

Seismic Refraction

Seismic refraction is a geophysical method used to determine the seismic compression-wave (P-wave) velocity structure of the subsurface. Seismic P-waves are generated on the surface, propagate through the soil and rock, and are recorded by geophones at known distances from the source. Since P-waves are the fastest portion of the seismic wave, they represent the first arriving energy at each geophone (either direct or refracted). A seismograph is used to record the travel-times of the first arriving energy, after which subsurface seismic P-wave velocities can be derived. A tomographic inversion is used to develop a 2D P-wave velocity cross-section from the data. Seismic refraction data may be acquired on land or in water covered areas.

- Non-invasively map stratigraphy and anomalous conditions
- Applications include characterizing rippability and dredgeability, mapping the top-of-rock, and identifying soft/weak zones
- Measurements made along survey lines or within a survey grid to provide plan-view contour maps of top-of-rock or other stratigraphic boundaries
- Measurements can be made over water-covered areas using an array of hydrophones and a marine source such as an airgun
- Survey procedures outlined in ASTM D5777-00

