Operator: Welcome and thank you for joining the Lake Okeechobee system operating manual project delivery team meeting. Before we begin, please ensure you have opened the WebEx participant and chat panels by using the associated icons located at the bottom of your screen. Please note that all audio connections are muted at this time. If you require technical assistance, please send a private chat message to the event producer, you are welcome to submit questions throughout today's conference. You may do so by selecting all panelists from the drop-down menu in the chat panel, type your question in the message box provided and hit enter to send. All questions will be addressed during Q and A. With that I'll turn the conference over to Tim Dyson, senior project manager with the US army Corps of engineers, Jacksonville district.

Tim: Great, thank you very much. If you can go to the first slide. Alright, thank you all. I just want to welcome everyone who is on the line and I'm sure there'll be some people joining us as we continue over the next few minutes, but just want to welcome everyone to our Lake Okeechobee system, operating manual June PDT meeting. You're in for a treat because they're not going to be doing attendance live like we have been at all at the other meeting, so you don't have to sit through that painful process. I will ask that if you could log in and use the chat function and just state your name and the agency or organization that you work for or you're representing so we can help take attendance that way. Also thank you for who has registered.

That will also help us track who is on the meeting as well. As a reminder, as we do get into the PDT and public comment periods, please do remember to state your name and the agency you're representing. Everybody knows who is speaking at that time. Our facilitator will be handling all of the comment periods helping us out with that to work through to provide your comments or your statements. I think as she already said, also we'll be muted until, until the comment periods and then you'll need to re raise your hand to ask a question or make a comment. We won't have to worry about folks not muting their phones in the background. That will take away some of the funny commentary that we've heard in the past, it will help us run the meeting a little smoother.

All right, next slide, please. I do you want to remind everybody that this is a PDT meeting and the intent of this forum is to allow federal state local agencies and tribal governments to exchange our views and information relating to the proposed Lake Okeechobee, CNS operation and potential impacts to the surrounding areas. This meeting is not a forum for official policy discussion or formulation, a reminder that the PDT performance technical staff functions and all the members are encouraged to participate and share their skills and knowledge during this meeting on all the topics that we're discussing. We do have public comment periods designated throughout the meeting time where we will welcome comments from members of the public. Those will be separate from our inner agency discussions. Next slide please.

All right, let's do a quick rundown of the agenda. We will start off right after I'm done with housekeeping with a 20 minutes open public comment period. If

there are any elected officials on the line with us that would like to make a statement during that opening period, we will welcome them to speak at that time as well. Then after that initial period which will end at 1:30, we'll move into the main part of the presentation and go over the performance measure package and the review process that hopefully everybody received the email that I sent out last night that had the draft performance measure package for everyone to review. Then we'll do some team updates and then open up for PDT and then public comment, depending on what time we get through all that, we do have a short break scheduled to let everybody get up from their chairs, get a drink or whatnot.

Then we'll have the presentation from the interagency modeling center on the period of record extension that they've been working on over the last couple of years. I know we've talked about that a little bit during the low sum [LOSOM] process, and they're here to let everybody know how that, period of record extension is wrapping up. I will be using that in low sum [LOSOM]. Then after that presentation, we'll open up for PDT and public comments again, and then we'll end with a quick look at the schedule and how we're going to be moving forward. I think that covers all the housekeeping. Before we get into the performance measured package review, I would like to open up for any elected officials or public to make any comments. If there are any- I wanted to hear those now, and if not, we can, we'll jump into the main part of the presentation. At this time, I would open it up for public comments. If anyone has any-. Can you reiterate the process for everyone on how to raise their hand to make a comment?

Operator: Yes. If you have a public comment you would like to make, please press pound two on your telephone keypad, which will put you in the queue. Mr. Martin, your line is open.

Martin: Yes. Can you hear me?

Operator: Yeah. Okay.

Martin: My name is Stuart Martin I'm speaking on behalf of the Life **[00:06:33 inaudible]** club. I appreciate your work and what you're doing. My concern is that we still don't seem to have enough water for the environmental uses and that the water is being allocated primarily to agriculture, even though originally the ecosystem of Lake Okeechobee. The sawgrass that was South of the Lake was universally water for the Everglades ecosystem. Now because so much is being diverted, it's important that part of your modeling, restore some of that water that's been diverted. I think there's been with the belief that the savings clause allows agriculture to take the vast majority of that water. I think the original idea was not to give agriculture all that water, but simply to make sure agriculture was able to get some of the water as it's turned out now.

Agriculture is getting the vast majority of the water, even to the extent that some of the utilities aren't getting enough water. I hope during this process that

you will focus on how we can change the modeling so that the Everglades ecosystem during particularly tough times can get more water that we get stability and how much agriculture takes because during wet times, agriculture is taking very little during dry times agriculture is taking quite a bit and that's throwing off the entire ecosystem because there's either too much water or not enough. Thank you for listening to my comments.

Tim: Thank you very much for your comments. Are there any additional comments?

Operator: Yes. There's one person. Hi, your line is open.

Male Speaker: Thank you. This is moving across; this is more of a test just to be sure that this thing is working is a little different than the Zoom. God bless. The fact of the matter is when water historically ran out of the Lake, the water ran out the ramble Lake and enter the pineapple forest. Pineapple forest happens to be VAA today. VAA naturally would receive a water when the Lake is wet, dry, or indifferent first, and then the water would travel on further South. The idea that you're going to pick water up out of the way you can put it somewhere down South I don't know how you're going to do that. Water tends to flow along the ground was irreverent. Every time I hear this about the water needs to go South, and now we get turned around and people start saying, well, don't send it South. They can't have it both ways fact of the matter is, water ran out of the lake historically South into what is now the EAA, used to be pineapple farms, but it continued to go South towards Florida Bay. That is what we need. We need the natural flow South unrestricted. Thank you very much.

Operator: I just have one additional person. Hi, your line is open.

Ryan: Hi yes can you hear me?

Tim: Go ahead we can hear you.

Ryan: Okay. Thank you. Good afternoon as always, thank you for allowing all of us in the public to participate in forums like this. That's certainly appreciated by all of us I'm sure. My name is Ryan Rossi, director of the South Florida water coalition. We've been advocating to ensure that our water supply is protected particularly for eight million residents in the tri County area. That protects protecting both in the short and long-term. I've spoken at your meetings about this previously. I've been raising concerns over water supply and the management of Lake Okeechobee. While many of us are relieved, certainly that the rainy season prevented a water shortage this year there is certainly no guarantee for what will happen next year beyond. Our communities are utilities and certainly the environment simply cannot afford to live year to year like this, not knowing whether we'll catch a break or not.

That's why protections like the savings clause are so important, critical, even because they ensured a minimum of baseline protection for all of our water

supply. Anything short of that, as I said, many times before I think of the gamble on the future. I think all of us is there better than that. For me personally, just as I close here, I can't help, but think about what a reality would be if we didn't get these recent rains. I mentioned this at the last meeting that we had together, what was the plan going to be? What would be the plan that the assurance of water supply protection is taken away? On behalf of all of us in South Florida, please consider this when making future decisions on the management of the Lake, as I'm sure that you will, we hope that you will, we're depending on your consideration to this. Thank you again very timely for your attention.

Tim: Great. Thank you very much for your comments Are there any additional public comments?

Operator: Yes. Two people have raised their hand. Mr. Moyer your line is open.

James: Yes. Good afternoon and thank you for having us at this meeting, my name is James Moyer and I'm a private resident, I live on the C24 canal and I have read Mr. Math's proposal, I've been in contact with him via email and sending him videos. My concern is I keep hearing discussions about discharges from the Lake. On the 4th of June, there was a public warning issued by Florida health about the water quality issues in the North fork of the St. Lucie river on January 5th, they began or excuse me, June 5th they began discharges out of the C 24 canal at a rate I've never seen before that continued about seven days. Then they cut the water flow back, but they are, as far as I know, as late as last night, last time I was down the canal, they are still dumping water out of C 24. I know that canal doesn't connect to a Lake Okeechobee, but I'm wondering what are the plans regarding C 24 canal and ending the discharges into the North fork of the St. Lucie River?

Operator: Mr. Matheson please go ahead.

Matheson: Yes. Hi. I'd like to thank the Corps. This is Merritt Matheson City Stuart Commission, and I'd like to thank the Corps for this process and the welcoming engagement, of public comments. Anyway, it's interesting to see how quickly we go from wet season or from dry season into the wet season here in South Florida. It's kind of the case year after year after year. I'm very much appreciative and so are all my residents of the heightened and actual capacity the Lake had when we got record amounts of rain over Martin County and the East coast here. To think that those rains will not come is just contradicting history.

They do come almost every summer. There's been a few when they haven't, but, you know, time and time again, the rainy season will come in Florida and we'll go from a dry season to wet. I'm incredibly thankful. All my residents are for the extra capacity that was in the Lake that as so far has prevented discharges from the C 44 canal. Actually, that extra capacity has allowed the Lake to absorb tremendous amounts of water from the C 44 canal. We have our own issues with local runoff and other canals that are coming out of the North

fork as the gentleman just spoke about. Anyway, again, I'm very thankful and all my residents are the management during this past dry season. Thank you.

Operator: At this time, there are no further hands raised or comments.

Tim: I really appreciate your attendance and comments at the beginning of this meeting and definitely take everything under consideration as we move forward during a low sum [LOSOM] process. If there are no additional public comments or the elected officials who would like to speak now, we'll go ahead and turn the floor over to our planning technical lead. Miss Lisa Ailey.

Lisa: Thank you, Tim. This is Lisa Ailey, the planning technical lead, as you just mentioned, you should have all received via email, a large PDF package yesterday, and it includes a tracking spreadsheet that lists every performance measure, evaluation metrics, and ecological planning tool that the listing team is planning on using to evaluate their plans. Up on the screen right now is an excerpt from that file, which I'll walk you through. Let's use the first example. Each metric is broken up by category. The first on this example would be environmental. We move through the tabs along the top, along with any other metrics, we are using the recover Lake Okeechobee Lake stage performance measure. Then we include a brief description of the performance measure. In this case, it is a measure of Lake Stages, incorporating seasonal targets and recovery strategies. We also include a goal statement not on the slide.

There wasn't enough room to include that as an example, but that's in there as well. As we move through each tab, we show how we are planning on using each of these performance measures. The first column is for the conceptual plan analysis and in the spreadsheet, we break it down further to indicate if this performance measure is either an evaluation criteria for the parades sorting analysis, or if it is supplemental information that we are producing in the initial modeling effort. We've spent a lot of time talking about which criteria you want to include, and we made sure that it's captured in this table and in the PDF document that you've gotten. In the case of this first example, the Lake stage performance measure, we've indicated with an X that it will be used in the conceptual plan analysis. Then we move on to indicate that the measure would be used for any of the subsequent iterations one, two, three.

We would we use it for the initial array of alternatives, the balanced array of alternatives or for the selected plan. For this example, the Lake stage performance measure will be used in all of those iterations as indicated by the X in the table. And then we show if it will be used for the NEPA effects you can see in this example, yes, it is. Finally, there is a catch all categories that we've included called the additional information requests. This is based on information request from the PDP that we're generating that our technical team determined to be reasonable for some of these, we are still determining how we want to use those, but we want it to keep track of everything in the same large tracking spreadsheet. You'll be able to see all of the additional requests, how we're capturing those.

Finally, the last column indicates if there is a documentation sheet associated with each measure and not describe how we would use this metric to evaluate plans, and then the science and the technical justification of that metric, not all of the measures will have documentation sheets, but quite a few of them do. As part of that PDF package that we sent you last night, we also included all of the compiled documentation sheets that are available at this time. This is a draft working document that we will periodically update as new doc sheets become available. We will send out updates as those already. What we would request from the PDT and members of the public is please review this package and give us your comments by July 17th. If you have any questions on this package, please contact me and I will do my best to answer those. Next slide, please.

Now we're moving on to the sub team updates and I have the first one. The first sub team to go through is the plan formulation and modeling sub-team. I will provide an overview of where we are in the planning process and some next steps. After that, I'll turn it over to Jessica Mallet, our engineering lead to walk us through the planning conditions. The last time the PDP met, we were near the beginning of step one, which involves compiling PDT feedback on water management tools to form conceptual like schedules. Now we're preparing for the second step, which is the conceptual plan evaluation. At that same time, the modeling team is preparing to simulate the conceptual schedule using the RSM BN model to generate thousands of simulations, and then they'll use the parado analysis to sort the performance of each of these schedules.

With the plan form sub-teams needs to start preparing for is essentially what to do with this output and to develop strategies for sorting through all of the information provided. We need to talk about the ways to process and compile these results in a way to facilitate the plan comparison. Then the process for identifying the schedules that performed the best for each objective. We'll also consider nipple performance of the remaining objectives. Those schedules retain from the conceptual plan. Evaluation will become the initial array of alternatives, which is set three in the overall process. Then after that, we need to start further defining the process, transitioning from the initial array towards the balanced array. Then finally to be recommended like schedule at this point, we will have access to the full suite of performance measures. We'll have more information to base our decisions on, and our strategy may evolve a bit at that point. There is a lot more to come for the plan form and modeling sub-team and we have a lot of work to do. With that I would like to transition it over to Jessica Mallet. Next slide please.

Jessica: Hi, good afternoon. This is Jessica Mallet, the engineering lead for Logan. Can you hear me alright?

Operator: Yes.

Jessica: Okay good so today we're going to talk about from a broad perspective, through the project conditions for the three defined planning conditions that we'll be using for low sum [LOSOM] and these conditions, these three planning

conditions will be used as comparative conditions when we're looking at the alternatives. One of the things we've been going through in the model plan formulation modeling sub-team is the more detailed modeling assumptions. One of the requests in the modeling sub-team was to step back and have in one table, just the planning conditions, so that we can look at each of the areas and how they relate, how the conditions relate for each area. The first thing we'll talk about is the Lake Okeechobee regulation schedule. For the three planning conditions we will be using the LO 2008 with the extended period of record for modeling as we progress, we will discuss later this afternoon. Then, so, because the Lake schedule is what we will be looking at modifying in this project, we'll be changing the schedule in the alternative, but we will not change the schedule in any of the baseline conditions.

