ERDC-EL
Moderator: Courtney Chambers
July 30, 2014
12:59 am CT

Courtney Chambers: Well, today at this time I'm going to introduce our speakers. We're going to have Mr. (Tim Welp) who is a research hydraulic engineer in the Engineer Research and Development Center here in Vicksburg, Mississippi. He began his career in a 4000 foot deep underground coal mine and then an open pit (gypsum) mine before coming to ERDC in 1990. Since then he has worked on dredging research and development projects primarily concerning prototype data collection and analysis and dredging research projects, investigating dredging and dredged material placement aspects. These activities have included dredging equipment optimization, environmental impacts of dredging production estimation and analysis and beneficial uses of dredge material. He is active in providing technical support to field projects and U.S. Army Corps of Engineers District Divisions and headquarters as well as other organizations. These activities have been supported by programs within the Corps of Engineers, the U.S. Army, Navy and Department of Defense and the U.S. Environmental Protection Agency, World Bank and private sector.

Our co-presenter is Mr. (Coraggio Maglio), a professional engineer with 10 years of specialized experience in coastal processes and freshwater stream systems. In his current position at the Army Corps of Engineers Research and Development Center he's in the coastal hydraulics laboratory and he incorporates his knowledge and love of sensible sustainability into every project he manages, researches or advises on. The diversity of his work experience ranges from storm damage reduction projects, beach and ecosystem restoration, navigation dredging and flood protection. His diverse and accomplished knowledge and physical biological science engineering and permitting processes, project management and construction techniques allows

for improved practical inclusive resolutions. He is recognized for his out of the box thinking and innovative approach to project solutions.

More about (Tim) or (Coraggio) can be found in their bios which can also be made available with the recording of today's presentation.

Gentleman, we've very happy to have you both sharing with us today. So at this time I'm going to move on over to your presentation and I'll give you the presenter rights. We will also enter a listen-only mode and then we can begin.

Operator: All participants are now in listen-only mode.

(Tim Welp): And good afternoon everyone. Today (Coraggio) and I will be talking about thin layer placement or sometimes I'll call it by its acronym TLP and here I'd like to acknowledge our co-preparers Dr. (Trudy Esses) and (Demarys Acevedo-Acevedo).

Now this Webinar is a product of a DOTS request by (Kevin Hodgens) of the Jacksonville district to address a growing interest in thin layer placement of dredge material for environmental enhancement. And (Kevin) requested that this Webinar provide information on TLP aspects such as current placement technologies, applications, permitting issues, case studies and ways to maximize interagency cooperation on minimizing detrimental effects.

These we've addressed in varying degrees in this Webinar. (Kevin) also included (rainbowing) for shore protection and near shore (burm) information in this request but we didn't want to go over an hour so we've not included those aspects today.

Now here's an outline of today's presentation. I'll be talking about TLP definitions, its history, current placement techniques and sediment containment and water control methods. And (Coraggio) will present information on various TLP case studies, regulatory considerations, engineering and construction considerations and then he'll conclude with a summary description of the thin layer placement Web site that's currently under development at ERDC.

Now in this slide we ask the question just what is thin layer placement. Now there's various definitions and use out there but in the context of today's presentation we've decided to start the description of TLP as the deposition of dredge material in thin uniform layers over emergent vegetation or shallow bay bottom. Now one of the reasons that TLP is currently being used more and more is because of its potential as an alternative to conventional disposal or placement methods because using TLP can minimize impact due to thick layer deposition.

So now hitting with the somewhat ambiguous terms of thin layer and thick layer we'll generally define TLP as the limited thickness placement of dredge material for beneficial use. And again for the purposes of this Webinar beneficial use will include the environmental enhancement objectives of wetland or marsh nourishment, wetland creation restoration and sustainable sediment management.

Now the concept behind marsh nourishment is that the increase in elevation provided by the addition of the sediment will improve plant growth by improving the conditions within that plant's growing environment. And this (deposition) layer, thickness is approximately around six inches. Wetland creation or restoration is where you're raising the sediment surface elevations and shallow open water enough to allow recolonization by emergent marsh

species. And for the sustainable sediment management I'll give you the example of Mobile Bay thin layer placement.

In Mobile over the last 20-plus years the district's been taking the vast majority of the maintenance dredging sediment out into the Gulf of Mexico. And from the upper bay that's a long 80 miles round trip by hopper dredge and I know because I made a couple of those trips. Well, now it's been determined Mobile Bay's become sediment starved and that the district has just recently started doing TLP in the bay and thus this is augmenting a sustainable sediment management strategy in maintaining a safe reliable channel while keeping the bay healthy. And (Coraggio) will talk more about this later.

And in this slide you'll see I used the terms to either dispose or place methods and I used those in context of how you dispose of sediment when you're not getting a beneficial use out of it as opposed to when you place that sediment you are getting a beneficial use. Another way to look at it is you dispose of garbage or the evil spoil term and you place sediment as a natural resource.

