

ERDC-EL

Moderator: Courtney Chambers
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12:55 am CT

Courtney Chambers: Okay at this time, I'd like to give you today's speaker - speakers on Sediment Management Web Application known as SEDMAN.

Mr. Rob Thomas is currently serving as the chief of the hydrology and hydraulics water management branch for the US Army Corp of Engineers, Galveston District. Prior to joining the Galveston District, Mr. Thomas worked for the Army Corp of Engineers Engineering Research and Design Center focusing on research and coastal engineering, navigation and data management. Mr. Thomas is a registered professional engineer in Texas and Louisiana, has a Masters in Science and Engineering and a Bachelors in Maritime Systems Engineering from Texas A&M.

Our next speaker is Mr. Klay Williams. He's a Senior Web Architect and GIS developer with Bowhead Science and Technology working under contract with the US Army Corp of Engineers in the Mobile District. Since 2008, he's worked at the Mobile District in the spatial data branch to create software for the collection, processing and visualization of geospatial data. Mr. Williams holds a Bachelor of Arts and Philosophy from the University of South Alabama. Rob's and Klay's PowerPoint and the recording of today's meeting is going to be posted on the DOTS webpage again. And that will be for your reference or to share with other colleagues.

And that website is located on the welcome tab here if you want to reference it on that third bullet. Okay. At this time, we're going to - Rob, I'm going to

give you the presenter rights. We'll enter listen only mode. And then we can begin.

Operator: All participants are now in listen only mode.

Rob Thomas: Can you hear me now?

Courtney Chambers: Yes, sir.

Rob Thomas: Alright. So we ready?

Courtney Chambers: Yes. Please go ahead. Thanks.

Rob Thomas: So this is an application, a website that we've been working on for the last year or two while I was at ERDC. And now that I've moved on, (Tim Welp) is going to be the new point of contact for this. He's working on this thing too. So if you have questions, you can talk to Tim or (Lauren Dunkin). They've both been working on this the whole time. Or you can ask me. It's still kind of fun to work on this stuff. So something important to point out as you know like all these websites, it's - you know it's a work in progress. The first version is done and it's out on the public website. So anyone you know in Corp or outside of the firewall can access this and use it. But I'll go - when I go through the presentation I'll point out some things that we'll want to work on. And that maybe you know people can help us with.

So (Tim) and I had a research task in the DOER Program, the Dredging Operations and Environmental Research Program to look into sediment management methods to reduce dredging. And we really had kind of two main tasks. One was to go out and evaluate new technologies. And the other was to come up with this kind of encyclopedia if you will of sediment management

methods. And so while we were doing that, we realized that that's been done quite a few times before. But honestly, you have to keep doing that. You have to you know continuously update that encyclopedia. But as you know as new technologies come out and also you know as our framework for working with them changes, you know the way that we present them has to change too. So we had some technical products that came out of that.

One was a technical report. And then we had a few tech notes. They're all still going through the publication process. So if you want a draft, just email me or (Tim). We can send it to you. But the thing that really kind of stood out to me when we wrote that report was it was really long. And nobody enjoyed reading it. I mean you know it's fun to read. But it's - you know it's long. And there's only maybe a page on each technology that we reviewed inside that report.

Inside - you know in that description there's other references to those technologies where you can go and read you know hundreds of pages on each one individually. So you know the sum total of the information that we reviewed was you know maybe 5,000 pages or something like that. And for you know a project manager or an operations manager you know or an engineer to go and review that much work, you know to have the same kind of picture that we had at the end of that project would be very difficult.

So we said you know, "Okay. How do we get this knowledge you know into everyone else's heads as fast as possible you know so that they can start using all our work without having to go through you know a 3 year process of learning all this stuff." So that's why we built the website. So what it really is it's a database of sediment management technologies that has since grown to include you know other kinds of sediment management besides navigation.

So we've also included reservoir sediment management. So it's really - the database so far has been populated with navigation sediment management and reservoir sediment management technologies. And each technology has you know, name, a picture of it, a short description, how it works. Some kind of key things you might need to remember you know if you're building a revetment. What's the purpose of a revetment? What kind of things might you want to remember about it? And then links to where you can get more information. So all the information that we put in the report you know is in the database for each technology. And then - and then we ranked those technologies. So think about it in terms of a spreadsheet which is the way that we kind of changed the data. And one - each row represents you know a technology. And then you'd have many columns, as many as you know 80 or 100 different parameters.

