

Indian River Lagoon Basin Management Action Plans

Meeting Summary

Tuesday, April 21, 2015

9:30 AM – 12:00 PM

City of Palm Bay City Council Chambers

120 Malabar Rd., Palm Bay FL 32907

Attendees

Beth Alvi, FDEP Carolina Alvarez, Brevard County Virginia Barker, Brevard County Ann Benedetti, SJRWMD Jason Bessey, St Lucie County Tiffany Busby, Wildwood Consulting Erik Charest, Indian River County Emily Dark, FDEP-Aquatic Preserves Dennis Davis, Jones Edmunds Roger Dykes, Cocoa Holly Edmond, FDACS Rebecca Elliott, FDACS Yesenia Escribano, FDEP John Fergus, City of Satellite Beach Amelia Fontaine, Collective Water Resources Lisa Frazier, Engineering Consultant Xueqing Gao, FDEP Ashley Gardner, FDEP Patricia Gertenbach, E-Sciences, Inc. Clyde Giesenschlag, Citizen Peggy Giesenschlag, Citizen Lorraine Guise, Brevard County David Gunter, Indian River Farms WCD Erlyn Hupfer, ISC Environmental Assurance Lydia Jackson, Brevard County Kerry Kates, Florida Fruit and Vegetable Assn. Claudia Listopad, Applied Ecology	John Matthews, Kennedy Space Center Tammy Mayfield, City of Melbourne Bach McClure, Brevard County Keith McCully, Indian River County Peter Merritt, Treasure Coast Regional PC Kyle Mertens, Dredging Marine Consultants Bill Messersmith, City of Vero Beach Matthew Mitts, City of Vero Beach Richard Morrissey, ECT Steve Peene, ATM Ken Poole, City of Rockledge Robert Potts, E-Sciences Jeff Ratliff, City of Cape Canaveral Sandra Reller, City of Titusville HM Ridgely, Evans Properties Todd Scaldo, Indian Harbour Beach Katherine Schmidt, NSLRWCD FPFWCD George Simons, Carter Associates, Inc. David Sinton, Melbourne Village Dani Straub, Melbourne Michelle Stromberg, City of Sebastian Bob Ulevich, Polymath Consulting Services Frank Watanabe, City of Sebastian Kaylene Wheeler, City of Palm Bay Curt Williams, Florida Farm Bureau Kelly Young, Volusia County
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Welcome and Opening Remarks

Tiffany Busby welcomed everyone to the Indian River Lagoon (IRL) Basin Management Action Plans (BMAPs) meeting, and noted that the meeting covered all three BMAPs. The participants introduced themselves and the entity they represent.

Tiffany asked if anyone had comments on the meeting summary from December 5, 2014. There were no comments or corrections.

Update on Brevard County Spatial Watershed Iterative Loading (SWIL) Model Status

Xueqing Gao provided a PowerPoint presentation to accompany his remarks. Xueqing noted that meetings were held in December 2014 and January 2015 with Brevard County and the St. Johns River Water Management District (SJRWMD) to review the SWIL model and the results of the Florida

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Department of Environmental Protection's (Department's) review of the model. He stated that he wanted to refresh everyone's memory on what has occurred so far with the model review and what will happen next.

Xueqing reviewed the conceptual framework of the model that was revised to include interactions with internal loading, macrophytes and epiphytes that are important to the overall health of seagrass populations in the IRL. He commented that the total maximum daily loads (TMDLs) focus on nutrients but other factors such as floating macro algae can affect light attenuation which then affects seagrass beds. Nutrient sources in the IRL include watershed loads, atmospheric deposition, ground water seepage and internal loading. A major part of the model estimation is focused on watershed loading.

The model being used has been used by the U.S. Department of Agriculture (USDA); Harvey Harper has also used this tool in his work. Claudia Listopad took this modeling approach and put it into a continuous simulation and a geographic information system (GIS) tool.

