SOIL AND PLANT SCIENCE DIVISION

Technical Soil Services

Special Projects Office and Connecticut NRCS

U.S. Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) Helps Reveal Lost Burying Ground

Purpose

On June 28, 2023, at the request of the Connecticut Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO), the Soil and Plant Science Division (SPSD) Special Projects Office (SPO) and Connecticut NRCS staff conducted a ground-penetrating radar (GPR) investigation to identify the location of possible marked and unmarked graves located in an active construction site in North Stonington, Connecticut. This investigation was completed in accordance with NRCS's commitment to the protection and enhancement of our nation's properties.

North Stonington, Connecticut

The North Stonington's Cemetery Commission suspected marked and unmarked graves located on a North Stonington property that was actively undergoing construction. The commission was concerned because of historical references and local oral histories positing that a certain area on the property had a burying ground. After noticing some movement of rocks that may be burial markers in this area, the commission reached out to OSA and SHPO who contacted the SPSD and Connecticut NRCS to conduct a GPR technical soil services investigation.

Figure 1 is a Google Map image with a superimposed soil map from the Soil Survey of the State of Connecticut showing the location of the GPR investigation[1]. The GPR survey area is located within a soil delineation that is labeled 38C Hinckley loamy sand, 3 to 15 percent slopes. Hinckley soils are excessively drained, coarse-textured soils formed in glaciofluvial materials derived principally from granite, gneiss, and schist. Depth to bedrock is more than 6 feet (2 meters (m)). Rock fragment content of the solum ranges from 5 through 50 percent gravel, 0 through 30 percent cobbles, and 0 through 3 percent stones. Due to their low clay, water, and soluble salt contents, Hinckley soils are considered very well suited for GPR investigations.

[1] Soil Survey of the State of Connecticut [Online]. Available http://casoilresource.lawr.ucdavis.edu/soilweb_gmap/ [verified June 2023]

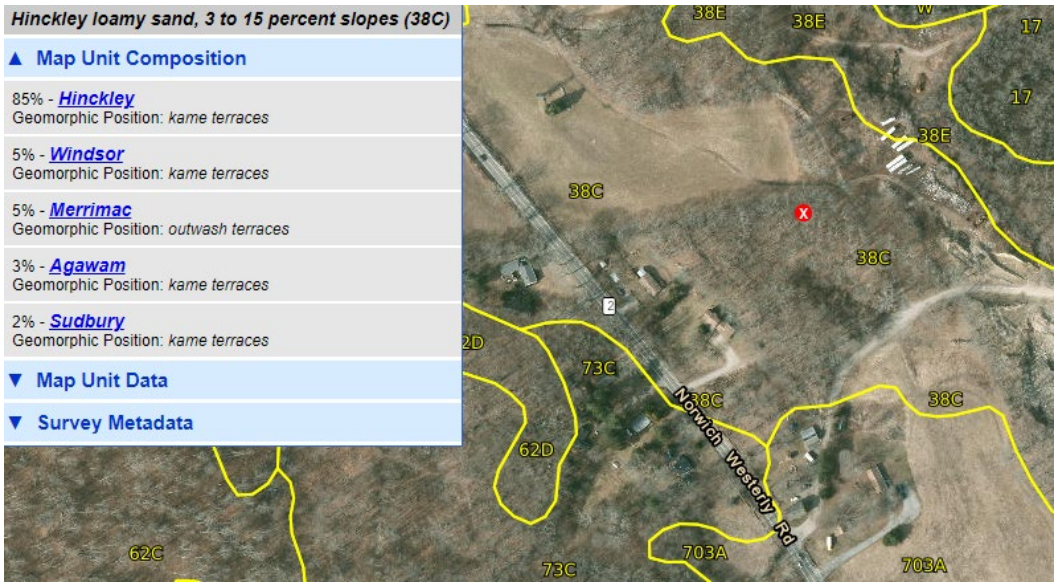

Figure 1. A SoilWeb image with soil lines and symbols from the Soil Survey of the State of Connecticut. The red-colored circle indicates the approximate location of the GPR investigation.

GPR Survey

A NRCS staff constructed one GPR grid (36 by 9 m) across the area of interest where the surface and subsurface soil layers of the kame, an irregularly shaped hill composed of sand and gravel, were largely left undisturbed (see Figure 2). To facilitate the construction of the grid, two parallel survey lines were laid out on the north and south sides of the designated site. Along these lines, survey flags were inserted into the ground at a spacing of 25 centimeter (cm).

To complete the survey, the NRCS and OSA staff sequentially stretched a rope between matching survey flags located on the opposing lines that defined the grid area. The SPSD soil scientist then moved the GPR survey cart along this rope for guidance while collecting subsurface data. Following data collection along the line, the tape was sequentially moved 25 cm to the next pair of survey flags to repeat the process, with the GPR moving in the same direction (south to north). The grid's origin (0, 0 m) was in the southwest corner.

