

SEA LEVEL RISE AND FLOOD RESILIENCY PLAN

Building Resilience and Mitigating Risks on South
Florida Water Resources

Central and Southern Florida System & Big Cypress Basin

Public Comments

(Comment period: June 14, 2022 - July 22, 2022)





Miami-Dade County

111 NW 1st Street

Miami, FL 33128

T 305-375-5593

July 25, 2022

Executive Director Drew Bartlett
South Florida Water Management District
Contact Information
3301 Gun Club Road
West Palm Beach, FL 33406

Re: South Florida Water Management District's 2022 Draft Sea Level Rise and Flood Resiliency Plan

Dear Director Bartlett,

The collaborative approach that your agency is taking to address the large issues of climate change and sea level rise is very commendable. We appreciate the District's consideration of the comments we provided last year and we look forward to continuing our collaboration during the upcoming South Florida Water Management District Resiliency Coordination Forum Meetings. This coordinated approach should create a strong foundation to seek funding in support of the improvements that we know are needed to keep pace with rising sea levels.

With respect to this year's resiliency plan, the addition of components focused on energy efficiency, renewable energy, nature-based solutions, and ecosystem restoration is welcome. There are many components that we strongly support such as hardening coastal control structures and implementing "self-preservation" mode, increasing locally distributed and regional storage, increasing basin interconnectivity, and maximizing the integration of green infrastructure and nature-based solutions. Miami-Dade County will continue to partner to advance these initiatives.

The partnership will be essential to address the larger regional adaptation needs to ensure that multiple flood protection measures are advanced. The excellent work by your agency has shown that expanding pump capacity on the primary canals may be necessary but may not be sufficient to address sea level rise, particularly for coastal areas. In some instances, it may be more effective, enduring, and cost-effective to elevate or floodproof properties. As shown in the C-7 Level of Service assessment, in some instances non-structural flood mitigation measures, such as raising the lowest-lying properties (shown in green below), may have substantially longer efficacy than forward pumps.

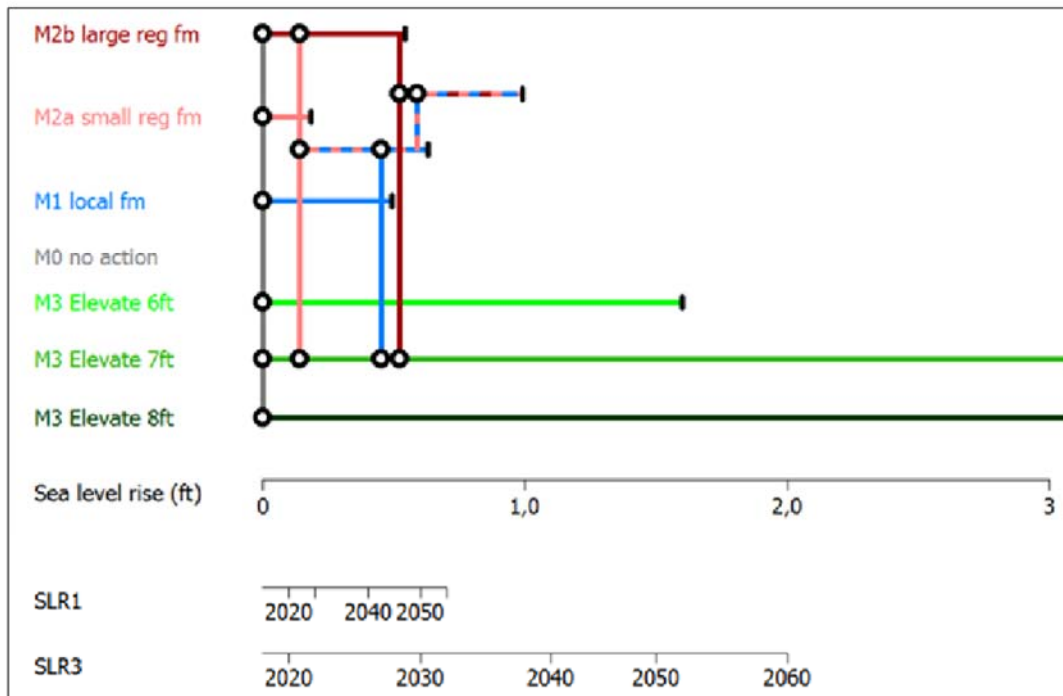


Figure 9. Adaptation Pathways map for the entire basin, based on the simulated expected annual damage for the current sea-level and the two possible future sea level rise scenarios.

Pursuing other flood protection measures in partnership with other entities may also delay or reduce the capacity needed for forward pumps. This would have the benefit of reducing energy and fuel use, reducing water quality impacts, and reducing disruption to wildlife in the canals and bay. While the implementation mechanisms are not yet in place, pursuing flood-proofing measures would also likely reduce the overall adaptation costs. For example, floodproofing all structures in the C-7 below six feet could cost between \$110M and \$220M.¹ It is likely that the most cost-effective approach is an optimized combination of measures. While additional pump capacity may be needed long term, greater emphasis should also be placed on protecting water resources and minimizing negative impacts to Biscayne Bay now. In this regard, additional flood mitigation alternatives should be considered in concert with Miami-Dade County to, among other opportunities, increase storage capacity, divert or otherwise reduce the volume of water conveyed through coastal structures and received by the Outstanding Florida Water body through restoration and infrastructure improvement projects and pilot and implement innovative technologies that improve water quality. This could include identifying opportunities for additional wetlands rehydration projects that can improve wetland habitat and function while

¹ Based on an estimated 736 structures below that threshold and a low end estimated cost of floodproofing/elevation of \$150,000 per structure and a high-end estimate of \$300,000 per structure.



providing additional water storage and water quality improvement prior to discharging to Biscayne Bay.

As part of the decision-making process, it should also be considered which measures will help protect our water quality, which our economy and community depends upon. In many canals, including the C-7 and C-8, existing water quality is compromised and is already stressing the health of Biscayne Bay and other water bodies. Moving toward a system that relies upon extensive forward pumping may compromise the health of the Bay. Given the current water quality conditions, it may be very difficult to design a forward pumping system that does not incidentally increase turbidity and pulsed discharges of nutrients and bacteria. This would be counterproductive to several on-going water quality initiatives funded locally and with state funding support. Understanding that the District understands the importance of the local water quality issues, Miami-Dade County values the District's partnership and commitment to the implementation of projects and activities related to the Reasonable Assurance Plan once it is developed to address issues of degraded water quality and verified impairments in many segments of the Biscayne Bay watershed.

Recognizing that a gravity-driven system may not be able to continue indefinitely, we would ask that the District fully consider and implement other flood mitigation and water quality programs in advance of moving toward extensive forward pumping. Other measures such as optimizing operations, non-structural flood mitigation, increasing basin interconnectivity, distributed storage, emergency detention basins, raising canal banks, and nature-based solutions could be pursued aggressively in the short term ahead of deployment of multiple forward pumps. In many instances, this type of approach will require coordination with other entities to implement flood mitigation measures that are outside the District's purview, and Miami-Dade County stands ready as a dedicated partner to pursue those projects.

To address the County's and District's shared concerns related to risks to the water supply as the result of reduced groundwater flow to the southernmost wellfields which may lead to increased saltwater intrusion and reduced freshwater flows into Biscayne Bay, the County suggests incorporating mitigating strategies that would provide both hydraulic and water quality measures to protect our water supply and natural resources.

Again, we would like to thank your agency for taking our previous comments into consideration and for working so diligently, proactively, a collaboratively to identify innovative and creative approaches to minimize water quality impacts. Our team recognizes that this is a difficult challenge and there are few easy solutions, but our teams are ready and willing to continue a partnership to identify the best path forward that helps us achieve our collective climate adaptation, climate mitigation, environmental, and resiliency goals.



Miami-Dade County

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Sincerely,

Handwritten signature of James F. Murley in black ink.

James F. Murley
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COUNTY
ADMINISTRATOR

Dan McIntyre
COUNTY ATTORNEY

July 15, 2022

South Florida Water Management District
3301 Gun Club Rd.
West Palm Beach, FL 33406

RE: St. Lucie County comments - SFWMD Sea Level Rise and Flood Resiliency Plan (June 2022 Draft)

Dear Resiliency Team,

Thank you for the opportunity to comment on the South Florida Water Management District's (SFWMD) Sea Level Rise and Flood Resiliency Plan. Please consider inclusion of St. Lucie County's input for this plan, as outlined below.

1. St. Lucie County, partnering with its municipalities, has been working on resilience planning efforts since 2019 and is currently developing a community-wide resilience plan through data collection, assessments, and stormwater master planning updates. We support the District's Basin-wide Hydrologic and Hydraulic studies and the Future Conditions Groundwater Modeling project and request the District prioritize both these initiatives beyond the immediate flood control threat areas shown in the current plan. St. Lucie County looks forward to working collaboratively in the coordination of these efforts, which we believe are essential to the success of our common goals and initiatives.
2. More data is needed to accurately understand existing conditions in St. Lucie County. In addition to the SFWMD Canals (C23, C24, & C25, among others) installed as components of the Central and Southern Florida project, St. Lucie County relies on two larger natural waterways, Ten Mile Creek and Five Mile Creek, which become the North Fork of the St. Lucie River (NFSLR) to drain nearly 100 square miles of the County. Long-term tidal influences should be studied by the District to determine the effects of sea level rise on these systems, as well as including consideration of the increased basin rainfall patterns. There is value to include support and needed funding for the continued restoration of the NFSLR, its floodplain, and the western lands/natural storage components of Comprehensive Everglades Restoration Plan (CERP).
3. The IRL-South project proposes large reservoirs and stormwater treatment areas (STAs) for the storage and abatement of excess fresh water being discharged to the Indian River Lagoon and the St. Lucie

Estuary. These critically important projects have been supported by St. Lucie County for their water quality improvements. However, the District has not provided substantial assurance to the concerns brought forth about flooding from the redirection of water from the C23/C24 system into the Ten-Mile Creek basin (the Northern Diversion). Ten Mile Creek is a severely overgrown FDEP-regulated waterway with documented severe response to high-flow events. An operational plan and model for the C23/24 system has not been provided to demonstrate that this additional flow into the system will not cause undue harm.

4. Page 15 of the document shows a map with basins in various stages of study. A large amount of southeastern St. Lucie County appears to be outside the Phase 1 project and has not been assigned a priority. Much of this uncategorized area is subject to tidal influence and is deserving of study. Please advise when the County would expect to see these basins integrated into the plan.
5. A critical aspect of resiliency planning is recognizing how Florida's coastal beach and dune system function and abate damages associated with future storm events and sea level rise. Barrier Islands rely heavily on this coastal feature for storm protection, and Florida's beaches and dunes play a vital role in preserving our Barrier Islands and Intracoastal Waterways. It should be noted that if the beach and dune systems were neglected most - if not all - future back-bay modifications would become obsolete. A strong coastal beach and dune system is a prerequisite to our future resiliency planning efforts. FDEP has extensive knowledge of facts concerning Florida's Critically Eroded Shorelines, and we believe the SFWMD should acknowledge their coordination with DEP and how these systems are managed.

St. Lucie County would like to thank the South Florida Water Management District for the opportunity to provide comments regarding this important issue. We recognize that planning for resiliency in Central and South Florida is not an easy task and we appreciate all the work you are doing to develop a data driven plan that benefits people, the environment, and the economy in an equitable and collaborative way.

Sincerely,



Mark Satterlee

cc: Howard Tipton, County Administrator
Amy Griffin, Environmental Resources Director
Patrick Dayan, Public Works Director
James Lappert, Water Quality Division Director
Josh Revord, Senior Coastal Engineer
Mike Middlebrook, Assistant Environmental Resources Director
Nicole Fogarty, Legislative Affairs Director
Courtney Calderone, Legislative Affairs Grand Coordinator
Jennifer McGee, Sr. Strategic P&R Coordinator
Sandra Bogan, Resilience Navigator

2022 SFWMD Resiliency Plan (DRAFT)

Comments & Suggestions by D. Samuel Rajasekhar

(Palm Beach County: Consultant GIS Analyst)

- Topo-Bathymetry LiDAR for flooding and SLR.
- Nature based solutions (NBS). Ecosystem restorations. NBS slows the flow (living shorelines, wetlands & artificial reefs). NBS + Green infrastructure helps mitigate SLR.
- Seawalls, living shorelines (including oyster reef planting) and mangroves. *How about dune stabilization (via NBS as well)?*
- Freshwater flows slowdown salt-water intrusion: what about Ag lands acting as fresh water reservoirs and keeping salt-water intrusion at bay due to ground water & aquifer recharge. In addition, *Ag lands may mitigate land subsidence due to fresh water withdrawals. Even though the goal is to convert the Ag lands back to wetlands, instead prevent the Ag lands from development and use BMPs to enhance the freshwater storage, recharge and to counter balance land subsidence.*
- Ground water modelling: simulates SLR and climate change.
- Water Conservation Areas (WCA 1 & 2) in PBC and Okeechobee help treat water.
- Desalination of brackish water - brine disposal issues. Desalination of seawater more expensive. Saltwater intrusion into ground water and landward migration of salinity wedge.
- SLR mitigation: Canals, increasing heights of gates, structure enhancements seepage barriers, etc.

- Potential project/s benefits community as well as environment. Increase resilience levels of agriculture, natural & urban areas to flood condition. As well as wild life corridors, habitat connectivity, salinity reduction and water quality. *Comment: Is salinity also an issue other than intrusion during high tides or SLR? Then what role does land subsidence play? How can the water holding capacity of agricultural lands mitigate the land subsidence or the effects of the same?*
- Mangrove migration & assessment: *even though mangroves mitigate SLR, for PBC inland migration indicates that salinity wedge has shifted negatively. Hence, modelling the salinity wedge and subsequent changes to landscape (freshwater to brackish water vegetation/ecosystem) is essential towards resiliency planning.*
- “Demonstrate the ability of coastal wetlands to adapt to rising sea levels via enhances soil elevation change.
- Improvements to engineering canal flow structures based on SLR scenarios to prevent saltwater intrusion. A couple of them have limited NBS solutions integrated in the plan.
- Strengthening levees & berms: usually come out from WMAs. Water levels kept artificially low impacting wildlife & habitat, restore the natural storage and improve hydrology” *To manage & model the hydrology of WMAs (there 2 in PBC), a ‘Green’ LiDAR is needed at least once to overcome the objections of SFWMD’s primary GIS Scientist Christine Carlson. Currently, these areas are classified as ‘low confidence’ for LiDAR.*
- EMMA (Everglades mangrove Migration Assessment): Soil accretion to catch up with SLR rate, carbon sequestration and other natural resiliency processes. Subsidence of coastal wetlands is noted and mitigation measures proposed to counter the detrimental

effects – NBS approach. Jakarta, Indonesia is a prime example of how excess ground water withdrawals has resulted in an unsustainable city. Result is the relocation of the capital City to a different location Research into the process would be conducted. *LiDAR & even Interferometric Synthetic Aperture Radar (INSAR) technologies be applied to study the process and rate of land subsidence due to ground water withdrawals. I would also recommend the integration of agricultural practices to compliment the resiliency initiative.*

- Waterways and canals improvement: channel the nutrients and contaminants to the ocean. Improvements, since this ecosystem is global in scale for unique flora and fauna.
-

My final comment:

Along with wetlands conservation, the agricultural lands should also be preserved. Agriculture lands if managed in sustainable manner are valuable source of ground water retention that can mitigate the coastal land subsidence due to ground-water withdrawals. In other words, most of the agricultural lands should not be converted to impervious urban development. Instead, integrate into water management workflow to compensate for rapid urbanization and ground water consumption. Innovatively managed agriculture lands can mitigate SLR, salinity intrusion to ground water and balance the coastal land subsidence. Spatial studies & modelling both aboveground and subsurface water conservation need to be studied. LiDAR and INSAR are valuable tools that can complement these studies.

