

NOGS LOG

SEPTEMBER 2012

Volume 53, Number 3

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En

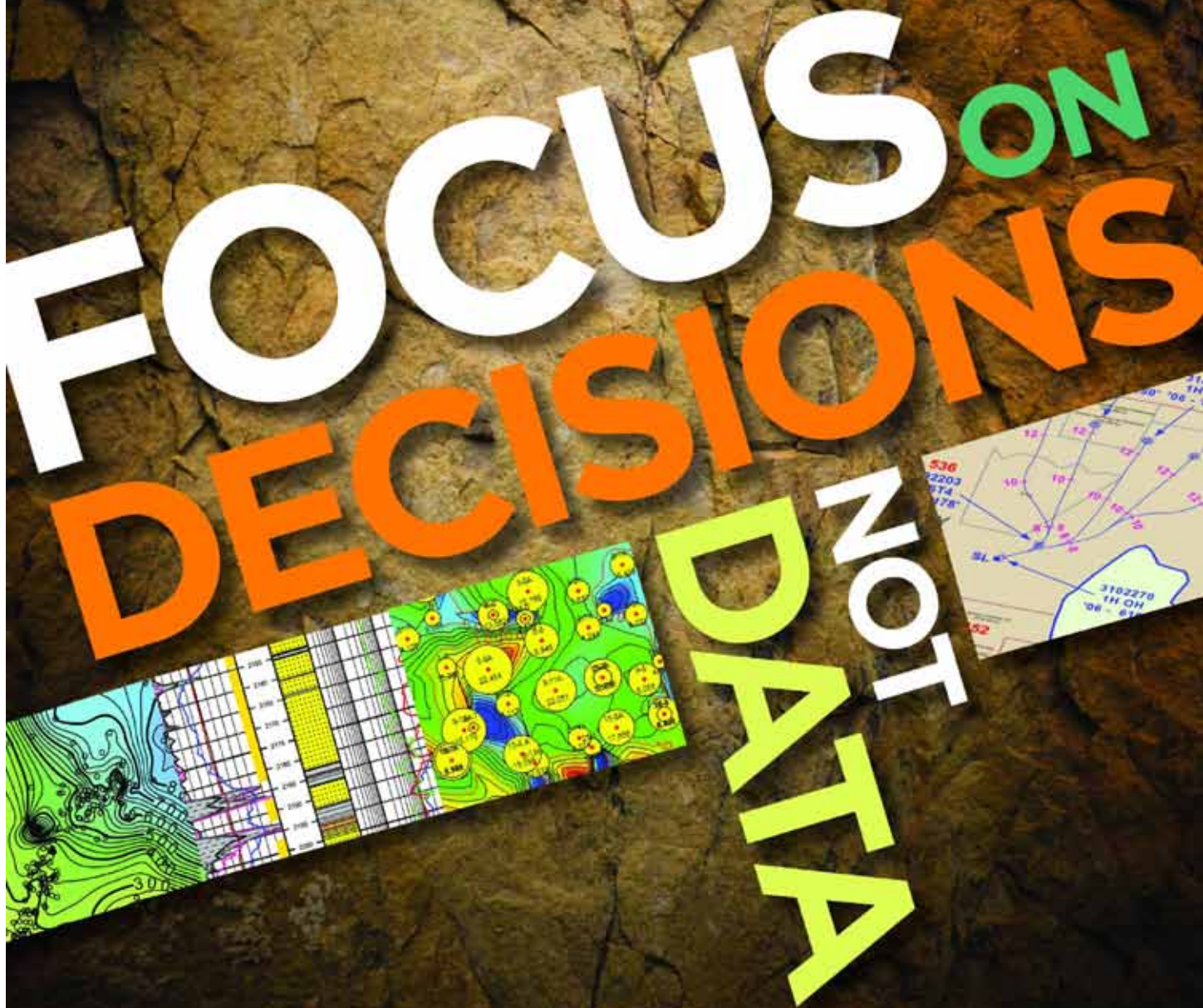


SEPTEMBER 10 - NOGS LUNCHEON

Presentation: Effect of the K/Pg Boundary Chicxulub Impact on the Northern Gulf of Mexico

Guest Speakers: Erik Scott and Richard Denne - Marathon Oil Corporation

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ON THE COVER:

Cover Photo Submitted by: Richard Denne

Photomicrograph (crossed nichols with quartz plate) of the K/Pg boundary deposit from DSDP Hole 536 in the southwestern Gulf of Mexico showing mixture of Upper Maastrichtian and Campanian assemblages.

Mm = *Micula murus*, which is restricted to the Upper Maastrichtian; En = *Eiffelithus nudus*, which is found from the Coniacian to the mid-Campanian.

From the Editor

Hello there NOGS members! We continue to receive suggestions on what is working well in the *LOG*, as well as what new features or changes our readers would like to see. I encourage you to keep the feedback coming as it is crucial to enabling the *LOG* staff to deliver a great publication that the Society can be proud of. On that note, last month we asked for our members to send in information regarding any updates in their personal life to be included in our new "NOGS Member Updates" section. Whether it is a new position, a move to a new location, a marriage, a new child, retirement or a promotion...you name it, we want to hear about it. We want to add this in as a personal touch to the *LOG*, and we hope this will help to promote a closer connection between the members of our professional society.

I want to also remind members to please send in any exciting geological or industry related photos to be the backdrop for our *NOGS LOG* cover. As you can see, our cover photo is a prominent feature of the new *LOG* and really sets the tone for each edition, so please send in any photos you may have from a recent field trip, a vacation, your graduate studies, or maybe even a picture of a drilling rig you visited recently. And don't forget to include a caption when you send it in so the context is well understood by our readers.

Thanks,

Jordan Heltz – NOGS LOG Editor

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From the President

Go Team USA! I understand that the Olympic results may be old news by the time this column goes to print, however at present the excitement knocks me right out of my La-Z-Boy. The way our athletes carry themselves and represent this fine country makes me proud to be an American. Just to think that Aly Raisman, captain of the gold-medal-winning US Women's Gymnastics team has become so successful at such a young age baffles me. Fortunately for her, she began gymnastics at a very young age, had the resources needed for training, and the guidance of a mother who is a former gymnast. I'm going to go out on a limb here and attempt to use this example as a segue into how successful I believe this past Fetch! Super Science Saturday was at the Louisiana Children's Museum. Together with 15 other local societies, Tom Bergeon once again knocked himself out organizing the NOGS exhibits. The kids' eyes were full of pure excitement and satisfaction when they lucked out and found oil while drilling a wildcat well. Unfortunately, they also learned the concept of risky ventures as they shamelessly went penniless after drilling back-to-back dusters. Teaching and connecting with the future "Gold Medal" winners (there's the link) for tomorrow's energy generators was a privilege.

Last month's speaker, Juan Lorenzo, a professor from the G&G Department at LSU, presented a very interesting talk on using seismic data as a relatively inexpensive tool to monitor artificial levees. As levees are an essential part to the very existence of New Orleans, I am happy to inform our members that NOGS has been a sponsor of Dr. Lorenzo and his team's research. If you are interested in knowing more about this proactive investigation into levee stability, a paper has been submitted to the Journal of Engineering Geology, so keep an eye out.

Looking ahead, our Kickoff Party is scheduled for Friday, September 21st, at the Rock 'N' Bowl on Carrollton Avenue. We had a pretty good attendance at last year's party, and I expect this year to be just as (if not more) successful than the Deutsches Haus event.

Also on the books is the annual Christmas Party! This will be held at the Chateau Country Club in Kenner on Friday, December 7th. Please mark this on your calendar, as this affair has proven to be a happening occasion time and time again.