Right now there's about 84 I think. So things like you know what kind of sediment does it work on? You know where would you use it? We'll go through that whole list. And we ranked them. Say, "Okay. This technology you know is better or worse in these conditions." It's not you know an objective ranking. It's very subjective. And that's one of the things that we still need help with is it's really ranked based on you know what we learned during this project, my experience, you know (Lauren)'s knowledge and experience, (Tim)'s. But just a few of us. And as people go and use this more, you know when we kind of do the demo, you might say, "Okay. You know really this condition would be better suited to a mechanical dredge than a hopper dredge or something." And as we start to get people's feedback, you know we'll continue to improve it. So it gives us a really nice tool for capturing you know knowledge of users.

And then feeding that back to people that have less knowledge about you know those conditions because nobody knows everything about everything.

So like we said, you know users go in. And you identify which parameters are important to your project. And then there's an algorithm in there that ranks those technologies based on that database that we created. And it's a very simple algorithm, right. It's just weighting. So if you've ranked a hopper dredge 10 in an inlet, you know and you've selected inlets, it's going to have that 10 there. And then it'll take the other values you've added and just adds them up and creates a weighting. And it compares in a rank then based on that weighting. And then the website displays the results. Really simple. So you've noticed on the right of the page it's as you click a technology, you know the little information box will pop up. And we'll do a demo here once we get through these couple of slides. So what kind of stuff can you do with it?

You could identify in stream alternatives. You know so if you're doing a navigation project and you're trying to decide you know how can I manage this sediment you know besides just dredging it with a hopper dredge which is what I've been doing for the last 50 years? You know what other alternatives are there? It lets you quickly do that. You can integrate the knowledge of those technologies into other tools.

And now that these technologies are in a database, you can plug this in to other places. So one of the things we've done is in the post Sandy studies that we did, we had a task to look into screening methodologies for strategic placement of dredge material. And one of the key parts of that is that you've got to know what your methods for dealing with material are. So once you kind of know you know what kind of material you have and what the environmental conditions are there, you need to know, "Okay. So how do those things match up?"

And so this gave us a way to take other tools that we had and kind of piece them together into a total process, right of how you might go about managing

dredge materials. And like we talked about, it gives us an easy way to store our knowledge in a database. So you know depending on how we go about doing it is if you've done a project and you've learned, "You know what, I used this SEDMAN tool and really it should have been ranked you know this guy above this guy when I was doing it", we can feed that back in there and improve it.

You can also avoid reading thousands of pages of reports which is my favorite part. Okay, live demo. So you can access the website either from the URL SEDMAN.usace.army.mil or through the CE-Dredge website. And if you go CE-Dredge the home page and you click on the application, it's the top one listed there right now. So I'll just click this and it'll open up. Okay. So here's the website. This reset criteria at the top if you've selected things and you just want to zero them out, you click that.

Along the left are what you - where you identify information about your project. And along the right side are all the technologies that are in here right now. So I think there's like 200 technologies in here right now focused on navigation sediment management and reservoir sediment management. And if you just want to look at the technology, you can just scroll through them. I'm not sure how fast that's scrolling. And you could go in and pick one. And you would you know click the one you're interested in. and a short description pops up. You know a picture of it. And you have multiple pictures these will scroll through. But most of them only have one picture. You know a little description of how it works. Some caveats about stuff you might want to think about. And then some links. Alright. So you just click on the link and that opens another website which sometimes are slow.

Now the map is one of the new - is one of the features that's getting done this year. So what we're hoping to do and this is you know kind of like you've

seen on some other viewers is you know once we've similar locations and these projects have been done before, you know they will be- they'll show. They'll be linked to a database to show you know their location. And that's something that's ongoing now. Okay. So we can do - so physical locations. So you select these guys on the left here, the main parameters here.

