

Applicability of grounded-source AEM to coastal areas: Comparison between Kujukuri and Awaji Island cases

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Understanding geological and hydrogeological characteristics in coastal areas is vital because they are the places where most people live and work. Especially, it is important to delineate underground distribution of fresh and saline waters to maintain sustainable development in coastal areas and also for siting of geological disposal of nuclear wastes. As for the latter case, it is desirable to increase the depth of investigation to at least 300 m. To this end, a grounded-source airborne electromagnetics (AEM) is more suitable than conventional AEM. Firstly we applied GREATEM, a type of grounded-source AEM, to an alluvial plain, Kujukuri, where sedimentary rocks and shallow water prevail. The results were remarkable in that a reliable resistivity structure was obtained to a depth of 300-350 m both on land and offshore and low resistivity structures prevail both on land and offshore. We then applied the GREATEM method to northwestern Awaji Island, where granitic rocks crop out onshore. From this survey, we obtained underground resistivity structures to a depth of 1 km onshore and to a depth of 500 m offshore. The results were feasible in that onshore resistivity is much higher than offshore but were not acceptable in that the absolute resistivity value onshore was much lower than the true one. To circumvent this problem, a 3 D inversion technique is currently under development.

Keywords: airborne electromagnetics, coastal area, Kujukuri, Awaji Island