

**Title: Geological Sciences Extension**

**Project Leader: Bill Clement**

**Project Overview**

This project entails lines of inquiry to understand the structure and physical properties of the near surface of the Earth. Most of the work involves measuring the electrical or seismic properties of the near surface to help evaluate water resources and determine the nature of the Earth's subsurface. I use ground penetrating radar and electrical resistivity tomography to characterize the water content of the subsurface and to determine potential pathways for water flow. I will also use seismic methods to characterize the near surface environment and sample the upper hundred meters to determine the structure, stratigraphy, and the physical properties of the Earth. The propagation velocity of seismic waves can be used to determine rock type or strength. Variations in soil or rock strength can help community planners and developers better locate critical infrastructure or adapt construction practices to mitigate hazard potential. Another parameter measured with seismic data is the depth to the underlying bedrock. This information can be used in the construction industry to better plan projects. The depth to bedrock is also an important measure for aquifer characterization.

**Activity Summary – 2018**

- Monthly data acquisition and analysis of geophysical data (10)
- Characterize volume and extent of aquifers to determine locations for well placement (10)

***Total Educational contacts***

	Youth Contacts	Adult Contacts
In Person		10
Indirect Contacts (Print, Web, etc...)		3

## **Narrative Summary and Impact**

Collecting ERT data on a monthly basis to image changes in the water distribution in the vadose zone and aquifer in a glaciated terrain. Processing and interpreting the data after each acquisition. Compare each new resistivity model with previous models. Measuring the water level at 2 wells coincident with the ERT line. I have also collected passive seismic data to measure the depth to bedrock at many locations in Southeastern Massachusetts and the Pioneer Valley as part of survey to map the surficial geology of Massachusetts.

## **Collaborating Organizations**

- Town of Amherst