Xueqing noted the components where the SWIL model improves the watershed loading simulation. First, the model used data from multiple sources to verify the land use data and their accuracy. The SWIL model uses more recent soil classification data and the soil type is important when estimating runoff. The SWIL model uses enhanced rainfall data and spatial heterogeneity to estimate the rainfall volume and timing. For each month, the model uses more than 20 stations to generate the rainfall in the model. The SWIL model takes into account the soil antecedent moisture condition when simulating the runoff generated by a rainfall event. Finally, the SWIL model simulates the surface runoff and the baseflow loads separately. This separation is helpful to examine the best treatment approaches for reducing nutrient loads to the lagoon.

Xueqing then noted the major comments that the Department provided to the modelling team for consideration. First, there were comments on the hydrology calibration. The model uses 16 years of monthly flow data. The latest version of the model uses different evapotranspiration data and ground water storage equations, so the predicted flows might be different now. Xueqing showed example flow calibration graphs from several areas including Crane Creek, Hickory Creek, North Prong, South Prong, and Fellsmere. The graphs showed some underestimation of flows during high flow periods. Xueqing stated that the underestimation could be caused by the runoff coefficients used in the model. The Department suggested that it might be beneficial to create a month-specific rainfall coefficient to improve the calibration.

Based on this suggestion, Harvey Harper created additional monthly rainfall coefficients, one set for each of the 192 months simulated in the model. The results were not consistent. In some months, the monthly values improved the calibration while in other months it did not. Overall, there was no net improvement in the calibration using month-specific rainfall coefficients. Dr. Harper also tested whether adding an exponential decay factor for baseflow increases after a rainfall would improve the calibration. The monthly flow simulation was improved a modest amount by this change.

In the end, the results indicated it was better to use the 12 long-term mean monthly simulations. The Department suggested caution, however, in using the monthly runoff volume for statistical analyses because of the errors associated with the flow simulation. The annual flow calibration appeared better than the monthly flow, which is favored for the seagrass-nutrient relationship analysis. Xueqing showed

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graphs of the annual total flow simulations in Crane Creek, Hickory Creek, South Prong, North Prong and Fellsmere, which look pretty good.

The second major comment made by the Department was that no water quality calibration was provided at the time the model was reviewed. After this comment was made, Harvey Harper located one station that could be used for water quality calibration based on the calibration requirement that a gauge and water quality station were co-located. The calibration site was on Crane Creek. Based on an analysis of the data from this site, the model-simulated total nitrogen (TN) and total phosphorus (TP) loads appear to match the measured data.

Another issue that was identified was the evapotranspiration (ET) data issues. Xueqing noted that ET is very important to the water balance in a model, particularly when 80 to 90 percent of rainfall can be lost to ET. The ET data applied to undeveloped areas within the SWIL model were generated by a group at the University of Montana. Since the SWIL model was first developed, the group replaced their ET data with a new dataset and declared they would no longer support the old data. Therefore, the most recent version of the SWIL model (delivered today to the Department) uses this new ET dataset that the Department has not yet reviewed along with its results.

Xueqing noted that the Department provided feedback that the final products from the SWIL model do not include a GIS shapefile that would allow for its application to a jurisdictional area for allocation purposes. The Department suggested that a GIS shapefile be generated that includes land use and nutrient unit loads that could be used for future BMAP purposes. Xueqing added that it is his understanding that Claudia Listopad will be contracted to set up this output for future BMAP-related uses.

Xueqing noted that now that the watershed loading has been modeled, there is another important factor that must be determined in order for the SWIL model to be used in a BMAP setting and that is that a target must be defined. There has not been an agreed upon target yet defined that the Department has agreed would support the TMDLs.

Xueqing also stated that the current model identifies where loading enters the lagoon but does not capture the transport or exchange of nutrients between segments after the load gets to the lagoon. Dr. Steve Peene has reviewed the information available and it is believed that the intersegment transport is a very large component of the segment loading. Xueqing commented that we don't yet know how to use this information to quantify loads in each segment and how to capture that nutrient transport in our approach.

Xueqing added that Dr. Tony Janicki did an analysis of seagrass depth-limit statistics. Initially, the depth limits change as seagrass acres expand but after some recovery, then the depth limits stays flat even though acreage continues to expand. We are discussing how we can better use the seagrass data as there are limits to using the depth-limit data as there is high variability in those data. Xueqing added that during the meetings with Brevard County and SJRWMD in December 2014 and January 2015, it was decided that seagrass coverage and depth limits would be included in the targets, but the details have not been determined.