From Paul Linton, Palm Beach County Water Manager

Page 12

Consider adding bullets that provide examples of the design and construction recommendation for ASCE Standard 24 that the SFWMD is incorporating in new structures.

Page 13

FROM

When remediation is needed, the lowest cost measures will be undertaken first, building to full replacement only when necessary [PFL Comment Overly prescriptive]

To

When remediation is needed, the type and schedule of the implementation will consider the forecasted changes in the FPLOS, expected funding, and needs of the entire FPLOS and will use lower cost interim solution as required or advantages. Complete replacement with the required increased capacity/flexibility will be evaluated and scheduled based on need, cost effectiveness, and overall funding availability.

Page 14

Defined NNBS (typing error of Nature Based Solutions?)

Page 18

“SFWMD-FIAT can calculate the flood damage costs for building structures and their contents – multiplied by the depreciated replacement value by square foot and by the area of the building footprint to calculate the max potential damage of the structure - as well as roads and other selected infrastructure components, for multiple flood inundation scenarios”

PFL QUESTION Why Depreciated Replacement Value. Replacement cost will be paid by either insurance or the owner or a combination of both.

Page 20

Solar energy systems are already integrated into of our projects

PFL Provide bullet list with location, type (solar, battery) and capacity

Page 22

Page 24

Installation of living shoreline along the C-8 Canal and vegetated flood berms to enhance flood protection.

PFL Question. I understand how flood berms (vegetated or lined) reduced flooding by prevent flood water from flowing out of bank. What is a “living shore line” and how will the capacity of the canal be affected by the vegetation from a hydraulic friction perspective and the risk that vegetation will uproot and clog structures.

PFL How is 17 acres a meaningful volume given the capacity of the gravity structure and forward pump. 500 cfs pumping for one hour is 41 acre-feet.

Page 32

How does the range of carbon capture rates compare with the carbon generated from the burning of the diesel fuel

Page 37

In addition to protecting existing water resources, the District also encourages the development of new or alternative water sources.

Page 41

PFL Comment. Need more details explanation of Figure 12. Provide a description of each line type and bar. The percent bars should me moved to well above the lines (zero percent should start at 15 hours)

Page 42

PFL Comment Should discuss that there are limitations on forward pumping causing high canal stages in the downstream reaches. The modeling results should compare the Tailwater (TW) conditions between the modeling runs with and without the forward pumps to quantify the impact (higher TW stage) or lack of impact. If there is impact it may be necessary to improve the downstream conveyance capacity.

Page 44

PFL Comment Charts in Figure 12 should be on separate pages (e.g., Figure 12A, 12B, 12C, and 12D) to be large enough to inspect. The charts (Change Figure 1 to Figure 12A)

Page 45

The labels for the C-7 Graph need to match in color and the leads from the text boxes need to connect to the line they are describing. The legend needs more informative names.

S27_H_06621 should be S27 HW with 0 cfs Pumps

S27_S should be S27_Q with 0 cfs Pumps

What is S27 (%)

What is the size of the S27+Pump is this S27_Q with 500 cfs Pump

Page 19 Figure 19

For Criterion 1.1 if this is flow resulting from rainfall events with various return periods recommend adding the word rain and a “-”; see the following example

FROM
Future Condition Less than 25-Year
TO
Future Conditions – Less than 25-Year Rain

OR

Future – Less than 25-Year Rainfall Event

If these are time windows, then I recommend

FROM
Future Condition Less than 25-Year
TO
Within 25 Years with Future Conditions.

For Criterion 1.4 is this Seal Level Rise Resulting in Overbank Flooding if so recommend the following change

FROM
Seal Level Resulting in Overbank Flooding
TO
Seal Level Rise Resulting in Overbank Flooding

Page 53 Figure 19

Are there headers for each section of the table.

For Criterion 2.4 what is changing the populations between columns

Page 54 Table 5

The Project Status Column should be located to the Right of the Total Points as its’ number is not part of the Total Points. Explain what the values in the Project Status mean.

Page 58 and page 93

“self-preservation mode” should be replaced by more descriptive text “high water protections” or “storm surge protection”.

Has the SFWMD considered installing connections for portable generators. The SFWMD could have several portable generators capable of powering site telemetry and gate movement which could be deployed after the storm.

This section should better describe the cause and procedure.

Most of the coastal structure located in Miami-Dade County and the southern half of Broward County have electrical equipment that is vulnerable to inundation by storm surge. This include but not limited to actuator motors, generators, gate sensors, limit switches, direction switches, electrical junction box, water level sensor connections and telemetry equipment. The inundation of one or more of these can result in the loss of control of the structure. To prevent the loss of control of the gates when the gates are closed during hurricanes, the SFWMD must assess the risk of inundation and then secure the gates in an open position before hurricane wind limit access to the Structure. With the current equipment and the location of the equipment the SFWMD must de-energize the site power to prevent shorting of the equipment. Also if the generator were inundated while running the water would likely damage the generator engine. Clearly improving high water protections should be implemented as soon as practical because it is less costly and provides considerable benefits for hurricanes with high storm surge

FROM

Each of these projects help to increase the functionality and capacity of the District's flood control system and protection of the environment

TO

Each of these projects help maintains or increase the function and capacity of the District's flood control system and protection of the environment

FROM

..was calculated using half of one quart of the design discharge capacity..

TO

..was calculated using either one half or one quarterer of the design discharge capacity..

OR

.was calculated using one quarterer of the design discharge capacity..

Page 59

All new developed structures and components will exceed existing and expected future flood related codes. The State of Florida Building code established the minimum floor elevation by determining the Baseline Flood Elevation (100-year flood line) per ASCE 24-14, plus 1 (one) foot. The Miami-Dade County Code (Chapter 11C) is at regulatory flood elevation (100 year flood).

PFL COMMENTS. What does "Miami-Dade County Code (Chapter 11C) is at regulatory flood elevation (100 year flood)" mean/compare to the State of Florida Building Code.

Discussion should include information on what storm surge, If any, was included.

Pages 60 through 80

Add design to capacity statements. For example

FROM

...has a discharge capacity of ??? cfs

TO

...has a design discharge capacity of ??? cfs

Page 60

FROM

This structure maintains optimum water control stages upstream in C-7 (Little River Canal); it passes the design flood (75 percent of the Standard Project Flood) without exceeding upstream flood design stage and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of high tides.

TO

This structure was designed to 1) maintain optimum water control stages upstream in C-7 (Little River Canal), 2) release the design flood (75 percent of the Standard Project Flood) without exceeding upstream flood design stage 3) restricts downstream flood stages and discharge velocities to non-damaging levels, and 4) prevent saltwater intrusion during periods of high tides.

Page 61

The flood protection level of service in the C-7 Basin is currently equivalent to a five-year flood/rainfall event recurrence interval, compared to the 25-year event minimum design criteria, and is further reduced under future sea level rise scenarios.

PFL Comment: Where does the 25 year minimum design criterion come from. Back when the C&SF Project was being developed they used Standard Project Flood (flows) arising from the Standard Project Storm. The Standard Project Storm was typically 40 to 60 percent of the Maximum Possible Precipitation. The Maximum Possible Precipitation for South Florida was estimated as 30 inches for a one day (24 hours) rain event on a 200 square mile basin (Plate 1 Civil Engineering Bulletin 528). The Standard Project Storm for South Florida was about 20 inches for a 24-hour rain event on a 200 square mile basin (Plate 2 - Civil Engineering Bulletin 528).

Page 65

FROM

This structure maintains optimum water control stages upstream in C-9; it passes the design flood (100 percent of the Standard Project Flood) without exceeding upstream flood design stage and restricts

downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides.

TO

The S-29 Structure was designed to 1) maintain optimum water control stages upstream in C-9, 2) release the design flood (100 percent of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) and it prevents saltwater intrusion during periods of extreme high tides.

Page 67

FROM

This structure maintains optimum water control stages upstream in C-8; it passes the design flood (100 percent of the Standard Project Flood) without exceeding upstream flood design stage and restricts downstream flood stages and discharge velocities to non-damaging levels; and prevent saltwater intrusion during periods of extreme high flood tides

TO

The S-28 Structure was designed to 1) maintain optimum water control stages upstream in C-8, 2) release the design flood (100 percent of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) prevent saltwater intrusion during periods of extreme high flood tides

Page 70

FROM

It passes the design flood without exceeding the upstream flood design stage and restricts downstream flood stages and channel velocities to non-damaging levels; and it prevents saline intrusion. G-57 is serviced by the Fort Lauderdale Field Station.

TO

The G-57 Structure was designed to 1) release the design flood without exceeding the upstream flood design stage, 2) restrict downstream flood stages and channel velocities to non-damaging levels, and 3) prevent saline intrusion. G-57 is serviced by the Fort Lauderdale Field Station.

Page 74

FROM

This structure maintains optimum upstream water control stages in C-14; it passes the design flood (40% and 60% of the Standard Project Flood from the western and eastern portions of the drainage basin, respectively) without exceeding the upstream flood design stage, and restricts downstream flood stages and channel velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides

TO

The S-37A Structure was designed to 1) maintain optimum upstream water control stages in C-14; 2) release the design flood (40% and 60% of the Standard Project Flood from the western and eastern portions of the drainage basin, respectively) without exceeding the upstream flood design stage, 3) restricts downstream flood stages and channel velocities to non-damaging levels; and 4) prevent saltwater intrusion during periods of extreme high tides

Page 75

FROM

This structure maintains optimum upstream water control stages in Arch Creek; it passes the design flood (60% of the Standard Project Flood) without exceeding upstream flood design stage; and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides

TO

The G-58 Structure was designed to maintain optimum upstream water control stages in Arch Creek, 2) release the design flood (60% of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) prevent saltwater intrusion during periods of extreme high tides

“The estimate includes modifications to the existing structure and control building, as well as an additional forward pump” i

PFL COMMENT: is there an existing pump and if so what is its' capacity

Page 76

FROM

This structure maintains optimum water control stages upstream in Canals C-100, C-100A, and C-100B; it passes the design flood (40 percent of the Standard Project Flood) without exceeding upstream flood design stage, and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides

TO

The S-123 Structure was designed to 1) maintain optimum water control stages upstream in Canals C-100, C-100A, and C-100B, 2) release the design flood (40 percent of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) prevent saltwater intrusion during periods of extreme high tides

Page 77

FROM

The S-20F Structure maintains optimum stages upstream along the C-103 Canal. The structure restricts downstream flood stages and discharge velocities to non-damaging levels and prevents saltwater intrusion during periods of extreme high tides.

TO

The S-20F Structure was designed to 1) maintain optimum stages upstream along the C-103 Canal, 2) restricts downstream flood stages and discharge velocities to non-damaging levels. And 3) prevent saltwater intrusion during periods of extreme high tides.

Page 78

FROM

This structure maintains optimum water control stages upstream in C1 and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides

TO

The S21 Structure was designed to 1) maintain optimum water control stages upstream in C1, 2) restricts downstream flood stages and discharge velocities to non-damaging levels, and 3) prevent saltwater intrusion during periods of extreme high tides

Page 87

FROM 540cfs TP 540 cfs

FROM

The purpose of the pump station is to pump surplus water through C-11 from the agricultural area west of the structure at a rate of 3/4 inch per day to keep water levels in the canal west of the structure at an optimum water control stages upstream in C-11 East

TO

The spillway and pump station were designed to move surplus water from agricultural areas in the western portion of the basin at a rate of 3/4 inch per day while keeping water levels in the canal west of the structure at an optimum water control stages. The agricultural areas have almost completely converted to residential and commercial use.

Page 88

FROM

This structure maintains optimum water control stages upstream in C-13; it passes the design flood (50 percent of the Standard Project Flood) without exceeding upstream flood design stage and restricts downstream flood stages and discharge velocities to non-damaging levels; and it prevents saltwater intrusion during periods of extreme high tides

TO

The S-36 Structure was designed to 1) maintain optimum water control stages upstream in C-13, 2) release the design flood (50 percent of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) prevent saltwater intrusion during periods of extreme high tides

Page 89

PFL Question. I thought that remote control (one gate at a time) was added to S-197

Page 90

FROM

This structure maintains optimum water stages in the upstream agricultural area. The structure passes the design flood (40 percent of the Standard Project Flood) without exceeding upstream flood design stage and restricts downstream flood stages and discharge velocities to non-damaging levels. S-20 also prevents saltwater intrusion during periods of extreme high tides.

TO

The S-20 Structure was designed to 1) maintain optimum water stages in the upstream agricultural area, 2) release the design flood (40 percent of the Standard Project Flood) without exceeding upstream flood design stage, 3) restrict downstream flood stages and discharge velocities to non-damaging levels, and 4) prevents saltwater intrusion during periods of extreme high tides.

