ABSTRACTS

Gulf Coastal Plain Marker Fossils in the Revised Miliolidae

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The foraminiferal family Miliolidae no longer includes the genera with a porcellaneous wall as seen in reflected light. The genera comprising the miliolids, as recently defined, have a three-fold, pitted wall and the potential of becoming the best marker genera, stratigraphically and/or environmentally, in the Gulf Coastal Plain Tertiary. The genera with the preceding characteristics are: *Miliola, Neaguites, Texina, Picouina, Helentappanella, Hemimiliola, Heteromiliola,* and *Miliolacostata*.

Of the samples studied, the Moodys Branch Formation (Eocene) and the Byram Formation (Oligocene) in Mississippi bear the largest number of individual specimens — six of the eight genera of the miliolids in the Gulf Coastal Plain. The Crystal River Formation (Eocene) and the Chipola Formation (Miocene) in Florida have a lesser number of miliolids with most having a quinqueloculine chamber arrangement that is similar to the many genera in the Lutetian of France.

The Weches Formation (Eocene) in Texas and the Cane River Formation (Eocene) in Louisiana, also in the samples studied, have two different miliolid genera, *Texina* and *Heteromiliola* respectively. The pelagic foraminifera present in the Cane River indicates that its sediment was deposited in deeper water than the Weches. The Yazoo Formation (Eocene) and the Rosefield Formation (Oligocene) in Louisiana, and the Red Bluff and Byrum Formations (Oligocene) in Mississippi also bear the miliolid genus *Heteromiliola* thus adding credence to it being an environmental marker genus for the Miliolidae.

Marker genera for the basal Eocene appears to be *Hemimiliola* and *Helentappanella*; and for the Oligocene the genera *Neaguites, Miliolacostata* and *Picouina*.

High Resolution Seismic and Core Data from Northern Gulf of Mexico Shelf Used to Develop Self-Instructional Web Sites in Sequence Stratigraphy and Reservoir Analysis

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Over 20,000 kilometers of high resolution seismic data and several hundred oil company platform borings and cores from the northern Gulf of Mexico continental shelf and upper slope are used to examine the response of different depositional systems to rising and falling sea levels during the last few glacial eustatic cycles. The study area extends from the west Florida shelf to the Rio Grande and includes a number of different fluvial valleys, deltas, paleoshoreline deposits, shelf-sand bodies and other depositional systems with different fluvial input, shelf gradient, and climatic and oceanographic settings.

A series of paleogeographic maps, coinciding with prominent seismic stratigraphic surfaces, and representative seismic sections and cores are used to illustrate how deposition varied from area to area during the last highstand, lowstand and transgression. Variations between deposits are profound. In some areas the stratigraphic section is dominated by highstand deposits while other areas are dominated by transgressive and/or lowstand deposits. Potential time equivalent reservoirs also vary along the shelf. Within a given area there is reasonable repetition of depositional patters over the several glacial eustatic cycles, so predictable trends in reservoir shape and stratigraphic position are observed. (These results are being used to develop a series of self-instructional modules on sequence stratigraphy and reservoir analysis that will soon be available on the Rice University web site.)

Examinations of MWD Wireline Replacements by Decision Analysis Methods: Two Case Histories

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Decision analysis (DA) methods were used to analyze the costs vs. benefits for MWD wireline replacement programs on two 6-well platform projects in the Gulf of Mexico. The DA on the first project indicated a cost savings between $0 - $50,000 per well could be expected, with a median probability of saving $21,000. The wells were drilled with MWD replacing wireline with total cost savings of over $240,000 for the project. The DA on the second project indicated that there was virtually a 100% chance of not realizing any cost savings, and that we could incur additional costs of up to $70,000 per well with a median probability of an additional $29,000 cost per well. It was decided to not use MWD to replace wireline on this project, which turned out to be a prudent decision as drill pipe was stuck in several of the wells and a bottom hole assembly (BHA) was lost in one well.

