



# Task 1 Summary Memorandum: Desktop Review, Website Project Viewer, and Partner Workshop on the Adaptation Planning and Mitigation Projects

*Deliverable 1.1.2*  
CONTRACT 4600004085  
Work Order 05



South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, Florida 33406

November 2021

**Task 1 Summary Memorandum:  
Desktop Review, Website Project Viewer, and Partner Workshop on the Adaptation Planning and  
Mitigation Projects Final Comprehensive Report**

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Prepared for the  
South Florida Water Management District

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November 2021

C2021-033

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## Introduction

The South Florida Water Management District (SFWMD or District) is conducting a system-wide review of the regional water management infrastructure to determine what mitigation projects would maintain or improve the current flood protection level of service (FPLOS). The FPLOS Phase 1 Study describes the level of protection provided by the water management facilities within a watershed considering sea level rise (SLR), future development, and known water management issues in each watershed.

This memorandum details the facilitation of the kickoff workshop for the adaptation planning and mitigation project study within the SFWMD C8 and C9 basins. Specifically, this memorandum details the desktop mitigation project research, the Build Community Resilience Planning for Flood Adaptation Website Viewer, the outcome of the partner user survey, the summary of the Partner Workshop meetings, and the list of mitigation projects. The next phase of the study (Task 2) will identify the framework for the mitigation efficiency criteria used to determine which mitigation projects will be evaluated through explicit modeling or through other approaches.

## Pre-Workshop

### Summary of Desktop Mitigation Project Research

The local communities and county governments within the C8 and C9 basins plan, fund, and implement flood mitigation and resilience projects; this sub-task sought to capture many of those projects. Typically, flood mitigation projects are documented in either a County's Local Mitigation Strategy (LMS) or a municipality's Capital Improvement Projects (CIP) list; often, flood mitigation and resilience projects are reflected within both. LMS lists consist of a variety of mitigation projects for a wide range of natural hazards, and often contain limited information such as the project's location, cost, and purpose. CIP lists, however, typically contain detailed design information of future public works projects. The specific sources of flood mitigation projects gathered in this sub-task are discussed below. As discussed later, the team also solicited input from partner communities and added those projects to the mitigation list.

LMS efforts gather local officials and technical experts to identify potential projects that would mitigate or reduce flooding or other hazards. These projects undergo a ranking process and are then catalogued and submitted to the State Hazard Mitigation Office (SHMO). The State uses this list to allocate funding in the event of a disaster when Federal Emergency Management Agency (FEMA) funds become available. The projects identified in the LMS have varying degrees of supporting information, from fully developed design drawings to locations where mitigation projects are needed. Communities typically capture flood mitigation projects in the LMS process.

The Miami-Dade and Broward County's extensive LMS lists were shared with the consultant team, who further refined the lists to identify flood mitigation projects for further evaluation in this study. The refining process included the evaluation of the following attributes: project location (i.e. within or adjacent to the C8 or C9 basins), time frame (i.e. has the project already been constructed or planned for the future), cost (i.e. smaller costs indicate micro-scale), and project name/description/type (i.e. regular canal maintenance, ditch improvements, and swale regrading not included, as the model assumes that the canals are operating at their designed capacity).

### **Miami-Dade County**

Two sources provided information about Miami-Dade mitigation projects. The first was the LMS project list, and the other was the CIP project list provided by the Miami-Dade County Department of Transportation and Public Works (DTPW) open platform. This platform provided sufficient project details and location for inclusion in the preliminary mitigation project list. The DTPW list included traffic, roadway, and drainage projects. Only those projects associated with drainage and within the C8 and C9 basins were selected for the initial list of flood mitigation projects. For this task, the team limited the projects included to stormwater/drainage projects with a date range of 2015-2030, assuming that plans before those dates would have been superseded or revised.

### **Broward County**

Broward County's LMS list was not publicly available; however, the District provided a list of potential projects filtered to display only projects from the municipalities within the C9 Basin. These projects did not have location data, so the team identified, to the best extent possible, project location from the given description.

In summary, the review of the County LMS and CIP data helped the team generate an initial list of potential mitigation projects (identified in **Appendix A**) to improve the resilience of the two basins. Many projects on the list contained few details or design information needed for evaluating each project. In post-workshop follow-up meetings, partners were asked to provide construction documents or other substantiating information to help the team evaluate projects for inclusion in the flood mitigation scenario model. This effort is detailed in a future section of this report, **Partner and Stakeholder Follow-up**, and within **Appendix B**.

### **Summary of Website Projects and User Survey**

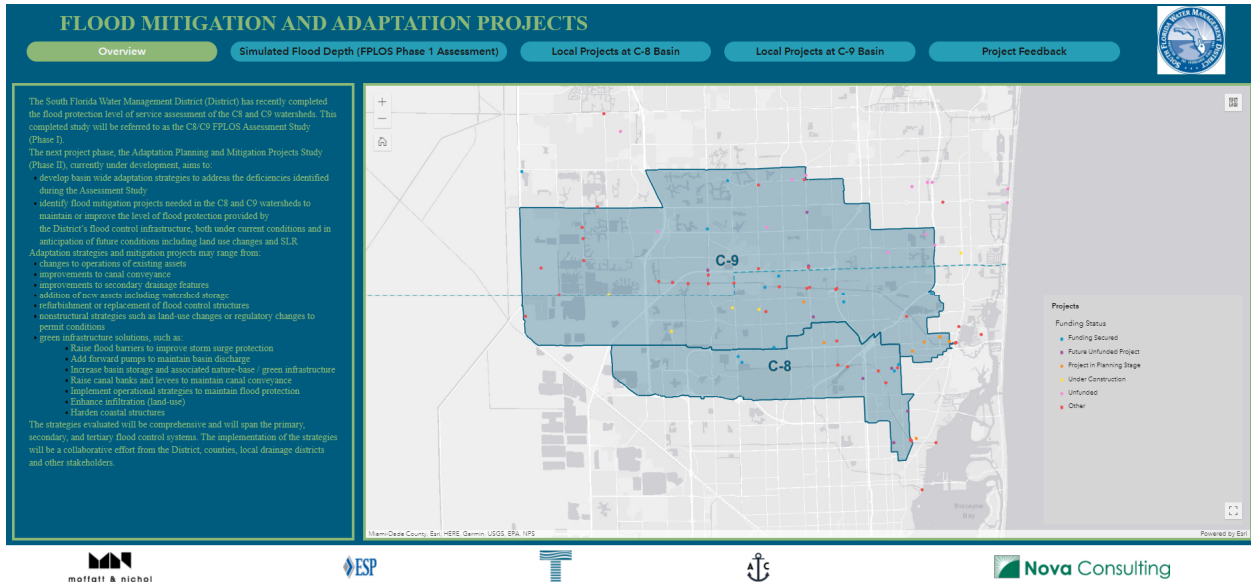
To facilitate the review of potential mitigation projects and enable community partners to add to the list, an interactive web-based map was developed for the C8 and C9 basins that presents the preliminary list of mitigation projects. The website address is the following:

<http://www.buildcommunityresilience.com/SFWMD/FPLOS/c8c9/>

Using Environmental Systems Research Institute's (ESRI) Experience Builder application, the team created a multi-tabbed map viewer. The map viewer provides a platform for local partners to view the projects identified, submit their own projects, and edit previously identified projects. Phase I result figures from the map tool were incorporated into the PowerPoint presented at the workshop as a deliverable. The reason for showing these results was to inform community partners of projected areas of flooding within their jurisdiction.

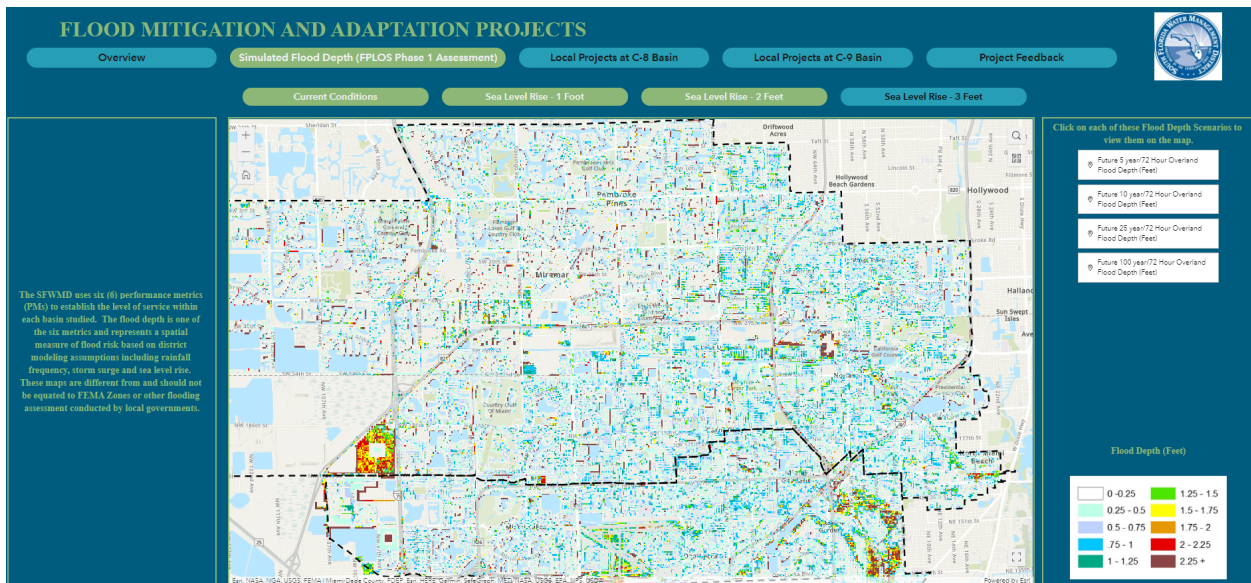
The SFWMD uses six (6) performance metrics (PMs) to establish the level of service within each basin studied. The flood depth is one of the six metrics and represents a spatial measure of flood risk based on district modeling assumptions including rainfall frequency, storm surge and sea level rise. These maps are different from and should not be equated to FEMA Zones or other flooding assessment conducted by local governments. Note that this was not the only assessment performed during the FPLOS, but the map viewer was utilized to represent graphically, areas of concern needing solutions. The five tabs in the map viewer provide more details on the Flood Protection Level of Service (FPLOS).

**Tab 1:** The Overview tab provides a summary of Phase II’s project goals and a map of all projects currently identified (**Figure 1**).



**Figure 1:** Interactive Web-Based Map Viewer – Overview Tab

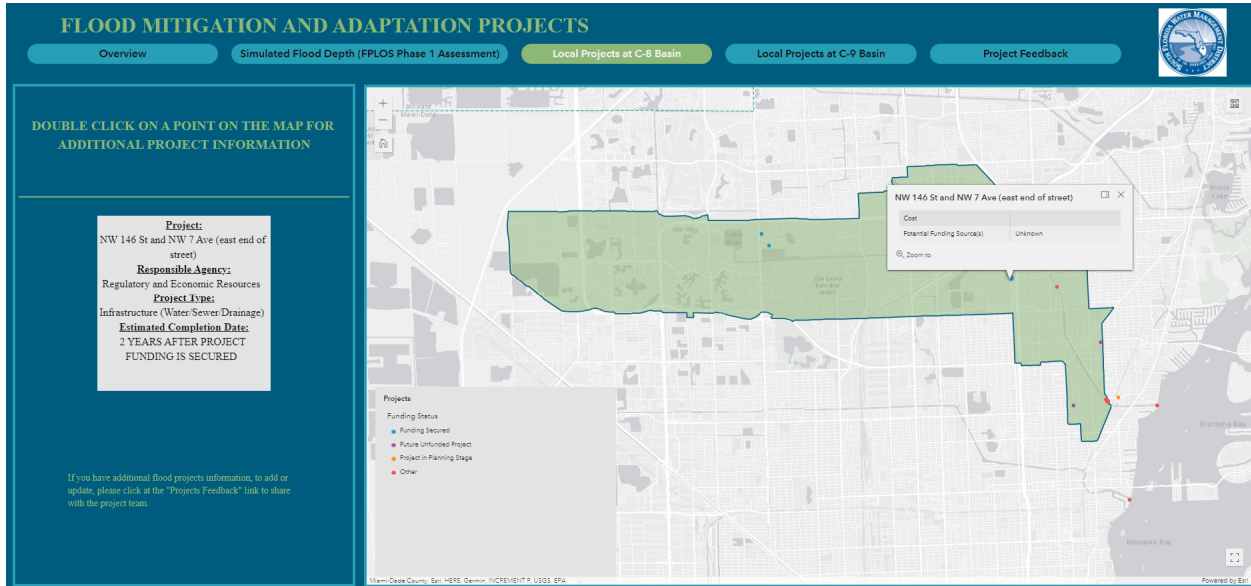
**Tab 2:** The Simulated Flood Depth (FPLOS Phase 1 Assessment) tab includes four maps on separate sub-tabs. Each map contains a different scenario – current conditions, sea level rise (SLR) with 1 foot, SLR with 2 feet, and SLR with 3 feet of flooding; each map displays future 5-, 10-, 25-, and 100-year/72-hour overland flood depth (**Figure 2**).



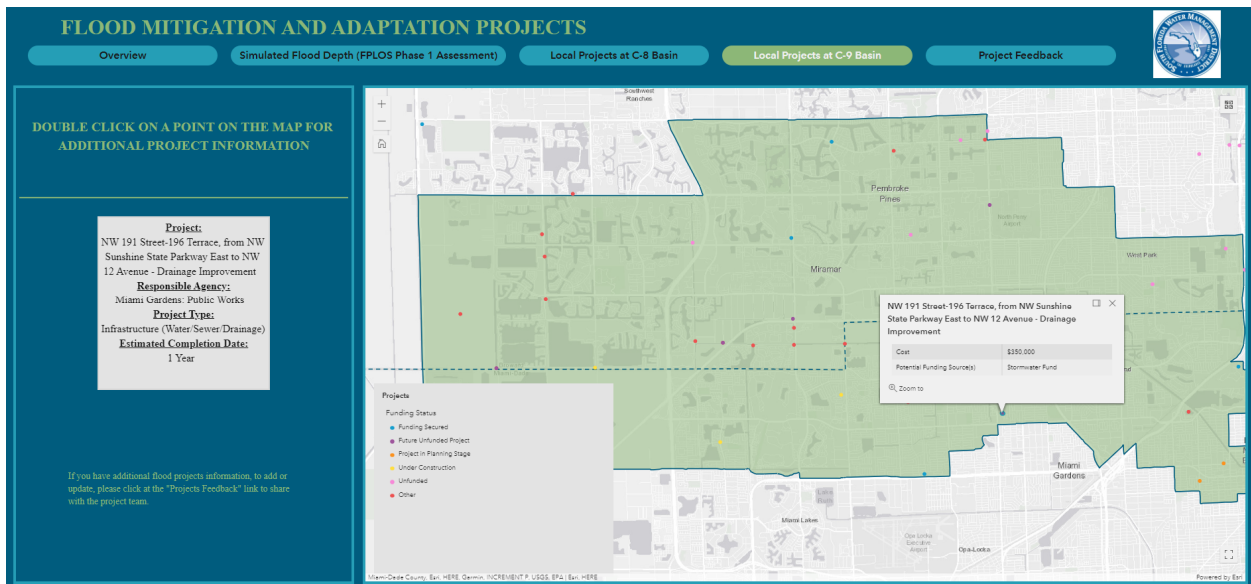
**Figure 2:** Interactive Web-Based Map Viewer – Simulated Flood Depth Tab

**Tabs 3 and 4:** Basin C8 and C9 are on individual tabs with pertinent information displayed in two different pop-ups. The bubble appearing on the map provides the project’s title, estimated cost, and

potential funding sources; the box on the left displays the title, agency responsible for the project, the type, and an estimated completion date range. These tabs provide additional information about the FPLOS study and illustrate the mitigation projects being sought for Phase II’s scenario modeling (**Figures 3 and 4**).



**Figure 3:** Interactive Web-Based Map Viewer – Local Projects at C-8 Basin Tab



**Figure 4:** Interactive Web-Based Map Viewer – Local Projects at C-9 Basin Tab

**Tab 5:** The Project Feedback tab (**Figure 5**) includes a link to the Project Form (**Figure 6**) and a map of the projects submitted through the form which updates each time a form is submitted. Using ESRI’s application, Survey123, the team set up a simple form to collect the necessary data shown on previous

tabs. In addition, the form collected contact information in case the consulting team should need further discussion.

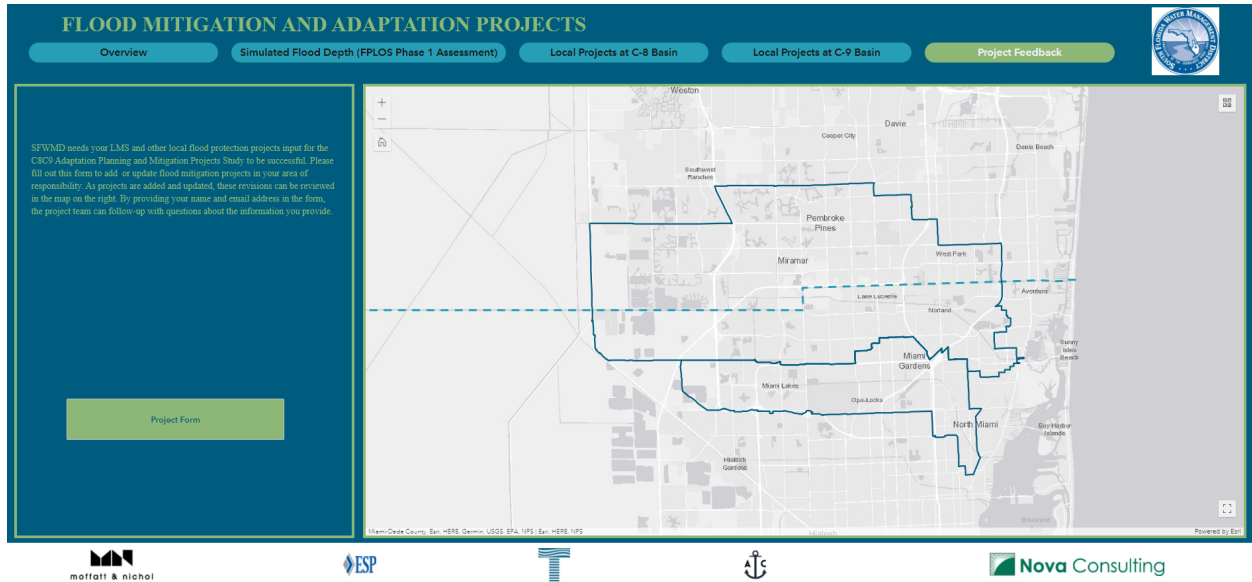


Figure 5: Interactive Web-Based Map Viewer – Project Feedback Tab

Flood Mitigation Projects Survey

**Would you like to add a project or update an existing one?**

Add a project

Update a project

**Please locate the project being submitted**

In the event that the map opens to the southern US; please click the home button to be directed to the project area.

If accurate location is unknown, please create a point in the Atlantic Ocean.

Esp. F&D. 1/044 Powered by [Esri](#)

📍 Lat: 25.97908 Lon: -80.20586

**Name of Project**

**Can you provide construction drawings?**

**Which mitigation strategy does the project use?**

Figure 6: Interactive Web-Based Map Viewer – Project Form Under the Project Feedback Tab



The site provides a simple avenue to share project information and documents. In addition to providing necessary information, the website offers more discretion for mitigation projects which are not yet public. The site hosts the map viewer and relevant project documents, which can be uploaded as needed. The project documents contained on the website will be transferred to the District for possible future hosting on their website at the conclusion of this project.

The team invited partner communities to fill out the Map Viewer questionnaire and submit relevant projects and documents to the website before the workshop. No new projects were received via the Map Viewer website prior to the workshop. An online survey was also deployed prior to the Partner Workshop. The six questions are listed below. The survey received responses from seventeen partners and are included in **Appendix C**.

1. What is your involvement in flood mitigation and adaptation planning?
2. Have you observed significant changes in flooding conditions in the recent 5-10 years? Do you have any documentation?
3. What do you believe are the major limitations of the existing flooding system at C-8 and C-9 Basins? Do you have a plan and preferred actions to address these limitations?
4. How are future conditions (e.g., sea level rise or increased rainfall) considered as part of project planning/design?

## Workshop

### Summary of Partner Workshop

The objective of the Phase II FPLOS studies for the District is to develop adaptation strategies within the basin that mitigate existing and future floodplain challenges in the communities. To that end, after soliciting input to view the web viewer, the District hosted a workshop to encourage dialogues around these mitigation plans with the communities, local, state, and federal government agencies interested in resiliency within the C8 and C9 basins. In addition to encouraging the discussion around mitigation projects, the District asked the partners to submit any projects they thought would benefit the study. The projects suggested during the workshop are listed in **Appendix A**.

The project team developed a list of partners and invited them to a workshop held on August 3, 2021, at Florida International University's Biscayne Bay Campus in North Miami. The meeting agenda is in **Appendix D**.

The main points presented at the workshop included background of flood protection responsibilities, an overview of District water managements systems, sea level rise (SLR) projections, and an introduction to the FPLOS program and its phases. A summary and background of the Phase I project was presented along with its findings, together with the objective of Phase II, which pertains to future land use and mitigation strategies. The importance of the map viewer and pre-workshop feedback was emphasized as critical in filling data gaps to achieve further progress in Phase II.

Topics of discussion raised by community partners included the mechanisms/functions by which water levels are maintained at the canals and at structures; a discussion of whether the influence of storm surge was accounted for in Phase I; and water quality interests, especially in Biscayne Bay. The Phase I

model resolution was also discussed together with the metrics it utilized. More information on these discussions is given in Sections 1 to 5 in the meeting summary included in **Appendix D**.

Following these presentations and discussions, the attendees were broken up into five (5) breakout groups – two (2) in person groups and three (3) virtual groups. The goals of the break-out sessions were as follows:

- Discuss the materials presented prior to the breakout groups (FPLOS Program, C-8/C-9 Phase I results presentation, Phase II Pre-workshop feedback, Map-viewer, etc.)
- To enhance connectivity among the community of practitioners in the C-8/C-9 basins through dialogue
- To share concerns about present and anticipated flooding/drainage problems
- To communicate ideas that the practitioners would like this project to address
- To generate ideas on future projects to be included, how to integrate these ideas into the existing basin configuration, and to develop additional solutions. This includes sharing innovative regulatory/policy ideas associated with planned or existing projects

Each break-out group had a moderator, scribe, and technical assistant that were either District employees or members of the project team. The break-out group instructions that were provided to the moderators are included in **Appendix E**. Following the break-out groups, one (1) member from each group reported out the main topics of their group's discussion. Within the breakout groups, some common points of interest included SLR and climate impact considerations on future projects; water quality considerations; and integration of local and regional projects.

The District, in response to the concerns of community partners, reassured its commitment to coordination efforts across agencies as well as its commitment to current and future system resiliency. It was expressed that flood control considerations are of primary importance, but that water quality improvements can be considered within the framework of successful flood control. In addition to affirming the importance of collaboration and interagency planning in facing flood control issues, partners indicated that there was a lack of awareness about the FPLOS program, and that spreading awareness may help in resolving community partner challenges together with regional flood control challenges.

The workshop concluded with a discussion of the next steps in the FPLOS study. The modeling priorities and the method to categorize projects was introduced and is further discussed in the Post Workshop section of this memorandum. Use of the Dynamic Adaptive Policy Pathways (DAPP) approach in relation to this study was also presented, which aims to support the development of an adaptive plan that is able to deal with conditions of deep uncertainty (e.g., climate change predictions). This approach was developed by Deltares and TU Delft to help specify actions to be taken immediately to be prepared for the near future and actions to be taken now to keep options open to adapt if needed. A monitoring system is used to collect information to get early warning signals (triggers) for implementation of actions or for reassessment of plans. Adaptation pathways are developed that describe a sequence of policy actions or investments in institutions and infrastructure over time to achieve a set of pre-specified objectives (e.g., flood protection) under uncertain and changing conditions (e.g., SLR). An adaptation pathways map (**Figure 7**) provides insight into policy options, the sequencing of actions over time, potential lock-ins, and path dependencies.