There were no questions for Dr. Gao.

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Virginia Barker delivered a separate PowerPoint presentation for the group. Virginia reviewed the requests made by the Department on model improvements, some of which were already discussed by Xueqing. These included an analysis of the confining layer assumptions in the Northern IRL; a comparison of month-specific runoff coefficients (192 coefficients) versus 12 coefficients; minimizing the error between the model estimated and measured flows; and calibration of the model-simulated nutrient loads with the measured loads.

For the first item which was an analysis of the confining layer assumptions in the Northern IRL and whether the model adequately addressed recharge areas, the Harvey Harper team reviewed the available data. They concluded that recharge is equivalent to 0.3 inches of rainfall (or 0.6%) over the basin. Therefore, the effect of recharge is very small and not worth complicating the model over capturing those effects.

For the second item related to runoff coefficients, they ran the model using 192 coefficients versus 12 coefficients (also known as “C values”). They measured the Nash-Sutcliffe efficiency (NSE) which is a coefficient used to assess the predictive power of hydrological models. Using this coefficient, no error would result in an NSE of 1.0 and error causes the coefficient to be a decimal number less than 1.0; therefore, it is desirable for the NSE to be as close to 1.0 as possible. They found that the least error occurred then they used the 12 monthly C values instead of the 192 C values. Using the 12 monthly C values, the mean NSE was 0.78 while under the approach using 192 C values, the NSE was 0.70 or 0.75, depending on the specific approach modelled.

To address the third item—the comment related to the underestimation of peak flows and overestimated of small flows—the error was partly due to how ground water storage was handled in the model. Virginia showed a graphic that described how the storage volume was modified in the latest version of the model, SWIL 3.0. SWIL 2.0 used a linear approach or “a sponge factor” to capture the response to rainfall and ground water storage. They changed the approach to better simulate a water depth and head pressure that is created that pushes water through the soil matrix and out into the tributaries. This is captured with an exponential factor that provides less error related to ground water storage.

Another factor in the third item about simulating peak and small flows was the ET. Based on feedback from stakeholders, SJRWMD and the Department, they were correcting some watershed boundaries and needed ET data a little further west from the lagoon. Updating the ET data didn’t go as planned because when the team contacted the data source (the University of Montana) they found that there was a new ET dataset and the former dataset was not available. Virginia showed graphics that compared the original ET data that were used and the new dataset that provides much higher ET rates than previously estimated.

Virginia reported that when the new ET data were used in the model, in certain areas negative flow numbers occurred. While forested wetlands would be expected to have high ET levels, it was unclear why the negative flow values were being generated. After much review of the model code looking for potential errors and not finding any, a gage station was located in one of the high ET areas in the Volusia County section of the North IRL and that gage shows that at times the water reverses direction and flows into the segment from the lagoon and not out, similar to what the simulation was predicting.

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So they used this gage station to set up a different calibration for that area to reflect the correct flow directions. Tiffany Busby asked if the second area that had high ET values and negative flows was not calibrated separately because there was no gaged data available to establish a separate calibration. Virginia responded that is correct. Instead, the area was combined with an adjacent area and overall the calibration works okay when it is aggregated together. Overall, the gaged information supports the new ET dataset and that the new ET algorithm is correct. Virginia showed a table that showed the Turnbull Creek discharge at Oak Hill.

Virginia then showed the loading estimates from the most recent version of the SWIL model (version 3.0) to the pollutant load screening model (PLSM) for TN and TP. The annual TN loadings are slightly higher using the SWIL 3.0 model compared to the PLSM and similar between the two models for TP loads. The main difference between the two models is in the monthly values. The SWIL model provides a finer time step and demonstrates the low and high loading periods.

Virginia listed the next steps that are planned related to the SWIL model. Steve Peene and Tony Janicki now have the SWIL 3.0 version of the model. Steve will work on adding the SWIL loading estimates to the other loads. Tony is working on the load-response relationships and specifically the seagrass response that then could be used to establish targets. An important next step is to set the seagrass-water quality targets for the IRL that would be used in conjunction with the SWIL model. They need to find the maximum allowable loads that would be the TMDLs and determine the appropriate load reductions and the allocation of those load reductions.

