

# 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



### Year-End Meeting

The CBTH Project held its 2012 Annual Sponsor Meeting on Friday, September 21st at the University of Houston. The previous day, CBTH staff members Murad Hasan and Jeff Storms hosted a workshop entitled "CBTH database, website, and mapping application." On the same afternoon, staff member Lisa Bingham and allied researcher Ian Norton presented a second workshop titled, "Introduction to PaleoGIS using data from the PLATES and CBTH consortia" with the help of Rothwell Group's representative, Karen Meinstein. We'd like to thank all our sponsors and colleagues for attending and offering insights and suggestions.

### Meeting Participation

We thank the 37 industry participants in the meeting for attending along with the 20 CBTH members from UH and 4 CBTH members from the University of Stavanger. Over the course of the day, we heard 22 presentations covering areas of recent work for the CBTH group. This was followed by a general discussion on the direction of the project with the industry sponsors. We have posted a group photo of the participants on the CBTH website.

### 2012 Atlas and Data Release

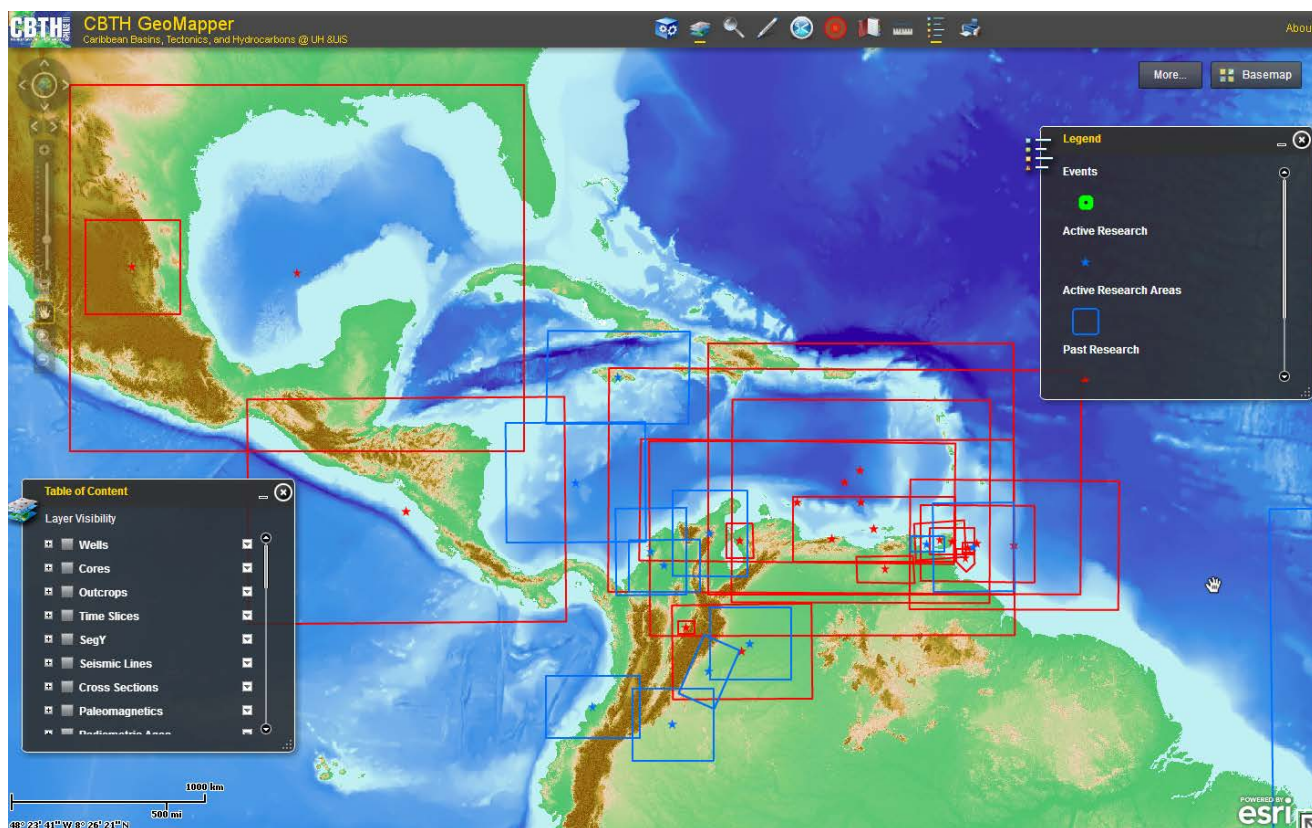
At the September 2012 CBTH Annual Meeting, project sponsors received access to the 2012 data release. This year's data release included a new format for our atlas consisting of extended abstracts written by each member of the CBTH Project. Our GIS release this year included a new basemap, updated PLATES Model, as well as additions to the literature compilation.