Will Jorgensen

NOGS Office

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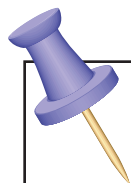
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UPCOMING Events & Activities

September 10 • NOGS Luncheon

Holiday Inn Downtown Superdome

\$2.00 validated parking in hotel garage

Presentation:

Effect of the K/Pg Boundary Chicxulub Impact on the Northern Gulf of Mexico

Guest Speakers:

Erik Scott and Richard Denne

Marathon Oil Corporation • Houston, Texas

See page 9 for Abstract and Biography

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ADMISSION:

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September 26 & 27

Baton Rouge Geological Society & Louisiana Geological Survey

**Presentation: Fifth Annual Louisiana Subsidence, Land Loss
and General Geology Symposia**

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For more info, email: dcarlson@lsu.edu

September 28

**Baton Rouge Geological Society & Louisiana Geological Survey
Louisiana Dept. of Natural Resources and Louisiana Oil & Gas Assoc.**

Presentation: The Third Annual Louisiana Oil & Gas Symposium

Dalton Woods Auditorium - LSU - Baton Rouge, LA

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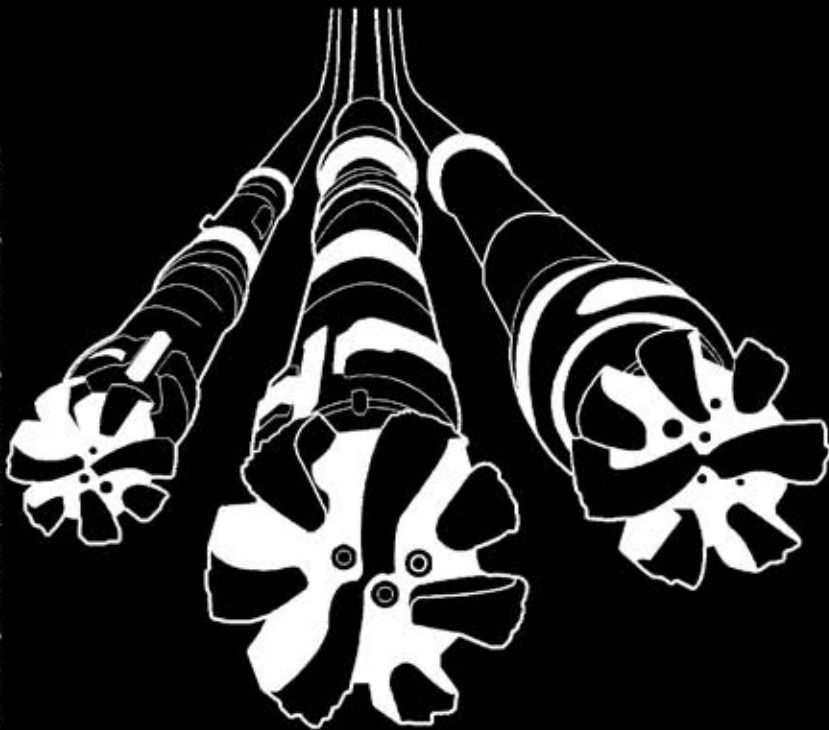
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September 10 NOGS Luncheon Presentation

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Effect of the K/Pg Boundary Chicxulub Impact on the Northern Gulf of Mexico



Co-Presented by

Erik Scott and Richard Denne*
Marathon Oil Corporation - Houston, Texas



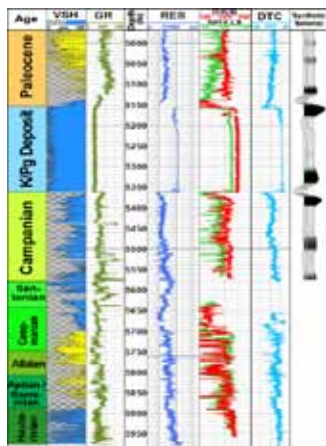
ABSTRACT

The Chicxulub impact on the Yucatan peninsula at the Cretaceous (K) / Paleogene (Pg) boundary has been cited as the cause of numerous geologic events including a mass extinction of 40-70% of all species, global distribution of ejecta material and re-mobilization of sediments along eastern North and Central America as well as around the Gulf of Mexico and redistributing it out into the deep water Atlantic, Caribbean and Gulf of Mexico. Well log and biostratigraphic data from Cretaceous well penetrations in the deepwater northern Gulf of Mexico show a distinctive micritic deposit at the K/Pg boundary that is similar in composition and biostratigraphy to sediments found near the Chicxulub Crater, DSDP/ODP cores and outcrops in Cuba. Investigation of seismic data in the northern Gulf of Mexico shows anomalous sedimentary wedges of high amplitude reflectors situated at the top of the Cretaceous section that are interpreted to be the resulting deposit from the mass transport flows and suspension fallout initiated by the impact. At the end of the Cretaceous, the northern Gulf of Mexico was undergoing allochthonous salt movement

from the Jurassic-aged Louann Salt that was expressed in numerous salt highs defining potential clastic sediment fairways. The sediment redistribution caused by the Chicxulub impact filled in the available accommodation space around the salt highs, as well as depositing on the highs themselves, and altered the seafloor topography across the northern Gulf of Mexico resulting in a highly efficient transportation pathway from shelf to deepwater and influence the sedimentation patterns of the subsequent sediment gravity flows of the Wilcox Formation.

*Co-Authors:

James Kaiser and David Eickhoff
Marathon Oil Corporation



Log characteristics of the K/Pg deposit in the deep water Gulf of Mexico.



Global distribution of key K/Pg boundary data locations. Note the locations and proximity of the Chicxulub crater to sites around the Gulf of Mexico. (After Schulte et al, 2010)

BIOGRAPHIES

Erik Scott is a geologist working for Marathon Oil Corporation in Houston, Texas, on a wide variety of projects in both exploration and production. Over his career, he has engaged in stratigraphic analysis of numerous areas including the Gulf of Mexico, North Sea, offshore West Africa, and the eastern Mediterranean. He received a Ph.D. in geology from Louisiana State University, studying under Dr. Arnold H. Bouma, with whom he investigated influences on deepwater sedimentation, based on the turbidite outcrops in the Karoo Basin of South Africa.

Richard Denne is the corporate Biostratigraphy Advisor at Marathon Oil Corporation. He is a graduate of the University of Iowa and Louisiana State University. He began his career as a paleontologist at Exxon Company, USA, and Exxon Exploration Company and then consulted for 12 years with Applied Biostratigraphix before joining Marathon. He has published extensively on the paleoecology of benthic foraminifera, sequence biostratigraphy, and the biostratigraphy of calcareous nannofossils.

THE LUNCHEON RESERVATION DEADLINE IS SEPTEMBER 5 - CONTACT THE NOGS OFFICE

"And Looking Ahead . . ."

The next luncheon will be held on October 1st. Our guest speaker, Andy Clifford of Saratoga Resources, will present "Treasures of the T-Zone: An Overview of Louisiana's Transition Zone, Past, Present and Future." Contact the NOGS office at 504-561-8980 or use the PayPal link on the NOGS website (www.nogs.org) to make your reservation.

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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 Labor Day	4	5	6	7	8
9	10 NOGS Luncheon Holiday Inn @ 11:30 A.M.	11	12 NOGA Luncheon	13	14	15
16	17	18	19 NOGS Board Meeting	20	21 NOGS "Kickoff Party" @ Rock n' Bowl	22
23	24	25	26 LA Subsidence, Land Loss, Geology Symposia	27 LA Subsidence, Land Loss, Geology Symposia	28 Louisiana Oil and Gas Symposium	29
30						

October						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 NOGS Luncheon Holiday Inn @ 11:30 A.M.	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17 NOGS/NOGA Board Meetings	18 GOM Deepwater Technical Symposium	19 SIPES Shale Play Seminar Houston, TX	20
21 GCAGS Convention Austin, TX	22 GCAGS Convention Austin, TX	23 GCAGS Convention Austin, TX	24 GCAGS Convention Austin, TX	25	26	27
28	29	30	31 Halloween			



2012 Kick Off Party

Where:

Rock 'n' Bowl



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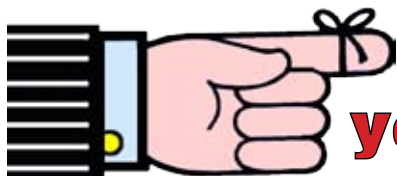
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Ronald F. Spraitzar has 35 years of experience with the USGS/MMS/BOEM as a Staff Geologist in the Regional Analysis group. His current position at BOEM is a Supervisory Geologist in the Lease Sale Tract Evaluation section. He graduated from Ohio University with a BS (1970) in geology and earned his MS (1977) in geology from Miami University in Oxford, Ohio. Ronald is also an associate member of AAPG. He and his wife, Margaret, reside in Kenner.

