

# Caribbean Basins, Tectonics, and Hydrocarbons Phase III

Principal Investigators:  
Paul Mann, University of Houston, USA & Alejandro Escalona, University of Stavanger, Norway  
<http://cbth.uh.edu>

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## What's New

As the summer progresses, the students and staff of the CBTH project have been keeping busy at UH, UiS, and targeted internships. Here's some of what we've been up to.

### Welcome new CBTH project sponsors

We would like to welcome Spectrum and Ecopetrol ICP as new sponsors. The CBTH project now has 15 sponsors that employs a total of 7 staff and 16 students at UH and in Stavanger. We appreciate your continued support!



### CBTH at AAPG Long Beach 2012

This year at the AAPG convention in Long Beach, California, Tricia Alvarez, Rocio Bernal, Luis Fernando Pachon, Lucia Torrado, and Paul Mann presented their work in oral and poster sessions. Tricia Alvarez served as a co-convenor of her session entitled "Exploration in Salt and Deep-water Structural Systems." Also at AAPG, the project held its annual AAPG luncheon at Gladstone's Restaurant right along the pier on scenic Long Beach. Thanks to everyone who came out to see us!

### UH Imperial Barrel Award Team Places 3rd

The UH IBA team placed third at the Gulf Coast IBA regional competition of 10 universities on March 30. CBTH student Bryan Ott was a member of this group and the team was co-advised by CBTH PI Paul Mann. While not directly related to the CBTH project, the IBA team used the CBTH work area and facilities at UH as their base of operations for meetings, work sessions and practice talks.

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## What's New

### CBTH Internships for Summer 2012

Targeted sponsorship means that the sponsoring company is allowing the student all or part of their time at the internship to work on their MS or PhD project.

**Javier Sanchez** – Shell, Houston (targeted: Northern Colombia)

**Lucia Torrado** – Shell, Houston (targeted: Llanos basin, Colombia)

**Kyle Reuber** – Spectrum, Houston (targeted: N. Brazilian margin)

**Alex Dale** – Statoil, Houston (targeted: Bahamas platform)

**Catalina Moreno** – TGS, Stavanger

**Luisa Restrepo** – Statoil, Trondheim

### Undergrad CBTH hires for summer 2012

We hired four UH undergrad geology or geophysics majors for this summer who are working under the supervision of GIS specialist, Murad Hasan. Most were selected from a group of students from Paul Mann's UH undergrad field methods class and have excelled in two UH classes: Intro to GIS and Intro to Remote Sensing. Their CBTH duties will include making a high resolution DEM for the CBTH region and helping to georeference maps and other data for the CBTH database. We look forward to working with these students on the CBTH project as they approach graduation from UH.

### CBTH Meetings with Sponsors

Over the past few months, the CBTH project has met with numerous sponsors and potential sponsors including Shell, BP, and ConocoPhillips to provide updates on student research and CBTH deliverables. If you'd like to schedule a meeting with your company, please contact us.

## 2012 CBTH Year-End Meeting

### Meeting Date Set

The CBTH Year-End Meeting has been set for Friday, September 21, 2012 at the University of Houston. Students and staff from the University of Houston and the University of Stavanger will present their research as a part of CBTH Phase III, Year 1. At this time, CBTH Phase III, Year 1 deliverables will also be signed out to sponsor representatives. The location is yet to be determined, but check back on the CBTH website for updates.

### CBTH App and PaleoGIS Workshops

On Thursday, September 20, 2012, the CBTH Project will host two workshops in the CBTH research lab at the University of Houston one day prior to our annual meeting. In the morning, Murad Hasan and Jeff Storms will host an overview of the CBTH database and the newly designed CBTH App, a cutting-edge web-based mapping software hosted on our website that allows sponsors to create high-resolution, presentation-worthy maps of all CBTH data since 2005. In the afternoon, Lisa Bingham, and Ian Norton with Karen Meinstein from the Rothwell Group will host a PaleoGIS workshop, which will cover how we use PaleoGIS in our research and how sponsors can use the CBTH database in reconstructions. There will be a theoretical discussion of plate reconstructions and how the GIS extension is used. The workshop will not cover how to create and edit plate models and is not intended to be an introduction to GIS. The workshop will use ArcGIS 10. Seating will be limited, so please e-mail us in advance if you wish to attend. We encourage participants to attend both workshops.

