
Florida Bay

Response to the Everglades Foundation's "Evaluation of the South Florida Water Management District's Plan to Increase Freshwater Flows to Florida Bay"

October 15, 2016

Preface

On Oct. 7, 2016 The Everglades Foundation released an assessment of the South Florida Water Management District's Florida Bay plan to increase freshwater flows to Florida Bay. This assessment reflects the Foundation's grasp of the District's plan and reflects the many months of technical exchange between modelers at the District and their counterparts at the Foundation. The conclusions drawn by the authors, however, demonstrate a serious misunderstanding of the scope and objectives of the proposed Taylor Slough and Florida Bay improvement plan elements.

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The assessment by the Everglades Foundation anchors on five key assertions. We have provided our response to each below.

1. **The plan does not restore Florida Bay**
2. **The plan does not include Shark River Slough**
3. **The plan does not create new water**
4. **The plan was not completed under a public process**
5. **The plan has water quality implications not explored by the District**

Foundation Assertion 1: The plan does not restore Florida Bay

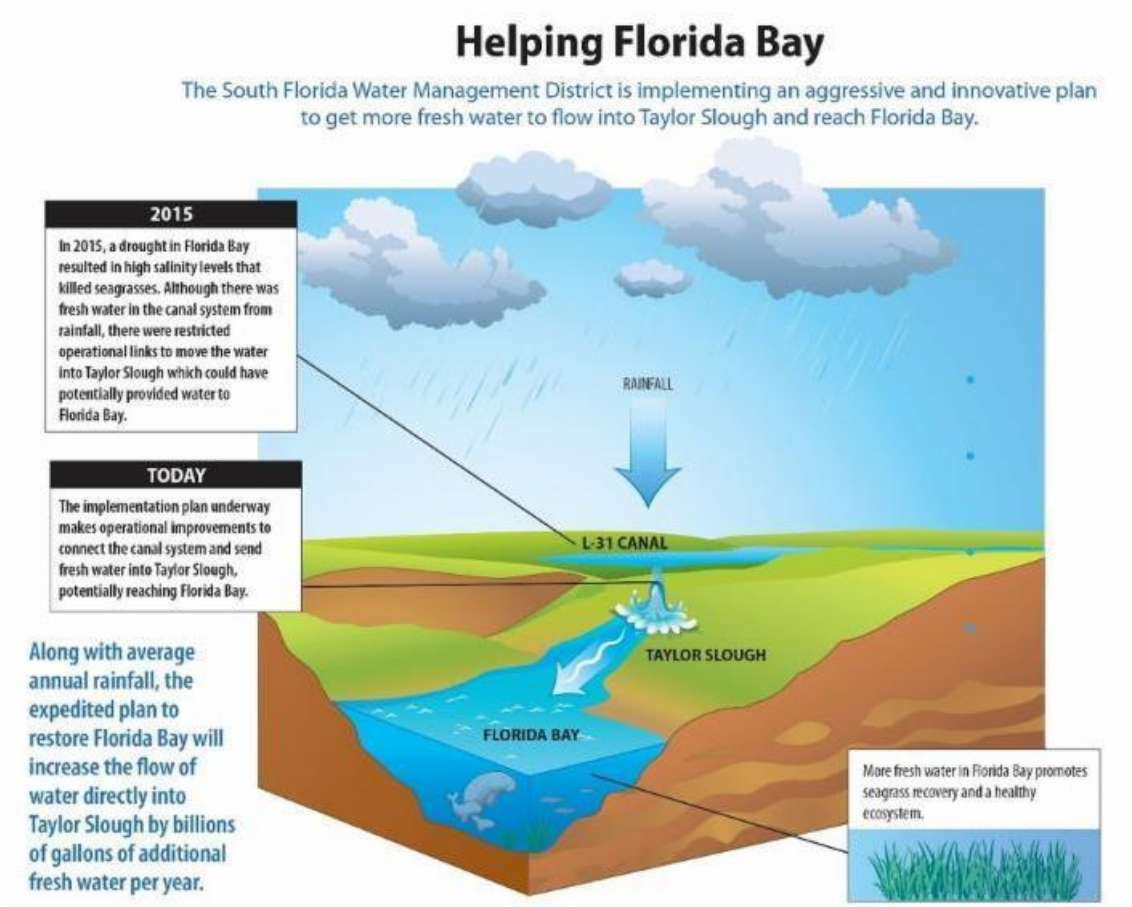
In 2015, Florida Bay was in the throes of a severe localized drought with significantly lower rainfall than average which resulted in hyper salinity followed by extensive seagrass die-off in parts of the Bay, especially the central and nearshore areas. Recognizing the significance of this ecologic disaster and knowing the South Florida Water Management District (SFWMD), U.S. Army Corps of Engineers and the U.S. Department of the Interior are undertaking several long term initiatives with estimated cost in the billions of dollars and time frames in decades to address the larger Florida Bay restoration issue, the District sought to identify actions that could be pursued expeditiously to enhance and help to protect Florida Bay.