Steve R. Kane, an intern with Haland Energy Partners, LLC in Chicago, IL, is a sophomore in the Environmental Science Department at Miami University in Oxford, Ohio. His interests are geology and the petroleum industry. Steve is a new student member of NOGS.



Have you renewed your NOGS Membership???

Dues are past due for the 2012-2013 Year!

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South Louisiana and Offshore Gulf of Mexico Exploration and Production Activities

LAFAYETTE DISTRICT, ONSHORE AREA

By Carlo C. Christina

SUBSALT—WILCOX—TUSCALOOSA—LOWER CRETACEOUS

McMoRan Exploration Co. is preparing to re-test the #1 Davy Jones well located in **South Marsh Island Block 230**, (S1). The well was drilled to 29,122 feet and encountered Wilcox sands below 26,480 feet with 12 to 15 percent porosities. Early attempts to produce the lower series of these sands failed when the hydraulic perforating equipment malfunctioned. Bottom hole pressures at Davy Jones are in excess of 25,000 psi and temperature exceed 400 degrees. The operator has now perforated 165 feet in 5 members of the Wilcox section and anticipates having a test sometime during the month of August.

McMoRan drilled the #2 Davy Jones well in South Marsh Island Block 234 and found the same series of Wilcox sands running several hundred feet high to the #1. The well was drilled deeper to 30,617 feet and encountered a series of Tuscaloosa sands at 29,000 feet having porosities in the mid-twenty percent range. Deeper drilling also penetrated a Lower Cretaceous carbonate section, interpreted as being possibly productive.

McMoRan had proven that this subsalt play located 15 miles south of the Louisiana coastline has penetrated not only Wilcox sands, but also deeper Tuscaloosa sands and a carbonate section worthy of future exploration efforts.

This geologic success has identified a major new subsalt trend on the Gulf of Mexico shelf and onshore Louisiana regions. What does this mean for future drilling activity in the onshore areas of Louisiana?

Actually, this play is now presently active onshore Louisiana. It began with the drilling of the Lighthouse Bayou Prospect, the Armstrong, LLC #1 BP Fee in Cameron Parish in **Johnsons Bayou Field**, (S2), Sec. 21, 15S-14W. The well was permitted to 26,000 feet and was drilled to 25,502 feet. It was temporarily abandoned in January, 2012 after setting **7 5/8" casing to total depth**. There are reports that the operator is waiting on a larger rig to drill deeper. Chevron and Stone Energy are working interest partners in this well.

Chevron is now drilling a similar play, the Lineham Creek Prospect, a **Cameron Parish wildcat**, (S3). The #1 SL 20571, located in Sec. 19, 15S-4W, is drilling below 20,170 feet toward a projected total depth of 29,000 feet. McMoRan has a 36% working interest in this well.

McMoRan has assembled an acreage block of 68,000 acres in Iberia, St. Martin, Assumption and Iberville Parishes, (S4), under its Highlander Prospect, in and around 13S-12E. A wildcat on this prospect will be drilled to 30,000 feet, and is expected to commence operations later this year.

McMoRan has identified an unnamed prospect, **Prospect B**, (S5), in the South Louisiana area and is in the process of putting this acreage together to drill at a later date.

A similar play is unfolding in the old **Vermilion Block 16 Field**, (S6), approximately 1 mile offshore Vermilion Parish. Lobo is drilling a well within the field to attempt to extend production in the LF-F sand. Saratoga Resources and McMoRan hold 4000 acres in and around the field and have held preliminary discussions on the possibility of drilling a subsalt well to 32,000' well to test the Wilcox section.

NEW LOCATIONS

The Office of Conservation, Lafayette District, Onshore Area, issued 35 permits to drill during the month of July. Following are the most significant locations:

In Cameron Parish, **Back Ridge Field**, (A), Manti Exploration will drill the #2 Henry Estate in Sec. 22, 14S-9W. The well will be drilled to 12,700 feet to test Planulina sands which produce in the field at 11,500 feet. (245218)

Midstates Petroleum Co. has permitted an additional 6 locations in **Pine Prairie Field**, (B), in Evangeline Parish. Three wells will be drilled to 13,000 feet on the west flank of the field in Sec. 34, 3S-1W. (245163 to 245167)



In Iberia Parish Forest Oil Corp. will drill the #4 Hodges in **Bayou Postillion Field**, (C), in Sec. 35, 12S-11E to a projected depth of 13,500 feet. (245159)

Castex Energy has permitted 2 wells in **Lake Enfermer Field**, (D), in Lafourche Parish. Although the wells are permitted in Lake Enfermer Field they are located more than 2 miles west of the nearest production, and more than 5 miles southwest of the most recent production in the field by Badger Energy. The #1 Castex Lafourche LP 24 will be drilled to 17,774 feet in Sec. 24, 20S-22E, and the #1 Castex #1 LP 23 will be drilled to 15,242 feet in Sec. 23, 20S-22E. (245222 and 245223)

In Lafourche Parish, **Larose Field**, (E), Square Mile Energy will drill the #5 Cris I, Devon-Marr in Sec. 38, 16S-21E to a proposed depth of 20,009 feet in a directional hole having a bottom hole located **13,112** feet from the surface location. The new well is located 1 mile southwest of the recently completed gas well, the Square Mile Energy #3 Cris I, Devon Marr, which was completed flowing 3382 MCFG and 216 BCPD. (245230).

This area, the Larose-West Lake Salvador complex, is extremely active lately with more than 7 wells completed and 3 well drilling within the past 12 months.

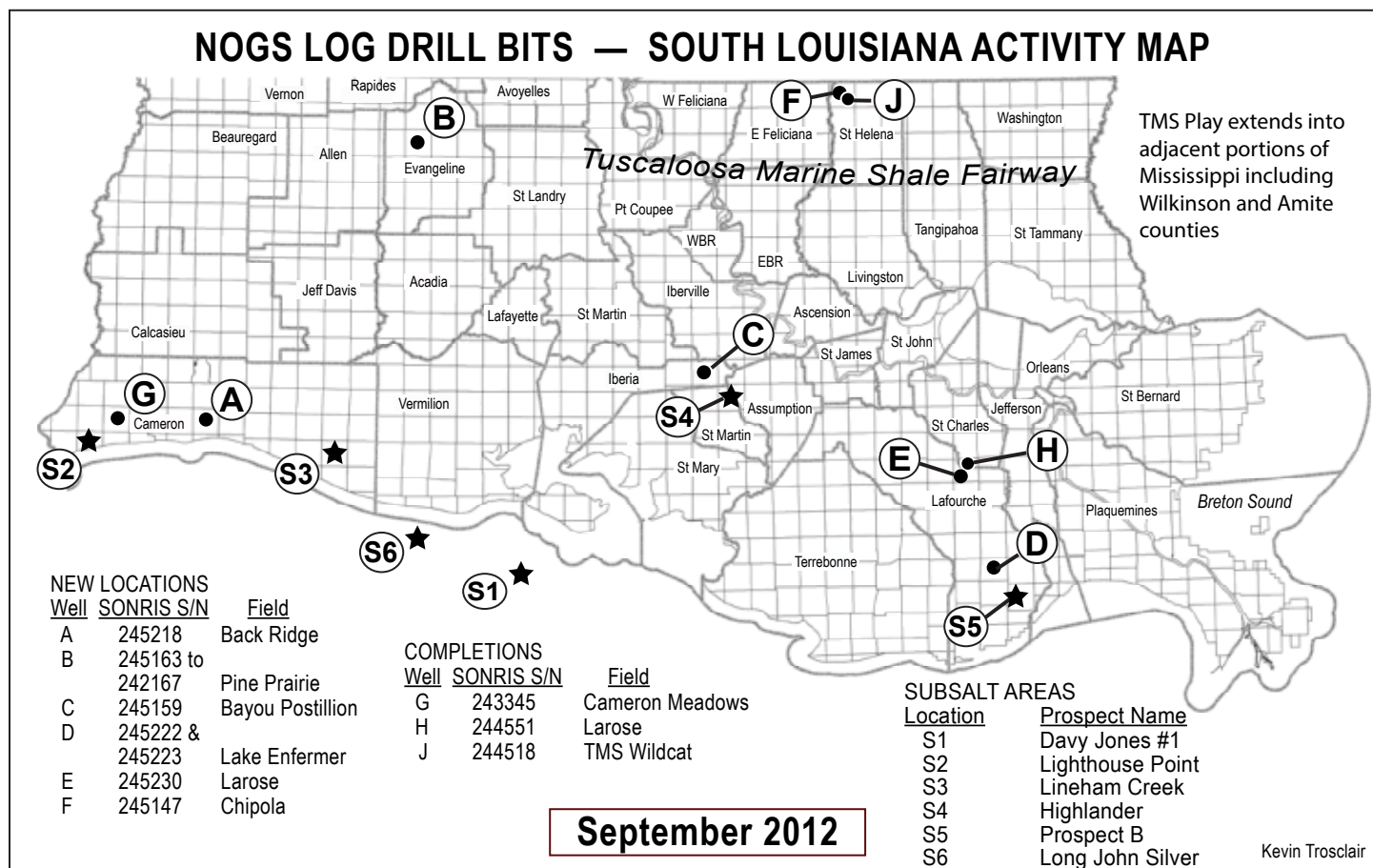
Devon Energy will drill a horizontal Tuscaloosa Marine Shale well in **Chipola Field**, (F), St. Helena Parish, in Sec. 72, 1S-4E. The #1 Weyerhaeuser 72 H will be drilled to 21,160 feet in an 8819' horizontal leg, located 1 mile west of the recently completed #1 Weyerhaeuser 14 H oil well. It was completed flowing 384 barrels of oil per day. (245147)

