

SEISMIC DATA THROUGH THE HICO STRUCTURE: A POSSIBLE IMPACT FEATURE IN NORTH-CENTRAL TEXAS. J. Glidewell, Institute for Geophysics, The University of Texas at Austin, TX 78758 USA [glidewell@mail.utexas.edu].

Abstract: Seismic data recently acquired in and around the Hico Structure provide evidence to further characterize the feature. Although data resolution improves with depth, it is thought that prevalent karsting in the subsurface does not translate to the surface. One possible explanation for the circular surface expression of the Hico Structure could be due to karst collapse; however, this does not appear to be true. The expression of karst features in seismic data is not found in the area of the Structure.

Introduction: The Hico Structure is a subtle circular feature centered near N 32.01° and W 98.03°. It is about 2.8 km from the city center of Hico, Texas (Fig. 1). The age is not well-constrained and is only thought to be post-Cretaceous [1]. This feature was first noted by [1] and its origin has been in question for over 55 years. The most extensive mapping and analysis of the feature to date was completed by L. Wiberg [2] and a concise history of the analysis was provided by P. Heinrich [3].

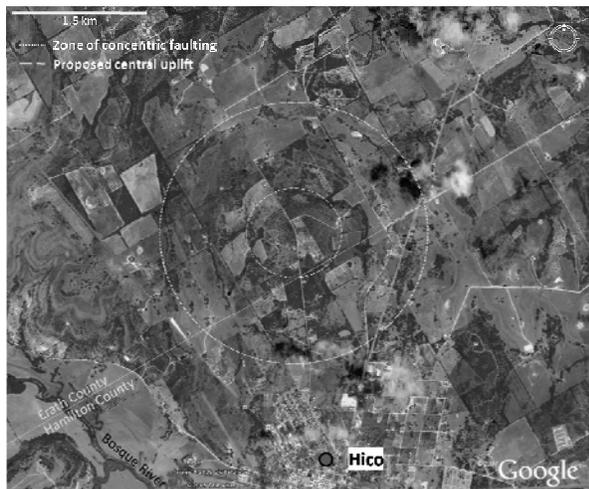


Fig. 1. Location map of the structure. Outer circle denotes boundary of the disturbed zone of concentric faulting. Inner circle defines the approximate location of the central uplift as suggested by [2].

Data: The data were acquired in 2005/2006. The data were shot with a 180 ft receiver interval with alternating 900/1080/1260 receiver line spacing. The source interval was 180 ft in a 'slash' pattern with a 1080 source line interval. The sweep length was 8 seconds (6 sweeps per station), with a frequency of 10-80 Hz. The average seismic velocity is approximately

10,000 ft/sec. The maximum vertical resolution for the data is around 55 Hz.

Interpretation: The seismic expression of karst features is most commonly shown as distinct, vertical disruptions of seismic reflectors. This characteristic is not noted within the data through the Hico Structure. Further analysis will provide a more extensive characterization of the subsurface in the area of this feature.

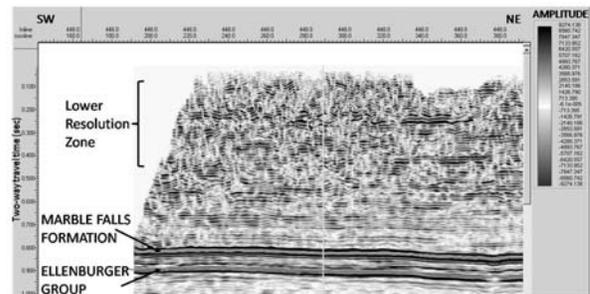


Fig. 2. Inline 448 through the Hico Structure showing the character of the seismic data. Note lack of post-Elleburger karst features through lower portion of the seismic line.

Discussion: Recent work by [4] has supported the theory of the Hico Structure being an impact feature [2,3]. This seismic data analysis supports this hypothesis.

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References: [1] McBride W. J. (1953) *MS Thesis*, University of Houston, Houston. [2] Wiberg L. (1981) *MS Thesis*, Texas Christian University, Fort Worth, 75 p. [3] Heinrich P.V. (2007) *Backbender's Gazette* 38(8), 11-16. [4] Heggy E. et al. (2004) *LPS XXXV*, Abstract #1462.