

Tuesday, May 19, 2009

Crowne Plaza Hotel - Greenspoint (former Sofitel)
425 North Sam Houston Pkwy E

Social 11:15 AM, Luncheon 11:30 AM

Cost: \$31 pre-registered members; \$35 for non-members & walk-ups; Emeritus/Life/Honorary: \$14; Students: FREE

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 Northsiders Luncheon Meeting

Bob A. Hardage
Senior Research Scientist
Bureau of Economic Geology,
Austin, Texas

HGS Northsiders Luncheon Meeting

Deepwater Hydrates in the Gulf of Mexico

Hydrates are found in shallow, near-seafloor sediments in most deep-water environments. The source of the hydrocarbon gases that form these hydrates can be biogenic or thermogenic in origin. In prolific hydrocarbon basins such as the Gulf of Mexico, thermogenic gases can make a significant contribution to deepwater hydrate systems, particularly when there are vertical permeability pathways for deep gases to migrate upward to the seafloor where pressure and temperature conditions are optimal for hydrate stability.

Scientists at the Bureau of Economic Geology have developed unique methods for studying deepwater hydrates across the Gulf of Mexico. In these studies, four-component ocean-bottom-cable (4C OBC) seismic data are used to produce high-resolution P-P and P-SV images of near-seafloor geology. The energy source used to generate the 4C OBC data is a standard air-gun array towed at a depth of a few meters. Although this system generates an illuminating wavefield with frequencies of less than 200 hertz, geological detail as small as one meter can be imaged using proper data-processing procedures.

This discussion will explain how hydrates are embedded in near-seafloor sediment, illustrate the nature of the hydrate targets that are to be imaged, show how high-resolution target imaging is achieved, describe how P-wave and S-wave seismic attributes are used to estimate hydrate concentration, and compare seismic estimates of hydrate concentration with estimates calculated from resistivity logs at calibration wells. ■

Biographical Sketch

BOB HARDAGE is Senior Research Scientist at the Bureau of Economic Geology and founder and Principal Investigator of the



Chunks of gas hydrates recovered from the sea floor in the Gulf of Mexico in 2002. Photograph source: United States Geological Survey.

Exploration Geophysics Laboratory (EGL). EGL focuses on the development and application of multicomponent seismic technology. Before moving to the Bureau in 1991, Mr. Hardage was Exploration Manger for Asia/South America at Phillips Petroleum Company and Vice President of Marketing and Geophysical Development at Western Atlas. He has written three books on seismic topics, published numerous papers in technical journals, and teaches short courses and workshops at several venues each year. He is past Editor of *Geophysics*, writes the monthly "Geophysical Corner" column for the *AAPG Explorer* magazine, and is current First Vice-President of the SEG Executive Committee.

