Monday, December 8, 2008

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

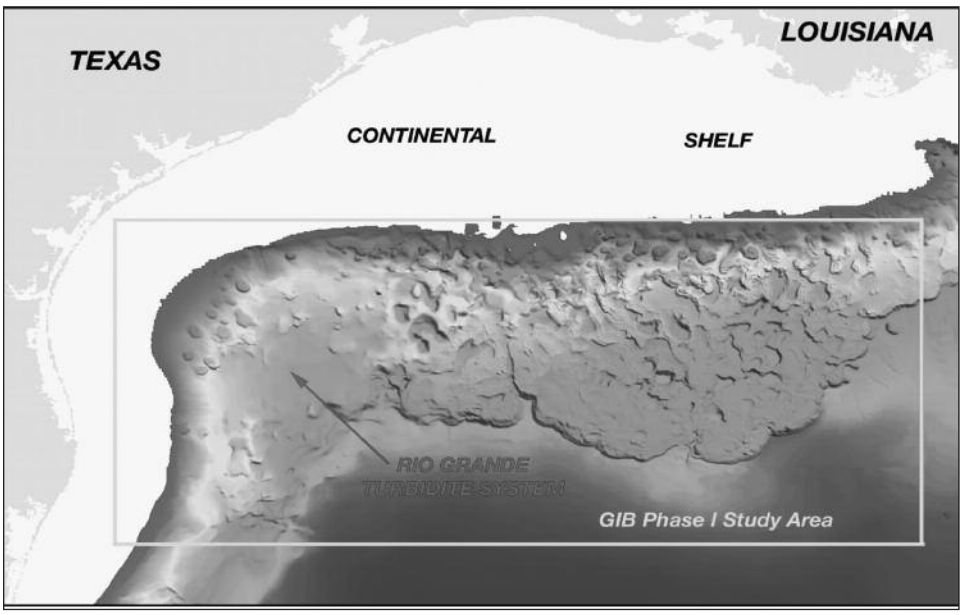
To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

C. Hans Nelson
CSIC University of Granada and Department of Earth and Environmental Sciences, University of Texas at Arlington
John E. Damuth
Department of Earth and Environmental Sciences, University of Texas at Arlington
Hilary Clement Olson
Institute for Geophysics, Jackson School of Geosciences, University of Texas at Austin
David C. Twichell
U. S Geological Survey, Woods Hole, MA
Carlota Escutia
CSIC, Instituto Andaluz de Ciencias de la Tierra, University of Granada, Spain

Modern Turbidite System Depositional Patterns as Analogs for Subsurface Petroleum Plays in the Northern Gulf of Mexico

Several analogs of known ancient depositional patterns are observed in modern turbidite systems of the northern Gulf of Mexico (GOM). Bryant Canyon/Fan feeds through a chain of mini-basins (2 to 15 kilometers in diameter) that exhibit seismic facies of: 1) mass-transport deposit (MTD) wedges of chaotic mud and sheets of chaotic mud and sand, 2) incised, ponded, and perched turbidites, and 3) bypass channelized facies. The mini-basin pathway of Bryant Canyon, which traps mud, has resulted in non-bifurcated aggrading channels that extend 200 kilometers across the sand-rich Bryant Fan to feed single distal depositional lobes which are approximately 30 kilometers in length. The Bryant mini-basin and fan patterns provide analogs for the Miocene systems in the Mississippi Canyon area. In contrast, the mud-rich Mississippi Delta and its associated 20-kilometer-wide gullied canyon sediment source have resulted in multiple mid-fan channel bifurcations and outer fan channel splays in 200-kilometer-long lobes of the mud-rich Mississippi Fan.

The Bryant mini-basin and fan patterns provide analogs for the Miocene systems in the Mississippi Canyon area.

