

MULTIPLE HIGH-RESOLUTION SEISMIC METHODS USED IN AN INTEGRATED COASTAL ZONE MAPPING PROJECT AT THE DANISH NORTH SEA COAST.

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Coastal studies and models previously used to quantitatively describe and predict the shoreface profile response on the beach, have generally not taken the underlying geology into account. However, this study shows that the geology below the mobile sand layer, as well as the distribution of the mobile sand, is much more complex than generally anticipated. This type of geological knowledge is valuable for future coastal zone planning. In the present co-operation project between GEUS and the Danish Coastal Authorities, the marine and land based geological data sets were integrated to understand the relations between the shoreface ramp and the on-shore geology. The objective has been to investigate the near surface geology in details from the coastal zone to about 25 m of water depth. Data for the investigation was acquired utilising multi-scaled seismic equipment: boomer, sub-bottom profiler and side scan sonar systems. A model for the Late Quaternary development and the recent sediment movement was set up based on seismic/acoustic data and 6 m vibrocores. An important conclusion to be highlighted, is that the presence of the recent and sub-recent mobile sand is concentrated locally in large subaqueous sand dune fields amongst widespread areas of erosion, where Quaternary and Tertiary clayey sediments are exposed to the present erosion.