The next item that we'll be talking about is Lake Okeechobee, regulatory release is South we've talked about this in detail, its part of the analysis that's happening in the second phase of the project. For the existing condition baseline, that's our 2019 condition. When we started this project, we've got 50,000-acre feet average annual flow to the central flow path within the EA of the restoration strategy, which is the area within the EAA. That would be FTA2, FTA3, FTA4 and A1 FEB, but the no action, 2022 condition, we'll be updating the average annual flow South to the central flow path. We will also be adding the combined operating plan. That will affect, potentially affect our ability to flow water south, because we'll be changing the regulations schedule and conservation area 3A. When we say updated average annual flows, that's the DMSTA analysis that we've been talking about in some of our other meetings.

We'll be looking back at the assumptions regarding how much capacity we have for treating flows south from the Lake and the ability to update and passes flows further South into the Everglades protection area. For the no action 2025. Again, this will be another, it will be a revised average annual flows South to the central flow path again, it will include, as in the 2022 conditions, and we'll also include the A2 FTA and that will be in it grow in only. Basically, we won't have any flows coming out of the FTA we'll just be in its Pre-Operational condition where it's accepting water for the purposes of developing vegetation and whatnot within the FDA.

We do have next the Herbert Hoover diet rehab rehabilitation project. This is just in there. It doesn't change our operation with respect to the regulation schedule. It’s important when we start talking about the alternatives and where we're comparing that too. The existing conditions baseline 2019, we have partial Dyke rehabilitation in 2022. That's when the Herbert Hoover dietary habits scheduled to be completed. That's when low sum [LOSOM] is expected to be implemented. Then the 2025 condition is the same as the 2022 with regards to the Dyke construction completed in 22 or 2025, we don't anticipate additional changes to the structure and integrity of the Herbert Hoover Dike. For inflows into Lake Okeechobee we're looking at inflows from Kissimmee River. We're evaluating what's occurring in the Kissimmee River restoration project for the existing conditions baseline 2019. We're looking at the restored reaches in pools

that existed as of last year or 2022 condition the Kissimmee restoration project construction is complete and we'll have a revised headwaters restoration schedule in place. That schedule will be completed this year. For 2025, we have the same condition as in 2022, next slide please.

Here, we're talking about the storm water treatment areas and the flow equalization basin, the FEB. For 2019, and for the other conditions, we'll talk about the EAA STA they're designed to reduce the total phosphorous in the surface water rental prior to discharging this water into the Everglades protection ingredient. The effective treatment areas are listed there for a total of 57 approximately 57,000 acres of treatment area. That number does include the STA two and the STA 56 expansion area. In addition to the treatment areas, we have storage provided in the FEB, the A1 provides 50,000-acre feet of storage, and that's used to attenuate the storm water flows prior to discharging into FTA2 and FTA3, 4.

Those are the central flow path feature. Then the LA FEB, which is in the Eastern flow path of restoration strategy, provides 45,000-acre feet of storage. No action, 2022 the STA one was expansion phases one and two are completed that adds an additional 5,900 acres of effective treatment area. Then for 2025, we also add the A2 STA. For low sum [LOSOM] we've discussed this in previous meetings, our focus is on the central flow path FTA2, FTA3 4, and eth A1FEB and then in the 2025 condition, that would also include the AT STA. Those are the facilities that in our planning modeling, we're going to be looking at for receiving Lake regulatory releases, Eastern flow path in the planning Realm is not utilized for releases from the Lake, and neither is the Western flow path for regulatory relief. Next slide please.

We have some additional projects coming online that are separate but related. One of those is theC44 reservoir and STA in 2019, those projects are not operational. They're still under construction, in 2022 the reservoir and STA cash and provide water quality treatment to the local runoff from C 44 basin and the return to C 44 at the lake when conveyance at the lake is possible in order to reduce peak close at SAT. C 44 reservoir stores, approximately 50,000-acre feet of water. The STA is approximately 6,300 acres. In low sum [LOSOM] the operations of these facilities will be governed by the draft project operating manual as described in the Indian River living South project implementation report. For 2025, this condition is the same 2022. Next slide please.

The 10-mile Creek water preserve area FTA is constructed and operational in the 2019 ACB condition repeats as excess water from the North fork basin to improve quantity and timing of deliveries to the North fork of the St Lucie river. For 2022 and 2025, we have the same conditions. Also, in Indian River lagoons we have the SERP 223 224, FTA not operational in 2019 or 2022, but in 2025, the FTA are constructed. If appropriate they'll be operated per the draft project operating manual. We also have the C23, C44 inter-connect that connects the C23 to eth C44 canal. It's not constructed or operational in 2019 or in 2022, but

in 2025, it will be constructed and it will be operated for the department. These are the assumptions that we'll be using in low sum [LOSOM].

Next slide, please C43 reservoir is not operational in 2019 or 2022, but in 2025, the no action, 2025 conditions. In the alternative, we will consider the C43 reservoir to be in place and storage approximately 170,000-acre feet of water accepting water from C43, when flows are over 450 CFS at F79 and storage available in the reservoir. It will release and flows to reach below 450 CFS at F79. It is providing some flows to the estuary for environmental condition, and we'll be operating per the C43 projects and implementation reports, project operating draft project operating manual. Next slide, please.

For the LA station we have several features that remained constant among the planning conditions. We had first, and most importantly, lake releases to tide through LA are consistent, so we said LOR will be the schedule that we are utilizing along the three planning conditions. The C50 with one reservoir is not in place city of West Palm Beach and the grassy waters procure diversion and impoundment permit apply. The G151 Structure is in place and operational, the G160 is operational G160 is operated to meet target stages, within Lacoochee G92 was operated to meet the Withlacoochee River LSL and S46 follows the approved DNSF water control plan. Next slide, please. For south it's not operational in 2019, in 2022 we've got the removal of the old Tamiami trail, completion of structures, 333 North and 36631, 632 and 633 Those will be completed. These three structure is 31, 32 and 33 are operated to match the 700, 750 CFS through the S152 to become physical model. For 2025 same as 2022. Although we add the S355W structure, that's in the L29 canal.

Tamiami Trail. Next step for 2019, the phase one bridging is complete; in 2022 the phase two constant culverts are completed. For 2025, that the tuber way rising is complete. We'll talk more about, what these items mean in the modeling when we translate these project assumptions into the model assumptions, and we'll have the crosswalk, the water conservationary one the Lacoochee national wildlife refuge, we're following the current CNSF regulation schedule, which is dated 1995, and that includes regulatory releases to tide through the LEC canal. That's saying through all the planning conditions. Next slide please.

For conservation 2A and 2B again, we'll be following up current CNSF regulation schedule, which is dated 1989, and it includes regulatory releases to tide through the LEC canal it’s the same for the 2022 and the 2025 conditions. For conservation area 3A for 2019, we'll be following the Everglades restoration transition plan the RTP, regulation schedule for conservation area 3A, which includes the incremental updates. Constraint in the L 29 Canal is eight and a half feet with a 90-day annual duration limit above 8.3 feet. For 2022 we'll be utilizing the combined operating plan, proposed regulation scheduled for conservation are 3A, and includes the Tamiami trail flood formula for implodes to Everglades national park. Again, the L 29 canal constraint is eight and a half

feet with a 90-day annual duration remotes above 8.3 feet. We carry the same condition into 2025.

That's the last slide in- that I going to present on the planning condition today. I think now I'm giving the water supply updates. If you would please go to the next slide. That concludes the plan formulation updates. Now for the water supply sub-team update, we did discuss at our last water supply sub team meeting and her decision to WLS 3BN performance metrics. These revisions were sent to the water supply sub-team on June 3rd for review. It asks that sub team members please consider that revision. We plan on having a sub-team meeting the week following the July 4th holiday. Keep your eyes on the email for our calendar invite for that week. We'll see where we can discuss the revisions in more detail. Another item of concern to the water supply sub team, the current planning assumptions for the Seminole tribe of Florida, a big Cypress reservation water demand are going to be utilized during the low sum [LOSOM] conceptual plan valuation and iteration one phases. Updated assumptions, maybe utilized for iteration two pending results from parallel coordination efforts between the South Florida water management district and Seminole tribe of Florida become available. Next slide, please. I would like to pass it to Jim Wiley, who is the lead for the water quality sub team, Jim.

Jim: I'm going to go over where the water quality sub-team is that with regards to, we're working on and the other tasks we have remaining we have high stakeholder interests and how low sum [LOSOM] addresses high risk. We want to try and address that in the schedules that we developed. The team is addressing it several ways we are working on developing a risk metric to use in schedule evaluation, how I schedule the alternatives, we're going to be looking at how we're going to operate the structures through the Corps head control over. We want to incorporate the best available science and the decision making the future Lake operations. We want to coordinate continued coordination with all the responsible agencies on the monitoring and current activities and a brief. We're also briefly going to talk about, future development of predictive tools. Next slide please.

The science on the prediction available blooms for Lake Okeechobee is not as advanced as we'd like it, or we have a predictive tool. For example, for Lake Erie, they have put a considerable effort in it, and they do their predictive tools for Lake Erie that NOAA and other agencies developed, I'm hopeful that sometime in the future, we can get those types of tools developed for the Lake Okeechobee and the estuaries. We have some agencies, some groups that are put together proposals, it's just a matter of them getting funded and once they're funded. You're talking maybe three years, but so we got to work with what we got right now. This tool is not intended to provide daily or weekly operational decision guidance. This tool is only to evaluate the alternatives.

Separately once we get through the metric development, then we want the water quality sub-team to work up specific operational recommendations for the operators to be included in the how we manage the Lake stages and levels.

What is the metric we got with metrics that we're working up using Chlorophyll A concentration is a substitute approximate a surrogate for estimating the phytoplankton abundance and biomass in the Lake. Chlorophyll A you see- high Chlorophyll A you see an algae bloom on the Lake so that's what we're going from. There is a very large database, of course, on a values and Lake Okeechobee stage data and the preliminary analysis in the case Chlorophyll A conditions are linked to lake stages under, during certain months of the year. The Chlorophyll A Concentrations Lake Okeechobee be predicted by these equations that were developed by Dr. Walker.

Which show, using the association between late stages and Chlorophyll A conditions all the large database we have and it predicts them separately for the literal zone, which is the Southwest sector of the Lake. That's where the water is most close to where the release structure is to go to the West coast and the palladium or the center of the Lake region that has another set equations to predict Chlorophyll A. We're thinking right now, at this point, if we feature this further discussed below some sub-team, we're going to use the literal zone equations to try and track potential impacts to the West coast. We would potentially also be using the region equations to predict what the potential algal bloom risk is to the East.

What are we going to learn with the Chlorophyll A we got two thresholds, we're looking at there's a concentration standard for lakes in Florida of Chlorophyll A 20 parts per billion are the same thing as micrograms per liter? So, you get a part per billion microgram per liter. They're essentially for the purpose of the same thing. That's the standard for the Lake. That’s one of the things we are going to be looking at. The other one is 40 parts per billion, that 40 parts per billion for Chlorophyll A is used in the target for the lake. The target for the lake, where should the lake be that the lake is in good shape and at the state as a TMDL target and they use 40 parts per billion of Chlorophyll A doing that's a good place- not a good place. It creates where you're going to see a moderate bloom condition.

When you get 40 parts going in or above the Chlorophyll A that's an indication of excessive nutrient concentration, not desirable. Next- yeah, I want to point out algal bloom risk. There's the term people here harmful algal blooms the way NOAA defined it. NOAA and USDS are the lead federal experts on for the federal government and algal boom list. They would find harmful algal bloom it may or may not have toxins. I just want to point that out. If you hear the term harmful algal bloom, it doesn't mean it has toxins. Sometimes toxins are produced by an algal bloom sometimes they're not. Do we know why? No, we have some real sharp scientists and they have some ideas and it's been developed that science is been working on. You hear algal bloom it means there's toxins, present, harmful can mean it’s bad for the economy. It’s hurting tourism, it's causing fish kills. It just looks bad. It's, putting a smelly mass, rotting vegetation on the beach now that's harmful. It doesn't have to have toxins in it to be considered a harmful algal bloom. Next slide please.

A little bit more about this metric that we're going to work in up, which is based off the DOE contractor Dr. Bill Walker, has been working with the some of the most renowned experts like Carl Haven and, you know, Tom James and all those other people that are Lake experts. I don't want to, there's a lot more of them. He is considered to be an expert on Lake ecology and he developed these equations. There are two sets of them. As I spoke before, there's one for the Northwest shore for the Southwest shore of Lake Okeechobee. It's called the literal zone and in the center of the Lake zone. As I said before, this is restating it, but I'm just trying to get it across. We're going to be looking at the state fare.

Now that's been, it includes criteria. It's just not a straight number. It's got magnitude duration and frequency to being above a 20 parts per billion. This, predictive approach doesn't allow evaluation. It does have some ability to do magnitude, but not on a monthly basis and same with the duration. This is the numbers we're going to get out of this would be like, how's it going to work out for a given year during the simulation for the modeling that are going to be used to evaluate each alternative trying to make sure I'm getting the point across. We are going to get one number for each year, and it's going to say, hey, this is what the average Chlorophyll A is going to be May through August. That's what I want you to get out of it. Not going to be monthly. It's not going to be daily. Next slide please.

How would we use these predictive equations? These are all concepts that we've discussed to some degree, but they've kind of got refined a little bit in the past couple of weeks and maybe even more refined as of yesterday. All these concepts have to be further discussed at the water quality sub-team level, but I think we're getting much closer. One way we could look use them is we run a period of record. I think its 52 years. We could count out how many years was the Chlorophyll A above 20 for a given alternative. How many years was above 40 for the Chlorophyll A then you could use that as a kind of a comparison, a higher number is not good. We are looking to find how can we help reduce algal bloom risk without negatively impacting the other authorized project purposes?

That's what we're trying to do. We are trying to find a sweet spot where we can reduce risks without causing other problems. Another way we're thinking of looking at it is what's the total volume of water delivered over each 52 period of record. If we're going to doing the modeling on to the East coast, the West coast, when the Chlorophyll A levels are above 20 and above 40. It gives us a way to come in a very large scale. It gives us a way to look at which one is sending more elbow mass to the East coast or the West coast. That's how I get my head around it. I think that could be useful metrics, but as I said, you have to verb further discuss this. We've got a lot of high-level scientists with the water quality sub-team level, and you've got to get all of them to look at it and think about it.