The common cost analysis on MWD wireline replacement is usually a simple comparison of invoice costs and anticipated rig time savings. While this type of method may yield useful information regarding cost benefits, it can be misleading as it does not take into account all of the risks and diverse factors that need be considered to evaluate the economic benefits of running MWD.

Decision analysis (DA) programs are capable of incorporating variable costs, risks, and diverse factors in evaluating the possible economic benefits of running MWD. They accomplish this by performing a Monte-Carlo simulation on a range of possible outcomes and their associated costs. Comparison of one set of outcomes and associated costs (wireline logging) to another set of outcomes and costs (MWD replacement) is then possible. Since risk is incorporated into this type of analysis, a more accurate picture can be obtained regarding the possible economic benefits of MWD wireline replacement.

Videomicroscopy: Linking Wellsite Geology and the Corporate Exploration Team

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Videomicroscopy is a relatively user friendly, computerized process that generates video images from well bore cuttings viewed with a microscope. While drilling a well, cuttings from the well bore are collected at the shale shaker every 10-30 feet. This 'sample' of the well bore cuttings is washed, sieved, drained, and placed on the well-lighted stage of a microscope for identification and description. Utilizing videomicroscopy, the image acquisition process is accomplished by positioning the sample under a microscope equipped with a video camera and the appropriate lens(es), focusing the microscope, and capturing still images from the live video signal. The resolution of the image depends or the hardware capability and software settings, the magnification of the image depending on the microscope and lenses.

Using videomicroscopy at the wellsite, cuttings are imaged at both low and high magnification, then saved onto disk. Images from the cuttings may be transmitted directly from the wellsite via modem to a remote location within 20 minutes from the time the cuttings are first collected at the shaker, or a digital "morning report" may be prepared and transmitted daily, which contains images of the previous day's cuttings. As a result of videomicroscopy, drilling information, microfossils and other lithologic information from the wellsite, important to engineers and explorationists, may be easily examined and influence decisions which have in the past required much more time, effort and money to resolve.

Prolific Upper Pleistocene Gas Sands: Southeastern High Island and Southern West Cameron Additions, Offshore Northern Gulf of Mexico

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Recent discoveries by Burlington Resources in the Southeastern High Island and the Southern West Cameron Additions, offshore Texas and Louisiana, have confirmed the presence of thick, stacked Upper Pleistocene gas sand reservoirs. These new fields are located in High Island block A371 and West Cameron block 635, in water depths ranging from 380 to 400 feet. Production from the two largest reservoirs at High Island block A371 has been sustained at rates exceeding 45 million cubic feet of gas per day per completion.

Lowstand shelf-edge deltas deposited sands from 850,000 to 400,000 years ago with an east-west oriented graben system near the present-day shelf edge. Syndepositional salt movement resulted in the accumulation of thick, high quality Upper Pleistocene reservoirs within the graben and the development of the hydrocarbon traps via structural uplifts and associated faulting.

Three-dimensional seismic interpretation was a key factor in the successful drilling of both gas fields. All known gas reservoirs in the study area exhibit strong amplitude response on three-dimensional seismic data sets. These amplitudes commonly conform to the areal extents of the gas reservoirs. Gas/water contacts are often identifiable from flat spots on the seismic data. Deltaic channel axes are also recognizable with the implementation of coherency technology.

Geoscience and engineering teamwork allowed quick development of the High Island A371 field. The high percentage of drilling success combined with high volume gas completions have resulted in a project with superior economic value.

Stable-Isotopic Comparison of a Late Eocene Archaeocete Whale, *Basilosaurus cetoides*, to a Modern Cetacean, *Tursiops truncatus*

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Analysis of the stable isotopic composition of a Late Eocene whale, *Basilosaurus cetoides*, from Wayne County, Mississippi, provided oxygen isotopic values for cetacean bone phosphate, carbonate cement, and structural carbonate. The least-squares regression comparing cetacean phosphate to seawater oxygen isotopic composition (Yoshida and Miyazaki, 1991) suggests either that Gulf