Virginia showed the gage at the Haulover Canal along with the flow data. The seasonal direction changes show a large volume of water moving in and out through the Haulover Canal. Virginia reviewed a chart showing the draft load comparisons including the watershed loads based on SWIL 2.0 (the 3.0 version should capture the loads better), the atmospheric TN loads, and the estimated inter-segment transport of TN. Based on these data, the internal flux of TN is significant and the portion of internal nutrient cycling due to flux from muck sediments is along the same order of magnitude as the watershed loads. Virginia noted that the SJRWMD (Pete Sucsy) has built a hydrodynamic model of the flows moving through the IRL. This SJRWMD hydrodynamic model is what Steve Peene is using to calculate inter-basin transport values.

Roger Dykes asked if the Haulover Canal directional changes are adding or subtracting loads in the lagoon. Virginia answered that the loads are coming from all different directions. We don't want to double-count loads as they come in and go out. There is definitely a sloshing affect, so we need to be careful how we quantify the loads. These are not simple issues to address.

There was discussion about the importance of muck and muck removal. Virginia noted that they have contracted with the Florida Institute of Technology (FIT) on a study of muck removal and its benefits. This study, being conducted by a team of professors including Dr. Trefry, is measuring the muck flux rates and the extent of muck in the North, Central and Banana River Lagoons (i.e., the BMAP area). The overall estimates are that the muck flux generates a load of the same annual magnitude as the annual watershed loads. Virginia added that the red line in her graph is related, in part, to the nutrient flux from muck deposits. So overall to improve the IRL, we need to reduce both the blue line (watershed loads) and the red line (internal flux).

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Virginia reviewed four studies being commissioned by Brevard County using legislative funds. The first study is on biological responses to muck removal. The second study is on the efficiency of muck removal and the benefits to water quality after muck removal. The third study is on the movement of muck and how much muck removal changes the movement of muck in the IRL. The fourth study is the development of a model based on soil diagenesis and how water quality is expected to respond when muck is removed. This model will help predict the value of muck removal and how to control flux from legacy loads within the IRL system.

Virginia provided a map that showed the locations of six muck removal projects scheduled in the IRL system. Five of the projects are being conducted by Brevard County (Mims boat ramp, Sykes Creek, Cocoa Beach, Grand Canal, and Turkey Creek) and one project is being contracted through the SJRWMD (Eau Gallie River). For the five Brevard-contracted projects, the state permits have been received and they are now waiting on the National Marine Fisheries Service comments so the U.S. Army Corps of Engineers permit can be issued.

Tiffany asked how the two projects—one by Trefry and one by Zarillo—that both are related to muck and water quality relate to each other. Virginia answered that Zarillo is developing the model to predict water quality benefits and Trefry is gathering the flux data that will be used in the model.

Roger asked what the difference is between a recharge area and a non-discharge area. He noted that there was a study done for the City of Cocoa that identified a non-discharge area. Virginia responded that she didn't know the answer to that question. Roger asked how we can correct any errors related to discharge and non-discharge areas. Xueqing responded that non-discharge areas can still be providing loading through baseflow.

Virginia stated that when the modelling process started, the purpose was to improve loading and to establish a good regression with seagrass response to load reductions. When we do that, it will provide direction on how to proceed. Virginia reported that they are developing a tool that can be used for BMAP allocations and that changes could be made going forward.

Roger asked when everything will be done. Virginia responded that they need the Department's approval on the SWIL 3.0 version before they migrate it into a more useful format for BMAP allocations. Roger asked when it will be known what credit will be given for various best management practices. Virginia responded that there is a back and forth process with the Department and with the local sponsors of the SWIL model. She stated that she is planning for a meeting with the local stakeholders in June and a subsequent summer meeting with the Department.

Roger asked if there will credit given for muck removal. Virginia responded that right now, the credit for muck removal is fairly small.

