
The Milano Fault System, Central Texas: Structure and Implications for the Simsboro Aquifer

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ABSTRACT

The recently remapped Milano Fault Zone provides examples of both extensional and transtensional fault development in the Peripheral Graben System (PGS); the preservation of Eocene strata gives new evidence on the timing of fault growth in the system. Surface mapping outlines most of the major faults, which can be traced as deep as the Edwards Limestone (Lower Cretaceous) on well data. Several quasi-symmetric grabens are present, which show slight overlap, forming a left-stepping en echelon sequence. At the north end, a large en echelon fault zone includes small but high-relief grabens such as the Calvert graben in Robertson County. Little fault motion took place during the Late Cretaceous; however, significant fault motion occurred during deposition of the Simsboro sand, a sand-rich stream plain in the middle of the Wilcox Group. Renewed sediment rafting due to loading of the sedimentary column by Lower Wilcox deltas is likely responsible for this phase of motion. Post-Carrizo motion is of similar magnitude.

Two hydrologic evaluations were performed to determine whether the Milano Fault Zone acts as a hydraulic barrier that slows groundwater flow in the Wilcox Aquifer System (Simsboro and Carrizo aquifers). One evaluation included interpreting 100 aquifer tests located at varying distances from the fault zone. The other evaluation included modeling regional groundwater flow through the Milano Fault Zone. Both evaluations confirmed that the Milano Fault Zone acts as a partial barrier to groundwater flow in the Carrizo-Wilcox Aquifer System in Bastrop, Lee, Milam, Burleson, Robertson, and Brazos counties. Results from the remapping and characterization of the Milano Fault Zone are currently being incorporated into an update of the State's groundwater model for the Carrizo-Wilcox Aquifer System in Central Texas.