



Soil and Plant Science Division

Technical Soil Services

North Central Soil Survey Region



Crow Wing County Land Services Soils Continuing Education (CE) Workshop

Duluth, Minnesota, Major Land Resource Area (MLRA) Soil Survey Office (SSO)

Purpose

On June 26, 2026, Duluth MLRA SSO and Baxter, MN, Area Office staff assisted with the Soils CE Workshop at the request of Crow Wing County Land Services staff. Septic professionals—designers, installers, and inspectors—provide a key service to the rural population that does not have access to local government water treatment systems. The Land Services office periodically hosts this workshop to facilitate the accreditation of local septic professionals by helping them keep their knowledge of regulations and soil properties and characteristics at a high level. Providing support for workshops like this strengthens partnerships and highlights how working with partners helps streamline and expand NRCS' ability to provide services to its rural customer base.

Background

Forty participants attended the Soils CE Workshop. It consisted of a 3-hour classroom session in the morning and a 3-hour field session in the afternoon. Through this workshop, participants met the Minnesota statutory requirement that all septic professionals complete 6 hours of continuing education credits every 3 years.

During the 3-hour classroom session, Duluth MLRA SSO staff provided participants with information on glacial geology, mapping scale and map unit types, and redoximorphic features (fig. 1). They explained how the origin of the glacier, the type of rock fragments that it incorporated, and the distance it traveled can all affect the size of soil materials a glacier leaves behind. They discussed parent material type and how that effects downward water movement in the soil profile. When this water movement is stopped by dense glacial till, there is too little natural soil to properly treat the effluent. In those cases, septic professionals need to take extra steps to protect the ground water.



Figure 1.—Duluth MLRA SSO Leader Mike Rokus introduces topics during the classroom session of the Soils CE Workshop.

Next, Duluth MRLA SSO staff defined and discussed mapping scale and map unit types emphasizing consociations, complexes, and associations. They focused on these three because they were the most common soil map unit types used in the development of the Soil Survey of Crow Wing County, Minnesota. They explained what redoximorphic features are, how they form, what they represent, and how they can be used to identify the seasonal high-water table levels. Septic professionals use these high-water table levels as guides for selecting the proper type of system to use to mitigate household effluent water and the proper location in which to install the system.

Duluth MLRA SSO staff rounded out their portion of the session by discussing soil properties and characteristics that are not redoximorphic features or potential false positives for identifying the seasonal high-water table. As septic professionals, the participants already have a wealth of knowledge of design and installation techniques and regulations, but they are less knowledgeable when it comes to soil interpretations. The soil information this workshop provides increases participants' technical abilities and gives them a chance to ask questions and get answers from subject matter experts. The greatest number of questions are about the elevation of the seasonal high-water table, as they need to design and install above that level to have a functional system.

NRCS Area Resource Soil Scientist Brandon DeFoe from the Baxter, MN, Area Office provided a tutorial on how to navigate Web Soil Survey. His presentation focused on navigation of Web Soil Survey to find a location through various techniques and tools within the software. He taught participants how to find soil properties and characteristics as well as soil interpretations that Web Soil Survey can generate. He showed the



participants how to find the Suitability and Limitations for Use for Septic Tank Absorption Fields written specifically to Minnesota statute. Finally, DeFoe showed participants how to export the data for their use through several data output methods.

Land Services staff presented on soil color, texture, structure, and horizonation. These soil properties guide how quickly, or slowly, water moves throughout the soil profile. They reviewed regulatory requirements related to septic installations and tied the soil properties to the state statutes that provide guidelines to septic system installation.

For the 3-hour outdoor session, participants met near the location of four soil pits excavated prior to the workshop. They split up into 4 groups of 10 and rotated through the pits. Each participant completed a soil description for each soil pit, and Duluth MLRA SSO staff provided assistance with the proper methods of determining horizons, coloring the soil, texturing, and assigning the structure. They also explained how the underlying dense till influenced hydrology by creating a perched water table and allowing the redoximorphic features to develop. For participants, these features were the most important aspect of each description. Redoximorphic features dictate where the lower limit of effluent treatment will occur within the soil, which is the most important factor in septic design.

Key Outcomes

By assisting with the Soils CE Workshop, Duluth MLRA SSO staff helped the Crow Wing County Land Services provide classroom and hands-on training to local septic professionals. Participants learned about and discussed many soil topics throughout the workshop. Understandably, most questions generated in the classroom and field focused on the formation of redoximorphic features since septic professionals use these features to identify the seasonal high-water table. With the information provided in the workshop, the participants can now make better informed decisions when designing, installing, and inspecting septic systems throughout Crow Wing County.

The workshop also provided an opportunity for staff to strengthen NRCS' partnership with Crow Wing County Land Services office and staff. For both the classroom and field sessions, NRCS staff worked alongside Land Services staff to ensure the septic professionals received training that helped them strengthen their technical skills.