So what I'm ultimately getting at is the definition of thin layer placement depends on the user and how they're using it like we previously mentioned in this picture here for the wetlands nourishment. It's approximately six inches thick so you don't kill the vegetation outright and try to encourage its growth where as opposed to over here we have the Mobile Bay thin layer sites adjacent to the channel about 2500 foot off where they're shooting for a 6 to 12-inch thick deposition layer. And then in wetlands creation you can easily go over 12 inches.

So now on this slide I'll give you a brief history of TLP. Back in the early days of oil and gas expiration Louisiana where they dredged the access

channels it was done by bucket and hydraulic dredges. But the bucket dredges didn't always work so good because back then they're too small by side casted material and fall back into the canal. So hydraulic dredges were primarily used in the 1930s and 40s and usually with a cutter head. And once they're open just a conventional regular open pipeline discharge at the end of the pipeline of a cutter head I'll refer to that as low pressure spray in the following slide. By the 1950s the bucket dredges have gotten bigger and better and so they are used more often.

But then back in 1979 was the first high pressure spray placement project that was conducted down in south Louisiana where down here on this if you can see my cursor moving you can see that spray that's forced out of a nozzle at the end of a discharge pipeline and it's shot out into the adjacent wetlands.

So this is what we know about thin layer placement is that similar to that historic sidecast practices but, and I'm putting this qualifier out, if designed and operated right you can have more operational controls. And by operational controls I mean having more control over the placement accuracy and deposition thickness resolution and this is why it's become in increasingly more attractive alternative to say this traditional disposal and placement methods.

But we have a relatively limited number of TLP projects that have been conducted in the U.S. and a relatively limited number of well-documented case studies and all this with very little formal guidance that's available out into the public domain.

I'll talk about current TLC placement technologies and in this slide we can see the three dominant methodologies. At the top the gentleman standing by is open pipeline discharge that are referred to earlier as low pressure spray. The

fine grain material or, you know, fine grain sediment and (slurry) flow of relatively long distance. But if you start to have an appreciable amount of sand, that sand can build up around a discharge and you either have to move the sand or move the pipeline discharge point to achieve a grade more frequently.

Next slide or next picture in the middle, you have a spreader plate that's used in the end of the pipeline to spread out the slurry more uniformly. A difference spreader plates or different ways to move the discharge point around.

So some use in this picture that the reaction force of the (slurry) against the spreader plate can move that entire discharge point around horizontally where others will use a barge with anchors or swing lines to reposition the horizontal location of the dredge.

And on the bottom you can see what started in 1979 project down in southern Louisiana that's a high pressure spray that uses a nozzle on the end of a pipeline discharge and shoots that (slurry) out into the wetlands and an art.

And properly designed and operated like I said earlier this can give you increased placement accuracies and a high resolution if you have a sensitive habitat or an area that you want to go around you merely swivel the bearing or adjust the (adsmith) of the spray to be able to mitigate that situation.

And instead of only using one pipeline discharge you can prepare multiple discharge points like the one you see in this slide where they used in the Galveston district that the Laguna Madre to increase their production.

And now we're getting into a lot of - it's a form of thin layer placement or a lot of the majority of information available out there is actually on capping like on capping or capping contaminated material with clean sediment and these are some of the placement technologies that you split or barge or sprinkle sediment over that site or an underwater discharge to be using a (Tremy) or a down tube or using the more sophisticated spreader barge or what hydraulic washing of the material from an open faced barge.

Now talk about sediment containment and water control structures. On this slide you'll see the structures that are used in confined disposal facilities that are in Jacksonville. I think you call it a dredge material management area, DMMA. Basically - okay I lied to you.

You can't see the (dissymmetry) or the (topal) in that when you're designing these projects and you can take advantage of the ambient surroundings, the (symmetry) or topography as a retaining structure, take advantage of it, reduce the cost of your project.

The more conventional confinement containment structure or burns and picture you can see coarse grain material, stack up with a high angle repost with the core screen material. So the other one with the air boat you can see jus the waterline is the air boat a low release fine grain (burm).

And we can also use geo tubes that you should be able to see over here with the cursor. Geotubes can be filled with coarse grain material. Former retaining structure or you can use fine grain material in conjunction with the filter cloth inside the geotube and fill these with fine grain material as well. And then you can have sheet piling that can be used as a containment structure as well.

Now in this slide you can see structures that are more commonly used in thin layer placement projects that focus on marsh restoration. And not with the available with the limited documentation that we've been able to look at, silk curtains haven't been used that much but what you see with the hay bails and the core of the coconut logs that you see here have been used in relatively high frequency on the east coast.

