

During the week of February 18th, NSSC's Soil Survey Research and Laboratory Staff and the Frederick MLRA-148 (Northern Piedmont) Soil Survey Office completed geophysical surveys at the Soldiers Delight Natural Environmental Area (SDNEA), which is located near Baltimore, Maryland. The SDNEA includes about 1900 acres of protected serpentine barrens and is part of the Maryland Wildlands Preservation System. Soldiers Delight is the largest protected serpentine barren in eastern United States. The site is protected because of the presence of serpentine soils and over 39 rare, threatened, or endangered plant species. Serpentine soils form in regolith weathered from serpentinite, a green-colored, ultramafic rock, which is low in silicon and high in magnesium and iron. Soils formed over serpentinite have low Ca/Mg ratios, are low in essential nutrients, and have high concentrations of heavy metals (nickel and chromium) that are toxic to many plant species. Unique plant communities grow on these soils. These unique plant communities contain few species that are common with the species found in the surrounding forests.

During this study, ground-penetrating radar was used to document the depth to rock within several soil map units. Electromagnetic induction was used to infer the spatial variability of soil magnetic susceptibility and the differing concentrations of heavy metals within the study areas. With the assistance of the New Jersey Soil Staff, a portable X-ray fluorescence spectrometer will be used to assess the concentrations of different metals in the soil samples collected from the study areas and to correlate these concentrations with the response of the electromagnetic induction meter. The information gathered from this study will be used to improve MLRA data map unit's interpretations and develop Ecological Site Descriptions for soils formed on serpentinite geology.