AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003

Zhiqiang Feng, Daqing Oilfield CO, Daqing, China

Regularity, a Parameter Quantitatively Defining the Development Degree of a Meandering River

Three-dimensional geometries of Pleistocene river channels and point bars in the Gulf of Thailand can be clearly seen in 3-D seismic time slices and high frequency (800-4000Hz) seismic profiles. These rivers were developed in the lowstand stages of five sequences (<100m in depth from the bottom of the sea). Their development processes were terminated by subsequent marine transgressions. The variety channel forms preserved present various stages of river evolutions.

Arc angles (θ), relative curvature (channel width/radius of curvature, ω), in-channel meander length (λ) etc. of 128 bends from 12 reaches were measured. Statistics over these measurements show that λ and ω are two key parameters which govern the development processes of meandering rivers at different stages. θ varies from 10ºã to 340ºã. When 10ºã<θ<150ºã, λ maintain relatively stable (4πw), whereas, ω increases. When 150ºã<θ<180ºã, most of ω values fall between 0.6 and 0.3, with a mean of 0.42. When 180ºã<θ<270ºã, ω maintain relative stable, whereas, λ increases. When θ > 270ºã, λ approaches to twice of its initial length, where compound channel form occurs.

Here, when 0.3<ω<0.6, bends are defined as developed meander bends. Regularity of a meandering channel is quantitatively defined as the percentage of developed bends over the total bends. A developed meandering river normally has a regular channel pattern. A regular river has undergone significant lateral adjustments and has created apparent point bars. Regularity can be a better parameter for describing the degree of a meandering river development than sinuosity.