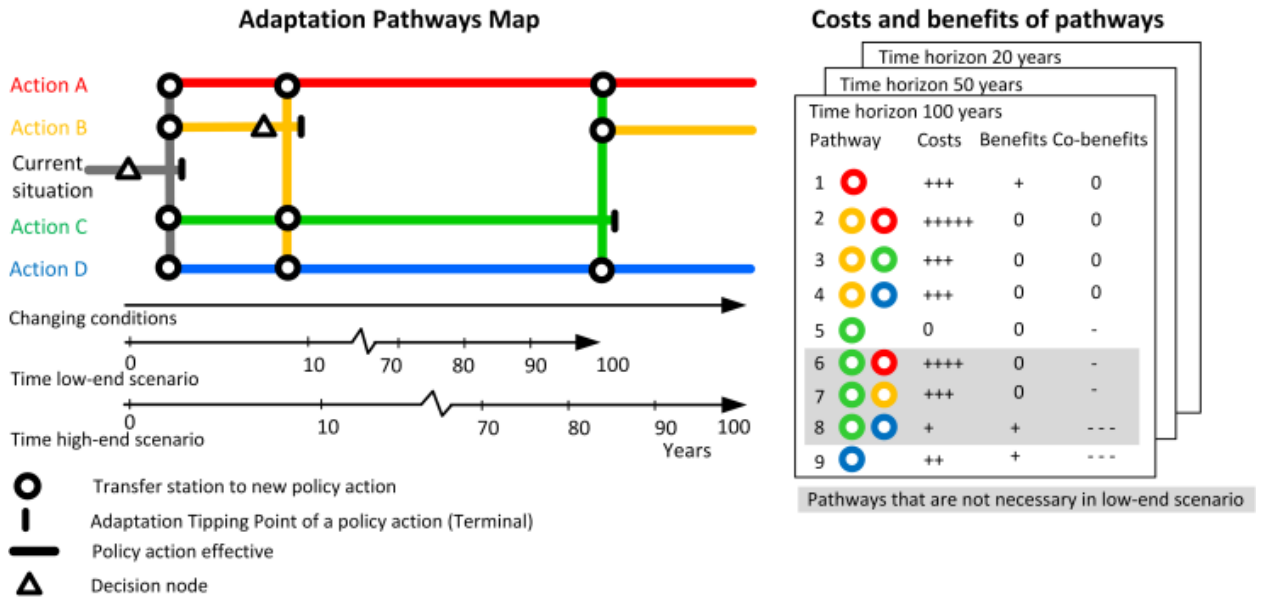


Figure 7: Example Adaptation Pathways Map

The full Workshop PowerPoint Presentation and pictures from the in-person workshop can be found in **Appendix F** and **Appendix G**, respectively. A summary of the workshop feedback from the Consultant/SFWMD team is provided in **Appendix H**.

## Post-Workshop

### Partner and Stakeholder Follow-up

Post-workshop partner and stakeholder meetings took place to follow up on mitigation projects discussed during the workshop. A comprehensive log of these meetings, including dates, involved entities, content, outcomes, and insights can be found in **Appendix E**. The projects suggested during the partner follow-ups are listed in **Appendix A**.

Beginning on 9/14/2021, a request was made to Robin Yang of Miami-Dade County Emergency Management for additional information on the County’s LMS Projects. Requested information includes construction drawings; culvert and gate sizes, dimensions, inverts, geometries, and geocoordinates; trigger elevations for gates and pumps; pump station capacities; and anticipated areas of impact. In response to this request, Robin Yang issued requests (via email) to jurisdictions that had submitted LMS projects, which include Miami Gardens, Miami Shores, North Miami, North Miami Beach, the Miami-Dade Public Works Department, and the Miami-Dade Department of Regulatory and Economic Resources.

On 9/22/2021 a meeting was held with the Miami-Dade County Stormwater Department regarding FEMA and Building Resilient Infrastructure and Communities (BRIC) coordination in the C8 basin. The SFWMD gave an overview of how various projects in these basins fit together within a broader resiliency program. Specific BRIC applications to the C8/C9 FPLOS project were addressed. The County was asked to review the Miami-Dade project list to ensure that all of the County's flood mitigation projects have been included; and to remove those projects that should be, in the County's view, excluded.

A meeting was held on 9/29/2021 with the Miami-Dade County Resiliency team. Topics discussed include the identification of potential distributed storage areas and how modeling efforts can help identify a critical storage threshold that makes more of a difference to the overall system. It was noted that water quality benefits may be derived from a more distributed approach to storage, a point to be revisited in future discussions.

On 10/07/2021, Armando Ramirez of the SFWMD hosted the Seminole Tribe of Florida to introduce the Tribe to the FPLOS. There are no tribal lands in the C8 /C9 basins. However, for future phases of the FPLOS program, there is potential for there to be some lands, potentially around the Hollywood area. The broader program was discussed as well as the C8/C9 workshop. The parties agreed to continue to share information as the FPLOS program develops and to continue to include the Tribe with information and include feedback.

### **Preliminary Project Types and Categorization**

The South Florida flood control system is an interconnected network of canals that drain from third-order systems (roadway swales and stormwater retention ponds) to second-order canals (systems controlled by local drainage districts and counties with pumps and flood control gates) to primary systems (those controlled by large canals and pumpstations maintained by the SFWMD). This system is truly interconnected, and no single piece can function well without the others. For example, an improvement in neighborhood drainage will require a secondary system to handle the additional flow volumes. And that secondary system requires a primary system that can, in turn, absorb the additional flow volumes. This project will assume that this interconnectedness is effectively addressed for each project. However small or large, each project can have a beneficial impact on the local area it serves. The project aims to allow a systematic approach to categorizing the mitigation projects proposed by each partner and allow further evaluation based on flood control and economic impact to the basin.

To categorize the mitigation projects, the team assessed each with respect to its impact to a tertiary, secondary, or primary system. As noted above, every project will, in some way, impact all three systems. But each project has a *primary* benefit, and the team used that benefit to categorize the projects.

The draft project list generated from the initial review of projects and partner input contained projects such as:

- 1.0 Stormwater systems, upgrades, or retrofit
- 2.0 Sluice gates
- 3.0 Pump stations
- 4.0 Seepage berms
- 5.0 Storm surge barriers

- 6.0 Flood criteria maps
- 7.0 Canal bank and roadway improvements
- 8.0 Lake outfall replacement
- 9.0 Basin interconnects

In addition to these projects, the team wanted to evaluate:

- 10.0 Green infrastructure projects downstream of the S-28 and S-29 pumps
- 11.0 Potential surface water storage in upstream areas of the system
- 12.0 Land use and zoning modifications/changes
- 13.0 Buyouts of homes or properties
- 14.0 Potential connection in the basin to move water south, so it discharges in the southern end of Biscayne Bay.

Each of the projects in the collective list (**Appendix A**) will likely have a beneficial impact at reducing flooding in the real-world within the immediate vicinity, with some projects contributing further-reaching impacts. However, in the flood model which will be set up in the next task of this project, a project which is effective in the real-world may show an underestimation of benefits due to the model's scale and design assumptions (i.e., rainfall distribution). The team is developing a scoring system to achieve a better understanding of what the anticipated real-world benefits would be for each project, if any. This scoring system evaluates the flood mitigation efficiencies for each project as well as the scale of the project, such as regional, local, or micro-scale. Use of this scoring allows the consultant and District team to assess which projects to prioritize for inclusion in the flood mitigation scenario models.

## Conclusion

The first stage of this project conducted a desktop exercise to collect mitigation projects identified by the communities within the C8 and C9 basins. The team presented these projects in a website viewer and solicited additional input from the communities. The District hosted a workshop inviting all the partners within the basins to understand more about the FPLOS projects and this Phase II study. In addition, the District asked for additional mitigation projects and the team followed up after the workshop leading further conversations with local and regional partners. These partner follow-up conversations provided clarification and substantiating information to help the team evaluate projects for inclusion in the flood mitigation scenario model.

In Task 2, the team is working with the District to evaluate which of the flood mitigation projects presented in this report will be included in the modeling study of the SFWMD C8 and C9 basins. A scoring system is used to assess the mitigation efficiency of each project in order to understand how effective the project will be at reducing flooding within the system. The scale of each project's benefits is also estimated, such as regional, local or micro. The project team and the District will use the results of the mitigation efficiency scoring and project scale to select which projects will be included in the future modeling runs.

**APPENDIX A: Pre-Workshop, From-Workshop, and Post-Workshop Project Lists**

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Broward	Phase I Report, 5/28	Basin S-5 Sluice Gate		South Broward Drainage District	Drainage				Other
C-9	Miami-Dade	Phase I Report, 5/28	Emergency Discharge Sluice Gate		South Broward Drainage District	Drainage	\$120,000		>12 Months	Future Unfunded Project
C-9	Broward	Phase I Report, 5/28	Encantada Sluice Gate		South Broward Drainage District	Drainage				Other
C-9	Broward	Phase I Report, 5/28	Harbour Lake Estates Sluice Gate		South Broward Drainage District	Drainage				Other
C-9	Broward	Phase I Report, 5/28	Sunset Lakes Sluice Gate		South Broward Drainage District	Drainage				Other
C-9	Miami-Dade	Phase I Report, 5/28	South Broward Drainage District S4/S5 Pump Station	5400 SW 172nd Avenue Miramar, FL 33029	South Broward Drainage District	Drainage		FEMA	<3 Months	Under Construction
C-9	Miami-Dade	MDC_LMS, 6/1	20021 to 20081 NW 13 Ave-Stormwater Drainage Improvements Project	20021-20081 NW 13 Avenue	Miami Gardens	Infrastructure (Water/Sewer/Drainage)		Stormwater Fund	1 Year	Funding Secured
C-9	Miami-Dade	MDC_LMS, 6/1	20601 NW 44 Court-Stormwater Drainage Improvements Project	20601 NW 44 Court	Miami Gardens	Infrastructure (Water/Sewer/Drainage)		Stormwater Fund	1 Year	Funding Secured
C-9	Miami-Dade	MDC_LMS, 6/1	Injection Well Construction	City-wide	North Miami Beach	Infrastructure (Water/Sewer/Drainage)		Capital Improvement Project	FY19-FY21	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	Kings Gardens #3	18605 NW 27 Avenue	Miami Gardens	Infrastructure (Roadway)		Unidentified funding at this time since it is on private property and the City cannot take over the streets due to the streets being part of the property lines.	Over one year	Other

# Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Miami-Dade	MDC_LMS, 6/1	Leslie Estates #4 Road and Drainage Improvements	Leslie Estates #4	Miami Gardens: Public Works	Infrastructure (Water/Sewer/Drainage)	\$1,500,000	Funding will be a combination of CITT, Stormwater, and State Appropriations.	1 Year	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	NE 10th Avenue/NE 159th Street and NMB Boulevard	NE 10th Avenue/NE 159th Street and NMB Boulevard	North Miami Beach	Infrastructure (Roadway)		Capital Improvement Project	FY16 -FY20	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	NE 167 Street and NE 14 Avenue	NE 167 Street and NE 14 Avenue	Miami-Dade County Regulatory and Economic Resources	Infrastructure (Water/Sewer/Drainage)		GOB	2 Years After Project Funding Is Secured	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	Miami-Dade County Regulatory and Economic Resources	Infrastructure (Water/Sewer/Drainage)	\$620,000	SWU	2/5/2022	Funding Secured
C-9	Miami-Dade	MDC_LMS, 6/1	NW 191 Street-196 Terrace, from NW Sunshine State Parkway East to NW 12 Avenue - Drainage Improvement	18605 NW 27 Avenue	Miami Gardens: Public Works	Infrastructure (Water/Sewer/Drainage)	\$350,000	Stormwater Fund	1 Year	Future Unfunded Project
C-9	Miami-Dade	MDC_LMS, 6/1	NW 42 Avenue and NW 167 Terrace	16760 NW 42 AVE	Miami Gardens	Infrastructure (Water/Sewer/Drainage)		Stormwater Fund	1 Year	Funding Secured
C-8	Miami-Dade	MDC_LMS, 6/1	NW 163 Street Drainage Improvement Project	5501 NW 163 ST	Miami Gardens	Infrastructure (Water/Sewer/Drainage)		Stormwater Fund	6 mos to 1 year	Funding Secured
C-8	Miami-Dade	MDC_LMS, 6/1	NW 159 Street Stormwater Drainage Project	5400 NW 159 ST	Miami Gardens	Infrastructure (Water/Sewer/Drainage)		Stormwater Fund	1 Year	Funding Secured
C-8	Miami-Dade	MDC_LMS, 6/1	Drainage Improvements NW 170 St west of 22 Ave	NW 170 Street and NW 22 Avenue	Miami Gardens: Public Works/Private	Infrastructure (Water/Sewer/Drainage)			> 1 year	Project in Planning Stage
C-8	Miami-Dade	MDC_LMS, 6/1	NW 146 St and NW 7 Ave (east end of street)	NW 146 Street and NW 7 Avenue (east end of street)	Miami Dade County Regulatory and Economic Resources	Infrastructure (Water/Sewer/Drainage)		Unknown	2 Years After Project Funding Is Secured	Future Unfunded Project



# Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-8	Miami-Dade	MDC_LMS, 6/1	Biscayne Gardens Community Rating System Site Mitigation	326 NE 152 Street	Miami Dade County Public Works	Infrastructure (Water/Sewer/D rainage)		SWU, CDBG, FEMA (CRS)	2 Years from acquisition of funding	Future Unfunded Project
C-8	Miami-Dade	MDC_LMS, 6/1	105 Street Drainage Pump Station	10050 NE 2nd Avenue	Miami Shores	Infrastructure (Water/Sewer/D rainage)		Potential future funding	Unknown	Future Unfunded Project
C-8	Miami-Dade	MDC_LMS, 6/1	Biscayne Gardens Stormwater Inspection	NE 150 St & Spur Dr	Miami Dade County Regulatory and Economic Resources	Infrastructure (Water/Sewer/D rainage)	\$25,000	SWU	5/4/2021	Funding Secured
C-8	Miami-Dade	MDC_LMS, 6/1	NE 154 Street and NE 5 Court	NE 154 Street and NE 5 Court	Miami Dade County Regulatory and Economic Resources	Infrastructure (Water/Sewer/D rainage)	\$182,000	SWU	8/3/2023	Funding Secured
C-8	Miami-Dade	MDC_LMS, 6/1	Correct Water Infiltration at City Hall (EOC) Basement	776 NE 125 ST	North Miami	Infrastructure (Building)		Potential	6 mos to 1 year	Future Unfunded Project
C-9	Miami-Dade	MDC_LMS, 6/1	Storm Water Pump Replacement Program	City-wide	North Miami Beach	Infrastructure (Water/Sewer/D rainage)		Capital Improvement Project	FY16-FY20	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	Vista Verde Phase #4 - Remaining Phase from Snake Creek Canal to NW 41 Ave Rd Community	18605 NW 27 Avenue	Miami Gardens: Public Works	Infrastructure (Water/Sewer/D rainage)		State, Stormwater, CDBG, CITT through each budget cycle	> than one year	Funding Secured
C-9	Miami-Dade	MDC_LMS, 6/1	Well Field Stormwater System Improvement	City-wide	North Miami Beach	Infrastructure (Water/Sewer/D rainage)		Capital Improvement Project	FY16-FY20	Project in Planning Stage
C-9	Miami-Dade	MDC_LMS, 6/1	West Dixie Highway Drainage Improvements	NE 22 Ave and Dixie Hwy	North Miami Beach: Public Works	Infrastructure (Water/Sewer/D rainage)		Stormwater enterprise fund or grant	June 2023	Project in Planning Stage
C-9	Broward	BC_LMS, 6/7	Enlargement of Silver Lake Control Structure		South Broward Drainage District	Flood control/reduction and waterway management - Potential mitigation project for investigation (from Phase I study)			Unknown	Other

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Broward	BC_LMS, 6/7	Hollywood Arthur and Cleveland Streets Drainage Improvement		Hollywood: Emergency Management Coordinator	Drainage	\$488,000	HMGP/PDM	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Hollywood North Lake Pump Station and Outfalls		Hollywood: Emergency Management Coordinator	Drainage	\$2,234,000	HMGP/PDM	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Hollywood South Lake Pump Station		Hollywood: Emergency Management Coordinator	Drainage	\$2,500,000	HMGP/PDM	<12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Hollywood Sunset Golf Course Pump Station Rehabilitation		Hollywood: Emergency Management Coordinator	Drainage	\$2,166,000	HMGP/PDM	<12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Pembroke Park Carolina Street/Park Road Pump Station		Pembroke Park: Emergency Management Coordinator	Drainage	\$2,785,000	HM, PDM, GF	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Pembroke Park SW 30 Avenue Drainage		Pembroke Park: Emergency Management Coordinator	Drainage	\$590,000	HM, PDM, GF	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Pembroke Park SW 52nd Avenue Drainage		Pembroke Park: Emergency Management Coordinator	Drainage	\$500,000	HM, PDM, GF	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Pembroke Pines Storm Water Project - Lakeside Key Storm Drainage System		Pembroke Pines: Public Services Assistant Director	Drainage Improvement	\$100,000	HMGP	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	Pembroke Pines Storm Water Project - Taft St. and 85th Way Culvert Linings		Pembroke Pines: Public Services Assistant Director	Drainage improvement	\$150,000	HMGP	>12 Months	Unfunded

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Broward	BC_LMS, 6/7	Pembroke Pines Storm Water Project - Taft St. Swale Regrading		Pembroke Pines: Public Services Assistant Director	Drainage Improvement	\$357,500	HMGP	>12 Months	Funding Secured
C-9	Broward	BC_LMS, 6/7	Pembroke Pines Three Basin Interconnect at Century Village Project		Pembroke Pines: Public Services Assistant Director	Drainage Improvement	\$125,000	HMGP	>12 Months	Funding Secured
C-9	Broward	BC_LMS, 6/7	Pembroke Pines West Communities Pump Station		Pembroke Pines: Public Services Assistant Director	Flood Diversion and Storage	\$1,250,000	HMGP, Florida Earmark, Capital Improvement	>12 Months	Funding Secured
C-9	Broward	BC_LMS, 6/7	SBHD Memorial Healthcare System Joe DiMaggio Vertical Expansion Flood Proofing Project		South Broward Hospital District: Safety Director	Flood proofing	\$15,031,781	HMGP	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	South Broward Drainage District Basin 3 Emergency Sluice Gate into the C-9 Canal		South Broward Drainage District	Flood control/reduction and waterway management	\$120,000	Capital Improvement	>12 Months	Future Unfunded Project
C-9	Broward	BC_LMS, 6/7	South Broward Drainage District Maintenance Dredging of Primary and Secondary Canals (Location #1)		South Broward Drainage District	Flood Control/Reduction and Waterway Management	\$300,000	Capital Improvement	>12 Months	Unfunded
C-9	Broward	BC_LMS, 6/7	South Broward Drainage District Maintenance Dredging of Primary and Secondary Canals (Location #2)		South Broward Drainage District	Flood control/reduction and waterway management	\$300,000	Capital Improvement	>12 Months	Future Unfunded Project
C-9	Broward	BC_LMS, 6/7	South Broward Drainage District Maintenance Dredging of Primary and Secondary Canals (Location #3)		South Broward Drainage District	Flood control/reduction and waterway management	\$300,000	Capital Improvement	>12 Months	Unfunded
C-9	Miami-Dade	BC_LMS, 6/7	South Broward Drainage District S.W. 54th Place/S.W. 164th Terrace Culvert Replacement	S.W. 54th Place and S.W. 164th Terrace	South Broward Drainage District	Drainage	\$10,000,000	HMGP/PDM	<12 Months	Unfunded

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Broward	BC_LMS, 6/7	South Broward Drainage District Seepage Management Storm Water Pump Station		South Broward Drainage District	Flood	\$1,250,000	Capital Improvement	>12 Months	Future Unfunded Project
C-9	Broward	BC_LMS, 6/7	West Park Stormwater Vaults along 441/SR7		West Park: Emergency Management Coordinator	Drainage	\$500,000	HM, PDM, GF	>12 Months	Unfunded
C-9	Miami-Dade	MDC_CIP, 6/24	Drainage Improvements Multiple Sites		Miami-Dade County Department of Transportation and Public Works	Stormwater				Under Construction
C-9	Miami-Dade	MDC_CIP, 6/24	NW 178 ST and NW 82 AVE		Miami-Dade County Department of Transportation and Public Works	Stormwater				Under Construction
C-9	Miami-Dade	MDC_CIP, 6/24	NW 57 PL from NW 194 ST to NW 198 TR		Miami-Dade County Department of Transportation and Public Works	Stormwater				Under Construction
C-9	Broward	SBDD, 6/28	Basin S-3 Sluice Gate		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District B-1 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District B-2 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District S-7 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District S-8 Pump Station		South Broward Drainage District	Drainage				Other

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Broward	SBDD, 6/28	South Broward Drainage District S-1 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District S-2 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28	South Broward Drainage District S-3 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/29 & Workshop	Rehabilitation of Triple 96" Culverts (CIPP)		South Broward Drainage District	Drainage	\$450,000	Capital Improvement/Grant	<12 Months	Future Unfunded Project
C-9	Broward	SBDD, 6/29	South Broward Drainage District Basin 3/Basin 7 Interconnect at County Club Ranches		South Broward Drainage District	Drainage	\$75,000	Capital Improvement/Grant	<12 Months	Future Unfunded Project
C-9	Broward	SBDD, 6/29	South Broward Drainage District East By-Pass & Sluice Gate at the S-1 Pump Station		South Broward Drainage District	Drainage	\$100,000	Capital Improvement	>12 Months	Funding Secured
C-9	Miami-Dade	Phase I Report, 7/7	North Lake Belt Storage Area Improvements (western mine pits)		US Army Corps of Engineers & South Florida Water Management District	CERP - Potential mitigation project for investigation (from Phase I study)			Unknown	Other
C-9	Miami-Dade	Phase I Report, 7/7	S-28 downstream of tidal structure - floodwalls and storm surge barriers (USACE Back Bay study)		South Florida Water Management District	Infrastructure (Water/Sewer/Drainage) - Potential mitigation project for investigation (from Phase I study)			Unknown	Other

## Pre-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Miami-Dade	Phase I Report, 7/7	S-28 improvements - pump station, higher platform and gates, tieback, levee and floodwall		South Florida Water Management District	Flood control/reduction and waterway management - Potential mitigation project for investigation (from Phase I study)			Unknown	Other
C-9	Miami-Dade	Phase I Report, 7/7	S-28 raise levees along canal and add operable structures to secondary system (gates/pumps) (Figure 3 from Phase I mitigation memo)		South Florida Water Management District	Infrastructure (Water/Sewer/Drainage) - Potential mitigation project for investigation (from Phase I study)			Unknown	Other
C-8	Miami-Dade	Phase I Report, 7/7	Dredging C-8 Canal		South Florida Water Management District	Capital Improvement - Potential mitigation project for investigation (from Phase I study)			Unknown	Other
C-9	Miami-Dade	Phase I Report, 7/7	S-29 improvements include Oleta River surge barrier, tieback levees, and floodwall		South Florida Water Management District	Infrastructure (Water/Sewer/Drainage) - Potential mitigation project for investigation (from Phase I study)			Unknown	Other

## From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Miami-Dade	Phase I Report, 5/28 & Workshop	South Broward Drainage District S4/S5 Pump Station	5400 SW 172nd Avenue Miramar, FL 33029	South Broward Drainage District	Drainage		FEMA	<3 Months	Under Construction
C-9	Broward	SBDD, 6/28 & Workshop	South Broward Drainage District S-1 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28 & Workshop	South Broward Drainage District S-2 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/28 & Workshop	South Broward Drainage District S-3 Pump Station		South Broward Drainage District	Drainage				Other
C-9	Broward	SBDD, 6/29 & Workshop	Rehabilitation of Triple 96" Culverts (CIPP)		South Broward Drainage District: Director	Drainage	\$450,000	Capital Improvement/Grant	<12 Months	Future Unfunded Project
C-9	Broward	SBDD, 6/29 & Workshop	South Broward Drainage District Basin 3/Basin 7 Interconnect at County Club Ranches		South Broward Drainage District: Director	Drainage	\$75,000	Capital Improvement/Grant	<12 Months	Future Unfunded Project
C-9	Broward	SBDD, 6/29 & Workshop	South Broward Drainage District East By-Pass & Sluice Gate at the S-1 Pump Station		South Broward Drainage District: Director	Drainage	\$100,000	Capital Improvement	>12 Months	Funding Secured
C-9	Miami-Dade	Phase I Report, 7/7 & Workshop	S-29 improvements include Oleta River surge barrier, tieback levees, and floodwall		South Florida Water Management District	Infrastructure (Water/Sewer/Drainage) - Potential mitigation project for investigation (from Phase I study)			Unknown	Other
C-9	Broward	Workshop, 8/3	C-9 Impoundment: Seepage Management		South Broward Drainage District	Drainage				Other
C-9	Miami-Dade	Workshop, 8/3	Drainage Improvements for Eastern Shores	Eastern Shores	Judeen Johnson	Drainage				Other

## From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-9	Miami-Dade	Workshop, 8/3	Outfall Replacement at Pickwick Lake		Judeen Johnson	Pickwick Lake outfall replacement project that may change flow in the eastern lakes.				Other
C-8	Miami-Dade	Workshop, 8/3	Bank stabilization proposed on Marco Canal		Leslie Pettit - Miami Gardens	Drainage; Bank stabilization of canals/concrete mattresses. Raise bank heights ~1.5'. There are issues with property owner buy in. Raising banks impacts drainage on adjacent properties. Sediment buildup due to erosion of banks is an issue.				Other
C-8	Miami-Dade	Workshop, 8/3	C-8 Spur Canal Non-structural Flooding Solutions		Miami-Dade County: Katherine Hagemann	Flood control/reduction and waterway management; Elevating low-lying areas Multiple flooding complaints outstanding				Other
C-8	Miami-Dade	Workshop, 8/3	Miami Dade County Flood Criteria Map		Amy Cook	Updating and improving Flood Criteria Map for Miami Dade County				Other



## From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-8	Miami-Dade	Workshop, 8/3	Retrofit the Control Structure to Block Surge		Miami-Dade County: Katherine Hagemann	Flood control/reduction and waterway management; System where gate can be closed and keep surge from going upstream. Currently, the gates are open as a hurricane approaches. SFWMD S-28 Tie in to high ground likely necessary. There is high ground nearby.				Other
C-9	Broward	Workshop, 8/3	Stormwater Master Plan		Jeff Jiang	Completed by CDM Smith				Other
	Miami-Dade	Workshop, 8/3	Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER); BBSEER project		Table 1 and Table 2	Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER); BBSEER project, a federal/regional collaborating project, is proposing a conveyance route to send water from north to south, such as Model Land				

## From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
	Miami-Dade	Workshop, 8/3	Add cut-off wall at impoundment to address seepage issues		Table 1	Add cut-off wall at impoundment. a. Introduce water quality features/components into the pumps. b. Add living shorelines				
	Miami-Dade	Workshop, 8/3	Make sure to consider different perspectives, such as insurance and land use issues		Table 1	Make sure to consider different perspectives, such as insurance and land use issues				
C-8	Miami-Dade	Workshop, 8/3	Canal bank improvement and roadway improvement planned in C8 Basin		Table 2	Canal bank improvement and roadway improvement planned in C8 Basin				
C-9	Miami-Dade	Workshop, 8/3	Lake Belt Storage project		Table 2	Lake Belt Storage project, high conductivity can be a concern. Need more details about this project				

# From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
N/A	Miami-Dade	Workshop, 8/3	Good Neighbor Stormwater Park project, City of North Miami		Table 2	Good Neighbor Stormwater Park project, City of North Miami, combines a community park with local flood prevention, addressing repetitive loss properties, bringing awareness of flooding and climate impacts to community, also used for native planting.				
		Workshop, 8/3	An ongoing project to alleviate low-lying area flooding along A1A		James Poole, FDOT, james.poole@dot.state.fl.us	An ongoing project to alleviate low-lying area flooding along A1A. This project involves the operation of small pump stations. Discharges will not exceed pre-project conditions and consideration is being given to WC issues.				