Before we finalize all these approaches, another way, another thing we could do is the long-term average meaning Chlorophyll A for an alternative. We go, how does each alternative perform over the 50-year, 52-year period of record? You

get one number for each alternative and you go, well, this one's higher, this one's lower, the higher one. Isn't, that's not as desirable. If you can get a lower Chlorophyll A number and it meets the other criteria, it doesn't hurt the other criteria. Well, that's going to be rank higher. It's going to add something more desirable. Then we would also another way to look at it is, Hey, what's the percentage of years over that 52-period record with the average of the Chlorophyll A is greater than 20 parts per billion. Next slide, please.

Some more ways we could do it. I think would be looking at main Chlorophyll A levels for longer averaging periods over two-year, three-year, five year. That's based on a five 52-year-old period record. We got to talk about that more and it was just brought up. I'm not completely I can't explain it well because I don't understand it**.** Then we also want to look at the long-term average risk exceeding the bloom criteria pertaining to 40 parts per billion which reflects the effects of the, how things change within each zone. Then the percentage of years where we had a greater than, or equal 10% risk of exceeding the bloom criterion of 40 parts per billion parts per billion.

Let me just go back. What does that number mean for Chlorophyll A well, that means you have a moderate bloom? You can see it, that's what that criteria is the 40. What I want you to get out of this is we're looking at two numbers. I'm seeing it again. We're looking at the 20 parts per billion because that's a state standard, the Chlorophyll A on Lake Okeechobee, as well as other lakes. We're looking at the 40 parts per billion Chlorophyll A because that's when you can, it's a moderate bloom. You can see it very likely. Next slide please.

Where we at with these predictive equations? They've been developed, they've been refined, but the documentation sheet know the explanation of how these equations were developed. That's what the documentation sheet will have and the, how exactly you would use these productive equations is being finalized. I just gave you a quick **[00:54:16 inaudible**] it's still being finalized. Dr. Bill Walker, he's put together all the data he used, which he pulled off of the public website and ed hydro. He's going to have it all in one package and the package will show how he derived the equations. That's been provided to DOI staff, Dr. **[00:54:41 inaudible]**. He's reviewed it and they're polishing it up. When we get it a little more polished up and it's going to be shared with the water quality sub-team for review and input, what are we doing with this?

We're coming up with a proposal on a new metric right now. The plan is the Corps as a center of expertise for ecosystem restoration and the plan to have them review it. That may change we're you have somebody in the Corps review. If there's going to be some level of, you're doing Corps, we've also started coordination with the Florida blue green algal task force to do this metric. We've already had an initial meeting with a chief scientist. I believe that his title here the state of Florida to give him an overview of what we're, doing with this thing. The metric review will focus. What are they going to be looking at? They're going to be looking at the predictive equations. Does it make sense how they were derived and how we use the data? I think that's the last slide. Is there

another slide? Now I'm just, I'm going to introduce our next speaker. It should be a Dr. Ed Hodgkin; I think its Anne who is next correct?

Male Speaker: Yeah, that's right.

Jim: Okay. All right. I'll go back on me. Does anyone have any questions on the PDT?

Male Speaker: We'll get there I think after Anne we'll open up for a PDT comment.

Jim: Got it because I want to have an opportunity for anybody from the low sum [LOSOM] water quality sub team it they want to correct or amplify anything I would like them to have a minute or so. Alright, thanks. I'll go on mute.

Male Speaker: Thank you Jim I appreciate that.

Anne: Okay great.

Male Speaker: Sorry go ahead Anne.

Anne: Thank you. All right, thanks Jim very much for that overview. Good afternoon folks. This is Anne Hantch from the **[00:56:52 inaudible]** technical lead for the low sum [LOSOM] project. I have a couple of short slides that I'm going to be presenting this afternoon just to continue to update the PDT and interested folks about the ongoing progress in evaluating potential performance metrics, how they might be used on a regional synthetic approach. Then as Tim said, when we get to the right moment, we'll have the question and answer session for everyone. I just have a couple of slides this afternoon. Earlier in the year we had several different eco sub-team meetings. We paused those back in February, and at that point we had a tentative list of proposed performance measures. The low sum [LOSOM] team took some time to review the plan formulation process. We are now at the point where we've developed the new approach going forward or the synthesize approach going forward.

On a geographic basis, we're looking at the applicability of performance metrics. Most of these have been developed through the recovery program over the years. Some of them are very current and have been used in recent projects. Some were developed at a tentative or a draft level and have been used to a lesser extent. We've also reviewed and tried to synthesize thoughts about these performance metrics from the various comments that have been received over the course of the public comment period and just with our interactions with the cooperating agency and the various geographic representatives. If we just focus for a moment on the geographic areas in the Northern estuaries, which include the St Lucie and the Caloosahatchee estuaries we we've got metrics proposed for high flows, a couple of variations there.

Low flows, a couple of variations in the last several weeks. We've had discussions about adding a metric for Lakeworth lagoon flows and we're diving

into developing that metric conceptually. There is an existing MSL for the Caloosahatchee, and we're looking at the how to apply the potential exceedences for that MSL. Then of keynote, the revised recovery salinity envelope performance metric is in final review and should be available about the end of June if the review schedule stays on target. That is one that has been discussed multiple times this is a valuable metric for the overall process. For the Lake Okeechobee area again, the recover stage envelope of performance metric review has been completed in that performance of the performance metric is available for use. MSL exceedences are always in the mix.

We've been working with the US fish and wildlife service, the Florida fish and wildlife conservation commission, and the university of Florida researchers, Dr. Rob Fletcher, and others to develop a an integrated sail case management and Lake recession rates, performance metric that's in development. We're moving forward in the development phase. We're also looking at just key performance metrics of frequency of stages below 10 feet stages above 10 feet. Those implications in a daily Lake O stage time series for the Everglades region, there are about 10 to 12 different recovery performance metrics or other ecological tools that have been developed. Some of those have been used in previous modeling and assessments. The Corps recently in the last week had a coordination meeting with the department of interior agencies, the US fish and wildlife service and the national park service to discuss relevance and utility of these various metrics.

Based on what we think that the potential project effects will be. We are waiting for feedback from the department of interior to be able to really call those proposed performance metrics. The department of interior national wildlife I'm sorry, national wildlife refuge system. The US fish and wildlife service national wildlife refuge system has proposed examining the C 51 canal, stagers, and close in the water regulation, a schedule, the stages, and the period of study. We have added those considerations to the max. Next slide, please.

All right. Finally, the two distinct geographic areas, Florida Bay we're in discussions about evaluating the extent of project effects and based on the recent discussion that we have as a department of interior key areas for evaluation would be transect 23 followed by transect 21. Then for Biscayne Bay, where again, discussed the project affects with the department of interior, we're evaluating the extent of those potential effects and really looking at the surface flow into North Biscayne Bay and further South. To reiterate what has been proposed and presented in the plan formulation overview, these apartments metrics are being screened for use in the analysis as supplemental information and iteration one iteration two iteration three which is the stepwise review of alternatives or for the NEPA effects analysis. That concludes my summary. When we get to the question and answer section, I'll be happy to answer any questions, Tim, I'll turn it back to you.

Tim: All right. Thank you everyone. Hopefully now everybody's up to speed on where we are in a low sum [LOSOM] process. I want to go ahead and open up the floor

for questions from the PD team members. If you can go ahead and go through the process to raise your hand, which I believe was pound two.

Operator: That's correct.

Tim: To get into the queue. We'll go ahead and start the PDT Q and A.

Operator: Stu Applebaum. Your line is open.

Stu: Hi, this is Stu Applebaum. I had a few questions for first a comment. We receive a lot of material late last night to go through, and I appreciate getting all that material, but it would be helpful in the future. If we can get the read ahead material a little earlier or a few days before the PDT meeting and make it easier to get prepared for the meeting. I had a couple of questions concerning the performance measures. There were a number of looking at the tracking sheet. There are a number of performance measures that are either TBD or pending. You asked us to respond with comments back on the performance measures of the 17th of July. Are you intending to have a second round of comments on performance measures once the missing or the pending ones are completed?

Female Speaker: That's fine. Yes, we will continue to update those as we as we get additional information. Yes, will continue to send those out as we have more information. I certainly can't expect you to comment on things that are TBD and NR yet. So, whatever's in it and the documents that are included. Yes.

Stu: All right. Second question. With regard to the pareto analysis, the schedule that I saw on the read ahead materials indicate that you're going to start that analysis probably 31 July. That's roughly a little over a month from now for the evaluation criteria that are going to be part of that parado analysis that are still missing specifically. We were like, dam safety, HAB, and the estuaries. Are you going to be able to complete that before the parado analysis starts?

Female Speaker: Yeah, that's the plan so we will have those.

Stu: So, will we have a chance to comment on those performance sheets or performance measures before the parado analysis starts?

Female Speaker: I would defer to Jessica for the dam safety one. I'm not sure if that's something that we're sharing. Also, I would defer to Jim about the algal bloom worksheet.

Jessica: Hi, this is Jessica Mallet yes, we will be providing the dam safety metric to the PDT team for their review and comment, and it has been approved by FAJ. We're just waiting on the last round of comments from the FAJ and software to water management district team, and then we'll be releasing it, for comment.

Stu: Last question I had concerned the estuary, the St. Lucie stress, estuary stress cap, the St. Lucie estuary damage count that includes the estuaries stress count,

includes the damaged council that's four performance measures that are listed as part of the, or at least in previous slides at the PDT plan formulation, they were listed as four of the evaluation criteria for the parado analysis. I don't really see those in the tracking spreadsheet.

Female Speaker: I'll have to double check and make sure they should be in there as well as not only in the parade evaluation criteria, but they would also be throughout the iterations as well.

Stu: I don't see them, like what I see as two placeholders, I think for St. Lucie, like a one and a two, but nothing else and nothing on the Caloosahatchee high side.

Female Speaker: Okay. Thank you. I'll look through and make sure that make the appropriate update if those are missing.

Stu: All right well, I appreciate all the answers.

Female Speaker: Thank you.

Tim: One more thing. I think on the performance, major package. There are some of the columns that have TBD as far as when the performance measure would be used. We would like feedback from the PDT on the appropriate use of some of those performance measures, whether they would be best be used in iteration and one or a future iteration. That is part of the comment that we are looking for. Are there are other questions in PDT?

Operator: Yes. Your line is open. May I ask your name, please?

James: James Evans- hallo?

Operator: Hi James are you a member of the PDT team?

James: Yes, I'm a member of the PDT.

Operator: Okay, please. Go ahead.

James: Thank you. Building on Stu's comments, as I reviewed the table showing the low sum [LOSOM] summary of the performance measures, I also noticed that it didn't include the performance measures for high flows for the Caloosahatchee. I just was wondering whether or not you're going to include the recover salinity and flow performance measures for the Caloosahatchee. Will that be incorporated, you know, now or later? We did provide some comments, kind of suggesting that we need to have those high flow PMs you know, for flows between 2,100 and 2600, which are stressful and greater than 2,600, which is damaging. We also provided some additional bins where we saw some regional impacts down downstream in the Caloosahatchee OD in the San Carlos Bay in

the Gulf of Mexico. It flows, over 4,500 CFS. I think we need to take another look at that.

I think there's some stuff missing from that table. I just had a quick question for Jim Riley regarding the harmful algal, bloom analysis. I appreciate the use of the zone equations to kind of use that as a surrogate for harmful algal blooms for the West coast. I think that'll be helpful. I'm just curious how that's going to be in real time operations when it- when we have, high Lake levels, are you really going to take into consideration the harmful algal blooms when there's a risk to flooding properties around Lake Okeechobee and how will that affect real time operations and discharges to the estuaries?

Jim: Okay, let me respond on this metric just to get it clear. We're not going to be using these equations for real time responses. Now, your next part of the question is during the actual real-time operations, let's take a scenario. We have a big algal bloom, mass piled up near S 77. It has to be balanced with all the authorized purposes. Ideally, you know, we want to be able to do the best we can to reduce the algal bloom mass discharged to like, for example, the Caloosahatchee, but it's very situationally dependent on what's going on. It's like, not my call. This is our engineering and operations group and flooding impacts human health and safety. It's not a simple answer. It has to be a case by case basis.

James: I understand that it's being used to kind of screen the alternatives and I think it's going to be a useful tool. I just want to, you know, as we move down the road how do we incorporate it in the day to day operations is going to be something that's going to be really tricky, but I appreciate all the work they're doing. I think it's been a very good process. You guys are letting the science drive the process and we really appreciate it. Thanks.

Jim: We want to discuss what you're saying. Once we get through this metric, then that's what I want to be getting input from the group on how would we practically implement measures and provide guidance to the operational people? You know, so we can reduce algal bloom risk. That'll be that's next. Once we get past this metric, which I think we're getting close, I hope we're getting close. I think we're, near the end on that. That's what the team needs to shift over in too- so more to follow.

Operator: We have a few other people on the line. Hi, your line is open. May I ask your name please?

Tom: Hi, this is Tom. The team member **[01:14:21 inaudible]**.

Operator: Welcome please go ahead.

Tom: I have a question for Jessica regarding the base condition assumption, and I can't tell if you all can hear me. Can you let me know if you can?

Operator: Yes, we can.

Tom: Okay, thanks. On the base condition Colonel Kelly, I think said this week, that he's within a very short period of time of releasing planned deviation operations. I'm wondering how you're going to incorporate that into the base conditions. Because the last time deviation was proposed last summer are going to be essentially in effect until the new low sum [LOSOM]. It seemed like planned deviation would be a part of any of your base conditions. I'm wondering how you're going to deal with that thank you.

Jessica: Hi Tom, can you hear me?

Tom: Yes, I can.

Jessica: Yes. Okay. Thank you. This is Jessica. Right now, the deviation is condition-based and so the plan is that it would once the deviation is approved and we have in place, then it would only be utilized as conditions one. There is no, there's not any set scenario that we would definitely be implementing it. At this point we are not looking to incorporate it into any of the base conditions, but I would like to defer to Savannah if she has anything else to say about the topic, because she has for the deviation and for the water management operations on Lake Okeechobee. Can the event producer please unmute Savannah Lacy?

Operator: Hi Savannah, if you could please press pound two on your phone. Welcome please go ahead.

Savannah: Sorry. I was on mute, trying to talk on this is Savannah Lacy. Basically, right now the deviation is still not approved. I think we have a little bit of time to figure out exactly how it may or may not be incorporated into how we're evaluating the existing condition with lowers. I think we have a little bit of time. I don't think we would come to a solid conclusion as to how exactly it will be incorporated, but that answers your question.

