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Prolific Deep Marine Slope Channels of the Nile Delta, Egypt

The Nile Delta offshore is rapidly emerging as a major gas province. High quality 3D seismic, coupled with data from sixteen consecutive successful deep-water exploration and appraisal wells, have highlighted clear phases of erosion and deposition within the Upper Pliocene deep marine slope channels. The gross reservoir architecture is spectacularly imaged by 3D seismic, both in time sections and through a variety of amplitude extractions whilst an extensive program of core and wireline log acquisition and analysis has enabled high-resolution definition of the channel-fill sediments. The channels were initiated by the introduction of coarse sediments to the shelf edge possibly at times of relative sea-level fall. Initially there was significant erosion, especially in areas up depositional dip, creating what we term slope valleys. Subsequent valley infill commonly commenced with debris flows, slumps and slides, sometimes overlying basal, bypass-related sands, and progressed to amalgamated or stacked channels in packages of upward-decreasing net-to-gross. This pattern was commonly repeated following re-incision, which may have occurred several times. The different stages of channel development can be considered in terms of slope equilibrium with a reduction in slope gradient promoted by increases in flow size and density and decreases in grain size.