Hello and welcome to the September 2021 edition of the Basin Dynamics Bulletin. Thanks again for tuning in.

September is *deep-water sedimentation appreciation* month. Did you know that many explorers are using September to learn new applications of deep-water sedimentation? What are the **top 4 ways to get a better understanding of deep-water sedimentation**? Here are some to think about.

1. **Add to your inventory of deep-water turbidite, contourite and hybrid system prospects.** Recognize 5 ways to propel your exploration and development programs by reading some of the latest applied research in deep-water stratigraphy and reservoirs.

2. **Increase your competitive advantage with online training in deep-water sedimentation.** We have developed new courses for integrated business units covering i) deep-water depositional environments and basin analysis, ii) applied deep-water sedimentology, and iii) masterclass topics in deep-water depositional systems. Links to courses are here.

3. **Interested in group field trips on deep-water depositional systems?** Get outdoors and look at the field analogs safely by following these simple recommendations.

4. **Register for Houston Explorers Club.** We're now accepting more nominations! Improve your exploration and appraisal game by registering to attend one of our business events.

In this issue, we continued the conversation with Paul Mann, the Robert E. Sheriff endowed professor of geology in the Department of Earth and Atmospheric Sciences at the University of Houston, where he also directs the CBTH Project. Anyone who has met Professor Mann or read his team's work understands his prolific understanding of rifted passive margins around the world. Read the interview starting on page 3.

Other opportunities to increase your effectiveness in subsurface interpretation:

- *Online* – September 14–16: New dates released for an encore of EAGE's **Integrated Methods for Deep-water Reservoir Characterization**. Register here.

- Houston – September 17: Register here for the September **Houston Explorers Club** leadership forum. Vicki Hollub, President and CEO of Occidental, will present *Occidental's Pathway to Net-Zero*. If not a member, request the new member nomination form here.

- Houston – October 11–15: **Applied Deep-water Sedimentology and Stratigraphy** is now offered through the Subsurface Consultants and Associates, LLC training program. Learn more here.

- Austin – October 27: **GeoGulf** offers a one-day seminar on **The Future of Deep-water Sedimentation** – registration available soon.

- *Online* – November 2–4: Register here for the course **Practical Methods for Mapping and Interpreting Deep-water Stratigraphy and Reservoirs (GEO53)** with updated

case studies and applied exercises to help you gain confidence in your exploration and development programs.

- Houston – November 19: We're still cooking on our 4th quarter **Houston Explorers Club** Leadership forum.

- Tyler – February 16, 2022: The **East Texas Geological Society** features a presentation describing global **Marine Sedimentation** trends.

- Lisbon – May 18–19, 2022: AAPG GTW on **Mixed/ Hybrid Systems (Turbidites, MTDs and Contourites) on Continental Margins**. Submit your abstracts soon and learn more here.

For additional online and in-person training opportunities, follow our LinkedIn page or Twitter. *As always, we appreciate your referrals.*

Be sure to stay tuned in by following **www.basindynamics.com** and our **LinkedIn page**, which now distributes up-to-date information to over 1300 members of the global energy industry. Thank you for your interest and enthusiasm for the applied aspects of sedimentary basins research. We have a **Twitter account** @BasinDynamics. For some of the up-to-date publications and research releases, see **Research Gate**.

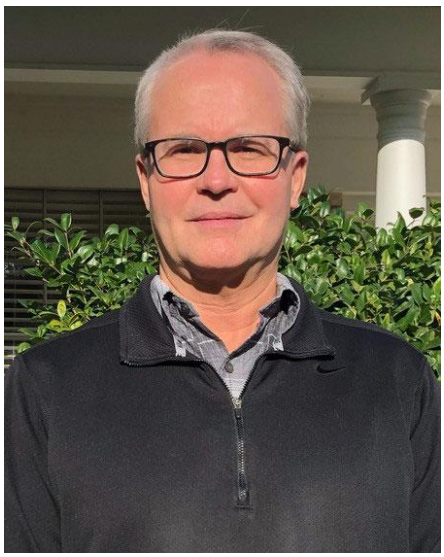
Download the article of the month titled **Mass-transport deposits** (Bulletin v. 3, no. 8, p. 1-6) here. *Express your interest and submit your technical article abstracts for a chance to appear in next month's Bulletin here.*

Due to the ever-changing nature of the business environment and training courses in stock, we ask you to check our currently available listings and submit a course request via our website: http://www.basindynamics.com/course-registration.html.