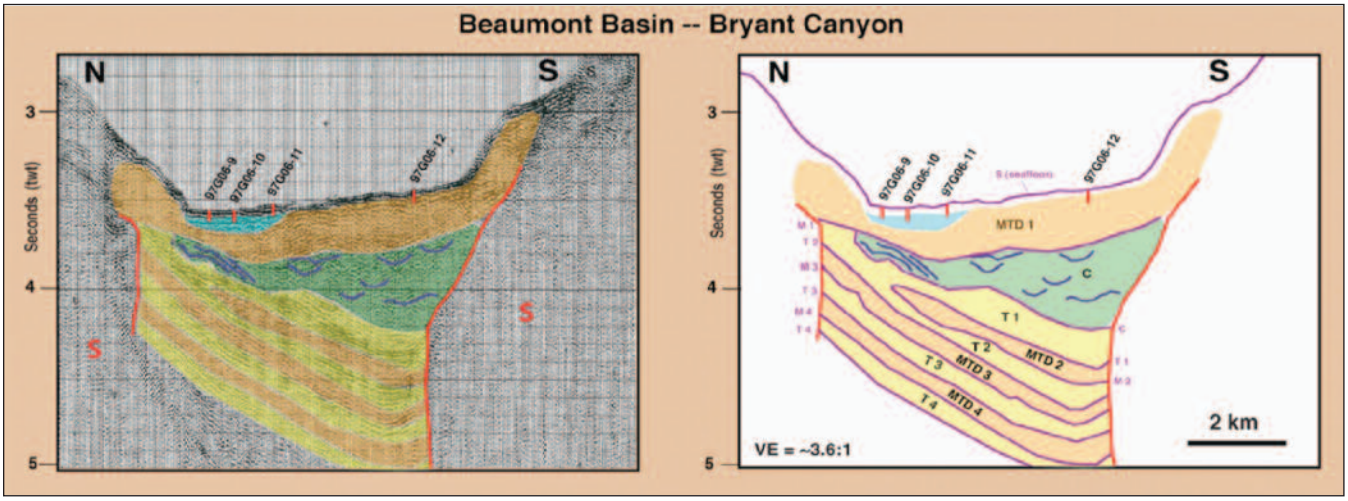


Seafloor relief map by Lui and Bryant

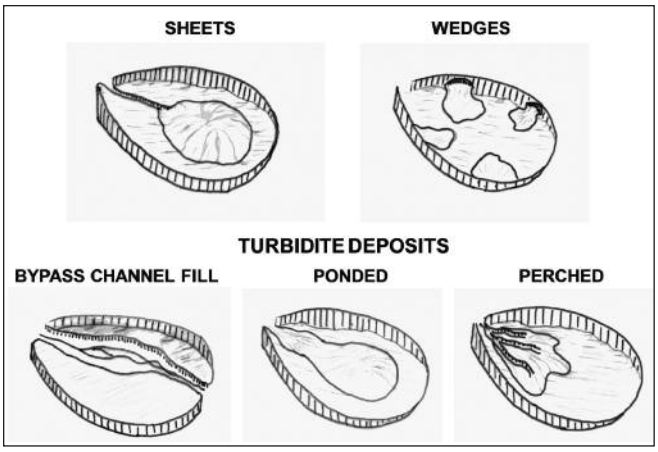
Extensive MTDs, ranging in size from 400-kilometer-long debris sheets to 10-centimeter thick MTD beds, were deposited during lowering and rising sea level episodes and are intermixed with the channel and lobe turbidite deposits. Similar to Bryant Canyon and Mississippi Fan, the intermixing of turbidites and extensive MTDs is found in some subsurface turbidite systems of the GOM margin. The Rio Grande Fan is a contrasting braided fan analog for some Paleogene subsurface

HGS General Dinner *continued on page 21*

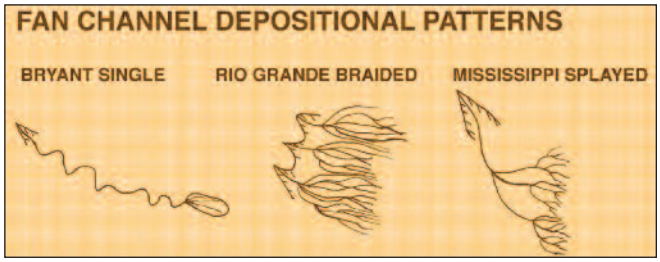
HGS General Dinner continued from page 18



Seismic Line across Beaumont Basin along the Bryant Canyon Pathway



Mini-basin depositional patterns, mass transport deposits



Northern Gulf of Mexico submarine fans
Bryant – Sand-rich, fed by canyon with mini-basins that trap muds; single sinous channel and lobe; limited MTD's & splays
Rio Grande – Sand-rich from mountain sources: multiple canyons & braided channels; lacks lobes & MTD's
Mississippi – Mud-rich, gullied canyon, meandering channels; multiple splays & lobes; half turbites and half MTD's

petroleum plays in the northwestern GOM. Multiple canyons provide coarse-grained sediment from adjacent mountain sources to deposit the fan on a continental-slope plateau. The seismic facies relatively steep fan gradient (1:250) and incised channels, rather than leveed channels, throughout the surface and subsurface show that the Rio Grande Fan is a braided sand-rich fan. ■

Biographical Sketch

Dr. Hans Nelson has a BA from Carleton College, an MS from the University of Minnesota, and a PhD from Oregon State University in geological oceanography. He spent 32 years studying continental margins as a Research Marine Geologist for the U. S. Geological Survey. His studies of resource, geologic hazards, and environmental assessment have focused mainly on turbidite systems and have resulted in nearly 200 refereed books, articles, and technical reports and approximately 160 abstracts. He has served as Chief Scientist for 30 scientific expeditions, mainly studying in Alaskan and Pacific NW seas, but also in the Atlantic, Gulf of Mexico, Mediterranean, and deep lakes such as Crater Lake, Oregon, and Lake Baikal, Russia. Dr. Nelson also has been a Visiting Professor for Stanford University, and the universities of Barcelona, Utrecht, Brest, Aberdeen, and Granada in Europe. He has given short courses in turbidite systems around the globe for professional scientific societies, universities, and petroleum companies. Dr. Nelson's current research interests as Principle Investigator focus on turbidite paleoseismology of the Cascadia subduction zone and San Andreas fault system, Gulf of Mexico intraslope basin and abyssal basin turbidite systems (GIB Project), and Antarctic turbidite systems. He also is a consultant for the Turbidite Research Group at the University of Leeds in England and for several petroleum companies.