## From-Workshop Project List

Basin	County	Source, Date Added	Project Name	Project Location	Responsible Agency	Project Type	Cost	Potential Funding Source(s)	Time Frame	Funding Status
C-8	Miami-Dade	Workshop, 8/3	Regarding the C8 Canal & S28 Structure		Miami-Dade County: Katherine Hagemann	Regarding the C8 Canal & S28 Structure, asked if the gates can be closed as storm approaches. Can the gates be tied by structural modification to higher ground (e.g., the Railroad embankment)?				
C-9	Broward	Workshop, 8/3	Add the conveyance between C9 and C11		SBDD, Kevin Hart	SBDD provided some facts to support this idea.				

## Post-Workshop Project List

Basin	County	Source, Date Added	Project Name/Description	Project Limits	Cost Estimate	Funding Year	Funding Status	Project Status	System
C-9 WEST	Miami-Dade	Alberto Pisani, 10/1	Ditch Planned Project improvements	Golden Glades (NW 170 St from NW 117 Ave to NW 137 Ave)	\$2,608,315		Unfunded	Survey, Design, & Construction needed	Secondary
C-8	Miami-Dade	Alberto Pisani, 10/1	Ditch Planned Project NW 107 Ave Canal improvements	NW 107 Ave canal improvements NW 107 Ave Between NW 138 St and NW 170 St	\$2,622,852	FY19-20	Funded - SWU	Design/Build	Secondary
C-9	Miami-Dade	Alberto Pisani, 10/1	NE 179 Street from NW Miami Court to End of Road Drainage Improvements Project	NE 179 Street from NW Miami Court to End of Road and NE 1 Court from NE 179 Street to NE 181 Street and NE 181 Street from NE 1 Court to End of Road.	\$788,357	FY19-20	Funded - SWU	Design	Tertiary
C-8	Miami-Dade	Alberto Pisani, 10/1	Ditch Planned Project NW 97 Ave Canal Improvements	NW 97 Ave Canal improvements - NW 97 Ave between NW 138 St and NW 170 St	\$1,100,000		Unfunded	Survey, Design, & Construction needed	Secondary
C-9 WEST, C-8	Miami-Dade	Alberto Pisani, 10/1	Secondary Canal Planned Project improvements	Golden Glades Canal Cross Section Improvements (from NW 82 Ave to NW 87 Ave)	\$702,000		Unfunded	Survey, Design, & Construction needed	Secondary
C-8	Miami-Dade	Alberto Pisani, 10/1	General drainage improvements	NE 4th Ave and NE 139 St	\$811,000		Unfunded	Survey, Design, & Construction needed	Tertiary

## Post-Workshop Project List

Basin	County	Source, Date Added	Project Name/Description	Project Limits	Cost Estimate	Funding Year	Funding Status	Project Status	System
C-9 WEST, C-8	Miami-Dade	Alberto Pisani, 10/1	Secondary Canal Planned Project improvements	Golden Glades Canal Cross Section Improvements (from NW 77 Ct to NW 82 Ave)	\$676,000		Unfunded	Survey, Design, & Construction needed	Secondary
C-9	Miami-Dade	Alberto Pisani, 10/1	945 NE 207 TER	NE 9 Place from NE 207 Terrace to NE 205 Street, NE 205 Street from NE 8 Court to NE 9 Place, NE 8 Court from NE 205 Street to NE 205 Terrace	\$669,620	FY19-20	Funded - SWU	Construction	Tertiary
C-9	Miami-Dade	Alberto Pisani, 10/1	Mitigation of Repetitive losses and flood complaints	Phase 3: NE 195 Terrace from NE 18 AVE to NE 22 Rd.	\$639,721	FY 18-19	Funded - SWU		Tertiary
C-9	Miami-Dade	Alberto Pisani, 10/1	Coventry Drainage Improvements-NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	\$620,000	FY20-21	Funded - SWU	60% Design	Tertiary
C-9W	Miami-Dade	Alberto Pisani, 10/1	Ditch Planned Project (No canal reservation exists, land acquisition may be required)	NW 127 Ave from NW 202 St to NW 186 St	\$579,296		Unfunded	Survey, Design, & Construction needed	Secondary
C-9	Miami-Dade	Alberto Pisani, 10/1	NW 57 Avenue and NW 186 Street 3-54" Culvert Repair	Culvert is located on NW 186 Street west of NW 57 Avenue	\$455,000	FY20-21	Funded - SWU	Bidding	Secondary
C-9 WEST, C-8	Miami-Dade	Alberto Pisani, 10/1	General drainage improvements and mitigation of repetitive losses and flood complaints	NW 169 Terr to NW 170 St between NW 87 Ave and I-75 Ext	\$217,000		Unfunded	Survey, Design, & Construction needed	Tertiary

## Post-Workshop Project List

Basin	County	Source, Date Added	Project Name/Description	Project Limits	Cost Estimate	Funding Year	Funding Status	Project Status	System
C-9 WEST, C-8	Miami-Dade	Alberto Pisani, 10/1	Secondary Canal Planned Project improvements	Golden Glades Canal Cross Section Improvements (from NW 767 Ave to NW 77 Ct)	\$0		Unfunded	Survey, Design, & Construction needed	Secondary
C-8	Miami-Dade	FDOT, 10/14	Golden Glades Interchange Enhancement	Golden Glades Interchange from SR 826/Palmetto Expwy to I-95	\$600,000,000	TBD	Federal Funding	~60% Design, has SFWMD Conceptual Permit	

## **APPENDIX B: Partner/Stakeholder Meeting Notes**



Date/Date Initiated	Purpose	Partner Agency	Partners in Attendance/ Correspondence	Project Team	Notes	Additional Information
9/14/2021	Miami-Dade LMS Projects: Request for additional information	Miami-Dade County Emergency Management	Robin Yang	Patrick Lawson (Lead) Others on email chain	<p>Patrick getting additional technical information for projects included in LMS list. Generally requesting:</p> <ol style="list-style-type: none"> <li>1. Construction Drawings</li> <li>2. Culvert and gates: sizes, dimensions, inverts, geometry and locations</li> <li>3. Trigger elevations for gates and pumps</li> <li>4. Pump station capacity (CFS)</li> <li>5. Anticipated area of impact</li> </ol> <p><b>09/16/2021:</b> Robin Yang sent email requests to jurisdictions that had submitted projects to LMS. Email went to: Miami Gardens Miami Shores North Miami North Miami Beach Miami-Dade Public Works Miami-Dade Regulatory and Economic Resources</p> <p><b>09/23/2021:</b> Robin sent reminder</p>	<p><b>Miami Gardens</b> Leslie (Les) Pettit lpettit@miamigardens-fl.gov; Bernard Buxton-Tetteh bbuxton-tetteh@miamigardens-fl.gov; Mike Gambino (Miami Gardens) (risingwatersconsulting@gmail.com);</p> <p><b>Miami Shores</b> Scott Davis daviss@msvfl.gov; Chris Miranda mirandac@msvfl.gov; Esmond Scott scotte@msvfl.gov;</p> <p><b>North Miami</b> Wisler Pierre-Louis pwisler@northmiamifl.gov; Thomas Positano tpositano@northmiamifl.gov; Chuks Okereke cokereke@northmiamifl.gov;</p> <p><b>North Miami Beach</b> Ana.Parada@citynmb.com; Tobias,Chidi Chidi.Tobias@citynmb.com; Proffitt, Justin Justin.Proffitt@citynmb.com;</p> <p><b>Miami-Dade Public Works</b> Hildoer, Daryl (DTPW) Daryl.Hildoer@miamidade.gov; Herrera, Liza (DTPW) Liza.Herrera@miamidade.gov; barria@miamidade.gov</p> <p><b>Miami-Dade Regulatory and Economic Resources</b> Dwyer, Cindy (RER) Cindy.Dwyer@miamidade.gov; Brown, Kimberly (RER) Kimberly.Brown@miamidade.gov; Blanco-Pape, Marina (RER) Marina.Blanco-Pape@miamidade.gov; Steelman, Marcia (RER) Marcia.Steelman@miamidade.gov</p>

Date/Date Initiated	Purpose	Partner Agency	Partners in Attendance/ Correspondence	Project Team	Notes	Additional Information
9/17/2021	FPLOS intro: Tribe was not able to make workshop	Seminole Tribe of Florida	Jill Horwitz Alfonso Tigertail Kevin Cunniff Whitney Sapienza Christopher Murphy Stacy Myers	Carolina Maran Hongying Zhao Akin Owosina Armando Ramirez Armando Villaboy Bryan Palacio Michael DelCharco Angela Schedel Joe Wilder Lynette Cardoch	09/17: Carolina requested Tribe availability. 09/20: Jill sent proposed times. Need to confirm if a time was selected.  <b>10/07/2021: Meeting held with the Tribe, with meeting hosted by Armando Ramirez (SFWMD)</b>	
9/22/2021	C8 Basin FEMA BRIC Coordination	Miami-Dade County Stormwater	Alberto Pisani Marcia Steelman	Carolina Maran David Colangelo Hongying Zhao Angela Schedel Lynette Cardoch	Marina Blanco-Pape (invited) SFWMD gave overview of how the various projects fit together--broader resiliency program, FPLOS C8/C9 project, and specific BRIC applications. <b>ACTION:</b> <b>Miami- Dade to review Miami-Dade project list.</b> Angela sent Project List via email 09/22/2021. With specific language: <i>While reviewing it, the FPLOS project team needs the following information:</i> <i>1)Are all of the County's flood mitigation projects identified on this list? If one is missing, please add it.</i> <i>2)Is there a project on the list that should not be included?</i> <i>3)Keep in mind that we will be asking the responsible agency for additional technical details about each project to help us determine the specifics needed for inclusion in the C8C9 basin FPLOS model.</i>	

Date/Date Initiated	Purpose	Partner Agency	Partners in Attendance/ Correspondence	Project Team	Notes	Additional Information
9/27/2021	Hollywood Drainage Projects	City of Hollywood			<p>09/27/2021: Lynette to ring Hollywood for potential meeting times.</p> <p>10/11/2021 Carolina Maran followed up with email requesting time.</p>	
9/28/2021	SBDD Project List	South Broward Drainage District	Kevin Hart	Joseph Wilder	<p>The SBDD provided information regarding the purpose and status of projects within the C8/C9 basin. Topics discussed include the following.</p> <ul style="list-style-type: none"> <li>•Enlargement of the Silver Lake control structure</li> <li>•Basin S-5 emergency sluice gate</li> <li>•Sluice gate at Encantada, Harbour Lake, and Sunset Lake</li> <li>•Basin S-3 emergency sluice gate</li> <li>•S-1, S-2, S-4/5, S-7 pump stations</li> <li>•B-1 and B-2 pump stations</li> <li>•Basin 3/ Basin 7 interconnect</li> <li>•East by-pass and sluice gate at the S-1 pump station</li> </ul>	

Date/Date Initiated	Purpose	Partner Agency	Partners in Attendance/ Correspondence	Project Team	Notes	Additional Information
10/14/2021	FDOT Golden Glades Interchange Project Information	FDOT District 6	Amanda Montgomery	Angela Schedel	<p>Emailed Jennifer Carver and Jennifer Green at FDOT. They forwarded the email to the District 6 Drainage Engineer, who forwarded my request to their environmental permits contractor, Amanda Montgomery. Amanda called Angela to discuss the extent, schedule, cost, and potential drainage changes to the area affected by the FDOT Golden Glades Interchange project. She shared information about the permits and emails for the FDOT District 6 Drainage Engineer, Stantec modelers, and EOR's for the project. Email with info about this project sent to SFWMD.</p>	

# Log Item 1: Miami-Dade County LMS Projects - Request for Information

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**From:** Chris Miranda <MirandaC@msvfl.gov>  
**Sent:** Friday, September 17, 2021 10:48 AM  
**To:** Yang, Robin (MDFR)  
**Cc:** Patrick Lawson; Michael DelCharco; Joseph Wilder; Esmond K. Scott  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information  
**Attachments:** Figure1.pdf

Good morning,

Here are the responses to the questions asked:

1. Construction Drawings – Working on schematic plans now. Should be completed within 2 weeks. 60% design to follow approximately 2 months after schematic design.
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations – To be determined upon completion of 60% design
3. Trigger elevations for gates and pumps – To be determined upon completion of 60% design
4. Pump station capacity (CFS) – To be determined upon completion of 60% design
5. Anticipated area of impact – Shores Estates Neighborhood (see attached map)

If you need anything additional just let me know.

*Thank You and Stay Healthy,*  
**Chris Miranda**  
*Director*  
*Miami Shores Village*  
*Public Works*  
*10050 NE 2<sup>nd</sup> Avenue*  
*Miami Shores, FL 33138*  
*(305) 795-2210; Fax (305) 795-2213*  
[mirandac@msvfl.gov](mailto:mirandac@msvfl.gov)

---

**From:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Sent:** Thursday, September 16, 2021 4:29 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Cc:** Patrick Lawson <plawson@taylorengeering.com>; Michael DelCharco <mdelcharco@taylorengeering.com>; Joseph Wilder <jwilder@taylorengeering.com>  
**Subject:** Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

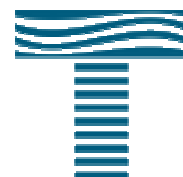
1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1326

[www.taylorengeering.com](http://www.taylorengeering.com)

Destin | Jacksonville | Sarasota | Tampa

Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
**"Delivering Excellence Every Day"**

---

**From:** Patrick Lawson  
**Sent:** Monday, September 20, 2021 2:00 PM  
**To:** Herrera, Liza (DTPW); Yang, Robin (MDFR); Blanco-Pape, Marina (RER)  
**Cc:** Molina, Maria (DTPW)  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Thank you very much, Ms. Herrera!

**Patrick Lawson, GISP, CFM** | **Director of Geospatial Science**  
Main: 904-731-7040 | Direct: 904-256-1326

---

**From:** Herrera, Liza (DTPW) <Liza.Herrera@miamidade.gov>  
**Sent:** Monday, September 20, 2021 1:37 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>; Blanco-Pape, Marina (RER) <Marina.Blanco-Pape@miamidade.gov>  
**Cc:** Patrick Lawson <plawson@taylorengeering.com>; Molina, Maria (DTPW) <Maria.Molina@miamidade.gov>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Good Afternoon,  
Please see attached the as built drawings and design plans for the projects requested:

- Coventry-NE 197 Terrace and NE 17 Avenue, currently under design attached are 90% design plans.
- CRS North-As built attached
- NE 167 Street from NE 14 Avenue to 13 Avenue - As built attached
- NW 146 Street and NW 7 Avenue (east end of street)- has not been designed.

Regards,

**Liza Herrera, P.E., ENV SP**  
**Manager, Stormwater Drainage Design Section**  
Roadway Engineering and Right-of-Way Division  
Miami-Dade County Department of Transportation and Public Works  
305-375-4526 Phone  
305-375-4969 Fax  
[herrel@miamidade.gov](mailto:herrel@miamidade.gov)  
*"Delivering Excellence Every Day"*

---

**From:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Sent:** Friday, September 17, 2021 2:10 PM  
**To:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Hello Liza and Marina,

Thank you for the update.

Have a great weekend!

**Robin Yang**  
**EM Planner, Office of Emergency Management**

**Miami-Dade Fire Rescue**  
 Office: 305-468-5427  
 e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
 "Delivering Excellence Every Day"



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**From:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>  
**Sent:** Thursday, September 16, 2021 5:09 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** FW: Miami-Dade County LMS Projects - Request for information

Robin,

Of the five stormwater projects included in the selected for the study, four are funded and in different stages of development. Liza Herrera, will provide the requested information for those projects.

The fifth project (address: NE 150 St & Spur Dr, FID: 1190) is in our unfunded list of projects. Therefore, we do not have the information requested at this time.

Regards,

Liza, for the four funded projects below, please provide the information requested. Thank you. Regards,

2015-60		6036	20190096	NW 146 Street and NW 7 Avenue (east end of street)	NW 146 Street and NW 7 Avenue (east end of street)	Wait updated from Alex Barrios	C-8	SPUR1-E-1,I95-1C8,7AV-1	C-8	2
	CPE316PWDRNG	7927	20140177	NE 167 Street from NE 14 Avenue to 13 Avenue	NE 167 Street & NE 14 Avenue	SWU	C-9	C9-S-43	C9-E	4
2014-41_1	CPE316RDD029	200		CRS North Mitigation of Repetitive Losses	NE 154 ST FROM NE 7 AVE TO NE 8 AVE NE 151 ST FROM NE 6 PL TO NE 8 AVE NE 154 ST AND NE 150 ST FROM NE 5 AVE TO NE 6 AVE	SWU fee increase (FY18-19)towards this project.	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	SPUR4-W-2,SPUR-4	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	2,3,4
2020-844	CPE316RDD059			NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	SWU	C9-E	COVENTRY	C9-E	4

**From:** [Yang, Robin \(MDFR\)](mailto:Robin.Yang@miamidade.gov)  
**Sent:** Thursday, September 16, 2021 4:28 PM  
**To:** [Yang, Robin \(MDFR\)](mailto:Robin.Yang@miamidade.gov)  
**Cc:** [Patrick Lawson](mailto:Patrick.Lawson@miamidade.gov); [Michael DelCharco](mailto:Michael.DelCharco@miamidade.gov); [Joseph Wilder](mailto:Joseph.Wilder@miamidade.gov)  
**Subject:** Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1326

[www.taylorengeering.com](http://www.taylorengeering.com)

Destin | Jacksonville | Sarasota | Tampa

Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**

Office: 305-468-5427

e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)

[www.miamidade.gov/oem](http://www.miamidade.gov/oem)

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**From:** Patrick Lawson  
**Sent:** Monday, September 20, 2021 10:48 AM  
**To:** Yang, Robin (MDFR)  
**Cc:** Michael DelCharco; Joseph Wilder  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Thanks so much, Robin!

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**  
 Main: 904-731-7040 | Direct: 904-256-1326

**From:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Sent:** Friday, September 17, 2021 2:12 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Cc:** Patrick Lawson <plawson@taylorengeering.com>; Michael DelCharco <mdelcharco@taylorengeering.com>; Joseph Wilder <jwilder@taylorengeering.com>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Hi all,

Our RER department provided the following update:

Of the five stormwater projects included in the selected for the study, four are funded and in different stages of development. RER, will provide the requested information for those projects.

The fifth project (address: NE 150 St & Spur Dr, FID: 1190) is in our unfunded list of projects. Therefore, they do not have the information requested at this time.

RER will be providing the information requested for the projects listed below:

2015-60		6036	20190096	NW 146 Street and NW 7 Avenue (east end of street)	NW 146 Street and NW 7 Avenue (east end of street)	Wait updated from Alex Barrios	C-8	SPUR1-E-1,I95-1C8,7AV-1	C-8	2
	CPE316PWDRNG	7927	20140177	NE 167 Street from NE 14 Avenue to 13 Avenue	NE 167 Street & NE 14 Avenue	SWU	C-9	C9-S-43	C9-E	4
2014-41_1	CPE316RDD029	200		CRS North Mitigation of Repetitive Losses	NE 154 ST FROM NE 7 AVE TO NE 8 AVE NE 151 ST FROM NE 6 PL TO NE 8 AVE NE 154 ST AND NE 150 ST FROM NE 5 AVE TO NE 6 AVE	SWU fee increase (FY18-19)towards this project.	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	SPUR4-W-2,SPUR-4	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	2,3,4
2020-844	CPE316RDD059			NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	SWU	C9-E	COVENTRY	C9-E	4

Regards,

**Robin Yang**  
 EM Planner, Office of Emergency Management  
 Miami-Dade Fire Rescue

Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
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**From:** Yang, Robin (MDFR)  
**Sent:** Thursday, September 16, 2021 4:29 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Cc:** Patrick Lawson <[plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)>; Michael DelCharco <[mdelcharco@taylorengeering.com](mailto:mdelcharco@taylorengeering.com)>; Joseph Wilder <[jwilder@taylorengeering.com](mailto:jwilder@taylorengeering.com)>  
**Subject:** Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256  
Main: 904-731-7040 | Direct: 904-256-1326  
[www.taylorengeering.com](http://www.taylorengeering.com)  
Destin | Jacksonville | Sarasota | Tampa

Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
"Delivering Excellence Every Day"

---

**From:** Tobias,Chidi <Chidi.Tobias@citynmb.com>  
**Sent:** Tuesday, September 21, 2021 4:28 PM  
**To:** Patrick Lawson  
**Cc:** Johnson, Judeen; Adediran, Emmanuel; Christian,Gregory; Yang, Robin (MDFR); Parada,Ana C.  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information  
**Attachments:** PUMP STATION ASBUILT 2020 PDF BINDER rev 07-24-20.pdf; Pump Controls.docx

Good day,

As requested, information for the Pump Station on West Dixie Highway is attached.

The station is capable of managing 9,875 gallons per minute (22 cfs) and is designed for a 25-year 3 day storm.

Regards,



**D. Chidi Tobias** | *Fields Division Manager*

City of North Miami Beach

Public Works Department

T (305) 948-2904, ext. 4115

---

1965 NE 151<sup>st</sup> Street, North Miami Beach, FL 33162 | [www.citynmb.com](http://www.citynmb.com) | City NMB on Social Media:   

---

**From:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Sent:** Thursday, September 16, 2021 4:29 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Cc:** Patrick Lawson <plawson@taylorengeering.com>; Michael DelCharco <mdelcharco@taylorengeering.com>; Joseph Wilder <jwilder@taylorengeering.com>  
**Subject:** Miami-Dade County LMS Projects - Request for information

**[EXTERNAL]** This email originated from outside the organization.  
Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon LMS partners,

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**Patrick Lawson, GISP, CFM** | **Director of Geospatial Science**

 **Taylor Engineering, Inc.**  
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Main: 904-731-7040 | Direct: 904-256-1326  
[www.taylorengeering.com](http://www.taylorengeering.com)  
Destin | Jacksonville | Sarasota | Tampa

Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
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---

**From:** Patrick Lawson  
**Sent:** Thursday, September 23, 2021 2:33 PM  
**To:** Herrera, Liza (DTPW); Yang, Robin (MDFR); Blanco-Pape, Marina (RER)  
**Cc:** Molina, Maria (DTPW); Stephanie Massey; Angela Schedel; Michael DelCharco; Joseph Wilder  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Good afternoon Ms. Herrera,

The Miami-Dade LMS records do not show a project at CRS North (NE 154th ST/7<sup>th</sup> Avenue). We can add this to our list of potential mitigation projects but will most likely request additional information.

Do you have any information about the nearby project at NE 154 Street and NE 5 Court?

Thank you!

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**  
Main: 904-731-7040 | Direct: 904-256-1326

---

**From:** Herrera, Liza (DTPW) <Liza.Herrera@miamidade.gov>  
**Sent:** Monday, September 20, 2021 1:37 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>; Blanco-Pape, Marina (RER) <Marina.Blanco-Pape@miamidade.gov>  
**Cc:** Patrick Lawson <plawson@taylorengeering.com>; Molina, Maria (DTPW) <Maria.Molina@miamidade.gov>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Good Afternoon,  
Please see attached the as built drawings and design plans for the projects requested:

- Coventry-NE 197 Terrace and NE 17 Avenue, currently under design attached are 90% design plans.
- CRS North-As built attached
- NE 167 Street from NE 14 Avenue to 13 Avenue - As built attached
- NW 146 Street and NW 7 Avenue (east end of street)- has not been designed.

