

Petroleum Club, 800 Bell (downtown)

Social 11:15 a.m., Lunch 11:45 a.m.

Cost: \$25 Preregistered members; \$30 Nonmembers & Walk-ups

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by Thomas E. Ewing
Venus Exploration, Inc., 1250 NE
Loop 410, San Antonio TX 78209

Review of Late Jurassic Depositional Systems and Potential Hydrocarbon Plays, Northern Gulf of Mexico Basin

Abstract

Post-salt Upper Jurassic siliciclastic and carbonate rocks in the East Texas–North Louisiana–Mississippi region record the early post-rift evolution of the Interior Zone rift basins of the northern Gulf of Mexico Basin. Four major river systems were fixed in space but variable in supply rate; they carried sand and mud in from the northwest (ancestral Red River), the north (ancestral Ouachita River), the northeast (ancestral Mississippi River), and the east (ancestral Alabama River). Shoal-water carbonate deposits formed when siliciclastic inputs were low and shallow-water, high-energy conditions prevailed—usually in association with basement highs, salt swells and abandoned deltaic shelf margins.

Smackover shoal-water carbonates formed within an extensive carbonate ramp from south-central Arkansas to central Texas and were influenced by initial salt movement. Subsequent Haynesville-age Gilmer carbonate shoals in Texas rimmed rift-related high blocks, as well as highs formed by early salt movement. Siliciclastic sedimentation progressively dominated east of Shreveport, and submarine fans developed in association with a lowstand episode. During early Cotton Valley time, a major southeastward advance of the ancestral Red River delta formed the Taylor and Bossier sand series, while to the east, lower Terryville shoreline sands began to prograde southward in front of an expanding lagoon. During late Cotton Valley time, continued clastic sedimentation formed wave-dominated deltas in Texas and upper Terryville strike-fed sandstones in north Louisiana. At the close of Cotton Valley deposition in the earliest Cretaceous, regional transgression allowed Knowles carbonates to “colonize” the abandoned shelf edge and form a thick shelf-

edge reef complex on its seaward slope. The significant “Calvin” lowstand wedge of sandstones was deposited offshore of this edge in Louisiana during a subsequent major sea-level fall, and was then covered by Winn carbonates deposited during the subsequent sea-level rise.

High-potential exploration plays remain in Upper Jurassic strata. Smackover and Buckner/Gilmer shoals have produced over 10 trillion cubic feet of gas (TCFG) and 750 million barrels of oil (MMBO) in East Texas and North Louisiana, but large segments of the complex atolls along the Sabine Uplift have not been defined. Complex shoals may rim old rift-related highs such as the Sabine and Wiggins highs. The Gilmer (“Cotton Valley Lime”) pinnacle reefs of the Robertson-Leon trend may develop (in one form or another) over a broad swath of east-central Texas into westernmost Louisiana. Haynesville-age submarine fans may extend eastward into Mississippi. Updip Cotton Valley is an established 10-TCF tight-gas sandstone play in Texas and Louisiana, but its basinward extensions have high untapped potential. Significant high-quality Upper Cotton Valley production similar to the North Louisiana “blanket sands” may still be found in central Mississippi. The earliest Cretaceous (Knowles/Calvin/Winn) margin is poorly tested. Calvin-like sandstones of the lowstand wedge should occur in east-central Texas and in southwestern Mississippi.

Biographical Sketch

DR. THOMAS EWING is a geologist and geophysicist with 21 years of experience in hydrocarbon exploration and research in geology and geophysics. He received a BA in Geology from the Colorado

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College in 1975, an MS in geochemistry from New Mexico Institute of Mining and Technology in 1977, and a PhD in geological sciences from the University of British Columbia in 1981. Dr. Ewing was a research geologist for over four years at the Texas Bureau of Economic Geology. While there he was in charge of geologic analysis of Gulf Coast geopressured reservoirs and geothermal resources, served as a co-author of the "Atlas of Texas Oil Reservoirs", and served as compiler of the Tectonic Map of Texas. Since 1985 he has been co-owner with Linda Ewing of Frontera Exploration Consultants, Inc., a San Antonio-based consulting company. He has worked with Venus Exploration, Inc. since 1985 for its ongoing, successful exploration efforts in the Yegua Trend of the Gulf Coast Basin, Cotton Valley trend of Texas and Louisiana, West Texas, and Kansas; he is now a Senior Explorationist at Venus. Dr. Ewing is a member of many regional and national professional societies, is a Certified Petroleum Geologist (#4538), and served as Treasurer and Vice-President of the AAPG Division of Professional Affairs. He is an AAPG Delegate from the South Texas Geological Society, and served as Vice-Chairman of the AAPG House of Delegates in 1992-3. He also served as President of the Energy Minerals Division of the AAPG, and in that position held a seat on the AAPG Advisory Council. Dr. Ewing chaired the Edwards Aquifer Committee of the South Texas Geological Society in 1988-90, which issued a call for geologic and technology-based aquifer management. He served as President of the South Texas Geological Society in 1990-1, and as General Chairman of the 1996 GCAGS Convention in San Antonio. Tom has spoken extensively at local, regional, and national geological meetings and has authored or co-authored over 70 published papers and abstracts. Among other awards, he has twice received the Gulf Coast Section AAPG Levorsen Award (1982 and 1999), and the GCAGS Distinguished Service Award in 1993. ■