And so basically you'd be able to use these retaining structures as far as retain the sediment where you want it and reduce suspended sediment where you don't want it. Now I'll turn it over to (Coraggio Maglio).

(Coraggio Maglio): All righty. We're going to go over 11 case studies. And these are from all around the country. We're going to first start off on projects that were conducted by the Baltimore district primarily by (Bob Bama). I don't know if most of you are familiar with him but he's done this for a very long period of time.

On this project in particular we're going to start out with the Black Water National Wildlife refuge in Maryland. This was a demonstration restoration project to demonstrate techniques. This project cost around 300,000. They sprayed four sites and they did lift placements on two different sites. Those were one acre and two acres each.

By lift placement what I'm describing that as is multiple feet of material being placed over an area to do wetland creation. These are some of the lift placement areas. They used hay bails per confinement and then they pumped behind them and you see this site has already been filled. This site's ready, prepped and ready to be filled.

Once they fill these sites they came back in and they planted them with plant plugs and you see May 2003 what the site looks like and then four months later had been totally re-vegetated with material with some vegetation because the material is highly organic and has a lot of nutrients within it. And you'll see that throughout a lot of these different slides.

This is another project done by the Baltimore district, however, this site is a fresh water site and you can kind of see their containment structure that they are employing here. They use a sheet pile wall and in this location you can see the core logs being installed and several layers thickness. And the reason they did this was to allow for this drainage swell to continue to remove storm water through the area even while they were constructing and post construction.

And then you can see the site being plugged and you can see the site after it's fully re-vegetated. This project was a French marsh wetland creation project. It cost roughly 3.3 million dollar and they created two different sites, four and 13 acres each. And required 74,000 cubic yards material that was dredged out of the maintenance channel and over 4000 feet of sheet pile installed over 350,000 plants to obtain this vegetation growth you see ultimately.

The next project we're going to look at is on the (Honga) River. Again, this is a Baltimore district project. This project occurred over several different phases over many years. They initially came out and they constructed a confinement system out of geotubes, however, some of those failed and some of them settled and so down the road they eventually installed armory units on top of the geotubes and basically put in rock.

And you can see what the site looks like. They basically used unconfined discharge, no spreading of material. And then through time and in 2000 they put roughly 273,000 cubic yards in material and then another 300,000 in 2003

and then in 2008 they finished off the projects another 52,000 cubic yards material.

And they way they achieved final grade because there was a lot of sand in this material they used a bulldozer to push it around. This is the Heritage Island project. Once again this is a Baltimore district project in a fresh water site. In this location they primarily used core logs along with wooden members to basically stop the flow from within the placement area and they pumped into these confinement areas, allow the material to consolidate and then came back in and plugged them.

And you can see what the site looked like after it was constructed and you see what the site ultimately looked like. This was a wetland creation project, roughly 1.3 million dollars in cost and they were able to create six acres out of 42,000 cubic yards of material.

And this is the last Baltimore district project we're going to look at. It's a little bit different. This is actually an open water placement area within a relatively large bag. You can see what the site looked like before they came in and did this project. It was basically a very small island. It had the historic structure on it.

When they came in they basically placed a large (spit) of sand around this existing island. And this was an island creation project to create intertidal habitat and that roughly costs 1.7 million dollars. They used 200,000 cubic yards and created 11 acres. And this was a very recent project that was in the past year.

Now we're going to jump over to the other side of the country over to Texas. And they've been doing a lot of thin layer placement type projects over there

for a good while now. You can see here in Galveston Bay where they did unconfined placement of materials in large mound configurations.

The reason they did this is because they were focused on creating fringe marsh. A few of the sites look like immediately after placement and almost a decade later how they've evolved in using the native seed stock that was there basically recruited and now a viable ecosystem.

And this was unconfined placement primarily using mound building and using a hydraulic discharge point. And they experienced basically point three to point seven feet of settlement after the projects were constructed. And there were actually two different sites shown in this slide.

This is another project from the Galveston area called the Boulevard Marsh and in this site they took an upland confined area with a dredge placement facility that was filled up to roughly the existing wetland elevation and then they came back in and they breached the dikes and they carved in these various geometric patterns and shapes of channels to hydrate the area in a more natural fashion to basically give it tidal reconnectivity.

And they also came back in and they created these kidney bean shaped features. And the reason they did that is because after they had done the mound placement events previously they learned how to control their placement more effectively and they're able to create more elaborate designs out of the material that was being placed hydraulically.

One thing that's pretty neat about this project is the planting plan was purely done by a seeding. That's something that's not done very often. This is a semi-unconfined hydraulic placement event with sacrificial (burms) primarily

for containment and protection of the site. And they restored 788 acres. Once again with a shoreline edge focus.