Regards,

**Liza Herrera, P.E., ENV SP**  
Manager, Stormwater Drainage Design Section  
Roadway Engineering and Right-of-Way Division  
Miami-Dade County Department of Transportation and Public Works  
305-375-4526 Phone  
305-375-4969 Fax  
[herrel@miamidade.gov](mailto:herrel@miamidade.gov)  
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---

**From:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Sent:** Friday, September 17, 2021 2:10 PM  
**To:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Hello Liza and Marina,

Thank you for the update.

Have a great weekend!

**Robin Yang**  
EM Planner, Office of Emergency Management  
Miami-Dade Fire Rescue  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
"Delivering Excellence Every Day"



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**From:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>  
**Sent:** Thursday, September 16, 2021 5:09 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** FW: Miami-Dade County LMS Projects - Request for information

Robin,

Of the five stormwater projects included in the selected for the study, four are funded and in different stages of development. Liza Herrera, will provide the requested information for those projects.

The fifth project (address: NE 150 St & Spur Dr, FID: 1190) is in our unfunded list of projects. Therefore, we do not have the information requested at this time.

Regards,

Liza, for the four funded projects below, please provide the information requested. Thank you. Regards,

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	CPE316PWDRNG	7927	20140177	NE 167 Street from NE 14 Avenue to 13 Avenue	NE 167 Street & NE 14 Avenue	SWU	C-9	C9-S-43	C9-E	4
2014-41_1	CPE316RDD029	200		CRS North Mitigation of Repetitive Losses	NE 154 ST FROM NE 7 AVE TO NE 8 AVE NE 151 ST FROM NE 6 PL TO NE 8 AVE NE 154 ST AND NE 150 ST FROM NE 5 AVE TO NE 6 AVE	SWU fee increase (FY18-19)towards this project.	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	SPUR4-W-2,SPUR-4	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	2,3,4
2020-844	CPE316RDD059			NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	SWU	C9-E	COVENTRY	C9-E	4

**From:** [Yang, Robin \(MDFR\)](mailto:Yang, Robin (MDFR))  
**Sent:** Thursday, September 16, 2021 4:28 PM  
**To:** [Yang, Robin \(MDFR\)](mailto:Yang, Robin (MDFR))

Cc: [Patrick Lawson](#); [Michael DelCharco](#); [Joseph Wilder](#)

Subject: Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1326

[www.taylorengeering.com](http://www.taylorengeering.com)

Destin | Jacksonville | Sarasota | Tampa

Thank you,

**Robin Yang**

**EM Planner, Office of Emergency Management**

**Miami-Dade Fire Rescue**

Office: 305-468-5427

e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)

[www.miamidade.gov/oem](http://www.miamidade.gov/oem)

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---

**From:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Sent:** Thursday, September 23, 2021 4:54 PM  
**To:** Patrick Lawson  
**Cc:** Michael DelCharco; Joseph Wilder; Angela Schedel  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information  
**Attachments:** RE: Miami-Dade County LMS Projects - Request for information

Hi Patrick,

I reached out to all the points of contact for LMS for the agencies listed in the excel sheet with project you provided:

Miami Gardens  
Miami Shores  
North Miami  
North Miami Beach  
Public Works  
Regulatory and Economic Resources

I've attached the email I sent out... I believe you should be able to see the BCC line this way.

Regards,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
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---

**From:** Patrick Lawson <plawson@taylorengeering.com>  
**Sent:** Thursday, September 23, 2021 4:29 PM  
**To:** Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>  
**Cc:** Michael DelCharco <mdelcharco@taylorengeering.com>; Joseph Wilder <jwilder@taylorengeering.com>; Angela Schedel <aschedel@taylorengeering.com>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

EMAIL RECEIVED FROM EXTERNAL SOURCE

Thanks for sending the reminder, Robin!

Would you mind sharing the list of partners that you reached out to? We'd like to document who we've requested data from.

Happy Thursday!

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**  
Main: 904-731-7040 | Direct: 904-256-1326

---

**From:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Sent:** Thursday, September 23, 2021 4:15 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Cc:** Patrick Lawson <[plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)>; Michael DelCharco <[mdelcharco@taylorengeering.com](mailto:mdelcharco@taylorengeering.com)>; Joseph Wilder <[jwilder@taylorengeering.com](mailto:jwilder@taylorengeering.com)>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

Please see the information request below regarding your LMS flood related projects. Some of you have not yet responded to the request. Please provide a response as soon as possible so this study may be as accurate as possible.

Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
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---

**From:** Yang, Robin (MDFR)  
**Sent:** Thursday, September 16, 2021 4:29 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Cc:** Patrick Lawson <[plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)>; Michael DelCharco <[mdelcharco@taylorengeering.com](mailto:mdelcharco@taylorengeering.com)>; Joseph Wilder

<[jwilder@taylorengeering.com](mailto:jwilder@taylorengeering.com)>

**Subject:** Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

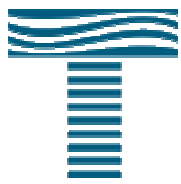
1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1326

[www.taylorengeering.com](http://www.taylorengeering.com)

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Thank you,

**Robin Yang**  
**EM Planner, Office of Emergency Management**  
**Miami-Dade Fire Rescue**

Office: 305-468-5427

e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)

[www.miamidade.gov/oem](http://www.miamidade.gov/oem)

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---

**From:** Herrera, Liza (DTPW) <Liza.Herrera@miamidade.gov>  
**Sent:** Friday, September 24, 2021 12:24 PM  
**To:** Patrick Lawson; Yang, Robin (MDFR); Blanco-Pape, Marina (RER)  
**Cc:** Molina, Maria (DTPW); Stephanie Massey; Angela Schedel; Michael DelCharco; Joseph Wilder  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information  
**Attachments:** FINAL PLANS UPDATE NE 154 ST-5 AVE to 5 CT.pdf

Good afternoon Patrick,  
See attached plans for the area requested.

Regards,

**Liza Herrera, P.E., ENV SP**  
Manager, Stormwater Drainage Design Section  
Roadway Engineering and Right-of-Way Division  
Miami-Dade County Department of Transportation and Public Works  
305-375-4526 Phone  
305-375-4969 Fax  
[herrel@miamidade.gov](mailto:herrel@miamidade.gov)  
*"Delivering Excellence Every Day"*

---

**From:** Patrick Lawson <plawson@taylorengeering.com>  
**Sent:** Thursday, September 23, 2021 2:33 PM  
**To:** Herrera, Liza (DTPW) <Liza.Herrera@miamidade.gov>; Yang, Robin (MDFR) <Robin.Yang@miamidade.gov>; Blanco-Pape, Marina (RER) <Marina.Blanco-Pape@miamidade.gov>  
**Cc:** Molina, Maria (DTPW) <Maria.Molina@miamidade.gov>; Stephanie Massey <smassey@taylorengeering.com>; Angela Schedel <ashedel@taylorengeering.com>; Michael DelCharco <mdelcharco@taylorengeering.com>; Joseph Wilder <jwilder@taylorengeering.com>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

**EMAIL RECEIVED FROM EXTERNAL SOURCE**

Good afternoon Ms. Herrera,

The Miami-Dade LMS records do not show a project at CRS North (NE 154th ST/7<sup>th</sup> Avenue). We can add this to our list of potential mitigation projects but will most likely request additional information.

Do you have any information about the nearby project at NE 154 Street and NE 5 Court?

Thank you!

**Patrick Lawson, GISP, CFM | Director of Geospatial Science**  
Main: 904-731-7040 | Direct: 904-256-1326

---

**From:** Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Sent:** Monday, September 20, 2021 1:37 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>; Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>  
**Cc:** Patrick Lawson <[plawson@taylorengeering.com](mailto:plawson@taylorengeering.com)>; Molina, Maria (DTPW) <[Maria.Molina@miamidade.gov](mailto:Maria.Molina@miamidade.gov)>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Good Afternoon,

Please see attached the as built drawings and design plans for the projects requested:

- Coventry-NE 197 Terrace and NE 17 Avenue, currently under design attached are 90% design plans.
- CRS North-As built attached
- NE 167 Street from NE 14 Avenue to 13 Avenue - As built attached
- NW 146 Street and NW 7 Avenue (east end of street)- has not been designed.

Regards,

**Liza Herrera, P.E., ENV SP**  
Manager, Stormwater Drainage Design Section  
Roadway Engineering and Right-of-Way Division  
Miami-Dade County Department of Transportation and Public Works  
305-375-4526 Phone  
305-375-4969 Fax  
[herrel@miamidade.gov](mailto:herrel@miamidade.gov)  
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---

**From:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>  
**Sent:** Friday, September 17, 2021 2:10 PM  
**To:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** RE: Miami-Dade County LMS Projects - Request for information

Hello Liza and Marina,

Thank you for the update.

Have a great weekend!

**Robin Yang**  
EM Planner, Office of Emergency Management  
Miami-Dade Fire Rescue  
Office: 305-468-5427  
e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)  
[www.miamidade.gov/oem](http://www.miamidade.gov/oem)  
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Please consider the environment before printing this e-mail.

---

**From:** Blanco-Pape, Marina (RER) <[Marina.Blanco-Pape@miamidade.gov](mailto:Marina.Blanco-Pape@miamidade.gov)>  
**Sent:** Thursday, September 16, 2021 5:09 PM  
**To:** Yang, Robin (MDFR) <[Robin.Yang@miamidade.gov](mailto:Robin.Yang@miamidade.gov)>; Herrera, Liza (DTPW) <[Liza.Herrera@miamidade.gov](mailto:Liza.Herrera@miamidade.gov)>  
**Subject:** FW: Miami-Dade County LMS Projects - Request for information

Robin,

Of the five stormwater projects included in the selected for the study, four are funded and in different stages of development. Liza Herrera, will provide the requested information for those projects.

The fifth project (address: NE 150 St & Spur Dr, FID: 1190) is in our unfunded list of projects. Therefore, we do not have the information requested at this time.

Regards,

Liza, for the four funded projects below, please provide the information requested. Thank you. Regards,

2015-60		6036	20190096	NW 146 Street and NW 7 Avenue (east end of street)	NW 146 Street and NW 7 Avenue (east end of street)	Wait updated from Alex Barrios	C-8	SPUR1-E-1,I95-1C8,7AV-1	C-8	2
	CPE316PWDRNG	7927	20140177	NE 167 Street from NE 14 Avenue to 13 Avenue	NE 167 Street & NE 14 Avenue	SWU	C-9	C9-S-43	C9-E	4
2014-41_1	CPE316RDD029	200		CRS North Mitigation of Repetitive Losses	NE 154 ST FROM NE 7 AVE TO NE 8 AVE NE 151 ST FROM NE 6 PL TO NE 8 AVE NE 154 ST AND NE 150 ST FROM NE 5 AVE TO NE 6 AVE	SWU fee increase (FY18-19)towards this project.	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	SPUR4-W-2,SPUR-4	C-9EAST,C-7,C-8,NBiscayne Bay - Arch Creek & Little Arch Creek	2,3,4
2020-844	CPE316RDD059			NE 197 Terrace and NE 17 Avenue Drainage Improvements	NE 197 Terrace and NE 17 Avenue	SWU	C9-E	COVENTRY	C9-E	4

**From:** [Yang, Robin \(MDFR\)](#)

**Sent:** Thursday, September 16, 2021 4:28 PM

**To:** [Yang, Robin \(MDFR\)](#)

**Cc:** [Patrick Lawson](#); [Michael DelCharco](#); [Joseph Wilder](#)

**Subject:** Miami-Dade County LMS Projects - Request for information

Good afternoon LMS partners,

As you may be aware, the South Florida Water Management District has contracted Taylor Engineering to conduct a study to model the Flood Protection Level of Service. If you are receiving this email, it is because projects you entered in the LMS list are part of the current study area.

Please respond to Patrick Lawson ([plawson@tayloengineering.com](mailto:plawson@tayloengineering.com)) with technical information about your projects not included in the LMS project list. Information they are requesting includes:

1. Construction Drawings
2. Culvert and gates: sizes, dimensions, inverts, geometry and locations
3. Trigger elevations for gates and pumps
4. Pump station capacity (CFS)
5. Anticipated area of impact

The projects in question are in the attached excel sheet.

**For your project to be included in this study, information must be submitted to Taylor Engineering by COB 9/24/2021.**

Please reach out to Patrick if you have any questions about this request.

**Patrick Lawson, GISP, CFM** | Director of Geospatial Science



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1326

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Thank you,

**Robin Yang**

**EM Planner, Office of Emergency Management**

**Miami-Dade Fire Rescue**

Office: 305-468-5427

e-mail: [robin.yang@miamidade.gov](mailto:robin.yang@miamidade.gov)

[www.miamidade.gov/oem](http://www.miamidade.gov/oem)

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## Log Item 3: FEMA BRIC Coordination

---

**From:** Pisani, Alberto (RER) <Alberto.Pisani@miamidade.gov>  
**Sent:** Friday, October 1, 2021 12:50 PM  
**To:** Angela Schedel; Blanco-Pape, Marina (RER); Steelman, Marcia (RER)  
**Cc:** Michael DelCharco; Cardoch, Lynette; Owsina, Akintunde; Zhao, Hongying; Maran, Ana Carolina; Colangelo, David  
**Subject:** RE: C8 Basin FEMA BRIC Coordination  
**Attachments:** C8-C9 Projects.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Angela:

I am sending you our complete list of funded and unfunded flood mitigation projects for basins C-8 and C-9. See attached.

Thanks

**Alberto Pisani, P.E., ENV SP**

*Sr. Professional Engineer*

Department of Regulatory and Economic Resources

Division of Environmental Resources Management

Water Management

701 N.W. 1<sup>st</sup> Court. 5<sup>th</sup> Floor

Miami, Florida 33136-3912

(305) 372-6834 (Office)

(786) 493-1439 (Mobile)

[alberto.pisani@miamidade.gov](mailto:alberto.pisani@miamidade.gov)

---

**From:** Angela Schedel <ashedel@taylorengeering.com>  
**Sent:** Wednesday, September 22, 2021 3:50 PM  
**To:** Blanco-Pape, Marina (RER) <Marina.Blanco-Pape@miamidade.gov>; Pisani, Alberto (RER) <Alberto.Pisani@miamidade.gov>; Steelman, Marcia (RER) <Marcia.Steelman@miamidade.gov>  
**Cc:** Michael DelCharco <mdelcharco@taylorengeering.com>; Cardoch, Lynette <lcardoch@moffattnichol.com>; Owsina, Akintunde <aowosin@sfwmd.gov>; Zhao, Hongying <hzhao@sfwmd.gov>; Maran, Ana Carolina <cmaran@sfwmd.gov>; Colangelo, David <dcolange@sfwmd.gov>  
**Subject:** RE: C8 Basin FEMA BRIC Coordination

**EMAIL RECEIVED FROM EXTERNAL SOURCE**

Alberto,

As requested during our talk today, I've attached the list of flood mitigation projects we have collected for the C8/C9 basins within Miami-Dade County.

Carolina requested the County's review of the list. While reviewing it, the FPLOS project team needs the following information:

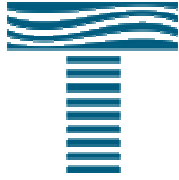
- 1) Are all of the County's flood mitigation projects identified on this list? If one is missing, please add it.
- 2) Is there a project on the list that should not be included?

- 3) Keep in mind that we will be asking the responsible agency for additional technical details about each project to help us determine the specifics needed for inclusion in the C8C9 basin FPLOS model.

Thank you.

Best,  
Angela

**Angela Schedel, Ph.D., P.E. | Vice President, Community Resilience**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

Main: 904-731-7040 | Direct: 904-256-1305

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-----Original Appointment-----

**From:** Maran, Ana Carolina <[cmaran@sfwmd.gov](mailto:cmaran@sfwmd.gov)>

**Sent:** Monday, September 20, 2021 10:05 AM

**To:** Maran, Ana Carolina; Colangelo, David; Zhao, Hongying; Marina Blanco-Pape; Pisani, Alberto (RER); Steelman, Marcia (RER); Michael DelCharco; Owsina, Akintunde; Cardoch, Lynette

**Subject:** C8 Basin FEMA BRIC Coordination

**When:** Wednesday, September 22, 2021 3:00 PM-4:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Microsoft Teams Meeting

---

## Microsoft Teams meeting

**Join on your computer or mobile app**

[Click here to join the meeting](#)

**Or call in (audio only)**

[+1 561-437-5958,654612180#](tel:+15614375958,654612180#) United States, West Palm Beach

Phone Conference ID: 654 612 180#

[Find a local number](#) | [Reset PIN](#)



[Learn More](#) | [Meeting options](#)

## Log Item 5: SBDD Project List

---

**From:** Joseph Wilder  
**Sent:** Tuesday, September 28, 2021 12:35 PM  
**To:** Kevin Hart  
**Subject:** SBDD Project list

Kevin,

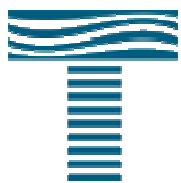
Thanks for providing detail regarding the status and purpose of projects on the SBDD list we have. Here are some notes to summarize our conversation, please feel free to correct or add detail as you see fit.

1. Enlargement of Silver Lake Control Structure:
  - A single 72" culvert already exists that connects C9 to C11 through the SBDD S-5 and S-9 basins
  - SBDD has no immediate plans of enlargement (crosses major road- Pines Blvd)
2. Basin S-5 emergency sluice gate:
  - Proposed project to provide emergency relief of S-5 Basin *with permission* from District.
  - Would *not* have a set trigger elevation that would allow it to start operating automatically. Manually operated.  
*Please provide example of emergency sluice gate (geometry, design capacity, etc).*
3. Encantada, Harbour Lake and Sunset Lake sluice gate:
  - Fixed crest weirs were replaced with sluice gates.
  - Project already installed, waiting on some final things (this is modellable as is).
  - Used for pre-storm drawdown  
*Please provide invert, height, width, and operation criteria (i.e., will they open automatically when HW > 5.0?).*
4. Basin S-3 emergency sluice gate:
  - Proposed project to provide emergency relief of S-3 Basin *with permission* from District.
  - Would *not* have a set trigger elevation that would allow it to start operating.  
*Same example as Basin S-5 emergency sluice gate.*
5. S-1, S-2, S-, S-4/5, S-7, S-7 Pump Stations:
  - These pump stations are at permitted allowance and have backup pumps (could readily increase discharge with permission from District)
  - Resiliency upgrades such as fire suppression systems, upgraded exhaust, concrete roof, etc
  - *No increase* in pump capacity or anything directly affecting discharge
6. B-1 & B-2 Pump Stations:
  - Upgrading from diesel to electric
  - Service area is relatively small, but larger pumps could help reduce flooding
  - If downstream pump station (S-1) is forced to turn off, then B-1 & B-2 would need to be turned off.  
*Upgrading from 15k GPM to 25k? These are manually operated, so no set trigger elevation to automatically turn on, right?*
7. Basin 3 / Basin 7 interconnect
  - Could help reduce flooding in secondary system when one basin is critical and the other isn't.  
*Please provide details. Gate/culvert/gated culvert, dimensions, etc. This would be manually operated, so no set HW/TW trigger?*
8. East by-pass & sluice gate at S-1 Pump Station:
  - Proposed operational gate.
  - No increase in permitted allowance, however, it could act as another discharge point and increase capacity if given permission from District.
  - Reduces burden on pump station and could act as a failsafe if pump(s) fail (given HW/TW conditions).  
*Please provide some preliminary detail such as gate width or estimated design discharge.*

I believe that covers everything we discussed.

Thanks!

Joseph Wilder, E.I. | Water Resources Engineer



**Taylor Engineering, Inc.**

14499 N. Dale Mabry Hwy, Ste 290, Tampa, FL 33618

Main: 813-963-6469 | Direct: 813-343-0817

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# Log Item 7: FDOT Golden Glades Drainage Project Information

---

**From:** Montgomery, Amanda <Amanda.Montgomery@dot.state.fl.us>  
**Sent:** Thursday, October 14, 2021 5:48 PM  
**To:** Angela Schedel  
**Cc:** Francis, Manuel; Restrepo, Juan; Pulido, Nathaniel; Dominguez, Mario; Navarro, JuanR; Greg Griffith  
**Subject:** FW: Drainage Question about Golden Glades Project

Hey Angela,

So nice to 'meet you' and hear about this exciting effort! Thank you for taking the time to chat with me on the phone about the GGI project.

As discussed, there is a SFWMD Conceptual Permit (Permit # 13-06504-P; Application # 180424-511) with information pertaining to the overall drainage condition that you can access through the ePermitting portal. We will be going back to SFWMD to obtain construction permits under the GGI Light scope in January 2022. I am including the master drainage EORs on this response in the event they can provide you with any additional information to assist the Districts mapping/modeling efforts.

Please let me know if I can be of any additional assistance. Best of luck with your endeavors.

Best wishes,  
Amanda Montgomery, PWS, WEDG

WGI – Environmental Permits Consultant  
Florida Department of Transportation - District VI  
1000 NW 111th Avenue - Rm 6211  
Miami, Florida 33172

FDOT | [Amanda.Montgomery@dot.state.fl.us](mailto:Amanda.Montgomery@dot.state.fl.us)  
WGI | [Amanda.Montgomery@WGIInc.com](mailto:Amanda.Montgomery@WGIInc.com)  
(d) | 786.878.5016

---

**From:** Pulido, Nathaniel <Nathaniel.Pulido@dot.state.fl.us>  
**Sent:** Thursday, October 14, 2021 4:02 PM  
**To:** Montgomery, Amanda <Amanda.Montgomery@dot.state.fl.us>  
**Cc:** Dominguez, Mario <Mario.Dominguez@dot.state.fl.us>; Navarro, JuanR <JuanR.Navarro@dot.state.fl.us>  
**Subject:** FW: Drainage Question about Golden Glades Project

Good afternoon Amanda,

Please see request below. Please reach out to EORs if needed to get requested info.

Regards,

**Nathan V. Pulido, P.E.**  
District Drainage Engineer  
Florida Department of Transportation - District 6 Adam Leigh Cann Building  
1000 NW 111th Avenue - Room 6211  
Miami, FL 33172  
Office (305)-470-5264  
Email: [nathaniel.pulido@dot.state.fl.us](mailto:nathaniel.pulido@dot.state.fl.us)



---

**From:** Green, Jennifer <[Jennifer.Green@dot.state.fl.us](mailto:Jennifer.Green@dot.state.fl.us)>  
**Sent:** Thursday, October 14, 2021 2:50 PM  
**To:** Poole, James <[James.Poole@dot.state.fl.us](mailto:James.Poole@dot.state.fl.us)>; Pulido, Nathaniel <[Nathaniel.Pulido@dot.state.fl.us](mailto:Nathaniel.Pulido@dot.state.fl.us)>  
**Cc:** Carver, Jennifer <[Jennifer.Carver@dot.state.fl.us](mailto:Jennifer.Carver@dot.state.fl.us)>; Dominguez, Mario <[Mario.Dominguez@dot.state.fl.us](mailto:Mario.Dominguez@dot.state.fl.us)>  
**Subject:** FW: Drainage Question about Golden Glades Project

James & Nathan,  
Can you help Angela with her request below?

Jennifer Green, P.E.  
State Drainage Engineer  
Phone: (850) 414-4351

---

**From:** Angela Schedel <[aschedel@taylorengeering.com](mailto:aschedel@taylorengeering.com)>  
**Sent:** Thursday, October 14, 2021 1:24 PM  
**To:** Green, Jennifer <[Jennifer.Green@dot.state.fl.us](mailto:Jennifer.Green@dot.state.fl.us)>  
**Cc:** Carver, Jennifer <[Jennifer.Carver@dot.state.fl.us](mailto:Jennifer.Carver@dot.state.fl.us)>  
**Subject:** Drainage Question about Golden Glades Project

**EXTERNAL SENDER:** Use caution with links and attachments.

Jennifer(s) 😊,

I appreciated your insight when we met last fall while I was working with DEP to define the SLIP tool requirements. I hope you can provide similar perspective on one of FDOT's planned projects – the Golden Glades Interchange Enhancement.

I have a resilience question that is unrelated to SLIP, that I'm asking on behalf of my client SFWMD. I'm working on a project with Dr. Carolina Maran's team where we are researching future flood mitigation projects within the District's C8 and C9 basins. My consulting team is creating hydrologic models of the basins with and without SLR and local partner's projects. More info about our project can be found at our project website:

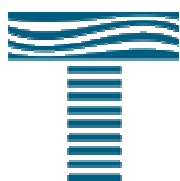
<http://www.buildcommunityresilience.com/SFWMD/FPLOS/c8c9/>

During a call with Jim Murley of MDC last week, he mentioned that we should reach out to FDOT to obtain more details on potential drainage changes within the Golden Glades project area. Do you have any preliminary conceptual designs that you can share with our consulting team? This would help us understand the extent of the project and if/how it may affect the C8 and C9 basins' future performance.

Thank you for your advice.

