Use of Ground-Penetrating Radar on Laterally-Discontinuous Coastal Sands. (S05-vanags094019-Oral)

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Abstract:

A Pleistocene-aged barrier island off the coast of Savannah, Georgia was chosen to study the transition between a Leon fine sand (Aeric Alaquod) and an Ellebelle loamy sand (Arenic Umbric Paleaquult) in a 15m X 40m area. The purpose was to examine a soil boundary in a young, highly-variable landscape using ground penetrating radar (GPR). A detailed topographic map was generated, and the subsurface mapped using GPR with a 500 MHz antenna. The data were truthed at 3m to 5m intervals to depths of 1.5m to 3m. GPR transects were examined individually, then compiled with GPR_Process, plotting reflection amplitudes at equal time (converted to depth) across the grid. The 15% lateral clay increase dramatically attenuated the GPR signal, resolving the boundary to within 20cm. The spodic horizon produced reflections which were perceivable, but overshadowed by those generated by localized ortstein. The topographic survey showed a large microdepression (imperceptible in the field), corresponding with the increase in clay content. The boundary between the soils was laterally discontinuous. Ground-penetrating radar is valuable for delineating soil boundaries in the field and mapping underlying features with conservative processing.

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