Page 92

Why are all the estimated costs \$27,500,000

Page 97

FROM

The first phase of the project included building 2.6 miles of levee to the east of the ITID Reservoir. However, the eastern section of levee remains unfinished due to lack of funding. Therefore, the project is currently not meeting its full flood protection and habitat enhancement potential

TO

The first phase of the project included re-building 2.6 miles of levee along the north side of ITID starting east of the ITID Reservoir. However, the remaining eastern levee section of 3.7 miles (?) remains unfinished due to lack of funding. Therefore, the project is currently not meeting its full flood protection and habitat enhancement potential

Page 97

Where is the missing three miles and what will be the maximum stage

Page 100

The labeling text of the Lines of Figure 26 are not explained and are not intuitive

Will the L31E levee require revetment

Page 119

Statewide Regional Climate Projections Statewide Regional Climate Projections will be developed in coordination with the Florida Flood Hub, FDEP, USGS, Academia, Water Management Districts, Regional

Planning Councils and other partner agencies to capture conditions/mechanisms of rainfall, and other related climate variables. Determination of future extreme rainfall conditions (both wet and dry conditions) is key for evaluating potential impacts from climate change to operation of District infrastructure and mission implementation. There is specific interest in determination of future rainfall scenarios as part of FPLOS Phase I Assessments. The District, the U.S. Geological Survey, Florida International University (FIU) and local governments have been working over the past five plus years at evaluating global and regional climate models to estimate future extreme rainfall conditions. In May 2019, the District and FIU organized a Workshop to define a strategy for the development of uniform rainfall scenarios in Florida. As part of the short-term workshop recommendations, the District is assessing best available downscaled climate datasets and identifying a subset of best performing model datasets that are relevant to inform the extreme rainfall scenarios.

PFL Comment and Question. Determining the expected 100 year three day and 25 year one-day storm volume is important as they are used in the design of drainage projects (e.g. house pads are designed with finish floors that are at or above the water level resulting from a 100 year three day storm for most of the SFWMD. This is both a point of reference and information for potential policy change. For example will the permitting manuals (Volume 4) be updated to reflect the expected rainfall. It would make sense to have one value for the entire SFWMD as are largest rainfalls are tropical storms and stalled fronts.

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COUNTY
ADMINISTRATOR

Dan McIntyre
COUNTY ATTORNEY

July 15, 2022

South Florida Water Management District
3301 Gun Club Rd.
West Palm Beach, FL 33406

RE: St. Lucie County comments - SFWMD Sea Level Rise and Flood Resiliency Plan (June 2022 Draft)

Dear Resiliency Team,

Thank you for the opportunity to comment on the South Florida Water Management District's (SFWMD) Sea Level Rise and Flood Resiliency Plan. Please consider inclusion of St. Lucie County's input for this plan, as outlined below.

1. St. Lucie County, partnering with its municipalities, has been working on resilience planning efforts since 2019 and is currently developing a community-wide resilience plan through data collection, assessments, and stormwater master planning updates. We support the District's Basin-wide Hydrologic and Hydraulic studies and the Future Conditions Groundwater Modeling project and request the District prioritize both these initiatives beyond the immediate flood control threat areas shown in the current plan. St. Lucie County looks forward to working collaboratively in the coordination of these efforts, which we believe are essential to the success of our common goals and initiatives.
2. More data is needed to accurately understand existing conditions in St. Lucie County. In addition to the SFWMD Canals (C23, C24, & C25, among others) installed as components of the Central and Southern Florida project, St. Lucie County relies on two larger natural waterways, Ten Mile Creek and Five Mile Creek, which become the North Fork of the St. Lucie River (NFSLR) to drain nearly 100 square miles of the County. Long-term tidal influences should be studied by the District to determine the effects of sea level rise on these systems, as well as including consideration of the increased basin rainfall patterns. There is value to include support and needed funding for the continued restoration of the NFSLR, its floodplain, and the western lands/natural storage components of Comprehensive Everglades Restoration Plan (CERP).
3. The IRL-South project proposes large reservoirs and stormwater treatment areas (STAs) for the storage and abatement of excess fresh water being discharged to the Indian River Lagoon and the St. Lucie

Estuary. These critically important projects have been supported by St. Lucie County for their water quality improvements. However, the District has not provided substantial assurance to the concerns brought forth about flooding from the redirection of water from the C23/C24 system into the Ten-Mile Creek basin (the Northern Diversion). Ten Mile Creek is a severely overgrown FDEP-regulated waterway with documented severe response to high-flow events. An operational plan and model for the C23/24 system has not been provided to demonstrate that this additional flow into the system will not cause undue harm.

4. Page 15 of the document shows a map with basins in various stages of study. A large amount of southeastern St. Lucie County appears to be outside the Phase 1 project and has not been assigned a priority. Much of this uncategorized area is subject to tidal influence and is deserving of study. Please advise when the County would expect to see these basins integrated into the plan.
5. A critical aspect of resiliency planning is recognizing how Florida's coastal beach and dune system function and abate damages associated with future storm events and sea level rise. Barrier Islands rely heavily on this coastal feature for storm protection, and Florida's beaches and dunes play a vital role in preserving our Barrier Islands and Intracoastal Waterways. It should be noted that if the beach and dune systems were neglected most - if not all - future back-bay modifications would become obsolete. A strong coastal beach and dune system is a prerequisite to our future resiliency planning efforts. FDEP has extensive knowledge of facts concerning Florida's Critically Eroded Shorelines, and we believe the SFWMD should acknowledge their coordination with DEP and how these systems are managed.

St. Lucie County would like to thank the South Florida Water Management District for the opportunity to provide comments regarding this important issue. We recognize that planning for resiliency in Central and South Florida is not an easy task and we appreciate all the work you are doing to develop a data driven plan that benefits people, the environment, and the economy in an equitable and collaborative way.

Sincerely,



Mark Satterlee

- cc: Howard Tipton, County Administrator
Amy Griffin, Environmental Resources Director
Patrick Dayan, Public Works Director
James Lappert, Water Quality Division Director
Josh Revord, Senior Coastal Engineer
Mike Middlebrook, Assistant Environmental Resources Director
Nicole Fogarty, Legislative Affairs Director
Courtney Calderone, Legislative Affairs Grand Coordinator
Jennifer McGee, Sr. Strategic P&R Coordinator
Sandra Bogan, Resilience Navigator

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: 2022 Draft Sea Level Rise and Flood Resiliency Plan
Date: Friday, July 22, 2022 12:04:32 PM
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Ottolini, Roland <ROttolini@leegov.com>
Sent: Thursday, July 14, 2022 9:13 AM
To: Resiliency <resiliency@sfwmd.gov>
Cc: Mora, Marc <MMora@leegov.com>; Harner, David <DHarner@leegov.com>; Boutelle, Stephen <SBoutelle@leegov.com>
Subject: 2022 Draft Sea Level Rise and Flood Resiliency Plan

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Good morning,

The report is well presented for the area of study. However, the plan by and large excludes Lee County. Although we receive minimal level of service for flood protection through a maintenance cooperative agreement with SFWMD and lack the flood benefits from SFWMD infrastructure, we have been omitted from the Flood Protection Level of Service Program. It should be recognized that the C-43 Caloosahatchee through Lee County does provide benefit to the C&SF system and its service area. Lee County should be provided a comparative flood protection level of service including any plans for resiliency.



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From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: Draft Sea Level Rise and Flood Resiliency Plan
Date: Friday, July 22, 2022 12:01:52 PM

Nicole A. Cortez

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From: Amy Eason <aeason@cityofpsl.com>
Sent: Friday, July 22, 2022 11:12 AM
To: Resiliency <resiliency@sfwmd.gov>
Subject: Draft Sea Level Rise and Flood Resiliency Plan

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SFWMD Resiliency group,

Below are my comments to the draft plan:

- Section 2 mentions that the FPLOS program will be implemented in a phase approach in a 10-year cycle for all basins within the District. Is there a prioritized map showing every basin and the phase each basin will be in over the next 10-years and beyond illustrating the cycle for each basin?
- Under “SFWMD Flood Impact Assessment Tool (SFWMD-FIAT), page 18, the last sentence states, “The recommended projects within this Plan will have an associated cost-benefit ratio as part of the next planning round.” What planning round? Is this one of the 3 phases mentioned in FPLOS? This is unclear.
- In Section 4, Nature Based Solutions, has operations reviewed these options and determine the feasibility on the maintenance and cost of maintenance? There are words that say “may be applied”. Is this section just mentioning them on an academic scale, or was a feasibility completed? For example, in one of the presentations, the term “living shoreline” was used with planting trees and vegetation on the canal slopes. How will operations maintain the original design intent on the canal with this Nature based solution? In addition, once vegetation is placed on the canals, the use of the canal changes and in cases the canals are re-classified as habitat and have other regulatory restraints on them. Has this been considered? I think it needs to be clear direction on where these solutions can be used. In addition, I believe the ability to operate and maintain these features along with costs should be added to the assessment methodology for Table 2 on page 28.
- Figure 7 shows the water supply plan update schedule. Since the Upper East Coast plan was done in 2021, does this plan already consider climate change? If so, wouldn't this figure show

the next update as 2026 since 2021 has past or by keeping it at 2021 are you indicating it has not been updated with these changes?

- I am assuming that the projects in this report under Section 7 are Phase 2, first round? I think it needs to be clarified as mentioned in my first comment, what basins are being assessed and what phases they are in. As mentioned in my public comment during the presentations, not all basins are represented in this report. You may have basins not impacted and maybe a stated illustrating the basins that are not being impacted should be added.
- In the FPLOS Assessment (Phase I Studies) there is a figure that is unclear. I believe you have done some of these already? Please clarify if any have been done or not.
- The plan shows SFWMD approach on determining vulnerabilities and illustrates potential projects to be completed, but does not include the entire District and is a good start. The plan does give specifics on the climate data used and is really a big picture plan. Please clarify whether specific plans are going to supplement this document moving forward.

Should you have any questions or need any additional information on my comments, please let me know.

Thanks.

Amy Eason, P.E.
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OFFICE OF THE TOWN MANAGER

Rafael G. Casals, ICMA-CM, CFM
Town Manager

July 14, 2022

VIA EMAIL

Dr. Carolina Maran, P.E., Ph.D.
Chief of District Resiliency
South Florida Water Management District
3301 Gun Club Road, West Palm Beach, FL 33406
cmaran@sfwmd.gov
resiliency@sfwmd.gov

RE: Updated South Florida Water Management District Draft Sea-level Rise and Flood Resiliency Plan Additional Comments

Dear Dr. Carolina Maran,

The Town of Cutler Bay (the “Town”) submits the following comments regarding the South Florida Water Management District’s (the “District”) June 2022 updated draft of the Sea Level Rise Flood Resiliency Plan (SLRFRP). On behalf of the Town Council and residents, I would like to thank the District for including additional plans which incorporate nature-based solutions and provide greater detail on the methods the District plans to employ to increase South Florida’s water supply security and flood resiliency. It should be noted that the SLRFRP still does not adequately address saltwater intrusion and impacts on Biscayne Bay in Miami-Dade County (the “County”), including concerns that the Town noted in our previous letter dated January 28, 2022 regarding *Comments on the District’s Draft Sea-Level Rise and Flood Resiliency Plan* (the “Letter”).

The Town is one of the most vulnerable municipalities in the County to the impacts of climate change and sea level rise. In early June 2022, the Town experienced extensive flooding from Tropical Storm Alex. Flooding events like these may prevent people from leaving their homes, damage property, and even tragically cause injuries and deaths. Climate change increases our risk of sea level rise and will increase the frequency and intensity of extreme weather events like hurricanes. Earlier this year, the Town received 26.35 inches of extreme rainfall between June 2nd and June 9th due to Tropical Storm Alex. This event deposited 47% of the previous year’s rainfall total over the course of a week and constituted an almost 200-year flood event for 1-day and 3-day flooding¹. The District was notified of standing water issues in the Town on Tuesday June 7, 2022, and upon assessment found the existing system was operating “as intended; with capacity and no obstructions”.²

¹ Cutler Bay Town Council Meeting Tropical Storm Alex, Kimley Horn, June 15 2022 (Appendix Item 2)

² District Water Management Overview , SFWMD, Bryan Palacio Regional Representative (Appendix Item 3)





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

While the District was helpful in volunteering two 8-inch pumps to lower water levels at the Town's request, the overloading of existing flood control capacity by this event suggests a need for additional preventative infrastructure. One of the main factors behind the prolonged flooding of properties and roadways was the absence of places for stormwater to go during such extreme weather events³. This flooding event so early in the year's hurricane season highlights the need for greater resilience to protect against sea level rise and future flooding events, particularly in the form of open space.

The Town appreciates that the District has placed a greater focus on nature-based solutions in the updated SLRFRP compared to the previous draft. The C-8 Basin resiliency Plan is an encouraging step in the right direction promoting the integration of nature-based solutions like living shorelines with gray infrastructure. While the addition of this section to the SLRFRP is a great start, we would like to see green infrastructure incorporated into additional projects within this plan.

In accordance with our previous Letter, the Everglades Mangrove Mitigation Assessment (EMMA) Pilot Study looks promising as an example of green infrastructure to mitigate the impacts of sea level rise in the District. However, the District should ensure that dredge soil used in the study does not cause negative impacts on water quality in the form of increases in turbidity or nutrient inflow. The EMMA study should take water quality concerns into account.

The Town appreciates that the District addressed solutions to increase energy efficiency including sustainable building certification and the use of renewable energy in this updated plan. The Town supports the District using these methods to reduce its carbon footprint and offset energy demands. In particular, our community is hopeful that the pilot project studying the feasibility of floating solar panels will be successful – positively impact the expansion of floating solar panels to reduce energy demands across the entire District.

The SLRFRP must consider equity in the entirety of its projects. As the Town stated previously, "Lower-income residents in our community tend to be more vulnerable to the impacts of sea-level rise and flooding. All projects should take into consideration potential disproportionate impacts on lower-income communities and areas. Furthermore, this plan should take into consideration steps to improve the resilience of areas that have been historically excluded in past projects because of how we calculate risk."

³ Tropical Storm Alex Flooding Event Summary, June 2-9, 2022, Town of Cutler Bay, Department of Public Works





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

In the Town's Letter on the previous draft of the SLRFRP, the Mayor specifically stated "The plan should focus more on reducing peat subsidence as a tool for carbon sequestration." The Town appreciates that the District acknowledged the benefits of peat formation in Section 5 of the SLRFRP. Ecosystem Restoration Projects and Resiliency: "Peat formation and chemical precipitation are the key pathways for long-term storage of carbon in the Everglades (pg 32)." Reducing peat collapse would increase resilience in the fragile and biodiverse Everglades ecosystems and increase the District's overall resiliency as a natural source of carbon sequestration.

In Section 6: Water Supply Resiliency, the SLRFRP includes water reuse as a main strategy to better conserve South Florida's existing water supply. The Town has previously recommended the use of reuse water in Turkey Point's cooling canal system in our comments for the previous version of the SLRFRP. Using reuse water would increase our sustainability by removing the need to use water from our regional water supply and the Floridian Aquifer for cooling. Additionally, the Town recommends that the District incorporates this suggestion into existing plans for increasing water supply resiliency.

