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Processes and Sedimentary Architectures along the Present Zaire Turbidite Channel (ZAIANGO project)

Meandering turbidite channels have been recognised in most of the large deep-sea fans. Using qualitative observations, they have often been compared to meandering rivers. However, a number of features suggest that these systems are not analogous. Understanding the morphological evolution and associated depositional histories of turbidite channels appears crucial for predicting and interpreting the resultant sedimentary architectures. A complete data set was acquired over the Zaire deep-sea fan during ZAIANGO cruises. Data include bathymetry, acoustic imagery, seismic and acoustic profiles, and Kullenberg cores. The morphological analysis of the whole Zaire turbidite channel has underlined four main areas: the canyon, a transition zone characterised by the presence of numerous terraces, the channel-levee system where well-developed meanders are observed and the distal lobe complex. The morphological changes, which occur along the turbidite valley, depend on the variation of several factors: decrease of slope gradient, decrease of channel maturity, and variation of flow characteristics (current energy, flow volume, sediment load). Imprints of the thalweg migration and abandoned meanders have been identified in the morphology and on seismic data. It confirms that the channel slowly migrates and evolves to a meandering pattern. The detailed study of the sedimentary architectures associated to meanders and terraces has shown there are different types of sedimentary units. Some of them suggest lateral accretion and could be interpreted as point bar. Others have similarities with levee deposits and are interpreted as inner or confined levees into the turbidite valley.