Best,  
Angela

**Angela Schedel, Ph.D., P.E. | Vice President, Community Resilience**



**Taylor Engineering, Inc.**

10199 Southside Blvd., Suite 310, Jacksonville, FL 32256

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## **APPENDIX C: Pre-Workshop Stakeholder Survey Responses**

Respondent	What is your involvement in flood mitigation and adaptation planning?	Have you observed significant changes in flooding conditions in the recent 5-10 years? Do you have any documentation?	What do you believe are the major limitations of the existing flooding system at C-8 and C-9 Basins? Do you have a plan and preferred actions to address these limitations?	How are future conditions (e.g. sea level rise or increased rainfall) considered as part of project planning/design?	Please state your name.	Please state your organization.	Please provide your email.	Please provide your phone number.
1	Shareholder	No	No	Respondent skipped this question	NA	NA	NA	NA
2	I am the Floodplain Administrator for the city of Miami Gardens, Hialeah and the Town of Medley	More severe flooding during major events	Gravity flow to the east in advance of flood events is not adequate to create capacity in both C8 and C9, different interests in habit he District from moving water more quickly (ESA, Miccosukee's, Everglades National Park, urban residents, Miami-Dade County residents and governments)	Not adequate currently, but now being considered, which is beneficial	NA	NA	NA	NA
3	State Drainage Engineer for Florida Department of Transportation	Respondent skipped this question	Respondent skipped this question	Sea level rise should be considered for tailwater conditions with appropriate risk tolerance of the agency. Using NOAA Atlas 14 rainfall data and confidence limits should account for future rainfall conditions.	NA	NA	NA	NA
4	Prepare plans and manage flood mitigation	N/A. I have been with the Town only 1 year. No documentation	Town would like better maintenance plan and coordination with FDOT for the C-9 canal	Increased rainfall causes increase lake levels. Outflow is constrained due to limited capacity. Pumps are operating non-stop to maintain lake levels and avoid floods.	NA	NA	NA	NA
5	Project management.	Yes and yes.	Respondent skipped this question	Factored in plans and design.	NA	NA	NA	NA
6	Municipal Public Works staff	Over the past 3 years yes. Do not have sufficient data to compare before that.	Capacity	Future storm drainage improvement projects are being designed with higher capacity than current data requires.	NA	NA	NA	NA
7	I'm the resilience program manager for adaptation in Miami-Dade County's Office of Resilience	I think tide gauge or other observational data support this. We also have photos.	Elevating certain homes/businesses will have to be part of the solution - some areas are just a foot or two above current high tides. It is too difficult to design a whole water management system around these lowest-lying areas. We need to raise the lowest areas.	Sea level rise is reasonable well incorporated into County planning. Changes in precipitation are not yet fully.	NA	NA	NA	NA
8	As the Public Works Director, I am on the high level decision making team for our municipality	We have a sub-division along the C-8 that has experienced a significant increase in flooding over the last 5 years.	I believe the embankment/seawalls need to be raised along the C-8	These conditions should be the driving forces behind project planning/design.	NA	NA	NA	NA

Respondent	What is your involvement in flood mitigation and adaptation planning?	Have you observed significant changes in flooding conditions in the recent 5-10 years? Do you have any documentation?	What do you believe are the major limitations of the existing flooding system at C-8 and C-9 Basins? Do you have a plan and preferred actions to address these limitations?	How are future conditions (e.g. sea level rise or increased rainfall) considered as part of project planning/design?	Please state your name.	Please state your organization.	Please provide your email.	Please provide your phone number.
9	Managers of a secondary canal system located in four N. Broward Water Control Districts	We have observed an increase in storm intensities which overwhelm drainage systems causing localized flooding	We are not familiar with the major limitations of the existing flooding system in C8-C9 basins and have no preferred actions	For N. Broward County, sea level rise and increased rainfall are included as considerations for all planning activities	NA	NA	NA	NA
10	Regulatory (issuance of SWM licenses and delegated ERP)	Respondent skipped this question.	Tidal influence. Pump and gated structures could be overtopped due to low elevation of canal banks on C-9 during storm surge events.	Conveyance capacity of tidal areas downstream of coastal structures serving C9 and C-8 basins must be considered. These areas will experience high tidal surge, and discharge from coastal structure may have to be balanced between the need to continued to provide a flood protection service in wester areas and preventing additional surcharge elevation on the eastern areas resulting from coastal structure discharges.	NA	NA	NA	NA
11	I lead a team at Broward county.	Yes, yes.	Respondent skipped this question	Respondent skipped this question	Gregory Mount	Broward County EPGMD	gmount@broward.ord	954-519-0356
12	Regional Planning Agency providing assistance to local governments.	Respondent skipped this question	Respondent skipped this question	Respondent skipped this question	Isabel Cosio Carballo	South Florida Regional Planning Council	isabelc@sfrpc.com	954-924-3653
13	Flooding inspections, sea level rise, king tide response.	Yes.	Unknown	Sea wall height changes, elevated ground water levels.	Larry Teich	City of Fort Lauderdale	lteich@fortlauderdale.gov	954-828-7844
14	Work with Resource Management Division at the NW FL Water Management District	(I do not have experience in basins C-8 and C-9.)	(Have no information on this topic.)	(Will be interested in learning about this.)	Paul Thorpe	Northwest Florida Water Management District	Paul.Thorpe@nwfwater.com	(850) 539-2643
15	Hydrologic modeling	Yes	Respondent skipped this question	Respondent skipped this question	Michelle Irizarry-Ortiz	USGS	mirizarry-ortiz@usgs.gov	(407) 803-5569
16	Planning activities with the Broward MPO related to resiliency	No documentation/ only anecdotal	No strong opinion/ no plan from the MPO for these systems	Yes, resiliency is a factor in project prioritization	James Cromar	Broward MPO	cromarj@browardmpo.org	954-876-0038
17	Ecosystem restoration projects, i.e., BBSEER	I have not received documents related to specific conditions	Not sure	Projected using relevant sea level curves and modeling	April Patterson	U.S. Army Corps of Engineers	April.N.Patterson@usace.army.mil	904-549-3803

## **APPENDIX D: Workshop Meeting Agenda and Notes**



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## South Florida Water Management District

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### AGENDA

## C-8 and C-9 Basins Flood Protection Level of Service Adaptation and Mitigation Planning Projects Study Workshop

August 3, 2021

9:00 AM – 12:00 PM

Florida International University

Biscayne Bay Campus

Wolfe University Center (Room 155)

3000 151<sup>st</sup> Street, North Miami, FL 33181

- |               |  |
|---------------|--|
| 9:10 – 9:20   | Welcome – Drew Bartlett, Executive Director, SFWMD   |
| 9:20 – 9:35   | Flood Protection Level of Service Program – Akintunde Owosina, PE, H&H Bureau Chief, SFWMD |
| 9:40 – 9:55   | Phase I Study Results – Michael DelCharco, PE, Taylor Engineering                          |
| 10:00 – 10:10 | Phase II Pre-Workshop Feedback – Lynette Cardoch, PhD, Moffatt & Nichol                    |
| 10:15 – 11:00 | Breakout Sessions  |
| 11:10 – 11:40 | Reporting on Breakout Sessions   |
| 11:40 – 11:55 | Next Steps – Carolina Maran, PhD, PE, District Resiliency Officer, SFWMD                   |
| 11:55 – 12:00 | Closing  |



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## South Florida Water Management District

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### MEETING NOTES

## C-8 and C-9 Basins Flood Protection Level of Service Adaptation and Mitigation Planning Projects Study Workshop

August 3, 2021

9:00 AM

Florida International University

Biscayne Bay Campus

Wolfe University Center (Room 155)

3000 NE 151<sup>st</sup> Street, North Miami, FL 33181

Please find the PowerPoint presentation and all files noted throughout on the project website:

<http://www.buildcommunityresilience.com/SFWMD/FPLOS/c8c9/ProjectDocuments.aspx>

1. Welcome via video, Drew Bartlett, Executive Director, SFWMD
  - a. See the video file “August 3, 2021 Workshop: Welcome Remarks from Drew Bartlett, Executive Director, SFWMD” on the project website.
2. Adam Blalock, Deputy Secretary for Ecosystems Restoration, Florida Department of Environmental Protection (FDEP)
  - a. Main Message:
    - i. Briefly explained the resiliency grant program.
    - ii. See <https://floridadep.gov/rcp/florida-resilient-coastlines-program/content/frcp-resilience-grants>
3. Flood Protection Level of Service Program (FPLOS) – Akintunde Owosina, PE, H&H Bureau Chief, SFWMD
  - a. Main Message:
    - i. Background of Flood Protection Responsibilities, the water management systems in the district, and sea level rise (SLR) projections

- ii. An Introduction to the FPLOS program and the different phases
- b. Partner Feedback and Questions:
  - i. Q: Are there other functions to maintain the water levels?  
A: Yes, there are two aspects – ground storage and the canals, which can move it across the land. Levels are kept high during the dry season to maintain the water system, and low during the wet season to create room and to maintain ground storage for smaller rain events. Gravity structures will eventually need to be raised to adapt to increased water levels.
  - ii. Q: Does Phase I account for storm surge?  
A: Yes, it does. We modeled storm surge as a boundary condition. Several factors are involved in a level of service - at least three different SLR scenarios, and four storm surge conditions, and rainfall events.
  - iii. Q: Since it is a remodeling job of an old system, there may be missed opportunities of new ideas, such as land acquisition, are not incorporated into the model to deal with the water quality in areas (Biscayne Bay). Pumping more water into it would be against Miami-Dade County's best interest.  
A: Yes, we might come across opportunities that provide both flood protection and water quality aspects. The initial focus is flood protection; but not all solutions will pump to tides. All these things are on the table as we evaluate the flood protection that projects may provide. The District will include water quality as a factor in the mitigation benefits, so that decision makers can make better decisions. Initially, nothing will be left out.
- 4. Phase I Study Results – Michael DelCharco, PE, Taylor Engineering
  - a. Main Message:
    - i. Phase I project – Summary/Background, explanation of the six metrics, model selections, and the findings (with example maps of limited results)
    - ii. The objective and overview of Phase II – future land use, potential mitigation strategies (examples of them to explain what the consultant team is looking for), and example results
  - b. Partner Feedback and Questions:
    - i. Q: Has the Phase I model been broken down into level of service? Is the primary system being modeled only?  
A: The whole basin is modeled – so the primary, secondary, and tertiary systems are included. The model resolution comprises 125 square grids. Metrics are analyzed based on district infrastructure and their ability to get water out to tide.
    - ii. Q: How is the level of service assessed for a whole system based on individual metrics? How is the return period being assigned?  
A: In giving “summaries” of the overall system we are making general statements primarily about the least efficient parts of the system. There exist different levels of service at different locations. Like a hurricane that can be a 100-year event in one location and a 25-year event in another. So too with the Metrics.



- iii. Q: Overbank flooding was looked at, but did the model account for water circumventing the structures?  
A: Yes, the surface water model allows the water to flow around a structure. In fact, the model is a fully 3D model containing no artificial barriers so it gets the overland and groundwater flooding that would happen in a flood. We can use the model to put in barriers and see 'What would happen if...' a barrier was put here.
  - iv. Discussion about how it matches to a Federal Emergency Management Agency (FEMA) study and MIKE SHE studies. The current FEMA map for Broward County used the same MIKE SHE model. However, this effort updated the model quite significantly with new channel and structure data. It is not the District's intention to re-create the FEMA floodplain maps.
  - v. Q: Since three feet is on low end of SLR projections in 25-50 years, is the future system resilient enough to accommodate/adapt to this?  
A: To date there are no agreed upon solutions or mitigation activities. This is the goal of this workshop.
  - vi. Q: Adaptation strategies include multiple layers. Is this strategy multilayered such that impacts to adjacent communities are accounted for? Is the model wholistic?  
A: The model is wholistic and accounts for adjacent communities.
  - vii. Q: It was mentioned that some options like tieback levees were modeled. Are the results of those modeling efforts available?  
A: No, those results were simply preliminary looks at the modeling system. They are neither published nor available, given that the team was just doing some test runs to assess the model's capability.
  - viii. Explanation of local mitigation strategies/project ideas that the team is looking at to see how they will work into the next phase. Such as:
    - 1. Implement operational strategies to maintain flood protection
    - 2. Enhance infiltration (land-use)
    - 3. Harden coastal structures
    - 4. Increase basin storage and associated nature-base / green infrastructure
  - ix. Discussion on use of drainage wells, land-use to store and hold water back, incorporate modeling for Miami-Dade County SLR strategy for structure elevations scenario.
  - x. There is high uncertainty in which is the correct SLR curve and what period into future should be planned for. The District's strategy is to ask at what threshold of rise would a structure become critically insufficient. Then the number of years to act is determined. Projects can be sequenced, and the appropriate system components can be addressed in this way and allows for decision makers to not forget about a possible strategy.
5. Phase II Pre-Workshop Feedback – Lynette Cardoch, PhD, Moffatt & Nichol
- a. Main Message:
    - i. Explanation of the map viewer; what information the team has collected and uploaded; and how to use the feedback portal/Summary of the pre-meeting survey results
    - ii. The data gaps that the team needs partner's assistance to fill
    - iii. Breakout clarification
6. Breakout Sessions: See detailed notes for each group (pp 18-22)

7. Breakout Groups Report-Out

- a. Table 1: Kevin Hart, PE, District Director, South Broward Drainage District (SBDD)
    - i. SLR and changes in climate; two of the last four years have seen record high rain fall in Southwest Broward
    - ii. Contrast between C-11 (large pump) and C-9 (dependent on gravity)
    - iii. Impacts the C-9 deals with – storm surge, high tides, etc.
    - iv. Water quality importance in all solutions
    - v. Pumps into the C-9/Raising banks/Increasing retention areas and storage basins/land acquisition
    - vi. Nature-based solutions, including green infrastructures
    - vii. Inter-agency collaboration/Phasing projects versus waiting until down the road
  - b. Table 2: Alberto Pisani, PE, Division of Water Management, Miami-Dade County
    - i. Integration of local and regional projects
    - ii. Combine water quantity and quality
    - iii. Identifying storage areas/Repetitive loss properties for storage
    - iv. Green infrastructure/Design criteria
    - v. Conveyance and increased maintenance
    - vi. County/District collaboration; United States Army Corp of Engineers (USACE) coordination as well
  - c. Virtual Room 1: Dr. Greg Mount, Water Resource Manager, Broward County
    - i. Improving Conveyance ([Leslie Pettit](#), Miami Gardens)
    - ii. Herbicides on banks and a greener solution?
    - iii. Looked at the map viewer
    - iv. Broward County Resilience Dashboard: Citizen Science King Tide reporting program
  - d. Virtual Room 2: Katherine Hagemann, Resilience Program Manager for Adaptation, Miami-Dade County
    - i. Water quality and the need to consider more than just traditional flood control measures to address it
    - ii. Non-structural solutions: smaller projects that may have basin-wide benefits/Elevating areas/Repetitive Loss Areas in the C-8 basin, consider buyouts?
    - iii. Rising groundwater: Infiltration into the stormwater system/King Tides are particularly challenging
    - iv. FDOT's project at I-95 and the Turnpike's interchange/Consider expanding storage?
  - e. Virtual Room 3: Michael DelCharco
    - i. Participants happy about what has been collected as well as map viewer
    - ii. Discussed future project ideas
    - iii. Discussion of the current projects
    - iv. Participants happy that the District is looking at all three systems
8. Next Steps – Carolina Maran, PhD, PE, District Resiliency Officer, SFWMD
- a. Main Message:
    - i. Reassurance about current/future resiliency and the District's commitment to coordination efforts across agencies
    - ii. Modeling priorities proposed by team (three levels)

- iii. The Dynamic Adaptive Policy Pathways/Flood Damage Cost Estimates explanation/Resilient Florida Program
  - b. Partner Feedback and Questions:
    - i. Q: Have we considered collaborating with developers, updating codes to include rainwater collection for toilet's purposes?
      - A: A piece of the solution: example of a regulatory aspects that can be implemented at the local level simultaneously to larger mitigation strategies
9. Closing
- a. Adam Blalock
    - i. Belief in collaborative effort/workshop was a great start
  - b. Akintunde Owosina
    - i. has heard plenty of feedback today/Reassurance that all is being noted for the flood mitigation project considerations

## In-Person Table 1 Discussion Notes

**Moderator:** Lynette Cardoch

**Scribe:**

**Tech:** N/A

### **Participants:**

- Dr. Tiffany Troxler, FIU
- Ms. Isabel Cosio Carballo, South Florida Regional Planning Council
- Bridget Huston, South Florida Regional Planning Council
- Mr. Karl Kennedy, City of Pembroke Pines
- Mr. James Cromar, Broward MPO
- Mr. Levi Stewart-Figueroa, Broward MPO
- Mr. Kevin Hart, SBDD
- Ms. Eva Velez, U.S. Army Corp of Engineers
- Commissioner Nan Rich, Broward District 1
- Dr. Matahel Ansar, SFWMD
- Mr. David Colangalo, SFWMD

1. Non-structural mitigation
    - a. Solutions need to be comprehensive enough to allow for inclusion of natural and nature-based features as well as other non-structural solutions (e.g., elevate structures, buy-outs).
  2. Bring holistic ideas together.
  3. Concerns with water quality not being fully incorporated into the decision making.
  4. Water quality concerns with pumping water:
    - a. For example: "Miami Beach" model works well for flood control, but not water quality.
    - b. Western pump at the SBDD boundary would bring water quality concerns.
    - c. Do you send east to Biscayne Bay/water quality concerns or do you send west/south to the Everglades/water quality concerns.
    - d. Impoundments on C-11/Pembroke Pines still must deal with nutrient loads.
    - e. S-29 pump = sends more water to Biscayne Bay.
  - i. Argued that "more water" is not precisely correct because it is the water that would have been going out. Making up for tide.
  - ii. Discharge is accelerated, which can produce different vertical gradients, reduce oxygen, and the physical and temporal variations are important.
5. Recent large events:
  - a. SBDD: Record rainfall in the last 4 years.
    - i. Also, flow at C-9 and C-11. Recovery at the C-11 was about 2 days, while the C-9 was about 10 days.
    - ii. Attributed to pumping capacity. Need additional pumping capacity at other areas.
  - b. Tidal influences at western county boundary: even the far west pup stations in the SBDD jurisdiction see the tidal influence with about a 3-hour delay.
  - c. During Tropical storm Eta: pre-storm pumping helped. C-11 pumps west and east
6. Flood water, can it be used for beneficial use?
7. Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER)
  - a. western features being contemplated to bring more water into area.
  - b. Keep water in the Everglades and continue to move it south
8. Can South Broward area serve as a stormwater treatment area and re-evaluate pump for a dual purpose: water quality and flood control?
9. Seepage issues: Add cut-off wall at impoundment?
10. Flood control versus water quality benefits

- a. The amount of area/volume need to capture water depends on goal: If you are looking for storage as the primary goal, then the area needs to have 15-20 feet of depth. If you are looking for treatment, then the depth would be 2-3 feet.
  - b. With substrate being so porous, how does one route the water and new sources of water?
11. Can we build a system that is adaptable and doesn't require re-do of structures in the future?
  12. Prevent repetitive losses
  13. Cannot allow communities to increase what is beyond their allowable discharges.
  14. Some recommendations:
    - a. Introduce water quality features/components into the pumps.
    - b. Add living shorelines
    - c. Make sure to consider different perspectives, such as insurance and land use issues.

**Action Item:** Follow-up with Kevin for more information on SBDD's pumps.

**Action Item:** Participants' environmental ideas should be noted to identify them in projects as they are collected to promote benefits in flood control as well as water quality.

**In-Person Table 2 Discussion Notes****Moderator: Hongying Zhao    Scribe: Nicole Cortez/ Maryam Roostae****Tech: N/A****Participants:**

- Alberto Pisani, P.E., Miami-Dade County RER-DERM
- Jason Engle, U.S. Army Corps of Engineers
- Jayantha Obeysekera, FIU
- Christina Miskis, South Florida Regional Planning Council
- Georgio Tachiev, Miami-Dade County RER-DERM
- Myriam Jacques, Town of Pembroke Park
- Juan Prieto, Nova Consulting
- Sashi Nair, SFWMD

1. Mr. Alberto Pisani, P.E., Miami-Dade County RER-DERM, [alberto.pisani@miamidade.gov](mailto:alberto.pisani@miamidade.gov)
  - a. Canal bank improvement and roadway improvement planned. Some projects are funded, and some projects are not funded.
  - b. BBSEER project, a federal/regional collaborating project, is proposing a conveyance route to send water from north to south, such as Model Land
  - c. Lake Belt Storage project, high conductivity can be a concern

**Action item:** Follow-up with Alberto to get the detailed projects locations in C8 and C9 basins.
2. Dr. Jayantha Obeysekera, FIU, [jobeysek@fiu.edu](mailto:jobeysek@fiu.edu)
  - a. Need to address water quality concerns. Green infrastructure technology can be an approach for consideration. Some examples. Distributed storage areas throughout the basins, small wetlands retrofit. This will benefit the small events.
  - b. Connect exfiltration trenches to the primary system, coupled with forward pump and pre-storm operations, to create additional storage prior to the storm.
  - c. ASR Deep injection wells
  - d. Allow storages in parks, convert the repetitive loss properties to storage area
  - e. Convert parking lot to impervious areas
  - f. Police/criteria change such as revisiting the allowable discharge for new development
  - g. Clean up the swale to improve efficiency

**Action item:** schedule a follow-up meeting with Obey to fine tune these options
3. Ms. Christina Miskis, South Florida Regional Planning Council, [cmiskis@sfrpc.com](mailto:cmiskis@sfrpc.com)
  - a. Good Neighbor Stormwater Park project, City of North Miami, combines a community park with local flood prevention, addressing repetitive loss properties, bringing awareness of flooding and climate impacts to community, also used for native planting. The solution will need collaborations from all tiers. (Totally agree!)

**Action item:** Follow-up with Christina to get the detailed project locations
4. Mr. Georgio Tachiev, Miami-Dade County RER-DERM, [georgio.tachiev@gmail.com](mailto:georgio.tachiev@gmail.com)
  - a. Dade County has a GIS database about funded and unfunded projects and DOT road information; not sure if golf courses can be used as storage.

**Action item:** Schedule a follow up meeting with Georgio to get more details about these projects that are in C8 and C9 basins.
5. Ms. Myriam Jacques, Town of Pembroke Park, [mjacques@tppfl.gov](mailto:mjacques@tppfl.gov)
  - a. C9, mostly C10, golf course, not enough storage, small municipality.
  - b. Requested the website link.

**Action item:** Hongying Sent the link to Ms. Ms. Myriam Jacques after the workshop.

**Virtual Room 1 Discussion Notes****Moderator: Angela Schedel****Scribe: Carol Ballard****Tech: Patrick Lawson****Participants:**

- Andrew Wolf, SFWMD
- Bridget Huston, SFRPC
- Bryan Palacio (In-Person), SFWMD
- Camile Campbell, Broward
- Jenny Staletovich, WLRN News
- Karin Smith, SFWMD
- Leslie Pettit, Miami Gardens
- Mitchell Moore, U.S. Army Corp of Engineers
- Rebecca Elliot, FDACS
- Gene Duncan, Miccosukee Tribe
- Christian Avila, SFWMD
- Jeremy McBryan, Palm Beach County
- Maria Del Mar Trejos, Brizaga

1. Leslie Pettit, Miami Gardens, [lpettit@miamigardens-fl.gov](mailto:lpettit@miamigardens-fl.gov)
  - a. Discussed planned projects addressing improvement of banks (bank stabilization, erosion control) and improvement of canal conveyance (removing sediment, vegetation buildup). There is a project located in the Marco Canal area which has funding, but he presented concerns about County requirements which were slowing/stopping the project progress. Apparently to get a permit for bank stabilization would require canal banks to be raised to 100 year elevations. This would add cost to the effort and include encroachment on properties of homeowners. He is looking for some help with solutions for this issue. The area he was talking about was in Miami Gardens around 17<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup>, & 20<sup>th</sup> Avenue – chain of lakes including Scott Lake. Note added by Scribe: The group attendees were more heavily Broward County participants so this may need to be communicated to Miami County Partners.
2. Maria Del Mar Trejos, Brizaga, [delmartrejos@gmail.com](mailto:delmartrejos@gmail.com)
  - a. Would like to see green strategies investigated for cleaning canals (not using herbicides so heavily). Should local universities lead local research effort
  - b. Could we do a citizen's crowd sourced to gather information on local areas which flood?
3. Dr. Greg Mount (Broward County) [gmount@broward.org](mailto:gmount@broward.org)
  - a. Provided a link to the Broward County Resilience Dashboard which is a web portal that gathers flooding information for and from the communities. There is anecdotal information but also some elevation data. There will be more information at the GIS Expo in Palm Beach County. He also mentioned there are documented flooding problems in Hollywood.
  - b. Link: <https://www.broward.org/Resilience/Pages/default.aspx>

**Action Item:** Joe looked at the website to determine what project information could be compiled.
4. Jeremy McBryan, Palm Beach County, Water Resource Manager; [JMcBryan@pbcgov.org](mailto:JMcBryan@pbcgov.org)
  - a. Would like a Palm Beach County FPLOS study soon
5. Patrick Lawson presented the map viewer. It was noted several projects were already in the database and were showing on the map.
  - a. Discussion about what to call the tool and it was decided to use FPLOS map portal for now.
  - b. Who would have access to the tool – if the tool would be available to universities? Partners at this workshop?
  - c. Link: <http://www.buildcommunityresilience.com/SFWMD/FPLOS/c8c9/>

## Virtual Room 2 Discussion Notes

**Moderator:** Ann Springston

**Scribe:**

**Tech:** Peter Sahwell

**Participants:**

- Anaily Padron, City of Miami Lakes
- Dorothy Sifuentes, USGS
- Irela Bague, Miami-Dade
- James Poole, FDOT
- Jennifer Green, FDOT
- Katharine Mach, Rosenstiel School of Marine and Atmospheric Science, University of Miami
- Katherine Hagemann, Miami-Dade
- Kimberly Brown, Miami-Dade Long-Range Planning
- Lehar Brion, SFWMD
- Mark Elsner, SFWMD
- Milan Mora, U.S. Army Corp of Engineers
- Omar Santos, City of Miami Lakes
- Pam Sweeney, City of Miami-Dade

1. Irela Bague, Miami-Dade, [Irela.Bague@miamidade.gov](mailto:Irela.Bague@miamidade.gov)

- a. Use of drainage wells, land use to store and hold water back, incorporate modeling for MDC SLR strategy for structure elevation scenarios
- b. Would like FPLOS projects to incorporate water quality improvements. Discussed that Phase 1 modeling did not include sediment transport or WC calculations. Why? Can it be included going forward?