The resulting plan, presented at the July 14, 2016 Governing Board, seeks to achieve an incremental improvement for Taylor Slough and portions of the Bay, not a full restoration for Florida Bay in its entirety. It takes advantage of existing planned project components, experiences gained through the recent high water emergency operations, and strategic construction to provide immediate benefits, ultimately helping to compliment the longer term restoration initiatives.

Neither the current SFWMD Florida Bay plan nor the longer term initiatives will drought proof Florida Bay -- no plan or project can drought proof a system. The goal of this project, and other projects that are in the planning stages, is to improve the overall hydrology and ecology of the Bay to make it able to withstand natural impacts. The modeling results show that average deliveries during extreme dry conditions (1971, 1975, 1981, and 1985) are extended by one month and deliver approximately four times the amount of water than would otherwise have been delivered without the project.

Flows from Taylor Slough are the most direct route to provide more water to the areas of eastern and central Florida Bay. The central area of the Bay is where the seagrass die-off started in 2015 due to an extreme rainfall deficit in the region. The authors rightly conclude that the plan presented to the Governing Board does achieve that objective and delivers thousands of acre-feet of additional water to the Bay. They further conclude that that the flows to the Bay are shifted westwards, "a definite benefit."

The Foundation's conclusion the plan is a definite benefit for Florida Bay is correct. However, the Foundation's assertion that the plan does not restore Florida Bay to be misleading because the plan was never envisioned to be the stand-alone solution to restoring the Bay.



Foundation Assertion 2: The plan does not include Shark River Slough

There are several projects underway (including the Comprehensive Everglades Restoration Plan, the Central Everglades Planning Project, Modified Waters Deliveries to Everglades National Park and the additional 2.6 mile bridging of Tamiami Trail) that will allow more water to enter Shark River Slough to the benefit of Everglades National Park. The District remains committed to those efforts and is actively engaged in advancing them. At the time of the development and refinement of this Florida Bay plan, the District was simultaneously working with the U.S. Department of the Interior and the U.S. Army Corps of Engineers on significant efforts to move previously unprecedented volumes of water into North East Shark River Slough.

Those efforts included expenditure of funds by the SFWMD to provide infrastructure (pumps, canal cuts, plugs), flood mitigation action at air boat concessions along the L-29 Canal and around the 8.5-square-mile area in South Miami-Dade County, changes to operational constraints, actions taken as part of the agency's response to the high water in Water Conservation Area 3A that resulted from unprecedented rainfall. These activities sent more than 80 billion gallons of water into North East Shark River Slough between February and August 2016.

Additional improvements to Shark River Slough were not included in this specific proposed plan. The objective was to provide more direct flows to the region of Florida Bay where the seagrass die-off started, for which flows from Taylor Slough are critical.1 Flows from Shark River Slough rarely reach the Bay and are limited to the western edge. Internal sub-basins within the Bay restrict the movement of water from Shark River Slough to basins that experienced the most extreme salinity values.

The Foundation's assertion that the plan does not include Shark River Slough is misleading. The plan was not designed to include Shark River Slough and other projects already underway will deliver more water to Shark River Slough as part of the joint restoration efforts of the SFWMD, U.S. Army Corps of Engineers and U.S. Department of the Interior.