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## What's New



## GeoMapper

In addition to the 2012 Atlas and Data Release, CBTH Sponsors now have access to our new GeoMapper application, developed by CBTH GIS specialist Murad Hasan. GeoMapper allows CBTH Project data from 2005 to present to be viewable online through a simple mapping tool that requires no knowledge of ArcGIS. Using GeoMapper, you can project and export a variety of basemaps, geologic maps, and other GIS data in your web browser. Please contact us with any questions.

## AAPG Explorer Article on CBTH Project

The CBTH Project is the subject of an article in October's issue of AAPG Explorer. The article spotlights the move of the project from the University of Texas to the University of Houston and the CBTH Targeted Internship Program (TIP). This initiative places graduate students in summer internships with sponsoring companies who allow each student the opportunity to work on his/her MS or PhD research in an industry environment. This ensures that the student will stay on task regarding his/her thesis while providing valuable hands-on experience and mentoring in the oil and gas industry. Follow the link on our website to view the complete article.



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## Graduating CBTH Students at the University of Stavanger

Brendan Figueira graduated from the University of Stavanger with an MSc in Petroleum Geosciences Engineering in June 2012. His MSc study was titled "Tectono-stratigraphic evolution of the southern Gulf of Paria, Trinidad-Venezuela." Brendan is a citizen of Trinidad and Tobago and attended the University of the West Indies (UWI), where he graduated with a BSc. Petroleum Geoscience in 2009. Following a summer internship in 2011 at Statoil in Oslo, Brendan now works as a geoscientist for Statoil in Stavanger.



Brendan Figueira



Catalina Moreno

Catalina Moreno graduated from the University of Stavanger with an MSc in Petroleum Geosciences Engineering in June 2012 and currently works part-time for the CBTH Project assisting with Landmark software support, seismic interpretation, and basin modelling. Catalina is also working part-time with TGS through the end of December. Her MSc thesis was titled "Tectono-stratigraphic evolution of the southern Llanos basin, Colombia." Her research interests include structural geology, tectonics and petroleum applications. Catalina completed a summer internship in 2011 with GEMS S.A. in Colombia, who also provided her with her MSc thesis data and was a summer intern at TGS Stavanger in 2012.

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## New CBTH Students at the University of Houston



Orietta Mata

Orietta is a BS graduate in geophysics from Simon Bolivar in Venezuela and worked with Halliburton as a Landmark as a software specialist in Colombia. She is currently interpreting a large well and seismic data set from the Middle Magdalena basin for her MS study that was kindly provided to her by CBTH sponsor, Pacific Rubiales.

Karilys began her MSc in Geology at UH in August 2012 as a CBTH Graduate Research Assistant. She graduated with honors in 2005 from a five-year program in geological engineering from Universidad Central de Venezuela and worked for PDVSA from 2005-2012 for the Barinas-Apure basin evaluation team, where her main responsibilities were seismic interpretation and reservoir characterization. She is looking for a 2D or 3D seismic data set from either the Caribbean or Gulf of Mexico for use in her MS thesis research. She anticipates completing her degree in August 2014 and will be a summer intern with ConocoPhillips in Houston in the summer of 2013.