**Action Item:**

2. James Poole, FDOT, [james.poole@dot.state.fl.us](mailto:james.poole@dot.state.fl.us)

- a. Mentioned an ongoing project to alleviate low-lying area flooding along A1A. This project involves the operation of small pump stations. Discharges will not exceed pre-project conditions and consideration is being given to WC issues.

**Action Item:** Schedule a meeting with James to discuss project further

3. Jennifer Green, FDOT, [jennifer.green@dot.state.fl.us](mailto:jennifer.green@dot.state.fl.us)

- a. Commented that other regional projects include consideration that groundwater infiltration into the drainage system will sometimes allow back flow preventers to open, thus allowing saltwater intrusion and sometimes flood conditions upstream of the BFP. FPLOS project should consider the effects of GW infiltration into the drainage system.

**Action Item:**

4. Katherine Hagemann, Miami-Dade, [hagemk@miamidade.gov](mailto:hagemk@miamidade.gov)

- a. Mentioned the I95 & Turnpike interchange improvement project and asked if this project could incorporate more storage.
- b. Regarding the C8 Canal & S28 Structure, asked if the gates can be closed as storm approaches. Can the gates be tied by structural modification to higher ground (e.g., the Railroad embankment)?
- c. Regarding the C8 Spur Canal, mentioned that neighborhoods to the north and west of this canal and south of the main C8 canal at the same location are repetitive flooding areas. Can consideration be given to buyouts? Elevations? A note was added to the portal database and Katy agreed to populate her projects after the meeting within a two-week time frame.



**Action Item:** Contact Katherine to schedule a meeting to discuss the improvement project.

**Action Item:** Stephanie checks the website regularly and will let the team know when updates occur.

5. Kimberly Brown, Miami-Dade Long-Range Planning, [Kimberly.Brown@miamidade.gov](mailto:Kimberly.Brown@miamidade.gov)
  - a. Wanted more details of Future Land Use – response was that Taylor used MD Future Land Use Map and Zoning to develop future conditions model. Requested that she provide more detailed FLU information if available.

**Action Item:** Check in with Kimberly about FLU information.

6. Pam Sweeney, Miami-Dade, pamel.a.[sweeney@miamidade.gov](mailto:sweeney@miamidade.gov)
  - a. Raised concerns regarding the quantity of water that must be dealt with and water quality issues.
  - b. Mentioned that flood control projects should be dual purpose (FC and WQ benefits). At a minimum WC must not be degraded.
  - c. Suggested the consideration of regulatory and operational means to enhance FC & WC

**Action Item:** See above

## Virtual Room 3 Discussion Notes

**Moderator: Joseph Wilder**

**Scribe: Michael DelCharco**

**Tech: Laura Vogel**

### **Participants:**

- Amy Cook, City of Miami-Dade
  - Brett Sanders, UCI
  - Christopher Miranda, MSV
  - Elaine Franklin, City of Hollywood
  - Feng (Jeff) Jiang, City of Hollywood
  - John Smith, Genterra
  - Judeen Johnson, City of North Miami Beach
  - Larry Teich,
  - Lois Bush, FDOT
  - Mario Diaz, Biscayne Park
  - Rajendra Sishodia, Broward
  - Robin Yang, Miami-Dade Fire Rescue
  - Susan Bodmann, Broward
  - Tibebe Dessalegne, SFWMD
  - Vijay Mishra, SFWMD
  - Wisler Pierre-Louis, City of North Miami
1. Amy Cook, Miami-Dade, amy.cook@miamidade.gov
    - a. Discussed the need for us to review the Miami Dade Capital Improvement Projects (CIP). They have a list of smaller projects, too, but they are mostly conceptual in nature. They have a “flood criteria map” that is currently being updated and be completed by the end of the year (2021). It requires policy changes. The CIP has some canal cross section improvement projects that would help flooding in C-8/C-9. They are working on updating sea walls in the local ordinance. Something like what Broward County has done.  
**Action Item:** Reach out to ask for the CIP list to add to the project website.
  2. Feng (Jeff) Jiang, City of Hollywood, FJiang@HollywoodFL.org
    - a. They are working on a new stormwater master plan for the City of Hollywood. CDM Smith is doing the work.  
**Action Item:** Perhaps get in touch with Susanne Mechler of CDM Smith?
  3. Judeen Johnson, City of North Miami Beach, Judeen.Johnson@citynmb.com
    - a. There is a Pickwick Lake outfall replacement project that may change flow in the eastern lakes. Not a big project.  
**Action Item:** Reach out to Pickwick Lake for more information
  4. Lois Bush, FDOT, lois.bush@dot.state.fl.us
    - a. Very glad to see we were including policy planning in the mitigation projects.
  5. Robin Yang, Office of Emergency Management: Miami-Dade Fire Rescue, EM Planner, Robin.Yang@miamidade.gov
    - a. Works with the Emergency Management group and they use the Local Mitigation Strategy list for projects. He said they have a dashboard for the local mitigation strategies (LMS), and we should check that. Many of the LMS projects are not up to date.

**Action item:** Reach out for the dashboard information. Compare to ensure they projects have been evaluated

6. Susan Bodmann, Broward County, SBODMANN@broward.org
  - a. Discussed some connector canals in northern Broward County. Joe was familiar with them, but they are outside of the C-8/C-9 basin and this study.

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Christina Miskis	South Florida Regional Planning Council		
Georgio Tachiev	Miami-Dade County	<del>irela.bague@miamidade.gov</del>	
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15618015493				
15616826526				
19549213930				
17868599847				
19543032383				
19049108554				
wuc poly3		<b>Stakeholders</b>	<b>SFWMD</b>	<b>Team</b>
	<b>Totals</b>	69	20	9



## **APPENDIX E: Group Moderator Instruction Notes**

## Breakout Groups

### Before Participants Breakout

1. Before participants are split into groups, participants (virtual and in-person) will get instructions on what to expect for the breakout sessions during the presentation (see draft slides).
2. Speaker (Lynette) will emphasize the goals of the session, with the slide of the breakout goals and what the group will be addressing (slide text pasted below).

### Breakout Groups

Develop and integrate adaptation and mitigation strategies and projects

- Share concerns about present and anticipated flooding/drainage issues
  - Enhance connectivity among the community of practitioners in the C-8/C-9 basins through dialogue
  - Communicate ideas that the practitioners would like this project to address
  - Generate ideas on future projects
3. Speaker will also emphasize that ultimately the collaboration amongst the different regional and local agencies will help all of us formulate projects and policies that can be accomplished by our different agencies. We also want to share the available tools (H&H model resources) and technical assessments that can support local planning projects. It is going to be key that projects get done at the various levels/tiers since not all can be done by the SFWMD.

### Breakout Session: Participants in Rooms/Tables

1. Moderator: Tech Information
  - a. Virtual Sessions: Give technical instructions before we roll into introductions
    - i. The virtual sessions are being recorded for the purposes of note taking. These audios/videos are not going to be kept long term nor posted after the session.
    - ii. Turn videos on, if possible.
    - iii. Mute your microphone when you are not speaking.
    - iv. Use the chat function to ask questions. While we intend this to be interactive, we do not want to lose any ideas that you may have. Please use the chat function liberally.
    - v. The chat can also be used to share files, much like you got the workshop packet this AM.
  - b. Virtual/In-person: Solicit help for a report-out person. Let them know that we are going to share, in just a few minutes, our highlights with the other groups after the session.
    - i. If you do not get someone immediately that agrees to report-out, we can call on one of the participants that we know are quite active (our key people) and ask them.

- ii. General time is 5 mins for intros, 35 min discussion, 5 min wrap up.
- iii. Moderators ought to use a timer to allow for the 5 mins at the end.

## 2. Group introduction

### a. Virtual

- i. Moderator has participant list. Use that as a guide for the order. Example: “We are going to do quick introductions. To keep us on track, we have names of anticipated participants on the screen with a number order. We can go down the list. Please share your name, organization, and role.” Tech support will pull up map while introductions are going along.

### b. In-Person

- i. Have participants share name, organization, and role.

## 3. Discussion/Project Area Map as background

### a. Virtual

- i. The project area map will be up as the main screen. This will be used to capture ideas on projects and policies. The map can also be used to document flooding “hot spots” that do not yet have projects planned or in CIPs.

### b. In-person

- i. The maps are on the table. They can be marked up to capture ideas on projects and policies. The map can also be used to document flooding “hot spots” that do not yet have projects planned or in CIPs.

### c. Virtual/In-person

- i. While the intent is to capture as many projects as possible, we want to have discussion on all the topics that were previously mentioned.
- ii. Moderator will need to review the topics again as we start conversation:
  - 1. Share concerns about present and anticipated flooding/drainage issues
  - 2. Enhance connectivity among the community of practitioners in the C-8/C-9 basins through dialogue
  - 3. Communicate ideas that the practitioners would like this project to address
  - 4. Generate ideas on future projects
  - 5. Feedback on potential projects for consideration from the Phase I study
- iii. Keep bringing the group back to actionable ideas. For example, ask for more specificity by saying, “What would that look like if we were to consider a project?” or “What information gives you “helpful-help”?”

#### 4. Discussion Tips

- a. Successful breakout groups tend to have a clear focus and goal. Our group goals are a bit mix given that we want to have project and policy input (measurable outcome) as well as collaborative dialogue (soft aspects of teambuilding). Keep an eye on the dialogue going too far into futile tones (“We’ve always flooded and there is nothing we can do”) and pivot back to the actionable dialogue of potential solutions that can be explored with this and other projects.
- b. Document issues but stay positive in looking for solutions and next steps.
- c. Encourage participants to share and ask each other questions. Moderators are there to help focus conversation and balance the team; stand back for the participants have their exchange.
- d. Try to balance speaking time amongst participants.
  - i. Virtual: take a look at the chat box to capture ideas from the more introverted in the audience.
  - ii. In-person: without placing a participant too on-the-spot, you can ask a quiet person to contribute with a broad question that can be answered with whatever areas feels comfortable to them. Example, “Is what you are hearing similar to what your city/agency/area is facing?”
- e. Ideas that are not closely aligned with the FPLOS project will be acknowledged and collected.

#### 5. 5 minutes wrap-up

- a. Group picks top 2-3 items to share with the other groups.
- b. They can share projects, policies, observations, requests for further collaboration, etc.
- c. Send projects through Portal or send to the project team within 2 weeks.

## **APPENDIX F: Workshop PowerPoint Presentation**

SOUTH FLORIDA WATER MANAGEMENT DISTRICT



**CC88 and CC99 Business  
Flood Protection Level of Service (FPLOS)**

Adaptation and Mitigation Planning Projects Study Workshop

August 3, 2021

[sfwmd.gov](http://sfwmd.gov)

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

**Welcome**



**Drew Bartlett**  
Executive Director  
South Florida Water Management District

[sfwmd.gov](http://sfwmd.gov)



2

2

## Project Team

### SFWMD

- Akintunde Owosina, PE
- Carolina Maran, PhD, PE
- Hongying Zhao, PhD, PE
- Ann Springston, PE
- Nicole Cortez
- Supported by other SFWMD staff

### Consultants

- Taylor Engineering
  - Michael DelCharco, PE
  - Angela Schedel, PhD, PE
  - Patrick Lawson
  - Stephanie Massey
- Moffatt and Nichol
  - Lynette Cardoch, PhD
- Nova Consulting
  - Laura Vogel, PhD, PE
  - Peter Sahwell



3



## Context and Big Picture Flood Protection Level of Service Program

A Systematic Approach to Ensure Infrastructure Readiness

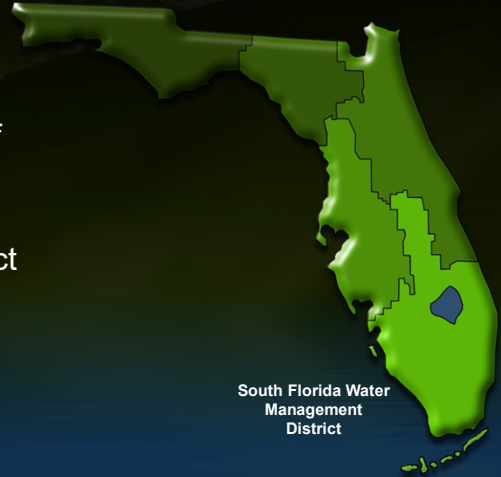
Akintunde Owosina P.E.  
Chief, Hydrology and Hydraulics Bureau  
South Florida Water Management District

4

## Who We Are and What We Do

### SOUTH FLORIDA WATER MANAGEMENT DISTRICT

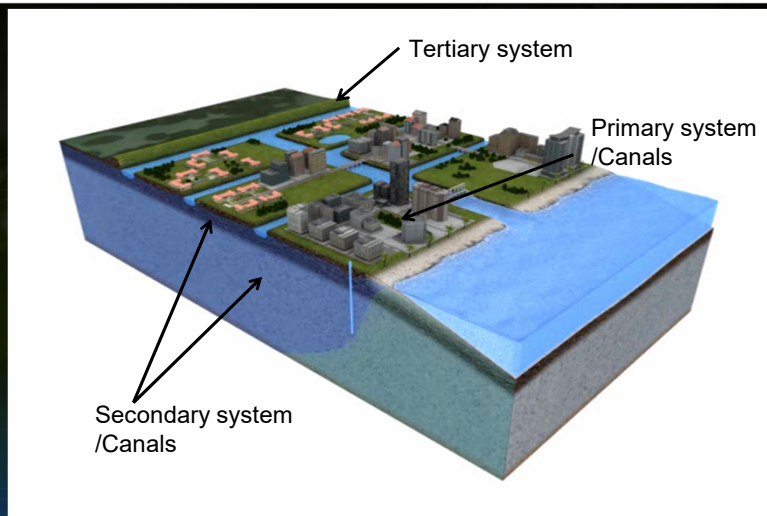
- Oldest and largest of the state's five regional water management districts
- Protecting water resources in the southern half of the state since 1949
- Our mission: To safeguard and restore South Florida's water resources and ecosystems, protect our communities from **flooding**, and meet the region's water needs while connecting with the public and stakeholders



5

## Flood Protection Responsibility

- Primary
  - USACE
  - SFWMD
- Secondary
  - Local Governments
  - Special Districts
- Tertiary
  - Homeowners Associations
  - Private Land Owners



6



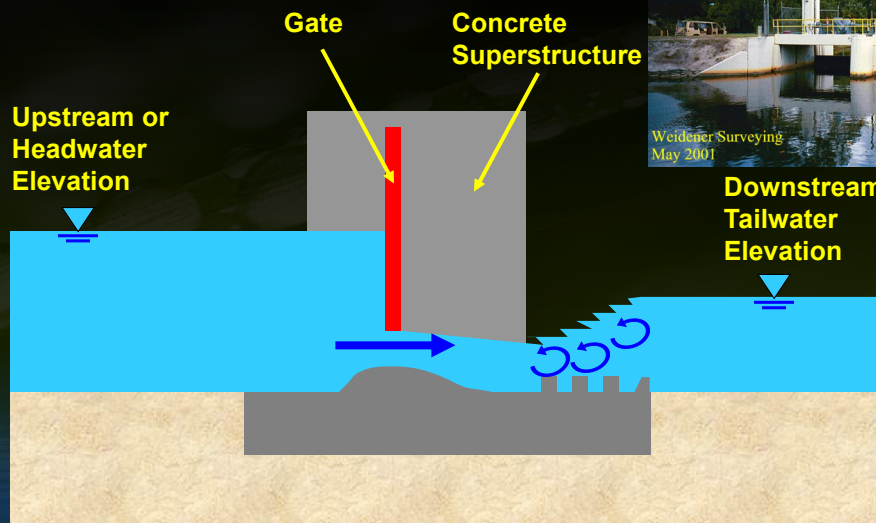
# Water Management System

- 2,060 miles of canals
- 2,028 miles of levees
- 160 major drainage basins
- 1,413 water control **structures**
- 71 pumping stations
- 60,000 acres of regional wetland Stormwater Treatment Areas
- Lake Okeechobee
  - 450,000 acre water storage area
- Water Conservation Areas
  - 959,000 acre water storage



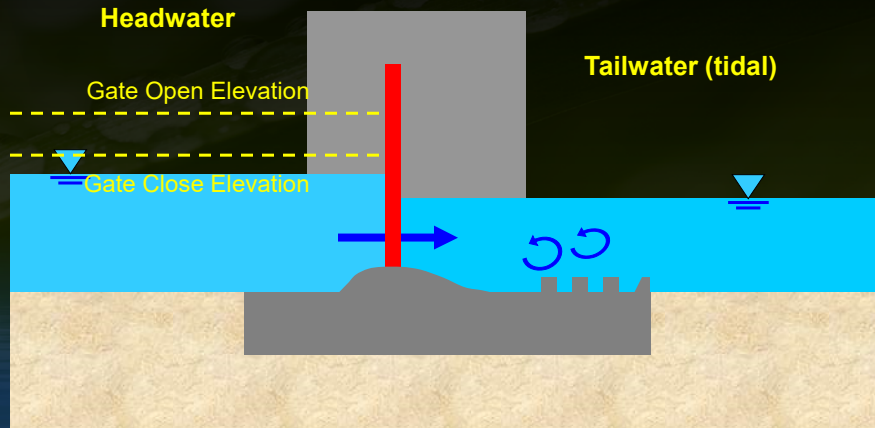
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# Gated Spillway Basics



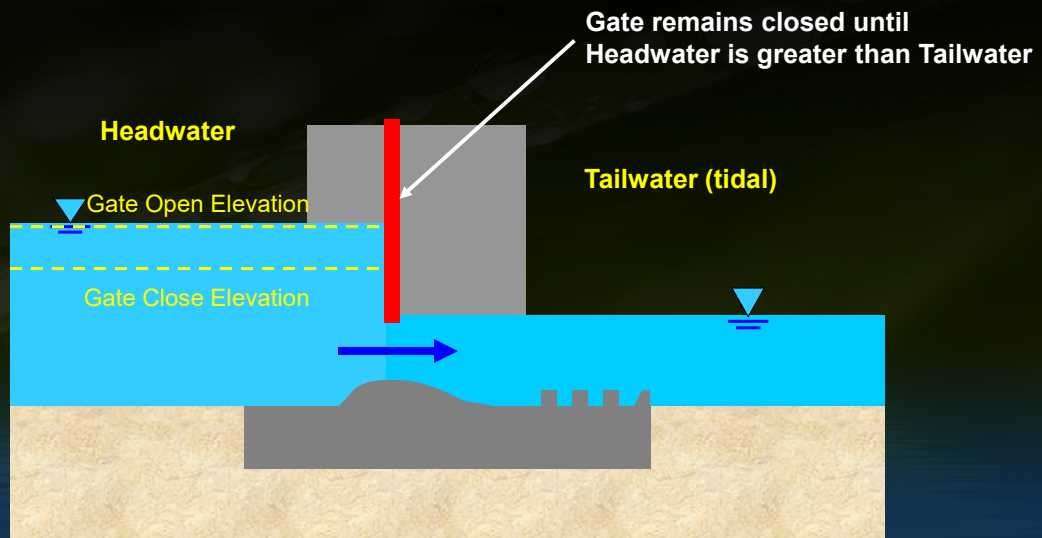
8

# Gated Spillway (coastal structures)



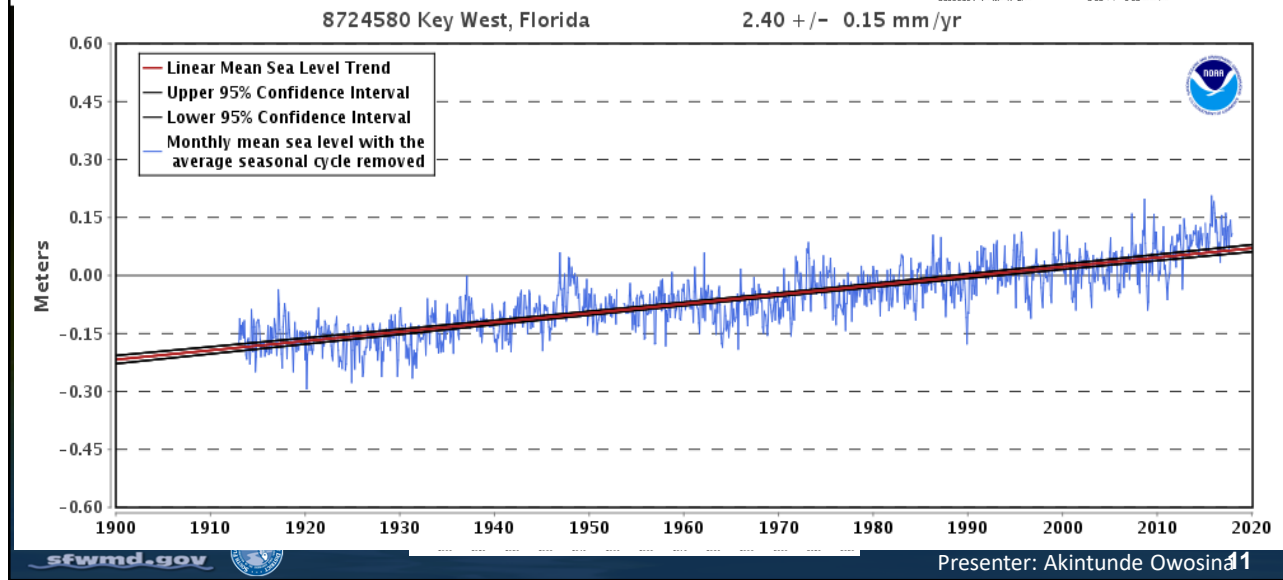
9

# Gated Spillway (coastal structures)



10

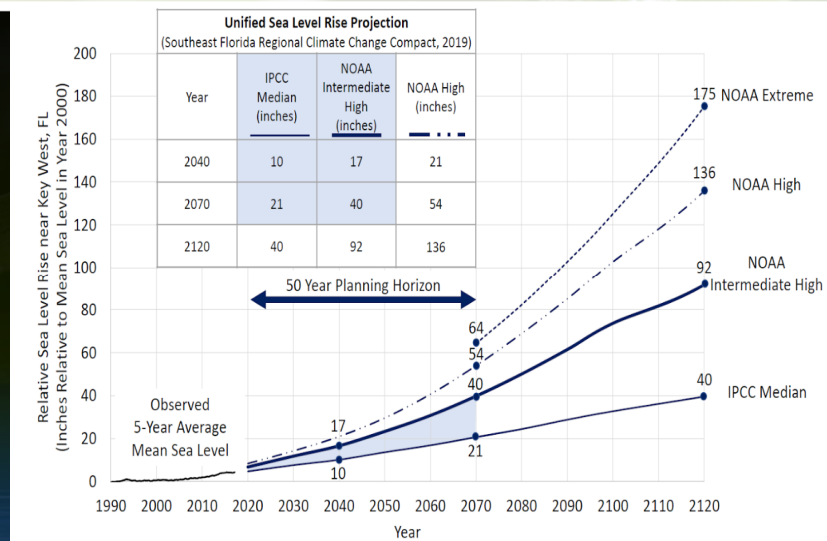
# Sea Level Rise Trends in South Florida (NOAA)



11

# Unified SLR Projections 2019 (Climate Compact)

- Developed by the Four-County Compact
  - Palm Beach
  - Broward
  - Miami Dade
  - Monroe
- SFWMD staff provided technical assistance



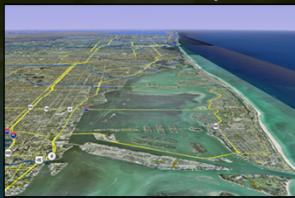
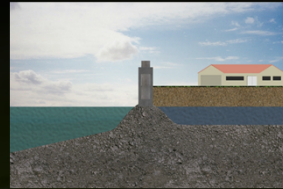
Presenter: Akintunde Owosina 12

12

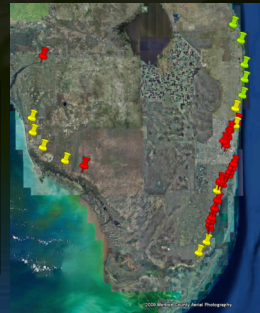
## Coastal Structures and Flood Protection



Potentially impacted gravity coastal structure in Miami-Dade County



Aerial Map of Coastal Miami



- Gravity Coastal structures on primary canals (also known as “Salinity Barriers”) showing inefficiency during high tide
  - Designed and built in the 1950s
  - Finding from initial screening: Miami-Dade County most potential to be impacted
- Future potential rise in water table due to sea level rise will further impact flood protection
- Future potential increase in extreme rainfall and the projected increase in intensity and frequency of hurricanes will exacerbate sea level rise impacts

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## ... The Manager’s Question ...

