Meeting Summary

Bureau of Ocean Energy Management Marine Minerals Program

Gulf of Mexico Offshore Sand Management Working Group

Thursday, December 7, 2017
9:00 a.m. – 4:00 p.m.
New Orleans, Louisiana

I. Introduction

The Bureau of Ocean Energy Management (BOEM) convened the Gulf of Mexico Offshore Sand Management Working Group (SMWG) meeting on December 7, 2017 at the InterContinental Hotel in New Orleans, Louisiana. As part of BOEM's collaborative engagement, this meeting was also webcasted to support remote participation. Participants included representatives from federal and state agencies, industry, academic and research institutions, and non-governmental organizations.

The meeting's objectives were to:

- Receive an update on BOEM Marine Minerals Program and SMWG efforts
- Share information on gulf-wide sand inventory initiatives
- Discuss lessons learned from recent sand management efforts
- Identify opportunities for continued Gulf of Mexico SMWG activities

A recording of the webinar is available to the public at the following link: http://kearnswest.adobeconnect.com/popczuncii6v/. The meeting agenda is available as Appendix A, and the PowerPoint presentations from the meeting are available on the SMWG project website.

This meeting summary document summarizes key outcomes and next steps from the meeting. It focuses on discussions and SMWG input received rather than the formal presentations made. It is not intended to be a detailed transcript. The meeting was facilitated by Kearns & West (K&W).

This meeting summary is organized into the following sections:

II. Discussion Highlights

A. Welcome and Introductions

Dr. Mike Miner, Geologist with BOEM's Gulf of Mexico Region (GOMR), opened the meeting by welcoming participants, reviewing the workshop objectives, and introducing members of the BOEM team.

B. Marine Minerals Program Updates

1. Program Structure, Mission, Vision, and Strategy

Ms. Bridgette Duplantis, BOEM Environmental Scientist, provided an overview of the program composition, noting that the Marine Minerals Program (MMP) is nested within the Office of Environment under the Gulf of Mexico Region (GOMR) as part of BOEM. Ms. Duplantis also noted the presence of three dedicated MMP staff members in the GOMR.

The program began in 1994, and its influence has increased markedly since 2009 as evidenced by increasing numbers of partnerships with outside entities and its support of several significant projects. Key projects include the Caminada Headland Shoreline Restoration Project in 2016, and executing the Mississippi Coastal Improvements Program Memorandum of Agreement in 2016.

MMP's mission is to "facilitate access to and manage the Nation's outer continental shelf (OCS) non-energy marine minerals, particularly sand and gravel." MMP operates upon five programmatic building blocks: 1) leasing, 2) resource evaluation, 3) resource management, 4) environmental studies, and 5) collaboration, partnerships, and communication. A key element of the program vital to its success concerns development of a sand resource inventory.

Ms. Duplantis also noted that on October 3, 2017, the Federal Register published BOEM's final regulations that define the process used by the MMP for issuing negotiated, noncompetitive agreements for sand, gravel, and shell resources on the U.S. Outer Continental Shelf. These regulations became effective on December 4, 2017 (30 CFR Part 583.)

Ms. Duplantis concluded by outlining the long-term strategy of the GOMR MMP, which focuses on building on the success of the program by expanding partnerships, engaging in regional Gulf restoration efforts, and improving stewardship capabilities by building the Gulf-wide offshore sediment inventory and managing multiple-use conflicts.

2. Project Updates

Dr. Miner provided an update on GOMR projects, beginning with the Whiskey Island Natural Resource Damage Assessment, which comprises a lease for 13.6 million cubic yards of sand issued in May 2015, with construction having started in May 2017. At present, construction is 60% complete. Dr. Miner also noted that a difference between GOMR and Atlantic projects is that in the Gulf, there is a significant focus on rebuilding barrier islands.

Further, Dr. Miner described the East Timbalier Island project, for which a draft Environmental Assessment is in progress. Dr. Miner noted complexities and cost increases related to use conflicts and that the lease is expected in the spring of 2018, depending on the issuance of a U.S. Army Corps of Engineers 10/404 permit. Dr. Miner also noted that construction funding has been requested through the National Fish and Wildlife Foundation (NFWF) Gulf Benefit Fund by the Louisiana Coastal Protection and Restoration Authority.

Dr. Miner also provided an update on the Mississippi Coastal Improvements Program, which is being undertaken by the USACE Mobile District. The lease, encompassing 19.6 million cubic yards, is the largest agreement issued in program history, and the start of construction is imminent. The project will be the first job for the new dredge – Ellis Island – which is the largest hopper in the U.S. fleet.