The Town is deeply concerned about the potential impacts of the South Miami-Dade Curtain Wall Project to Biscayne Bay. The Town is concerned that the SLRFRP has not made any changes to the curtain wall project based on concerns brought up in our previous Letter: "The curtain wall proposal in the SLRFRP would exacerbate the problem of saltwater intrusion in South Dade, negatively impacting the health of Biscayne Bay."

Restoration projects like BBSEER seek to restore the natural flow of freshwater into Biscayne Bay. It is the Town's position that the curtain wall project would go contrary to these goals by blocking this natural eastward flow from the Everglades into Biscayne Bay. In our previous letter, the Town suggested "potentially expediting the purchase of the Bird Drive Recharge Area and creating a flowage equalization basin (FEB) there to recharge groundwater." The Town also suggested the "preservation of a green buffer to allow for aquifer recharge along the east side of the County to help preserve pathways for recharge and seepage management."

The Town urges the District to implement and complete projects that restore the flow of fresh groundwater to Biscayne Bay and improve the Bay's health before additional sections of the curtain wall are approved. Should the District move forward with the extension of submerged bentonite wall infrastructure described in the updated plan, representatives must ensure that the amount of water flow from the Everglades to Biscayne Bay, current and future phases of the Biscayne Bay Coastal Wetlands Project, and other associated projects under BBSEER remains the same. These considerations should be incorporated into the ongoing planning efforts for BBSEER.





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Town Manager

In addition, the Town's previous Letter brought up concerns about the impact of the curtain wall project on the County's water supply: "Any one of the three alternative curtain walls would further block the flow of groundwater to the Biscayne Aquifer, reducing wellfield recharge essential to maintain Miami-Dade's water supply". The historic flow of freshwater from the Everglades through Miami Dade County to Biscayne Bay is critical to the health of Miami Dade County's natural resources and ecology. Halting this flow would imperil freshwater resources which are already at risk from ongoing urban development trends, restrict the flow of freshwater to Biscayne Bay, and reduce incentives to protect open space on the county periphery. These concerns were not adequately addressed in the updated version of the SLRFRP. The SLRFRP includes no consideration of how the curtain wall may impact Miami-Dade County's wellfields.

It is the Town's position to expose Biscayne Bay to potential reduction of freshwater inputs. A recent study by NOAA researchers published in *Estuaries and Coasts* showed that rates of change in chlorophyll-a and nutrient concentrations at 48 stations throughout Biscayne Bay over a 20-year period indicated that pollution emanating from Biscayne Bay's nearshore waters from landward sources) has brought the bay to the precipice of a phase shift, characterized by rapid eutrophication and seagrass die-offs⁴. The Town urges the District to ensure that the curtain wall project will not negatively impact the County's supply of drinking water before this project goes forward. Town residents derive tremendous cultural and quality of life benefits from a healthy Biscayne Bay. The Town and its residents have contributed significant resources to implement policies and infrastructure improvements to help protect the bay's aquatic ecosystem. We have a substantial interest in ensuring that any plans approved will continue to support bay health in conjunction with Miami Dade County and Army Corps of Engineers restoration goals. It is the Town's position that it cannot support the curtain wall project if it is not made much clearer how the District intends to mitigate for the consequences of this project on Biscayne Bay and the County's water supply.

Overall, this version of the SLRFRP is a positive update from the previous version. Thank you for listening to our comments regarding a lack of green infrastructure in the plan. The Town hopes to work with you to increase this plan's effectiveness and ultimately achieve our shared goal of increased resiliency against sea level rise and flooding. Given the recent flooding in our community and across the County, a comprehensive resiliency plan is necessary to mitigate the effects of sea level rise and an increase in the frequency of flooding due to climate change.

⁴ Millette, N.C., Kelble, C., Linhoss, A. et al. Using Spatial Variability in the Rate of Change of Chlorophyll a to Improve Water Quality Management in a Subtropical Oligotrophic Estuary. *Estuaries and Coasts* 42, 1792–1803 (2019). <https://doi.org/10.1007/s12237-019-00610-5>





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

At this time, I would like to request a meeting with you and your team before the draft SLFRP becomes final, so that we may understand how you plan to address our concerns and work with the Town to help make us and other coastal municipalities like us more resilient.

If you should have any questions or concerns, feel free to contact me at (305) 234-4262 or rcasals@cutlerbay-fl.gov

Sincerely,

Rafael G. Casals, ICMA-CM, CFM
Town Manager

Cc: Scott Wagner, Vice Chairman, South Florida Water Management District, swagner@sfwmd.gov
Carlos "Charlie" E. Martinez, Member, South Florida Water Management District, cmartinez@sfwmd.gov
Drew Bartlett, Executive Director, South Florida Water Management District, dbartlett@sfwmd.gov
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Daniella Levine Cava, Mayor, Miami-Dade County, mayor@miamidade.gov
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Lisa Spadafina, Assistant Director, Division of Environmental Resources Management (DERM), Department of Regulatory and Economic Resources, Lisa.Spadafina@miamidade.gov
Jim Murley, Chief Resiliency Officer, Miami-Dade County, resilience@miamidade.gov
Alfredo Quintero, Jr., Public Works Director, Town of Cutler Bay, aquintero@cutlerbay-fl.gov
Laura Reynolds, Environmental Consultant, Town of Cutler Bay, lreynolds@conservationconceptsllc.org





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

Appendix:

1. Town Comments on the First Draft of the Districts Draft Sea-level Rise and Flood Resiliency Plan (*dated January 28, 2022*)
2. Town Council Meeting Presentation of Tropical Storm Alex Flooding Event Summary– Town’s Public Works Director (*dated June 15, 2022*)
3. Town Council Meeting Presentation of Tropical Storm Alex Flooding – Consultant, Kimley Horn and Associates, Inc. (*dated June 15, 2022*)




OFFICE OF THE TOWN MANAGER

Rafael G. Casals, ICMA-CM, CFM
Town Manager

January 28, 2022

Ms. Carolina Maran, P.E., Ph.D.
 Chief of District Resiliency
South Florida Water Management District
 3301 Gun Club Road
 West Palm Beach, FL 33406
cmaran@sfwmd.gov
resiliency@sfwmd.gov

RE: Comments on the South Florida Water Management District Draft Sea-level Rise and Flood Resiliency Plan

Dear Carolina Maran,

The Town of Cutler Bay (the "Town") submits the following comments regarding the South Florida Water Management District's (the "District") Sea-level Rise and Flood Resiliency Plan (SLRFRP) required under Senate Bill 1954 (2021). This bill recognized Florida's vulnerability to sea-level rise and flooding, which is an admirable step in the right direction. We commend the state and your agency for recognizing this issue and working to solve it. The bill also acknowledged the importance of mitigating the effects of sea-level rise and flooding to preserve the state's water supply, which is critical.

As shown in Figures 1 and 2, the Town's coastal location makes it one of the most vulnerable areas in the district to the impacts of sea-level rise, flooding, and climate change. Figure 2 displays a LIDAR map of the Town. In the past, the Town has partnered with the District to increase resiliency to sea-level rise and flooding in the region, notably with the purchase of an 8.4-acre parcel of land purchased adjacent to BBSEER by the Town in 2020 for the purpose of increasing the efficacy of regional restoration efforts and by working to find funding to restore the adjacent 53-acre parcel to the BBCW footprint owned by the District. We would look to find more ways to partner with the District because we are so vulnerable to the impacts of flooding and sea-level rise.

Overall while we are happy to be taking this first step, we feel the District's SLRFRP does not go far enough to improve the resilience of the District's water resources and does not describe how it will mitigate against some of the associated impacts of the actions proposed. In addition, the effects of climate change on South Florida and the ongoing issues of saltwater intrusion and sea-level rise need to be at the forefront of this plan; this should not be a catch all for already existing plans like the curtain wall for example. These funds should be used to make your district in the built environment more resilient, not less.

There are many unexplored opportunities to expand the scope and ultimate impact of this plan. For example, in spite of the tremendous capacity for carbon storage in healthy everglades, only twice does it mention carbon sequestration. Reducing our carbon footprint while restoring the Everglades and investing in infrastructure will have to work in coordination with a much more aggressive time schedule and in coordination with a more aggressive land-buying program, and not once do we see a proposal to expedite land buying here which if done now will be a much better investment than waiting.





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

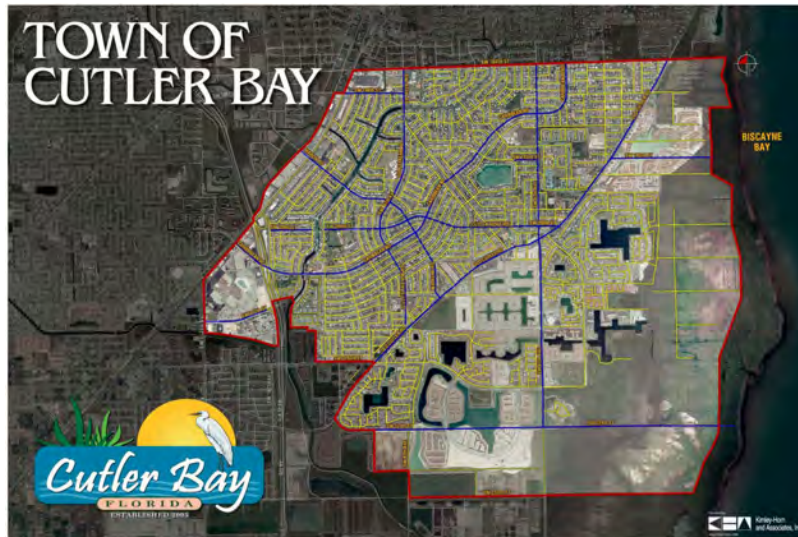


Figure 1. Aerial Map of the Town of Cutler Bay¹

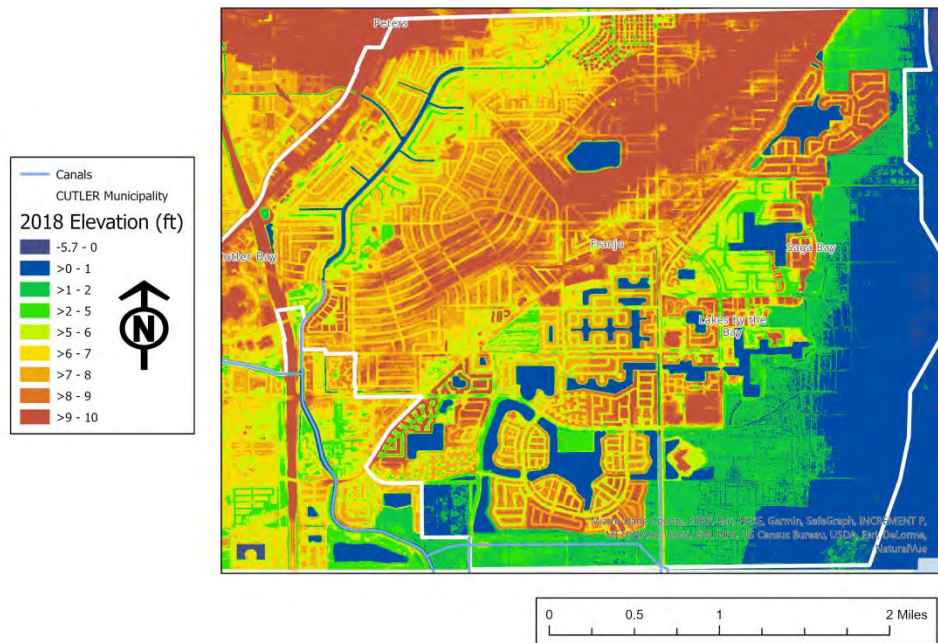


Figure 2. LIDAR Map of the Town of Cutler Bay Selecting the Vulnerability to Sea-level Rise

¹ Town of Cutler Bay, Florida. (n.d.) *Town Map*. Community. Cutlerbay-fl.gov. https://www.cutlerbay-fl.gov/sites/default/files/fileattachments/community/page/2971/2cutler_bay_arial.pdf





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

We are glad to see many of the infrastructure upgrades in and around our area on the priority list. For example, the upgrade of the S-123 spillway will improve water drainage around the Town following extreme storm surge and flooding. In addition to the upgrades of coastal structures just to the south and north of us. The Town is concerned about sunny day flooding especially during king tide events and our ability to move water off the landscape during severe weather events, so we appreciate that several of the infrastructure upgrades are set to improve water drainage in the area surrounding and within the Town, we would hope that more information can be provided about our area specifically and how this work will improve flood risk to the Town.

We would like to see implementation of natural shoreline defenses rather than hard, engineered defenses, such as the flood wall proposed for Miami by the ACOE Back Bay Plan, it is in our best interest to expand nature based solution and expedite and possibly expand projects like EMMA. If this pilot project is successful the SFWMD should investigate the possibility of expanding the EMMA project to include a demonstration/research site at a location within the Town or adjacent to us. Expanding the footprint of the EMMA project to include a shoreline location in or near the urbanized coast is the fastest way to demonstrate whether constructed mangrove wetlands offer a feasible strategy for resilience in built-up areas near the shoreline.

I. The SLRFRP Must Take Climate Change, Green Infrastructure, and Equity into Consideration

Florida must reduce carbon consumption and promote carbon sequestration statewide. At the same time, adaptation and mitigation considerations are key to a successful climate plan. We will have to do both to extend our ability to thrive in South Florida into an uncertain future. The Town supports any effort to sequester Carbon and promote resilience through the purchase and protection of buffer lands surrounding the southern end of the county and through restoration and mangrove planting efforts that will help accelerate accretion rates along the coast to keep pace with sea-level rise.

Much of the open land in Miami Dade is threatened by development. This plan is missing an opportunity to aggressively purchase coastal areas that remain in South Dade which many have been identified already as needed for restoration but are already threatened by development. We suggest that this could be achieved through an aggressive land-buying strategy centered upon acquiring lands for resiliency and facilitating continued agricultural operation until the lands are needed for projects like an expanded EMMA or BBSEER or can just be acquired for flood protection and carbon sequestration projects just simply stripping development rights. A similar process took place when the STAs to the north were being purchased; if we wait the lands will be too expensive or already developed.

This plan should focus more on reducing peat subsidence as a tool for carbon sequestration. The decaying organic matter in peat soil reduces global warming by storing atmospheric carbon. When peat subsidence occurs the stored carbon is released back into the atmosphere. The Everglades have suffered from conditions of peat subsidence over the course of the last century as a result of drainage and sea-level rise.





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

It is estimated that peat soil is subsiding in the Everglades at a rate of 1 inch per year.² If preserved, the natural ecosystem services provided by peat can be used to mitigate carbon emissions and reduce greenhouse gas emissions. This plan needs to address the threat posed by peat subsidence, as well as the incredible opportunity to simultaneously address climate change at the source and promote a healthier Everglades ecosystem through the targeting and mitigation of this phenomenon.