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## 2012 CBTH Year-End Meeting

### Preliminary List of Presentations

1. Tricia Alvarez - "Systematic variations in the age and thickness of subducting crust as a control on regional structural variations at the subduction-to-strike-slip-transition zone of the Southeastern Caribbean and implications for hydrocarbon prospectivity."
2. Rocio Bernal - "Defining the geometry of the subducting Caribbean slab beneath northwestern Colombia and its controls on the overriding Lower Magdalena forearc basin"
3. Lisa Bingham - "A new heat- flow compilation and Error propagation of petroleum exploration favorability model"
4. Luisa Campino - "Tectonostratigraphic evolution of the Tumaco Basin-Colombia"
5. Nestor Cardozo - "Flexural modeling of a Cenozoic foreland basin: The Llanos Basin of Colombia, Northwestern South America"
6. Irina Chursina - "Sinu accretionary prism, offshore Colombia: Structure, palaeohistory, fluid migration, implications for hydrocarbon exploration"
7. Alex Dale - "Seismic reflection-gravity-magnetic transects across the Bahamas platform"
8. Brendan Figueira - "Examination of the spatial and temporal evolution of a complex transition zone in the southern Gulf of Paria, Trinidad-Venezuela"
9. Murad Hasan - "CBTH database & web application"
10. Paul Mann – Major tectonic phases in hydrocarbon basins of eastern Mexico and western GOM
11. Catalina Moreno - "Tectono-stratigraphy of the southern Llanos basin"
12. Ian Norton & Alejandro Escalona - "Jurassic-recent plate tectonic reconstructions of the circum Caribbean and Gulf of Mexico regions"
13. Bryan Ott - "Structural and stratigraphic studies of the eastern Nicaraguan Rise: Initial findings from reprocessed 2D seismic data from Jamaica"
14. Luis Pachon - "3D flexural model of Putumayo foreland basin, description and implications for presence of forebulge"
15. Kyle Reuber - "Tectonic and structural controls on basin evolution and petroleum systems of the offshore Barreirinhas basin, northern Brazil."
16. Javier Sanchez - "Timing of Cenozoic convergent tectonics in northwestern South America"
17. Jeff Storms - "CBTH Phase III, Year One: database, atlas materials, and website overview"
18. Lucia Torrado - "Non-marine Late Eocene-Oligocene sequence stratigraphy and changing fluvial style in the northern Llanos basin of Colombia."
19. Zach Wolfe - "Stratigraphic controls on the structural evolution of the Sierra Madre Oriental fold-and-thrust belt, eastern Mexico"



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## New CBTH Students at the University of Houston



Luis Carlos  
Carvajal

Luis Carlos is a geologist from the National University of Colombia who started his MS degree in summer 2012 at UH as a CBTH Graduate Research Assistant. His MS study will be developed in the Los Cayos Basin, Northwest offshore Colombia. In his study, he will interpret more than 13,000 km of offshore data that was shared by Spectrum and ANH. His study will include regional modeling, depth maps, hydrocarbon potential analysis, and prospect analysis. Luis Carlos has worked for 3 years as an Exploration Geologist in several projects in the Llanos Basin of Colombia.

Orietta is a BS graduate in geophysics from Simon Bolivar University in Venezuela and has been working with Landmark as a software trainer in Colombia. She is currently organizing a database from the Lower and Middle Magdalena basins for her MS study that she will begin in August 2012.



Orietta Mata



Naila Dowla

Naila is an undergraduate student in the geophysics department who joined the CBTH project for a 2012 summer internship. Naila will work on compiling CBTH database materials, georeference new maps, integrate the east Mexico database, and conduct miscellaneous GIS tasks. She also holds a BA in Physics and French from UT Austin and is expected to graduate in summer 2013 with a BS degree in geophysics from UH.

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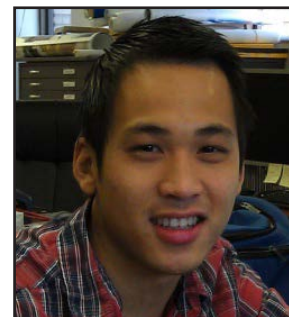
## New CBTH Students at the University of Houston



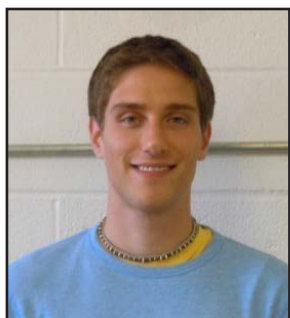
Chris Leubbert

Chris is an undergraduate student in the geophysics department and has a BS degree in math from UH. Chris joined the CBTH project for a 2012 summer internship and will work on creating a high-resolution DEM for the entire CBTH area. He will also use Crust v. 2.0 software to produce crustal thickness maps for the area. He also holds a BS in Mathematics and is expected to graduate with a BS in geophysics in spring 2013.