Finally, Dr. Miner presented an update on the Collier County, Florida project. The lease has been amended to extend time and increase volume to 1.7 million cubic yards due to Hurricane Irma impacts, and the lease was expected to be signed imminently at the time of the presentation.

Following the presentations, meeting participants had an opportunity to ask clarifying questions, of which there were none.

C. Environmental Science Updates

Overview (Jessica Mallindine, BOEM)

Ms. Jessica Mallindine, BOEM marine biologist, began the next session with an overview of GOMR MMP environmental studies. The purpose of the studies is to provide the information needed to predict, assess, and manage impacts from offshore marine mineral exploration, development, and production activities on human, marine, and coastal environments. The MMP has spent about $40 million on studies over the past 22 years, focusing on identifying potential mitigation and minimization measures using research findings. The program is also focused on providing critical information for consultations, as well as identifying data gaps for future research needs.

1. MMP Science Strategy
Ms. Mallindine outlined the MMP science strategy, focusing on the Studies Development Plan (SDP.) The SDP is an internal strategic planning tool intended to guide studies for the next two years and beyond. It describes a cohesive and integrated plan to collect information to support BOEM's activities and lays the foundation for making future decisions regarding the National Studies List (NSL).

2. Recently Completed and Ongoing Studies
Ms. Mallindine highlighted several ongoing and completed projects and studies. She covered two studies in depth:

- *Discerning Behavioral Patterns of Sea Turtles in the Northern Gulf of Mexico to Inform Management Decisions* is an interagency agreement, currently in its third year, between BOEM and the U.S. Geologic Survey (USGS) with the objective of capturing and tagging

sea turtles in the Northern Gulf. The specific goals include assessing movement and migration patterns, characterizing habitats, and providing data on abundance and distribution.

- *Development of a Decision Support Tool to Reduce Sea Turtle Dredging Entrainment Risk* is an effort to develop a standardized tool to assess project-specific entrainment risk to improve the effectiveness of mitigation planning within federal marine resource areas.

3. Take Away Messages

Ms. Mallindine concluded her presentation by offering three key messages:

- The MMP is a science based program that responsibly manages development of America's offshore non-energy resources.
- The MMP has robust partnerships with other federal agencies, states, and communities.
- The MMP is a forward-looking program that seeks to build and strengthen coastal resilience.

Following the presentation, meeting participants had an opportunity to ask clarifying questions, of which there were none.

Morphology and Infilling of Offshore Dredge Pits (Dr. Kevin Xu, LSU)

Dr. Kevin Xu, Geologic Oceanographer from Louisiana State University (LSU), presented an update on Dredge Pit Evolution of Borrow Areas in Offshore Louisiana. He noted in particular that the Louisiana coast has numerous small paleo river channels but that the state has relatively limited knowledge of these channels. Highlights from Dr. Xu's presentation are recapped below:

- Louisiana's sand deposits are often high in mud content, which limits their accessibility as sand resources.
- Wall migration in dredge pits can affect oil platforms and pipelines, especially when considering stipulations that require pipelines to be covered by three feet of sediment.
- Dr. Xu focused on two types of dredge pits: sandy shoals, and paleo river channels. Sandy shoals are large and may not be close to the restoration site, whereas paleo river channels are small, can be very close to the site, and are often covered by mud overburden.
- The presentation discussed three examples: the Sandy Point Dredge Pit, the Peveto Channel Dredge Pit, and the Caminada Dredge Pit. Dr. Xu noted their salient characteristics in terms of sedimentation, changes in pit walls, and rate of infilling.

Dr. Xu finished his presentation by offering several conclusions:

- The edges of pit walls are relatively stable, and migration tends to be limited to tens of meters, which is less than prescribed buffer distances.
- "Mud caps" prevent widespread pit wall collapse and help preserve the localized pit morphology.
- Complex morphology is found in 100% of pit infilling.

Ongoing work for this project will seek to quantify parameters for Nairn models[1], validate and improve Nairn models, provide a recommendation to the setback buffer distance for both paleo river channels and sandy shoals, and assess ecological functions and recovery.