COMPLETIONS

Square Mile Energy has extended production in **Larose Field**, (G), Lafourche Parish, with the completion of the #3 Cris I as a good gas well flowing 3382 MCFD and 216 BCPD through perforations 14,710 to 14,754. (244551)

In Cameron Parish, **Cameron Meadows Field**, (H), Apollo Energy has completed the #51 Dore as a good gas well in the Planulina 2 sand, flowing 3278 MCFD and 237 BCPD through perforations 7892 to 7936. (243345)

Devon Energy has completed a **Tuscaloosa Marine Shale wildcat**, (J), as an oil discovery in St. Helena Parish in Sec. 14, 1S-4E. The #1 Weyerhaeuser 14 H was drilled to a depth of 18,786 feet and was completed in a 6500' horizontal hole flowing 384 BOPD through perforations 12,920 to 18,653. (244518)



OFFSHORE GULF OF MEXICO SHELF AND DEEPWATER ACTIVITIES

by Al Baker

During July, the BOEM approved 90 drilling permits, of which 40 were for Gulf of Mexico shelf wells and 50 were for Gulf of Mexico deep water wells. There were 3 shelf (2 exploratory and 1 development) and 4 deepwater (3 exploratory and 1 development) new well permits granted. On the shelf, Walter Oil & Gas was given a permit for the **South Timbalier 127 #1** exploratory well, **Pisces Energy** was awarded a permit for the **West Delta 40 #2** exploratory well, and Tana Exploration was granted a permit for the **Main Pass 163 #1** development well. In deepwater, BP received 1 development well permit for the **Green Canyon 743 #DC-317** well. Deepwater exploratory well permits were awarded for the following wells: ExxonMobil **Keathley Canyon 918 #1**, Anadarko **Keathley Canyon 875 #SS-1** and Shell **Walker Ridge 95 #1**.

In the first half of 2012, there have been a total of 191 drilling permits granted. Of these, 107 were for wells located in the Offshore Louisiana shelf, none in the Offshore Texas shelf and 84 in the deepwater or the Northern Gulf. This compares to 108 Offshore Louisiana wells, 8 Offshore Texas wells and 19 Northern Gulf wells for a total of 135 wells during the first half of 2011. It is obvious from these numbers that the Northern Gulf activity has ramped up significantly, whereas the drilling activity in Offshore Texas remains non-existent in comparison to last year. Of the 2012 Offshore Louisiana shelf permits, 20 were for new field wildcats, and 87 were for development wells. The 2012 Northern Gulf permits included 22 new field wildcats and 62 development wells.

Since the BP Macondo oil spill and as of June 2012, the average permit approval time was 99 days compared to the 5-year historical average of 61 days. This represents a 62% increase in the time it now takes to receive a drilling permit from the BOEM.

On July 27th, IHS-Petrodata reported that the Gulf of Mexico mobile offshore rig supply totaled 114, and the contracted rig count remained at 75. Thus, the region's fleet utilization rate currently stands at 65.8%. This compares to 65 out of the 121 rigs available during the same period in 2011 (53.7% utilization rate). Even though the contracted rigs have increased by 15.4% since last year, the overall fleet is 7 rigs fewer than last year. The majority of the available but unused rigs are cold-stacked and not currently marketed for contract.

Additionally, there were 24 platform rigs under contract out of the 52 total in the fleet for a fleet utilization rate of 46.2%. The current number of platform rigs under contract in the Gulf is the same as reported last month.

On July 27th, the BakerHughes Rig Counts indicated that there were 51 active mobile offshore rigs in the Gulf, which represents 68.0% of the total mobile rigs under contract. This is an increase of 3 rigs from last month. All of the drilling remains in Offshore Louisiana and the deepwater Northern Gulf. The current active rig count compares to 37 active rigs during the same period last year. This represents a 37.8% increase in the active rig fleet on a year-to-year basis. Additionally, of the 24 platform rigs that are under contract, 10 (or 41.7%) are currently working. This is double the number of working platform rigs since last month.

In the first half of 2012, there were a total of 156 wells spudded in the Gulf. This compares to 106 wells begun during the first half of 2011. During 2012, there were 101 wells started in Offshore Louisiana, no wells in Offshore Texas and 55 wells in the Northern Gulf. As a comparison, the 2011 starts included 78 wells in Offshore Louisiana, 8 wells in Offshore Texas and 20 wells in the Northern Gulf.

On July 17th, Helix Energy Solutions Group Inc. announced an oil discovery at its **Bushwood Field** located in **Garden Banks Block 506**. Their Danny II exploration well operated by Deep Gulf Energy LP found more than 70 feet of high quality net oil pay. The well was drilled to a total depth of 14,750 feet in an approximate water depth of 2,800 feet. The

well is currently being completed and will be produced via a subsea tie back system to Helix's East Cameron Block 381 Platform, which is located 31 miles to the north in 370 feet of water.

On July 23rd, CNNOOC Limited entered into a definitive agreement to acquire Calgary-based Nexen Inc. for \$15.1 billion. The deal is anticipated to close in the fourth quarter, pending approvals from shareholders and regulators in Canada, China and the U.S. The move will expand CNOOC's North American presence by giving it stakes in several Western Canadian oil sands projects plus the shale gas-rich Horn River Basin in British Columbia. It will also expand CNOOC's exposure in the deepwater Gulf of Mexico where Nexen has recently focused its exploration and appraisal program with its partner/operator, Shell, in the Norphlet play in the Appomattox and Vicksburg projects located in the Mississippi Canyon Area. Nexen currently has an interest in a total of 224 blocks in the Gulf of Mexico. In addition, they were the high bidder on 4 deepwater tracts in the most recent Central Gulf OCS Lease Sale 216/222 held in June 2012.

On July 23rd, the BOEM announced the Proposed Western Gulf of Mexico Lease Sale 229, which is scheduled for November 28, 2012 in New Orleans. This will be the first sale under the Obama Administration's new Outer Continental Shelf Leasing Program for 2012-2017 (Five Year Program). All terms and conditions for Western Sale 229 are detailed in the Proposed Notice of Sale information package, which is available at: <http://www.boem.gov/Sale-229/>.

McMoRan Exploration Co. on July 30, 2012 updated its activities at the **Davy Jones #1** well in South Marsh Island Block 230. The workover currently in progress has successfully perforated 165 feet of Wilcox sands and on July 13 commenced running of the production tubing. Prior to removing the blow out preventer and installing the production tree, McMoRan performed a routine pressure test on the seal system, which indicated that a seal assembly located at approximately 16,400 feet in the wellbore needed replacement. This unanticipated additional activity to replace the seal will delay the flow test that was expected during the week of July 30th until sometime during the month of August.

New Orleans Geological Auxiliary News

"The objective of the Auxiliary is to promote fellowship among the wives of the members of New Orleans Geological Society and to render assistance to NOGS upon request."

