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Applicability of airborne electromagnetics to coastal areas: Kujyukuri case

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Understanding hydrogeological character in coastal areas is an issue of paramount importance considering that most people live and work while catastrophic natural disasters occasionally happen. It is also important to delineate the distribution of fresh and saline water to maintain sustainable development in coastal areas and also for siting of geological disposal of nuclear wastes. Nonetheless limited information has been acquired to this day for the lack of suitable survey method. Airborne electromagnetics (AEM) is a method to survey underground by means of electrical resistivity. It has a merit to survey both land and sea simultaneously. While conventional AEM can reveal resistivity only to a depth of ˜300 m on land, we succeeded to increase the survey depth to ˜1000 m by employing grounded electrical source airborne transient electromagnetics, or GREATEM. Here, we applied GREATEM to a coastal area for the first time. The Kujyukuri coastal plain, Boso Peninsula, was selected for our study. This area is suitable because shallow seawater develops and enough resistivity data are available by grounded electromagnetic survey on land, electrical resistivity measurements at sea, and borehole logging. As a result, it was found that GREATEM can reveal resistivity structure in the coastal area to a depth of 300-350 m within ˜1 km offshore.

Keywords: Airborne electromagnetics, Coastal area, Kujyukuri