Following the presentation, meeting participants had an opportunity to ask clarifying questions. Key clarifications included:

- Question (Q): Have the studies been able to determine whether infilling is the results of wall collapses or suspended sediment? Is infilling the product of internal rearrangement or external deposition?
    - Response (R): There are three possible sources of infilling: 1) wall collapse, 2) re-suspended sediment from ambient seafloor (estimated to comprise 60-70% at studied sites), and 3) river plumes. This could be a high number for Caminada, but has yet to be studied.
- Q: How does BOEM classify overburden on paleo river channels, and how is the removal of that overburden permitted?
    - R: It depends on what is done with the overburden. In some cases, it can be used for marsh restoration. In some cases it is sidecast, which requires a U.S. Environmental Protection Agency (EPA) permit for ocean dumping, administered by U.S. Army Corps of Engineers (USACE).
- Q: Have you detected any groundwater discharge from the dredge site or in paleo channels capped with marine mud?
    - R: Past studies have mostly focused on geology and geophysical methods. Water quality may be the subject of further study in the future and might be detected using temperature, salinity, or turbidity tests.
- Q: Regarding channel-cut features, is it possible to have permission to mine them for sand?
    - R: They are potential prehistoric cultural resources, which would require a more detailed assessment. We know that people didn't live in the channels, so occupation by humans tends to have been further away. The channels suggest looking at the flanks for higher ground relic terraces, for example.
- Q: Regarding the caved-in walls, are they predominantly sand or mud? One would expect sandy walls to stand up better than mud.
    - R: The filling material is dependent on the source and the surrounding ambient seafloor, (e.g., Caminada is surrounded by lots of sand and is periodically affected by muddy river plumes). In depressions, where energy is low, mud tends to settle more than in high

[1] Nairn, R.B., Langendyk, S.K., and Michel, J., 2004, Preliminary Infrastructure Stability Study, Offshore Louisiana: U.S. Department of Interior, Minerals Management Service, Gulf of Mexico Region, New Orleans, LA, OCS Study, MMS 2005-043, 179 p. with appendices.
Nairn, R.B., Lu, Q., Langendyk, S.K., and Michel, J., 2005, A study to Address the Issue of Seafloor Stability and the Impact on Oil and Gas Infrastructure in the Gulf of Mexico: U.S. Department of Interior, Minerals Management Service, Gulf of Mexico Region, New Orleans, LA, OCS Study, MMS 2005-043, 179 p. with appendices.
Nairn, R.B., Lu, Q., Langendyk, S.K., Hayes, M.O., Montagna, P.A., Palmer, T.A., and Powers, S.P., 2007, Examination of the Physical and Biological Implications of Using Buried Channel Deposits and other Non-Topographic Offshore Features as Beach Nourishment Material: U.S. Department of Interior, Minerals Management Service, Gulf of Mexico Region, New Orleans, LA, OCS Study MMS 2007-048, 231 p. with appendices.

energy areas where it gets washed away. Clays tend to be indurated (as opposed to unconsolidated mud) or cohesive and stand up better than sand and can enhance the stability of pit walls. The sediment in the bottom of the pit is almost like pudding.

Benefit-Cost Analysis of Using OCS vs. Nearshore Sand for Coastal Restoration (Dan Petrolia, MSU)

Dr. Dan Petrolia, Mississippi State University (MSU), presented an overview of his work on the economic value of OCS sand. Key points from his presentation are listed below:

- Nearshore sand tends to be cheaper per unit, lower in quality, and constrained by quantity. Additionally, dredging has the potential to impact project area dynamics. OCS sand is more expensive per unit, higher in quality (less mud, larger grains), augments the nearshore sand budget, and is not constrained by quantity.
- BOEM OCS sand is high quality, and there are several sources of it. It is important to move beyond the cost and to focus on the benefits trajectory (i.e., benefits of the source measured over time).
- There are unquantified impacts, such as benefits to adjacent sites due to downdrift or environmental and habitat costs associated with dredging.
- The ecosystem services value (ESV) of the sand is important to make the comparison of the net benefits delivered over time for any given unit of sand. This information helps determine whether it makes more sense to go offshore and get the higher quality sand or stay near shore.

Following the presentation, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- Q: How do you define nearshore vs. OCS?
    - R: We usually delineate them by federal vs. state waters. Riverine projects are classified differently (e.g., Scofield Island used sand from the Mississippi River). Additionally, we are ultimately looking at whether the sand comes from outside the system or not (i.e. whether it is being dredged in an active coastal system). From the cost perspective, what we are ultimately interested in is if there is a fixed difference between nearshore and OCS sand that one cannot attribute to observables (e.g. volume).
- Q: Sediment size affects the slope. Do you consider that as a factor?
    - R: That is considered when examining quality. It is not currently reflected in the physical model.

D. Pipeline Coordination Update Panel & Discussion

The meeting included a panel discussion on the topic of pipeline coordination in the Gulf. Dr. Miner began the discussion by noting the various issues that arise from multiple-use conflicts and the procedures around pipeline removal.