The Everglades Mangrove Mitigation Assessment (EMMA) Pilot Study needs to take water quality concerns into account but looks very promising. It is encouraging to see this pilot study using green infrastructure in the form of mangroves to mitigate the impacts of sea-level rise. However, the EMMA Pilot Study must include a clear plan to offset the impacts of turbidity and nutrient inflow on water quality from the distribution of dredge soil. Potentially that could be in the upstream purchase of lands to offset water quality impacts to the bay. We are currently seeing losses of seagrass and that are impacting tourism, the fishing industry, and quality of life for our residents and we are concerned that BBSEER does not make Water Quality a goal but only a constraint.

If the EMMA plan proves to be successful from this pilot study with minimal impacts to water quality, we encourage the widespread implementation of the plan. As a form of green infrastructure, mangroves sequester carbon and protect the built environment from flooding. We encourage the District to use resilience funds to purchase additional land in order to incorporate mangroves as a region-wide flood resilience strategy.

The SLRFRP should consider equity in the entirety of its projects. Lower-income residents in our community tend to be more vulnerable to the impacts of sea-level rise and flooding.³ All projects should take into consideration potential disproportionate impacts on lower-income communities and areas. Furthermore, this plan should take into consideration steps to improve the resilience of areas that have been historically excluded in past projects because of how we calculate risk.

We are at an increased risk of depletion of our water supply due to saltwater intrusion County-wide and the County consumptive use permits are predicated on the full implementation of CERP, these projects will have to be more robust to keep pace with sea-level rise. For that reason, this plan should endorse the most robust BBSEER and Southern Everglades Study efforts to ensure full benefits of CERP are realized.

[SPACE LEFT INTENTIONALLY BLANK]

² American Society of Agronomy. (2020, January 15). Are sinking soils in the Everglades related to climate change? ScienceDaily. Retrieved January 10, 2022 from www.sciencedaily.com/releases/2020/01/200115075617.htm

³ Ariza, M. A. (2009, September 29). *As Miami Keeps Building, Rising Seas Deepen Its Social Divide*. Yale Environment 360. <https://e360.yale.edu/features/as-miami-keeps-building-rising-seas-deepen-its-social-divide>





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Rafael G. Casals, ICMA-CM, CFM
Town Manager

II. The SLRFRP Does Not Make it Clear how the District will Mitigate for Excess Saltwater Intrusion into Miami-Dade County

Overall, this plan does not address the diminishing flow of fresh groundwater into Biscayne Bay. In fact, the construction of the curtain wall proposed in this plan will further limit fresh groundwater flow into the bay. It will also limit inflow of water into the Biscayne Aquifer, exacerbating conditions of saltwater intrusion. Figure 3 displays the extent of saltwater intrusion between 2011 and 2018. As indicated in the diagram, the greatest extent of saltwater intrusion is occurring in Southern Miami-Dade County and according to your basic modeling results most of the loss of water flow occurs in that same area. Saltwater intrusion is already occurring and is being exacerbated by other activities such as the seasonal agricultural drawdown and the operations at Turkey Point. A better use of these funds would be to improve our vulnerability to sea-level rise not continue to make us more vulnerable without a plan to fix existing concerns. We understand the benefits of a curtain wall on the water supply of the Taylor Slough and Florida Bay, but the Town cannot support the curtain wall project if it is not made much clearer how the District intends to mitigate for the consequences of this project on Biscayne Bay and Miami Dade County's water supply.

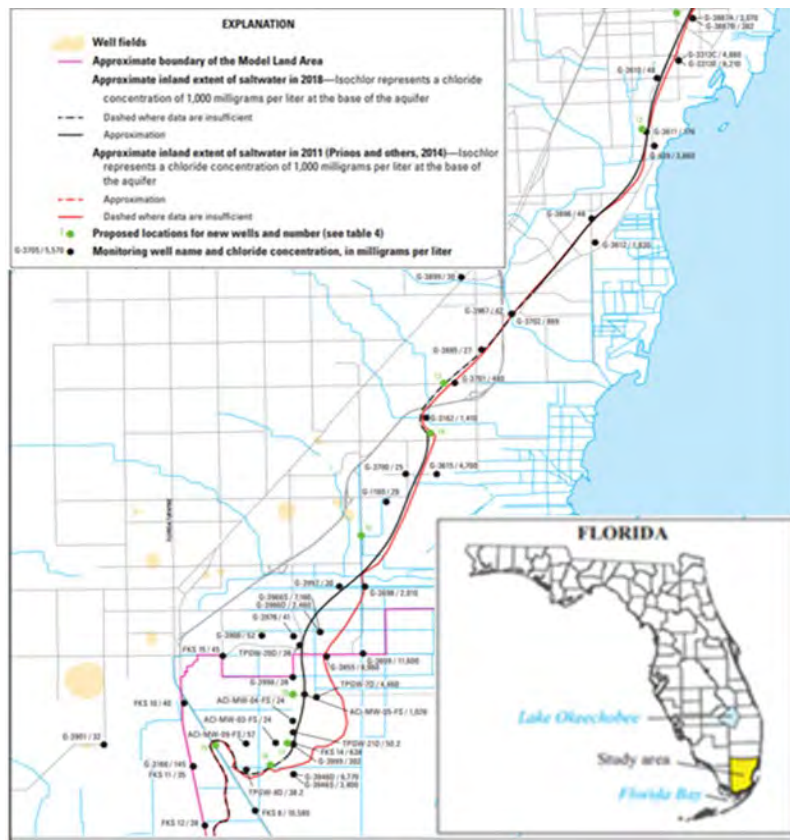


Figure 3. Inland Extent of Saltwater in the Base of the Biscayne Aquifer in South Miami-Dade County⁴

⁴ Prinos, S.T., 2019, Map of the approximate inland extent of saltwater at the base of the Biscayne aquifer in Miami-Dade County, Florida, 2018: U.S. Geological Survey Scientific Investigations Map 3438, 10-p. pamphlet, 1 sheet, <https://doi.org/10.3133/sim3438>





OFFICE OF THE TOWN MANAGER

Rafael G. Casals, ICMA-CM, CFM
Town Manager

To help prevent saltwater intrusion into the Biscayne Aquifer the District must modify the seasonal agricultural drawdown practices within Miami-Dade County. Currently, the agricultural drawdown practice reduces the groundwater level by releasing an average of 21.4 billion gallons of freshwater.⁵ Without sufficient recharge from the Everglades, the release of this volume of freshwater from the Biscayne Aquifer leaves our source of drinking water increasingly vulnerable to saltwater intrusion. The agricultural drawdown practice harms Biscayne Bay by rapidly increasing saline conditions.⁶ Alternatives to current agricultural drawdown operations have been proposed which deserve further investigation and an expedited timeline. Can we really wait until 2026 to fund this under BBSEER? We think it would be more appropriate to have those kinds of solutions proposed here so they can be expedited and additional work can be done in BBSEER to enhance a project that has already begun.

The curtain wall proposal would exacerbate the threat of saltwater intrusion by blocking freshwater recharge from the Groundwater and making the coast more vulnerable. It is questionable whether the use of resiliency funds is appropriate for a curtain wall given it will make Miami Dade County more vulnerable without major mitigation and a clear plan.

Any one of the three alternative curtain walls would further block the flow of groundwater to the Biscayne Aquifer, reducing wellfield recharge for Miami-Dade's water supply. Figure 4 displays the location of wellfields in Miami-Dade County. Note that these wellfield recharge areas are located east of the proposed curtain wall. We would like more data on the modeling results including all of the assumptions built into the model itself. We would also like to understand the timing of all projects in the area and how these impacts will be mitigated for and how the Town will benefit from this activity.

[SPACE LEFT INTENTIONALLY BLANK]

⁵ Kearns, Edward & Renshaw, A. & Bellmund, Sarah. (2008). Environmental Impacts of the Annual Agricultural Drawdown in Southern Miami-Dade County.

⁶ Kearns, Edward & Renshaw, A. & Bellmund, Sarah. (2008). Environmental Impacts of the Annual Agricultural Drawdown in Southern Miami-Dade County.





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Town Manager

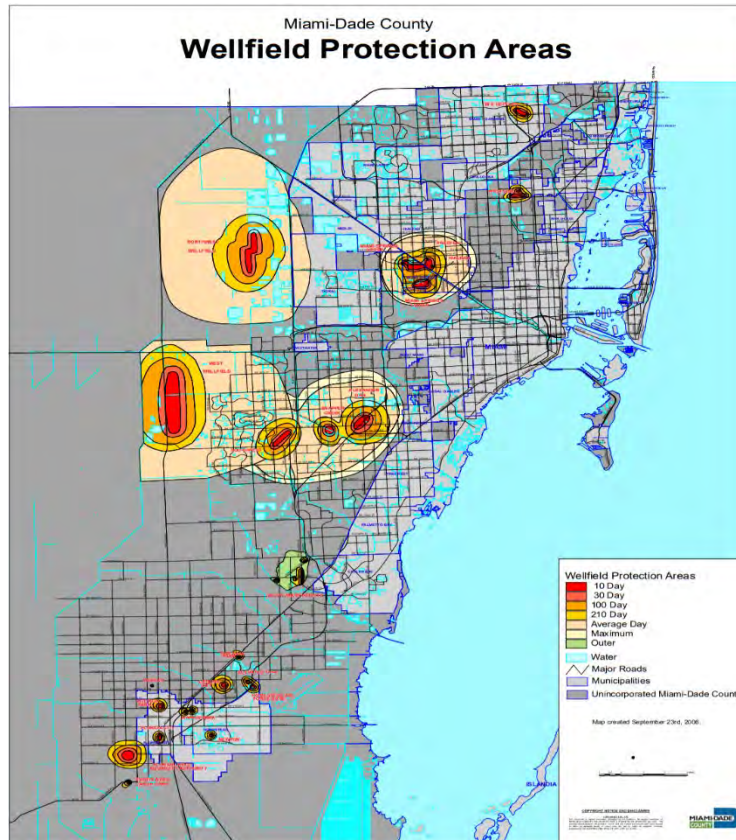


Figure 4. Wellfield Protection Areas in Miami-Dade County⁷

III. The SLRFRP does not consider impacts to Biscayne Bay

We expected to see a more detailed discussion of additional measures addressing the 10-mile hypersaline plume of salinity and nutrient pollution from Turkey Point. This plant is operating at sea-level and no mitigation to date has been required to offset decades of impacts to Biscayne Bay. The National Park Service and the District have noted a historical increase in salinity in Biscayne Bay.⁸ The rise in salinity has already affected the population of a number of species in the bay, including oyster (*Crassostrea virginica*) beds and red drum (*Sciaenops ocellatus*) species. In their Ecological Targets for Western Biscayne National Park, the National Park Service stated that water flow decisions should be made specifically to promote the estuarine condition of the area to promote healthy ecosystems.⁹ In accordance with this, water flow management decisions should consider Biscayne Bay's resultant salinity levels. In the recent weekly ecological conditions report published by John Mitnik, Biscayne Bay is not even mentioned.

⁷ Miami-Dade County. (2017, August 10). *Wellfield Protection Areas*. Regulatory and Economic Resources.

<https://www.miamidade.gov/environment/library/maps/wellfield-protection-areas.pdf>

⁸ Stabenau, E. (n.d.). *Freshwater Discharge and Protecting the Coastal Ecosystem in Biscayne National Park*. National Park Service South Florida Natural Resources Center. https://www.sfwmd.gov/sites/default/files/documents/water_challenges_facing_bisc_np.pdf

⁹ National Park Service. (2006, April). *Ecological Targets for Western Biscayne National Park*. Florida International University Libraries. <http://dpanther.fiu.edu/sobek/F111060807/00001>





OFFICE OF THE TOWN MANAGER

Rafael G. Casals, ICMA-CM, CFM

Town Manager

We suggest, the Cooling Canal System just like with Unit 5, the use reuse water for cooling to replace the use of our regional supply and the Floridian Aquifer. The cooling canal water budget uses both. The more we can reduce our reliance on the use of groundwater and replace it with reuse water, the more sustainable we will be. We suggest mechanical draft cooling towers for all cooling activities at the plant, with the use of deep well injection and the placement of those mechanical draft towers well above sea-level to increase the plant's resilience to sea-level rise and flooding. If done properly, deep well injection will preserve the health of the Biscayne Aquifer and Biscayne Bay. This would allow restoration activities of over 6,000 acres on the coast of Biscayne National Park to work in tandem with BBSEER to achieve shared resiliency goals and would be a perfect location for expanded EMMA projects.

The curtain wall proposal in the SLFRP would exacerbate the problem of saltwater intrusion in South Dade, negatively impacting the health of Biscayne Bay. Groundwater flow is more biologically available than surface water.¹⁰ The flow of fresh groundwater is vital to maintain the ideal mesohaline estuarine conditions in Biscayne Bay's nearshore. The rise in salinity in Biscayne Bay has caused a decrease in ecosystem productivity, reducing the bay's environmental and economic value.¹¹ Currently, groundwater only consists of 10% of freshwater input into Biscayne Bay in the wet season and 5% of input in the dry season. Any further limitations of this flow would be contrary to restoration plans of current projects like BBSEER that seek to increase freshwater input into Biscayne Bay. Many times surface water is dumped into the bay and never mixes prolonging the lagoonal conditions that persist impacting fisheries and tourism in our area. Potentially expediting the purchase of the Bird Drive Recharge Area and creating a flowage equalization basin (FEB) there to recharge groundwater would offset any negative impacts cause by the curtain wall and preservation of a green buffer will allow for aquifer recharge along the east side of Miami Dade County to help preserve pathways for recharge and seepage management. These projects should be expedited and completed before any additional seepage barriers are built.

IV. The District should conduct and publish analyses based on the DBHydro Data

We support the development of a Water and Climate Resiliency Metrics Web Tool as a way to inform the public of resiliency metrics. This new web tool should emphasize the impacts of climate change on each of these criteria. However, the release of this data to the public should not replace the District conducting their own analyses and publishing of the results of trends in this data. An analysis by the District will increase residents' understanding of the threats of sea-level rise, flooding, and the importance of resilience for their homes and communities.

Climate change must be central to the District's plans going forward since it exacerbates the threats of sea-level rise and flooding. This plan must recognize nature-based solutions such as preservation of peat soil and restoration of seagrass beds to mitigate and adapt to sea-level rise caused by climate change, as well as the importance of sufficient freshwater recharge from the Everglades to the Biscayne Aquifer and Biscayne Bay.