The opening event for Fall 2012 will be a luncheon at the home of Duncan and Margaret Goldthwaite on September 12th. We will visit artist Margaret's third floor studio and can admire the lovely home and enjoy a view of the lake.

The annual "Thank You" luncheon, when officers thanked the many ladies who have made the past year so successful, was held at Camille Yeldell's beautiful home in June. Past President Jean Jones, 1st Vice-President Alma Dunlap, and 2nd Vice-President Camille provided a delicious lunch which immediately followed the NOGA Board's transition meeting.

Newly elected President, Mary Walther, presided over the transition meeting when outgoing officers passed on duties to the incoming officers. Mary will reprise the presidency she held in 1981-1982 as she guides the group in 2012-2013.

Come meet new friends, renew old acquaintances, and enjoy a great year by joining now. Please fill out the application below and join us for a truly exciting and informative year.

Peggy Rogers, NOGS LOG

New Orleans Geological Auxiliary Membership Application

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City, State, Zip _____ Email _____

Spouse's Company _____ **DUES: \$25.00**

Please send \$25 check payable to NOGA to Judy Lamarié, Treasurer, #2 Yosemite Dr., New Orleans, LA 70131

MISSISSIPPI RIVER LEVEE MUD CRACKS

By Mike Merritt, Southeastern Louisiana Flood Authority-West

EXECUTIVE SUMMARY

During the May, 2011 Mississippi River high water event, severe levee cracking took place along the west bank Mississippi River Levee (MRL) downstream of the Huey P. Long (HPL) Bridge. Southeastern Louisiana Flood Authority-West (SLFPA-W) officials inspected the levee repeatedly and contacted the United States Army Corps of Engineers (USACE) on May 23, 2011 to raise concerns.

In July 2011, the USACE Geotechnical Branch (GB) issued a report describing the robust levee cracks as clay shrinkage cracks formed by drying. Merritt did not concur and in September, 2011 explained his field observations, crack map, and public safety concerns in a presentation for a NOGS luncheon. Using a geological (exploration projects) paradigm Merritt recommended several geological questions be taken up by levee authorities.



Global stability levee project area plans circa June, 2012. Montage is courtesy of SLFPA-W. Fair use Google Earth Image shows planned project area per engineering drawings courtesy USACE (white outline) with existing sheet pile in red and proposed additional sheet pile in blue just upstream of the cracked levee section on the opposite side of the HPL Bridge.

In June 2012, USACE officials initiated a Right of Entry (ROE) request to the SLFPA-W in connection with a large construction project planned to correct seepage and global stability concerns at the HPL Bridge site. This September 2012, report is an update to respond to the lively, continuing interest in this seeping and dynamic levee. Also included with a renewed call for a thorough geological investigation at the site, is a recommendation for designers to consider modifying their plans to address the problems on both sides of the bridge in a unified way by incorporating data from the proposed geological study.

DISCUSSION

The USACE GB July 2011 report raised an expectation the cracking in clay would (1) be near the surface of the levee, (2) be minor in extent, (3) cease as the clay dried and (4) form complete, well developed polygons with consistently sized cracks.

Instead, there existed a dynamic, narrowly aligned, quarter of a mile long zone of linear cracks, some as long as 10 feet, or wide as 5 inches or deep as 38 inches. If there was creeping movement between River Road and the crown of the levee, such active widening, would easily result in a protected side slump scar.

For example, please compare Figure 1, a typical crack in drying clay downstream, with Figure 2, the suspected structural cracks near the HPL Bridge. The profound



Figure 1: Typical view of levee clay shrinking as it loses moisture (and cracking as it loses volume). This photo was taken May 23, 2011, on West Bank MRL, downstream of Algiers Point (Maritime Navigation) Light.



Figure 2: Excessive cracking downstream of HPL Bridge on West Bank MRL.

differences in the nature and size of the cracking were the original basis for investigating if there may be another structural or stratigraphic process at work on the levee causing these differences.

SLFPA-W staff watched with mounting concern as the severe cracks increased in size and length. By their large size and numbers, these wider, deeper and longer cracks had no equal anywhere in the jurisdiction increasing worries they were caused by a structural issue and not dry weather. Specifically, if this linear trend of larger, deeper cracks is not a structural problem, where are the polygons usually formed by drying clay?

SLFPA-W INSPECTION



Figure 3: Flood side view of Mississippi River Flood cresting in New Orleans, May 23, 2011.

Photos and data were obtained May 23, 2011, a cresting day for the high water. Because of prior concerns about seepage through the Mississippi River Levees, when inspectors noted the levee was cracking, the



Montage, on fair use Google Earth Base courtesy SLFPA-W, showing May 23, 2011 cracks mapped by Merritt. Note widest, deepest, sometimes 10' long cracks in red, orange arrow showing post "drifting" downslope away from reference string and smaller, perpendicular crack trends in yellow aligned with flood-side slump boundaries.

Figure 4, inset: Excessive (structural) cracking on HPL Bridge reach of Mississippi River Levee. Levee inspectors were flagging these prominent cracks so newly formed cracks would be apparent.

Figure 5, inset: The "Drifting" Post. Arrow points up slope.

first question asked was: **"Are the cracks appearing on the protected side at the same elevation as high water on the flood side?"**

The montage shows apparent movement of post #6 is downslope away from reference string held taut by distant anchor posts.¹ Less than two weeks after being staked, the sixth post was out of line on May 23, 2011. (Post #6 was between two posts, 50 feet either side, each still touching the reference string.)

Post #6 was near and down slope from new cracks (Figure 6) on the flank of the levee together with an apparent extensional crack (Figure 7) on and parallel to the levee crown cracking the blacktop sidewalk.



Figure 6: New cracks upslope from the drifting post.

This suggested extension, or pull-apart, forces were at work slowly moving levee material, and post #6, down the levee's flank creating ever larger cracking.

Figure 8, courtesy SLFPA-W, illustrates (with a prior Google Earth image at low water), the May 23, 2011 field sketch of the length and orientation of some of



Figure 7: Inferred tension crack in levee crown above Drifting Post #6 and new cracks. Flood Authority Superintendent Mr. Chris Muscarello stands at the end of the inferred tension crack seen in the foreground.

the levee cracks. Note the linear character of the large, long, "parallel" cracks (shown in red) and compare them with other unusual features (like the location and movement of the drifting post (arrow) or the small "perpendicular" cracks (in yellow).

Surprisingly, one of the prior collapse areas (indicated by white rock partially restoring the batture) is alongside the cracked levee reach and the

flood side slumps' up and downstream limits align with the protected side levee cracks shown in yellow!



Figure 8: Cracking levee and bank collapse location are the same! Inferred tension cracking in levee crown and protected side extension cracks correspond to two recent flood side bank collapses.

SLFPA-W ACTION

After examining the cracking levee, President Maclay and SLFPA-W Regional Director Mr. Miserendino telephoned officials at the USACE Geotechnical Branch (GB). After President Maclay summarized SLFPA-W's concerns, Regional Director Miserendino requested specific action, such as asking for a survey of the water elevation on the flood side and the crack elevation on the protected side.

When it was Merritt's turn to speak, he said: **"...until proved otherwise this is to be considered a dynamic and continuing problem, not just dismissed as shrinkage cracks."** Mr. Miserendino also sent an e-mail to USACE expressing the SLFPA-W Commissioners' concerns (1) about a prior collapse of the Mississippi River bank along this reach and (2) whether ongoing



Figure 9: Cracks flagged by Southeast Louisiana Flood Protection Authority-West (SLFPA-W) inspectors. Note Huey P. Long Bridge pier in background is aligned with crack trend.

pile driving and bridge construction too near weak sediments beneath the levee is either a contributing factor or the primary cause of protected side cracks and (3) bank instability. He included a topographic map showing the area of concern and also sent a digital copy of the just completed map of the crack zone.

USACE GB RESPONSE

In July, 2011, the USACE Geotechnical Branch (GB) responded to the SLFPA-W phone conference and email by providing SLFPA-W a written report of a cursory investigation showing a recheck of annual River bank monitoring surveys found the bank was stable **"sic"**. Also, USACE was placing a stone berm in this area to protect the vulnerable, highly plastic, river bank material from flood side creeping and prevent any future erosional adjustments undermining the toe of the levee. The work to place additional rock on the bank began when the water dropped below 15 feet on the Carrollton Gauge. Another USACE GB recommendation was to excavate and repair the area.