Tom: Well, I think, you know, we haven't seen the deviation, so I guess we'll know more. Once we see it where there is something that should be incorporated or not. We'll just wait on the document, coming out and bring the topic back up if it's appropriate. Thank you.

Savannah: Thanks Tom.

Operator: Scott Kelly your line is open.

Scott: Yes. Can you hear me? This is Scott Kelly.

Operator: Yes.

Scott: Representing West Palm beach. I just wondered if there was any more evaluation done in regard to a performance metric of the Loxahatchee river meeting the Loxahatchee River MFL that had been brought up before, but I didn't see it as a performance measure.

Jessica: Yeah. Scott, this is Jessica Mallet the Lox NFL is included as a performance metric. I believe it's BNH I want to say.

Scott: I just didn't see it in your table that you just presented.

Jessica: I don't think that the tables in the presentation were comprehensive. If you look in the PDF packet as a PM package WSAB is Northwest fork of the locks river NFL evaluation, and there's a dock sheet in there for that.

Scott: Thank you.

Jessica: You're welcome

Operator: Jerry, your line is open.

Jerry: Thank you. May I make a statement?

Tim: Jerry you are a member of the public, correct. I see we have a few more minutes of PDT comments before public comment open, be free to make a statement.

Operator: Hi your line is open are you a member of the PDT?

Matheson: Yes.

Operator: Mr. Matheson.

Matheson: Yes. It's Merritt Matheson, a city of Stuart. My question was for underwater quality for Jim. I'm wondering if there's going to be any more of a tiering in regards to chlorophyll and HABS. If it's 40 parts per billion, it's just a classified, that's the start of a moderate bloom. Is there going to be any variation, say of a severe algal bloom? It would maybe treat deviations or metrics differently going forward. Say you had 100 parts per billion or so- thank you.

Jim: This is Jim Riley here. I think that's one of the concepts that we need to further talk about. That's where we got to balance it out., I think we're going to be looking at that, but we need to flash that out at the, at the sub team level. Cause you know, it's, it's at 40, but then if you get some years where it's just, it's getting hammered and you're seeing some very high levels you know, I think that would have to be considered as well. The answer is yes, that's my thought right now. As I said, we got to further discuss it at the sub-team level yes.

Matheson: Well, thank you. I would think a severe algae bloom has to be treated differently and what caused that then maybe a moderate algae bloom so thank you.

Jim: I agree. I just want it, but I want to have all the input from all the, we got a lot of smart people that are not in that team and just want to get that vetted. I think that's going to be one thing to look at over.

Matheson: Thank you.

Operator: There are no more PDT questions.

Tim: All right. We do have one question that was asked in the chat from Peter Doring DAS, what flow ranges are considered in the highest flow and low flow one and two performance measures for the Caloosahatchee and St. Lucie. I'm not sure if Phyllis Klarman from the water management district is on the line, if she would be able to respond to that question. If not, we will get back with you, Peter.

Operator: I'm sorry. What was the name of the person?

Tim: Phyllis Klarman.

Operator: Hi is this Phyllis Klarman**?**

Phyllis: Hi yes can you all hear me?

Operator: Yes, you can. Thank you.

Phyllis: Perfect. Hi everyone. This is Phyllis Klarman with water management district. For the low flows this is going to be based on the flows that are below the low flow bound for each of the estuaries based on the updated salinity envelope performance measure. For the purposes of Caloosahatchee, I think what we determined was we would be looking at two different low flow categories. One that was below 457 and that is separate from the metric that is being evaluated for MSL exceedences. Then we were also going to look at the range between 457 and 750 CFS. Then for the St Lucie, I believe low flows would be less than 150 CFS. In response also to James Evans comment earlier regarding the high flow bound especially the comments that we had received in excess of the damaging ranges for flows that are going to be affecting further downstream resources, such as San Carlos Bay in the Gulf of Mexico, as well as the Indian river lagoon on the East coast. For the purposes of the parado analysis, we are not going to be including those just because we, what we want to do is, is one of model those using CH3D based on the same modeling exercise that we did for the salinity envelope performance measure update.

I recognize that the floats that were selected and submitted as part of the public comment were based on previous work from Peter and Bob Chamberlain. We want to really do our due diligence and make sure that we model those. The

intent is to look at some of those higher flow bins and try to determine based on what we're looking at with CH3D what areas of the downstream East resources are expected to be impacted and use that criteria as additional PMs for the more detailed evaluation of different schedule alternatives. I expect based on the comments you received, the fact that this is really good information to have that this may also be incorporated into an addendum to the salinity PM. We agree that looking at these higher flow ranges is going to be critical to ecology of those downstream systems. I'm not sure if that answers your question, but I'm happy to provide further detail if you would like.

Operator: I see a comment from James Bearskin that he would wish to make a comment. If he could press pound two on your phone, please? Hi please go ahead.

James: Thank you James Bearskin FWC I would like to say thank you for the PDF file that lays out all of it from performance measures. That's really good to see a couple of direct comments on and on page five, there is an environmental performance measure behind low water closure criteria in the Everglades wildlife management area. There are different itineration and different places for it to be considered. My question is the regards to that if it's not marked explicitly for itineration's one, two, three, or four, and only for the NEPA effects, does that mean it will not be considered as part of an alternatives analysis? That would be the question and the second one I'll comment, and I'll put it out there at the same time. That is the comment on the HAB performance measure that Jim Riley was talking to. I just want to say, I really appreciate the fact that you're engaging the state side, chief science officer on that and the harmful algal bloom task force. I think that's the right thing to do. Thank you.

Lisa: James this is Lisa I can answer the first part of that question. That should be when there's no X when you're talking about the iterations that should be to be determined and thank you for that comment on that too make edits the table. Some of these TBD like Tim mentioned earlier, we want feedback from the team, how we think we need to use these, and sometimes you need the modeling results to determine. A lot of these are still TBD, so thank you for that comment. I'll make that change.

James: Yeah. Thank you. At this stage, data is available for those during the model and runs. We certainly would like to use them as a consideration. Thank you.

Operator: James Evans has raised his hand again,

James: Thanks. I'm going to defer my comment. I'll send you comments in writing. Thank you.

Tim: Is there any other PDT comments? I'm going to take this now and if not, we can go ahead and open the forum for public comments for the next 15-.

John: Tim its John Campbel Brad Stuart has a comment and he is a member of the PDT I believe.

Tim: Okay.

Operator: Mr. Stuart, if you could press pound two on your phone. Stu Applebaum has also raised his hand again. Mr. Stuart your line is open.

Stuart: Thank you my question was in regards to the- because we're talking about the recover Northern envelope performance measure and how that was going to be utilized. I just wanted to clarify that because the numbers in that performance measure are based on total water flows into those estuaries not just water flows from the Lake. I wanted to clarify how you intended to calculate the quantity of water coming from other sources so that the, so, I mean, we can't just take the, that number and convert it to, we can discharge up to this amount from the Lake, because that's not what that performance measure was measuring. That's my question. Thanks.

Phyllis: Hi this is Phyllis Klarman again can you hear me?

Stuart: Yes.

Phyllis: Hi yes for the salinity envelope performance measure, the total flows do include all measured sources of inflow, but some of the model outputs that we can generate using the RSM BN, will include looking at contributions from Lake Okeechobee versus the tidal basin. That's something that we'll be able to further evaluate.

Stuart: Okay. Thanks. I just want to make sure, because it seems like in **[01:30:27 inaudible]** I wasn't here for that, but some of the Northern estuary performance measures that found, 2000 CFS for the St. Lucie were just adopted as we can discharge up to 2000 CFS from the Lake. Obviously, that's not how those performance measures are intended. I just want to make sure that that that's being taken into account.

Operator: Excuse me, Stu Applebaum also raised his hand again, please go ahead.

Stu: Hi I had two more questions. First for, for Jim Riley on the HAB can you comment on the development of performance measure for the estuaries? Your presentation was on the Lake Okeechobee performance metric, I didn't hear anything about the estuaries.

Jim: This is Jim, Riley here this is where we're at right now. It has to be further discussed at the sub-team level. Right now, the concept for the estuaries is to track the volume of water that has, above 20 and above 40 and to each estuary and use that to compare the alternatives. Right now, that's the concept., I think we got Phyllis who's more, much more of an expert. I'm not an expert on

estuaries at all. I think that was acceptable to the estuary people is a current concept. That's where we're at right now. If Phyllis has anything to add, she wants to give any feedback on that. That'd be great. As I said, we got to talk about it further in the water quality sub team.

Phyllis: Yeah. Hi, this is Phyllis again. I'm a little bit less familiar with the work that I think it might be either Paul Julian or Dr. Bill Walker, that's working on some more quantitative metrics for the estuaries, for which I'm not very familiar. One of the things that I will mention is that the estuaries component is a little bit more complicated. From our perspective, what we're looking at are two different things with algal blooms, for the estuary, we're looking at risks from transport of Microsystems to the estuaries from the Lake or from the canal systems. Then there's another component in which we often see algal blooms of, of different phytoplankton classes, including diatoms and that form into two that has nothing to do with lake operations necessarily. In order to pull apart those different components, there's, it's a little bit more complicated.

For the purposes of, of this act, this exercise where we're not quite there yet, where we can produce some sort of predictive models to say under these different floats scenarios, we would expect an algal bloom to occur. Again I'm not very familiar with any of the work that Paul Julian, or Walker might be working on for the estuaries, but for the purposes of, of an algal bloom risk metric for the estuaries, we would suggest that if there is a risk, a high risk for algal bloom in the Lake, and we know that it occurs during certain months where discharges are likely that that would inherently mean that there would be a risk to the estuaries for the algae blooms as well.

Stu: Thanks. Second question was on the deviation. If I'm understanding it correctly. And that's what I want to kind of make sure Jessica's answer to Tom McVicker was that sounded like the deviation was a permanent deviation and it would be triggered under certain conditions, but am I correct? That it's a permanent deviation.

Savannah: This is Savannah. Can you go, can you also hear me?

Stu: Yeah.

Savannah: We're, not going to get into specifics about the deviation right now. I think, we're still working on finalizing a document for public review and it should be out soon. It is a temporary deviation, so it's not a change to our control plane and we'll leave it at that. Any further questions about the deviation we can take them offline.

Stu: Okay.

Savannah: Thank you.

Operator: It doesn't appear that there were any more PDT questions at this time.

Tim: All right. Thank you. So, at this time we will go ahead and open the floor for public comments. If there are any members of the public that are on the meeting with us today, please go ahead and get into the queue to make your comment.

Operator: Mr. Gavino, your line is open.

Gavino: Yes, may I speak now?

Operator: Yes, please.

Gavino: I'm a private citizen. I live off the St. Lucie River and it is my opinion as an environmental scientist that what's trying to happen here is to put a round peg into a square hole. The discharge situation into the from Lake Okeechobee to the St. Lucie river is manmade and the condition of Lake Okeechobee in terms of its nutrient content, especially its total phosphorus level, which is a determinant in producing the high chlorophyll values, which is correlated with the harmful algae blooms is not necessarily being addressed by the Corps of engineers, because it's a water quality problem. Is there any concern through the Corps of not just reducing the water volume, discharge to the Northern estuaries when it's inappropriate, but you control the nutrient levels in the sediment and in the water? That's my question.

Tim: Thank you for that comment then question and we will do our best to try to answer that forward. Are there any other public comment?

Operator: Yes. Mr. Martin, your line is open. Yes, we can.

Martin: It can handle more flooding events and that would play into how much water is held in Lake Okeechobee to adjust for those various events. Thank you for listening to my comments.

Tim: Thank you very much and I appreciate those comments. Are there additional public comments at this time?

Operator: Yes. Please go ahead. Your line is open.

Nyla: Hi, Nyla Pipes One Florida Foundation. I wanted to start by talking about the presentation regarding the HABS and chlorophyll A and algal blooms. While I find that it's admirable and necessary to look at that as a metrics that we need to consider I think you're going to discover it has more to do with nutrient enrichment than it does Lake stage as far as how much those algal blooms occur. My thoughts on that, the next thing is the assumption that the C23 C44 interconnect is in place by 2025. I'm going to take this opportunity to, again,

encourage you all to really revisit that as far as public engagement goes because that was all approved a very long time ago with IRL South.

Then again, kind of lumped into SAP It is a small project that has a huge impact as far as continuing with Everglades restoration and obviously it is needed. Or at least it seems to be needed as far as considering the Lake Okeechobee, low sum [LOSOM], and the operation of the Lake. I got to tell you the St Lucie County, they're wanting more public participation on that particular small but important project. I thought it was a good opportunity to remind you all of that. The next thing is the rainy season. We're all sort of going into a revisionist history thing about what happened this year with the deviation and the lower Lake stages, and we're all going, yay we did it. It's great, but I want to underscore the fact that the rainy season began mid may. Oftentimes we don't see the rainy season actually begin until mid June. Let's be really careful not to let that deviation and this wind, because Mother Nature to cooperate overly color the low sum [LOSOM] process. Thank you very much.

Tim: Thank you for your comments are there any additional public comments at this time?

Operator: Yes, Marisa Coratso your line is open.

Marisa: Thank you. Good afternoon, everyone. I'm Marisa Coratso and I'm here on behalf of the Conservancy of Southwest Florida project. Appreciate the opportunity to comment today and all the work already put into this process by the PDT and sub-teams. The first comment I have was that we definitely support the inclusion in development of the algal bloom risk predictive tool and the alternative evaluation process, both for the Lake itself and the downstream estuaries. We are also glad to hear that Florida blue, green algae task force will be providing feedback on how best to include that. I also though want to underscore how important it will be to translate this into actual lake operations and not just being considered and the alternative evaluation I'm hoping on. It sounds like that the water quality sub-team will be considering if there is an existing bloom in the downstream estuaries how that may be exacerbated by discharges containing additional nutrients and we're an algal bloom in the Lake..

Obviously, the ramifications of these blooms for the health of the Lake, the downstream estuaries, the economy, public health, these all need to be central considerations to how decisions about like management are made in real time and also incorporate it into the future schedule. Thank you for providing that update today. I also wanted to comment on the, the performance measure. I did do a preliminary review of the low sum [LOSOM] summary performance measures that was in the package that was provided. On the bottom of page six, there are the three metrics related to low flow to the Caloosahatchee of course is a critically important evaluation tool. As a few others noted the high flow discharge metrics are missing from the spreadsheet. I did hear in the environmental sub-team report that there, there an intention to use the high flow recover performance metrics. I want to flag this since we need to be

considering reducing the incidents of damaging high-volume discharges, especially getting those are often accompanied by harmful algal blooms as well. Finally, it does appear that none of the estuary recover performance metrics are being included in the parado analysis based on the spreadsheet. We wanted to recommend that both low flow and high flow metrics be included. Thank you for the opportunity to comment today.

