

Soil and Plant Science Division

Dynamic Soil Survey Focus Team

Fiscal Year 2023 – Annual Briefing

Executive Summary

Dynamic Soil Survey (DSS) is the foundation of land-use planning and management.

DSS uses the practice of complementary soil survey project administration within the same geographical footprint or with a geographical overlap. All current and future soil survey projects contribute to the DSS. The power of DSS is leveraged when a Soil Survey Inventory, Ecological Site, or Dynamic Soil Property project is conducted coincidentally with a research or a monitoring project. The full potential of DSS is realized when the products of these coincident projects are paired with a raster soil survey and used to deliver enhanced interpretation of all soil survey data and information.

Introduction



A soil survey provides data on static soil properties—physical, chemical, and mineralogical—as well as enhanced soil survey products including estimates of in situ soil moisture by depth, seasonal saturation, the status of dynamic soil properties based on land use, and choices of conservation planning principles in the context of ecological state and transition models. These soil products

produced with partners are better suited to support conservation planning for climate-smart agriculture and forestry.

DSS Focus Team Leadership Members

- Focus Team Leadership:
 - Jo Parsley, South Central Regional Director
 - Skye Wills, National Leader for Research
 - Jamin Johanson, National Leader for Ecological Sites
 - Suzann Kienast-Brown, Soil Scientist, National GIS Specialist
 - Francine Lheritier, National Resource Soil Scientist, Dynamic Soil Properties

DSS Focus Team Taskforce Members

The DSS Focus Team differs from other focus teams in that it does not support a broad sub-team base or a lengthy membership.

Taskforce and sub-taskforce areas of concentration include:

- Soil Systems
 - Simplifying MLRA Correlations
 - DSP-ES intersections
- Soil Water Dynamics
 - Soil Hydrology
 - Watershed Strategy/Sampling Strategy
 - Collaborative Project Status
 - Water Relations Research Projects
- Federal Lands - National Park Service
- Data Processes

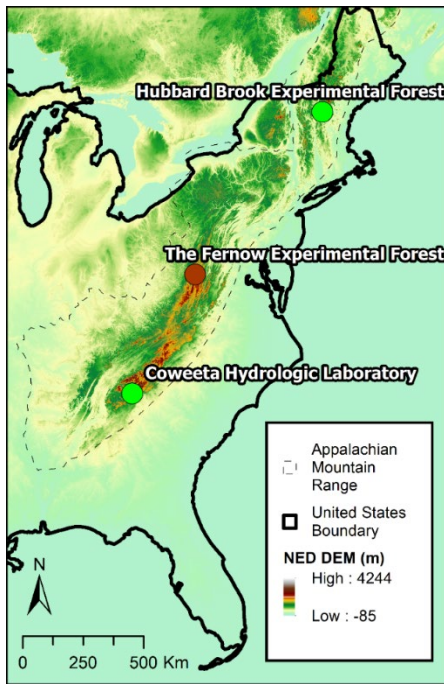
- Comprehensive Dataset
- Database processes/Integrate other databases
- Spatial Prediction
- Internal Database
- Outcomes
 - Customer Experience Division POC
 - Integrate ES/DSP/Refine ES Concepts/Conservation Planning
 - Interpretations
- Customer Communication – Marketing and Customer Communication

Taskforce updates

Soil Systems

This taskforce has been active in trying to coordinate examples and a workflow for producing soil systems to aid in not only DSS but also in the efficient use of resources in every project type. Soil systems in this respect could be thought of as a systematic way of organizing soil components, ecological sites, geomorphology, idealized water flow, and much more in a graphical representation of a group of these items. Through this process, certain conceptual groupings that hold significance or occupy a “keystone” association in reference to other groupings (i.e., without the “keystone” grouping, other groupings cannot stand by themselves). With the identification of these groupings, they will signify the greatest potential for future work and leverage of our financial and staffing resources as well as provide the greatest utilization of data for the investment.

