Geophysical Research Abstracts,
Vol. 11, EGU2009-6373, 2009
EGU General Assembly 2009

Fluvial sediment delivery and human impact in a large coastal plain river: The case of the Trinity River, Texas

M. Slattery (1), J. Phillips (2), L. Todd (1), and J. Breyer (1)

(1) Institute for Environmental Studies, Texas Christian University, Fort Worth, TX 76129, (2) Department of Geography, University of Kentucky, Lexington, KY 40505

The impact of dams on land-to-ocean sediment flux has been widely documented. A recent review suggests that over 100 billion metric tons of sediment is now sequestered in reservoirs constructed largely within the past 50 years. Our focus in this paper is on the lower reaches of the Trinity River, Texas, and the response of the river's sediment delivery system to the construction of a 2.2 billion m^3 reservoir 175 river kilometers from the coast. The purpose of the study is to document pre- and post-dam sediment transport within the meandering, alluvial reach of the river. We show that the effects of sediment retention behind the dam, even in a massive reservoir controlling $\sim$ 95 percent of the drainage area, are unnoticeable in the lowermost river reach. In this system, a sediment storage bottleneck has created an essential decoupling, such that changes in sediment regimes in the upper basin are simply not reflected in the lower river reaches. Radiocarbon dating of shell fragments recovered from sediment cores in the delta indicated sediment accumulation rates of between 1.2 and 1.8 mm yr^{-1}. At these rates, modern sediment input from the Trinity River is inadequate to account for sediment accretion on the delta. Therefore, other non-fluvial sediment sources must be contributing to the accretion of sediment within the delta.