This is another Texas project. It's called Golden Path. You can see t he placement area here in this picture. This is a 2000 acre marsh that has subsided significantly due to oil and gas extraction in the area. And so maintenance dredging material was utilized beneficially to basically place two feet of hydraulic fill over the entire marsh and you can see the operation with the discharge pipe and a marsh buggy to move the pipeline around more or less continuously.

And this was a maintenance dredging project. They basically dredged 2 million cubic yards of material and placed it two feet thick over the marsh and they were able to restore 2000 acres like I said and they pumped the material three to five miles. And they used 200 grade control stakes that you can see here in this picture, this white post to actually get the grade that they were intending.

This next project is moving a little closer to Jacksonville. This is the Goose Point marsh creation project. And on this site this is a marsh creation project using confined placement. They're using earthen perimeter containment dike which you can see in these pictures to confine the material as they pumped it in.

And they pumped in 3.1 million cubic yards from a borough site with a 24 inch dredge. And they were able to create 566 acres and they were able to re-nourish an additional 155 acres of marsh.

And now we're moving back over the east coast into Delaware. This project is called Pepper Creek and this was a maintenance marsh restoration project

using unconfined placement with the material sprayed over the marsh which we can see in this picture.

And you can see kind of the heat map here shows the design thicknesses they were trying to achieve during the placement of said material. And you can see the different thicknesses they were shooting for pretty much six inches or less pretty much everywhere. And you can see the dredge that was employed. This was a mudcat 12 inch dredge and you can see the marsh after it was completed and re-vegetated.

This project cost $125,000 and used 35,000 cubic yards of material using a 4-inch high pressure discharge nozzle. This was a highly successful and it still being monitored to this day.

Now we're going over to Mobile. This is the largest thin layer placement project that we know of and this was thin layer placement within the bay and this was to alleviate the costs of the 40 mile transit to the ODMDS each way.

And in 2012 they were able to place 9 million cubic yards of material in these locations along the edge of the channel. And they were able to place from 6 inches to no more than 12 inches in all of these - in most of these areas. And they were able to do that by using a spill barge and this trill was placed approximately 2500 feet from the edge of the channel.

And during their modeling effort to support this project they were able to estimate about 35% of the material placed in these areas would eventually make its way back into the channel. However 65% of the material would be dispersed throughout the rest of the bay re-nourishing areas that were sediment starved.

And this team that worked up this 2012 project is once again working to this next year and they're going to placing several more million cubic yards within Mobile Bay hopefully within the next year.

And there are lots of other projects proposed particularly up in the Philadelphia district within the state of New York in various national wildlife refuges. And apparently in the design and planning phase right now and they're going to be appearing all along the intercoastal waterway in the great state of New Jersey.

Now we're changing focus to the regulatory aspects of thin layer placement. I've coordinated a bit with some of the folks in Jacksonville on this and I'm just going to go through some of the important points to be aware of. And we're going to focus on U.S. Army maintenance dredging events primarily.

Typically these events require a water quality certificate for thin layer placement. They're also going to require a NEPA certificate and essential fish habitat and an endangered species at coordination. And that's when this material is placed on private or federal lands.

However if it's placed within state property that are wet you'll need a sovereign submerged land lease as well. And one of the things I want to stress the most important aspect of getting all your ducks in a row in terms of getting the regulatory side of things is you need to stand up, you need to work up some sort of interagency working group.

It's highly instrumental to the success of these types of projects and these groups typically have various components in them, lots of different government agencies, NGOs as well as various other stakeholders.

And the reason thin layer placement is catching on in a lot of places around the country right now is due to primarily sea level rise and the focus on resiliency as well as living shorelines becoming a huge issue in a lot of areas. And the degradation of marshes are becoming a serious problem so marsh and nourishment is becoming a hot button as well as well as building new wetlands to mitigate wetlands that have been lost through time as well as the continued emphasis on smart sediment management.

And I wanted to kind of over how things occurred in the Mobile Bay project and it all boils down to teamwork. Address all the regulatory hurdles you have which there are a lot of them for a project like this that's a little outside the box. You really need to stand up to some sort of interagency working group. This needs to be established to evaluate and provide guidance, vet out the issues, address them.

And if you look here on this slide you can see all the different agencies that were involved in the Mobile district interagency working group. This is a laundry list of different entities and it's highly important to have all these folks at the table and get them all on the same page.

Now we're going to change focus once again and we're going to look more into the engineering, construction and monitoring aspects of a thin layer placement project.

One of the first things that kind of jumped out to me when I started looking at these projects is the production. When you're doing a thin layer placement project such as a spring project shown on this picture one thing that's going to be altered more than anything else is your production.

And a lot of the NAB projects they are experiencing about 50 cubic yards in hour production rates. And this material is able to be sprayed anywhere from 50 to 300 feet.

And during the course of their work in NAB they're able to develop some rules of thumb on placement and they are able to nail down kind of the rules of thumb of how much material you can place into a marsh placed on the cubic yards and the acre feet depending upon the material type.

