

# Multi-channel Analysis of Surface Waves

Multi-channel Analysis of Surface Waves (MASW) is a seismic method that uses the dispersive characteristics of surface waves to determine the variation of shear-wave (S-wave) velocity with depth. S-wave velocity values are calculated by analyzing seismic surface waves generated by an impulsive source and recorded with an array of geophones. The resulting shear wave profiles from multiple locations along a survey line can be combined and contoured into a 2-D cross-section of shear-wave velocity. Shear-wave velocity is a function of the elastic properties of the soil and rock and is directly related to the hardness and stiffness of the materials. Advantages and applications of the method include:

- Non-invasively obtaining the shear-wave velocity profile for Vs30 site classification measurements (no boreholes needed).
- Developing a shear-wave velocity cross-section to depths of 60-100 feet
- Identifying anomalously soft zones in soil and weathered rock
- Correlating measurements to SPT tests and other borehole data
- Mapping karst and other geologic hazards
- Identifying velocity inversions (soft zones beneath hard zones) which may go undetected by other methods such as seismic refraction
- Landstreamer configuration allows for efficient data acquisition on soil and paved areas

