


The Paleocene-Eocene Thermal Maximum (PETM) is a ~200 ka interval of global warming beginning at 56.01±0.05Ma associated with a massive perturbation to the worldwide carbon cycle resulting in a global temperature increase of 5-8°C. In less than 10,000 years, atmospheric pCO<sub>2</sub> increased by ~1,200 ppm. The PETM is evidenced by a 3-5‰ decrease in global δC<sup>13</sup> isotope values, a negative carbon isotope excursion (NCIE). This study incorporates sedimentology, ichnology, δC<sup>13</sup> bulk organic matter isotopes, and biostratigraphy to identify the PETM and younger hyperthermals by examining outcrops and cores from Bastrop and Anderson Counties, TX.

Outcrops containing the Sabinetown-Carrizo Formation transition in Bastrop, TX, were examined using sedimentology/ichnology and 3D models developed from drone photogrammetry. Facies and stratigraphic architecture analyses revealed Sabinetown depositional environments to be sanding-upward and coarsening-upward deltaic parasequences. Paleoenvironments include prodelta, distal-proximal mouth bars, tidal channels, as well as fluvial-distributary channels, swamps, and rare paleosols. The age of the Sabinetown is late Paleocene, based on biostratigraphy. The PETM is identified by a -2.5‰ isotope excursion immediately underlying an *Apectodinium* acme in a 'dark band' exposed intermittently below the Carrizo. The dark band comprises siltstone, lignite, and heavily bioturbated siltstone, recording delta front to offshore deposits. The erosionally based Carrizo comprises large-scale trough crossbedded sandstone containing abundant *Ophiomorpha*, heavily bioturbated sandstone, and bioturbated heterolithic sandstone-siltstone. Carrizo paleoenvironments are those of a proximal tidal delta front including tidal bars, tidal channels, and mouth bars. Carrizo sediments returned no biostratigraphic results (barren).

Six cores from Anderson County, TX were selected to refine facies, δC<sup>13</sup> values, biostratigraphy, deposystems, and age control and aid regional correlations of the Wilcox/Claiborne groups. Wireline logs, facies, and biostratigraphy indicate that cores are from the Carrizo and overlying Reklaw Formation. A facies analysis identified tidally modified fluvial-deltaic deposits, including distributary channels, distributary mouth bars, and inter distributary bays (Carrizo), and prodelta to offshore shelf deposits (Reklaw). δC<sup>13</sup> isotopes range from -24.13‰ to -28.54‰, Biostratigraphy indicates that all deposits are latest Ypresian. No PETM NCIE was identified; instead, the NCIE from these cores may record younger hyperthermals such as the ETM2 and/or EECO.

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