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Architectural Analysis of Sinuous, Erosionally Confined Channels: The Under-Appreciated Deepwater Channel Type

Dominant reservoirs in offshore West Africa are large, erosionally confined deepwater channels and a spectrum of architectural styles and channel-fills are observed. Although many of these reservoirs have been thought to be dominated by low-sinuosity channels, advances in seismic data quality and resolution indicates that high-sinuosity channels are also an important reservoir element. Integration of high-resolution 3-D seismic, well data and outcrops has allowed better characterization of high sinuosity deepwater channels. These channels are easily recognizable on 3-D seismic data due to their distinct sinuous amplitude map patterns. Dominating the fill of many these channels are shingled seismic reflections that dip toward the channel axis or in the case of the outcrop examples shingled, inclined sandbodies. These shingled seismic reflections and sandbodies at channel margins in sinuous channels are interpreted to form as a result of the lateral and downdip migration of the channel. Deposition of accretion beds occurs in the inner side of the channel and erosion at the outer side of the channel. Amplitude extractions in sinuous confined channels can be use to determine the position and dimensions of each accretion package. The accretion packages are named in this paper Lateral Accretion Packages (LAP's). Lithologic composition of LAP's is variable, although they tend to be dominated by a mixture of coarse-and fine-grained sandstones at the base and finer grained, less amalgamated beds towards the top of the unit. Importantly, they form sizable reservoir elements, reaching a maximum thickness of 45 meters over as much as 0.75 kilometers2.