**We have the aging infrastructure approaching or past design end of life:**

- Do I replace them and if so When do I replace them ?
- What do I replace them with ?
  - In kind - same as it was? or
  - Different to accommodate known changes since design and projected changes?
- Where and how ?
  - What goes first, what happens next?
  - What happens downstream of our current assets?
- What liability or risk am I exposed to – due to action or inaction
- Who pays for the fix ?
- What assurances do I have ? (responsibility to manage public funds) considering high uncertainty

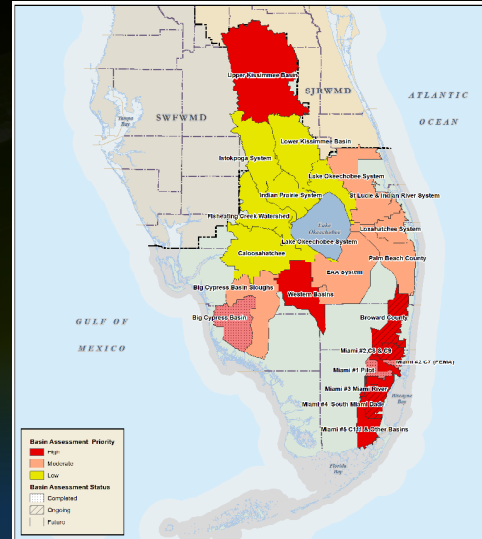


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## Flood Protection Level of Service Program

How we ensure that our flood control assets are up to the task considering development, land use change, SLR and climate change

- Identify and prioritize long-term District infrastructure needs
- Assess level of flood protection throughout the 16-counties of the SFWMD – relative to design
- Identify at-risk structures and needed improvements to operations, canal conveyance or structures
- Provide a **formal process** to initiate retrofit and adaptation efforts for future infrastructure improvements and/or modification of regulatory criteria
- Incorporate **resilient** design standards and construction
- Coordinated with SFWMD Operations, local government entities, drainage districts and other agencies with flood control or related responsibility



Presenter: Akintunde Owosina 15

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## Three Phases of the FPLOS Program

### ➤ FPLOS Assessment:

- Identify location of potential challenge
- Identify time horizon of potential challenge
- Prioritize watersheds for detailed resilience studies

### ➤ FPLOS Resilience Study and Adaptation Design

- Based on findings of assessment
- Detailed study focused on identifying most cost effective adaptation
- Involves solution search in all three tiers
- Identification of uncertainties and time horizon for implementation
- Culminate with preliminary design sufficient for cost development

### ➤ Resilient Infrastructure Implementation

- Final design, permitting and construction of sequenced adaptation



Presenter: Akintunde Owosina 16

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# Activities Completed in a Typical FPLOS Assessment

- Focus on primary system
- Compilation and publishing of a multi-volume water control operations atlas of the basin
- Hydraulic and hydrologic model of basin including structures, pumps stations and canals
- Assessment of current conditions using different severity of storm events (rainfall) plus storm surge
- Simulation of future conditions with three different Sea Level Rise projections also with rainfall and storm surge
- Identify underperforming or at-risk segments or components
- Coordination with counterparts in the County
- Activities for the C8/C9 Basin



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# Activities Completed in a Typical FPLOS Adaptation and Mitigation Planning and Design



18

# Questions?



# Break



# C-8 and C-9 Basins Flood Protection Level of Service

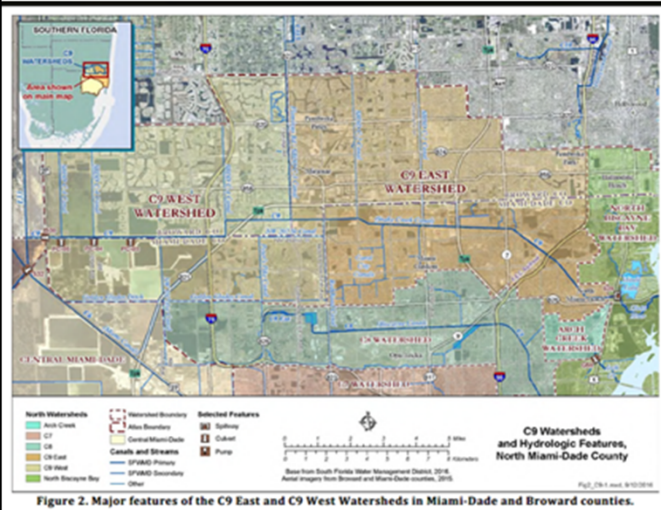
## Phase I Study Results

Michael DelCharco, PE  
 Vice President of Water Resources  
 Taylor Engineering

[sfwmd.gov](http://sfwmd.gov)

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# C-8 and C-9 Basins FPLOS Phase 1 Study



- Focus on primary system
- Evaluating effects of changes in SLR, storm surge, and land use on FPLOS
- Model Calibration and Validation
- Current Condition Assessment (4 return periods and storm surge)
- Future Condition Assessment
  - 4 return periods and storm surge
  - Sea level rise (+1, +2, +3 ft)
  - Groundwater level
  - Future land use and project
    - American Dream Mega Mall
    - C9/C11 impoundments (USACE)
    - C-9 Impoundment

[sfwmd.gov](http://sfwmd.gov)



Presenter: Michael DelCharco 22

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## Six FPLOS Performance Metrics

### Canal

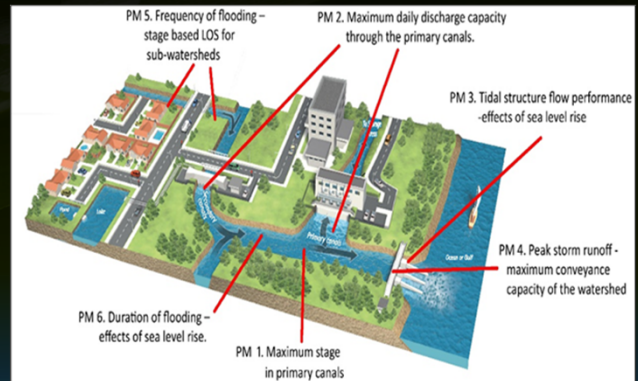
- Maximum stage profiles (PM1)
- Discharge capacity of sub-basins (PM2)

### Tidal Structure (Sea Level Rise)

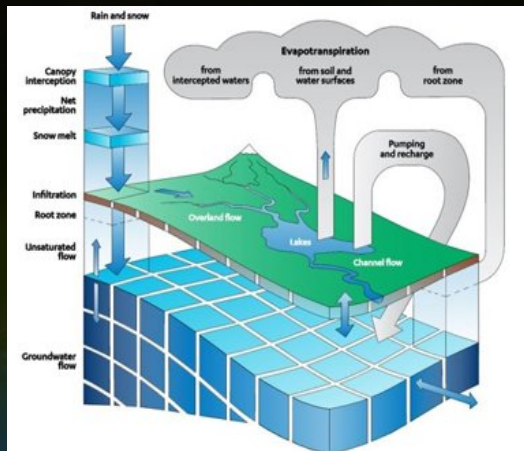
- Structure discharge capacity during surge (PM3)
- Max conveyance capacity at tidal structure caused by surge and SLR (PM4)

### Land

- Maximum flood depth map (PM5)
- Flood duration map (PM6)



## Model Tool Selection



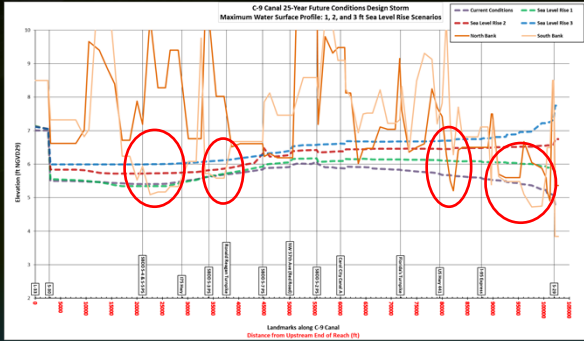
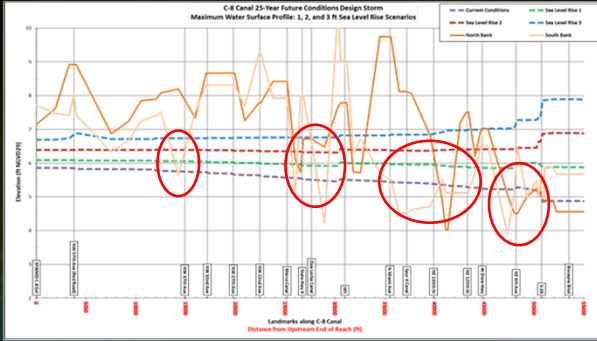
### Model Tools Selected for C8 and C9 Basins

- Physics-based spatially distributed model tools
- Simulate
  - Overland flow
  - Unsaturated flow
  - Groundwater flow
  - And fully dynamic channel flow
  - Including all their complex feedbacks and interactions



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# C8 and C9 Basins FPLOS Assessment – PM 1

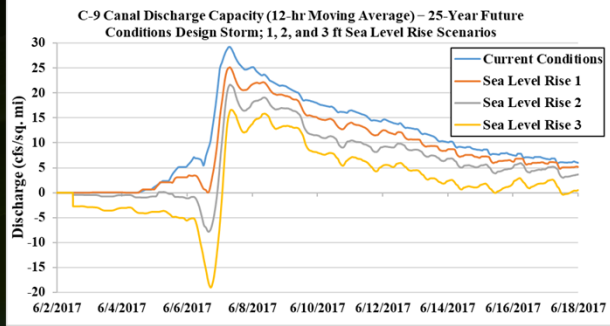
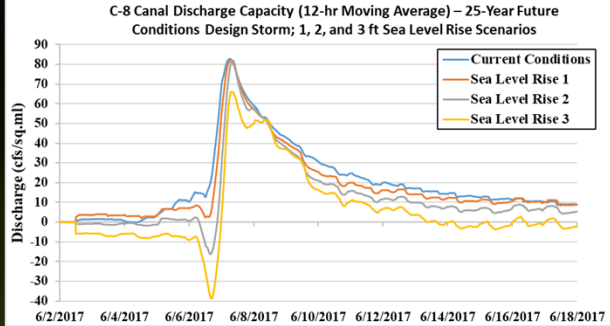


Examples of 25yr event

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# C8 and C9 Basins FPLOS Assessment – PM 2



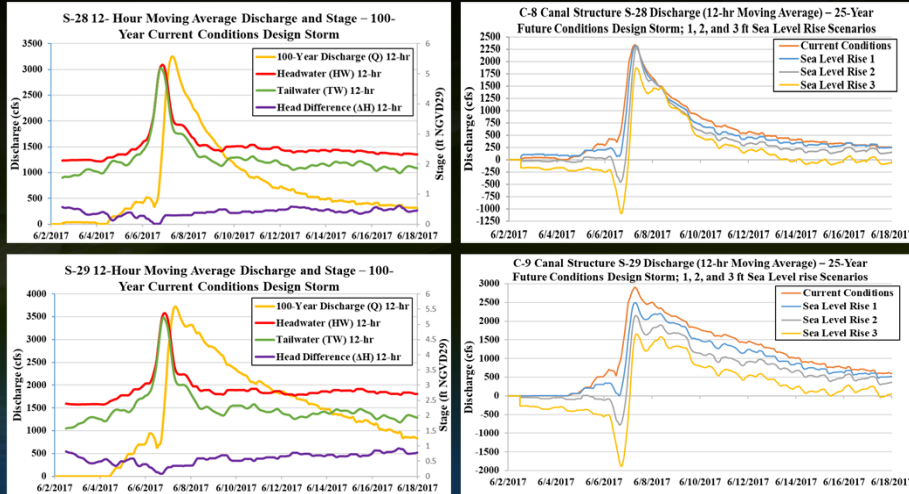
Examples of 25yr event

26

# C8 and C9 Basins FPLoS Assessment – PM 3 and PM 4

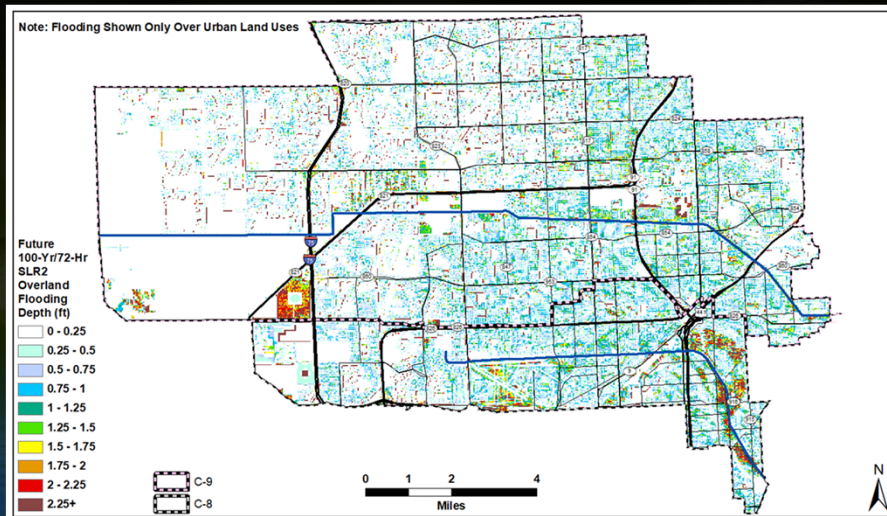
PM 3

PM 4



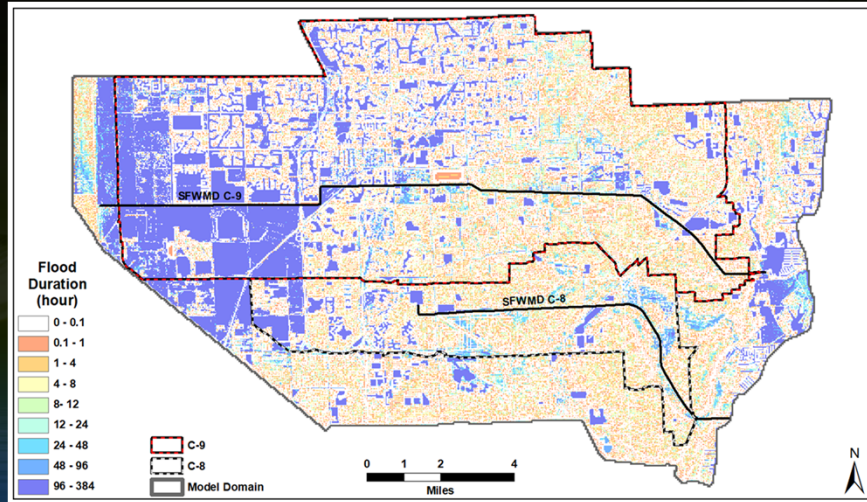
27

# C8 and C9 Basins FPLoS Assessment – PM 5



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## C8 and C9 Basins FPLOS Assessment – PM 6



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## C8 FPLOS Phase 1 Assessment Summary

### C8 Basin

- Overall, C8 provides about a 10-year FPLOS under current conditions. Western half of C8 performed better than eastern half. Multiple areas in eastern C8 performed poorly.
- Under future 1 ft and 2 ft SLR scenarios, the basin overall provides a 5-yr LOS. For the 3 ft SLR Scenario, portions of the system was overwhelmed even for the 5-yr event.
- Western segment of the C8 performs better than eastern segment, maintain about a 25-yr LOS for current conditions and SLR1.
- Discharge capacity at S28 is reduced dramatically under SLR 3. Reduction ranged from 19% to 28% for different events.



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# C9 FPLOS Phase 1 Assessment Summary

## C9 Basin

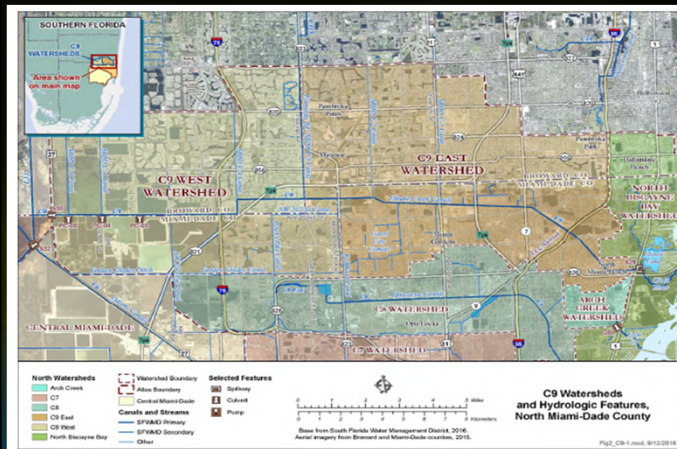
- C9 generally functions at about a 25-year FPLOS under current conditions.
- Bank exceedance occurred in several locations under SLR conditions.
- The 12-hour peak discharges at S-29 for all storms are sensitive to all SLR scenarios
- Under future conditions, the C9 generally function at a 10-year or lower FPLOS for the 1 ft and 2 ft SLR scenarios, and a 5-year FPLOS for the 3 ft SLR scenario.
- Widespread bank exceedances, with corresponding flood depths and durations occur for the 25-year event, for all SLR scenarios.
- Western segment performs better than eastern segment.



Presenter: Michael DelCharco<sup>31</sup>

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# C-8 and C-9 Basins FPLOS Adaptation and Mitigation Planning Projects Study – Phase II



- Objectives: To develop basin wide flood adaptation strategies and mitigation projects for the C8 and C9 watersheds to maintain or improve the level of flood protection in anticipation of future conditions including SLR, land use changes, and increased ground water.
- The development and implementation of the strategies will be a collaborated effort from the District, USACE, counties, local drainage districts and other stakeholders.

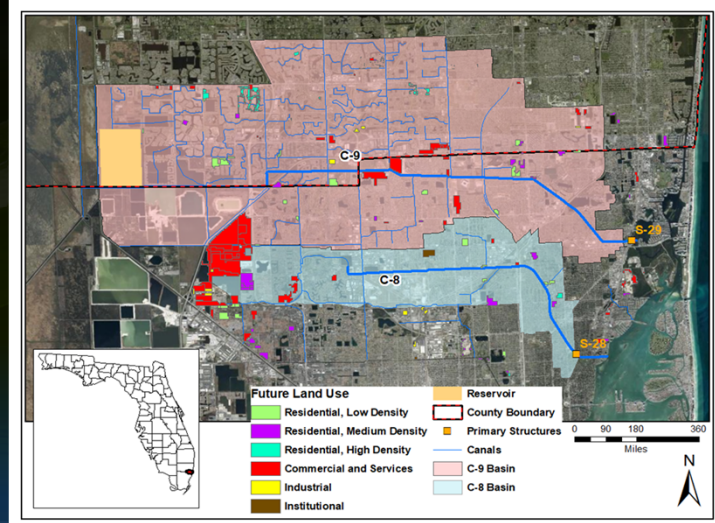


Presenter: Michael DelCharco <sup>32</sup>

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## Future Land Use

- Approx. 4,000 acres identified for change
- Parameters affected:
  - OL Manning's Roughness
  - Paved Area Fraction
  - Detention Storage
  - Topography



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## Examples of Potential Mitigation Strategies

### C8 Basin:

- Canal Conveyance Improvements
- S28 Structure Improvements
- Flood Walls and Surge Barriers
- Raise Levees along C8 Canal and add Gates/Pumps on Secondary Branches

### C9 Basin:

- C9 Impoundment
- Connect Western Mine Pits South of C9 to Canal
- S29 Structure Improvements
- Raise Levees along C9 Canal and add Gates/Pumps on Secondary Branches

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## Examples of Potential Mitigation Strategies

### C7 Basin:

- Looked at structural changes
- Examined land use building code changes
  - Building codes to elevate roads and buildings
    - Economic review of “what if” elevations at 100-yr with SLR3 in 2065
  - Very effective, but very expensive and slow to implement
  - No hydraulic modeling
  - Included in economic modeling/calculations



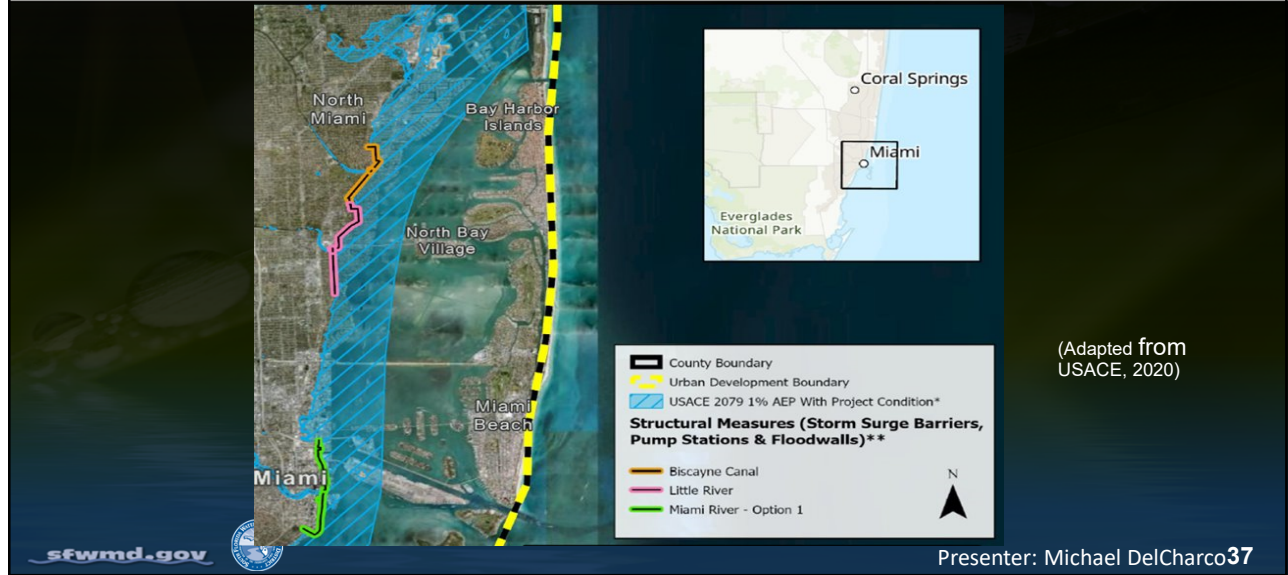
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## S28 Structure Improvements



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# Surge Barriers and Flood Walls on C8 and C7

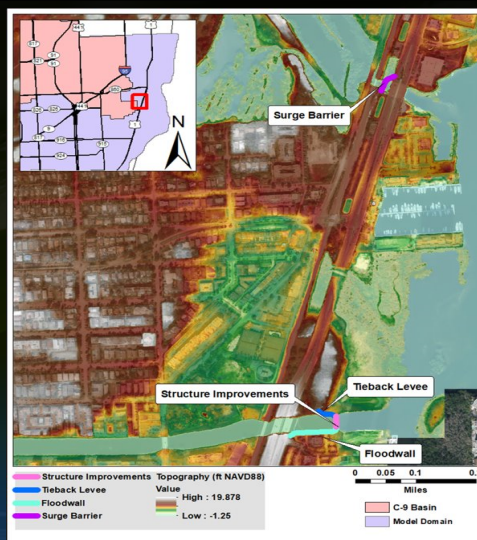


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# Locations of S29 Improvements and Potential Oleta River Surge Barrier

## Example of Mitigation Project at S29

- Add pump
- Add levees
- Add floodwalls and surge barriers
- Tie in to existing topography

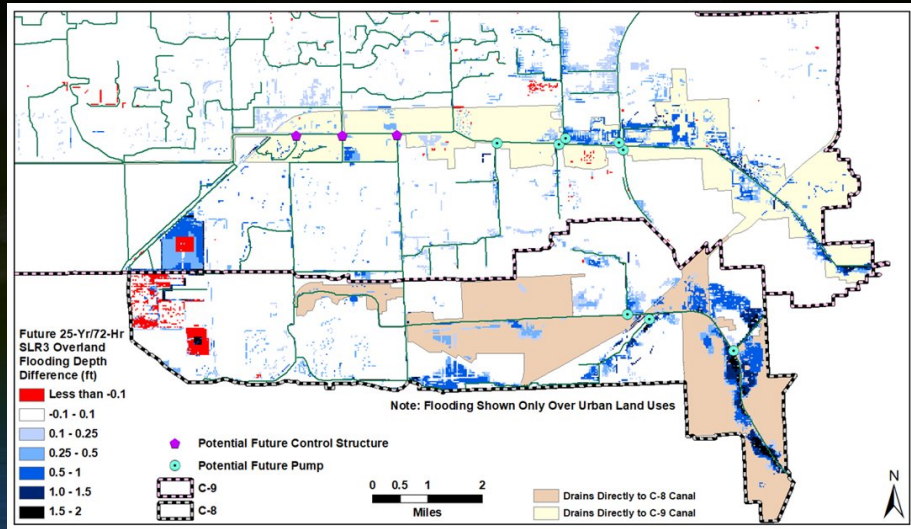


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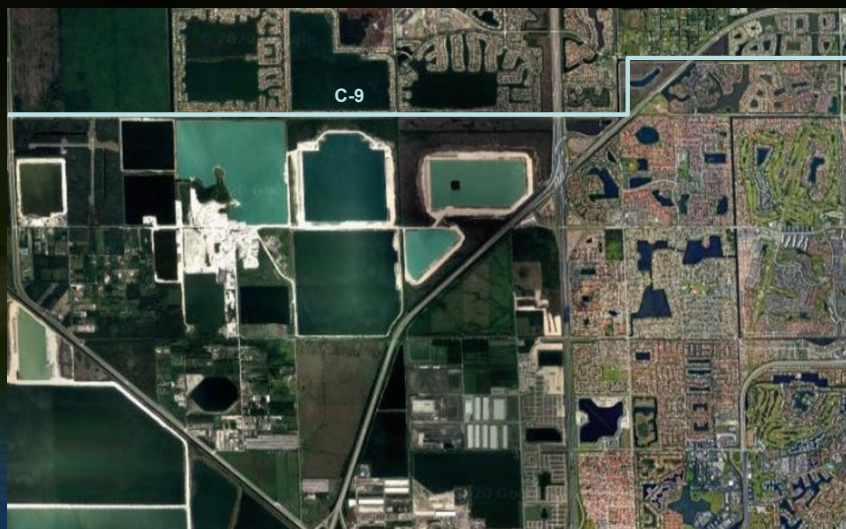
## Example of Modeling Results from Structural Mitigation Projects