So for silk they can get 800 cubic yards per acre foot for a mixed sediment of both (silk) and sand. You can get about a thousand cubic yards and 1200 for pure sand.

Some of the other drawbacks of thin layer placement projects is you obviously have your produced production rates and thus your duration of your contract will increase to accommodate the decreased production. And your cubic yards cost will also increase.

However thin layer placement has some very obvious benefits. First of all, your placement can be very selective. You can place where you spray your material. You can reposition your spray nozzle very, very accurately. The material is also placed very homogenously.

And by that I mean if you're spraying the material into a marsh and you have a mixed sediment, if you had to stay low pressure discharge your course fraction would sell out right at the discharge while your fine fracture would spread out throughout a much larger area via spring you're able to more homogenously spread this material over this area.

Some of the other benefits on thin layer placement projects most of the time there is no real estate acquisition required. Some of the other things that are huge benefits is you can get away with minimal containment a lot of time and minor site development can be pretty much avoided in a lot of cases. So you don't need to build upland dikes and all those costs that would be incurred.

So if you look at the overall inclusive life cycle of dredging and placement operations thin layer placement can be very competitive with traditional operations.

One of the most important aspects of a design of one of these projects is elevation. Elevation is critical and by that at I mean grade control. If you don't have good control on your grade of your final placement you could have serious issues of invasive species. In Florida you'll have Brazilian pepper and soft cedar that could move in if you're just a few inches above your design target elevation.

And some of the things that affect elevation are consolidation. A lot of these materials are very fine and fluffy and will bulk up a lot when they're initially placed and will consolidate through time. And so it's very difficult to achieve the desired grade.

To address that most locations have developed adaptive processes where they do multiple list events. I'll come in and they might put in six inches initially and then they might put in six inches initially and that consolidates down to four inches and I'll come back in and add three more inches and it will consolidate down to the desired target elevation.

To ensure that you achieve proper grade control sampling is used quite often in terms of push probes and (unintelligible) to determine how much material you ultimately placed over the (insiching) materials.

And to obtain grade control traditionally grade stakes are employed, however, one of the alternate methods which is also employed quite frequently is if you have existing vegetation that's at the elevation that you would like to ultimately achieve, a lot of times they use that as an eyeballing technique to basically determine when they bring the material up to the proper elevation.

And while serving in these areas RTK real-time (kinomatic) is a must. You cant use DGPS and get the vertical accuracy that you're going to need and you can't use plain based (liar) to get the vertical accuracy required. At a minimum you need to use RTK and land-based (lidar) if you're going to go that route. And you need to have very tight controls on your vertical accuracy.

And now I'm going to change focuses once again and look at our underdevelopment Web site that's being produced here in the environmental lab at ERDC. This project was funded and supported by the DOTS, (dewar) and RSM programs. And this is a link to the front page.

And like I said it's still in development. A lot of the links don't really function totally yet. It's a work in progress. The one thing I wanted to point out was this link right here. It's something that's the port hole into the ultimate Web site.

So what is the purpose of this Web site? Well, this Web site is to create a Web-based portal to aggregate all the present state of the art in terms of thin layer placement, to be able to pull in all the available literature and resources

and to basically to go out and solicit and populate this site in case studies from all over the country.

This Web site if going to be (CAC) enabled though so people outside the corps will not be able to enter information. They will be able to provide it to people within the Corps and they would be able to then enter it.

Some of the other aspects of this Web site is to develop a link and create a useful tool to help design teams whether it be from the planning stage, the design construction, cost and planting a modern planned stages. Similar projects. I can see what other people have done and thus more appropriately and more cost effectively design better projects. Some of the secondary objectives of this Web site are basically to create a data integration framework where all this information can be housed in a GIS-based interface.

That link I pointed out before, if you click on that it would take you to this page to this edit button over here. And if you click on that that would then take you to this next page here. And once you are in this page there will be various layers, sediment source, thin layer placement and project.

And once you click on one of these layers you are able to then go in and draw in a polygon of your project area. In this case they clicked on thin layer placement so where your material ultimately ended up. And after you draw that in you would then be able to go in and fill out a survey pertaining to each of the layers after you draw them.

And these are the various survey forms that are on the Web site. So once you draw in your sediment source you can then fill out all these different fields describing where your project is, the volume that was placed, the date start

and stop. You can also add attachments of various other files that you'd like included.

There's once again thin layer placement areas so once your material was placed you can then go in there and you could add attachments and fill out all these different fields. And then the overall project survey tab allows you to go in and add additional information about the project as well as attachments.

And like any (ESRE-JAS) product you have lots of ability to go through and filter layers and rack and stack in search for things in a geospatial format. And so that wraps up our presentation. I'd like to entertain any questions and thank you all for your time.

