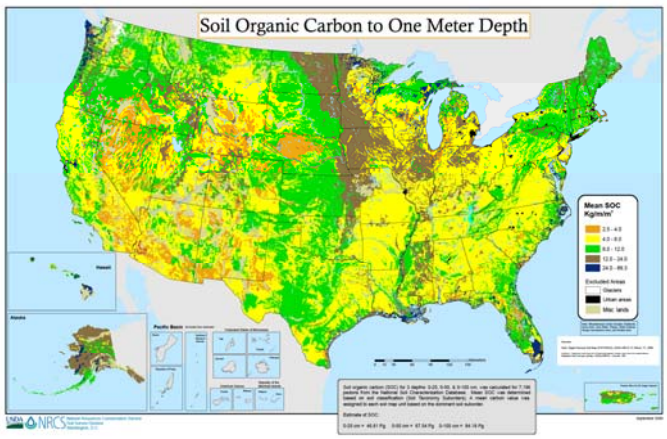
Rapid Assessment of U.S. Soil Carbon for Climate Change and Conservation Planning

United States Department of Agriculture
Natural Resources Conservation Service

Nationwide program being initiated by the USDA-NRCS, Soil Survey Division, to derive a comprehensive inventory of soil carbon stocks for soils of the U.S. as affected by soil properties, agricultural management, ecosystems, and land uses. Enhanced carbon data are needed for evaluating the effects of conservation practices on soil carbon and for global carbon accounting.



Initial inventory will be derived from the existing detailed soil survey (SSURGO) enhanced through an overlay of land cover and validated against NCSS pedon data.

Subsequent inventory will be based on measurement of soil carbon, and related data will be collected for Benchmark and other important soils stratified by agricultural management, ecosystem, and land use conditions.

- Inventory will encompass all lands and include all ecosystems.
- Data collection protocol is based on substitution of space for time.
    - Same soil with different land use, ecosystem, or management at steady state
- Evaluation will be for Benchmark soils, other extensive soils, and soils that represent important ecosystems, such as wetlands and flood plains.
- Stratification within soils by management/ecosystem groups expected to have similar soil carbon stocks
    - Dominant and “optimum” condition evaluated to provide basis for current and potential carbon sequestration through changes in land use and management
- Sufficient replicate sites for each soil-management/ecosystem combination to provide statistical confidence in the data
    - About 35,000 sites planned for evaluation
- Data for horizons to 1 m to include morphology, soil carbon, bulk density, and rock fragments
- Data collection will be by field soil scientists using procedures and equipment adapted for field or small laboratories.
- Soil carbon measurement will be with visible-near infrared UV (VNIR) diffuse reflectance spectroscopy.
- Soil carbon for 3-5% of horizons will be analyzed by the NSSC Soil Survey Laboratory (SSL) for quality assurance.
- Products:
    - Scientifically and statistically valid inventory of effects of agricultural management, land use, and ecosystem properties on soil carbon amounts and on the distribution of U.S. soil carbon stocks
    - Publically accessible soil carbon database for model development and validation

For additional information, contact: Larry West, NSSC, 402-437-5138, larry.west@lin.usd.gov or Chris Smith, Soil Survey Division, 202-205-0346, christopherw.smith@wdc.usda.gov.