Operator: There are couple of other people on the line. Stephanie Lewis your line is open.

Stephanie: Hi, good afternoon. This is Stephanie Lewis with the nature Conservancy. Can you hear me?

Operator: Yes.

Stephanie: Okay, great. Thank you. My comment goes to process and timing of the schedule with regards to the performance measure document. Again, I want to thank the corp for producing and releasing this material for all of us to review. I want to follow up on the PDD comment in particular about timing. One of the comments that you've asked you know, the public and folks to make has to do with the PDDs about whether certain metrics, you know, the dam, the safety metrics, for example, or the northern estuaries algal blue risk metrics should be used in the conceptual modeling in the parado analysis. In order for us to make that determination, we need to be able to see the actual performance measures in a timely manner so that we can respond appropriately, have the time to review, and contemplate what these actual metrics are. I would just encourage the corp to think about the schedule that you're proposing for beginning your conceptual modeling and building in an appropriate time to allow for review and comment. Thank you.

Operator: Hi, your line is open.

Male Speaker: I'm **[01:46:52 inaudible]** conceptual analyzing we are not still very clear what performance measures are intended to use in analyzing but we would like to see a broad range of performance metrics as well as parameters in this analyzes. If you can **[01:47:19 inaudible]** metrics and parameters now you will need an opportunity to address the wide brand of **[01:47:26 inaudible]** analyze, this is very critical. We would like to see a transparency on how you derive inputs the parameters and how you link this RSM basin simulations with RSM model thank you.

Tim: Great. Thank you for the comments. Are there any other public comments at this time?

Operator: Not at this time.

Tim: All right, then we are at the point on the agenda where I would like to go ahead and take a short break. We will go on mute now and reconvene at 2:55 we got a

very short time to take a break and then we'll have the IMC give us an update on the period of record extension after that break. We'll convene in about in about five minutes.

Operator Hi this is **[01:48:45 inaudible]**. I'm sorry can I help you?

Tim: All right. Welcome back, everyone. Hopefully, you had time to go grab a drink. The next presentation that you will be seeing on the period of record extension, and we have with us Walter Wilcox, and Jamie Santiago from the IMC who will walk us through everything that they'd been doing on the period of record extension for our modeling tools. I will turn the floor over to Walter.

Walter: Okay, thanks Tim. Good afternoon, everyone can you hear me this Walter Wilcox?

Operator: Yes, we can.

Walter: Okay great so as Tim said, this is Walter Wilcox with the South Florida water management district. The district works in collaboration with the army Corps through the interagency modeling center to kind of support the regional modeling tool suite that we use in so many of these projects to help us understand how the system behaves and predict what future changes might occur as we consider changes in infrastructure changes in operations and try to understand what the ramifications of our decisions might be. We appreciate the invite from the Low sum [LOSOM] team to come today and kind of share with you some of the work that the NRC modeling center has been doing really in the background over the last several years, I think this actually initiated probably close to 2016.

We have a lot of information that we could share today. There's a lot more information we're not sharing. If you're interested in these outcomes or want more detail, we're certainly available to provide more information over time. Today's presentation will focus on some of the key highlights of the efforts that we've been working on. Then kind of bring it back to how it pertains to the low sum [LOSOM] effort and how the low sum [LOSOM] team plans to utilize some of the recently updated modeling tools to help inform the decisions that you all were trying to identify for this project going forward. I'll start the presentation and then I'll pass it over to Jamie at a certain point, and then I'll come back to it to kind of wrap things up. If we can move on to the next slide, thank you.

As I mentioned, the district has kind of the primary steward of the regional modeling tools and the agency that develops and maintains those tools and the IMC where we partner with the army Corps of engineers in, at times department of the interior we try to use a very scientifically robust and independently reviewed regional modeling tools to help us make decisions in planning studies in defining projects, here in the future that might be able to improve how the system functions and also kind of pertinent to the listen effort

and development project operating manuals and water control plans. These models have been around for a long time. They have a long record of accurate prediction and successful application in many studies prior to low sum [LOSOM] and in kind of the recent history.

When I say recent modeling kind of spans decadal timeframe. probably the last decade or so what our models have done is they've attempted to simulate a climate history from 1965 to 2005. When we use these computer models, what we're doing is we're putting in a bunch of inputs to the model that help us to understand how the system behaves and help us to try to predict how the system might behave in the future. What we want to do is we want to analyze a wide range of conditions that we might expect to occur in the real world as we moved forward. We use historical climate drivers to try to observe that range of changes for what we might be able to see. We know that it's not a fully comprehensive, there are things like climate change going on in any new event, might be more extreme or different than what we observed in the past.

We try to analyze a very long simulation climate grid to try to give us an idea of how these systems might function in the future. We did have a very robust and highly varied range of conditions observed in that 1965 to 2005 period. I'll show you some examples of that as we go through the presentation but to kind of compliment the work we've done in these previous planning studies. As I mentioned, the IMC has been working on an effort to extend the model climate record through 2016. That would help us to ensure that we are basically bringing in the most recent observations, the most recent weather patterns. There's been some very severe droughts in the last in that period from 2006 through 2016, including the 2007, 2011 droughts.

Operator: I think we may have lost your line. I believe it, his line may have just disconnected. Is there someone else who can take over the presentation for him?

Tim: I'm not sure. Jamie can jump on this part or not.

Jamie: Yes, can you guys hear me?

Operator: Yes, we can.

Tim: Yes.

Walter: Hey, sorry about that. I don't know why my phone clicked off there, but so yeah, so I'm back. You guys hear me?

Tim: Yes.

Operator: Thank you.

Walter: What I was saying is, there's also some high-water periods that have occurred in particular, the super event that happened in 2015. By adding these, more recent years, the period of record, I will expand the range of climate conditions that we're able to analyze. It also helps us to kind of reference what the models are telling us to some of our real-world experiences, because it's kind of hard to go back to 1965 and, understand what was happening in the system at that time and how it might relate to the, rainfall record. Many of us have lived through these more recent events. It gives us a little better reference point for being able to understand what the modeling is telling us.

Also, the system continues to evolve over time. In many cases, these models have to be updated and recalibrated to reflect kind of the most recent conditions and make sure that we're essentially ground-truthing and predicting results that are very close to what we've observed in the real world. The last time that we went through a major model update was probably in the 2000 to 2005 timeframe. This effort by the IMC over the last four to five years has really given us an opportunity to update the models to much more recent observations. We are bringing in data from not just the eighties and nineties, but also from the two thousands of 2010 timeframe to give us some better information to, to improve our tools. Next slide please.

Today's presentation will describe some of those key points as I mentioned about the PR extension efforts that the IMC has been supporting. We are providing, we're kind of near the end of that effort, but we're not yet complete. I think there's still some room for feedback in the final products. Today's presentation is one of the arenas where we're going to look for that feedback. We are also going to initiate a review of the data extension efforts through a SERPs regional coordination verification team will recover. The IMC is actually a cert programmatic arm, and we want to coordinate with the other programmatic arm of the science branch of CERP, which has recovered. It kind of gets them independent checks on the work that we've done. We expect to have a lot of that coordination and final refinement complete by essentially September of this year, so that we're kind of primed and ready to begin the list of project support.

What has been talked about today as iterations one, two and three. The plan is to use these modeling tools in low sum [LOSOM] in their detailed forms going into that first iteration and make sure that everything is fully updated to, to reflect the latest and greatest information by that time. If we go onto the next slide. I'm going to quickly just talk about some of the key data sets that have been updated. As I mentioned, we're kind of working toward finalizing the effort and we'll be producing quite a bit of documentation on both the data sets and the tool updates that have occurred over the last several years. We'll be delivering that to both Wilson PDT and the recover group as it becomes available over the next two to three months.

Stay tuned and if you're interested in any of these topics in a little more detail but just to kind of list some of the major updates that have occurred there's

been updates to the rainfall in reference about the transpiration data sets. Those are the primary climate drivers that kind of create the water budget that the models have to react to. As we get rainfall, a lot of opportunity comes into Lake Okeechobee. We have to kind of understand how we want to operate and manage the system to respond to that rainfall. There is other data sets we've updated, including title data sets to reflect kind of the most recent historical information. We're not yet at a point to be doing significant future sea level rise or sea level change conditions, but that's on the horizon for the IMC.

There's some efforts in the Southern part of the system with the Biscayne Bay and Southeastern Everglades restoration efforts that are initiating where we expect to really do a lot. We are finally in the context of sea level rise moving forward. For right now, we've, basically just brought it up to kind of the more recent data records through 2016. We've done a lot of work to update the land use and the demands that are represented in the model. I'll show you some examples of that in the next couple of slides, if you move on, thank you. The first major kind of input update from the Landis' perspective is we've updated the models from, in the Lake Okeechobee service area of region to reflect the latest version of the Lake Okeechobee, what they call the ledger.

If you're not familiar with the land uses of Lake Okeechobee and the permits that are issued by the state are subject to a rule that's in state law that basically provides a restricted allocation for Lake Okeechobee essentially what that means in layman's terms is that if anyone comes in requesting a permit for additional water there has to be some kind of balancing with another action. What else are the basin where the land use and the permit water has been removed and basically become available that you have to be reallocated. For example, as we construct restoration projects and we move land, for example, in the footprint of the EA reservoir to from production into restoration projects that kind of frees up some of that allocation under the restricted allocation rule to be redistributed.

The two columns that are shown here are the 2012 representation of the land use and on the left and the 2017 representation of the land use on the right. From a Molly perspective, they kind of add up to the same type of land, use drivers for demand. What has changed is there some redistribution of prop types and acreage between the different subs. We want to make sure that the models represent that latest reality and kind of make sure that we get the spatial distribution of water, correct. The total of amount of permanent acreage in low sum [LOSOM] is actually very similar. As you'll see, as we go through some of the updated calibration work the demands associated with that land use have actually gone down a little bit from previous model representations based on our observation of recent data.

[02:01:42 inaudible] will talk about that a little more in a couple slides. If you move to the next slide, we've done a similar exercise in the lower East coast for updating the land use from the 2009, 2010 snapshot that had previously been used and kind of shown on the left of this graphic to the 2017 to 2008 snapshot

that's shown on the right. You can just kind of tell visually that is similar. There is a restricted allocation, a rule in place for the lowest cost service area that prevents land use from having a significant impact on the greater Everglades system. There are changes within the lower east coast and there some increases in permanent demands that kind of have some localized effects that from a big picture perspective, as far as what types of demands are coming from the regional system and affecting the greater Everglades, and Lake Okeechobee there is updates in the land use, but the roll up is, is very similar at the- we move on to the next slide.

I also just wanted to mention that from the last time that we updated the typography, which is basically the ground surface elevation that these models see this is showing actually one of the tools that self port alarm management model, that the Jaime will talk about a little bit more. But this was a graphic that has already been produced and kind of shown shows some of the major differences in topography that have been observed in the system. Basically, the take home is we're leveraging newer and more updated data steps to the latest version of the models. You can see that some of the changes, for example, in the Northern part of concert. There are updates in available data sets there's new LIDAR information, similarly in the Western Everglades and big Cypress space, there's been some work done as part of the cert planning efforts in those areas.

Those data sets as well as others from County comp plans and other sources, I have all been integrated and kind of a ground truth. We know that there's some issues with LIDAR data in its raw form, as far as penetrating through water surface profiles. There's been a lot of work done to kind of make sure that the data is representative of ground surface and reflects the latest and greatest data sets. You can say again, big picture, not huge changes in overall relative differences or, kind of global patterns. Locally, there may be some changes that are significant and best things. Move on to the next slide.

I do just want to mention, I kind of talked a little bit about some of the challenges with topography. There were challenges and the other data sets and again, we've been working on this kind of in the background for almost four years now. There has been a lot of technical hurdles encountered and we've worked through those with not just our own team, but reaching out to experts from other groups to try to make sure that we're representing things in a reasonable way for the modeling purposes. To show you an example of one of those, it's kind of hard to see, but in the graphic that has the green and blue circles, there's actually, the state of Florida is underneath that. This is a graphic that NOAA the national oceanographic and atmospheric administration generated.

What that graph shows are the locations of the radar towers that are used for estimating rainfall with a product that we call **[02:05:10 inaudible]**. The kind of the point of the graphic is just to show that there are areas in the system that tend to have a very good coverage when they're close to the radar towers.

There are other parts of the system that, maybe further removed and may not have quite as good a set of information available to be utilized. That's kind of the cartoon sketch on the right shows that, because of the curvature of the earth, as you shoot out your radar beams you can actually shoot over storms that are too far away, or you may not capture the full magnitude of that storm.

There's also other technical challenges with the way that the radar beam itself kind of spreads out spatially over long distances. We've acknowledged those, we understand where there's some higher uncertainties and datasets, and we've worked through kind of at the regional scale. Ground-Truthing the radar rainfall estimates to the observed data at cages and doing transformations where necessary to make sure that the kind of records that we're using these models to try to predict what may happen are the best that they can be added and very representative of the conditions we've observed on the ground and in response to these types of rainfall events. With, I'll pass it over to Jamie on the next slide. He'll take you through some of the updates that have happened to the modeling tools over the course of the last several years.

Jamie: Okay. Can everybody hear me okay?

Operator: Yes, we can.

Jamie: Okay good afternoon, everybody. My name is as Walter mentioned. My name is Jaime, I'm a part of the Inter Agency modeling teams managing some of the staff there on the workload. Essentially in this slide, we kind of want to highlight the modeling tools that we're using for the low sum [LOSOM] project. I mean, I think this has been presented in the past to this project delivery team. Essentially we have in the Northern part of the system, we're going to be simulating that Northern Everglades and the Kissimmee chain of lakes with the version of the tool that is called the audit and RFM being a basis model. The basins are stimulated based on link note type of strategy. Whereas the Southern part of the system where the Everglades are and the lower conservation area are going to be simulated more or a mesh-based type of a model.