Panel member introductions included the following:

- *Charles Reulet*, *Louisiana Department of Natural Resources DNR (LA DNR) Office of Coastal Management*

  - LA DNR reviews pipeline removal and abandonment issues, and also works with BOEM and the Bureau of Safety and Environmental Enforcement (BSEE). If developers encounter an abandonment in place, LA DNR will review it on a case-by-case basis with Louisiana Coastal Protection and Restoration Authority.
- *Brian Cameron, BOEM Coastal Zone Management (CZM) coordinator*
  - Mr. Cameron works with Atlantic and Gulf states to ensure Coastal Zone Management Act (CZMA) requirements are met. Pipeline removal or abandonment falls under the regulations as a federally-approved or licensed permitted activity. BOEM works closely with Louisiana when it receives an application to ensure the project is within a sediment block. If the applicant wants to do removal, it is not required to go to the state for consistency review. However, if the applicant wants to abandon the pipeline, they have to go to the state for consistency review.
- *Jessica Mallindine, BOEM GOMR Marine Biologist*
  - Ms. Mallindine's role is primarily to address Outer Continental Shelf Lands Act (OCSLA) requests. When an application is sent to BSEE and is subsequently sent to coordinators in BOEM, if the applicant's project falls in the sediment block, BOEM is notified that an MMP review needs to be done. This review includes looking at infrastructure (e.g., well density, other pipelines in the area) and a geology review. BOEM then considers how a pipeline will affect the future of the area and sends its recommendations back to BSEE. Ms. Mallindine ensures that applicable state agencies are aware of what BOEM is recommending to BSEE to make sure all parties are on the same page.
  - Ms. Mallindine also noted that the MMP has reviewed 245 pipeline applications, which resulted in 90 rejections of requests to abandon in place, 63 waivers, and 12 partial removals.
- *Angie Gobert, BSEE Pipeline Section Chief*
  - BSEE approves different pipeline applications and send applications to BOEM. If an application is for removal, BSEE works with BOEM to ensure there are no environmental impacts in removal. If the application is for decommissioning, BSEE sends the application to MMP to make sure there are no impacts for abandoning the pipeline. BSEE's role is primarily to expedite pipeline activities. To date:
    - There are more than 4,000 active pipelines, which comprise 20,000 miles of pipeline.
    - 1,425 pipelines are out of service.
    - More than 8,000 pipelines have been decommissioned in place.
    - 944 pipelines have been decommissioned by removal.

    Ms. Gobert also reviewed facts about regulating pipelines located within significant sediment resource areas (SSRAs).

    - Decommissioning means end of life for wells, platforms, and pipelines.
    - Obstructions can include pipelines; if a pipeline affects other activities or uses, it is considered an obstruction.
    - Developers must remove a pipeline decommissioned in place when it is determined it becomes an obstruction.

Before inviting broader discussion, Dr. Miner noted that the current pipeline buffer requirements, which apply to both active and inactive pipelines, impose a significant opportunity cost because they render significant volumes of sand inaccessible. In total, only about 10% of Ship Shoal sand is accessible because of these restrictions. Dr. Miner also noted that BOEM has had success coordinating with companies to survey larger fields when conducting pipeline assessments, allowing them to gather more holistic data in large swathes as opposed to surveying piecemeal.

SMWG discussions included the following:

- Q: Regarding the pipeline database, are the data updated on a regular basis such that users can download GIS files to use for their project research?
    - R: There are several databases:
        - The pipeline database is used for designing projects. It is maintained by BSEE and is updated on a continuing basis.
        - Significant Sand Resource Blocks are determined through literature review and research coops by BOEM to contain sand resources.
        - The Marine Mineral Information System (MMIS) includes a range of data, including sediment samples, potential resources, and borrow areas. It is currently in development.
        - The BSEE website data center allows users to locate pipeline permits and other information, including a GIS layer that classifies pipelines by status.
        - Some data are also available through the Marine Cadaster.
        - The resources that the state reviews for federal consistency are available at the LA DNR's GIS site, somrise.com.
- Q: Are BOEM and state agencies exploring the possibility of allowing sand retrieval while leaving pipelines in place, in a manner like Rigs-to-Reef, where operators can cover part of the cost of decommissioning as a donation to the state?
    - R: BOEM has conducted a lot of research to understand the physics of the sediment covering the pipelines. Based the data available, BOEM has not changed from the 1000-foot buffer, largely because sandy areas are often high in energy, which makes it difficult to maintain cover; the 1000-foot buffer helps to mitigate that uncertainty.
    - There is an option to use data and modeling to justify a smaller buffer, in which case the burden is on industry. In some cases, companies have provided higher resolution data to influence BOEM's decision. In any case, the burden is on the lease applicant to demonstrate that the pipe is covered by enough sand.
    - Compensatory mitigation has been offered in the past, noting that the focus is sand availability, not the complete removal of all pipelines.
- Q: How up-to-date is the SSRA Blocks Database? Is that something BOEM plans on changing? Can industry use these data to make plans moving forward?
    - R: The database is updated as BOEM receives data indicating that blocks can either be removed or added (e.g., when sand bodies migrate). There is a page on the MMP website that contains information on blocks. BOEM notify stakeholders when it makes changes and does not have immediate plans to update it. The blocks are primarily there to trigger coordination as a matter of safety.
    - The list also identifies which states have requested review.

