

EaES 350 Laboratory 7: Sedimentary structures II

During a period of booming oil and gas prices, you have made it to the top floor of the Amoco Building – you were hired as a reservoir geologist by one of the big oil companies. You have joined a research group that is particularly interested in hydrocarbon reservoirs that have been formed in shallow clastic seas. One of the activities of your group is to carry out facies analysis in modern analogs in order to better understand hydrocarbon reservoir rocks. The results of such work can be used to interpret cores and well logs from the oil and gas fields your company is focusing on. Before you were hired, a consultant was asked to collect some reconnaissance field data from various depositional environments in the Wadden Sea in the northern Netherlands. The consultant used box cores or open pits to make lacquer peels of different facies in this area, and three peels were shipped to your employer for further study. Unfortunately, the three lacquer peels had no labels, and although a map was provided with the locations of the three sites visited, it is unclear which one comes from where. Therefore, your first task is to figure out where the three lacquer peels came from.

Based on your experience from the previous lab, provide a short description for each, with information on grain size, sedimentary structures, fossil content, and any other relevant features. Subsequently, infer the depositional processes that may have formed these facies. Using this information, it will be possible to determine where the three peels have been collected. Explain how you arrive at your conclusions.

Considering that from a reservoir geology perspective your ultimate goal is to assess these facies in terms of potential as hydrocarbon reservoirs, provide your opinion about which environment yields the best reservoir rocks in terms of porosity and permeability.