Courtney Chambers: Great. Thank you, (Coraggio) and (Tim). We're going to return to interactive mode at this time.

Operator: All participants are now in interactive mode.

Courtney Chambers: All right. And (Coraggio) is taking us back to the Web meeting interface. So you'll notice the chat box again in the lower right hand corner of your screen. So at this time if you'd like to take your phone off of mute you can ask your question verbally or again use the chat box.

(Robert Weaver): Hi (Coraggio). It's (Robert Weaver) at FIT.

(Coraggio Maglio): Hello.

(Robert Weaver): I have a quick question and this came up during a conversation I had last week. How long typically before the plantings can occur - this gets into the idea of the consolidation time for these fine sediment materials?

(Coraggio Maglio): It depends on the material that you're dealing with on these projects in particular in Baltimore it was relatively quickly thereafter, so within literally days or weeks.

(Tim Welp): And (unintelligible) also you use the hydraulic discharge the added seeds into the slurry as it was sprayed and he tried that as well. That worked fairly well I believe.

(Coraggio Maglio): We have other pictures of people literally wading through the (slurry) within these thin layer confinement areas up to their navel installing plugs. So they were able to walk through it while plugging it.

(Maury Ceiling): This is (Maury Ceiling) with Florida DEP. About 10 years ago we reviewed a disposal in Pensacola Bay I believe for thin layer disposal in open water. And one of our major concerns was turbidity. Have you been able to evaluate that and what did you find?

(Coraggio Maglio): Well, turbidity is definitely an issue but that's, you know, site specific obviously. And it just depends on the protocols that you're willing to live with and the cost you're willing to incur.

(Tim Welp): What depth was the project sited at?

(Maury Ceiling): I'm going to guess it was around 30 feet to 40 feet.

(Coraggio Maglio): Yeah, there's lots of different design protocols that can be employed like the (tremy) tube like we were talking about that's something that can be utilized that can get the material to the bottom without mixing to the water column. But obviously consolidation will take some time. And if there is

currents enforcing the material will move around and get re-suspended to a degree.

(Maury Ceiling): Was that fine grain material to be placed?

(Coraggio Maglio): It's pretty fine.

(Tim Welp): Is it also private industry as well as (the) waterways experiment station designed a diffuser to reduce the exit velocity of the flurry to minimize the re-suspension? So that would be able to mitigate the impacts by potentially incorporating additional operational controls. I operate the dredge as well as engineering controls such as the silk curtain, diffuser and those other types of technologies. Possibly it's all site specific plus you're going to a deeper depth than we've heard about so far I believe. Right, (Coraggio)?

(Coraggio Maglio): Yeah, typically these are in more or less shallow water.

(Maury Ceiling): Yeah, we didn't see it as the beneficial placement. It was inexpensive disposal.

(Coraggio Maglio): Yeah, but the type of operation sounds like you're talking about is pretty much how they do dredging in placement in Japan. They pretty much do it all in deeper water with a (tremy) type tube which they call sea injection dredging over there.

(Maury Ceiling): All right. Thanks.

(Jim McAdams): This is (Jim McAdams). Can you hear me?

(Coraggio Maglio): Yes, sir.

(Jim McAdams): Most recently we've done a 206 restoration project on a project called Stevenson Creek where we actually did mangrove habitat restoration with sand. And the contractor who had a number of problems with the project however the sand went down quite nicely and it was actually growing mangroves before he was actually putting sand on the bar. Eyeballing technique. It was a small dredge and he actually used the dredge to squirt down the high spots and, you know, fill up the low spots. And it was growing almost before he finished - it was growing even before he finished off the surface.

(Tim Welp): We did a placement down in New Orleans at the head of passes with a modified dust pan dredge and we only were allowed to dredge for five days before some marsh grass started to emerge and basically we were told that the project was a success and it was time to terminate.

(Bob Brantly): This is (Bob Brantly) with Florida DEP. I've got a couple of questions. With regard to the spill barges that were used in Mobile Bay, what was the depth of the placement area and the draft of the barges?

(Tim Welp): We don't specifically know - I mean I'd say that the barges - the spill barge wouldn't draft more than two to five feet and that the areas that they've placed sediment

(Coraggio Maglio): Were between four and six feet.

(Tim Welp): But that's these types of information, you know, if we could get your name we could look it up because that's one of the primary reasons that we're creating this Web site is to address these types of questions and make the information available on a wider scale.

(Bob Brantly): The production rate for the high pressure discharge spray - the fifty cubic yards per hour - are there any variables that can be adjusted to improve that production?

(Coraggio Maglio): Yeah, dredges are very innovative. Those projects that we're talking about there they used pretty much 10 to 12-inch dredges. And they nozzled it down to a 4-inch discharge. And when they're dredging they're only pumping around 10% solids. So if you could use a larger nozzle or in a larger dredge you can obviously bump that up quite a lot.