Soil Water Dynamics



This taskforce has discussed the possibility of putting estimates in the component month table in NASIS as a possible solution. Another possibility that was discussed was to draw upon the Newhall model in lieu of modifying component month tables prior to moving toward modifying any population in NASIS. There has been some progress made in the development of a baseline water balance. A minor bug was identified that prevents accessing all the water in the soil. This was a small issue in the model that was being addressed. An item that has been brought forward and identified for investigation by the taskforce was in reference to Rosetta and making estimates for water potential vs. volumetric water content; however, it was also identified that estimates of volumetric water content have not been requested by users of the data at present.

In January 2023, virtual introduction meetings were held for project Local POCs in MLRA Soil Survey Offices where MLRA Soil Survey projects that aligned with DSS and were also part of a reimbursable agreement or other usage/access agreement were located. These projects include the following: Coweeta Experimental Forest, Hubbard Brook Experimental Forest, Fernow Experimental Forest, Minute Man National Historic Park, Acadia National Park, Cuyahoga National Park, and Clay Center, KS edge of field. Several follow-up meetings between some of the project local POCs and DSS co-leads followed, and where work was able to progress, coordination of efforts, resources, and assistance followed too.

In Coweeta Experimental Forest, previously installed soil data loggers were damaged by inquisitive bears and were further damaged by water intrusion. A team of staff proposed a plan, vetted it, and made repairs, as well as learned some best practices to move forward with in these areas.

Plans were made to perform instrumentation installation at Hubbard Brooke Experimental Forest in July 2023, and that was completed. Instruments are undergoing their “settling in period” there and will start to deliver usable telemetry soon.



Fernow Experimental Forest instrumentation was installed in September 2022, and after a “setting in period”, it appeared to be reporting “good data” at the time of this report’s drafting.

In Clay Center, Kansas, edge of field sensors have been installed and have gone through their “setting in period”. Some rodent activity provided another opportunity for noting some best practices for future sites. Repairs were made, however, and more recently, a pit was excavated to provide for sensor calibration by clay percentage. Clay Center, Kansas, is in the preliminary planning stage of research and was presented on at the NCSS National Conference in Bismarck, North Dakota, in 2023. This site aims to capture baseline sampling across watersheds, establish relationships among soil properties and soil microbial communities, provide soil moisture and runoff modeling, and examine the treatment and temporal effects of watershed management.

Federal Lands

This taskforce has had some setbacks in the coordination of the initiating meetings for the agreement that is in place for Acadia National Park, Cuyahoga National Park, and Minute Man National Historic Park. A refresher meeting to discuss the interagency agreement was held between SPSD National Resource Soil Scientist for Federal Lands, DSS Focus Team Lead, National Leader for Soil Business

Systems, and NPS Geologic Resources Lead on September 29, 2023. A follow-up meeting between the Soil and Plant Science Division (SPSD) National Resource Soil Scientist for Federal Lands, DSS Focus Team Lead, resident Soil Survey Regional Director, Local MLRA POC, and Local Park Unit Lead is slated to occur prior to the end of February 2024. The SPSP began these agreements on May 30, 2022, and they conclude, May 30, 2027, work on these park units is of the utmost priority and needs to commence very soon to produce meaningful deliverables prior to the expiration of the agreement.

Some approaches that have been considered for Acadia National Park are to consider gearing project work there heavily toward ESDs, secondarily augmenting with a raster soil survey, and using the park unit as a case study for soil knowledge systems.

In Cuyahoga National Park, the inverse may be true, where DSP would be the primary focus and ESDs the secondary, also augmented by a raster soil survey.

In Minute Man National Historic Park, there has been some discussion about some of the potential we may have for DSP in an intensively used near urban environment, coupled with research and monitoring, perhaps a SCAN site. This site is especially difficult as it is thought to contain a significant quantity of cultural resources in a small area, and as such, excavation approval may prove to be difficult to obtain.

Per the agreement between the Soil and Plant Science Division and the National Park Service, deliverables in each park are required to include at least one but could include more than one of the following:

- Raster Soil Survey
- Ecological Site Descriptions
- Dynamic Soil Properties

Data Processes

This taskforce has been working on getting the Dynamic Soil Property (DSP) data into the new data model, with DSP being a project type that has a strong tie to DSS. There is also a pursuit of the integration of US Forest Service partner data and, to that end, discussions for cross-walking the Terrestrial Ecological Unit Inventory (TEUI) to ESDs on a 1-1 basis. There was little, if any, positive movement in mobile data collection at the time of this briefing.