- Comment (C): There are also additional cost implications on dredge productivity depending on the orientation of the borrow area defined by pipelines.
    - R: The two types of dredges have a hard time turning because they are rigid pieces of equipment. There is also increased risk to sea turtles when you pick a drag-head up off the seafloor bottom. Operating in small areas can significantly increase environmental impact and risk.
- Q: Has BOEM considered allowing smaller buffers for pipelines that have been flushed and cleaned and left in place?
    - R: The cover requirements are related to U.S. Coast Guard requirements, fishing requirements regarding nets and anchors, etc., so they are treated exactly as active pipelines. BSEE can still order the removal of pipelines that have been approved for decommissioning in place.
- Q: Pipelines are sometimes left in place pending future removal. Is there bonding for that?
    - R: Historically, all the bonding has been based on decommissioning in place. The new paradigm has spurred an ongoing conversation about removal in the interest of multiple uses.
    - BOEM is working with BSEE to acquire more information on costs of decommissioning and the number of operators that want to do it in place as opposed to removal.
- Q: Do BOEM and BSEE have similar setups for offshore renewable energy and transmission?
    - R: BOEM and BSEE would if there were an active renewable energy program in the Gulf. However, there are no plans for offshore renewable energy development in Gulf of Mexico federal waters.
- Q: Has anyone considered removing abandoned pipelines to free up sand resources?
    - R: The topic has been raised. However, there are multiple liability issues involved.
- Q: Can you clarify the coordination between states to identify sand resources they are interested in short term as part of Coastal Zone Management plans?
    - R: Louisiana is the only state conducting consistency reviews on a regular basis when it comes to decommissioning and placement within sediment blocks.
    - There are two separate statutes and departments that simultaneously deal with this issue.
    - Many companies are familiar with the Coastal Zone Management Act planning process through access and exploration and applying for pipeline permits.
    - It is a timely process requiring public input, which means states can have significant application backlogs.
    - Since streamlining was implemented on the state-side of the process, there is a GIS report that will show impacts for indicated plots on the map. In the case of removal, the state does not need to be involved.
- Q: Are the applications to remove pipelines in the SSRAs evenly distributed across Ship Shoal and other areas, or are they just concentrated in Ship Shoal?
    - R: It depends on what the companies are looking to do. There are some areas where there are more removal requests. BOEM's analysis is based on the shoal itself and the material that is there rather than where projects are occurring.

E. Gulf-wide Sand Inventory Initiative Overview and Updates

1. Overview

Dr. Miner opened the session with an overview of MMP's Sand Inventory Initiative, a nation-wide effort of which the Gulf-wide Offshore Sand Inventory is one component. BOEM seeks to create a comprehensive database for storing geographic and geologic data to carry out its long-term vision of serving as proactive stewards of sand resources. The GOMR MMP has seen an increase in both the number of agreements executed and the volume of sand conveyed. One reason for the increase in demand for OCS sand is a paradigm shift in coastal management, where it has become more widely recognized that construction projects are better served by involving sand from external resources.

Additional highlights from Dr. Miner's presentation are recapped below:

- Managing multiple uses is particularly important in the GOMR, which is confounded by a lack of accurate and detailed information on the location of sand resources.
    - As an example, in the case of the MsCIP project, the Mobile District opted to rely on nearshore sand resources in Alabama state waters. Alabama's mineral code requires royalty payments, which would have made the project too expensive, prompting them to opt for OCS sand resources instead.
    - Based on surveys conducted during the project, there is reason to believe that there are additional sand resources near Ship Island that have yet to be mapped and which would have made the project significantly less expensive.
- Five methods are essential to the Gulf-wide Sand Inventory:
    - Coordination with Gulf states and other federal agencies.
    - Developing the MMIS.
    - Collecting new geological and geophysical data based on gap analyses.
    - Delineating sand bodies, developing quantified reserve estimates, and characterizing resource properties.
    - Mining, digitizing, and incorporating existing data.
- The near-term strategy for implementing the Gulf-wide Offshore Sand Inventory Initiative is through cooperative agreements with states and interagency agreements. The long-term strategy is to develop a proposal for RESTORE funding and ultimately secure funding.
- Major challenges include managing the volume of analog data, coordinating with stakeholders, and securing long-term commitments of resources and funds.