(Tim Welp): Because frankly going from a 12 to a 4-inch reduction - I mean, they were going for the long throw because that's a real dramatic. Some of the other projects that we've looked at we're looking at like from a 14-inch to an 8-inch reduction.

And then some of these ongoing projects that (Coraggio) mentioned that are currently in design in the planning stages on the east coast are looking into those nozzles and be able to reduce that reduction in production because like Coraggio said it's a major parameter that you have to include into your estimate.

(Bob Brantly): So do you have a realistic for that where you could look at the reduction and the discharge diameter to the nozzle diameter. And also does it correlate with the spray distance?

(Coraggio Maglio): Yes, it does. And it also - the other thing that factors in is the amount of solids you're pushing to the pipe as well as the grain size.

(Tim Welp): As well as the pump curve that you're looking at, you're pumping distance currently, that type of information. Like right now that Pepper Creek project that (Coraggio) mentioned, the state of Delaware basically went out and did some basement bomber engineering and they created - they designed and manufactured that nozzle that you see - that you saw in the slide as opposed that there are patented - the jet spray I believe is a patented product where they go out - and I think I got this from (Blama) - that on the dredge they actually have three, four different nozzle configurations to optimize your production under the given set of conditions because how far you're pushing it like I said depends on diameter, the reduction ratio, the pump curve and the sediment that you're in. And even on just one project you could encounter different sediments it's been modify you're production and result in spray geometry.

(Bob Brantly): Sounds like there's a lot of different variables.

(Tim Welp): Like any dredging project it's pretty complicated for just digging a hole in the water.

(Bob Brantly): With a lot of the project areas looked like that there wasn't really any development - residential development around them but have there been any issues with an aerosol from the high pressure spray and how far that might carry and the sediment load that might be in that?

(Tim Welp): I have not heard of any aerosol concerns. Pretty much a lot of these were conducted out in the boonies.

(Bob Brantly): Out in the marsh. Yeah. Florida has marshes but we usually have a subdivision not far away.

(Coraggio Maglio): Well, something to look at. I mean, if we get any of these nearby, Bob, I would definitely invite you to come take a gander.

(Bob Brantley): Okay. I'll stand downwind.

(Tim Welp): We did ask that question about the aerosol 10 years ago. I don't remember what the answer was.

(Man): Bob, I've heard within the last couple of days that Palm Beach County is going to use a squirting technique on their grassy flats project which is a marsh restoration project. And I think you guys even permitted it but they're going to use a squirting technique to be able to put sand over top of the mud to keep it from moving out of a mud wave toward one side or the other. They're going to try to stabilize their material. So that's something that Palm Beach County is doing, (Bob).

(Bob Brantly): Okay. Well, there's certainly as you know a lot of residential areas adjacent to many of their restoration areas. One last question with regard to water quality. You mention a lot of the material it carries a pretty high organic content. Have there been any measurements with regards to effects on say dissolved oxygen after placement after spraying?

(Coraggio Maglio): On none of these projects have I come across any literature discussing that. So to my knowledge none of the ones we looked at had that.

Bob Brantly: Okay.

(Tim Welp): Likewise as hopefully you learned something from this Webinar we in turn are learning from you and as researchers these are exactly the types of aspects that can shake out from having the teamwork approach.

(Bob Brantly): We often get questions with regards of effects with dissolved oxygen.

(Tim Welp): Thank you, sir.

(Courtney Chambers): We have a few questions from (Paul) in the chat box about the different case studies that you presented. So if we can read those and you all can address them if you like. For Golden Pass, do you know how long it took for wetland plants to become established?

(Coraggio Maglio): No, I do not.

(Paul): I asked that question, (Coraggio), because correct me if I'm wrong for Golden Pass I think they put down two feet of material. It looks like a very large area. So just wondering if there was a seed bed that was underneath that was able to merge through that material.

I'm sure they got recruitment from the edges and windblown seed over time but I was curious about whether or not they got some seed regeneration throughout the site. Maybe that's a question we could contact Golden Pass managers and ask them. I'm kind of curious about that.

(Coraggio Maglio): Yeah, I definitely could find that out. I'm pretty sure it's on the Web site somewhere. And that was a (Ducks) Unlimited project that was actually a duck pond that they were filling in. So I would assume they went back in and plugged it as well. It's just too large of an area not to put something out there, some sort of seed or plugs.

(Paul): Yeah, I would imagine that there was probably some planting with ducks unlimited. Through both of our flats I think you had mentioned that they had

learned how to better control placement to create, you know, the topographic features, you know, high low marsh that they wanted to create. Do you know exactly what they did?

(Coraggio Maglio): Yeah, I was referring to the kidney bean shaped islands. They were able to more accurately move around their pipe so they used a marsh buggy to continuously move the pipe to create the features they wanted.