The report appeared to rely on three clay samples to explain the levee cracking, but these samples seemed to conflict with prior USACE data from drilling and core descriptions. (The gist of the explanation is a "fat" clay, tested May 11, 2011, is sandwiched between lean clays, tested May 24, 2011.) Note Figure 10 is a slide shown during the NOGS presentation last year and displays USACE data of the plasticity index (PI) of these three samples taken at two different times.



Figure 10: USACE findings given to SLFPA-W

This unusual (higher) plasticity index, of 65, in the cracked levee reach is the basis for concluding clay

is simply swelling or shrinking harmlessly. However, more than one undocumented sample is needed to define this problem area. A fully detailed geological report is needed to fill in gaps in the data and resolve omissions or discrepancies. Furthermore, the moisture content of 19% is far below the 32% moisture content necessary for the clay to behave plastically. Unanswered by the GB report is why, when it is so dry, should the levee continue to crack (as the newly discovered cracks and drifting post indicate it was)?

GEOLOGICAL ISSUES AND GOOD PUBLIC POLICY

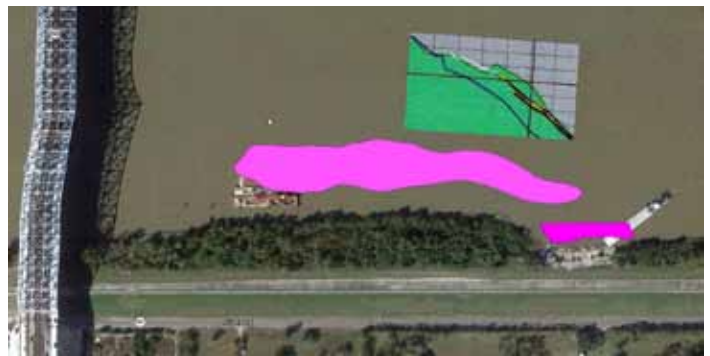
Finally, study of the USACE reports revealed a public works construction issue. There has been haste to build and geotechnical zeal to reclassify rocks and soils of various sorts, (by diagramming them as a single material type characterized by building material properties). With all this emphasis on the engineering details of building a project, the importance of the basic physical geology of the building site is being overlooked. This is another reason for obtaining a new geological study.

For geologists, the most worrisome thing is having a layer of sand under the levee in contact with the river channel. The USACE report showed an interpreted profile, referred to at the NOGS luncheon as a “Dagwood Sandwich”, with many sediment layers of various strengths in this changing depositional facies. However, most of the area between the downstream crack zone and the upstream seepage area was not mapped and no borings on the geological profile tested this important nexus.

FLOOD SIDE STABILITY ISSUES

As portrayed in this montage, the USACE GB report also shows bank profile data documenting two prior collapses of material, off the upper slope of the River bank, are now resting over previous slopes of the channel.

For example, the Geotechnical Branch advises: each annual (underwater) monitoring survey of the bank profile is represented by a different color, for example, 2008 in yellow, post flood 2011 in black. The green area reflects the bank line. Overlapping lines indicate the bank was stable from one annual survey to another until, as interpreted by Merritt, a section of the bank became unstable and slid down into the River’s



SLFPA-W Montage of Figures 11, cartoon of bank profile after Corps public report picture, and Figure 12, artwork courtesy SLFPA-W, on fair use Google Earth image. Note white rock filling slump scar on flood side of cracking levee.

Figure 11, inset: Cross section/bank profile data courtesy USACE report to SLFPA-W. Annual bank profile surveys show mass wasting phenomenon occurred during or before 2011 High Water Season.

Figure 12, inset: Thickness maps' zero line (showing location of fallen bank portions in pink) outlining approximate areas of zero to more than 25' thick slump flows resting in deeper water of Mississippi River Channel.

channel coming to rest as shown by the pink areas on the levee’s flood side.

The USACE GB interpreted geological profile traversed up and down stream of the HPL Bridge, shown at right. Project area proposed for Right of Entry from SLFPA-W on June 12, 2012 is outlined in white. Existing sheet pile in project area is highlighted in red. Blue lines indicate proposed sheet pile sections and “nodes” separating line segments illustrate survey reference points from USACE engineering drawings.

Comparison of the July 2011 report on shrinkage cracks (geological section and sample logs of stratigraphic tests bored in the vicinity) with June 2012 engineering drawings gives rise to concerns the current global stability levee project does not go far enough and more repairs are necessary.

The September 11, 2011 presentation to NOGS showed there is more than an 800 foot levee section near or under the bridge deck and continuing downstream to about the beginning of the cracking section with no



Montage of June, 2012 project area. Montage base courtesy fair use Google Earth image and SLFPA-W drawings.

core drilling or sampling. The sheet pile is planned for a levee reach chronically prone to seepage. The stratigraphy in the upstream, seepage prone, section was the “Dagwood Sandwich” of stacked fine grain clastic beds shown in the luncheon talk. The downstream cracking section is related to a weak clay bed under the levee. The slumping shows this downstream bank is trying to adjust to a gentler slope, just as the clay bank upstream of the montage at Avondale Dock #5 had to be reworked, in order to save it. In the latter, upstream, bank there is now barely enough room for a tractor mower deck to scrape through on the batture. In the downstream cracking/slumping river bank section, USACE reported the original 170 feet of batture has been restored with rock to 100 feet of batture between Mississippi River and the levee toe. This is why Merritt worries: “If the aggressive natural slope abatement of the clay bank continues, will there be room for one pass by a mower in five years at the downstream site as well?”

REASONS FOR A GEOLOGICAL STUDY

Frequently, levees are made of stronger material, than they rest upon. Therefore, the engineering classification of the material filling the embankment is not the determining factor about whether or not a flood protection structure can survive.

Review of available data shows this Mississippi River flood protection levee (MRL) consists of less plastic material, less prone to cracking and better suited to keeping the levee dry and strong than the natural levee it is built upon. This makes it all the more puzzling that cracks have occurred in the MRL as the clay forming the bank on the flood side is failing intermittently.

The basic physical geology of the site and careful understanding of the underlying stratigraphy are the determining factors. This is the reason New Orleans residents need a comprehensive geological report with far more infill drilling, sample work and geophysical reconnaissance to clearly define this levee’s dynamic geological circumstances controlling whether our flood protection projects seep or crack or succeed or fail.

CONCLUSION AND RECOMMENDATION

Last year USACE GB suggested the cracking levee be excavated and repaired. Merritt agreed and also recommended a thorough geological study, including acquiring more data to fill in the blanks

on the geologic cross section (between a river bank alternately seeping and slumping) to correct the lack of drilling data on the July 2011 report’s geological profile between seeping section upstream of bridge and cracking section downstream. This year it is apparent the new construction plan will not, without a contract modification, remediate the cracking problem. Therefore, it is also recommended a map be made of the depth and location of any sheet pile up and downstream of the HPL Bridge for ½ mile. Additional sheet pile should be added immediately to unprotected areas along the cracking reach (no sheet pile is indicated for the cracking levee in current plans) because the soft clay bed may not grade to more durable “Dagwood Sandwiches” until deeper than 8 feet below sea level. This means continuing to pour rock on sliding slumps coming to rest in the channel (maximum depth 97 feet below sea level at the location) will not preserve the eroding bank at its most vulnerable spot - 8 feet below sea level. Project Designers should consider installing additional sheet pile further downstream of the HPL Bridge to provide a “spine” to protect and stabilize the soft clay under the levee. It seems wise for the Corps to immediately begin work on a modification to the current contract for placing sheet pile near the bridge as soon as core data can be drilled to show how best to design and place additional improvements on both sides of the HPL Bridge once the stratigraphic details are known and clearly defined.

