

عنوان مقاله:

Monitoring Changes In The Water Table Depth Using Seismic Surface Wave At A Silty Sand Site

محل انتشار:

چهارمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1382)

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خلاصه مقاله:

A very shallow (<5 m) seismic surface wave experiment, using the Spectral Analyses of Surface Wave (SASW) technique, was conducted to investigate the position of the water table in the Bosque Wetland Park (silty sand) site near El Paso, Texas in February and June 2002. We performed both laboratory (83 cm long with two receivers) and field experiments. Laboratory tests were held to verify the velocities of dry and saturated materials from the site. Direct measurements of the water level in two monitoring boreholes were taken during each field visit to clarify the saturation measurements obtained by the SASW surveys. These measurements indicated that the average depth of the water table was 2.75 m for winter and 2.2 m summer, which were about the same values obtained by the SASW method during the same periods (2.4 and 2.15m). Our shear wave velocity analysis suggested a three-layer model with the third layer having a lower shear velocity than the second layer for both sites. We interpret this low velocity layer as the fully saturated zone (water table) in this study. Our surface wave results indicated the average shear velocity of the saturation zones is ~130 m/s. The shear wave velocities and the geophysical layering determined by the SASW method are comparable with the measurements of the first two shear velocity layers obtained from seismic down-hole measurement and consistent with DC resistivity studies of the area. Our periodic observations suggest that the SASW technique has a high potential to locate and detect the change in behaviors of saturated/unsaturated sediments in the vicinity of El Paso, Texas.

کلمات کلیدی:

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