¹⁰ Stalker, J. C., Price, R. M., & Swart, P. K. (2009). Determining spatial and temporal inputs of freshwater, including submarine groundwater discharge, to a subtropical estuary using geochemical tracers, Biscayne Bay, South Florida. *Estuaries and coasts*, 32(4), 694-708.





OFFICE OF THE TOWN MANAGER

Rafael G. Casals, ICMA-CM, CFM
Town Manager

We understand this draft of the SLRFLP is only the first step to increasing resilience in the District, we want to work with you to help improve it and its effectiveness. Our Town is one of the area's most vulnerable to sea-level rise in the entire county. We look forward to working with you more closely to increase our understanding of your plans and vision and ultimately our resilience against sea-level rise and flooding in our Town. On behalf of the Town Council we thank you for taking time to review our comments.

If you should have any questions or concerns, feel free to contact me at (305) 234-4262 or via email at rcasals@cutlerbay-fl.gov.

Sincerely,

Rafael G. Casals, ICMA-CM, CFM
 Town Manager

CC: Drew Bartlett, Executive Director, South Florida Water Management District, dbartlett@sfwmd.gov
 Jennifer Reynolds Division Director for Ecosystem Restoration & Capital Projects, South Florida Water Management District Governing Board, jreynolds@sfwmd.gov
 Daniella Levine Cava, Mayor, Miami-Dade County, mayor@miamidade.gov
 Danielle Cohen Higgins, Commissioner, Miami-Dade County, District8@miamidade.gov
 Jim Murley, Chief Resiliency Officer, Miami-Dade County, resilience@miamidade.gov
 Laura Reynolds, Environmental Consultant, Town of Cutler Bay, lreynolds@conservationconceptsllc.org





Tropical Storm Alex Flooding Event Summary

June 2-9, 2022



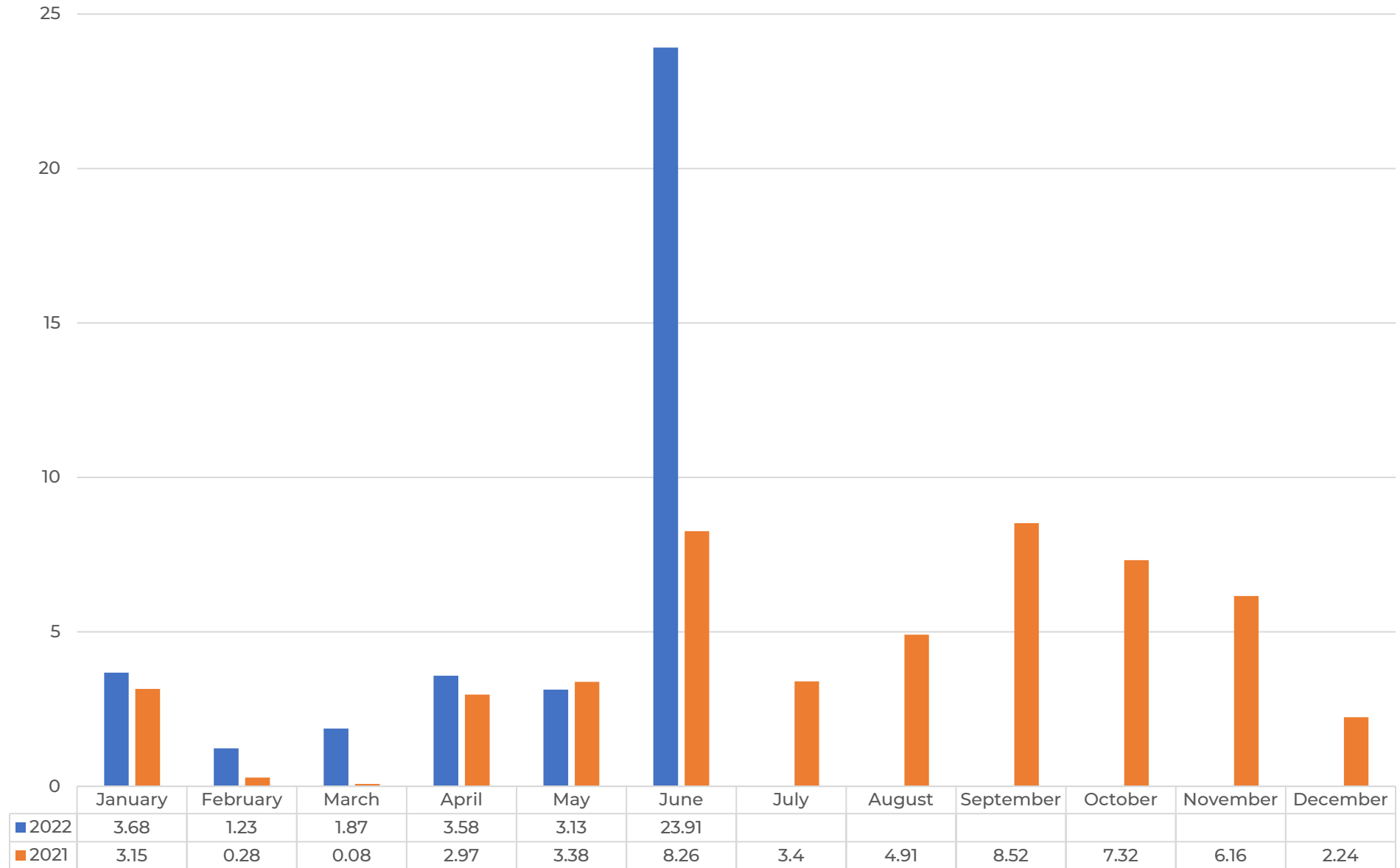
Flooding Event Summary

- 22.68 inches of rain received in Cutler Bay from June 2 to June 9, 2022 (source: SFWMD)
- Kimley-Horn ran a storm intensity frequency model and it yielded a 100 year storm. (probability of occurrence is 1% annually)
- FEMA Maps are done using the 100-year storm frequency.



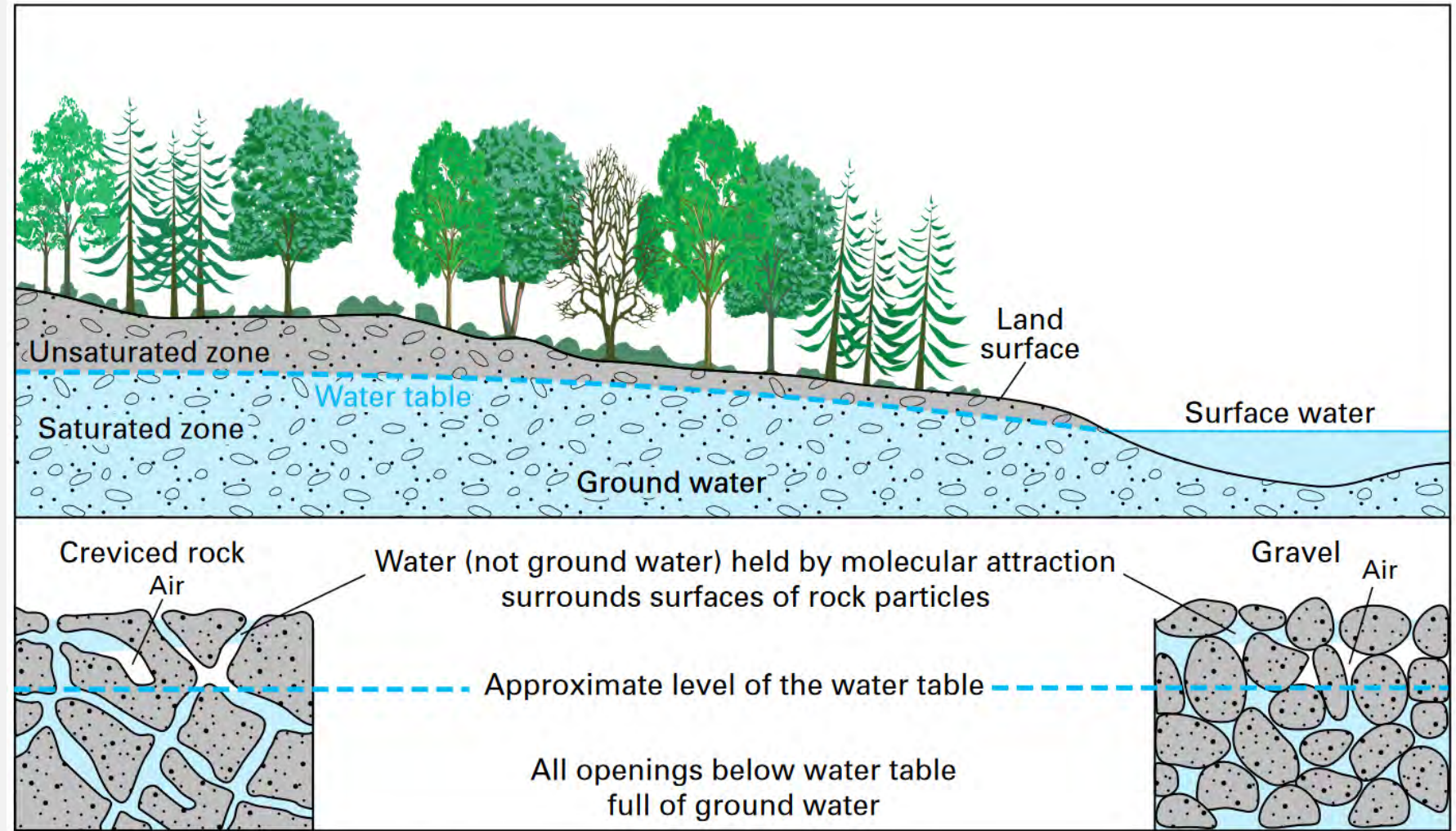
Monthly Rainfall, Town of Cutler Bay

- 2021 Total Annual Rainfall was 50.67" inches
- Town Received 47% of the total rainfall of the previous year during this event.



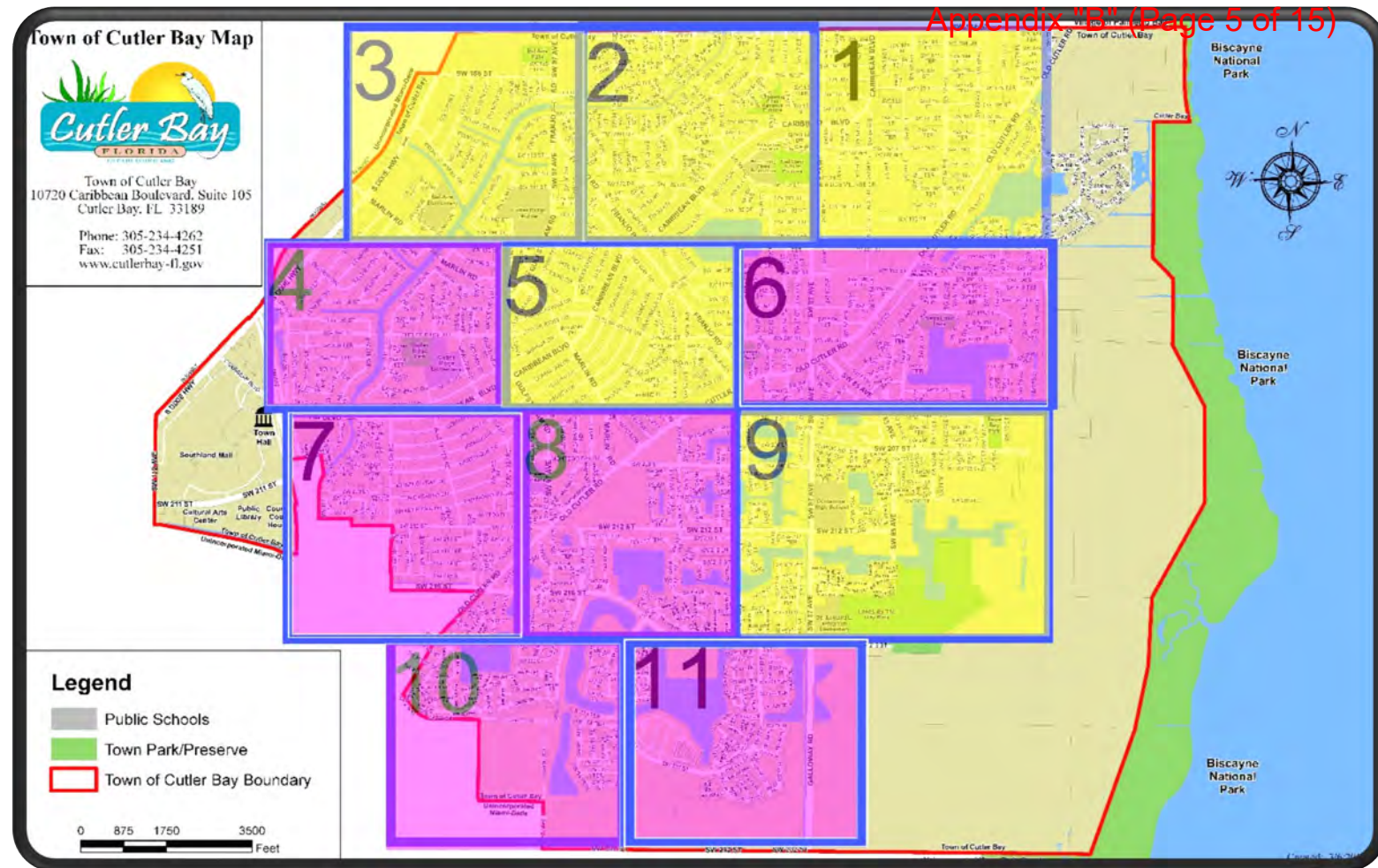
Why did it happen?

- Water Table Completely Saturated.
- Water Table impacted by heavy rain events and rise /fall of tides.
- Stormwater has nowhere to go in a 100-year event.



