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"Seismic Reflector Dip Trends in Late-Stage Deposits of the False River Point Bar"

by

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Abstract

Various studies of ancient point bars have noted that a relationship can be observed between the dip angle and grain size of point bar lateral accretion deposits, with the most mud-rich deposits tending to exhibit the greatest dip. No analysis and only cursory explanations for this relationship have been provided. This study accomplishes two tasks to investigate this relationship in a modern point bar. First, we successfully image the architecture of late-stage point bar deposits with a near surface 2D seismic SH-wave reflection survey and generate an SH-wave velocity model of the subsurface in the study area in order to interpret the history of its development. The presence of inclined reflectors with uniform dip directions toward the paleochannel confirms a common model of point bar architecture, but the observation of coherent reflectors dipping away from the paleochannel complicates the ideal model by suggesting the burial of a mid-channel bar by the migrating point bar. Second, we compare spatial trends in reflector dip magnitude calculated via the analysis of dip-affected reflectors to trends in grain size and/or mud content suggested by the SH-wave velocity model and by well-logs from previous studies. We demonstrate that confirmation of the expected vertical and lateral fining trends is supported by the velocity model and log data, then show that the dip magnitudes tend to increase in the fining directions. Finally, we suggest potential lithological or depositional mechanisms to explain the relationship between mud content and dip angle in point bar lateral accretion deposits. As a whole, this study provides an example of the ability of seismic SH-wave reflection methods to image and characterize the shallow subsurface.

Biography

Adam Gostic was born in Corpus Christi, Texas and was raised in Spring, Texas. His favorite activities include cooking, team sports, playing piano, and working with computers. In 2015, he received his Bachelor of Science in Geology with a minor in Mathematics from Sam Houston State University. After completing a geoscience consulting internship with GWS Consulting in Houston, he moved to Baton Rouge in 2016 to begin a graduate degree at Louisiana State University. He anticipates graduating with the degree of Master of Science from the Department of Geology & Geophysics in December 2018 and pursuing a career involving seismic interpretation.