And it'll give you some things in here you can check. So notice the list on the right. When you click on the inland, it changes. So all we've done is we've taken those technologies and said, "Okay. If this technology is inland versus in the ocean, which ones are better or worse?" And in this case, it doesn't really tell you a lot because most of them are you know valid both places, right. But you can see that the number here has changed. So the weighting has changed. So we have one guy that we had ranked higher in inland and everything else. And that doesn't necessarily tell you very much. Ocean I think is a little more because there's very few things you know we have ranked for the ocean. So hopper dredge you know probably the No. 1 thing we do to manage sediments in the ocean is No. 1.

So project type, so in this case like we talked about, we have reservoir and navigation data loaded in here right now. So if you click reservoir, it'll through out most of the stuff that was applicable to navigation. Not everything but a lot of it. I mean if you click navigation, the same thing happens, right. Hopefully that's scrolling okay for you guys. Somebody yell if it isn't. So if it's a new or existing facility, you've got that option. Project objections which some seem similar to project type. But you know recreation isn't a project type you know.

EWN goals. So one of the ways that we tried to make this tool integrated with the other tools that we've made is to take you know the exact headings out of other tools. So we got the EWN goals from Tom Fredette from his tool. And

these were the exact goals that they had in there. So you know if you were building another tool and you wanted to have this and EWN tool feed into it, this is where they would cross reference from this exact field.

Klay Williams: Hey, Rob.

Rob Thomas: Sir.

Klay Williams: This is Klay Williams. Rob, would you explain what EWN is? What that acronym stands for?

Rob Thomas: Engineering with Nature. I'm sorry.

Klay Williams: Okay.

Rob Thomas: I think there was a presentation last time on that.

Courtney Chambers: That's right. We did on the map, the Pro Map. So they can reference that.

Rob Thomas: If you need more information on that. Yes. It's on the website. Okay. So placement area, it's another you know key thing that you'll know about your project. And these came directly from the placement area options that (John Childs) had been developing, the tool he was developing. So this is the field that interfaces with that tool, the beneficial use tool. Same thing as before. So if you select open water, you know options that are ranked higher for that.

So right now, it has a field for annual dredging requirements. So more or less than 100,000 cubic yards per year. And you can see this one is missing a word there. Environmental constraints are included, types of sediments. You know is it sand or silt/clays or is it a mixture. You know is it fluid mud which is a

special case for us, right. So a totally different list for that. How the sediment load is carried is included. And the source of sediment is an optional parameter, sediment forcing or critical parameters.

So some of these you know they kind of cross over. And that's something that we're still kind of working on. And we would like feedback on you know from people that are using it. You know which things never get used or which things maybe need you know more detail. And then we have another major class here called "sorting parameters." So there's you know these key concepts. So when you think about sediment management, you know everybody's heard of the keep sediment out, keep sediment moving or keep sediment navigable, right.

So these, like basic concepts of ways you can manage sediments. And if you go under - you know you can select this one. So here's things that are better you know that keep sediment out. So what that means is you know not letting sediment transport into the area that you care about, right, so a sediment trap, a sediment collector, things like that. Materials. So you know if you want something that's made out of artificial materials or natural materials.

And then we have preferred solution methods. So you know would you want a structural solution, a non-structural solution or a management solution. Okay. So a demo. So I was thinking you know as an example you might consider you know dredging the Galveston Entrance Channel, right. So your operations manager says, "Okay. Well it's an inlet. Okay. It's a navigation channel. It's an existing facility. It's navigation here."

You might not know any ENW goals yet. You do know the placement area. You know typically it's open water which is not our favorite. But you might you know say, "you know what" and this is something that's happening right

now. And you can see here on the list. Now the list has gotten very short, right. And if it's hopper dredge 100% which is actually the preferred method for dredging that location, right. That's what we use as frequently as possible. It lists agitation dredging you know which in this case really isn't a very good solution because of this particular channel. But I think it's important to kind of point that out. And this - I don't know if you could see this happening or not. But the picture at the top left is actually scrolling through. So we had a couple of different pictures in here for agitation dredging.

Courtney Chambers: It is showing up, Rob.

Rob Thomas: Cool. Alright. But that's kind of the point of this. This tool isn't - like it's very subjective. It doesn't give you the 100% answer. What it does is it lets you go through all of the technologies that we know about and that we've included. And lets you screen them out to a manageable level. So if like - you know someone could sit down and flip through ten things. They might not want to flip through 200, right. That's kind of the point.

