Identification of the Bedrock Level with Sub-bottom Profiling Data

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Abstract

This study dominantly inquiries about the accuracy of the interpretation of sub-bottom profiling data for the identification of the bedrock level that is essential for underwater constructions and other marine activities. Although the physical core samples give the data more accurately, it is expensive and time-consuming. It stimulates the inspection of alternative methods such as sub-bottom profiling. A boomer profiler has been used in this study for the data collection from the north and west sides of the Colombo harbour in Sri Lanka with a 1 kHz frequency. The acquired data were processed using the SonarWiz software and visual identification was employed for the layer identification. The borehole data were utilised for the validation of the results and standard penetration test (SPT) values were crucial while concluding due to most interpretations showing the bedrock level from SPT-50 level with its stiffness. Re-sedimentation is an error occurring during the borehole investigation. Apart from that, equipment failures can be occur during the seismic survey. According to the interpretation, the bedrock level reflection signature is often associated with the SPT-50 level. However, deviations occur due to factors like layer thickness and absolute bedrock presence. To improve the accuracy of interpretation, various frequencies and different types of bedrock can be considered.

Keywords: Acoustic impedance, Filtering, Seabed, SPT value, SonarWiz