Charge 4: Climate Change & Drought Mitigation Recommendations Cont'd

- CZOs are evaluating shallow /erosional/non-productive soils
 - Deep alluvial, high productivity soils are the ones that can buffer (resilience) and sustain life in face of climate change.
- Hydrologic and ecosystem response to climate change
 - Land surface models (sensible latent heat driven by soil moisture and water storage)
 - Need for proximal sensing and disaggregation—how things change in space

Charge 5: Other Research Needs

- Develop new methodologies to rapidly populate the database
 - Models and pedotransfer functions
 - Validation sampling design
- Soil Security
- Nutrient dynamics - field to watershed scale
- Infiltration and Ksat - methods, models, pedotransfer functions

Charge 5: Other Research Needs Cont'd

Soil Systems (Benchmark Landscapes?)

- Aerially extensive “Soil Systems” as focal point for research
 - Potential for extrapolation of information and knowledge
- Permanent infrastructure
- Soil and landscape properties and relationships intensively evaluated
 - Genesis
 - Hydrology
 - Geochemistry
 - DSP
 - Ecological sites

IN PROGRESS

Charge 6: Identify Funding

- Soil Survey Division has made limited funds available for competitive research projects in 2012 to address priority areas
 - 4th year
 - Expected to continue in future years as the budget allows
- NIFA soil processes program
- Other
 - CESU
 - AFRI
 - NASA Terrestrial Ecosystems
 - DOE
 - NSF

Questions? Comments?

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