Foundation Assertion 3: The plan does not create new water

The South Dade investigation, which was the vehicle that developed key elements of this plan, was initiated to address a specific opportunity. The agricultural portions of South Dade were experiencing increased flooding risk while the adjacent natural areas were dryer than desired. The challenge was to develop a plan that would simultaneously benefit the agricultural areas by reducing seepage from the natural areas and enhancing the natural areas by retaining water otherwise lost to seepage. The investigation achieved this balance and identified options that would further improve the natural areas by enhance flows towards Taylor Slough and eventually to Florida Bay. This outcome was achieved in three ways:

- First, targeted operational changes were implemented based on extensive analyses with input from public and other agencies, allowing lower operation of the canals in the region. This provided the needed flood protection and returned the seepage, otherwise lost to the natural areas.
- Second, strategic placement of infrastructure and more efficient utilization of existing infrastructure to provide conveyance of the water from areas that had undesirable high levels and/or flooding. Water was directed towards Taylor Slough where it would flow to benefit the Bay.
- Finally, by promoting flows westward and spreading water across areas adjacent to eastern Everglades National Park, the plan raises groundwater close to Everglades National Park, thereby, reducing the eastwards gradient that causes seepage loss of marsh water. The effect is that net seepage out of the park was reduced upstream of Taylor Slough allowing more water to stay in the park and make its way towards Florida Bay.

In combination, these actions provide additional water towards the Bay during all conditions --wet or dry. The initiatives, as evaluated by the Regional Simulation Model (RSM), increase flows towards the Bay -- both in wet season and early dry season - and, very importantly, provide conveyance that allows water available during the dry season to more effectively enhance flows towards Taylor Slough.

In 2016 the District tested revised South Dade operations and demonstrated that additional water was available, which in conjunction with the Florida Bay plan features, could be routed towards Taylor Slough.

The Foundation's assertion that the plan does not create new water is inaccurate because modeling shows it provides additional water to Taylor Slough, which flows into Florida Bay, during wet and dry months.

Foundation Assertion 4: The plan was not developed in a public process

In response to the ongoing local drought and sea grass die-off affecting Florida Bay, several organizations with interest in the Bay met in the Fall of 2015 to discuss the problems as well as opportunities to address the evolving situation. At a subsequent South Florida Ecosystem Restoration Task Force meeting held on Nov. 19, 2015*, a team presentation on Florida Bay was given by the U.S. Department of Interior, U.S. Army Corps of Engineers and the South Florida Water Management District. The presentation highlighted the issues, identified long-term solutions that were currently being implemented and provided some short-term, immediate opportunities to help the Bay by routing increased flows through Taylor Slough toward Florida Bay.

All participants were clear in the understanding that these initiative would not restore the Bay, but agreed they were a step in the right direction and have the potential to maximize the benefits of available water in the regional system. Over the next several months, the options presented to the Task Force were refined. In July 2016, the project was presented to the Governing Board of the SFWMD and ultimately proposed as a Governing Board initiative to help Florida Bay.

The South Dade Investigations process in 2015 and 2016 involved several noticed public workshops*, team meetings with interested parties including governmental and non-governmental entities (including the Everglades Foundation), presentations to the WRAC and SFWMD governing boards and public posting of the investigations presentations and video coverage on SFWMD hosted website.**

The process that was followed in the development and refinement of this plan was public and included engagement both before and after the proposal to the Governing Board. Modeling staff at the SFWMD have spent a significant amount of time with

their counterparts at the Everglades Foundation and have continually offered the same to other organizations.

SFWMD staff continue to be available to ensure that the assessment and modeling performed in support of the plan as well as the plans scope and objectives are well understood.

In addition, based on input from the public, interested parties and other agencies, the District amended its Florida Bay plan to take their input into account while still delivering billions of gallons of clean freshwater to Taylor Slough annually.

The Foundation's assertion that the plan was not developed in a public process is inaccurate because many elements of the plan were developed through a publicly vetted process. SFWMD modelers and scientists have also explained the plan at great length to all who have asked and the District has revised the plan in response to public input.