Dave Siltan asked if he understood correctly that the modelling team is sidelining the work on the 192 month version of the model. Virginia answered yes, the calibration using the 12-month dataset worked better than the 192-month version. The other problem with using the 192-month version was that it didn't leave a time period and dataset to use for model validation.

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Lisa Frazier asked what happens to the muck when a project removes it from the IRL. Virginia replied that the muck is very salty, so that does limit where it can be placed. For example, you can't use it as a soil amendment unless it can be well-flushed by rain. For the marsh restoration projects, there is an impoundment used for depositing muck. There are also possible sites near the causeways where there are large underwater borrow pits that the deposits could be used to fill, with the potential that if the voids were negated that seagrass might be able to grow again in those locations.

Lisa asked when the last time a muck project was performed. Virginia responded that the Florida Inland Navigation District (FIND) conducts regular maintenance dredging.

David Gunter asked Virginia what her gut feeling is about the legacy loads and their relative importance. Virginia responded that when you look at the chart that showed the internal flux along with atmospheric deposition and watershed loads that gives us a clue that the internal flux is important. The internal flux from muck alone appears to be on the same order of magnitude as the watershed loads. So we need to understand the importance of legacy loads. We may not be able to ignore the internal loads and expect the IRL to fully recover. We still need to reduce watershed loads also, but to succeed we may need to pay attention to the internal loads as well.

Update on Seagrass Target Step 1 Analysis

Yesenia Escribano reviewed her PowerPoint presentation related to this topic. Yesenia reminded everyone that at the December meeting the Department reviewed the results of the Step 2 analysis based on the 2013 mapping data but the Step 1 analyses were not yet complete. Yesenia stated that the goal of the TMDLs is to recover the deep edge of the seagrass habitat. The restoration target for seagrass is based on the depth limit from seven mapping years ranging from the dates 1943 through 1999. The TMDL targets were set to restore 90% of the union depth from those years.

Compliance with the seagrass targets for the TMDLs is measured in two steps. In the first step, a cumulative frequency distribution analysis is performed. Compliance is achieved when at least 50 percent or more of the assessment years' frequency distribution curve, including its 50th percentile value, lies on or to the right of the frequency distribution curve for the seven years used to set the TMDL. In the second step, the median seagrass depth for each of most recent four years of data is compared to the median depth from the TMDL data years. At least three of the four assessment years must meet or exceed the TMDL median in order to be compliant. Both steps must be compliant to be considered compliant with the TMDL.

Yesenia reviewed the Step 1 and Step 2 results for each project zone based on incorporating the 2013 seagrass data. For Step 1, the compliant zones were Banana River A, Central A, Central SEB, and Central B. Banana River B, North A and North B did not meet Step 1. For Step 2, none of the project zones met the TMDL median for that zone. Therefore none of the project zones were compliant for the 2013 assessment.

Yesenia reviewed the Step 1 assessment curves for each project zone. As previously stated, the project zones that did not meet Step 1 were Banana River B, North A and North B. Yesenia also recapped the Step 2 medians that were presented at the last meeting and reviewed the medians. For 2013, each project zone was below the TMDL median. This means that each project zone had more than one year based on the 2007, 2009, 2011 and 2013 data that did not meet Step 2 and therefore all the project zones

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are failing the compliance measurement. Yesenia also showed bar charts of the median for each of the most recent four years of seagrass data compared to the TMDL median. She added that Central SEB is the closest to meeting the TMDL median based on the 2013 data.

Yesenia described the implications of the most recent results. For the project zones that were previously noncompliant with the TMDL assessment including Banana River B, North A and North B, implementation of load reduction projects should continue. For the areas that were compliant previously but now are not, including BRL A, Central A, Central B and Central SEB project zones, additional nutrient reductions are needed in order to make progress towards compliance in future years.

Matthew Mitts asked what the timing would be for the Central IRL to achieve additional reductions. Beth Alvi responded that when the Central BMAP was developed, allocations were not calculated because at the time, the three Central IRL project zones were meeting the compliance measurements. Beth added that the Department did collect projects in this area, so we know that there are efforts underway to reduce nutrient loads. Also, the Department has the PLSM model to calculate allocations and compare that to the project reductions, so we are prepared to share those numbers with those that want to see where they stand. Now we have the SWIL model also, there is still work to be done in order to be able to use it for BMAP allocations. The Department plans to come back at future meetings with more information on the status of the new model.

