
Petroleum Geology of the Mississippi Canyon, Atwater Valley, Western DeSoto Canyon, and Western Lloyd Protraction Areas, Northern Deepwater Gulf of Mexico: Seals, Source Rocks, Generation, and Accumulation: Preliminary Results

Paul Weimer¹, Renaud Bouroullec^{1,2}, Veit Matt^{1,3}, James Adson⁴,
Aaron van den Berg^{1,5}, Todd Lapinski^{1,6}, and John Roesink^{1,7}

¹Energy and Applied Minerals Research Center, Department of Geological Sciences,
University of Colorado, UCB 399, Boulder, Colorado 80309

²TNO, Princetonlaan 6, 3584 CB, Utrecht, The Netherlands

³ConocoPhillips, 600 N. Dairy Ashford Blvd., Houston, Texas 77079

⁴Level 3 Communications, 1025 Eldorado Blvd., Broomfield, Colorado 80021

⁵BP Exploration, P.O. Box 4381, Houston, Texas 77210

⁶Anadarko Petroleum, 1201 Lake Robbins Dr., The Woodlands, Texas 77380

⁷Jagged Peak Energy, 1125 17th St., Ste. 2400, Denver, Colorado 80202

GCAGS Explore & Discover Article #00043*

http://www.gcags.org/exploreanddiscover/2016/00043_weimer_et_al.pdf

Posted September 13, 2016.

*Abstract extracted from a full paper published in the *GCAGS Transactions* (see footnote reference below), which is available as part of the entire 2016 *GCAGS Transactions* volume via the GCAGS Bookstore at the Bureau of Economic Geology (www.beg.utexas.edu) or as an individual document via AAPG Datapages, Inc. (www.datapages.com), 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.

ABSTRACT

The Tithonian petroleum source-rock in the Mississippi Canyon and northern Atwater Valley protraction areas of the northern deepwater Gulf of Mexico were modeled to evaluate the timing of generation and migration in relation to the age of reservoirs and timing of trap development. Source rocks include the Oxfordian, Tithonian, and Lower Cretaceous intervals. Basin modeling results indicate that the source rocks began to generate large volumes of oil during the middle Miocene (15 Ma). Today, about one-half of the source rocks are within the oil window. The upper to middle slope regions are in the dry and wet gas windows, respectively, and a small part of the abyssal plain reside in the microbial gas window. The study area includes 84 fields and discoveries, 15 of which are subsalt.

The results indicate that most of the reservoir sands 50 fields were deposited after oil generation had begun for the Tithonian source rock, as well as most of the traps for 53 fields. The fields are primarily in the central and western part of the study area, where thick overburden is present and where extensive deformation of the allochthonous salt occurred. Most of the remaining fields are found in the eastern part of the study area, where the overburden is thinner (later oil generation), and fewer structures are

Originally published as: Weimer, P., R. Bouroullec, V. Matt, J. Adson, A. van den Berg, T. Lapinski, and J. Roesink, 2016, Petroleum geology of the Mississippi Canyon, Atwater Valley, western DeSoto Canyon, and western Lloyd protraction areas, northern deepwater Gulf of Mexico: Seals, source rocks, generation, and accumulation: Preliminary results: Gulf Coast Association of Geological Societies Transactions, v. 66, p. 601–624.

present. These overall trends are controlled by the evolution of the Neogene depocenters, which migrated northwest to southeast through time, differentially loading the allochthonous salt systems.