Have a safe September – *and find more oil*.

Sincerely,

Jon R. Rotzien, Ph.D.
President
Basin Dynamics



For this month's edition of the Bulletin, Jon continued the conversation with Paul Mann (at right) to learn about the Conjugate Basins, Tectonics and Hydrocarbons Research Group (which is now in its sixth phase) at University of Houston. Paul Mann received a B.A. in geology from Oberlin College and a Ph.D. from the State University of New York at Albany. His main interest area is the tectonics of sedimentary basins in the Caribbean, Gulf of Mexico, circum-Atlantic margins, and southwest Pacific. He is currently the Robert E. Sheriff endowed professor of geology in the Department of Earth and Atmospheric Sciences at the University of Houston, where he directs the CBTH Project: http://cbth.uh.edu/index.php. Read the second half of the interview below.

JR: You have used so many different methods for evaluating tectonic processes.

PM: I started my career as a field geologist and spent the late 1980s and early 90s traveling to places like the Dominican Republic, Puerto Rico, Cuba, Panama and Costa Rica for outcrop-based field work. When you have a career as long as mine (now coming up on 4 decades), one of the advantages is being able to apply new technologies and tools as they become available. For example, I was glad to be around as GPS-based geodesy evolved back in the late 80s and early 90s. I'm grateful for being able to work with GPS experts Eric Calais and Chuck DeMets along with many other experts on a regional GPS study of the northern Caribbean. Also, I was intrigued by applying fault trenching methods to the active Caribbean strike-slip faults and was able to do this by working with Carol Prentice of the USGS who had honed her skills from years of fault trenching of the San Andreas fault in California. We worked together on fault trenching for about 10 years and produced the first prehistorical records of earthquakes on faults in the northern Dominican Republic.

The more geology I worked on in different geographic areas, the more I realized the importance of the subsurface to understand the "complete picture", so by the late 90s I was increasingly involved in marine geophysical surveys and was working with various seismic reflection data sets provided by the oil industry. About 2000, our institute at UT had moved to the Pickle Campus about 10 miles north of the main UT campus in a brand new building right next to the UT Bureau of Economic Geology - which is a powerhouse of subsurface mapping. There I began working with Lesli Wood who had worked in Trinidad as part of her PhD and during her time at Amoco. We both had a shared interest in Trinidad and thought: "Why don't we start a consortium study for the Trinidad on- and offshore area?" She knew how to run a consortium so we worked collaboratively on a Trinidad consortium for 3 years.

As Lesli was more into the sedimentological aspects of the basins and I was more interested in the structure and tectonics, my postdoc, Alejandro Escalona, and I thought, "Why don't we start our own consortium?" Which we did in 2005. We built it around work we had done in Trinidad and in Venezuela and expanded the consortium to include Colombia. At that time, oil prices were high, and we had lots of interest and great sponsorship. Alejandro completed his PhD at UT in 2003 and his postdoc at UT in 2006 and took a professor job at the University of Stavanger in Norway in 2007 where he continues to lead the CBTH group at that university.

My next career turning point occurred when I left UT Austin and moved to UH in 2011. We had reached a natural break at this time with the completion of a 2011 special issue in the journal *Marine and Petroleum Geology* on the Venezuela-Trinidad projects we had been working from the early 2000s to about 2010. During the UH move, the group was pared down from graduations to myself, Rocio Bernal, a PhD student from Colombia who had started at UT, Jeff Storms who was our project manager who had started with us a UT undergrad in 2005, and two new students, a Colombian PhD student Javier Sanchez who had done his MS with Brian Horton at UT, and MS student Luis Pachon, another Colombian, whom I re-routed as an entering new student from UT to UH. We hunkered down in temporary offices while our present, spacious work area was being completed. The larger workspace allowed us to grow our UH student numbers to 21 within 3 years. Our focus remained on Colombia and that took us up to the 2015 CBTH publications in AAPG Memoir 108 on Colombia that was edited by Claudio Bartolini and myself. With the larger group and improved ties to Houston-based data companies we were able to begin student projects mainly in the southeastern Caribbean. Much of this work that includes many papers from our groups both from our CBTH group at UH and Alejandro's CBTH group in Stavanger is now in press in AAPG Memoir 123 that is edited by Claudio Bartolini. We appreciate all of his efforts in merging all of our CBTH work with many other studies from other groups into a volume that is more than 800 pages long.