Luan is an undergraduate student in the geophysics department who joined the CBTH project for a 2012 summer internship. Luan will work on updating the references database, assist with researching oil seeps in the Caribbean area, compile SAR images for the region, and scan maps and research materials. He is expected to graduate with a BS in geophysics in summer 2013.



Luan Nguyen



Johnathon Osmond

Johnathon is an undergraduate student in the geophysics department who joined the CBTH project for a 2012 summer internship. Johnathon will work on updating the CBTH wells datasets and analyze tectonic uplift in Jamaica using geomorphological tools. He is expected to graduate with a BS in geophysics in summer 2013.

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## CBTH Meetings

### Recent Meetings

Brendan Figuera presented his work, "Examination of the complex transition zone in the southern Gulf of Paria, Trinidad –Venezuela," at the Copenhagen meeting of the European Association of Geoscientists & Engineers on June 4-7, 2012.

UH PhD Student Rocio Bernal and UiS PhD Student Irina Chursina presented their work at the GSA Penrose meeting "Deformation, Fluid Flow, and Mass Transfer in the Forearc of Convergent Margins" and "Sinu accretionary prism, offshore Colombia: structure, sedimentation, shale tectonics, implication for hydrocarbon exploration" respectively, in Lucca, Italy from March 28-31, 2012.

Lisa Bingham, and Catalina Moreno presented their work, "GIS-based Fuzzy Logic Analysis for Petroleum Exploration and Case Study of Northern South America " and "Inversion history of the southern area of the Llanos basin, Colombia," respectively, at the St. Petersburg meeting of the European Association of Geoscientists & Engineers on April 2-5, 2012.

### Upcoming Presentations

XI Bolivarian Symposium on Petroleum Exploration in Subandean Basins, Cartagena, Colombia, July 29-August 1, 2012. Rocio Bernal will present her work on the Lower Magdalena basin as an oral presentation at this meeting.

Fifth Geological Conference of the Geological Society of Trinidad and Tobago (GSTT) to be held in Port-of-Spain, Trinidad. Paul Mann and Tricia Alvarez, who is finishing her CBTH funded PhD study at UT Austin, will present a one day shortcourse on hydrocarbons in the Trinidad region, and Brendan Figueira will present the final results of his MSc thesis.

American Geophysical Union (AGU) Fall Meeting in San Francisco December 3-7, 2012. Paul Mann will be co-convening sessions titled "Active Caribbean Plate Margins: Integrating studies for earthquake and tsunami hazard" and "Tectonic Mechanisms for Extension along Convergent Margins".



