



Soil and Plant Science Division Technical Soil Services Northeast Soil Survey Region

Vermont Soil Horizonation Training Event

St. Johnsbury, Vermont, Major Land Resource Area (MLRA) Soil Survey Office (SSO)

Purpose

On January 28, 2026, St. Johnsbury MLRA SSO Soil Scientist Paul Gadecki attended a training event to teach soil horizonation basics to farmers, researchers, and conservation district staff. The request came from the Land Care Cooperative, a Vermont-based, farmer-led organization dedicated to restoring soil health and watershed resilience through technology and community driven land management. Land Care Cooperative partners with LandWEB, a Vermont-based nonprofit that specializes in environmental monitoring and modeling to create more data-driven land management and mitigation strategies. Working together, they take soil cores and model soil properties across Vermont farms and forests. For this training event, Land Care Cooperative members wanted an NRCS soil scientist to teach them how to delineate soil horizons and to talk about soil mapping across the Champlain Valley of Vermont.

Background

Initially, Land Care Cooperative members and LandWEB staff reached out to Vermont NRCS staff with the request for assistance. Recognizing Land Care Cooperative's potential as a partner for future soil mapping projects, Vermont NRCS staff put St. Johnsbury MLRA SSO Soil Scientist Paul Gadecki in contact with Land Care Cooperative members. After an initial meeting, NRCS staff and LandWEB staff brainstormed ways to collaborate on future soil mapping projects in Vermont. Shortly after this meeting, Gadecki was asked to help teach the Land Care Cooperative members and LandWEB staff how NRCS describes soils.

At the training, LandWEB staff gave a presentation on their approach to soil mapping, focusing on key soil physical, chemical, and topographic properties used to synthesize and interpret raw data. They use the data to facilitate continuous, adaptive land management strategies across landscapes. They work with local farmers and foresters, as well as county conservation districts, to improve LandWEB's modeling approach to soil mapping and implementation of conservation practices.

During the training, Gadecki described soil cores taken by LandWEB (fig. 1), identifying different soil horizons and defining the technical terms used in the descriptions. Due to the nature of the heavy clay soils in the Champlain Valley, LandWEB staff had a particular interest in how NRCS soil scientists delineate redoximorphic features. The training group held an in-depth discussion on suffixes attached to master horizon symbols to indicate specific physical or chemical properties. Primary examples included suffixes denoting redoximorphic features, subsoil compaction, and evidence of soil disturbance, such as an Ap horizon.



Figure 1—St. Johnsbury Soil Scientist Paul Gadecki (right) discussing soil horization while a participant delineates a soil horizon based on Gadecki’s teaching.



Land Care Cooperative members and LandWEB staff plan to attend the upcoming Vermont State Technical Committee—Soils Subcommittee meeting where they will present and propose collaboration with NRCS on future projects. In particular, they want to collaborate on the upcoming NRCS project updating the current soil map used in the Champlain Valley. In some cases, these soil maps have not been updated since their initial publication in the 1970s.

Land Care Cooperative members and LandWEB staff plan to integrate NRCS products to improve upon their models and soil property raster maps. A partnership between NRCS and LandWEB would include intensive, hands-on training from NRCS staff, such as using a pedon description sheet when describing and validating soil cores collected by LandWEB staff. The training would help LandWEB staff more accurately describe soil cores they collect in the future, and the soil cores used for the training would help improve the soils training data for NRCS' Lake Champlain update mapping project.

Key Outcomes

In response to the request, St. Johnsbury MLRA SSO Soil Scientist Paul Gadecki provided Land Care Cooperative members and LandWEB staff with training in soil horizonation and mapping concepts across Vermont. Through the training, St. Johnsbury MLRA SSO staff helped increase the soils knowledge and understanding of local landowners, researchers, and conservation district staff. The training also provided an opportunity for NRCS staff to discuss collaborating with Land Care Cooperative members, LandWEB staff, and local conservation staff on upcoming projects.