Roger noted that at a recent Florida Stormwater Association (FSA) legislative overview mentioned that projects involving the phase out of septic tanks may be eligible for credit, but there are a lot of issues about who will pay for those kinds of projects. Beth responded that the Department currently has a tool called ArcNLET model that is available to calculate nitrogen load reductions from septic tanks. Separately, there is also a Florida Department of Health (FDOH) study underway to measure the effectiveness of additional passive treatment options. FDOH has recently reported that their study may be completed in June 2015. Tiffany added that there will be information available from FSA on the legislative actions in the recent session that is currently underway. Tiffany mentioned that there is a legislative hearing scheduled today on some proposed revisions to state legislation on septic tanks in springs areas. Since the current legislation is focused on springs, it may not be applicable in the IRL but depending on what the final legislation actually says, it may have broader implications for the laws related to septic tanks. The situation is in a state of flux right now but FSA will hold a webinar after the legislative session is complete to provide an update on what actually occurred.

John Fergus noted that we had a super bloom and now we are in recovery. He asked if we are going to spend money on restoration efforts, why not focus our spending on removing the legacy loads. Xueqing responded that most of the load does come from the watershed, so we need to make certain that we control those loads. John responded that there is half a century of inputs that were not controlled, so now we are dealing with a combination of two loads—watershed and legacy. John asked why we would not focus on the legacy loads, especially in the Banana River Lagoon. Tiffany responded that the current BMAP policies do provide a credit mechanism for projects that address legacy loads and credits for projects that address watershed loads. It is possible that the muck research studies that are underway will provide better data and the Department might modify the credit calculations for muck removal, but there are options available now for those kinds of efforts. Beth added that the Department is open to updating the calculations and to addressing the internal loads as well as the watershed loads.

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Xueqing stated that this concern has come up in other basins too and the Department has been open to different approaches to address both internal and external loads. For example, in Polk County the Department has worked with stakeholders there to give them flexibility to perform projects where they want within the basin.

Xueqing added that there are no conclusions yet on the cause of the super bloom. It is possible that the cold winter may have killed a lot of the macrophytes and triggered the response, but we are not sure. We should continue to look at both internal and external loading to address the TMDLs.

Bill asked Yesenia to put up the slide with the Central B medians. He noted that there is a good chance that Central B will meet the seagrass median in 2015 and yet the project zone would still fail the compliance assessment. He asked why the stakeholders are expected to meet these criteria when things happen—such as the super bloom—that are beyond their control. It is not possible to control the weather and temperature changes. The Department should not impose allocations in Central IRL because the stakeholders there have been doing their part and they shouldn't have to send money down the drain to achieve reductions that aren't necessary.

Beth responded that at this point, the Department is sharing the results of the seagrass assessment that we agreed to do. Now we need to have further discussion about the numbers based on the current (PLSM) model and if the new model is going to be done soon, we can discuss using that too. We don't have to allocate, but we do need to plan to do more reductions and we need to continue to discuss the best approach to use here. It's not a black and white situation; what we know is that we want to see the improvements continue and we want the seagrass to recover. Yesenia added that the goal is really focused on the seagrass recovery and not the specific load reductions, so if the seagrass recover, additional load reductions will not be assigned.

Virginia commented that there were concerns about the 2-step process when it was originally explained. Going forward, we need to think about the right assessment techniques to use. We need to make sure that we are headed in the right direction with load reductions, especially if there is a time lag in seagrass response to the load reductions.

Roger asked why that approach can't be used today. Tiffany responded that the Department has enough information available and a model in place that they could move forward now with allocations, but they want to discuss the approach some more with you before any decisions are made on how to proceed. Xueqing added that the simulation is an important piece of this consideration.