2. Marine Minerals Information System GIS Database Updates and Demo

Ms. Bridgette Duplantis, BOEM Environmental Scientist, presented an update on the Marine Minerals Geospatial Information Management System (MMIS) and discussed MMP's plan for the tool in the future. Key takeaways from Ms. Duplantis' presentation are provided below:

- The MMIS is a relational database management system housing both historical and current non-spatial and geospatial data. It will have tools for the power user such as query tools to analyze data (SediSearch) and web services that will be public facing allowing MMP to share data with partners and stakeholders. The MMIS centralizes and standardizes marine minerals data (with associated metadata) from the Atlantic and Gulf of Mexico and eventually the Pacific regions.
- In the past, there have been minimal tools to organize and store data received from BOEM funded studies and cooperative agreements. It is difficult to answer questions or build on past

data if one is not able to find it. The MMIS will increase MMP's efficiency and decrease response time.

- The goal is for BOEM to be the authoritative data source for federal offshore sand information and to provide credible and reliable information to stakeholders and those interested in OCS sand. In early 2018, MMP will be providing web services on the BOEM MMP website to publicly share information from the MMIS as well as make information available through the Marine Cadastre and regional data portals such as those hosted by the Northeast Regional Ocean Council (NROC) and the Mid Atlantic Regional Council on the Ocean (MARCO).

Following the presentation, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- Q: Will the MMIS be linked to the website information on pipeline status?
  - R: The pipeline status information will be available in the future, but it is not currently.
- Q: Will the MMIS enable a user to export layers to ArcGIS?
  - R: In the future, this will be possible.

3. Texas Offshore Sediments: Geophysical Workflows, Data Recovery, and Process Model for Sand Resource Evaluation

Dr. Sean Gulik, University of Texas at Austin, presented on the work of a UTIG/BOEM cooperative project. The presentation covered recent findings on recognizing and predicting sand deposits, developing marine geologic and geophysical best practices, and a conceptual model of regional stratigraphy. Additional highlights presented below:

- Finding buried sand resources at an appropriate scale requires full resolution chirp data. Subsequent data processing can further increase the value of this data significantly, which is also applicable to legacy data.
- The UT Marine Geology and Geophysical field course offers students the opportunity to study research methodologies and conduct research projects to collect further data.
- The Trinity River Paleovalley Project intended to find and delineate significant sand bodies on the East Texas inner continental shelf by conducting high-density geophysical surveying and sediment coring.
- Incised valley systems are an important subject of study for understanding distribution of beach compatible sand resources.
- Sand resources appear present in past fluvial settings and in remobilized sand.
- A systems approach is required to understand source-to-sink, and the data show greater complexity than previously suggested.

Following the presentation, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- Q: In many cases, these data are not georeferenced. Is that something you are working on?
  - R: By recovering and reregistering legacy data, we are hoping to place these data in their correct location in a GIS context.
- Q: How much more data storage is required for full waveform data?

    - R: Around four times more, which suggests that when you make an envelope data set, you are throwing away 75% of your data.
- Q: How deep was the transgressive ravinement?
    - R: In many cases, it is quite shallow and can be challenging to map. In many cases, we think they have been mapped incorrectly.
- Q: What instrument did you use for this analysis?
    - R: 0.7-0.12 kHz sweep with a 20 millisecond pulse. If you survey deeper, you lower it slightly.
- Q: Do you have a tool to get below the "top of the bottom"?
    - R: We have used a high-resolution mini generator-injector that generates a three-meter resolution. Collocating two resolutions allow you to map accurately. Boomers are susceptible to producing unusable data because of biogenic gas.
- Q: If you were setting up an inventory locating sand, how deep are the layers?
    - R: In some places, you can find fluvial sections at depths of ten meters. It is a matter of mapping in detail and looking for the shallowest fluvial sections. Texas has relatively shallow waters, which means you can go quite deep. Because of dredging technology, the sand inventory is limited to 90-100 feet of depth.
- Q: How far are these resources from shore, on average?
    - R: Within 30 nautical miles of shore.