The differences of the two is that essentially in the Northern part of the system, you have datasets that are temporally distributed, but not necessarily spatially distributed, but in the Southern part of the system, you have data that is temporally and spatially distributed. For instance, if you look at stages in any one of those basing on top of that red line, you can see differences in stages across that. Let's say water conservation area one where if you look at the note on the Northern part of the system, you will see that for a particular note, for instance, Lake Okeechobee, you have single stage on an every daily basis. Next slide please.

Some of them are new updates that went into this exercise for we kind of separate those in two there are some portions of the modeling tools that we needed to recalibrate, and that's kind of where I'm going to be focusing most of my presentation today. Some of the other those tools were used to essentially

supplement the tools on the right to essentially extend the datasets that are being used for those. Essentially on the recalibration efforts, we have RSMB, recalibration, we have the Kissimmee hydrology and hydrologic modeling application. We have the regional software, the water management model that includes the EAA the Everglades area, we have some applications that we use to estimate demand and runoff in the Lake Okeechobee service area basing. We have some a wash model that we use and the Caloosahatchee base. Next slide please.

This one is the tool that we use for stimulating the, Kissimmee basins both the lower and upper portion of the Kissimmee basins, the Kissimmee channels, legs up to the 65 and then all the Kissimmee River, which are the influence to the Lake Okeechobee. Essentially historically we used **[02:10:24 inaudible]** models that were developed way back in the 1990s. We are also leveraging some of the tools that were developed under the KB at the Kissimmee basing modeling and operation study, and those were tools that were developed with. Our inter agency modeling center used these tools to develop more updated tool for the Kissimmee basin model. Next slide please.

When you look at the recalibration efforts of the tool what you see in the slide is that the historical data set on the simulated benefit has a very good match. I think to one another, I mean, there's some periods where we have overestimated flows, like for instance, the 1998 a year, but overall, over the 1995 through 2016 record the stimulated discharges through X65C compare reasonably well with the study historical dataset. That's some of the data sets that we're using for the re-modeling. Next slide, please.

After the update essentially. This is a tool that we use to, like I mentioned before emulate the demand and run off of some of those Lake Okeechobee service area-based thing. It uses the requirements simulation software, which essentially simulates the field scales demands on spreadsheet type of model and also use the model, which in combination would be, asked to simulate runoff generated by those are non irrigated areas in those spaces. Essentially the combination of those tools will give us a time of runoff and demand that we use in our model. The models are used to determine some of the supplemental irrigation on demand. Essentially we use that in our models as well. For this particular tool, we calibrate the tool from the 2007 to 2016 and validated from the 1986, 1995. Next slide please.

What you see here for the top chart shows an average monthly demand in acre-feet for some of the basis. You will see here how the tools essentially matches pretty well, the measured or the historical demand on an average monthly basis. The bottom part of the chart shows the simulated versus measured runoff again on an average monthly basis. We can see that the tool pretty much as the historical data very accurately. Next slide please.

From there we jump into the water management model. This is one of the models that initially have been used historically to approve many clients on the

comprehensive Everglades restoration plan, actually, what, the tools that was used for the serve way back when it's a regional scale model with a two by two. Two mile by two-mile grid and it has about it covered an area about 7,600 square miles. We went through an extensive exercise of recalibrating the tool to a more recent, also we introduce some additional calibration metrics in the Everglades areas because we recognize that if calibrations there was an assumption that every single sale on the EAA was only irrigated relative to the land use. We recognized not being of the sale is irrigated on a spatial basis. Essentially what we introduced was a factor in each of the basis, that account for portions of that grid sales that are non irrigated. Next slide please.

When you look at the how the model simulates again, and the supplemental demand, one on an average monthly basis lump sum of his bare EAA. You'll see that the calibration exercise and the match between the observed on the historical datasets are pretty close relative to one another. Essentially the exercise of not only updating the tool on the parameters, but also introducing those factors, that account for portions of the cell that are nonintegrated because that much because he started on observation. Next slide please.

For the EAA for the Everglades on LEC calibration we went through an extensive exercise where we updated lineage parameters throughout the entire Everglade analysis area and that included mining's coefficients. That's essentially a coefficient that a big base, how EC or for HAB is for water to move over the landscape. Essentially, that's a formulation of friction formulations for those of you who are engineers. We also look at the co-efficient that essentially the big data to what extent of where you have water over the landscape water is going to be able to run up essentially to move from one location to another, or just based in the same location because the depth is not that high. We also look at interaction essentially how water moves from the Overland plane into a canal.

By first off when they come **[02:17:15 inaudible]** stages, some of the banks, of the essentially wants to kind of the water wants to get out of the canal. Those co-efficient were used also in the calibration. We also included in the middle of the slide, you'll see the East coast protective levy and their co-efficient in the tools that dictates how much water it takes through that, if you wish based on water levels on the West side of that Fisher and water levels from the right side of the fisher. Essentially those co-efficient are used for calibration. Then on the third portion of that slide you'll see that we had, because the tool is **[02:18:05 inaudible]** system. We have to find a way of calibrating the down water system as well, but we want to kind of **[02:18:18 inaudible]** what we know about the system, the hydrogeology of the system, the data sets that are being collected throughout the time period based on the expert knowledge of some of the hydrogeologist potentially their stuff, technique that is called the pilot point techniques where we kind of look at some of the values of those green dots that you'll see on the slide, but then we prepare those values to give us a field that better match historical observations, but honoring the, what we know about the hydrogeology of the system. Next slide please.

What you see here is that if we look at historical stages across the Everglades landscape and compared that with what this model is stimulating for calibration on verification period you'll see the red line shows what the simulated time series is from the tools and the black dots represent that historical observation. You will see in the calibration period from 1991, through 2001, the **[02:19:32 inaudible]** does a very good job at stimulating the dynamics of the system for that particular gauge. This is a gauge in conservation that, then we don't only look at that calibration period, but we also look at a time window where we can once we have those parameters modified the parameters to match that middle of the period, we use the same parameters to verify other, where the model is now projected to change those parameters.

For instance, if you look at diversification of 80 or 90, you'll see that the model, again, it's able to represent those dynamics pretty well. Also, the verification window on 2006, 2010. The reason why we've done a verified that period from 2002 through 2006 is because that was the period where we the South Florida water management district transition from gauge rankled data to data. During that transition period, there some issues, some of the issues that wasn't mentioned before associated with quality control and quality assurance of some of the products that we were receiving from the datasets, next slide, please. Here is some other, you will see that in the calibration period as well, the model pretty much, not only the average of stages in that location, but also high stages and low stages. The same is true when you look at the verification period of 2006 to 2010. Next slide, please.

Here you have a table which essentially shows some of the calibration threshold for calibration parameters that we use. We use individuals, for instance, in any calibration exercise that we do for this region models we kind of look at that green portion, which is our calibration period. We look at that our bias number, essentially the difference, the average difference between the observed and historical data, if not more than half a foot. Likewise, we look that to that ultimacy coefficient that is also shall not be on half a foot. The closer that we have that determination coefficient to one, it means that the model replicates pretty well, the historical data, as well as the efficiency. Those are our calibration parameters that we're kind of looking at. You see here that from the 1991 through 200. We do a pretty good job of simulating and capturing the dynamic at all those stations from all the way from conservation area one all the way to Everglades national park, both not only in the calibration, but also the 1984 to 90 verification period, 2006 through 2010 verification period. Next slide please.

Here is the part of what we look when we had that previous version of the model 6.8.3 with the all calibration and to the right, you see how the system looks when we have that updated calibration parameters for the period of 1965 to the side. In general, the slope looks similar, but you'll see some of the stages in the EAA that are different, some stages around water conservation area two are slightly different, but in general, we're keeping some of the patterns when

you look at the comparison between what we used to have before in version 6.8.3 of the tool versus the new updated category. Next slide, please.

Here is some extra map of how essentially showing the general flow patterns of the regional system, particularly the Everglades analysis you'll see, for instance, in the natural system that we have slight increases in flows coming to the gap in the version seven to regarding conservation 3A relative to what we used to have in 6.8.3. Likewise, we have some slight increases in flows going to the Western side of Florida Bay. You'll see like a little bit more blue maybe blue arrows coming to that area relative to what we used to see in version 6.8.3 of the model. I think that's probably my last slide- with that I'll turn it over back to Walter.

Walter: Okay speaking, go to the next slide. Thanks Jamie for going through that. I guess there's, we wanted to kind of emphasize a little bit that there has been a lot of work and a lot of diligence put into updating these new modeling tools as part of the IMC effort. The rest of the presentation, will kind of be focusing on ramifications and trying to bring home, what some of these changes might mean as we approach the development of a new Lake schedule. If you can go to the next slide there are some models that Jaime kind of started his part of the presentation would be RSM, VN, and the RSM GL, they really leverage the information that Jaime, just went through on many of the other tools.

For example, in the RSMVN model it's the calibration for low sum [LOSOM] which has been updated to the most recent 2007 to 2016 historical record. That's kind of driving our representation of agricultural demands, and the list of nations. Similarly, the work that was done in the two by two in EA and the South Florida water management model, and the EAA that worked is captured in the RSM basements model as representing the demands for that part of the system. There are definitely changes that have occurred in those calibrations, Jamie touched on a couple of them and in order to kind of help illustrate what those changes mean in terms of how we apply these models, what we wanted to do was we wanted to run kind of a preliminary version of what's now a 52 year simulation period.

We are running the, as I mentioned, the climate record from 1965 through 2016 through what we're calling it a preliminary 2019 2020 existing petition. If you've been involved in low sum [LOSOM] conversations or the low sum [LOSOM] sub teams you know that the low sum [LOSOM] team is defining a set of modeling assumptions for their planning conditions and their baselines. Just to be clear, these results don't fully represent those tables yet that's work that will be done as part of the low sum [LOSOM] effort. This is really just looking at kind of a first starting point snapshot of an existing condition to kind of get a feel for what types of changes have happened as a result of the new period of simulation and what types of changes may have happened as a result of the model updates.

Like I mentioned, we made a preliminary run for the 52-year implementation of the RSMVM and the RSMGL models. What I'm going to show you in the rest of

the presentation is a set of comparisons that kind of first summarize a apples to apples comparison using the old simulation periods. 1965 through 2005, and I'm going to compare what I'm calling the legacy or it may be annotated. In the slides is LAG compare basically what we've used in previous planning and kind of, if you've worked in any of these planning studies, whether it's the EAA reservoir or central Everglades, or even you could look at the performance of that legacy. Where it's kind of indicative of what are we doing pass. Then we have a summary of this 52 year-round, but only over the 41-year period of record.

We'll be comparing those two runs to, again, kind of from an apples to apples comparison. Tell us how the model data set updates and how the model recalibration efforts have changed our view of how the hydrology and how the world is simulated. Then we'll add in the additional period of simulation and kind of show you the results from the 52-year period of record to illustrate how adding in those additional 11 years of simulation has the potential to affect them. If you go to the next slide so first kind of taking that approach, which you can see here is this is a stage duration curve for like the chubby. What that means is we take the, the daily stimulation of what the Toby stages that occur over the entire 1965 through 2016 period. In this case, we're looking at 1965 through 2005, and we sort the data.

Generally, the weather times show up on the left side, of the graph and the signs show up on the right side of the graph. Looking at these duration curves just tend to give a quick indication of the general changes in water levels that can be observed moving from one scenario or run to another. What you can see is that the red dash line, which is the legacy simulation compared to the purple dashed line, which is the period of record summarized for the 41 year run, you can see that as a result of those data and model updates, we are experiencing now generally higher, like throughout these stages the purple line is a little bit higher than the red line, really throughout the entire simulation period from a sort of a data perspective.

That gives you an indication that something's going on to result in kind of more water being in Lake Okeechobee. If you go to the next slide if we then go and look at the period of record over the 52 years. If we add in the additional 11 years it's kind of hard to see on this graph. If you were to flip back and forth a couple of times in the presentation that was sent out by Tim you'll see that the purple line here, which is now simulating or now summarize it in the 1965 to 2016 period. If we compare that to the last graphic, they're actually very similar. What that tells us is that the extended period of record, it adds additional years of interest and it gives us some additional information.

Those additional 11 years do not result in a significant stage regime change for Lake Okeechobee compared to what we would have experienced with the earlier 41 record. Even though we've had wet years, and even though we've had dry years, the variation within those 11 years is still kind of similar to what we would have experienced with the earlier droughts with 2001, or would the

earlier wet period is like the late nineties, the general state regime is still very similar compared to what we've used in the past. The only difference that kind of popped out to me and tried to prepare this presentation was that some of the low stages are a little bit lower, and that reflects that some of the more recent perhaps, and in particular, 2007 were very severe.

If you can move on to the next slide. I think it becomes a little clearer if you start looking at the daily time series of data. I know this is a lot of information, but just an attempt to summarize and kind of show a different way of looking at the same information. The, red trace again, is kind of the legacy before we did any of the model updates for extended, the period of record. The purple trace is the first 41 years of that new simulation that includes all the model updates and data set up dates. What you can see is the red and the purple are pretty much on top of each other for almost all of the simulation period. With the exception of where the blue circle is shown, which is kind of the late eighties.

What you can see is that during that period, the new model runs are higher in terms of late stages than the previous version of the model. The green trace that's on, is actually the observed historical stage over that record. Again, when we do these simulation models, we're not filling really trying to match history when we're, stimulating at 2019 or 2020 condition, because the system has changed. When Jaime was talking about recalibration efforts, what we try to do is we try to make sure that the physical eaters in the model are representing historical observation. Then we run through the current infrastructure and through the current operations, that historical climate record. We see what kind of what happens and what you're seeing here is that in that late eighties period, there is a time where two models, simulations, diverged, and there's a little bit wetter conditions observed in that part of the simulation and essentially looking at it a little bit more.

What we see is that in that period, the, the changes in the Kissimmee basin Jaime mentioned the updates to the Kissimmee model have a big effect in that late part of the simulation period. Essentially in the red trace what was being represented was kind of a historic operation and a historic inflow to the Kissimmee basin and in the purple we've have now an updated representation flow that would occur with the current system with the current restored reaches of the Kissimmee river would be current land use in the upper chain. What it's telling us is that we have essentially a higher inflow expectation from Kissimmee during that time period. That is coupled with changes in low sum [LOSOM] and it results in higher stages during that time. One of the reasons why I'm focusing on that so much is because the 89 90 drought was one of the key droughts in the historical period of record.