Outcomes

This taskforce has met frequently with Customer Experience Division (CXD) and the POC from the focus team leadership worked directly with CXD contacts on a weekly basis to help steer and craft the survey question development and decipher the responses from the surveys.

Customer Communication

This taskforce has been active in the coordination of a DSS Fact Sheet, a video by Dr. David Lindbo, Director, Soil and Plant Science Division, introducing DSS, as well as surveys for both internal and external users and customers. They have worked hand in hand with the Customer Experience Division (CXD) in FPAC, and at the time of this briefing, the external and internal survey results were received, and the CXD team has presented and briefed the DSS Focus Team leadership on the results and made several recommendations.

Summary

DSS Focus Team holds leadership meetings on a monthly basis. Taskforces meet depending on developments with frequency but are determined by the individual responsible officials for taskforce deliverables. Each taskforce provides status updates at least on a bi-annual basis, if not more frequently, to the DSS Focus Team co-leads. DSS co-leads stepped in between January and August to facilitate progress and meetings as the Focus Team lead's time was redirected for participation in the Strategic Leader Development Program through FPAC. A brief, non-inclusive list of the Focus Team Leadership activities follows:

- Focus Team Lead—Talking points delivered to federal partners at the Federal Land Advisory Group meeting in Tucson, Arizona, January 2023.
- Focus Team Lead—Revised and re-recorded a portion of the DSS for Basic Soil Survey presentation.
- Focus Team Co-Leads—Discussion of DSS vision and potential delivery applications with ARS in Denver, Colorado, March 2023.
- Focus Team Lead and Co-Leads—Development of revised talking points and project alignment scenarios. Delivered to the SPSD Spring Leadership Meeting, Lincoln, Nebraska, April 2023.
- Focus Team Lead—Development and delivery of the “Fundamentals of Dynamic Soil Survey” presentation to the Wisconsin/Minnesota cooperative meeting in River Falls, Wisconsin, August 8-11, 2023.

- Focus Team Co-Leads—DSS Focus Team Strategic Meeting in Grand Junction, Colorado, September 18-22, 2023.
- Focus Team Lead —Refresher meeting with National Resource Soil Scientist for Federal Lands and NPS POC to discuss state of interagency agreement with NPS on Cuyahoga, Minute Man, and Acadia National Park Units and DSS, virtual, September 29, 2023.

Looking Forward

The DSS Focus Team leadership took the opportunity at the most recent strategic meeting to ensure that all taskforces within the focus team were solvent and had a pathway forward into FY2024. We also had a briefing from the Customer Experience Division (CXD) to get a good read-in on the results of the internal and external surveys for DSS. We have developed a DSS strategic plan for FY2024–FY2027 and an action plan for FY2024 and for tasks beyond FY2024. The DSS Focus Team co-leads have time set aside to develop language for the National Soil Survey Handbook (NSSH) to add context and guidelines to the concept of DSS. Initially, it was thought that this would take the form of a National Instruction, however, upon some reflection and thought, it was determined that the best path forward is a section within NSSH to add clarity, context, and purpose to DSS. This section in NSSH will show the nexus between DSS and the confluence of projects rather than show DSS as an entity unto itself. The DSS Focus Team co-leads have developed short-term goals, long-term goals, achievable objectives, an elevator pitch, a leadership pitch, a potential motto, and a logo for DSS and have secured some time with the SPSD Communication Specialists to further develop these in FY2024.

The DSS Focus Team lead will brief the Steering Focus Team on October 25, 2023, at their regularly scheduled meeting. The DSS Focus Team Co-Leads will collectively brief Soil and Plant Science Division leadership on November 28, 2023, on progress the team has made and proposed steps forward for DSS. One key step forward is a proposal for a National Instruction for Soil Knowledge Systems and a proposal for a case study to build upon the work already done in the South Central Region in this case study and then nationally.

The DSS Focus Team will continue to meet on a monthly basis virtually to touch base on progress among the individual co-leads and periodically will call upon responsible officials to report on taskforce progress. The next annual in person DSS Focus Team meeting is proposed for the week of September 9-13, 2024 and will rotate to one of the remaining co-lead's locations for host.