Karilys Castillo



Laura Nathalie  
Pulido Arias

Laura, born in Colombia, is an undergraduate student in the geology and geophysics department. She joined the CBTH project for the fall semester of 2012. Laura works on compiling CBTH database materials, conducting miscellaneous GIS tasks, and keeping our references database organized. Laura hopes to work on petroleum exploration in sub-Andean basins.

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## New CBTH Students at the University of Houston



Kherlen Batbayar

Kherlen is an undergraduate junior studying in the geology and geophysics department and joined the CBTH project for the fall semester of 2012. She works on compiling CBTH database materials, conducting miscellaneous GIS tasks, and keeping our references database organized.

## New CBTH Students at the University of Stavanger

Elisabeth is a Stavanger native and now an MSc student at the University of Stavanger. Her MSc study with the CBTH Project focuses on 3D flexural modelling of the southern Caribbean and northern South America. Elisabeth expects to graduate in June 2013.



Elisabeth  
Johansen



Karoline  
Kverneland

Karoline is a Norwegian MSc student at the University of Stavanger and will graduate in June 2013. She is working on a thesis study for understanding the onshore-offshore geology of central Cuba.



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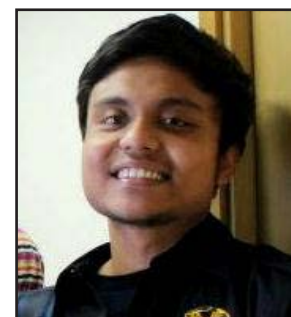
## New CBTH Students at the University of Stavanger



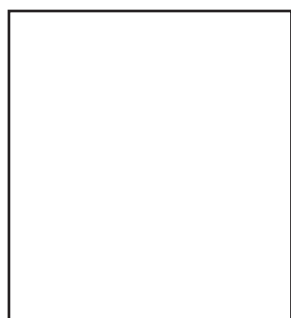
Bereke Kairanov

Bereke, originally from Kazakhstan, is an MSc student and Graduate Research Assistant at the University of Stavanger and will graduate in June 2013. He is creating subsidence plots from the many basins in the CBTH area using Zetaware Genesis. These subsidence plots will be used to characterize the basins and understand the geological processes of the area.

Rizky is an international MSc student and Graduate Research Assistant at the University of Stavanger and will graduate in June 2014. He is currently working to update figures for the literature compilation to reflect the change from the webpage-centric database to the webmap-centric database.



Rizky Amanda  
Syahrul



Trond Kastet  
Thorbjørnsen

Trond, originally from Norway, is an MSc student and Graduate Research Assistant at the University of Stavanger and will graduate in June 2013. He is working to improve and expand the wells database to more accurately include stratigraphic data including intervals, paleoenvironments, and facies for all of the wells compiled from literature in the CBTH database.

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## Recent Meeting

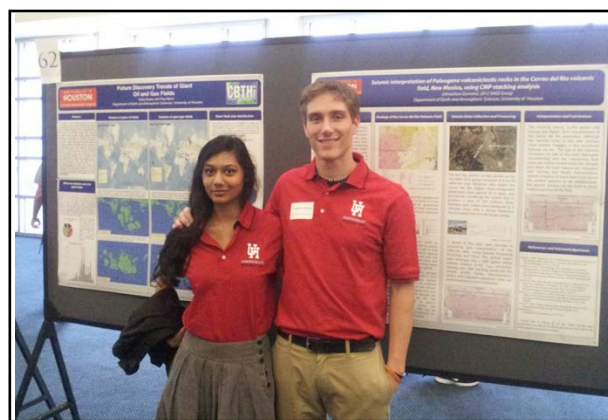
Brendan Figueira presented his work titled "Examination of the complex transition zone in the southern Gulf of Paria, Trinidad-Venezuela" based on his Master's Thesis research at the Copenhagen meeting of the European Association of Geoscientists and Engineers on June 4-7, 2012 and at the Geological Society of Trinidad and Tobago 5th Geological Conference in Port-of-Spain Trinidad from September 3-7.