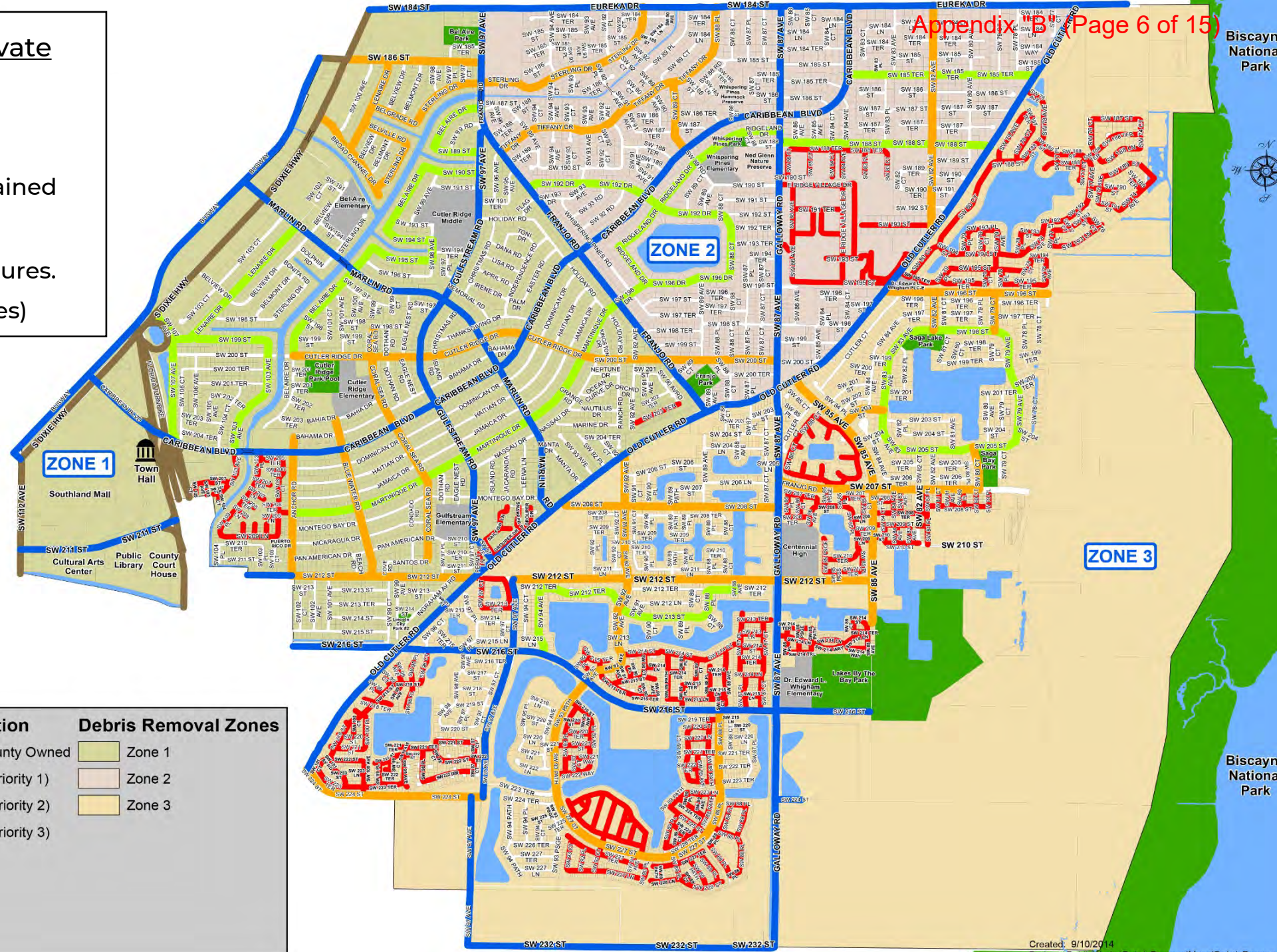
How ground water occurs in rocks.

- Town performs 300k of storm drain maintenance annually.
- Yellow = Cleaning Performed in Fiscal Year 2021 – 2022
- Pink = Cleaning scheduled for Fiscal Year 2023-2024
- Entire town owned storm drain system cleaned every 2 years. (FDEP recommends every 10 years)
- Vector Trucks remove sediment from storm drains to improve percolation.



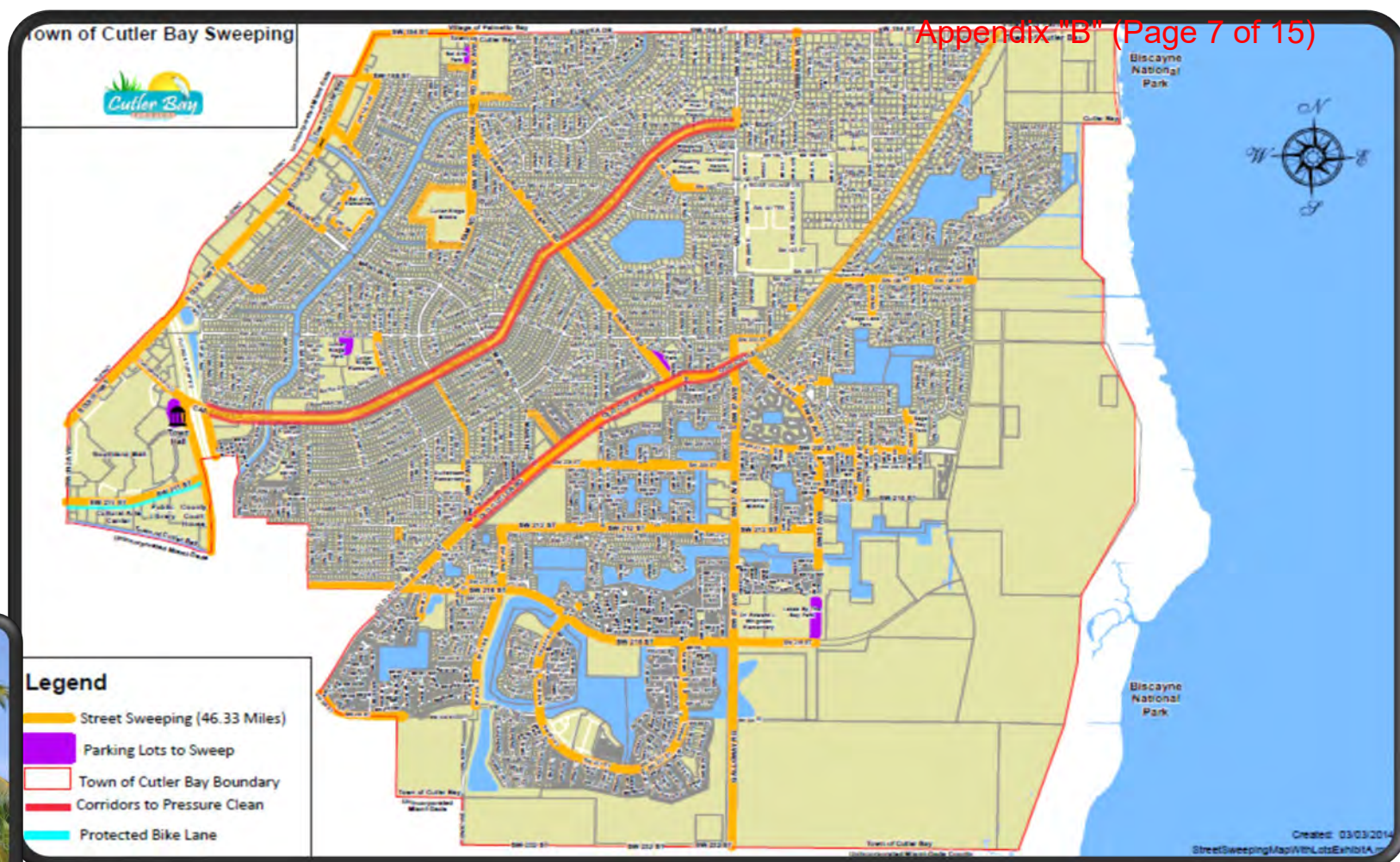
Public Right of Ways and Private Communities.

- 2,256 Town owned and maintained storm drain structures
- 3,039 privately owned and maintained storm drain structures.
(HOA & Commercial Properties)



Street Maintenance Jurisdiction		Debris Removal Zones	
	Class A Roads: Miami-Dade County Owned		Zone 1
	Class B Roads: Town Owned (Priority 1)		Zone 2
	Class C Roads: Town Owned (Priority 2)		Zone 3
	Class D Roads: Town Owned (Priority 3)		
	FDOT Owned		
	Private Community Road		
	Town Parks		
	Public Schools		

- Street Sweeping done bi-weekly on all roads with curb & gutter.
- Over 46 miles of town's roadways swept per cycle.



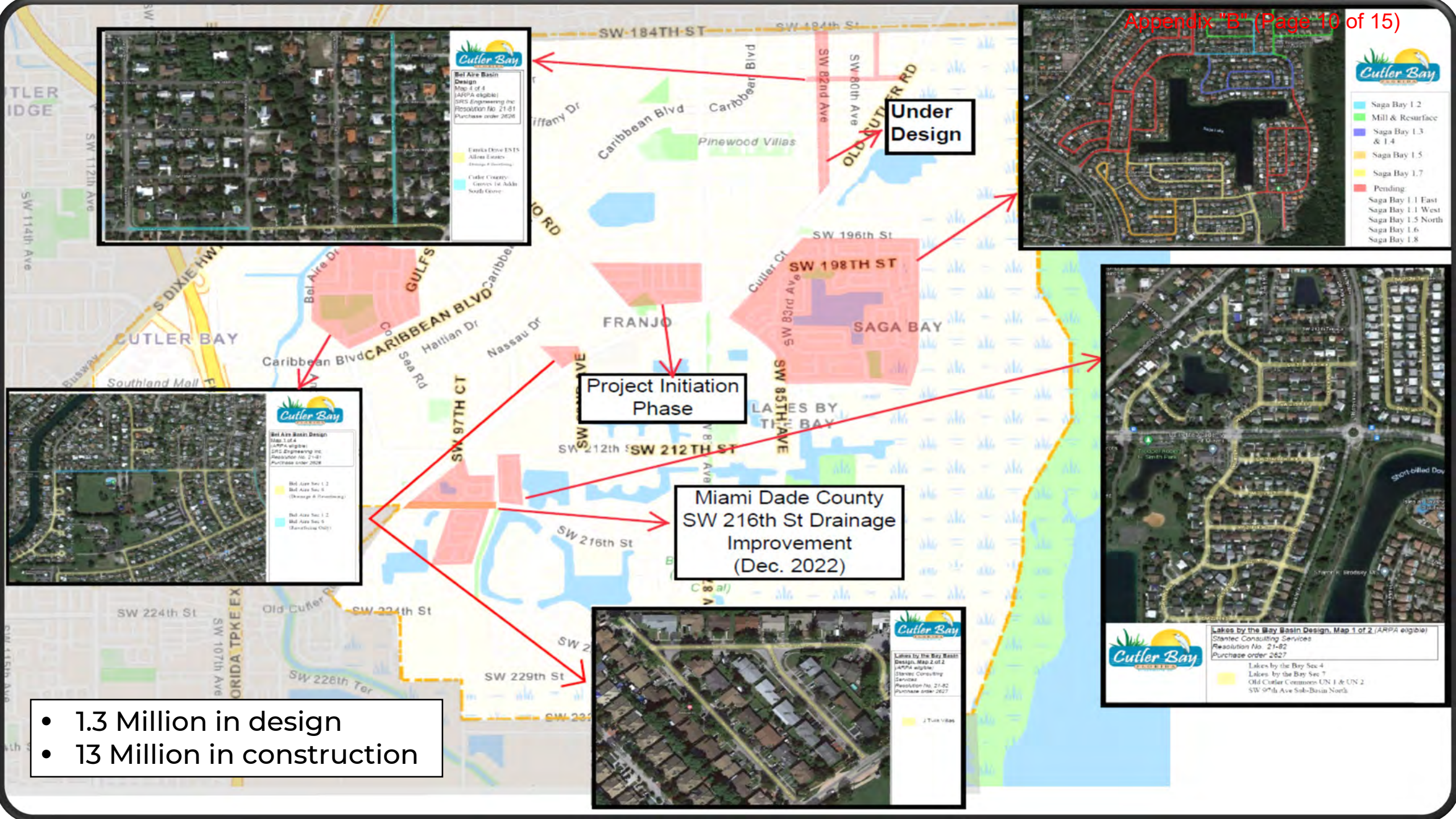
Completed Projects

- Joint Participation Agreements
- Miami Dade County funding.
- Grant funding.

LMS Project	Project Name	Cost/ Estimate	Status	Grant Award
	Cutler Ridge Elementary Area	\$770,000	Completed	\$200,000
	Saga Bay Section 1.3, 1.4, and 1.5 Sub-Basin	\$500,000	Completed	\$250,000
	Bel-Aire Section 5.2 Sub-Basin	\$450,000	Completed	\$210,000
	SW 212 Street Drainage Improvement	\$727,591	Completed	\$700,000
342	Point Royale Section 5 Sub-Basin (SW 100 Avenue Drainage Improvement)	\$843,087	Completed	\$374,000
346	Saga Bay Section 1.2 Sub-Basin	\$494,294	Completed	\$165,000
9442	Manta Drive Sub-Basin	\$488,600	Completed	\$344,260
10050	Cutler Ridge Section 3 Drainage Improvement	\$1,015,160	Completed	\$200,000
	SW 97 Ave Drainage Improvement Project	\$291,494	Completed	
	SW 216 St & SW 97 Ave Traffic Circle	\$204,486	Completed	
	Old Cutler Road JPA Project (SW 87 Ave to SW 97 AVE)	\$7,524,319	Completed	
	Caribbean Boulevard JPA Project & GAP 1 (C-100 Canal Bridge to SW 87 AVE)	\$11,173,054	Completed	
	Caribbean Boulevard JPA Project & GAP 2 (Homestead Extension of Florida's Turnpike to C-100 Canal Bridge)	\$1,102,188	Completed	
	SW 216 Street Drainage Improvement (From SW 97 th Ave to SW 87 th Ave)	\$1,197,059	Completed	
	Caribbean Boulevard Bridge Project	\$1,456,086	Construction/Procurement Stage (C100B Canal)	
	<u>Franjo Road</u> JPA Project (SW 184 ST to Old Cutler RD)	\$8,946,748	Design Phase	
	Marlin Road JPA Project (US-1 to Old Cutler RD)	\$12,000,000	Project Initiation	\$520,000
	SW 216 Street Drainage Improvement (From Old Cutler Road to SW 97 th Ave)	\$550,000	90% Design Phase	

