

TECTONIC BOUNDARIES OF THE EASTERN GULF COAST OF NORTH AMERICA

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ABSTRACT

Two Precambrian extensional fault episodes, recorded in mapping from central Arkansas across Mississippi, central Alabama, southern Georgia, and into the Atlantic Ocean affected later Pennsylvanian and Triassic Tectonics. This interpretation is from magnetic anomaly data and is supported by seismic, gravity, core, and well-log data. The fault system was first suspected from an anomalous magnetic high, representing a feature which affected tectonism during the Ouachita and the Alleghenian orogenies of the eastern Gulf Coast and southeastern United States. The north-most upthrown block is considered part of an ancient passive continental margin developed during the late Precambrian. The southern downthrown block is deformed by left-lateral transverse faults which were active during the Ouachita Orogeny. The Ouachita Orogeny may have deformed terrain farther east than the Black Warrior Basin. These transverse fault blocks were buttressed by the footwall of the extensional fault system. These left-lateral faults were again displaced by later right-lateral Alleghenian wrench faults extending from Florida and Georgia into Alabama, Mississippi, and southern Arkansas.

Differential ramping by low angle thrusts along the trend of the Precambrian extensional fault system in Georgia and Alabama shifted the tectonic transport direction during the Alleghenian Orogeny toward the southwest into the Gulf Coastal area. The abrupt truncation of the Southern Appalachians in Alabama and Georgia marks a transition zone of tectonism during the Alleghenian Orogeny from one of predominantly thrusting to one of right-lateral wrench faulting. The extensional fault system formed during the Precambrian delineates a tectonic boundary between extensional and later compressional features.