

# Newsletter

## Comparative Sedimentology Laboratory

### New CSL Sponsors

We welcome **Schlumberger** and **BP** as new members of CSL Industrial Associate Program. The CSL now has 12 sponsors on 4 different continents.



**Schlumberger** joined the CSL shortly before last year's annual meeting. Scientists from Schlumberger are actively collaborating in petrophysical studies. Claude Signer, Austin Boyd and Jean-Baptiste Clavaud visited the CSL in late January to outline the projects. In March David McCormick and Peter Kaufman visited to discuss and give input to field oriented projects for example the fracture project with Layaan Al-Kharusi. We thank Claude Signer for his efforts to bring the company into our program.

**BP** joined the CSL this spring. Andrei Belopolsky invited members of the CSL to Houston to introduce the program. Subsequently, Art Donovan visited the CSL to see the entire group and the research facilities. He also gave a presentation to the Division about his work in siliciclastic turbidites. We thank Andrei Belopolsky, Greg Wahlman, and Art Donovan for their efforts to bring the company into our program. We also thank Andrei for his support and for the dinner invitation to the students of the CSL in Dallas. The contact person from BP to the CSL will be Carl Steffensen.

### New CSL Members

We welcome Sandra Vega, Steven Truss, Robert Otto, Eduardo Gomes da Cruz, and Kathleen Willis as new members of the CSL. Kathleen Willis and Robert Otto joined the CSL last Fall. Sandra Vega, Steven Truss, and Eduardo Gomes da Cruz started in January.

**Sandra Vega** obtained her Ph.D. in Geophysics at Stanford University. Her doctoral research focused on studying acoustical anisotropy, mechanical properties, and stress anisotropy in unconsolidated sediments.

**Steven Truss** gained a B.Sc. in Earth Sciences at the Open University in 2000. Since then he has been researching for his Ph.D. at the University of Leeds in the UK, where he has been using Ground Penetrating Radar and Time Domain Reflectometry to investigate sedimentary structure, hydrogeology and flow



Sandra Vega



Steven Truss

mechanisms in the Triassic Sherwood Sandstone aquifer of Northeast England.

**Sandra Vega** and **Steven Truss** are working as Post-Doctorate Associates with Mark Grasmueck on the project "Definition of Litho- and Hydro-Stratigraphic Elements of the Miami Oolite Carbonates with 3D/4D Ground Penetrating Radar".

**Eduardo Gomes da Cruz** is a sedimentologist from Petrobras. He came from Rio de Janeiro (Brazil) to work on his Ph.D. with Gregor Eberli.

## Comparative Sedimentology Laboratory



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groups/csl/index.htm](http://mgg.rsmas.miami.edu/groups/csl/index.htm)



**Eduardo Cruz**



**Robert Otto**

**Robert Otto** received his A.B in Geology from Colgate University. He was recently chased out of the NW Great Bahama Bank during a research cruise under the threat of Hurricane Isabel. At the moment he is teaching introduction to marine geology lab as well as enjoying his first year at RSMAS. He will be conducting his Ph.D. research with Peter Swart.

**Kathleen Willis** received her M.S. in Geology from the University of Texas at Dallas. Currently she is working on her Ph.D. with Gregor Eberli and Peter Swart on carbonate diagenesis and platform evolution.

Previously she worked in International Exploration and Development in West Africa, Indonesia and the Middle East. Lived in Jakarta, Indonesia for seven years working on acreage offshore Northwest Java, Malacca Straits, and East Java.



**Kathleen Willis**

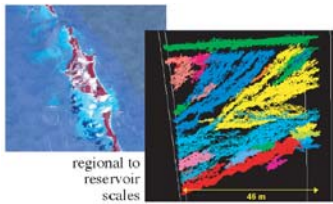
## 2003 Sponsors Meeting Fieldtrips

Don McNeill, Gregor Eberli, and Mitch Harris (thank you) led a group of 17 CSL sponsors on a field seminar to the Exuma Island last October. The theme of the trip was bank-margin sands and the Exuma's provided an excellent example of ooid-peloid sand deposits. Calm seas and beautiful weather added to the success of the fieldtrip.





## Comparative Sedimentology Laboratory



## Research Program Prospectus for 2004



available online

[http://mgg.rsmas.miami.edu/  
groups/csl/index.htm](http://mgg.rsmas.miami.edu/groups/csl/index.htm)

## 2004 Research Projects

### Carbonate Systems and Reservoir Characterization

Patterns and Processes in Modern Carbonate Grainstone Systems.

Sedimentologic, Hydrodynamic and Facies Relationships of a Complex, Evolving Coastal System: Cape Sable, South Florida.

3D/4D GPR Imaging of Sedimentary Structures and Fractures at Submeter Resolution.

Three-Dimensional Sedimentologic Architecture of the Miami Oolite.

