Decoupling tectonic and autogenic controls on the development of cyclic fluvial strata: Flume experiments

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- Year 1: Effects of Imposed Varying Lateral Subsidence Rates on a Deltaic System
 - During the 1st year of the project we conducted a series of six experiments in the Sediment Transport and Earth-surface Processes (STEP) basin facility at the University of Texas at Austin. The STEP basin's dimensions are 4-m long, 5-m wide, and 1.5-m deep, and contains a hinged table that acts as a subsiding basin basement, which can be raised or lowered to create many different subsidence patterns in combination with placement of the sediment source. We utilized the table to impose lateral basement tilting to examine the effects of spatially varying rates of subsidence on an evolving fluviodeltaic system.



Overhead images



✤ STEP 2012: Slow Lateral Tilting

- Subsidence side: No steering of channels by slope increase; Enough sediment to rework the delta fluvial surface; Deeper water depth at the shoreline - Slow progradation
- Uplifted side: Shallower water depth at the shoreline Fast progradation; Incisional channel - longer residence of channels

✤ STEP 2012: Rapid Lateral Tilting

- Subsidence side: Steering of channels by increasing slope to the subsiding side;
 Deeper water depth at the shoreline Not enough sediment to make progradation
- * Uplifted side: Delta fluvial surface abandoned in the early stage; Static shoreline