Respectfully,

Mike Merritt

Acknowledgments:

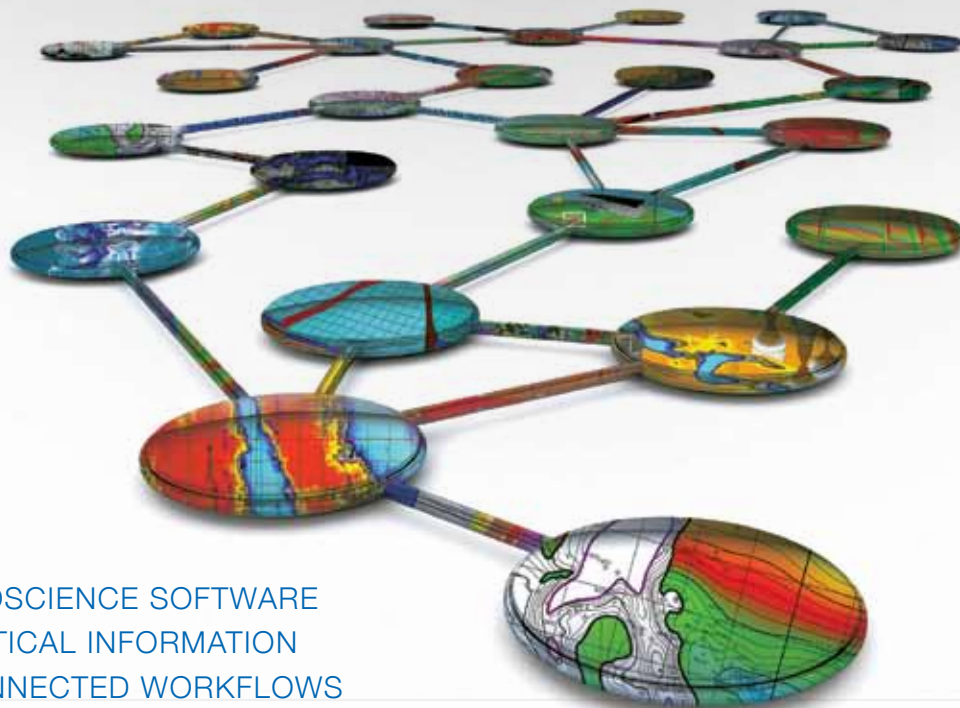
SLFPA-W Commissioners for their inspiring altruism and support.

SLFPA-W Staff, especially Mr. Brian Schoolmeyer of Creole Technologies, for technical assistance with cartography and graphics.

USACE Geotechnical Branch and Mr. Walter Baumy for bringing forth relevant public information and data in their helpful and timely way.

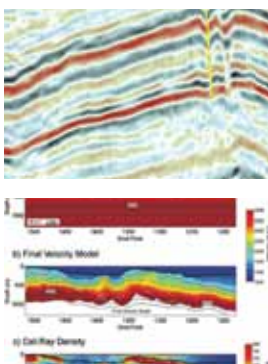
All original levee photos and errors are the author’s.

¹*Steel rods had been driven in the levee several score yards apart so a reference line could be pulled taut between these posts. Alongside the reference line, stakes were driven so, if the levee slope was creeping, it would be clear the stake was being moved away from the reference line so it could be monitored.*



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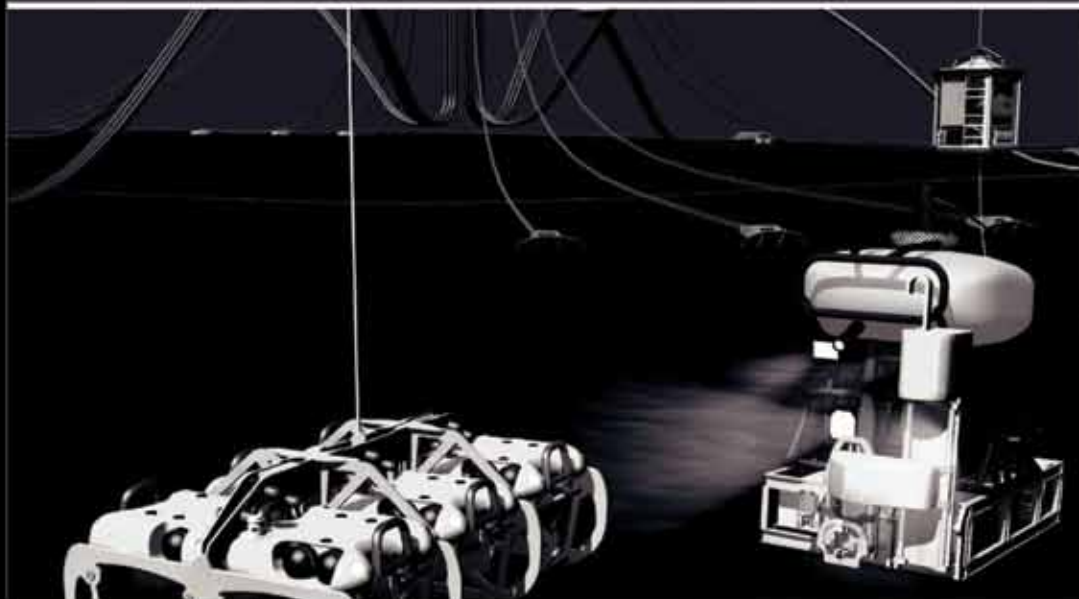
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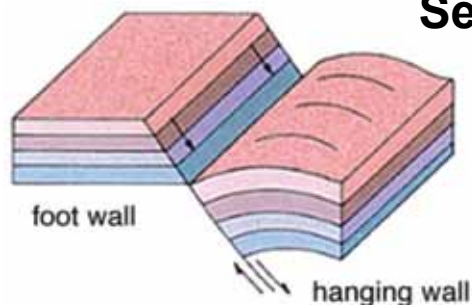
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Kurt Steffen, ExxonMobil Geologist, will describe how to create profits through integration of Geology, Reservoir Engineering and Commercial Factors for Evaluation of Unconventional Resource Opportunities.

Mark Kaiser, Center for Energy Studies at Louisiana State University, will review his comprehensive and probabilistic approach to reserves, economics and profitability of the Haynesville Shale.

J. Michael Bodell, Independent Geologist & Geophysicist and expert on oil and natural gas market fundamentals will share his work on future pricing and its impact on resource plays.

Trevor Sloan, Director of Energy research at ITG –Calgary. Recently completed comprehensive Eagle Ford Shale reserve and economic analysis.

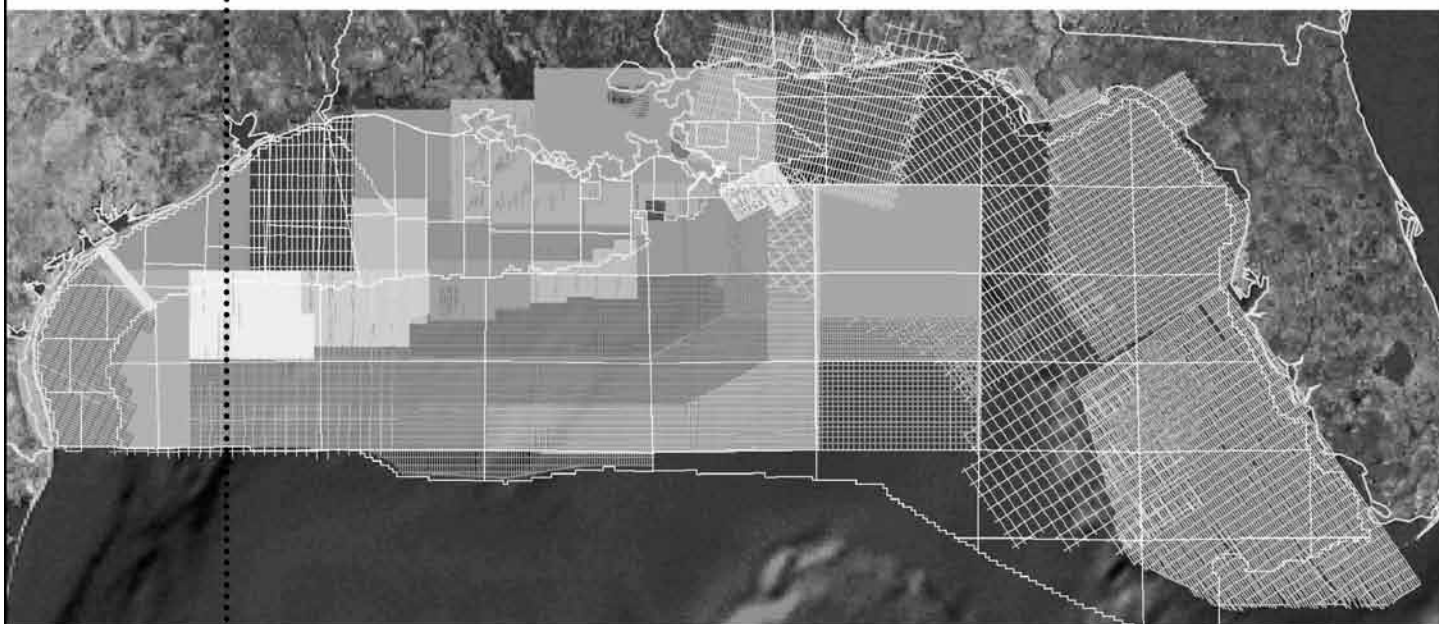
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Submitted by Jordan Heltz

FuelFix- Jennifer Dlouhy - “Coastal Governors Decry Limited Role in Offshore Drilling Plan” August 9, 2012.
<http://fuelfix.com/blog/2012/08/09/coastal-governors-decry-limited-role-in-offshore-drilling-plan/>

The Obama administration ignored the wishes of coastal leaders when assembling a plan for offshore drilling near their shores, says a group of Republican governors from Texas, Louisiana and other states.