Roger commented that the Department has leadership and people who listen to our comments, but if we figure out what we want to do and there are other people within the Department who aren't convinced, then that is a problem. Xueqing responded that the BMAP process often includes discussion and negotiations with the stakeholders. Beth added that the staff that come to the meetings to discuss the approaches and the concerns internally before the meetings and those discussions are very specific. For example, Deputy Secretary Drew Bartlett is aware of the dynamics that are occurring in the IRL and that we need to assess how to proceed.

Roger asked if there is more pressure from the federal agencies and the Clean Water Act requirements than from the stakeholders. Beth answered that we have a framework set up to assess and develop

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TMDLs. Even outside the Clean Water Act requirements, our mission at the state level is clear that we need to restore our waters.

Roger asked why no one asks the big questions. There are different groups working on their own agendas and so we could be wasting money and time going in different directions. Virginia responded that on the federal level, there is a mindset to control pollution at the source is the best approach. Florida is really ahead of the curve compared to most of the other states. Here in Florida, we do have places such as the waterbodies in Polk County where they are grappling with the legacy load issue, so we are at the front edge of the legacy load issues and Florida is at the front edge overall with our programs. We are fortunate to have leadership at the Department, like Drew, who have risen through the ranks and understand what we are trying to do. Polk County and their lake issues is different from the legacy load situation we have in the IRL, so just one approach or one set of regulations won't work.

Tiffany reviewed the action items from the first part of the meeting that included the Department's review of the SWIL 3.0 model, continued work by the Brevard modelling team on the SWIL model, including items such as target identification and providing a tool so that the model output could be used for jurisdictional allocations.

There was a short break.

Update on Implementation Efforts for the Central IRL

Yesenia presented a PowerPoint to describe that status of calculations in the Central IRL. She reported that the Department's intention is to set the stage of what may need to be done in order to estimate the nutrient load reductions required to achieve seagrass recovery. The results we have are based on the PLSM and the targets in the TMDL. This is a check-in on where things stand based on the current platform we have available.

Yesenia reported that the proposed methodology is to use a method similar to the one that was used in the Banana River Lagoon. Using this approach, the areas in the watershed that have natural land uses are removed and the reductions are focused on anthropogenic loading in the basin. This means that target loads for the Central IRL project zones would be based on the TMDL targets but adjusted for the exclusion of natural land areas; the loads from natural land uses are subtracted from the total TN and TP TMDL target loads to provide a total amount of loading that can come from anthropogenic land uses.

This method uses a GIS-based process and the PLSM is set up for each sub-lagoon. The PLSM shapefile contains the land use-soil acreage, rainfall data, runoff coefficients, and event mean concentration (EMC) values related to land use and soil types to generate TN and TP loads from the watershed to each sub-lagoon. The baseline loads are based on the TMDL loads. First, the natural land use areas are removed and then a GIS "clipping" process occurs. First, Florida Department of Transportation (FDOT) roads are removed and then agricultural land uses. After those two steps, the municipalities are clipped to their own jurisdictional boundary, then water control district areas, and the remaining area is assigned to the applicable county. Yesenia showed a graphic of what the clipping process looks like. Yesenia added that these calculations are based on the jurisdictional boundaries we have on file. Each entity in the Central IRL should have received an email last week asking for help in verifying their boundary. Please respond to Yesenia quickly, if you have not already done so, and make sure the boundary we are using for your calculations is correct.

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After the clipping the baseline load can be calculated for each entity or jurisdiction. When these loads are known, the *de minimus* loads would be those that the cumulatively less than or equal to one percent of the total loads. *De minimus* entities are still important stakeholders but are not assigned a specific reduction in the current iteration of the BMAP. Yesenia explained that the target loads for each project zone are estimated by summing the waterbody identification (WBID) specific TMDL targets within each project zone. Using this information, the per acre target loads are the target loads divided by the total acreage of each project zone. Yesenia showed a table showing the results of these calculations.

Yesenia noted that future discussions are needed to review the draft nutrient reductions, by entity, based on this analysis. As discussed earlier in the meeting, more discussions are also needed on how and when the new model may be used. Even though the new model has been delivered today, we still need targets that can be used in association with the model. So more discussion is needed on the seagrass depth limit targets and the timeframe for updating the Central IRL BMAP and the activities to achieve nutrient reductions.

