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Late Quaternary Transpressional Deformation Along the Submarine Extension of the Warm Springs-Central Range Fault Zone, Eastern Offshore Trinidad

The Warm Springs-Central Range fault (WCFZ) is a strongly arcuate, right-lateral strike-slip fault system that has been defined by offshore mapping in the Gulf of Paria and by remote sensing and outcrop mapping in the Central Range of Trinidad. GPS data from Trinidad indicate that most of the 14 mm/yr present-day Caribbean-South America plate motion is accommodated along the WCFZ. In the Gulf of Paria, the Warm Springs fault exhibits a transtensional structure consistent with its slightly east-southeast strike. An abrupt change in strike to a more east-northeast strike near the western shoreline of Trinidad is consistent with the more transpressional structure of the onland Central Range fault zone. In this presentation, we use industry 3-D seismic data to document recent deformational features of the eastward continuation of this fault over a 55 by 22 km shelfal area. The submarine extension of the fault can be traced across the shelf as a linear, east-northeast-trending lineament in seafloor sediments of Holocene age. In the subsurface, the WCFZ exhibits a positive flower zone structure flanked by parallel anticlines at or near the seafloor. This transpressional structure is consistent with parallel onland, transpressional faults and folds in the Central Range. In the shallow subsurface, the offshore fault dextrally offsets one branch of a lowstand, fluvial channel system by ~400 m. The dominant structural style of this shelfal area is transpressional and the influence of north-northeast-trending normal growth faults to the south and southeast is not observed.