Facies and Geometry of Mixed Sedimentation on an Isolated Carbonate Platform: Bocas del Toro Basin, Panama.

Relations Among High-Resolution Sequence Architecture, Diagenesis, and Mechanical Characteristics of Outcropping Lower Carboniferous Grainstones, Missouri.

Quantitative Analysis of Flexural and Tectonic Subsidence and Eustasy on the Stratigraphic Architecture of a Carbonate Ramp: the Madison Group, Idaho, Wyoming, and Montana.

Relationship Between Fractures and High-Resolution Sequence Stratigraphy.

The Demise of Shallow-Water Platforms in the Bahamas.

### Petrophysics of Carbonates

Parameters Controlling Petrophysical Heterogeneity of Bank-Margin Grainstones, Ocean Cay, Bahamas.

Permeability in the Miocene Marion Plateau Platforms.

Quantifying 3-D Pore Geometry and its Effects on Ultra Sonic Velocity and Permeability in Carbonates.

Saturation Effects on Velocity in Carbonates.

Sonic Velocity and Permeability of Dolomites.

Origin of Uranium Anomalies in Carbonate Rocks.

### Geochemistry and Diagenesis of Carbonates

Surface Sediment Mapping of the Bahamas.

Lower Mississippian Carbonate Geochemistry: Montana and Wyoming.

Geochemistry of Dolomitization and its Relationship with Sequence Stratigraphy.

**Sponsors Meeting 2004**

**September 20-21**

*followed by a fieldtrip to the*

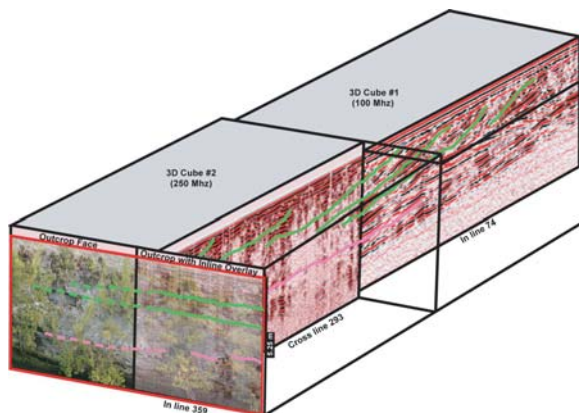
**Paradox Basin**

**September 22-25**



**Detail information on page 5**

**Definition of Litho- and Hydro-Stratigraphic Elements of the Miami Oolite Carbonates with 3D/4D Ground Penetrating Radar**



This figure shows an outcrop photo and two ground penetrating radar cubes.

The bedform geometry seen in the outcrop are brought into the 3rd dimension with the ground penetrating radar cubes.

The green lines show the prograding shoals, the pink line shows a primary bounding surface.



Drilling team working to get a core from the Miami Oolite that would be used for ground-truthing the GPR data and laboratory measurements.

**AAPG 2004 Posters and Oral presentations**

Hydrothermal Brecciation Associated with Calcite Precipitation and Permeability Destruction in Mississippian Carbonate Reservoirs, Montana and Wyoming.

Using High-Resolution Ground Penetrating Radar to Investigate the 3-D Sedimentologic Architecture of the Pleistocene Miami Oolite.

Characteristics of an Unusual Reservoir Facies in the Lower Cretaceous Cogollo Group, Maracaibo Platform, Venezuela.

Gassmann Revisited: Variations in Dynamic Shear Modulus of Carbonate Rocks.

A New Look at the Distribution and Geochemistry of Surface Sediments from the Bahamas.

Enhanced Porosity Development in the Arab-D as a Result of Alteration by Hydrothermal Fluids.

Morpho- and hydrodynamic evolution of a rapidly changing carbonate coastal system, Cape Sable, Southwest Florida.

## PARADOX BASIN FIELD TRIP

September  
22-25  
2004

A 3-day fieldtrip in connection with the annual meeting is planned to the ancient carbonates in the Paradox Basin

The theme of the fieldtrip is:

Outcrop To  
Subsurface  
High Resolution  
Sequence  
Stratigraphy of  
the Mixed  
Carbonate/Silici  
clastic Systems,  
Paradox Basin,  
U.S.A.

Upper Paleozoic rocks in the Paradox basin of southwestern Colorado and southeastern Utah contain large hydrocarbon resources in subtle stratigraphic traps within a cyclic deposition of mixed carbonates, siliciclastics and evaporites. Deeply incised canyons along the San Juan River provide spectacular exposures of rocks lateral to the oil producing reservoirs in the nearby subsurface. We will utilize these outcrops to examine the mixed carbonate-siliciclastic-evaporite depositional system that may be analogous to other oil producing basins. We will pay particular attention to the cyclic nature of Pennsylvanian strata and the vertical and lateral variations of reservoir and associated facies. In particular, we will observe the dimensions and heterogeneities of an exhumed algal mound field and relate it to subsurface data.