JR: Your research group produces so much excellent research, and it is so collaborative – one of the most productive research groups I've ever seen. Can you describe for our readers what teamwork means to you in your research group?

PM: Thank you for that nice compliment on behalf of the CBTH group, including both present and past members! Although I am the primary supervisor of many students in the CBTH group that has included up to 21 students at one point, with such large numbers I quickly reach my limits in both my time and my skill sets. We involve many UH faculty members on the thesis committees like Dale Bird, John Suppe, Jonny Wu, Julia Wellner, Stuart Hall, Jiajia Sun, Mike Murphy, and John Castagna. I have encouraged the participation of subject matter experts like yourself, Charles Sternbach, and Kurt Rudolph to become adjunct professors at UH and have a closer link to our project. But we also reach outside the pool of full-time and adjunct UH professors to people I know in the wider community and ask them "Would you mind meeting on Zoom or Teams with this student to discuss their project?" For the Houston area we have such a great pool of oil industry experts to choose from.

JR: Absolutely, it's been a mutually beneficial learning experience to get to work with you and your students on subsurface projects. How do you get students started on their research?

PM: I then ask the student to prepare a PowerPoint to share with the expert to test ideas and methods. These meetings are especially important for those new students starting out. I emphasize to new students the importance of not "reinventing the wheel" – i.e., starting a project that turns out to be a project someone else has already done or are currently working on with similar methods. The best way to avoid reinventing wheels is to have the student show that they have an encyclopedic knowledge of previous work on their topic and that they have also met with the leading subject matter experts in that area to gain insider knowledge of the state of the art. Also these discussions lay a vision of what topics have not been solved and what is the best way to address those problems. I find the people we reach out to are very giving of their time, their ideas, and are happy to see this new generation following up on problems that they have thought about for a long time.

JR: The CBTH students are very industrious, creative and hardworking, and their success is evident at regional and international research meetings. How do you organize your time with your students?

PM: The time I put into students comes in two phases: Phase 1 is when they enter the program with the question of what they will work on, what is the research problem, what data will they use? The sign that Phase 1 is succeeding is when the student begins to take "ownership" of his or her project. Ownership means they are now "driving their own band wagon" - so my role diminishes as their role expands as they are now fully empowered. I know ownership has taken hold when they start sending me references on their topic rather than me always sending them references. This gives me a great feeling that I have linked the right student with the right project.

As Phase 1 wraps up, I move to the sideline but remain a cheerleader who meets with them weekly to track their progress. This is where my patience comes in as students are all different. Some students are like rocket ships blasting off the launchpad – others are like old cars that will take longer to rev up. For this period I encourage them to present their results at meetings that were in person conferences in the old days - nowadays virtual conferences. These meetings act as what I call "milestones" and I ask the students to map their grad school milestones as a Gantt chart. This graphic representation shows their entire MS (2 year) or PhD (3-4 year) timeline with all of their conference milestones indicated.

JR: That is excellent!

PM: General Eisenhower said something like: *Plans are useless but planning is indispensable* – the idea being that plans may change in during the heat of the battle - but having the baseline, long-term plan is critical.

JR: What an applicable quote. What does the next part of the phase look like?

PM: UH requires students to have their committee organized and a proposal meeting in their first or second year. This is the culmination of their Phase 1 project planning so this period is a spike both in their workload and mine in order to get ready for this meeting. I encourage them to write their first chapter/article by the time of this meeting – the bonus for them is that this submitted paper would exempt them from the UH qualifying exam – which is a general exam on all the major fields of geosciences.

JR: A very challenging exam.