4. Mississippi Offshore Sediment Resources Inventory: Late Quaternary Stratigraphic Evolution of the Inner Shelf

Dr. Davin Wallace, University of Southern Mississippi (USM), presented on the USM/BOEM cooperative research project. The motivation for the research is the vulnerability of the Gulf coast to sea level rise. As sand resources are quantified, it is possible to better understand how coastal geology has responded in the past so as to better inform future coastal management decisions. Because low-stand systems have led to many sand deposits, understanding their locations can help identify future resources. Additional highlights are presented below:

- Research tasks include collecting existing data and conducting quality control, reviewing and synthesizing literature to compile a reference database, developing stratigraphy-based nomenclature, collecting new data, developing a conceptual model for deposits in Mississippi waters, and integrating new data and interpretations into a final spatial database.
- Existing data are accurate at a high level, but higher-resolution data must be collected for effective resource management.
- Quality assurance and quality control is important to making existing data more useful.
- Fluvial channels that extend beyond the barrier islands may be indicative of sand resources further away from shore.
- Ravinement is a suspected explanation for the current location of many near-shore sand deposits in the study areas.

Following the presentation, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- Q: What criteria do you use to determine the Holocene-Pleistocene divide?

    - R: We look for bright reflectors tied to sediment cores. There is some uncertainty in determining exact depth, but it is a heavily oxidized and stiff layer, making it a diagnostic process.
- Q: Were you able to come up with your volumetrics with the line spacing that was available?
    - R: The line spacing in question was approximately every 100 meters. If you ravine away parts of the Bayhead delta (approximately five meters), you would produce enough sand for the Petis-Bois project.

5. Gulf of Mexico Outer Continental Shelf Analog Seismic Data Conversion and Preservation

James Flocks, U.S. Geological Survey (USGS), presented on his work recovering and digitizing analog data. Highlights presented below:

- There is an extensive forensic process required to convert legacy data to usable formats. Specifically, navigation data is essential, which requires using track-line maps that are not always comprehensive or accurate.
- USGS maintains metadata archives with all the relevant information.
- Some of the data rolls contain as much as 1 GB of data each.
- Digitizing allows users to integrate different lines into 3-D models that enable comparing across sample types.
- All data will be published into USGS archives that are html linkable.

Following the presentation, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- Q: Are the digitized core logs tabular?
    - R: Yes, the vibracore description sheets are tabular, which is not as common anymore. Current lithology does not include that level of detail. Gint and Rockware are the two most widely used software platforms.
- Q: Is there a process for prioritizing data according to projects or needs?
    - R: This project uses BOEM criteria for prioritization (depth is less than 100 feet in OCS waters). It is also conducted under the USGS National Geophysics and Geologic Data Preservation Program, which is a grant funded program for recovering data. We might look into different waters under that purview further down the road.
- C: BOEM's most recent Ocean Science Magazine is available on the BOEM website. It contains information on many of the topics discussed here.
- Q: Regarding the tools to deal with masking underlying the stratigraphy of the sand, which have the resolution required to define the valleys?
    - R: It is true that gas renders most methods inoperable. We have had some success by taking everything down to the multiple and subtracting to that level. Once you hit gas, signals are no longer coming back to the microphones.

F. Wrap Up and Next Steps

Dr. Miner provided closing comments, noting that it is important to bridge gaps between organizations so there is more data standardization. Dr. Miner also noted interest in developing a chirp data

processing tool for practitioners and invited all interested parties to reach out to participate in the testing process.

After Dr. Miner's initial remarks, meeting participants had an opportunity to ask clarifying questions and make comments. Key clarifications included:

- C: It is important to identify large-scale restoration projects on the horizon to better connect sand sources to projects.
    - R: In areas where there are more projects, there are issues with allocation. This is a key issue for the Atlantic SMWGs. It is important to note the difference between sand deposits and sand resources. The MMIS is intended to be a tool with parameters that help connect projects to resources.
- C: Mississippi is just beginning to engage in a longer-term planning process; restoration efforts to date has been relatively opportunistic. Setting up a master plan for the state with more realization about resources being identified is an exciting prospect.
    - R: BOEM is interested over the next year to find ways way of better linking the coops to the end users.
- C: The need exists to expand the bathymetric surveys. Lessees are required to pre- and post-survey to calculate the volume of sand removed. The quality of data has been insufficient in this regard. Over the next year, a group should be assembled to ensure precise and accurate multibeam bathymetry.

