

NHDOT SPR2 PROGRAM

RESEARCH PROGRESS REPORT

Project # SPR 42372G	Report Period Year 2022 <input type="checkbox"/> Q1 (Jan-Mar) <input checked="" type="checkbox"/> Q2 (Apr-Jun) <input type="checkbox"/> Q3 (Jul-Sep) <input type="checkbox"/> Q4 (Oct-Dec)	
Project Title: Advancing Subsurface Investigations Beyond the Borehole		
Project Investigator: James Degnan Phone: (603) 226-7826 E-mail: jrdegan@usgs.gov		
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.):

HVSr data was collected at sites in New London and Troy which were selected from the list of NHDOT Project Exploration Plans provided by Krystle Pelham on 2/10. Multifrequency electromagnetic data was collected at the Troy NH site using the new DualEM instrument. HVSr data was also collected at the USGS NH/VT office test well to compare coupling methods. An additional priority site in Canterbury where new slope failure was identified by NHDOT in March of 2022 was added to the list of sites on 6/15 and surveyed with HVSr on 6/21 with NHDOT and NHGS. Preliminary data processing has been completed and results have been communicated to NHDOT.

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

Boring logs from data collection sites are needed for processing and interpretation. Access to split spoon samples needs to be discussed to determine the feasibility of direct current resistivity lab measurements.

Anticipated research next three(3) months:

Additional field work, data processing, and a technical advisory group meeting is planned.

Circumstances affecting project:

We have what we need to get the project on schedule.

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
Task 1. Compile and assess literature and sites	100	70
Task 2 Collect geophysical data	100	50
Task 3 Conduct analysis	0 to 50	20

Barriers or constraints to implementing research results

None