



Alternating paleoenvironments in a deep-water rift: initial results from IODP Expedition 381, Gulf of Corinth, Greece

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Relatively few detailed studies exist of rift axis depositional systems and the allogenic and autogenic controls on their sedimentology and stratigraphy. New results of IODP Expedition 381 from the central axis of the Corinth rift represent the longest and highest resolution stratigraphic record for an early phase rift. The age model has been constructed by integrating magnetostratigraphy with palynology and micropaleontology results. Cyclic variations of 10s-100s of kyr in sediment flux and paleoenvironment record periodic connection to global oceans across a sill as eustatic sea level varied. Overall deep-water fine grained turbiditic and hemipelagic sediments dominate. Interglacial periods are recorded by marine conditions while isolated/semi-isolated conditions correspond to glacials. Marine sub-units are dominated almost exclusively by homogenous mud with a high bioturbation index and reduced coarser grained sediment. These periods are characterised by relatively low sedimentation rates and higher organic carbon concentration. Isolated/semi-isolated sub-units are characterised by numerous facies associations including laminated greenish gray to gray mud with mud beds, finely bedded mud with silt to fine sand beds sometimes rich in organic carbon, some debris flows, homogenous mud and sand couplets. These glacial sub-units record relatively higher sedimentation rates. Transitions between terrestrial and marine basin conditions are characterised by finely laminated carbonate-rich intervals. We infer that in the source areas on the rift flanks reduced glacial vegetation cover drove higher sediment flux (in the order of 2-10 times interglacial rates).