PM: The other important part of this middle phase is the student becoming a good team member. So people come in ready to go as team players – for example, they were athletes on college teams - or they led student organizations - or they had jobs where they had worked in teams. Other students arrive to us with little idea of what being on a team means in terms of their behavior or view of the world. To promote our CBTH team, we meet for 2 hours on Friday of each week and we all present what we have worked on that week. In these meetings, you'll often hear other students say to their peers, "Hey, you know there's a better way to do what you are working on…" which encourages collaboration. We file these hints into a "work saving tips folder" that archives them all for future use.

JR: That's a brilliant method. Can you describe the inspiration for the work saving tips?

PM: The idea is that they recognize that freely sharing information benefits the group so the sum of the parts become greater than any individual. Also I encourage the older students to help the newer students – how to set up their, layered, GIS database of their areas, for example. Over time I can see the transition in reticent, non-team type students to sharing team players. This is an important life lesson that can be applied to all aspects of their future lives.

Since we have been virtual since March 2020, I meet individually with each student for 15 minutes on Mondays and Tuesdays to get a quick update of their progress. Here I can offer up suggestions and any more focused input on what they are doing. There is an incredible amount of polishing needed to get the final product. All these virtual meetings are meant to keep them engaged and feeling that they are part of the group despite the physical isolation.

JR: Sounds like CBTH was able to efficiently shift gears quickly during the pandemic with the virtual meetings. How do students get a feel for the timeline of graduate school?

PM: I ask them to plan their grad student timeline so each thesis chapter is presented as a poster or talk at a minimum of one conference. That way their work is vetted in a public way to gain input and to polish and fine tune their message. So this middle part of the study (Phase 2) is the heavy lifting by the student where most of their original work is happening and being reported to both me and the larger community.

My workload again spikes for the crescendo of Phase 3: that is their final year when they are completing the thesis student that usually is one chapter/article for the MS student and three articles/chapters for the PhD student (and the necessary course work of 30 credit hours). If Phase 2 goes well and they have submitted as they progressed though Phase 2 their article or articles then this final workload is lessened. The workload spike would nevertheless include the MS or PhD defense and the preparation of that final thesis document.

There you have a long-winded explanation of our student workflow - and along the way I remind the students to start think outwardly and beyond the walls of UH. UH is one of the largest geosciences departments in the western hemisphere - but it will not provide them the source of their first internship or job – nor all the expertise, data and resources that they will need to solve their thesis-related problem. Jobs are not going to happen if you're under a rock. Instead, they need to put themselves out there, reach out to industry, and other institutions.

JR: What a focused and effective workflow – very impressive. How are the students achieving this today?

PM: I give new students the task of creating a Research Gate site, a Google Scholar site and LinkedIn site to expand their world beyond our physical department. Also on Research Gate set up a project based on their thesis study that runs up the flag on what they are working on and starting assembling those with similar interests. All are important for career building and finding a job. Close to 100% of the students in our group get jobs. Most have figured out teamwork, which is important to get and to keep a job. If you're not team oriented, you're not going to survive in industry. You need to be open for change, and ready to make those changes.

JR: That is great preparation for joining industry.

PM: We have Jeff Storms who as our web developer and database manager has worked diligently for years to improve our website and deliver our products via the website. The project website is our window to the world - especially during the Covid time when travel to meetings

has been restricted. Anyone on the planet with an internet connection can see what the CBTH project has done in the past and the areas that we are presently working on. While Covid has been challenging, I applaud the group here since the start of the virus in March, 2020, for adapting to the new situation – especially given that the group has been as productive as the groups pre-2020.

JR: That's great on the productivity, and from the excellent website, anyone can see your team has worked all over the world. What is next for the consortium?

PM: We have several newer students who are in the pre-proposal starting phase for the Permian basin, Colombia, Gulf of Mexico, Brazil, northwest Africa, and the Red Sea. Our project footprint now takes in the Permian, GOM, and Atlantic margins. The Red Sea is out of that footprint but we would like to develop it as an analog to the Mesozoic rifts around the circum-Atlantic margins and GOM.

JR: Congratulations on your regional and world championship wins in the AAPG IBA. What was it like for University of Houston to win those competitions?