What you can see is that as you kind of moved from the wetter periods in 85 and 86 and 87 into the 89 90 drought you can see that the starting point of the water levels in Lake Okeechobee has a big influence on how you're able to move through those drought conditions. If the Lake starts out in a low condition and you experienced a drought where you don't experience what seasonal rainfall,

like what we've seen this year, the chance of the Lake going very low is exacerbated. If you start off with a little bit higher Lake stage in those conditions, you can set the 59 90 route does not go as low. That really is an effect of the changes in the Kissimmee inflow in this case affecting the performance. It can go a couple of different ways, there's other periods in the record where if you start on fire and you get a big inflow event, you simply prior just wanted to kind of illustrate what's happening with the model update changes there.

If you move on to the next slide, just to show the 52 year here again, let's kind of evident here is that if you look at the bottom right portion of this graphic, you can see that now the model simulation is going through 2016 and what's kind of evident is the 2007 and 2008 dry conditions show up as another one of those very low like stage conditions similarly in 2011. Then you can also see that the 2013, 2000 end events where there were much wetter conditions, you can see that the late stages go very high during those conditions. As a result of those highlight stages, there are increases in inflows to the Northern estuary as well. We are gaining additional information by having these additional years in the presentation. We can move on to the next slide.

To kind of summarize the change in the model data sets this is the Lake Okeechobee service area. Jaime mentioned that there was recalibration effort done for, which is kind of the Caloosahatchee and St. Lucie basins in this diagram, as well as in the South Florida water management model, which is the EPA in this diagram. As we kind of get ready to support low sum [LOSOM] it's important to note that with calibrating to the more recent period of record, essentially most of these models previously were calibrated to conditions that were observed in the eighties and nineties and the newer calibration focuses on the more recent period of record from, kind of the nineties through the more recent period, including 2016. What you can see is that when we matched the data in these models to the more recent observations the magnitude of the supplemental demands goes down and really the entire lake for the service area.

There is a decrease in agricultural water supply associated with the model tool updates. If you recall earlier in the presentation I showed you that the land use under the permitted conditions for the ledger really hasn't changed, but this is an example where by updating our tools and calibrating to a more recent historical record despite the fact that we're kind of telling the model that the land use is very similar, the end result is that that land use requires less delivery because that's what we've seen in the real world in recent records. It may be due to things like improved efficiencies in agricultural practice. Maybe back in the eighties, there was a less efficient use of water to try to meet the crop needs. Now there's more efficient irrigation systems and more efficient recycling within the basin due to the implementation of best management practices and other factors.

Again, this is, you know, one of the changes that's kind of noticeable in the model of simulation record. If you move on to the next slide part of the effect of that is that because there's more water coming in from like the semi in certain years, and because there's generally less demand on Lake Okeechobee as represented by the Lake Okeechobee service area, but the effect is that there's more water in Lake Okeechobee because less of the water is going to meet more supply needs and there's more water coming in from the watershed. As you might expect, if there's more water in Lake Okeechobee we've already seen one effect, which is the Lake Okeechobee stages get a little higher. The second effect is that, with that additional water in Lake Okeechobee there's the potential for higher estuary discharges to the St. Lucie and Caloosahatchee.

In this graph, what we're looking at is a count of the number of months that discharges are to the St Lucie and the Caloosahatchee. This is using the older recovery performance measure. We haven't yet coded and updated the new performance measure that Phyllis Klarman described earlier in today's call. This is kind of still looking at it with the with the older performance measure. What you can see is that the yellow and the white bars and the top part of the graphic show you the number of high discharge events. If you compare the legacy, which is in the middle to the POR 41, which is summarized, with the same 1965 through 2005 period you can see that there's a large increase in high discharge, 14-day events from the local basins.

What that's telling us is that as a result of the changes in hydrology and the changes in Lake Okeechobee, water number one Lake Okeechobee is a little bit higher. There's less chance for backflow from the St. Lucie into the Lake. The way the accounting works, a lot of the changes are being attributed to based upon, off but essentially there's more events in total in the updated hydrology compared to the lake work that's been done. Then if you extend the period of record from a 41 year to a 52-year paper record, you can see that there's increases in both the yellow and the white bar. I apologize for the, kind of the scale on these graphics. These are manually edited to try to show the same scale, but essentially it shows that there's a potential for even more increases due to, the added years in the 52-year period of record.

We see higher counts of Lake discharges as well as higher counts of basin distracters. If you go onto the next slide it's a similar story for the Caloosahatchee. In this case, the yellow bar is the high discharge conditions for the for the Caloosahatchee estuary. The green is the low flow conditions below 450. You can see that with the kind of moving from, I apologize, the label's not updated on here, but moving from the middle graph, which is the legacy to the period of record 41 you can see that there's an increase in both high and low discharge events resulting from the changes in hydrology associated with these tool and data set updates. When we go to the 52-year period of record, you can see that the high discharge events, for example, increased from 113 up to 136.

There's also an increase in the low discharge events. There's definitely more water represented in the newer model runs that affect that are both due to tool

updates and due to the extension of the period of record. It just kind of sets the bar even higher for trying to achieve success in a low sum [LOSOM] process. There's a, a lot of events that need to be improved in the baseline. You move on to the next slide. I'm going to go kind of quickly through the remaining slides and just kind of, tell you the take home. Once we moved from the Northern part of the system, I think you saw, there are a number of significant changes in the Northern part of the system whether we're talking about the Kissimmee or the Lake Okeechobee service area, or Lake Okeechobee with the Northern Estuaries.

Once you move kind of South of that red line interface and into the Southern domain model the changes are much less noticeable and that's largely because the EA runoff is, very similar to the legacy application. There is also constraints on how much Lake water can go South as part of the planning exercise. The effects in terms of changes in the If we start by looking at pawning depths in the Everglade system on the left is the legacy model run. On the right is the new 52-year period record, including the data through 2016. You can just kind of visually see that from a kind of a big picture perspective, the spatial patterns and the magnitudes of the water depths are all relatively similar when you compare, the left graph to the right graph.

If you go to the next slide, it's similar for hydro period. This is the essentially the amount of time that these cells spend with water above ground. The Everglades, the Everglades system is a wetland system desirable for there to be relatively long extended Hydro periods in these graphs as indicated by the blue or shades of color, as opposed to the greener or the yellow, or the orange shades. Again, there's not much of a change if you look at the left, which is the legacy performance compared to the, which is the new baseline with the 52-year period of simulation. Much fewer changes in the Everglades. Although as Jaime pointed out, there are some small changes, for example, in conservation area too, move to the next slide. If we looked at the stages and a little more detail, and you can see that it's kind of a similar story.

If we compare this was for one of the gauges in 3A again assorted duration plot, just kind of give you an indication of the overall performance. Generally, the stages are right on top of one another very similar as opposed to what we saw in Lake Okeechobee where there was a clear offset. If you go to the next slide, when we look at the extended period of record again, just to kind of show you the variability we definitely get more information by adding on the 2006 to 2016 period. I want to kind of use this graph to highlight, maybe some of the differences between model land and historical observation. We all remember the 2015, 2016 high water event and conservation area three, where there was a lot of rainfall that they kind of came on as quickly in the February timeframe.

There wasn't a whole lot of good options for us to, to try to reduce water levels and conservation area three. What you can see here is in the far bottom, right of this graph, you can see that indeed the model is simulating that, that rainfall event and that there are increases in stages in response to those climate

conditions. The magnitude of the stages is actually lower than you might expect if you were to go back and compare to historical data or observation. The reason for that is that the existing condition 2019 2020 condition there's been changes since 2015, 2016 in the way that we operate the system and indicate ability of the system. There has been additional bridging at the trail. There's been increases in allowable water levels in the L 29 canal.

Essentially, there's more ability to convey water out of concentration, today than there was back in 2015 and 2016. As a result of that, when we do the model simulation, reflecting today's conditions, even though we get a lot of rainfall and it pushes water levels up the observed stages in the simulation are not as high as what we experienced in the real world, because the model sees that additional conveyance capacity and is able to kind of keep the stages a little bit lower and thinking kind of from a predictive perspective, what that means is in future conditions, because we've made these improvements in the system, we would expect that we would be better equipped and better able to handle a rainfall event like the 2015, 2016 rainfall events to improve the way in which the system is managed and avoid some of those by water stages and convey more water into Everglades, national park and towards the Southern estuaries.

Again I do want to kind of highlight if you go to the circle, the blue area on the left side and the bottom of this graph despite the fact that I just showed you an example of where the additional convenience helped us to manage an event like 2016 there are events in the period of record that are even more severe than that event. If you look at 1995 and 1998 there were some very wet events and transpiration rate of three 95 being a super nino that was you know, kind of beyond the scale of much of the rest of that rainfall record. It's still very possible for the system to, to get kind of backed up and to experience these very high-water levels. That emphasizes the need for additional Everglades restoration activities like central Everglades.

Thought this was a good example to kind of illustrate how we use models versus the actual observation in the real world and where some of the changes might occur as we try to look for this data. If you move on to the next slide yeah, I'm not going to focus on this, but from a flow perspective, things look very similar generally from the legacy to the updated period of record Everglades system. The next slide shows that from kind of a transect flow perspective. This is one of the ways we typically look at flow moving through the system. Just to show you too, that the transects in Everglades national park in Northeast Everglades, Northeast again, moving from the legacy to the period of record extension, we really don't see significant changes in flow volumes resulting from the data and modeling tool updates.

If you move onto the next slide. This is really just to kind of emphasize those points and show that from the Everglades perspective, if you start looking at the individual structures and the Everglades, for example, S323 about halfway down, you can see the flow volumes are very similar, despite some of the data set and multiple updates. There are local effects and I kind of circled in the

bottom, the floods to Biscayne Bay. I mentioned that there was an update in land use and an update and information in the coast, that didn't you know, kind of as a result of the rules that are in place to didn't have a significant effect on the greater Everglades, but it did have some local effects. You can see that in Biscayne Bay for example there were some decreases in flow in the Northern part of the system, but actually some increases in flow in the Southern part of the system as a result of those tool updates.

There are local changes and as the documentation comes out and as these results are, released free to dive in and ask us any questions. If you see anything that isn't clear in the documentation. If you go to the next slide and just to kind of show you the effect of some of those land use changes from another perspective. If we look at the lowest cost service areas kind of, it's a different story than the Lake Okeechobee service area. Lake Okeechobee service area I showed you that the demands were generally kind of across the board lower than previous modeling exercises in the coast, they're kind of across the board higher as a result of the changes in the land use that have been put into the models.

You can see that there's increases in both utility pumping and agricultural in really the entire service area, which is somewhat offset by some of the changes in industrial and local residential use which has actually gone down as a result of the data updates. There is generally more pumping in the lower East coast. It's just that the, that pump has been kind of constrained so that it doesn't have a significant effect on the greater Everglades system. It has more of an effect locally within these counties and service areas and affect and force the time. If you move on the last slide, just as a quick wrap up I know that was really quick and a lot of information just wanted to kind of highlight some of the key factors.

I know that it probably wasn't fully satisfying to those of you who want to get into the technical details. It was maybe too much for some of you who don't care, but just wanted to kind of give you a feel for the types of changes that have happened with all of the work that's been done by the IMC. We're close to completing the data extension efforts. These tools are the tools that will be the basis for low sum [LOSOM] planning, formulation, evaluation. So, it's important for us to kind of familiarize ourselves with them as we begin the, testing of new regulation schedules to see how we can best improve the performance of the system moving forward. As I mentioned, the largest changes tend to be in the Northern part of the system really and the Kissimmee as the drivers of those change basically matching the more recent historical data as opposed to using older data sets has resulted in some changes in those two areas.

Those changes as a result of updated hydrology tend to affect Lake Okeechobee in the Northern estuaries. There are much smaller changes in the Everglades in the LEC. Like I said, we're working hard on the documentation and also independent review of this work, and we'll be distributing further information to recover with the goal of completing all that documentation by the end of September this year. That's all we wanted to share. Thanks. I hope that was

helpful to the Low sum [LOSOM] team and we're here to answer any questions or fill in any details you might want.

Tim: All right. Thank you Walter and Jaime for that, and really good information for everybody I'm sure that kind of late last night, there probably aren't a lot of questions up front, but like to go ahead and open up the discussion to the PDT. If you have any questions for Walter, I may on the material that you just heard about

Operator: Just a reminder pressing pound two on your phone to enter the queue. This portion is for PDT members. Hi, may I ask your name?

Watford: Scowling Watford mayor of city Okeechobee.

Operator: Please go ahead.

Watford: Walter did I understand your assumption correctly that recalls agricultural demands are, quite a bit less that made the discharges to the estuaries greater. Did I understand that assumption correctly?

Walter: Yes. That's our observation from the from the tool updates. That's correct.

Watford: Thank you.

Operator: Hi your line is open may I ask your name?

Susan: Hi this is Susan Grey can you hear me?

Operator: Yes, we can thank you.

Susan: A similar session to what was just asked is the change in agricultural demand, Walter do you believe that is the largest driver in changes to releases, or are there others that you would.

Walter: Yes, Susan, this is Walter. I'm not sure I heard that fully clearly, but I think the question, the primary driver or are there others. I'll answer that question. I think it's a mix. I think that the list of demands is one of the drivers, but changes in like Lake Okeechobee watershed in flow in particular from the Kissimmee is also a major driver. As we update the low sum [LOSOM] basins, we don't just supplement update the demand side of the equation. We also update the runoff side of the equation. In the EAA there was a relatively small change in some of the local less basins there may be more differences that are affecting discharges to the Northern estuaries in particular. We can look into that in a little more detail, but there are changes in both demands and runoff from the watersheds that are affecting these performances.

Susan: Thank you Walter.

Operator: At this time. No one else raise their hand.

Tim: I think you guys blew everyone's mind. As Walter said in that last slide, there will be an ongoing review profit under the umbrella that recover under SERP. If you do have additional question or comment or want to get into more data during the review, there will be a parallel practice that will be ongoing. That's not part of low

Male Speaker: I just want to emphasize from the IMC perspective. I think we are very interested and open to feedback on these results. You know, I think hopefully as you've seen, we try to put in a fair amount of diligence and effort to ensure that the tools available to projects like low sum [LOSOM] are well formulated and ready in time to support the needs of the water resource planning in South Florida. I think it's very important for people to understand kind of what's in those tools and kind of give us their feedback on where they think that they're doing a good job and where there's room for improvement. I just want to thank everyone or the time today and, open the door. If you're interested in any more detail or have a feedback, please reach out to myself or find me. We're more than willing to listen

Tim: Again, as you're looking through the, the presentation material, if you do have questions or comments, feel free to reach out as Walter said directly to him or Jaime, if you do feel like sending comments to us, we'll be happy to pass them along to the IMC as well. Are there any other PDT questions or comments at this time? If not, we can open up for public comment. Give the PDT another few seconds to get in the queue. Alright if there are no PDT talent, go ahead and open up the forum for public comment. Any members of the public would like to make a comment please do so now.

