



SOIL AND PLANT SCIENCE DIVISION

Technical Soil Services

Special Projects Office and Connecticut NRCS

Ground-Penetrating Radar (GPR) Investigation Supports Farm Bill Conservation Planning

Purpose

On June 3, 2024, at the request of the Connecticut NRCS programs and engineering staff, NRCS staff Mihika Sinha, Hispanic Association of Colleges and University Program archaeology intern, Ashley Geissler, archaeology Pathways intern, Sam Tonan, archaeology technician, and Debbie Surabian, soil scientist and GPR operator with the Soil and Plant Science Division completed a GPR investigation in Sprague, Connecticut. The investigation evaluated the depth of bedrock for the construction of multiple conservation practices, including a well, bedded pack structure, livestock and irrigation pipelines, and high tunnels.

Outcomes

First, the team used an open trench to verify the depth of the bedrock and set up the GPR equipment (see fig. 1). Next, the team collected GPR transects in the pasture where the farming operations will be expanded (see fig. 2).

In figure 3, the continuous, nearly horizontal, moderate amplitude (colored gray and red) reflection patterns that begin at depths ranging from about 0.50 to 0.70 meters represent a highly contrasting natural subsurface interface (highlighted by green-colored dashed lines). This conspicuous and highly contrasting reflection pattern forms the basis for discriminating two distinct soil layers, most likely the soil solum (A and B horizons) over a distinct stratum (Cd horizon) within the glacial till. Because of the high amplitude of these reflections and the location of the transect in a soil survey delineation of Paxton soils, this reflection pattern is believed to represent the upper contact with denser soil materials (lodgment till). Below the reflections from this interface, high amplitude (colored white and gray) reflectors are apparent, suggesting the presence of bedrock.

The use of geophysical equipment provided added insight into subsurface conditions and helped identify potential hurdles that may be encountered during construction of conservation practices at the farm.



Figure 1.—A photograph of the open trench behind the fence.



Figure 2.—NRCS staff collecting a GPR transect in the pasture.

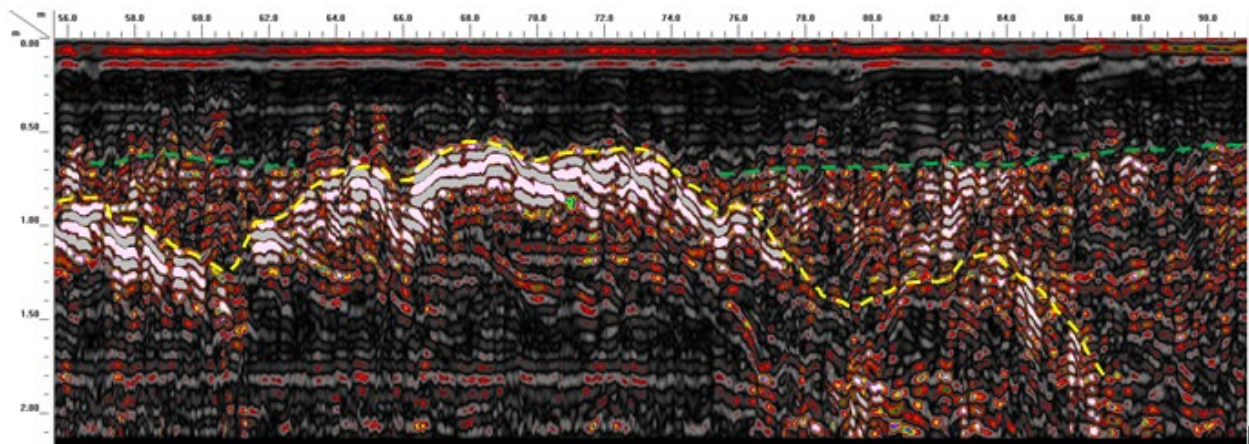


Figure 3.—A two-dimensional radar record (from meter marker 56 through 90) collected near an open trench.