Yesenia reminded everyone that the goal of the TMDLs is the recovery of the deeper seagrass habitats and that the success of the TMDLs is based on the biological response of the seagrass.

Jason Bessey commented that the same GIS clipping method was used in the St. Lucie BMAP and the process works great except for little strips that are created by the clipping process that really belong to FDOT or agriculture but end of being left and then assigned to the county. When these are added up, they can be a large load that the county is assigned incorrectly. Yesenia responded that the agricultural areas and natural lands will be taken out of the county's area. Jason responded that, yes, they are taken out but there are slivers that are left that add up for the county. Beth responded that we are still discussing the approach and that perhaps we can address that problem.

Roger asked if some of the models use a time of concentration in their calculations. Xueqing responded that the PLSM uses a share-curve number approach that simulates loads on a bigger time scale than the time of concentration approach.

Judy asked if FDOT is only responsible for their outfalls. Yesenia responded that the FDOT outfalls are clipped out and assigned to FDOT and we can talk about the process more later. Tiffany added that the FDOT assigned area is more than just the outfalls. Their starting loads are based on the roadway area as well as their right of ways, so they are assigned more than just outfall locations.

Matthew asked how the TN target of 4.55 was calculated. Yesenia responded that the target is the allowed amount of load per acre for the sub-lagoon area. The reduction needed is calculated by taking the starting load and subtracting the target load.

Virginia commented that it seems strange that Central SEB has a lower target load per acre than the other two project zones in the Central IRL, even though the inlet is there and so there is more flushing than the other two project zones. Yesenia stated that the results are based on the model outputs but if you have ideas we can talk about other ways to approach the calculations. Virginia also inquired if the legal concerns that were discussed when we started the BMAP development process with the water control districts had been resolved. The legal concerns voiced at the time may still remain.

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Virginia added that it is good that agriculture is subtracted out and given its own assignment. Virginia asked if there is anything we can do to ensure that the appropriate funding is directed to addressing the loads from agriculture, particularly if standard best management practices are inadequate to achieve the reductions assigned to agricultural land uses. Holly Edmunds responded that we can't say anything definite about the Florida Department of Agriculture and Consumer Services' (FDACS') funding levels until after the legislative session is complete. The water bill is being debated, but its focus is primarily on springs. Holly said she is hopeful that FDACS will have decent funding and that they are hiring more staff to increase enrollment efforts.

Steve Peene stated that it would be worthwhile to do some calculations on where standard agricultural BMP implementation gets you, so that it is clear how much additional effort (advanced BMPs) may be needed to achieve the load reductions assigned to agriculture. Beth responded that the Department and FDACS perform a few calculations such as the enrollment numbers. There are a range of reductions that apply to BMPs and FDACS is trying to extend their reduction estimates to other areas around the state. Rebecca Elliott added that it is important to understand that the enrollment goals for FDACS stated in the BMAP are very aggressive. Tiffany added that we are fortunate that citrus was the subject of some of the first BMP manuals, so when we started the BMAP process, the enrollment levels were well underway as the manuals had been in place for a while. Also, in the Banana River, there isn't much agriculture remaining, so it's not a big issue in that area. Even though the FDACS enrollment goals are aggressive, FDACS has not been able to meet those goals in some other areas of the state, so it's helpful that enrollment here was well underway and that they are adding staff to augment their enrollment efforts. Virginia stated that now is the time to understand what those load reductions needed from agriculture might be and what those would cost while we have good opportunities to request funding for advanced agricultural BMPs.

Adjourn

The meeting was adjourned at 12:12 PM.

Action Items

- The Department should review the SWIL 3.0 model and provide feedback to the developers.
- The SWIL team should continue their work adding in the non-watershed loads and developing an appropriate target. Also, work may be initiated on developing a tool that would allow the SWIL model to be used for jurisdictional allocations.
- Each of the Central IRL entities should verify their jurisdictional boundaries, respectively, so that the starting load and allocation calculations can be performed correctly.
- The Department or FDACS should consider doing some calculations on where BMP implementation gets you in the IRL, so that it is clear how much additional effort may be needed to achieve the load reductions assigned to agriculture.