In the last 6 years, the Washington State Department of Natural Resources, Division of Geology and Earth Resources (WA-DNR) has been carrying out shallow seismic site characterizations (with past and ongoing projects funded by the USGS-NERRP / Eversource Grant) in 73 sites to estimate velocity profiles and calculate Vo/h for understanding and quantifying soil behavior at earthquake-prone sites and for ShakeMap and HAZUS applications. We have been specifically targeting seismogenic sites in Washington and Oregon, and compiling earthquake site-specific information (geotechnical boreholes, water well logs and local geology) in order to evaluate the sites qualitatively and quantitatively from previously accessioned estimates. Shallow seismic site characterizations have been carried out using active-source and passive-source systems. We have used Interferometric Array Measurements and Horizontal-to-Vertical Spectral Ratio (HVRS) methods. Site-specific seismic information for specific sites and for ShakeMap and HAZUS applications has been compiled and generated using seismic data collected in conjunction with the available subsurface database in Washington and Oregon.

An example of forward, center and reverse shot examples of a 32-second 24-channel passive survey (MAM) data set is shown filled triangles. The seismograph record consists of cultural and natural noise propagating through the earth. To determine Vs velocity profile is considered as fundamental mode dominate ambient vibrations. The initial model is determined from travel time data from these picks, b) HVRS fundamental frequency peaks should be carefully made using supportive geologic and geophysical data. multichannel surface wave analysis in a power tool to estimate Vs profile. Results found from this method are used to estimate Vs profile for a site. The final model until travel time data fits the desired goal. The Vs velocity profile is considered as fundamental mode dominate ambient vibrations. The Vs velocity profile is considered as fundamental mode dominate ambient vibrations.

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