PM: Thank you for that compliment. The UH IBA success we have enjoyed took many years of slow, steady effort. John Castagna and I took over the faculty leadership of the UH IBA program started in 2012. Before we started, IBA at UH was a "club activity" so was not a for-credit course. Our first action was to convert it to 3 credit course - as the program is run in most other geoscience departments. Interest lagged and in 2012 we could only recruit four students for what normally is a five-person team. From 2012 to 2016, we had three consecutive third place finishes in the Gulf Coast area and finally in 2016, we broke through with a second place finish and followed on in 2017 with our first global championship. So there was a long learning curve in figuring out the program what a good presentation should include and look like. We also worked a lot on the Q and A session by preparing students for likely questions and making sure that they could answer those questions in a concise way. All the success made recruiting easier and we were able to expand the non-presentation teams, or those students who could take the class - but not be part of the five-person presentation team. This opened up the wonderful, IBA hands-on learning experience to a lot more UH students. All the awards in the competition were a huge boost in confidence - not just for those on the competition team but also for the entire UH geosciences program. Recruiting also got easier as more UH students thought: "If they did it, I can do it."

JR: What else drives the success of the team?

PM: A lot comes down to picking the right students and then helping them prepare. The chemistry between the students has to work. Sometimes we have to work out inter-personal differences - but that adds to the value of the experience. For most students, they have never been part of such an intensive team effort so it's no surprise of the importance that recruiters place on the IBA program.

JR: For universities just getting started with IBA, what are some good pointers?

PM: First priority is to find a faculty advisor who will coordinate the effort and put the time in. The time commitment can discourage many from joining.

Second priority is to maintain faculty continuity as we have maintained at UH since 2012. Because of the time and commitment, some universities will alternate advisors every second or

even third years. When you rotate advisors, however, you can lose some continuity and collective knowledge that accumulates with each passing year.

Being consistent in the effort level over the eight week period also important. Long-term planning is important to avoid any sort of last minute crunch in getting tasks done – or equally as important to practice and polish the presentation and Q and A session. Excellence is not the result of one action, but the result of many good habits.

JR: The consistency sounds key.

PM: In the end, there is great payoff – and it's not just about winning awards. I observe that students who come out of the IBA program are supercharged and operate at a higher energy level. Their time spent working goes way up and you can see that work ethic persist - and you can see a higher confidence levels. Part of it is that they have learned a lot of new skills – including on how to put together and deliver a presentation.

JR: Congratulations on your recent AAPG Distinguished Educator Award! That is a huge achievement – can you tell us a little more about what that means to you?

PM: I greatly appreciate this award and I thank Charles Sternbach for nominating me. Charles has been a big advocate of UH Geosciences for at least 10 years and all of us at UH really appreciate his efforts along with those of his partner Linda Sternbach. Also kudos to AAPG and the bequest by Grover E. Murray to set up the award.

JR: What do you tell students interested in getting into the energy industry? How do you prepare your students for successful careers in the energy industry? UH has a long and distinguished record of producing top energy industry professionals.

PM: That's a tough question during this era of transition between the fossil fuel-based and expansion of non-carbon based green fuels. I get asked, "Why aren't you interested in CCUS?" Our CBTH group remains focused on conventional, deepwater exploration and the students are continuing to be employed in this sector. Their skills could be applied to the reverse problem of putting carbon back into reservoirs rather than extracting oil and gas from reservoirs – but we are not yet at that point.

JR: What is your message for oil and gas explorers today? For those in the energy business?

PM: The biggest problem facing the oil and gas industry today is the need to reduce fossil fuels and their emissions. But that said, we also need energy to get us to the promised land: a non-carbon based world. For those of us in Texas who huddled in freezing, blacked-out homes back in February, we had a hard lesson in the consequences of losing our energy supply. But we cannot just stop using fossil fuels on a dime as the green segments of the energy spectrum are only a very minor component today. The challenge is now to increase the green component, decrease the fossil fuel component, and make the transition in a way without events like the Great Freeze of 2021.

JR: Thank you so much Paul. For more information on CBTH's current work, see http://cbth.uh.edu/.

This interview inspired by the Graduate School of Business "View from the Top" Speaker Series.