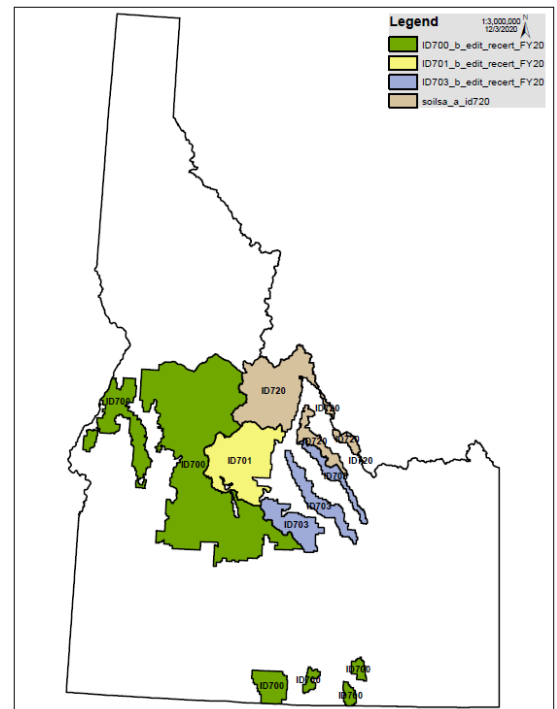


Digital Soil Mapping Field Week for Idaho Forests and Soils2026

Submitted by Suzann Kienast-Brown

During the week of September 19th, staff from three Soil Survey Offices (Idaho Falls, ID; Moscow, ID; Dillon, MT) and the Regional Office in the Northwest Region gathered with members of the Digital Soil Mapping Focus Team in Ketchum, ID to focus on a path to completion of nearly 9 million acres of NOTCOM in central Idaho as part of the Soils2026 Initiative. The DSM Focus Team has been mentoring the digital soil mapping projects in the three offices for a few years, but this was the first opportunity to join forces in-person and brainstorm collaboration to enhance and extend the work each office has accomplished to date. The overarching goal for the field week was to explore ways to bring the individual modeling efforts of each office together to fill in the gaps, particularly in limited access wilderness areas, and provide a consistent Raster Soil Survey product over the entire forest conglomerate.

The first day of the field week was spent on a field tour of the Challis National Forest for an introduction to the soil-landscape relationships in the area and opportunity to discuss gradients in climate, soils, and ecological sites across the large project area. A variety of landforms were visited to highlight the diversity of the area. Each stop involved discussion of soil-landscape relationships, field observations, and landform modeling results and challenges. This orientation was very beneficial for the DSM Focus Team members who have never mapped in this area.



Soil survey project areas in central Idaho that were the focus of the DSM Field Week.



Carla Rebernak, SSO office leader in Idaho Falls, explains the soil-landscape relationships in the Lost River mountain range.



The group discusses difficulties in modeling extensive moraines (left) and working with multi-scale covariates, such as climate and terrain derivatives (right).



The group discusses the critical role of the marsh/fen landform in semi-arid systems and the importance to USFS that the location and extent of these wet areas can be identified for management purposes.

The rest of the week was focused on methods to refine individual project models, combine modeling efforts between offices, build a global model for the entire forest area, and use digital soil mapping to reach completion of this large NOTCOM area by 2026. The group divided up into teams to focus on individual model refinement for the Challis and Payette National Forest projects and global modeling for the entire forest conglomerate. Once individual project models are working well, the intention is to combine modeling concepts and legends to develop a global legend that can be used for the global modeling approach.

The purpose of the global modeling approach is to fill in gaps in mapping, particularly in wilderness areas, and to create a consistent, seamless Raster Soil Survey product for the entire forest area. This global modeling effort is important to successfully reach Soils2026 goals for this project but will also help develop national standards for creating seamless Raster Soil Survey products that don't reflect soil survey project boundaries or other artificial discontinuities. The teams also explored development of modeling domains based on lithology and climate, using Synthetic Minority Over-sampling

Technique (SMOTE) to help balance classes, raster to vector conversion for SSURGO products, how to develop Raster Soil Survey legends in NASIS, how to use model uncertainty to target field data collection, and potential methods for developing a global model using individual project model probabilities.



The group discusses individual project and global modeling tasks (left) and works in teams to start tackling tasks (right).

Another major goal of the week was to set up all project staff in Google Cloud Platform with shared projects, data, R scripts, and virtual machines to support collaboration between offices, efficient workflows, and high-powered computing resources for maximum efficiency. DSM Focus Team members also used Google Cloud Platform and Google Earth Engine to start processing covariate for the global modeling effort.



The group learns how to use Google Cloud Platform to run modeling tasks and individual virtual machines for efficient workflows.

Long term goals for the field week will include publication of Raster Soil Surveys for the five forests and three wilderness areas, creation of SSURGO products from the Raster Soil Surveys to meet Soils2026 goals, and development of a job aid for combining models from different projects to support delivery of seamless Raster Soil Survey products. The week wrapped up with full brains and a plan for regular engagement between project staff and the DSM Focus Team moving forward to ensure project success by 2026. If your office is conducting a DSM project and interested in hosting a DSM Field Week, please contact Suzann Kienast-Brown (suzann.kienast@usda.gov) for more information on how to apply.