In a letter to President Barack Obama late Wednesday and obtained exclusively by Hearst Newspapers, the pro-drilling governors say they are “concerned about the lack of communication from the federal government on critical matters that affect our coastal development.”

In particular, the group complains that the Interior Department did not consult properly with coastal states on its plan for selling offshore oil and gas drilling leases from 2012-2017 before finalizing the plan in June.

The five-year offshore lease plan focuses on allowing oil and gas development in already-explored areas of the Gulf of Mexico and the Arctic, while ruling out lease sales in Atlantic waters, despite pressure from some Virginia officials eager for exploration off the commonwealth’s shores.

The administration’s program sets up 12 Gulf of Mexico lease sales as well as the possibility of three auctions for rights to drill in waters near Alaska. The nine governors who wrote Obama on Wednesday under the umbrella of the year-old Outer Continental Shelf Governors Coalition described that drilling plan as anemic.

Signers were Govs. Rick Perry of Texas, Sean Parnell of Alaska, Bobby Jindal of Louisiana, Phil Bryant of Mississippi, Robert Bentley of Alabama, Nikki Haley of South Carolina, and Robert McDonnell of Virginia

The Financial - “EIA has Updated Gulf of Mexico Energy Statistics” August 8, 2012
http://www.finchannel.com/news_flash/Oil_%26_Auto/113966_EIA_has_updated_Gulf_of_Mexico_energy_statistics/

The U.S. Energy Information Administration has updated energy statistics and an interactive map that highlights the role of the Gulf of Mexico in the U.S. energy picture.

As EIA reported, the Gulf of Mexico (GOM) area, both onshore and offshore, is one of the most important regions in the United States for energy resources and infrastructure. In 2011, the Gulf of Mexico federal offshore region accounted for about 23% of total U.S. crude oil production and about 7% of total U.S. dry natural gas production.

The interactive energy infrastructure map contains information on power plants, storage terminals, pipelines, petroleum refineries, liquefied natural gas terminals, natural gas processing facilities, and electricity transmission lines in and around the Gulf of Mexico.

Total domestic production of crude oil and natural gas increased in 2011, despite decreases in Gulf of Mexico federal offshore production of 15% for crude oil and approximately 19% for dry natural gas. Refineries along the Gulf coast comprised about 44% of total U.S. petroleum refining capacity, as of January 2012. Gulf coast natural gas processing plants accounted for 30% of total U.S. natural gas processing plant capacity, as of January 2012.

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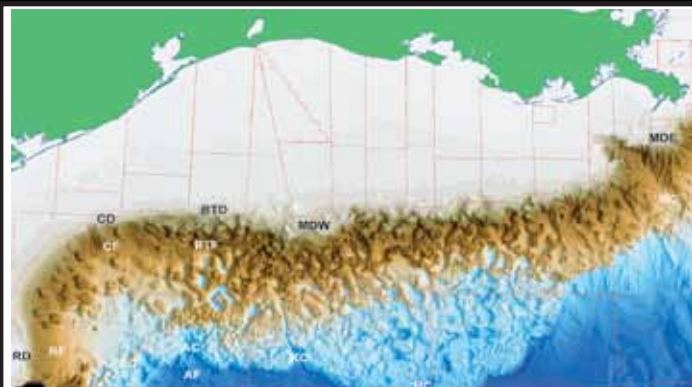
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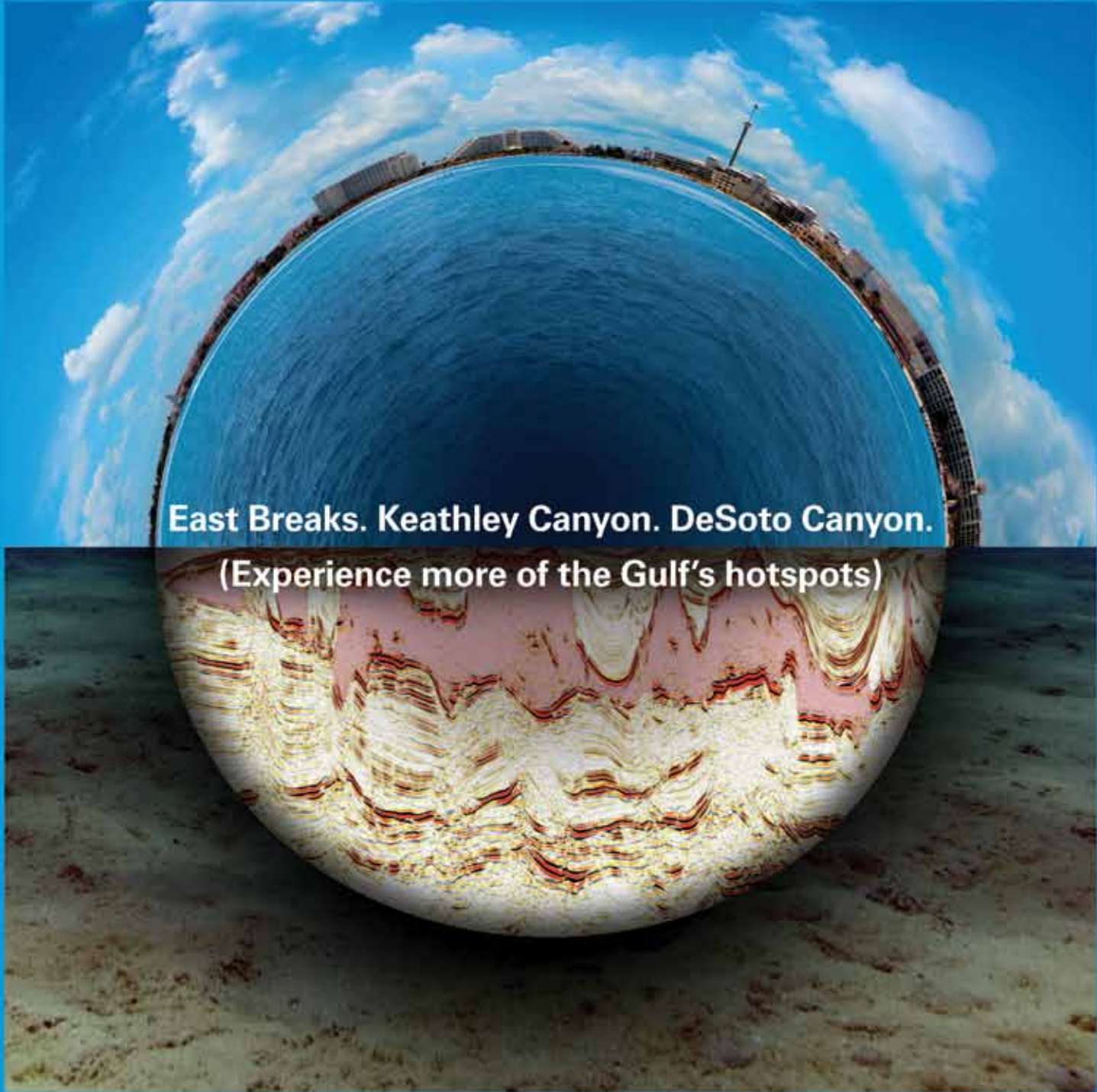


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