

BEDROCK MAPPING USING MASW WITH INVERSION AND INTERPRETATION CONSTRAINTS FROM SEISMIC REFRACTION

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We acquired three multichannel analyses of surface waves (MASW) profiles from the town of Perkins in central Oklahoma to map the bedrock surfaces along the locations of the profiles. Although the MASW method has been widely used for mapping bedrock surfaces, it was challenging to identify the bedrock surface with reasonable accuracy along the three MASW profiles. The bedrock surface did not exhibit a significant seismic velocity contrast from the overburden and appeared as a smooth and gradual increase in velocity with depth. To better delineate the bedrock surfaces, we analyzed selected high-quality MASW shot gathers as seismic refraction data to generate a depth model for constraining the inversion and the interpretation of the MASW profiles. The results showed an improvement in mapping the bedrock surface compared to relying solely on the MASW results. This study showed that analyzing selected MASW shot gathers as refraction data can improve the curacy of mapping shallow bedrock surfaces using MASW without the need to acquire additional data.