

NHDOT SPR2 PROGRAM

RESEARCH PROGRESS REPORT

Project # SPR 42372G		Report Period Year 2022 <input type="checkbox"/> Q1 (Jan-Mar) <input type="checkbox"/> Q2 (Apr-Jun) <input type="checkbox"/> Q3 (Jul-Sep) <input checked="" type="checkbox"/> Q4 (Oct-Dec)	
Project Title: Advancing Subsurface Investigations Beyond the Borehole			
Project Investigator: James Degnan		E-mail: jrdegan@usgs.gov	
Phone: (603) 226-7826			
Project Start Date: June 30, 2021	Project End Date: September 30, 2023	Project schedule status: <input type="checkbox"/> On schedule <input type="checkbox"/> Ahead of schedule <input checked="" type="checkbox"/> Behind schedule	

Brief Project Description:

Geotechnical site characterization sometimes fails to fully characterize the below-ground bedrock surface and hydrologic conditions using conventional borings. By combining passive Horizontal-to-Vertical Spectral Ratio (HVSr) seismic and multi-frequency electromagnetic induction geophysical methods and boring data analysis, a more thorough and accurate representation of geotechnical subsurface conditions can be produced. This effort will contribute to the overall goal of improving efficiency of the Department by reducing the disruption work plans, forced revision of designs, and cost increases from schedule delays, claims, or change orders.

Progress this Quarter (include meetings, installations, equipment purchases, significant progress, etc.):

The HVSr data release was published on October 4th and is publicly available at <https://doi.org/10.5066/P943EEFQ>. A second data release with GPR and EM data is in draft form and data is currently available to NHDOT and NHGS on the cooperator sharepoint site. Additional GPR and EM processing has been completed for the Canterbury site.

Jeff Reid of Hager-Richter Geoscience volunteered on 9/13 to collect refraction microtremor analysis (ReMi) data to further refine velocities as a free technique demonstration to help the NHDOT RAC project. The Canterbury slope failure site was selected for the work and Michael Howley, NHGS and Jim Degnan helped Jeff collect data on 10/13.

Items needed from NHDOT (i.e., Concurrence, Sub-contract, Assignments, Samples, Testing, etc...):

Boring logs are needed for geophysical data processing and interpretation, including logs from 1) Lee 41322 (have a file dated 4/5 named Updated Log Drafts - LEE 41322), 2) New London 42877 (do not have any logs), and 3) Troy 40371 (do not have any logs) sites.

The project champion has agreed, but concurrence that a Highway Geology Symposium (HGS) manuscript and supporting data releases are acceptable final report product types is needed from the RAC. Expected 2023 HGS abstract and manuscript submission deadlines and location of notices (web site, email, other) for the conference are needed for report planning.

Anticipated research next three(3) months:

Data processing, interpretation, and report writing is planned.

Circumstances affecting project:

We anticipate getting the project on schedule.

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
<i>Task 1. Compile and assess literature and sites</i>	100	90
<i>Task 2 Collect geophysical data</i>	100	90
<i>Task 3 Conduct analysis</i>	100	50

Barriers or constraints to implementing research results: None