Paul Mann and PhD Student Tricia Alvarez presented a one-day short course titled "Tectonics, basin formation and hydrocarbons in the Caribbean and Trinidad area" at the Geological Society of Trinidad and Tobago 5th Geological Conference in Port-of-Spain Trinidad on September 3-7.

PhD Student Rocio Bernal and CBTH MS Graduate Henry Campos presented their research on the Lower Magdalena and Llanos basins, respectively, at the Bolivarian Symposium of Petroleum Exploration in Sub-Andean Basins in Cartagena, Colombia, July 29th - August 2nd.

Paul Mann presented a four-day short course for PDVSA geoscientists in Maracaibo, Venezuela on basin analysis and structural styles in petroleum exploration from August 20-23, 2012.



CBTH Undergrads Johnathan Osmond and Naila Dowla participated in the University of Houston Undergraduate Research Day on October 11. Undergraduate Naila Dowla was voted as one of the top three posters for her work titled, "Giant Oil and Gas Field Discovery Trends."

Student volunteers from the CBTH group at UH organized by Kyle Reuber and Naila Dowla presented K-12 hands-on activities covering earthquakes, global distribution of hydrocarbons, plate tectonics, and sedimentary basins at the Houston Energy Day Festival on Saturday, October 20 at Hermann Square, City Hall. Other groups from the UH Dept of Earth and Atmospheric Sciences and the Physics Dept also had hands-on demonstrations of physics, geophysics and atmospheric sciences.

PhD Student Javier Sanchez presented at the 2012 GSA Annual Meeting in Charlotte, North Carolina from Nov. 4-7. His presentation is titled "Sedimentary and structural response of right-lateral transpression associated with oblique convergence along Caribbean-South American plate margin, Northern Colombia."

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## Upcoming Meetings



8 members of the CBTH Project at UH and 1 member at UiS have submitted abstracts to present at the 2013 AAPG Annual Convention in Pittsburgh, Pennsylvania on May 19-22. Please check our website for a list of accepted presentations.



Paul Mann, Bryan Ott, Naila Dowla, and Murad Hasan will attend the American Geophysical Union (AGU) Fall Meeting this year in San Francisco, California, December 3-7, for both poster and oral presentations. Please check our website for an updated schedule of presentations as the meeting approaches.



UiS members of the CBTH Project will submit abstracts to present at the EAGE Annual convention in London, May 2012.

## CBTH Contributions

### 2012 MS theses from students supported by the CBTH project (3)

Figueira, B., 2012, An examination of the spatial and temporal evolution of a complex transition zone in the Gulf of Paria, Trinidad-Venezuela (Eastern Venezuela Basin/ EVB): MSc thesis, University of Stavanger, 80 p.

Moreno, C., 2012, Evolution of the southern Llanos basin, Colombia: MSc thesis, University of Stavanger, Stavanger, 88 p.

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 Presentations (20)

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.

Bernal-Olaya, R.D. and P. Mann, 2012, Controls on Migration of Forearc Depocenters, Lower Magdalena basin, Colombia, GSA Penrose Meeting, Lucca, Italy.



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## CBTH Contributions

### 2012 Presentations (20)

Bernal-Olaya, R.D., P. Mann, and 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.

Bernal, R., 2012, Defining the geometry of the subducting Caribbean slab beneath northwestern Colombia and its controls on the overriding Lower Magdalena forearc basins, XI Simposio Bolivariano, "Exploración petrolera en las cuencas subandinas," Cartagena, Colombia.

Bingham, L., A. Escalona, R. Zurita-Milla, 2012, GIS-based Fuzzy Logic Analysis for Petroleum Exploration and Case Study of Northern South America, EAGE Conference, St. Petersburg, Russia.

