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## Biostratigraphy for Understanding Stratal Surfaces and Facies Variability in the Eagle Ford Group of South and West Texas

T. Scott Staerker<sup>1</sup>, Jim Pospichal<sup>2</sup>, Bronwyn Moore<sup>3</sup>, Matthew Wehner<sup>3</sup>, Matthew J. Corbett<sup>4</sup>, Christopher M. Lowery<sup>5</sup>, Michael C. Pope<sup>3</sup>, and Arthur D. Donovan<sup>4</sup>

<sup>1</sup>Atlantes Geoconsulting, 19207 Swift Falls Court, Houston, Texas 77094

<sup>2</sup>Bugware, Inc., 1615 Village Square Blvd., Tallahassee, Florida 32309

<sup>3</sup>Department of Geology and Geophysics, Texas A&M University, MS 3115, College Station, Texas 77843

<sup>4</sup>BP Exploration, 200 Westlake Park Blvd., Houston, Texas 77079

<sup>5</sup>Institute for Geophysics, University of Texas at Austin, 10100 Burnet Rd. (R2200), J. J. Pickle Research Campus, Bldg. 196 (ROC), Austin, Texas 78758

GCAGS Explore & Discover Article #00169\*

[http://www.gcags.org/exploreanddiscover/2016/00169\\_staerker\\_et\\_al.pdf](http://www.gcags.org/exploreanddiscover/2016/00169_staerker_et_al.pdf)

Posted September 13, 2016.

\*Abstract published in the *GCAGS Transactions* (see footnote reference below) and delivered as an oral presentation at the 66th Annual GCAGS Convention and 63rd Annual GCSSEPM Meeting in Corpus Christi, Texas, September 18–20, 2016.

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### ABSTRACT

As recent oil and gas interests have promoted geologic study of the Eagle Ford Group, biostratigraphic data and interpretations have improved to provide constraints on regional and sub-regional sequence correlations in South Texas. Within complex geologic sections, sequence-based correlations using only seismic, petrophysical curves, and elemental geochemistry profiles ultimately breakdown into non-unique solutions. These correlative solutions for wells involve either lateral, lithologic facies changes within coeval units or the erosion of strata along sequence boundaries to juxtapose rocks of different rock properties and apparent thicknesses. As Eagle Ford stratigraphy has proven to be more complicated than initially thought, microfossil biostratigraphy offers additional input to help refine sequence stratigraphic and petrophysical log based correlations.

Several significant sequence boundaries and flooding surfaces were correlated using calcareous nannoplankton abundance data collected from Eagle Ford rocks at Lozier and Antonio canyons of Terrell County, Texas, and Hot Springs and Ojinaga sections of Brewster and Hudspeth counties, Texas. Interpretations from these regional outcrops were integrated with recent subsurface data to create, a simple, reproducible, and age-restricted criterion for classifying the 3rd to 4th order sequences of the Eagle Ford Group. This nannoplankton-based framework, supplemented with foraminifers and palynomorphs, has allowed for both the duration of erosion along some of the most significant sequence boundaries to be quantified and a regional composite section for the upper Eagle Ford to be constructed.

These biostratigraphic results have implications to exploration and production activities of the Eagle Ford within the region. By understanding the timing of sequence

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Originally published as: Staerker, T. S., J. Pospichal, B. Moore, M. Wehner, M. J. Corbett, C. M. Lowery, M. C. Pope, and A. D. Donovan, 2016, Biostratigraphy for understanding stratal surfaces and facies variability in the Eagle Ford Group of South and West Texas: Gulf Coast Association of Geological Societies Transactions, v. 66, p. 1057.

**boundaries and the spatial variation of these stratal surfaces, a clear differentiation of eustatic versus sub-regional uplift controls on sedimentation within the play can be achieved. Within this context, the controversial Eagle Ford to Austin Formation boundary and importance of the Langtry Member of the Upper Eagle Ford is also discussed.**