And then you might say, "Well, what if I want to put it upland instead? Like you know what other things should I consider?" You know and it gives you some other options. That kind of thing. So if we left it in open water, we can go and say, "Well, we know it's more than 100,000." And if you get - I don't know if you can tell changing the rank over here. So it moved agitation dredging down in that case when we selected more. Less, it moved the sediment collector up, right.

And it's not - it may not necessarily be intuitive because we have these other things selected. You know it's basing the weight on the combination of all the things you have selected you know in addition to the last one you're selecting. Contaminated sediments. You might go in there. But that's kind of how we

use it. If - it's probably time for questions unless you guys just want to do another demo.

Courtney Chambers: Alright, Rob. Well I'll enter interactive mode. And then if anybody has a question, they can speak up. Remember you'll still need to take your phone line off of mute.

Operator: All participants are now in interactive talk mode.

Courtney Chambers: Alright. So it's open for questions at this point in time. If you're more comfortable asking the question through the chat box, you can also do that. And I'll watch for it.

Man: Hey, Rob. After this selection is made is there any way to save your settings?

Rob Thomas: There is no way to save your settings right now. But that's a good suggestion.

Klay Williams: I'm writing it down as we go.

Rob Thomas: And it's probably a good time too for if (Tim) or Klay or anybody wants to chime in and add additional comments, stuff I probably left out.

Klay Williams: I did have one thing to point out. The - we discussed a lot about how to present the rankings of the solutions as they fit the different criteria. And we kind of went with a percentage score. But that percentage score is relative to the top - the highest sum for the weightings. So hopper dredge in this case the absolute score maybe you know a total of 30 points of weighting. But it's the highest so it gets 100%. And everything else is ranked percentage wise relative to that.

And we didn't - we were trying to avoid making it sound like if it has 100%, then that is the perfect solution for the job. So we're open to suggestions of different ways to show the rankings so that it's more obviously relative.

Rob Thomas: That's a really good point. This does not mean that the hopper dredge is the only answer or that it's 23% better than agitation dredging.

Klay Williams: Right.

Man: Rob, the second question you know can I change the criteria? Is that - because it's subjective right, not whatever is in the system you know you have. But if I want to move up, down or set to specific values, you know does that system allow me to do that?

Rob Thomas: Same set of which values? You mean the ranking values or the add different criteria?

Man: Yes. Different criteria.

Rob Thomas: Absolutely.

Man: Or whatever percent. You know basically you assigned . You know if there's a criteria I want to adjust those.

Rob Thomas: Absolutely. That's the kind of thing that we want for feedback. So you can't do it on this website. What you would do is you would email Klay or (Tim) or me and we would give you access to the database so that you could change the - and that would be - I mean we would really appreciate that kind of. So you could go through and you could rank them. Say, "You know what? You know you guys are crazy. This should be like this."

And then we can - you know what I mean. That would be very helpful. And you can definitely - it takes - I mean I - it takes 5 minutes to go through the whole thing super quick.

Man: You know but I think you want to make it user friendly so that the user can do that on the fly rather than going through some channels and things like that.

Rob Thomas: It would be really cool if there was a way for users to change it on here. And then it saves that and lets us kind of look at what different kinds of users want to do. We just aren't - you know we're not there yet.

Klay Williams: That's definitely possible.

Man: Well I think it is because it's just the base of the input that you know you can ultimately edit you in other words you know.

Rob Thomas: Yes.

Man: The input. And then update that you know. And it's user specific. You still have your default in the background and use that. That's why I said that in my first question. I think that users basically selections, you know basically operations, should be saved on a temporary file. And it applies to that person only. And the person can go adjust them anyway they want. They can save it and bring it back. And that kind of thing.

Rob Thomas: That would be cool. And if we can make it so that other people - so that maybe if you're on a PDT and your expert reviews it and kind of changes it around...

Man: Exactly.

Rob Thomas: Then other people in the PDT could select that expert's rankings. That would be cool.

Man: Yes. Yes. That's a suggestion.

Rob Thomas: Good suggestion.

