

**DETAILED MAPPING IN EAST-ERN BREWSTER COUNTY, TEX-AS**

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This research produced a detailed, 1:12,000-scale geologic map of a 11.5 mi<sup>2</sup> area in eastern Brewster County, 37 miles ESE of Marathon, Texas. Descriptions of the Cretaceous Santa Elena Limestone, three Quaternary sediment units, and regional folds and faults supplement the geologic map. The only two published maps covering this area are less detailed and do not contain strikes and dips (Barnes, 1979, 1:250,000; Henry and Price, 1985, 1:100,000). Techniques applied include locating positions with handheld GPS, measuring orientations with Brunton compass, plotting structural data on stereographic projections, constructing cross-sections, using high resolution ortho-imagery to extend mapping, and displaying spatial data using ESRI ArcMap software.

The over 900 ft-thick Santa Elena Limestone consists of cliff-forming intervals of thick-bedded lime mudstone containing sparse spherical chert nodules and subordinate intervals of slope-forming marl. Primarily gently southwest-dipping Santa Elena strata are folded in two southwest-verging map-scale monoclines displaying axial planes of 292 82NE and 311 78NE and fold axes of 112 02 and 130 01. A NW-striking normal fault, not on previous maps, parallels monoclines. Conjugate shear fracture sets in the southern map area strike 330 and 020. Elsewhere one dominant mineralized joint set strikes 316.

Monoclines are interpreted to be fault-propagation folds above Laramide reverse faults. Monocline vergence indicates tectonic transport to the southwest above northeast-dipping reverse faults, which does not support the model of a single Laramide Marathon-El Burro-Peyotes uplift. The normal fault is

interpreted to be an easternmost Basin and Range fault. Conjugate shear fracture orientations indicate ENE least principal stress consistent with early Basin and Range extension.

