

Middle Eocene Storm Deposition in the Northwestern Gulf of Mexico, Burleson County, Texas, U.S.A.

James E. Flis¹, Thomas E. Yancey², and Christopher J. Flis³

¹13304 Attaway Cove, Corinth, Texas 76208, U.S.A.

²Department of Geology and Geophysics, Texas A&M University, MS 3115, College Station, Texas

³Whiteside Museum of Natural History, 310 N. Washington St., Seymour, Texas

ABSTRACT

Many storm beds deposited during the beginning of the MECO (Middle Eocene Climate Optimum) climate event are exposed at Stone City Bluff on the Brazos River. Hummocky sands preserved in inner-mid shelf deposits of a transgressive systems tract record many storms affecting this part of the Gulf of Mexico during the Eocene. Hummocks have width of 0.14–5.3 m and height up to 0.6 m in a continuum that includes multi-meter width hummocks. Small-width hummocks occur as isolates and within large-width hummocks. The storm sands have a primary grain size mode of 85–95 μm and secondary mode of 180–200 μm for peloids and bioclasts. Gutter fills are present, containing coarse clasts derived from winnowed seafloor sediment, including high-density clasts that exceed the capacity of combined flow currents to transport sediment. They are interpreted to originate as the basal part of a bipartite mass flow that developed concurrent with combined flow currents. Comparison of Stone City Bluff storm beds to historic Gulf of Mexico storm deposits suggests that storms as strong as Hurricane Carla, a Category 5 hurricane that hit the Central Texas shoreline, occurred during the Eocene.

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