Campos, H., 2012, Tectonic and subsidence history of the Llanos foreland basin of Colombia, XI Simposio Bolivariano, "Exploración petrolera en las cuencas subandinas," Cartagena, Colombia.

Chursina, I., A. Escalona, 2012, Frontier Exploration in Accretionary Prisms: Sinu belt Colombia, GSA Penrose Meeting, Lucca, Italy.

Dowla, N. and P. Mann, 2012, Future Discovery Trends of Oil and Gas Fields, AAPG-SEG Student Expo, Houston, Texas.

Dowla, N. and P. Mann, 2012, Oil and Gas Field Discovery Trends, University of Houston Undergraduate Research Day, Houston, Texas.

Figueira, B. and A. Escalona, 2012, Examination of the complex transition zone in the southern Gulf of Paria, Trinidad-Venezuela, EAGE Conference, Copenhagen, Denmark.

Figueira, B. and A. Escalona, 2012 Examination of the spatial and temporal evolution of multiple terranes in the southern Gulf of Paria, GSTT Conference, Port of Spain, Trinidad and Tobago

Mann, P., 2012, Are "uncharacteristic" earthquakes spatially linked to strike-slip restraining bends?, Fall AGU Annual Meeting, San Francisco, California.

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## CBTH Contributions

### 2012 Presentations (20)

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 Conference, St. Petersburg, Russia.

Osmond, Johnathan, 2012, Seismic interpretation of Paleogene volcanoclastic rocks in the Cerros del Rio volcanic field, New Mexico, using CMP stacking analysis, AAPG-SEG Student Expo, Houston, Texas.

Osmond, Johnathan, 2012, Seismic interpretation of Paleogene volcanoclastic rocks in the Cerros del Rio volcanic field, New Mexico, using CMP stacking analysis, University of Houston Undergraduate Research Day, Houston, Texas.

Ott, B. and P. Mann, 2012, Early origins of the Caribbean plate from seismic and gravity data across the Nicaraguan Rise, AAPG-SEG Student Expo, Houston, Texas.

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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## CBTH Contributions

### 2012 Publications (4)

Bingham, L., R. Zurita-Milla, and A. Escalona, 2012, Geographic information system–based fuzzy-logic analysis for petroleum exploration with a case study of northern South America: AAPG Bulletin, v. 96 no. 11.

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, v. 31.

Vargas, C. and P. Mann, 2012, 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, v. 31, pt. 4.

Vargas C. and P. Mann, and C. Borrero, 2011, Field guides for excursions to the Nevado del Ruiz Volcano and to the Romeral Fault System (Colombia) in the frame of the Neotectonics of arc-continent collision concepts, Earth Sciences Research Journal, v. 14, no. 1.

### Upcoming Publications (4)

Escalona, A. and W. Yang, 2012, 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 Five Giant Hydrocarbon Occurrences within Four Active Strike-Slip Regions: California, Southern Caribbean, Sumatra, and East China: in AAPG Memoir 100, Tectonics and Sedimentation: Implications for Petroleum Systems.

Koehler, R., Mann, P., Prentice, C., Brown, L., Benford, B., and Grandison-Wiggins, M., in press, Enriquillo-Plantain Garden fault zone in Jamaica: Paleoseismology and seismic hazard: Bulletin of the Seismological Society of America.

Prentice, C., Mann, P. and Pena, L., in press, Comment on “Historical perspective on seismic hazard to Hispaniola and the northeast Caribbean region”: Journal of Geophysical Research.



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## Thanks to our new and returning sponsors!

As we continue into Phase III of the CBTH project, we would like to thank our company sponsors for their ongoing support in providing data, software, funding, and knowledge to further student research in Caribbean geology. Your support has provided many opportunities for CBTH students to pursue research projects in the region and your efforts are truly appreciated.

