

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 checked="" type="checkbox"/> Q3 (Jul-Sep) <input type="checkbox"/> Q4 (Oct-Dec)	
Project Title: Advancing Subsurface Investigations Beyond the Borehole			
Project Investigator: James Degnan		E-mail: jrdegnan@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.):

Data from 8 additional passive seismic HVSr measurement locations, 7 GPR survey lines and 4 electromagnetic survey lines (DualEM) were collected at the Canterbury slope failure site on 7/12 and 8/10. Data from 25 additional passive seismic HVSr measurement locations and four electromagnetic survey lines (DualEM) were collected at the Lee 41322 site on 8/9.

Preliminary results were presented to the NHDOT Technical Advisory Group (TAG) on 7/22 and to an internal USGS technical review team on 9/15. A sharepoint site (USGS, NHDOT, and NHGS access) and a draft data release (publicly available when approved) was created on 8/11 as a response to NHDOT TAG comments about the need for more rapid and broader data availability. The data release was pending final approval during the time period of this report. Raw data from the HVSr measurements will be publicly available at <https://doi.org/10.5066/P943EEFQ>. The data release can be rapidly updated with additional measurements and processed data as they become available.

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

New boring logs from Lee 41322 (have 4/5 file named Updated Log Drafts - LEE 41322), New London 42877 (do not have any logs), and Troy 40371 (do not have any logs) sites would improve processing and interpretation. Access to split spoon samples for direct current resistivity lab measurements would also be helpful.

Anticipated research next three (3) months:

Final field work, data processing, and report writing is planned.

Circumstances affecting project:

We anticipate getting the project on schedule.

Tasks (from Work Plan) add lines to table as needed	Planned % Complete	Actual % Complete
Task 1. Compile and assess literature and sites	100	90
Task 2 Collect geophysical data	100	90
Task 3 Conduct analysis	0 to 75	40

Barriers or constraints to implementing research results: None