(Tim Welp): This is (Tim Welp). Rob eluded to the different R&D programs that helped develop this. RSM are also contributed in the Reservoir Sediment Management technologies. And navigation systems is footing the bill for this year's demonstration development. Also I'd like to - Rob did a real nice job emphasizing how we're trying to link to other databases by using common - common languages, the fields. So if you have any suggestions on other ways that we can make this tool most useful, let us know. So keep them coming.

Man: Oh Yes. I'll bug him.

(Keith Bowers): Hey, Rob. This is (Keith Bowers). Is there - many projects have multiple objectives to them. Is there a way to click on more than one objective and get a ranking based on that?

Rob Thomas: Absolutely.

(Keith Bowers): Okay. Alright.

Rob Thomas: Yes. And sometimes, it's - so that was one of the things that we've kind of thought about. Sometimes you want them to be exclusive. But right you could

- I mean you could select them all. And it just adds the weight together just like we talked about.

(Mary): Hello, Rob. This is (Mary) in Savannah. I pulled up the website while you were going through this. And I actually went through a dredging project we have here. And it said, hopper dredge, hopper dredge, hopper dredge which you'd expect. And then I went through the whole thing. And then all of a sudden sweeping dredging is up there. And that shocks the hell out of me. But they're all 100%. Does that mean that sweeping dredging is preferred over hopper even though they're all 100%?

Rob Thomas: Absolutely not.

(Mary): Okay.

Rob Thomas: In fact, a lot of this is - it's just to screen that list to the stuff that people you know with good sense could go through quickly. You know you probably know when - you're probably, "Okay. That's not even an option." And that would be good feedback for us to update our database with it. For that particular case we'd want to make it screen lower.

(Mary): Okay.

Rob Thomas: We... Go ahead.

Klay Williams: If two solutions have or if several solutions have the same score, then that's what you'd pay attention to is the score not necessarily its position in the list.

(Mary): Okay.

- Klay Williams: Because any solution can only occupy one place in the list. And one of them has to be first. So it's just - it kind of reverts back to a default.
- (Mary): Right. And I've got a feeling I selected something kind of screwy because I have a feeling that every option is on - has been ticked at 100. So I've just - I've selected something screwy I guess.
- Rob Thomas: Like if you don't select anything, it goes to 100. Usually they don't all pop up there.
- (Mary): I pretty much got something on all of them.
- Rob Thomas: Yes. Usually they're different.
- (Mary): Yes.
- Rob Thomas: If the number's the same like Klay says, it comes out that way.
- (Mary): Yes. It's just it's a regular O&M navigation dredging in a - on the east coast for Brunswick.
- Rob Thomas: And we might take the numbers off so it just kind of goes - you know that might be a good way to do it too. So it's just a list of stuff - a shorter list of stuff. Instead of the 200, it's a 10.
- Klay Williams: You know it's got competing concerns for that ranking though. Because if you take the numbers off, then it looks like the position in the list. It's the top 10 things may have the same rank. But you wouldn't see it. There in the list in order from 1 to 10. So...

Rob Thomas: Exactly.

Klay Williams: So we've got to find some way to you know satisfy both concerns.

Courtney Chambers: Are there any other questions for Rob or anything you'd like to see? Or an example you'd like to run through? Or Klay or (Tim) as well, yes. Alright guys, you have anything else you feel like would be helpful to share?

Rob Thomas: No it's just you know if anybody you know has an interest and is willing to help us make it better, we definitely appreciate phone calls and emails.

Courtney Chambers: Okay. And now on the website as well did you have - you have contact information for people to maybe make recommendations on the rankings or things like that. Is that what you mentioned?

Rob Thomas: They would just email Klay or (Tim) or me.

Courtney Chambers: Email Klay, (Tim) or you. Okay.

Rob Thomas: Yes.

Courtney Chambers: Well great. Thank you very much guys. It looks like a very valuable screening tool. Well if there aren't any other questions, I just want to remind all of you that you can request a PDH credit by sending me a chat message with your affiliation and email address if you're not with the Corps. And we want to thank you all for joining us today. Rob and Klay and (Tim), thank you all for contributing and sharing the tool with us.

Please be watching your email for upcoming notices about additional DOTS webinars. And those messages come from (Cynthia Banks) here at ERDC. I hope you all have a wonderful afternoon.

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