The relatively narrow grid line spacing and south to north direction was necessitated by the anticipated confined dimensions of the potential graves and position of internments. The internments could be Native American burials that are placed in a flex position or traditional Christian burials that placed the remains face up and facing east in the direction of the rising sun to see the "Second Coming of Jesus".

Figure 2. A photograph of survey flags on the north side of the GPR grid.

GPR Results

The results of the GPR survey are displayed in this report as two-dimensional (2D) radar records. A radar record or profile is an image of a vertical depth section along a radar traverse.

Figure 3 shows six 2D radar records labeled L047, L071, L089, L109, L118, and L123 that were obtained along the GPR grid. These radar records appear to have multiple breaks or dips from the soil surface down to 50 cm deep and no clear linear or horizontal boundaries from the soil surface to about 1 m deep. There are also multiple hyperbolas starting at about 50 cm from the soil surface which indicates potential burials.

These radar records are interpreted as having disturbed soil materials and possible marked and unmarked graves. With the area having what appears to be stone grave markers, the archaeologists speculate it is a colonial burying ground.

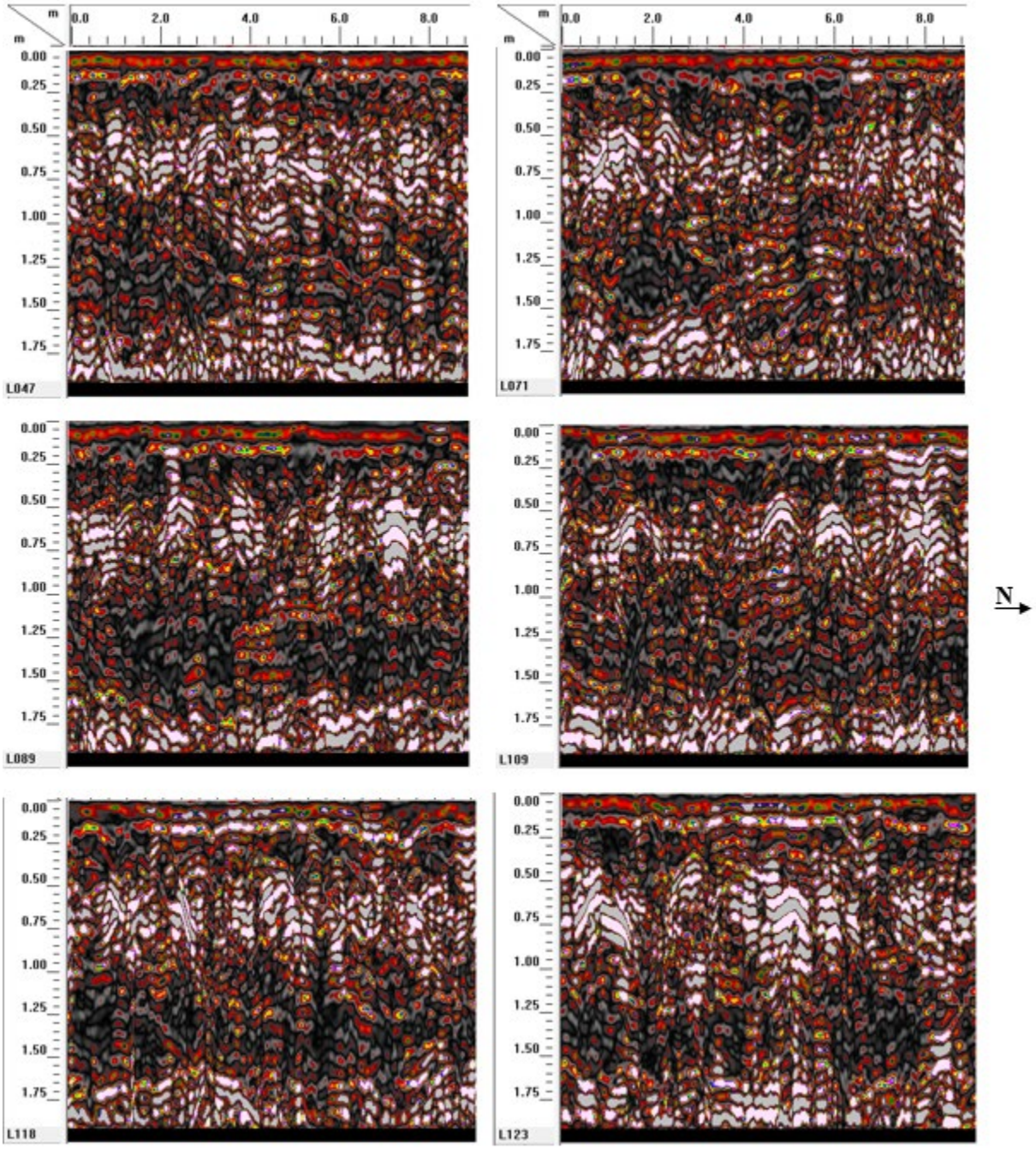

Figure 3. Six 2D radar records moving north within the GPR grid survey showing areas that are interpreted as having disturbed soil materials that may have unmarked graves.