Cook: Thank you. This has **[02:58:02 inaudible]** Cook great presentations and incredible amounts of technical information. It kind of reminds me that back on the old Lake Okeechobee rack when lowers 2008 was the topic of the day. Of course, the driver was Katrina and the need to take a foot off the top of the Lake for the safety of the dike. It was quite a private experience going through that for a couple of years. Now we've started another one with a lot more experience than I must have had as a lot more technical information and 60 some odd years of model this where we were back in those days, working with 20 some odd, first of all the mover back in those days, as I said, was Katrina the mover today.

If you come up with low sum [LOSOM] is a mix and include several different things, including I look at water quality, which the Corps really doesn't normally deal with. They worried about the flooding, not the how muddy the water is. My only comment is this most important thing we could do with low sum [LOSOM] is to keep Lake Okeechobee healthy and to improve the health of Lake Okeechobee. That was what low sum [LOSOM] is all about. It's all about the Lake, and we must concentrate on the lake first. We need those 80,000 acres, vegetation and Lake Okeechobee, Irma, knock it down to 5,000. We were able

this year to let the Lake go down a bit for awhile, and some vegetation is coming back, but when you do low sum [LOSOM], my requests and a lot of people request is, think about the lake first. If you do that, then we will work out the rest of it, driving the Lake down to drought levels every year. In 0.5 feet as some people have suggested it would destroy the 80,000 acres of vegetation. Well, it would be vegetative, but it wouldn't be submerged, aquatic, vegetation. It would be willows useless. That's all I ask there's a lot of people who will be on that issue because the health of the lake is the most important thing about low sum [LOSOM] thank you.

Tim: Thank you are there any additional public comments?

Operator: Yes, there are several people on the line hi your line is open. Hi Mr. Martin, your line is open your phone might be muted. Yes, we can.

Tim: I appreciate those comments. I think there is maybe one more on the line.

Operator: There are several, actually, the next person in line. Your line is open go ahead.

Paul: Thank you. This is Paul Gray from Audubon. Thanks Walter presents a great presentation. I, hope everybody appreciates that. There's just about nowhere in the world that has as much quality data and modeling to help us make decisions. It's just really impressive. I think it's really important that you added these extra years because the Atlantic multidecadal oscillation, AMO we need the Atlantic Ocean gets periodically warmer or cooler. The weather pattern has changed a lot and from 65 to 95, we were in a relatively cool phase. Since 95 we've been in a warmer phase. That warmer phase, we just have Wilder weather and significantly more influence of Lake Okeechobee. I think that's part of why you're seeing the, lake being deeper now because we just added 11 years that are wetter than the period of record. I think this expanded period of record gives us a more robust modeling period to look at where we can see a larger range of things that the Lake may be doing and all the other effects. I just want to thank you guys for that. And then I'm really looking forward to seeing how the modeling goes. That's all I have. Thank you.

Operator: Hi, your line is open, please go ahead.

Jackie: Hi, this is Jackie Thurlow Litmos council's point, and I do sit on the governing board for the South Florida water management district. Very educational to listen to today thank you. I wanted to ask specifically, I believe Mr. Wilcox, at some point made a comment that the modeling doesn't allow for water to go South basically, or for more water to go South. I just wanted to note that I would like some clarification on that and I'm sure it's very simple, but I think sending water South should be our main goal. A comment like that just kind of threw me, but I'm sure that's a structural part of on the modeling. Thank you.

Walter: This is Walter- Tim I think we can answer clarifying questions. Is that correct? As part of the discussion.

Tim: Yes.

Walter: I don't want to violate that code, but I'd like to respond to my board member. The, models don't have a limitation on sending flow South structurally what I was referring to and probably should have added context is that as part of that late schedule, there was an assumption about how much water could be moved South. The previous schedule, the schedule that we're moving, that we're operating under currently as part of low sum [LOSOM], we are opening up that assumption and we're looking for opportunities to potentially convey more water South. That's definitely part of the work that will be happening in low sum [LOSOM]. What I was referring to is in this first pass at looking at the current condition, which is still subject towards the **[03:06:33 inaudible]** we maintain the same constraint that was put into its planning study. The limitation comes from the assumptions that are used in planning associated with the existing motor delayed schedule. Certainly, as we move forward, we'll be looking at that in detail and exploring opportunities to try to convey more water South.

Operator: Hi, Nyla Pipes. Your line is open.

Nyla: Hi, this is Nyla Pipes, One Florida Foundation excellent presentation. I think it's really important that we have expanded the period of record because there's been not only, a difference in the climate since the last time this was all done, but also major land use differences. I think that you captured quite a bit of that. I just wanted to emphasize that we have so much growth happening at the very headwaters region. Osceola County is one of the fastest growing counties currently in the nation. I think that we have to be absolutely certain that we capture all of that when we start talking about the difference in the way the water is flowing into Lake O because I think that storm water runoff probably has more to do with it than we probably even really realize on first brush. I just wanted to make sure to put out there, Hey, great work. Let's keep digging into the weeds on this. I see the important that we have looked at the more recent history, because it really has changed quite a bit since the last time we went through this process. Thank you.

Operator: Hi your line is open.

Mark: Yes. this is Mark Harry Florida **[03:08:25 inaudible]**, Walter. I've known Walter a long time and I appreciate the presentations of course. I agree with expanding a period of record for comments that Paul Gray made the Atlantic multidecadal oscillation, which is definitely now encompassed in the new period records. That would be better to represent that typical averages and so forth. On the number of times of salinity envelope criteria are not met, but say for the St Lucie estuary. I've seen the graphic before. I know that Walter was using the, basically the 2007 recover metrics for salinity envelope being the 350 to 200 cubic feet per second, for that recover metric that was used back then for the things with

the estuary. It still is alarming that in an expanded period of record, of course, we're going to get even more frequently estuary discharge events and more discharge events that are due to the extended period of record.

At the same time, I understand that we going back and I'm sorry, I didn't come out earlier, but on the performance metrics using those the new recover for the Northern estuaries performance measures for salinity envelope that will come out sometimes the energy in here, or that have been under review for right now, even looking at those optimum stress and damaging numbers instead of the old 2007 350 to 2000 which was totally inadequate for this estuary, but even looking at, we have to understand that this is from all sources. There are five other basins within the, the watershed of the St. Lucie estuary, and then you add on Lake Okeechobee. When we look at the estuary meeting, those kind of demands are meeting those salinity envelope areas we really need to take into account, and it should take into account. I think it was mentioned earlier by Brett Stewart and all was to say, all of those sources entering into this estuary have to be accounted for in this calculations CFS for meeting that sliding envelope criteria. I just want to make sure we get that into account. I do agree with expanding the period of record it more represents, conditions that we all look at in modeling these situations rather than the previous period record. Thanks for the opportunity to comment.

Operator: Michael Connor your line is open.

Mike: Yes. Hi, thank you very much. Mike Connor, executive director, Indian River keeper. I'll go back to the first comment by Newton Cook and agree with Newton that our first concern here is the health of Lake as well, being downstream estuary. We are looking at a situation now this year where our estuary has been inundated by a lot of runoff local from the rainfall unprecedented rainfall. We had probably more than the last 20 years in a week's time. Our Estuary is pretty much fresh right now. We still are dealing with local runoff, also went off from well, inland from canal set to C 2324. One thing estuary can't stand right now is the possibility of Lake O discharge. I know Colonel Kelly did go public with a comment that possibly at 13 five with rainy season so young.

There may be a need for Lake O discharges. I just feel that's, that's a horrible situation for us given our estuary results are just recovering now from the local base and runoff. I'm hoping, especially with the shape of the Lake right now, with the cyanobacteria bloom at its present state, which is really early this year we have really hot weather and we have a lot of rain, a lot of water going Okeechobee this community can't take another discharge that is basically latent with cyanobacteria and toxic water. Especially in this COVID era I'm sorry, when people are already having health problems, and there's a thought of the problem microsystem in our river in Lour lake microsystem. It's just a disaster scenario. I'm hoping that there's a way that the district corp can send water anywhere else, but into the residential areas. The treasure coast at this time, I

do appreciate the presentation, very educational, and I think, thank you for my chance to comment.

Operator: Hi please go ahead your line is open.

Male Speaker: Can you hear me?

Operator: Yes, we can.

Male Speaker: Thank you okay **[03:13:40 inaudible]** two comments. One following through with what Jackie said regarding the water flowing South. If I understood the excellent talk by Mr. Wilcox, Kissimmee river has been increasing in terms of volume flow, the agricultural use overall has decreased. Therefore, the Lake tends to be higher and in, so doing therefore it puts more pressure on low sum [LOSOM] to stop or to reduce discharges when they're unhealthy. However, we're also increasing 8 million, or there are 8 million people who need portable water that if I understood correctly comes from a water catchment area three. Now, is it possible in further modeling to look at increase water flow into, into WCA three, to provide more of the portable water that the growing population needs so that it would tend to balance the inputs versus the outflows.

The second comment is this the major inability of Lake Okeechobee to cleanse itself is predicated upon the fact that the water is so turbot most of the year photosynthetic light can only penetrate maximum about 3.8 feet from studies that have been done. That means that the submergent aquatic vegetation, which is a major need to clean up the Lake is not met, in my previous work I have done a lot of planting of the taker and a spouse, an area, which is the one that's growing in the Lake naturally. I've been able to get my total phosphorus down to around 75 parts per billion. I've been able to get the SAV to grow down to 10 to 15 feet, if that could ever be accomplished in Lake Okeechobee, the water quality issue in the Lake would be, handled. Number one, and number two, that any discharges that come out of that would certainly be enhanced because you would not have to have the HAB outflow and you wouldn't have the turbidity that smothers the grasses on both the Caloosahatchee and the St. Lucie river.

Operator: We have one additional person on the line, hi please go ahead your line is open.

Male Speaker: I'm **[03:16:39 inaudible]** from Everglades foundation. The presentation by Walter and Jamie is very informative. I would like to say, thank you for updating both South Florida management models and regional simulation models for a longer simulation period. It definitely increases the reliability of the model. The model is no more applicable even for wider range of climatic conditions, but make sure that you compare, this is really a good work thank.

Operator: Someone else did raise their hand Stephanie Lewis your line is open.

Stephanie: Hi this is Stephanie Lewis again with the nature Conservancy, just to echo other comments, thank you so much for putting together the incredible amount of information that you presented us today on the extensive work that the IMC has done to improve our modeling and improve the period of record. I just wanted to comment on the fact that the transparency that you have shown by giving us the example, modeling to really help us understand how the period of record will change outcomes. I think that's going to be incredibly beneficial as we move through this process. As we look to low sum [LOSOM] will affect all parts of the SalesForce ecosystem. Thank you.

Operator: At this time, there are no further public comments.

Tim: All right, well, thank you, everyone really appreciate your time and all of the feedback that you're giving to us, it's imperative throughout this process that we do have feedback from our stakeholders and from our PDT. Thank you very much for your participation. Before I let everybody get, I did want to go over the schedule where we are, and I'm generally kind of a little more detail on the, how we'll work through contextual plan evaluation phase and into iteration one, two, and three, to get us to buy selected plan. We can go to therapy again. This is our overall schedule. You can see we're right at the end of formulation, right on the precipice of getting to alternative evaluation phase a lot of work still to do, to get us there. Part of which is the review of the performance measure documentation.

I want to remind everybody that there's no expectation to have a lot of feedback on that today, but we just wanted to give you an overview of what's in the package. Some key points to look at as you're reviewing and provide feedback on, as Lisa mentioned, that feedback we're looking for by the 17th, but I also do want to remind everybody that we will have sub team meetings between now and then, and feel free to please engage in those sub team meetings and ask questions, provide feedback during the sub team meetings on the performance measures. If you do have questions, that's a great place to engage. Before we get to another PDT meeting.

Ongoing work, or the next 90 days, I said, there is a lot going into the conceptual plan modeling that coming up, finalizing the performance measures is a big part of that. So, we'll know what we're using for evaluation is to get conceptual plan, model results and can work on the parado evaluation portion with those results. We do want to try to get that algorithm bloom risk metric finalized and into the review process is that one is a real important one since it is new we want to get that ready. So, we have it available to use for parado.

The, modeling, as we mentioned, should be beginning in July and start getting results from our different plan modeling in August. We'll be working on that parado evaluation and share those results with the PDT. As we start to get those, I do want to remind everybody just on the larger scale that what we're working for is to have a selected plan by July end of July of next year. We have a lot of work to get through all of our alternative evaluation between now and

then, and then we'll talk a little bit more detail on that in the next slide. That is kind of our longer-term goal is to get through our selected plan by next July, that'll allow us to have a draft report out for a public agency review by January of 2022. With an eye on our record of decision and being able to implement the new low sum [LOSOM] schedule by the end of October of 2022.

If you go to the next slide, I did want to provide a little bit more detail about the upcoming modeling phases that we'll be going through. This is very familiar, the client formulation process that Lisa covered earlier, but I did add some dates in here for each of the phases that we'll be all participating in and how that gets us to our recommended Lake schedule. As you can see from a box to the conceptual plan evaluation should be getting going by the end of July. We want to have that evaluation complete and result of that by the end of September, which will allow us to move into iteration one, which is the initial array of alternatives by the beginning of October. That phase lasted approximately February the 5th, that’s not only be final tweaking and initial array and scheduled, but the modeling and evaluation using all of our performance measures that will get us to results. Then moving into our sentence balance iteration to by that second week of February, that phase schedule the last important, the end of May, at which point we would have dependably selected Lake schedule.

I know a couple months, of the intended evaluation process be that iteration review at that recommended schedule and do our forward and backward compatibility as well as future condition within place that is about a two-month process. That will be a little faster as we're down to just one schedule, but that kind of gives you a little bit more of a flavor for the timeframe that we'll be working in for each of those iterations. Anybody who has worked on a large planning study before can take a look at that and realize it's not a lot of time we can.