

Reconstruction of subsurface layers of sediments in the estuaries Parak and Shoor by using ground-penetrating radar

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Abstract

The study area on the North West Coast of Oman Sea in Shoor and Parak estuaries is located within Near the Chabahar. Preparation outcrops GPR to produce and record all events take place at shallow depths below surface. The GPR and seismic profiles are in order to prepare and investigate the effects of subsurface. Identification of shallow subsurface structures and thickness of the different is due to the contrast in electrical properties such as electrical conductivity. This is important objective of the study research that is done by GPR methods. In this study, the GPR profiles were taken with instrument of GPR-Mala Geoscience-3 Step charger. In order to calibration the seismic data with characteristics facies obtained by using handy coring instrument (Euger) was prepared involves two cores to lengths of 4.35 and 5 m. The data from these two methods are compared and was obtained the necessary conclusion. The study showed that the cores are composed of two sedimentary facies. The first facies set (Muddy facies) with brown color that the sedimentary environment is supratidal and the second facies set (Sandy facies) with gray color that specificities are related to depositional environment intertidal. Profiles of the Shoor estuary show up four different facies that they are consistent with the core sedimentary facies in the environment are supratidal that thickness of Subsurface layers increases from northeast toward the South West. Profile of the Parak estuary show up two different facies that they are consistent with the core sedimentary facies in the environment are supratidal that thickness of Subsurface layers does not changed from northeast toward the South West. Since, the profile GPR Numbers the 73 and 74 was nearer to the sea and influence the saltwater sea on GPR data. Thus, in Parak estuary and the effect of sea water on depth Penetration is more and detection of subsurface structures is weaker that has leading to the identification two layers of subsurface. In Shoor estuary (The profile GPR Numbers the 71 and 72), high distance from the sea and the effect of sea water on depth Penetration is less and detection of subsurface structures is stronger that has leading to the identification four layers of subsurface. On the other hand comparison of sediment cores and GPR profiles with curve changes in global sea levels show that during two-Interval time (respectively 2100 to 2800 & 4900 to 5800 years ago) sedimentation rates was higher than average (0.1 mm per year). Finally, using GPR profile and cores, sea level changes in coastal environments can be revealed. These changes indicate that the two sedimentary cycles includes of a rise and fall sea level locally in the North West estuaries of Oman Sea in connection with the tectonic situation in the region.

Keywords: Shoor, Parak, Electrical Conductivity, GPR Profiles, Chabahar, Estuary.