Flood Difference Map with Possible Locations of Future Control Structures and/or Pump Stations



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## Western Mine Pits (a.k.a. North Lake Belt Storage)



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## Questions and Comments



[sfwmd.gov](http://sfwmd.gov)



Photo: [MiamiDade.gov](http://MiamiDade.gov)

Presenter: Michael DelCharco<sup>41</sup>

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## C-8 and C-9 Basins Flood Protection Level of Service

Phase II Pre-Workshop Survey

Lynette Cardoch, PhD  
Director, Resilience & Adaptation  
Moffatt & Nichol

[sfwmd.gov](http://sfwmd.gov)

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# Flood Mitigation and Adaptation Projects

Build Community Resilience | SFWMD - Planning for Flood Adaptation at C-8 and C-9 Basins in Miami-Dade and Broward Counties

## FLOOD MITIGATION AND ADAPTATION PROJECTS

Overview

Simulated Flood Depth (FPLOS Phase 1 Assessment)

Local Projects at C-8 Basin

Local Projects at C-9 Basin

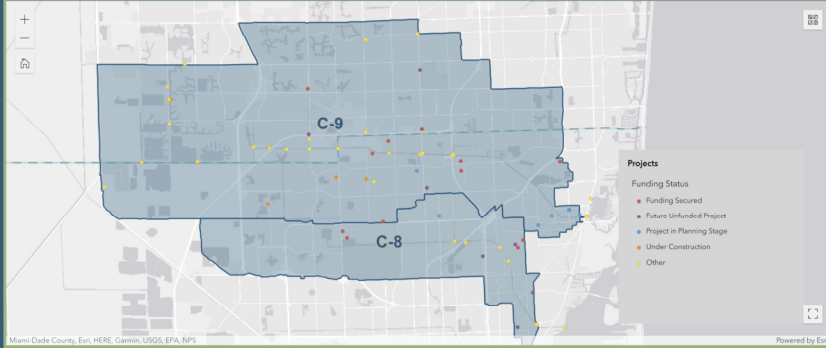
Projects Feedback

The South Florida Water Management District (District) has recently completed the flood protection level of service assessment of the C8 and C9 watersheds. This completed study will be referred to as the C8/C9 FPLOS Assessment Study (Phase I). Our upcoming workshop is part of the next project phase, the Adaptation Planning and Mitigation Projects Study (Phase II) to:

- develop basin wide adaptation strategies to address the deficiencies identified during the Assessment Study
- identify flood mitigation projects needed in the C8 and C9 watersheds to maintain or improve the level of flood protection provided by the District's flood control infrastructure, both under current conditions and in anticipation of future conditions including land use changes and SLR

Adaptation strategies and mitigation projects may range from:

- changes to operations of existing assets
- improvements to canal conveyance
- improvements to secondary drainage features
- addition of new assets including watershed storage
- refurbishment or replacement of flood control structures
- nonstructural strategies such as land-use changes or regulatory changes to permit conditions
- green infrastructure solutions, such as:
  - Raise flood barriers to improve storm surge protection
  - Add forward pumps to maintain basin discharge
  - Increase basin storage and associated nature-base / green



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Presenter: Lynette Cardoch 43

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# Simulated Flood Depth (FPLOS Phase I) Example: 2 Ft SLR, 25-year, One of 6 Performance Metrics

Build Community Resilience | SFWMD - Planning for Flood Adaptation at C-8 and C-9 Basins in Miami-Dade and Broward Counties

## FLOOD MITIGATION AND ADAPTATION PROJECTS

Overview

Simulated Flood Depth (FPLOS Phase 1 Assessment)

Local Projects at C-8 Basin

Local Projects at C-9 Basin

Projects Feedback

Current Conditions

Sea Level Rise - 1 Foot

Sea Level Rise - 2 Feet

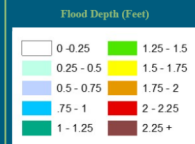
Sea Level Rise - 3 Feet

The SFWMD uses six (6) performance metrics (PMs) to establish the level of service within each basin studied. The flood depth is one of the six metrics and represents a spatial measure of flood risk based on district modeling assumptions including rainfall frequency, storm surge and sea level rise. These maps are different from and should not be equated to FEMA Zones or other flooding assessment conducted by local governments.



Click on each of these Flood Depth Scenarios to view them on the map.

- Future 5 year/72 Hour Overland Flood Depth (Feet)
- Future 10 year/72 Hour Overland Flood Depth (Feet)
- Future 25 year/72 Hour Overland Flood Depth (Feet)
- Future 100 year/72 Hour Overland Flood Depth (Feet)



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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# C-8 Potential Future Project Potential Pump Station Identified in Phase I

Build Community Resilience | SFWMD - Planning for Flood Adaptation at C-8 and C-9 Basins in Miami-Dade and Broward Counties

**FLOOD MITIGATION AND ADAPTATION PROJECTS**

Overview Simulated Flood Depth (FPLOS Phase 1 Assessment) **Local Projects at C-8 Basin** Local Projects at C-9 Basin Projects Feedback

DOUBLE CLICK A POINT ON THE MAP FOR ADDITIONAL PROJECT INFORMATION

**Project:** Potential Future Pump  
**Responsible Agency:**

**Project Type:**  
Infrastructure (Water/Sewer/Drainage)  
- Potential mitigation project for investigation (from Phase I study)  
**Estimated Completion Date:**  
Unknown

If you have additional flood projects information, to add or update, please click at the "Projects Feedback" link to share with the project team.

Miami-Dade County, Esri, HERE, Garmin, USGS, EPA, NPS

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# C-9 Actual Project Under Construction SBDD: Adjustable Sluice Gate

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**FLOOD MITIGATION AND ADAPTATION PROJECTS**

Overview Simulated Flood Depth (FPLOS Phase 1 Assessment) Local Projects at C-8 Basin **Local Projects at C-9 Basin** Projects Feedback

DOUBLE CLICK ON A POINT ON THE MAP FOR ADDITIONAL PROJECT INFORMATION

**Project:** Adjustable Sluice Gate 1  
**Responsible Agency:** South Broward Drainage District  
**Project Type:** Drainage  
**Estimated Completion Date:** <3 Months

If you have additional flood projects information, to add or update, please click at the "Projects Feedback" link to share with the project team.

Miami-Dade County, Esri, HERE, Garmin, INCREMENT P, USGS, EPA | Esri, HERE

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Presenter: Lynette Cardoch 46

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## Pre-Meeting Stakeholder Questions

- What is your involvement in flood mitigation and adaptation planning?
- Have you observed significant changes in flooding conditions in the recent 5-10 years? Do you have any documentation?
- What do you believe are the major limitations of the existing flooding system at C-8 and C-9 Basins? Do you have a plan and preferred actions to address these limitations?
- How are future conditions (e.g. sea level rise or increased rainfall) considered as part of project planning/design?



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## Knowledge Gained

- Respondents indicate increased flooding events in past 5-10 years
- Capacity concerns in both basins
- Gravity flow will not accomplish needed drainage
- Uneven consideration of future conditions for rainfall and SLR
  - Not at all → Factored into plans and designs
  - Rain/precipitation changes less understood
- Different conditions in tidal areas versus the western parts of the counties
- Interest in inter-agency and multi-jurisdictional collaboration



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## Data Gaps

- Additional feedback on potential mitigation projects at the various levels
- Lacking information on projects that may be more local
- Want more sharing of innovative regulatory/policy ideas
- Integration of new projects and new ideas into the existing basin configuration



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## Breakout Groups

**Develop and integrate adaptation and mitigation strategies and projects**

- Share concerns about present and anticipated flooding/drainage issues
- Enhance connectivity among the community of practitioners in the C-8/C-9 basins through dialogue
- Communicate ideas that the practitioners would like this project to address
- Generate ideas on future projects



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## Breakout Topics

- Share any implemented and/or planned specific projects, and innovative regulatory/policy ideas.
- What flood control items do you would like to see assessed in this project to address concerns in your jurisdiction?
- What are the priorities for your region or the broader basin? How can projects be integrated within the region/basin?
- Phase I study put together a list of projects for considerations (reported in the presentation). What do you think about these projects?



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## Breakout Group Instructions

- Virtual participants
  - Assigned to a virtual breakout room
  - Zoom platform will automatically take them to correct room
  - More specific platform instructions given in room
- In-person participants
  - Group was designated at check-in
- 45 mins
- Moderator, Scribe, Report-Out



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# Questions and Comments



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# Breakout Groups Report-Out



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# Dynamic Adaptation Policy Pathway & Project Next Steps

Carolina Maran, PhD, PE  
District Resiliency Officer  
South Florida Water Management District

[sfwmd.gov](http://sfwmd.gov)

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# SFWMD Commitment to Resiliency

Ensuring the Region's Water Resources and Ecosystems Resiliency Now and in the Future

## Central and Southern Florida Flood Resiliency Study

The District is committed to analyzing the current and future impacts of climate change on the region's water resources and ecosystems. This study is a critical project for the District, and we encourage you to learn more about it.

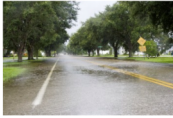
## Water and Climate Resilience Metrics

## Resiliency and Ecosystem Restoration

## Resiliency and Water Supply

## Resiliency and Flood Protection

The District is committed to ensuring the region's water resources and ecosystems resiliency now and in the future. This effort is integrated into the District's Capital Improvement Program to ensure its structures, pumps, canals -- all of which are critical in keeping South Florida habitable -- are functioning as designed, and will remain



[sfwmd.gov](http://sfwmd.gov)



Presenter: Carolina Maran

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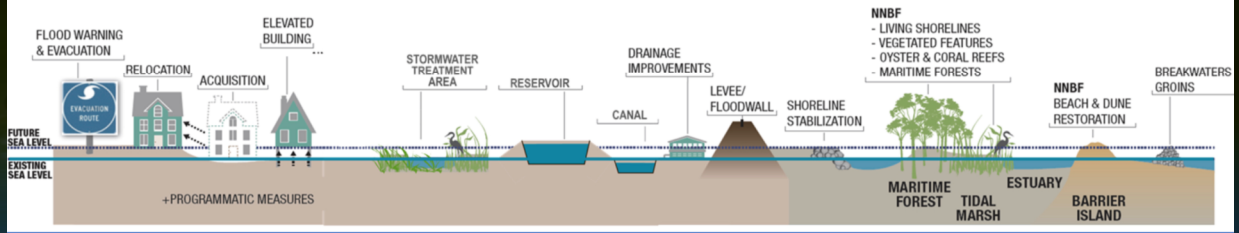
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# Coordination with Water Managers

## Building Resiliency: Integrating Inland and Coastal Flood Mitigation Strategies

### POTENTIAL MEASURES TO IMPROVE RESILIENCE AND SUSTAINABILITY

Graphic modified from [https://ewn.el.erdc.dren.mil/nbf/other/5\\_ERDC-NNBF\\_Brochure.pdf](https://ewn.el.erdc.dren.mil/nbf/other/5_ERDC-NNBF_Brochure.pdf)



Source: USACE



# Modeling Representation Priorities

### Category 1 - Modeling Priority 1

Modellable and benefits expected under current assumptions

- Has appropriate detail such as geometry, inverts, etc.

Example 1: Add municipal pump at confluence of primary/secondary canal

Reason: There are ways to determine the benefits associated with it (such as reduced stages upstream or reduced overland flooding).

### Category 2 – Modeling Priority 2

Modellable and expected benefits underestimated under current assumptions

- Has appropriate detail such as geometry, inverts, etc.

Example 1: Clearing out culverts.

Reason: Model assumes structures are operating at design/maintained condition

### Category 3 - Not Modeling

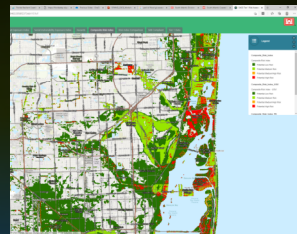
Not modellable / uncertainty to accurately quantify benefits

- Does not have appropriate detail
- Requires modification to modeling assumptions/baseline

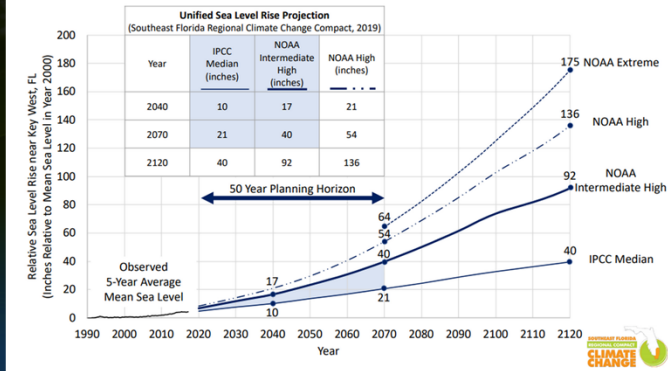
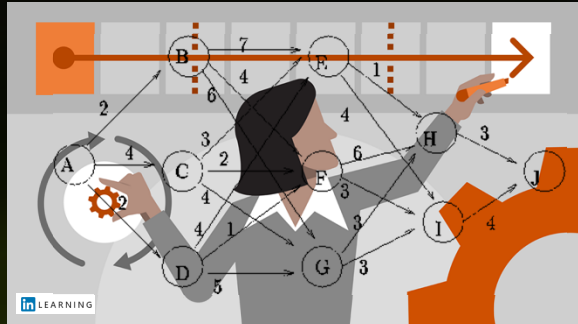
Example 1: maintenance dredging in sec. canals

Reason: Too much uncertainty in existing condition cross sections to be able simulate maintenance dredging.

### GIS Assessment



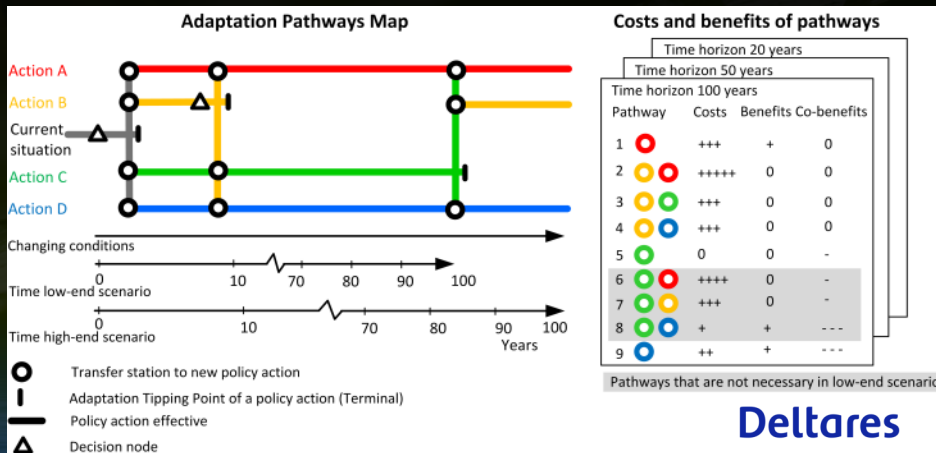
# WHAT IF: Dealing with Uncertainties



Presenter: Carolina Maran 61

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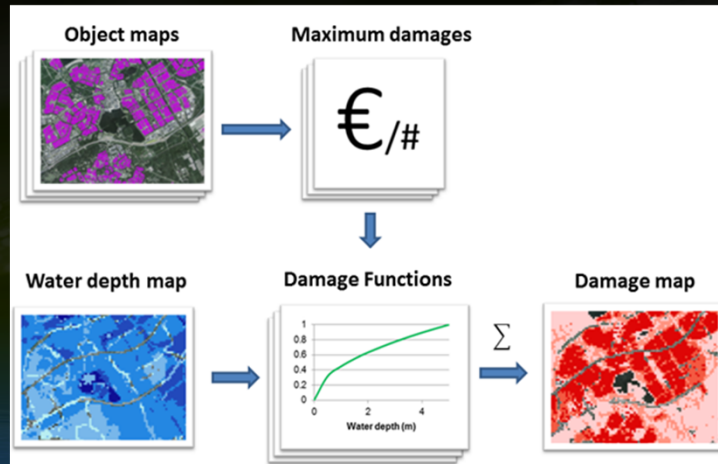
# Dynamic Adaptive Policy Pathways



Presenter: Carolina Maran 62

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## Flood Damage Cost Estimates



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## Historic and Largest Florida Flooding and Sea Level Rise Resilience Initiative

- SB1954: Resilient Florida Program
- Over \$640 million available to support efforts to ensure state and local communities are prepared to deal with the impacts of sea level rise, intensified storms and flooding



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## Collaboration is Key

We count on your continuous engagement throughout the project development, scenarios formulation, review of initial results, etc.

Stakeholder Engagement



Local & Regional Partnerships



Reduced Flood Risks



Maximize Other Associated Benefits

Source: FEMA BRIC

Please reach out to the Project Team if you want to set up a 30-min briefing for elected officials or additional technical staff in your area



# Thanks!

# Questions?

# Closing Comments



## **APPENDIX G: Workshop Pictures**





Picture 1: Date, Time, and Location of the FPLOS Phase II Opening Workshop



Picture 2: Report-out Session of the Workshop Break-out Groups



Picture 3: Report-out Session of the Workshop Break-out Groups



Picture 4: Report-out Session of the Workshop Break-out Groups



Picture 5: *Presentation by Dr. Carolina Maran*

## **APPENDIX H: Workshop Feedback**



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## South Florida Water Management District

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### **C-8 and C-9 Basins Flood Protection Level of Service Adaptation and Mitigation Planning Projects Study**

Workshop Feedback (August 3, 2021)

SFWMD Project Team

August 11, 2021

#### **I. Was the workshop outcome what we planned for?**

1. Yes, we all agreed that the workshop outcome appears to have met the planned objectives and expectations. Time will confirm how well. The workshop also opened up new avenues for collaboration.
2. Now we have a bigger commitment to deliver the next project steps.
3. The virtual breakout session #2 produced a lot of discussion and brought some stakeholders together to discuss different agency projects.

#### **II. What went well?**

1. The overall planning went very well.
2. The stakeholder coordination is very effective.
3. The pre-survey and the website for collecting information (such as projects and concerns) and sharing information (such as Phase I results and the workshop related message) are very well designed and is a very innovative tool.
4. The agenda is very well planned.
5. The presentations are very robust and covered all the critical components.
6. The breakout groups were very well formulated.

7. The subgroup discussion packet was very well prepared; the discussion topics were very well formulated.
8. The subgroup discussions were very effective.
9. All the subgroup moderators conducted discussions in a very effective way.
10. The breakout group report back truly showed the stakeholder engagement.
11. Uploading all the notes from the discussion groups is also a critical step.
12. The overall workshop moderator led the workshop in a very professional way and the atmosphere was very friendly and encouraging.
13. All four presentations are very robust and delivered a clear message about the FPLOS, resilience, and collaborations.
14. Debriefing and lesson learned allows us to continue to improve in future endeavor.
15. The collaborations from the entire team were the key to success.
16. Outside of the technology challenges, most planned aspects of the event went well.
17. The venue was close to the partners and adequately sized for the in person attendance.
18. Though not planned, the in-person DEP presence was a plus and the flexibility to amend the agenda to accommodate an opening and closing statement by Adam B was excellent.
19. The movement between parts of the event was well planned and nothing was too long, keeping the attendee's attention through the workshop.
20. The pre workshop work including the web tool showed preparation.
21. The mix in the breakout sessions appears to have achieved the desired goal of fostering cross region engagement.
22. The level of stakeholder engagements was encouraging.
  
23. Level of participation was excellent and only a few communities did not have a participant attending.
24. Participants came ready to share thoughts, ideas and overall project details with the District team. They seemed open to coordinate with us now and in the future (as part of scenario simulations).
  
25. Materials were super well prepared, the room looked great, the food offer was also very good.
  
26. The ZOOM breakout session was well thought out. The instructions to the moderators were very helpful and kept the discussion on track.
27. Having a list of attendees assigned to the BO room was essential. Most attendees kept their cameras off.
28. It was key to have a SFWMD FPLOS team member in the BO room to advise of policy and answer specific questions.
29. The event structure (hybrid set-up, group breakouts, venue/space, etc.) and material presented (program wide, study specific, etc.) were well planned, this was apparent to me based on the engagement received in person and online via zoom and the enthusiasm of many of the participants to continue working together to share/learn where improvements are needed between our agencies.
30. The public calendar posting.



### III. What could have been better?

1. Some technologies related to the audio and the hybrid type of meetings can be improved.
2. Consider having a website for the project to communicate all the critical milestones.
3. The breakout discussion session can use a little more time.
4. The engagement with elected could have improved. I do not know for example how many elected officials were represented and if there was some way of acknowledging the office to help start the process of finding a couple of champions for the work.
5. We need to have better coordination with Counties. We are not sure yet if all projects were brought to the discussion, via tool or via breakout sessions. Miami Dade County (Marina) mentioned their projects developed as part of the latest XPSWIMM Modeling effort (in our separate coordination meeting) and it seems these projects were not fully incorporated yet as part of the Workshop process.
6. The Counties participation in the Workshop was more on the overall project's aspects and review, and not yet to share project details. I agree that the engagement with elected officials ended up being ineffective.
7. The initial part of the ZOOM meeting audio (while presentations were being made) before the breakout sessions had audio issues.
8. Increasing the participation of elected officials. Internal engagement, I did receive last minute link requests for the meeting link as well as after the workshop from District personnel. Some folks had great input and resources after the fact that would have been helpful. Perhaps an invite to all bureau chiefs or section leads next time.
9. The handling of the audio issues by venue staff could've been improved – e.g. using breaks in the presentation to bring in the soundboard instead of doing so while a presenter was speaking.
10. During Q&A, I find it would've been helpful to allow the more technical members of the consulting team to address the participants, e.g. Joe W. had excellent insights in response to some questions and during the field trip the next day.

### IV. What did we learn?

1. In general, I think this is the right direction for conducting an adaptation and mitigation planning projects workshop and to encourage stakeholders' engagement.
2. Three important things.
  - There is stakeholder interest and desire to engage (district interest in local projects).
  - The suite of adaptation strategies is not too different from those we could have anticipated going in.
  - There is a strong local desire to incorporate green and water quality considerations - not news but confirmed.

3. Several projects and willingness to collaborate One Water approach - accounting for Water Quality implications.
4. Stakeholders want to incorporate water quality issues with flood control issues where possible. They want FC projects to improve WC where possible.
5. Folks are interested in collaborating and advancing approaches/projects that address flood issues in addition to providing other beneficial services/outcomes (e.g. community benefits, water quality, etc.).

#### **V. What are our next steps?**

1. The next step will be completing the remaining subtasks.
2. Develop a workshop minutes.
3. Summarize all the projects collected through survey and workshop.
4. Fine-tune the criteria and prioritization scheme to select the final M1 projects to be included in subsequent modeling activities.
5. Identify the projects that need follow-up discussions with stakeholders to collect additional information to be able to do the assessment in the next task.
6. Follow-up discussions with stakeholders.
7. Develop Task 1 technical memo.
8. Leverage the engagement and relationships established. Finalize a list of strategies that we know of and determine the feasibility of evaluating with existing tools (with or without modifications).
9. Determine if a new tool is needed to augment the available suite of tools and if it is in or out of scope of the current contracts Take on the WQ challenge I put to the team to develop a metric (monetized) that shows up as a cost under current or no action condition and a cost avoidance under alternative scenarios that improve (or have the potential to improve) WQ Revisit and follow the scope of work for the project. Confirm timelines.
10. Crosswalk between counties and SFWMD models will be a very strategic next step, to get more recognition from our efforts and have the capacity to represent their efforts in an integrated model. Share results along the way to boost engagement, not only next DAPP Workshop.
11. Reconnect with the stakeholders to flesh out projects they submitted or get projects from them that they did not submit at the Workshop.
12. Keep the engagement going through data sharing and follow-up.
13. Somehow address all projects/ideas, if not through modelling, then GIS or other avenues.
14. Engage with any cities/municipalities that were not represented at the workshop.
15. Use of comms news updates.