Foundation Assertion 5: The plan has water quality implications not explored by the district

The project plan calls for the delivery of water via sheetflow along the L-31 West Canal and does not involve any point source discharges. The quality of water in the area, monitored for decades, contains very low levels of phosphorus similar to amounts found in rainfall. Total phosphorous concentrations at structures contributing to Taylor Slough are extremely low and stable with long-term averages of 5 - 6 micrograms per liter**.(2)** Similar extremely low values are reported from marsh sites in the Taylor Slough marsh at 2 - 3 micrograms per liter and no increases were evident during the recent High Water Emergency Order. Downstream at Taylor Slough Bridge, total phosphorus concentrations are at the limit of detection, 2-3 micrograms per liter of total phosphorus. The total phosphorus in rainfall is typically 5 micrograms per liter. (**3)**

However, as with all of projects implemented by SFWMD, additional monitoring is being proposed in the area of Taylor Slough Headwaters to assess hydrologic benefits and document environmental changes associated with the additional flows. The District is proposing to use an Adaptive Management approach to evaluate cause and effect relationships, adjust for legacy effects and manage for uncertainty.**(4)** An annual Adaptive Management Review process will be conducted to assess the hydrologic and ecological data.

The Foundation's assertion that the plan has water quality implications not explored by the District is inaccurate because observed water quality is within the range of rainfall and we are using all of our water quality tools to monitor and document the additional water reaching Taylor Slough.

Conclusion

The Florida Bay plan expedites the implementation of several components of previously endorsed plans. It delivers clean freshwater that meets the state's stringent water quality standards to Taylor Slough through overland flow along the L-31 West Canal.

The plan results in a net increase of billions of gallons of water on average each year to Taylor Slough, which flows south directly into a region of Florida Bay where seagrasses have been impacted by localized droughts.

The plan can be implemented quickly and deliver additional water to help reduce salinity levels soon while more long-term projects that will deliver more water are implemented. It is not the only solution for Florida Bay, but rather a strong initial step to provide immediate benefit.

We commend Drs. Paudel and Davis for their efforts to provide a comprehensive assessment of the District's plan as presented at the SFWMD Governing Board meeting on July 14, 2016 and the modeling work products and presentations delivered shortly after. We look forward to working with them to ensure that their understanding of the scope and objectives of the plan is on par with their familiarity of the tools and analyses.

Finally, we are always willing and available to discuss our science and engineering and welcome a collaborative approach to improving the South Florida Ecosystem, including Florida Bay.

Citations

1. Lee et al, 2016. Circulation and Water Renewal of Florida Bay, USA. Bulletin of Marine Science 92(2):153-180; and references therein
2. Van Horn, S. 2015. Water quality trends in South Dade. South Dade Investigation Workshop, 10/15/2015
3. Pollman, C.D., W.M. Landing, J.J. Perry and T. Fitzpatrick. 2002. Wet deposition of phosphorus in Florida. Atmospheric Environment 36: 2309 - 2318.
4. LoSchiavo, A. J., R. G. Best, R. E. Burns, S. Gray, M. C. Harwell, E. B. Hines, A. R. McLean, T. St. Clair, S. Traxler, and J. W. Vearil. 2013. Lessons learned from the first decade of adaptive management in comprehensive Everglades restoration. Ecology and Society 18(4): 70.

* To view videos of the Florida Bay presentation at the Nov. 19, 2015 meeting of the South Florida Ecosystem Restoration Task Force please visit: https://evergladesrestorationblog.wordpress.com/2015/11/18/south-florida-ecosystem-restoration-task-force-meeting-6/
** To view presentations that were part of the South Dade Investigations public outreach process please visit: www.sfwmd.gov/miamidade.

To learn more about the District's plan to help Florida Bay by delivering water to Taylor Slough, please visit: www.sfwmd.gov/floridabay

The South Florida Water Management District *is a regional governmental agency that manages the water resources in the southern part of the state. It is the oldest and largest of the state's five water management districts. Our mission is to protect South Florida's water resources by balancing and improving flood control, water supply, water quality and natural systems.*