

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

Cornel Olariu¹, Janok P. Bhattacharya², Robert J. Stern³ (1) University of Texas at Dallas, Richardson, TX
(2) UT Dallas, Richardson, TX (3) University of Texas at Dallas, TX

**Morphology of a Modern Lacustrine Delta Changes with River Discharge: Red River Delta,
Lake Texoma, Texas-Oklahoma**

The modern Red River delta has prograded more than 15 km into Lake Texoma since it was impounded in 1944. Because the river water is salty, there has been no other major engineering construction upstream of Lake Texoma. The Red River delta is an excellent place to examine the morphometric evolution of a modern, unconstrained lacustrine delta in a temperate setting.

Aerial and satellite images from 1952 to 2002 show the evolution of the delta. In the earliest images, the delta is not distinguished as it is largely subaqueous. The 1976 image shows that the delta has grown more than 8.7 km into lake. This represents an average progradation rate of 270 m/year. The 1976 image shows a lobate delta containing 4 active terminal distributary channels. The 1982 image shows that most of the discharge was captured by a single channel. Since 1982, the delta has developed a more elongate shape built by a single distributary channel. Despite the change in the number of active distributary channels, the progradation rate for 1976 to the present is similar to the lobate phase, about 270 m/ year.

Delta morphology is interpreted to relate to river discharge. At low discharge, the delta develops numerous active terminal distributary channels due to increased friction. At high discharge the delta develops an elongate shape, with a single main distributary channel. This may be a consequence of the increase in inertial forces during large magnitude floods.