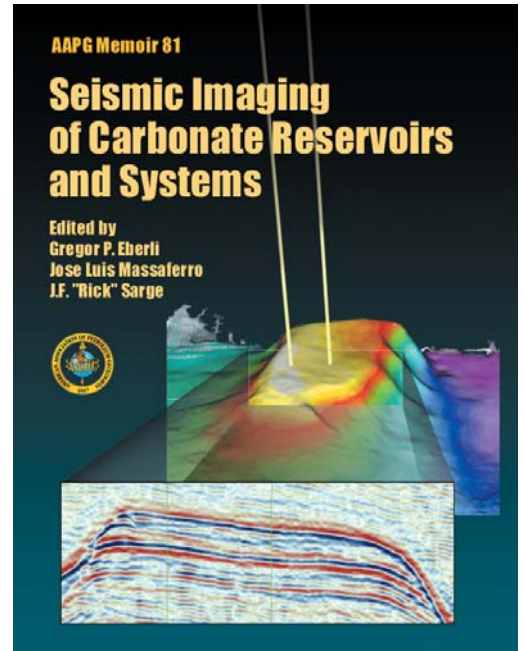
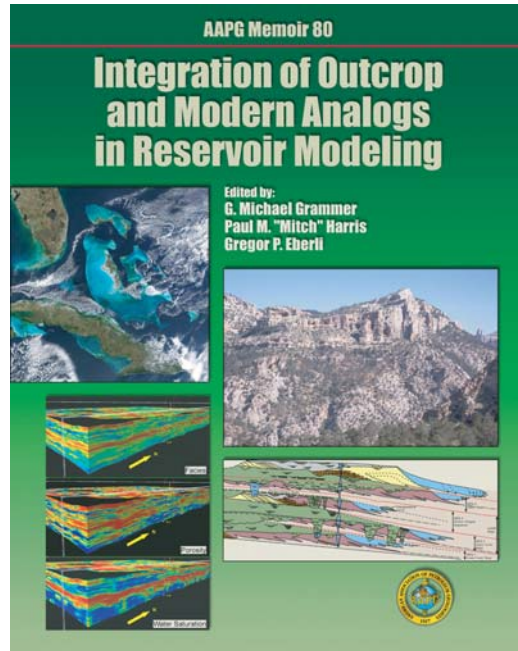
The goal of the field trip is to demonstrate how outcrop and subsurface data are integrated to develop reservoir models and in particular within the context of a predictive sequence stratigraphic framework. We will present the results of this year's fracture study in the basin. 3-D seismic data from a producing field will provide the subsurface data to discuss the exploitation strategy in these systems and compare to the production strategy in the Aneth Field. Geological, seismic and petrophysical data are integrated with the geology to refine and validate geologic concepts and develop an understanding of interwell- and reservoir scale heterogeneities.

With river rafts, we will reach the algal mound field at 8-Foot Rapid to examine their dimensions and architecture. The vertical facies successions and cyclic nature of the strata will be studied in sections at Raplee Anticline and Honaker Trail. These field sections will be used as points for discussion the significance of lateral and vertical variability observed in outcrop for the exploration and production history in the basin. In addition, we will discuss how high resolution sequence stratigraphy is applicable to exploration and producing ventures worldwide.

**NEW**

AAPG is printing two Memoirs that were put together by friends of the CSL

Both publications are in print at AAPG and hopefully they will be available in the bookstore within the next month



**Memoir 80 "Integration of Outcrop and Modern Analogs in Reservoir Modeling"** is edited by **Mike Grammer, Mitch Harris** and **Gregor Eberli**. This publication provides an overview of current approaches used in the development of geologically-constrained and integrated reservoir models using the comparative sedimentology approach. Each of the 18 papers addresses various stages in the process of creating a reservoir model through the development and incorporation of an analog, extracting the quantitative input parameters on lateral and vertical variability, and the development and modification of a 3-D reservoir model based upon geologically-constrained data.

**Memoir 81 "Seismic Imaging of Carbonate Reservoirs and Systems"** is edited by **Gregor Eberli, Jose Luis Massaferrro, and Rick Sarge**. The book emphasizes the newest approaches in seismic visualization, seismic sedimentology and stratigraphy, seismic attribute analysis and their application for building improved 3-D reservoir models. Among the topics covered are the delineation of the complex histories of carbonate platform sequences from seismic data, the relationships between geometries and forming processes, the imaging of faults for improved mapping of potential fluid migration pathways, and use of seismic attributes for the extraction of rock properties in the sedimentary bodies. The book illustrates the power of integrating seismic and geological data to better predict the architecture and heterogeneities in carbonate depositional systems.