(Paul): So it was probably just a question of very careful monitoring and just moving the pipe around with the equipment just to get it to do what they wanted.

(Coraggio Maglio): Exactly. It was a learning curve for basically the contractor. And so after the contractor figured it out the engineers on the previous project all how to do it better and they employed that on the next project which is the (Baltimore) project.

(Paul): And then the Pepper Creek project I think that was a project where, correct me if I'm wrong, they actually place material on an existing marsh with wetland vegetation. Did I get that right?

(Coraggio Maglio): Yes.

(Paul): How many acres did they do?

(Coraggio Maglio): I'm not certain. I'm sure we could find that out. But it was several acres.

(Paul): My last question was I saw a lot of information being presented on the use of (q) tubes but has anybody tried to use water dams just the way I understand a water dam it's a synthetic material like a (q) tube but instead of being filled with sediment it's filled with water.

I've heard some people say that water dams are just too unreliable and can be damaged punctured either on purpose or accidentally. So people generally don't use that but it would certainly make for a much better containment structure if you could drain it and remove it at some point rather than let the geotube degrade.

(Tim Welp): Plus it seems to me you have to anchor that down real well so it actually forces to the sediment containment.

(Coraggio Maglio): Yeah, typically water dams or bladder dams are used with water elevations the same on both sides unless you have a really big tube and so you'd have a lot of issues and the rental cost for those are very, very high and you need to have the material sitting out there for a long time to get the consolidation you need to make the material stable to be able to pull them out.

So most of the areas we're talking about the material would be pumped in and it would consolidate over months and years and your rental rates for maintaining an aqua dam would just be too much. You might as well build something more permanent at that point. Add (riprap) or sand or something.

(Paul): Understood. I've got one more question for you guys. In your literature and coordination with all the different entities, has anyone initiated a program? Have any of the states initiated a program that you know of to use dredge material beneficial manner specifically on marshes in order to, you know, prevent marshes from submerging too far due to sea level rise?

That might be another discussion but I don't know if anybody's actually initiated a program to start you know, placing a material on marshes strictly because of sea level rise.

And I know it's been done in places like the Mississippi Delta in order to restore marsh and probably raw placement of material and shallow water area to create marsh or to reestablish marsh historically but I'm not aware of anybody actually doing this for sea level reasons yet.

(Tim Welp): Sea level rise is part of the reason that the state of New Jersey in particular the Department of Transportation is communicating with different landowners and the federal governments and the national refugees in conjunction with the Philadelphia district to explore that very purpose to be able to place material from the intercoastal waterway. So there's nothing like formalized. It's been negotiations is my understanding at this time.

(Paul): Thank you.

Courtney Chambers: Hi, I just noticed that, (Jim), you had your hand raised. Did you get your question answered yet?

(Jim McAdam): Did you say (Jim)?

Courtney Chambers: (Jim), yeah. (Jim McAdams).

(Jim McAdams): I did. My hand but I already had my question and I already made my statement.

Courtney Chambers: Thanks. I just wanted make sure. All right. Any more questions?

(Tim Welp): And I'd like to include the state of Delaware to the previous question about states that are trying to formalize or more efficiently use wetland creation of wetland nourishment to address sea level rise.

Courtney Chambers: All right, any final questions before we wrap up for the day? Okay. Great. Well, (Tim) or (Coraggio), do you have any closing comments?

(Tim Welp): I'd just like to say I appreciate you listening in and thank you very much for identifying issues and concerns that you have relative to this topic because, you know, from what we're seeing this is common that's getting hotter and hotter and we can address these questions up front or learn through monitoring through ongoing projects, you know, I think it could be a win-win for all of us for more sustainable sediment management.

(Coraggio Maglio): Yeah, and we look forward to working with any of you guys in the districts or within the state. It's something we're highly interested in. We think this is the way of the future.

(Cynthia Banks): And this is (Cynthia Banks). I'm the Program Manager for the DOTS program and I just want to thank everybody for taking the time to participate in this Webinar. Certainly want to thank Mr. (Kevin) for submitting the DOTS request. I let the districts know that this is what DOTS is here for. We're here to support you at no cost to you by the way.

So if there are other issues that come up or challenges that you run into, please don't hesitate to give the DOTS programs a call. Our Web site you can plug in dredging operations in Google or any search engine and it should pop up. And you can get in touch with me via email. So that's all we have on this end. Courtney, you're welcome to close us out.

Courtney Chambers: All right. Thank you again (Coraggio) and (Tim) for sharing today and participants for engaging and asking questions to make this a successful meeting. I will ask one more time that if you're calling in as a group that you

might let us know how many are in your group just so we can have a better idea of today's attendance. And you can send that to me through the chat box. With that we'll close the meeting today. Thank you all very much and have a great afternoon.

(Coraggio Maglio): Thank you.

END