

Monday, December 13, 2010

Westchase Hilton • 9999 Westheimer  
Social Hour 5:30–6:30 p.m.  
Dinner 6:30–7:30 p.m.

Cost: \$28 Preregistered members; \$35 non-members & walk-ups

To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.

Pre-registration without payment will not be accepted.

You may still walk up and pay at the door, if extra seats are available.

## HGS General Dinner Meeting

**Phil Gregory**

Shell

Brazil Deepwater Development Team  
Houston, Texas

# Deepwater Depositional Processes and Stratigraphy of the Atlanta Field: Santos Basin, Block BS-4, Offshore Brazil

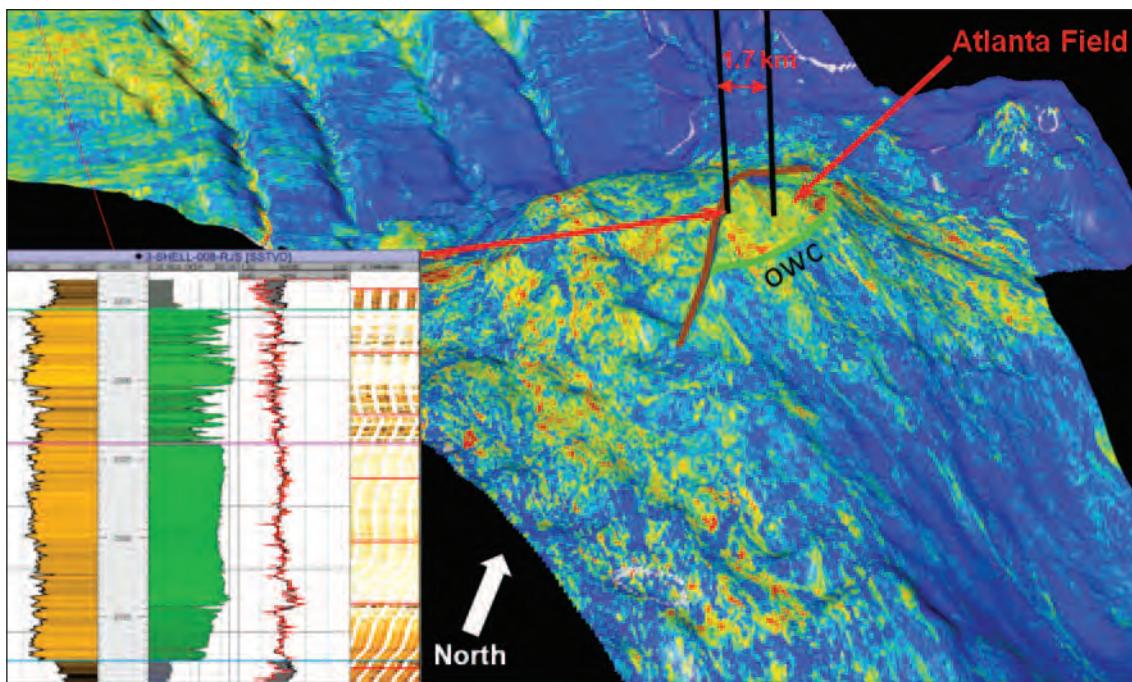
The Atlanta Field, located in the northern Santos Basin, offshore Brazil, is a world-class turbidite reservoir with over 1.5 billion barrels of heavy oil in place. The 115 meter thick, high net-to-gross reservoir, exhibits porosities over 35% along with multi-darcy permeability. The Eocene age, shallow reservoir (-2400 m) is well imaged on 3-D seismic, including a "textbook quality" seismic flat-spot defining the oil-water contact. The field was discovered in 2001 and has been appraised with three additional well bores. An additional appraisal well followed by a phased development is currently planned.

The Atlanta reservoir is part of a 600 km<sup>2</sup> channelized slope apron complex deposited on a stepped-slope topography during the Eocene. The slope apron was fed through several southeast-trending slope channels and is interpreted to have been sourced by the collapse of nearby shelf-margin deltas. Within the lower

reservoir section, seismic interpretation reveals a broad incised valley with nearly 100% net-to-gross sand fill. Within that incised valley fill, stratal slicing shows systematic migration patterns that are more often seen in steeper slope channels and are unusual in a low-gradient and sand-rich setting. These pass upward into more distributary channel and lobate forms. Well data show a corresponding split between lower massive sands and an upper more heterogeneous section characterized by the occurrence of shale-clast conglomerate layers within high-quality sands.

Despite the good reservoir quality, development of this reservoir presents challenges due to the viscous crude. A detailed understanding of structural and stratigraphic heterogeneity is required in order to reduce uncertainty in reservoir performance. To achieve this, a data acquisition and integrated interpretation

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3-D perspective showing seismic amplitude on the base Eocene structural surface. Warm colors depict areas of sandy turbidite apron accumulation downdip of their slope feeder canyons. Inset well log depicts the Atlanta reservoir interval in the 3-SHEL-008-RJS appraisal well

program was conducted as part of field appraisal. Interpretation of reprocessed 3-D seismic to enhance stratigraphic detail, from sub-regional down to seismic loop scale, has enabled a detailed interpretation of the geometry of this channelized apron. The observations suggest that the system was overall strongly aggradational, consisting of a limited number of channel and lobate elements. Use of borehole image logs calibrated to limited cores and coupled with a database of outcrop and subsurface analogs allows for subsurface recognition and quantification of potential baffles and barriers to flow within the reservoir. Our integrated subsurface interpretation approach provides a framework for generating multiple scenarios of the reservoir architecture and spatial distribution of key heterogeneities in the static models that will be used to forecast reservoir performance in this sand-rich turbidite system. ■

**Biographical Sketch**

**PHIL GREGORY** is a geologist in Shell's Brazil Deepwater Development Team in Houston, TX. He is currently involved in reservoir modeling in both the Campos and Santos deepwater basins. Mr. Gregory began his career in 1981 with Texaco in New Orleans where he worked a variety of exploration and development projects in both the onshore and offshore Gulf of Mexico Basin. After joining Shell in 2002, he worked on several development projects in the deepwater Gulf of Mexico before joining the Brazil Team in 2006. Mr. Gregory holds both B.S. and M.S. degrees from Memphis State University and is an active member of both the HGS and AAPG.

