

Compaction processes of the New Jersey shallow shelf based on petrophysical data from IODP Expedition 313

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IODP Exp.313 was conducted on the New Jersey shallow shelf in May to July 2009. The purpose of this study is to clarify compaction and dewatering processes associated with the architecture of the sedimentary sequences under frequent sea-level changes (based on core-log integration). Particularly, a high sedimentation rate often induces underconsolidation of sediments with overpressured pore fluids which complicates consolidation behavior. Understanding the compaction process and its effect on architecture of the sedimentary sequences reveals probable geometry of sedimentary structure before deformation, and provides important information to estimate frequency and amplitude of eustatic changes. In this study, we aim to discuss initial in situ diagenesis and dewatering processes based on physical properties such as porosity, density, natural gamma ray (gamma ray spectrum), resistivity, P-wave velocity, magnetic susceptibility, and buried depth measured or estimated from down-hole logging and petrophysical properties from the Multi Sensor Core Logger System (MSCL). Correlation of the three Expedition 313 sites and the seismic profile will provide better estimation of the spatial distribution of dewatering paths. During the expedition, wireline-logging was conducted successfully at all the three holes, M0027A, M0028A and M0029A. From the three holes, high-quality data were obtained including spectral gamma ray (through pipe / open hole), electrical resistivity and magnetic susceptibility. In addition, sonic velocity and sonic images were also obtained from M0027A and the lower part of M0029A. Onboard MSCL measurements also provided physical properties of whole-round cores. This presentation is an overview and a preliminary report of this study. This research used data provided by the Integrated Ocean Drilling Program. This study is supported by Japan Drilling Earth Science Consortium (J-DESC).

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