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## CBTH Meetings

### Full List of 2012 Presentations

- Alvarez, T., P. Mann, C. Vargas, L. Wood, J. Latchman, 2012, Systematic Variations in the Age and Thickness of Subducting Crust as a Control on Regional Structure; the Barbados Accretionary Prism, the Island of Trinidad and the Associated Offshore Areas, and Implications for Hydrocarbon Prospectivity, AAPG Annual Conference and Exhibition, Long Beach, California.
- Chursina, I., A. Escalona, 2012, Frontier Exploration in Accretionary Prisms: Sinu belt Colombia, GSA Penrose Meeting, Lucca, Italy.
- Bernal-Olaya, R.D. and P. Mann, 2012, Controls on Migration of Forearc Depocenters, Lower Magdalena basin, Colombia, GSA Penrose Meeting, Lucca, Italy.
- Bernal-Olaya, R.D. and P. Mann, A. Escalona, 2012, Tectonic Controls on the Spatial and Temporal Migration of Depocenters in Forearc Basins: A Comparison of Modern and Ancient Caribbean Examples, AAPG Annual Conference and Exhibition, Long Beach, California.
- Bingham, L., A. Escalona, R. Zurita-Milla, 2012, GIS-based Fuzzy Logic Analysis for Petroleum Exploration and Case Study of Northern South America, EAGE Annual Conference, St. Petersburg, Russia.
- Figueira, B. and A. Escalona, 2012, Examination of the complex transition zone in the southern Gulf of Paria, Trinidad-Venezuela, EAGE Annual Conference, Copenhagen, Denmark.
- Mann, P., 2012, Are "uncharacteristic" earthquakes spatially linked to strike-slip restraining bends?, Fall AGU Annual Meeting, San Francisco, California.
- Mann, P., 2012, Major hydrocarbon plays in the Mexican sector of the Gulf of Mexico, the Caribbean and northern South America, SEG Annual Meeting, San Antonio, Texas.
- Mann, P., Emmet, P., Roberson, R., 2012, Crustal thinning of the continental borderland bounding the oceanic Cayman trough, Fall AGU Annual Meeting, San Francisco, California.
- Mann, P., W. Yang, A. Escalona, 2012, Regional Effects of the Cuban Arc-Continent Collision on Structure, Stratigraphy and Hydrocarbons in the Deepwater, Southeastern Gulf of Mexico, AAPG Annual Conference and Exhibition, Long Beach, California.
- Moreno, C. and A. Escalona, 2012, Inversion history of the southern area of the Llanos basin, Colombia, EAGE Annual Conference, St. Petersburg, Russia.
- Pachon, L.F. and P. Mann, 2012, Hydrocarbon Structural Traps above Inverted, Mesozoic Normal Faults in the Putumayo Foreland Basin, Southern Colombia, AAPG Annual Conference and Exhibition, Long Beach, California.
- Sanchez, C.J., and P. Mann, 2012, Thick-Skinned Style and Timing of Convergent Tectonics in Northwestern South America and Implications for Petroleum Exploration, AAPG Annual Conference and Exhibition, Long Beach, California.
- Torrado, L., P. Mann, J. Bhattacharya, 2012, Non-marine Sequence Stratigraphy and Changing Fluvial Style in the Northern Llanos Foreland Basin of Colombia, AAPG Annual Conference and Exhibition, Long Beach, California.



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## Recently completed CBTH Publications

### 2012 Thesis-Dissertations

Wolfe, Z., 2012, Stratigraphic Controls on the Structural Evolution of the Sierra Madre Oriental Fold-thrust Belt, Eastern Mexico: MSc thesis, University of Houston, Houston, 74 p.

### 2012 Publications

Bingham, L., R. Zurita-Milla, and A. Escalona, in press, Geographic Information System-based fuzzy-logic analysis for petroleum exploration with case study of northern South America: AAPG Bulletin.

Escalona, A. and W. Yang, in press, Subsidence controls on foreland basin development of northwest offshore Cuba, southeastern Gulf of Mexico: AAPG Bulletin.

Mann, P., in press, Comparison of Structural Styles and 5 Giant Hydrocarbon Occurrences<sup>6</sup> within Four Active Strike-Slip Regions: California, Southern Caribbean, Sumatra, and East China: in AAPG Memoir 100, Tectonics and Sedimentation: Implications for Petroleum Systems.

Sánchez, J., B. K. Horton, E. Tesón, A. Mora, R. A. Ketcham, and D. F. Stockli, 2012, Kinematic evolution of Andean fold-thrust structures along the boundary between the Eastern Cordillera and Middle Magdalena Valley basin, Colombia, Tectonics, 31.

Vargas, C. and Mann, P., in press, Morphologic expression of accretionary processes and recent submarine landslides along the southwestern Pacific margin of Colombia: in Submarine Mass Movements and their Consequences, edited by Y. Yamada et al., Advances in Natural and Technological Hazards Research 31.

Vargas, C., and Mann, P., in press, Tearing and breakoff of subducted slabs as the result of collision of the Panama arc-indenter with northwestern South America: Geophysical Journal International.



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## Thanks to our new and returning sponsors!

As we continue into Phase III of the CBTH project, we'd like to thank our sponsors for their ongoing support in providing data, software, funding, and knowledge to further student research in Caribbean geology. Your help has ensured a valuable education for our students and your efforts are truly appreciated.

For a list of student or sponsor contact information, please e-mail [cbthproject@gmail.com](mailto:cbthproject@gmail.com). Contact information for Dr. Paul Mann, Dr. Alejandro Escalona, and project consultant Jeff Storms is available on the front page of this newsletter. Let us know if you have any questions, comments, or concerns, and thank you for your interest in the CBTH Project!

