Research in Progress

Massachusetts Depth to Bedrock Project

Research Need

Fundamental to any transportation planning and engineering activity is having a reasonable estimate of the thickness of the overburden. Knowing the overburden thickness not only influences cost but may also affect selection of the appropriate foundation system for a particular structure and selection of a suitable subsurface investigation method. The overall goal is to help reduce the uncertainty in highway projects by providing a rational approach to clarifying overburden thickness during project planning and design development.

Goals/Objectives

The purpose of this project is to collect thousands of borehole and geophysical records, compile these data and build a high-resolution data layer of the varying thickness of the overburden across Massachusetts. Tasks include collecting existing borehole and geophysical data from publicly available sources, collecting passive seismic data in the field during the summer of 2021, combining this data along with LiDAR data and mapped outcrop and shallow-to-bedrock areas from the recently completed statewide surficial materials map to create continuous overburden thickness and top-of-rock data layers. Main outcomes will be resource maps in raster and/or TIN format showing the altitude of the top-of-bedrock and thickness of overburden. A NEHRP soil classification map will also be produced.

Methodology

1. Collection and compilation of borehole, well and geophysical data from existing databases and contractors.
2. Collection of passive seismic data to estimate depth to bedrock in areas where borehole/well density is sparse.
3. Processing of depth and thickness data
4. Evaluation of different geostatistical methods for estimating the bedrock surface
5. Examination of uncertainty propagation in creating a depth-to-bedrock model.
6. Classification of surficial materials into NEHRP soil categories.

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