Eric Poncelet, Kearns & West, asked participants to provide topics of interest for future SMWG meetings. Suggested topics included the following:

- C: More information on project owners, funding, objectives, relationship to sand mining, and other project information would be helpful for participants who are not local to the region.
- C: It would be helpful to develop a protocol for sharing student collected data with BOEM.
- C: It would be helpful to hear more from the oil and gas industry about how they are working and what they are doing in the Gulf. The SMWG is interested to bring industry to the meetings. Industry more commonly participants if they are having an imminent problem.
- C: The Offshore Operators Committee (OOC) has planned a workshop next year to focus on pipeline conflicts.
- C: Sharing data between agencies should be a future topic. Continued conversations about quality of data with an eye toward use by multiple groups would be helpful.
- C: Louisiana CPRA has worked on the coastal master plan. The oil and gas industry has participated in that process, asking what they can do in terms of restoration projects. It would be helpful to focus on industry projects related to coastal resiliency.

Appendix A: Meeting Agenda

AGENDA

Bureau of Ocean Energy Management (BOEM), Marine Minerals Program
Gulf of Mexico Offshore Sand Management Working Group

Thursday, December 7, 2017
9:00 AM - 4:00 PM

Location: InterContinental New Orleans
444 St. Charles Ave.
New Orleans, LA 70130
Treme Room

Information for Remote Participants:
Call-in Number: 1-719-457-0816
Participant Passcode: 959947
Webinar Link: https://kearnswest.adobeconnect.com/enter?m=BOEMSM

Note: Please follow the Adobe Connect instructions to join the webinar audio. The above dial-in number is an alternate way to connect to the meeting if not joining the webinar.

Meeting Purpose/Objectives:

- Receive update on BOEM Marine Minerals Program (MMP) and Sand Management Working Group (SMWG) efforts
- Share information on gulf-wide sand inventory initiatives
- Discuss lessons learned from recent sand management efforts
- Identify opportunities for continued Gulf of Mexico (GOM) SMWG activities

TIME	ITEM
8:30-9:00 a.m.	***Arrivals***
9:00-9:15 a.m.	**Welcome and Introductions** • Welcome and introductions of new MMP staff and Headquarters staff (*Mike Miner,* BOEM) • Review agenda, meeting objectives, and process approach (*Facilitator*) For Webinar Participants *(will send this out in advance as well)*: • Please select *6 or the mute button to mute your audio to the phone • **Please do not put the line on hold!** • Click the "raise hand" icon in the top of the webinar window to enter the discussion queue • You can also share questions using the chat pod in the bottom left of the webinar window • Click the "full screen" button – top right of the presentation pod – to make the presentation bigger

9:15-9:30	**MMP Program Update** • Mission, Vision, and Strategy *(Bridgette Duplantis,* BOEM*)* • Project Updates *(Mike Miner,* BOEM*)*
9:30-10:30	**Environmental Science Updates** • Overview *(Jessica Mallindine,* BOEM*)* • A Comparison of Morphology and Infilling of Muddy and Sandy Dredge Pits*, (Kevin Xu,* LSU*)* • Benefit-Cost Analysis of Using OCS vs. Nearshore Sand for Coastal Restoration (*Daniel Petrolia,* MSU*)*
10:30-10:45 a.m.	***Break***
10:45-11:45 a.m.	**Pipeline Coordination Update Panel & Discussion** • *Mike Miner*, BOEM (moderator) • *Brian Cameron,* BOEM • *Jessica Mallindine,* BOEM • *Angie Gobert,* BSEE • *Charles Reulet,* DNR
11:45-1:15 p.m.	***Lunch (on your own)***
1:15-1:20 p.m.	**Introduction to Afternoon Session** *(Facilitator)*
1:20-1:40 pm	**Overview of Gulf-wide Sand Inventory Initiative** (*Mike Miner,* BOEM*)*
1:40-2:40 pm	**Gulf-wide Sand Inventory Initiative Updates** • MMP GIS Database Updates and Demo (*Bridgette Duplantis*, BOEM) • Texas Offshore Sediment Resources Inventory: Geophysical Data Collection, Analysis and Development of Post-Processing Tool (*Sean Gulik*, UTIG)
2:40-2:55 pm	***Break***
2:55-3:50 pm	**Gulf-wide Sand Inventory Update (cont.)** • Mississippi Offshore Sediment Resources Inventory: Late Quaternary Stratigraphic Evolution of the Inner Shelf (*Davin Wallace*, USM) • Gulf of Mexico Outer Continental Shelf Analog Seismic Data Conversion and Preservation (*James Flocks*, USGS) • Gulf-wide Sand Inventory Next Steps (*Mike Miner*, BOEM)
3:50-4:00 p.m.	**Wrap Up & Next Steps (Mike Miner, Facilitator)**
4:00 p.m.	***Adjourn***