LMS Project	Project Name	Cost/ Estimate	Status	Grant Award
	Saga Bay Section 1.5 Sub-Basin	\$2,050,000	Planning to fund with ARPA	ARPA
335	SW 87 Avenue Sub-Basin	\$2,300,000	Future Unfunded Project	
336	SW 97 Avenue Sub-Basin (North Portion)	\$585,000	Future Unfunded Project	
337	Bel-Aire Section 1.2 Sub-Basin	\$1,245,000	Planning to fund with ARPA	ARPA
338	Saga Bay Section 1.1 Sub-Basin	\$800,000	Planning to fund with ARPA	ARPA
339	Saga Bay Section 1.7 Sub-Basin	\$920,356	Awarded an FDEP Grant for 600k in FY 2020.	\$600,000
340	Pine Tree Manor Sub-Basin	\$894,000	Planning to fund with ARPA	ARPA
341	Cutler Ridge Section 5 Sub-Basin	\$4,093,000	Planning to fund with ARPA	ARPA
343	Bel-Aire Section 1.1 Sub-Basin	\$2,285,000	Future Unfunded Project	
344	Saga Bay Section 1.8 Sub-Basin	\$703,000	Planning to fund with ARPA	ARPA
345	Saga Bay Section 1.6 Sub-Basin	\$498,000	Planning to fund with ARPA	ARPA
347	Bel-Aire Section 6 Sub-Basin	\$907,000	Planning to fund with ARPA	ARPA
10050	Cutler Ridge Section 3 Drainage Improvement	\$1,600,000	Procurement Applying for additional funding under CDBGDR Grant	\$200,000
	Whispering Pines Swale Improvements	\$456,000	Planning to fund with ARPA	ARPA
	South Groves	\$265,000	Planning to fund with ARPA	ARPA
	Bel Aire Sec 19 & 23	\$450,000	Planning to fund with ARPA	ARPA
	Old Cutler Common UN 1 & 2	\$870,000	Planning to fund with ARPA	ARPA
	Lakes by the Bay Sec 7	\$640,000	Planning to fund with ARPA	ARPA
	Lakes by the Bay Sec 4	\$1,000,000	Planning to fund with ARPA	ARPA
	Saga View	\$280,000	Planning to fund with ARPA	ARPA
	SW 82 Avenue Roadway Improvement	\$990,000	FDOT LAP Grant	\$800,000
	Caribbean Blvd Roadway Improvement Project (SW 87 Ave to SW 184 St)	\$1,800,000	FDOT LAP Grant	\$1,000,000
	Canal Bank Restoration C-100 (from Franjo Rd to SW 184 St)	\$1,650,000	FDEP	\$750,000

- Local Mitigation Strategy
- Town planned drainage improvements.
- American Rescue Plan Act (ARPA)



Under Design

Project Initiation Phase

Miami Dade County
SW 216th St Drainage Improvement
(Dec. 2022)

- 1.3 Million in design
- 13 Million in construction

Cutler Bay
Bel Aire Basin Design
Map 4 of 4
(ARPA eligible)
GRC Engineering Inc.
Resolution No. 21-81
Purchase order 2626

Emilia Drive-ENT5
Allene Estates
(Design & Rendering)

Cutler Country
Cannes de Akle
South Grove

Cutler Bay
Bel Aire Basin Design
Map 1 of 4
(ARPA eligible)
GRC Engineering Inc.
Resolution No. 21-81
Purchase order 2626

Bel Aire Sec 1, 2
Bel Aire Sec 8
(Design & Rendering)

Bel Aire Sec 1, 2
Bel Aire Sec 5
(Rendering Only)

Cutler Bay
Lakes by the Bay Basin Design
Map 2 of 2
(ARPA eligible)
Stantec Consulting Services
Resolution No. 21-82
Purchase order 2627

J Turn Villas

Cutler Bay
Lakes by the Bay Basin Design
Map 1 of 2 (ARPA eligible)
Stantec Consulting Services
Resolution No. 21-82
Purchase order 2627

Lakes by the Bay Sec 4
Lakes by the Bay Sec 7
Old Cutler Commons UN 1 & UN 2
SW 9th Ave Sub-Basin North

Cutler Bay

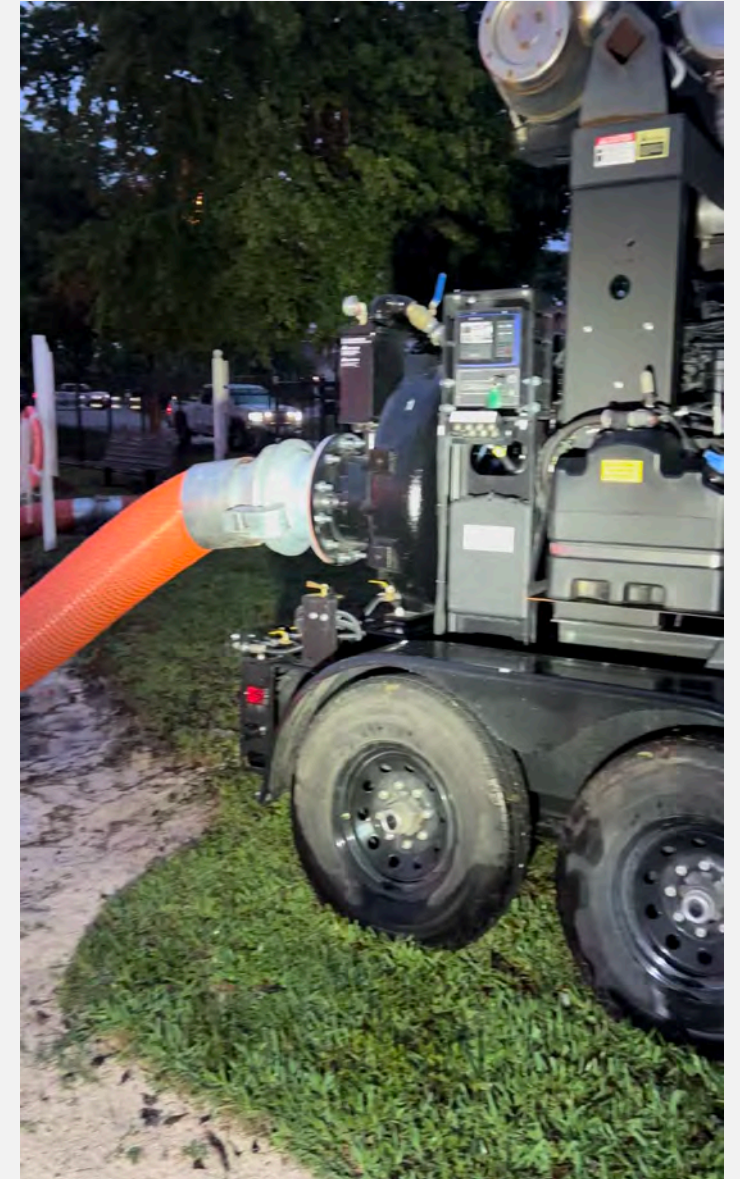
- Saga Bay 1.2
- Mill & Resurface
- Saga Bay 1.3 & 1.4
- Saga Bay 1.5
- Saga Bay 1.7
- Pending
- Saga Bay 1.1 East
- Saga Bay 1.1 West
- Saga Bay 1.5 North
- Saga Bay 1.6
- Saga Bay 1.8

Town rented several pumps to mitigate flooding in Saga Bay.

- 1 - 12" inch pump
- 1 - 6" inch pump
- 1 - 4" inch pump
- 3 - 3" inch pumps

Additional Resources:

- 1 - 12" inch SFWMD
- 1 - 6" inch Miami Dade County



What else has the Town done to mitigate flooding?

- Adopted a Stormwater Master Plan (being updated)
- Adopted a Flood Mitigation Plan
- Adopted a Program for Public Information
- Adopted a Watershed Master Plan
- Adopted a RLAA
- National Flood Insurance Program CRS Class 4.
- Improving to a Class 3 as of April 1st, 2023 (Savings of 35% in the SFHA).
- Higher regulatory standards above the Florida Building Code



Community:		CUTLER BAY, TOWN OF		State:		FLORIDA	
County:		MIAMI-DADE COUNTY		CID:		12D218	
		Current CRS Class = 4				[Printable Version]	
		TOTAL	SFHA *	X-ST/DI/AR/A99 ***	PRP ***		
PIF		7,493	7,013	42	438		
PREMIUM		\$4,972,848	\$4,744,649	\$2,336	\$175,661		
AVERAGE PREMIUM		\$664	\$677	\$1,246	\$402		
CRS Class							
09	Per Policy	\$46	\$46	\$69	\$0		
	Per Community	\$341,811	\$338,903	\$2,906	\$0		
08	Per Policy	\$97	\$97	\$69	\$0		
	Per Community	\$680,714	\$677,806	\$2,906	\$0		
07	Per Policy	\$136	\$145	\$69	\$0		
	Per Community	\$1,019,617	\$1,016,710	\$2,906	\$0		
06	Per Policy	\$182	\$193	\$136	\$0		
	Per Community	\$1,301,428	\$1,355,613	\$5,615	\$0		
05	Per Policy	\$227	\$242	\$136	\$0		
	Per Community	\$1,700,331	\$1,694,516	\$5,615	\$0		
04	Per Policy	\$272	\$290	\$136	\$0		
	Per Community	\$2,039,235	\$2,053,419	\$5,615	\$0		
03	Per Policy	\$317	\$336	\$136	\$0		
	Per Community	\$2,378,138	\$2,372,323	\$5,615	\$0		
02	Per Policy	\$363	\$387	\$136	\$0		
	Per Community	\$2,717,041	\$2,711,226	\$5,615	\$0		
01	Per Policy	\$406	\$435	\$136	\$0		
	Per Community	\$3,055,944	\$3,050,129	\$5,615	\$0		

* SFHA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class.

** SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AC): 10% discount for Classes 1-6; 5% discount for Classes 7-9.

*** Preferred Risk Policies are not eligible for CRS Premium Discounts.

Class 4 = 30%
\$272 per policy
Total Savings =
\$2,039,235

\$290 per policy
In SFHA

Class 3 = 35%
\$317 per policy
Total Savings =
\$2,378,138
\$338 per policy
In SFHA

1,740 communities in CRS, only 18 are a class 3 or better.



FLOOD WARNING NOTIFICATION

Miami-Dade County officials can alert the public using the Emergency Alert System (EAS) which sends out alerts to broadcast media and television.

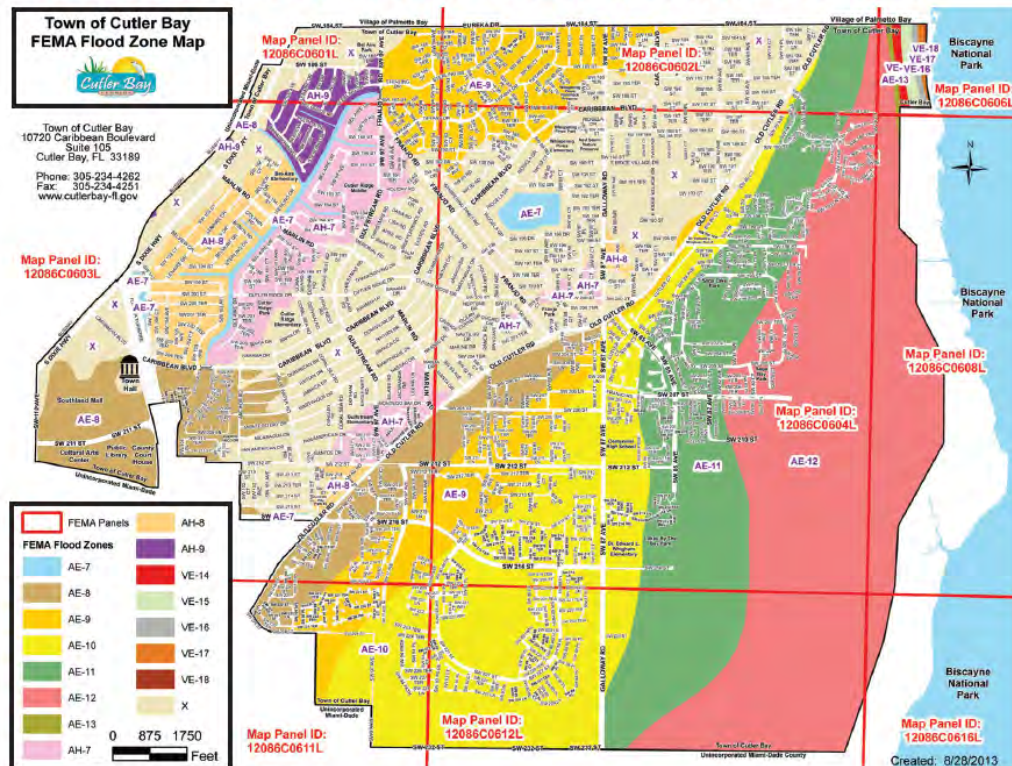
County officials can also send warnings directly to mobile phones within the county via Wireless Emergency Alerts (WEA). The notification will appear like a text message and provide information regarding the type of warning, affected area and expected duration. No registration is required, but a Commercial Mobile Alert System (CMAS) enabled device is necessary. For a list of CMAS enabled devices, please check your mobile phone carrier's website.

The NOAA Weather Radio (NWR) broadcasts official

Weather Service warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week. All hazard NWR's are available for purchase in local electronic retail or department stores and provide access to the NOAA Weather Radio System.

The County also provides Miami-Dade Alerts, a service that enables residents to receive emergency texts and/or emails about public safety issues such as: weather warnings like tornado, tropical storm or hurricane warnings; recommended public protective actions; or other emergency information. Registration is required—visit miamidade.gov/alerts. For more information, contact Miami-Dade County Emergency Management at (305) 468-5400.

ALL ZONES ON MAP EXCEPT ZONE X ARE IN A FLOOD PLAN.



DID YOU KNOW YOUR HOME IS IN AN AREA SUBJECT TO FLOODING?

FOLLOW THE 11 STEPS INSIDE
to prepare and protect yourself from flooding.



STAY CONNECTED!
Keep up with the latest Town news, events & more by signing up for the Town of Cutler Bay's e-newsletters. Scan the QR code to sign up.

ARE YOU PREPARED FOR A FLOOD IN YOUR NEIGHBORHOOD?

You're receiving this brochure because your property is located in or near a flood-prone area.

The Town of Cutler Bay is located in very close proximity to Biscayne Bay and the Atlantic Ocean. Flooding in the Town can be attributed to three sources: 1) tidal flooding and storm surge resulting from hurricanes and tropical storms; 2) flash flooding resulting from heavy rainfall that overburdens the drainage system within the Town; and 3) riverine flooding resulting from heavy and prolonged rainfall which causes the capacity of canals and stream channels to be exceeded. Being prepared is your best defense against a flood.

**HERE ARE 11 STEPS TO HELP YOU PREPARE FOR A FLOOD:****STEP 1: KNOW YOUR FLOOD HAZARD**

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRMs). It is the official map for a community on which FEMA has delineated both the Special Flood Hazard Areas (SFHAs) and the risk premium zones applicable to the community. SFHAs represent the areas subject to inundation by the 1-percent-annual chance flood event. Structures located within the SFHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. FEMA FIRM maps are available for free public viewing online at msc.fema.gov/portal. Also, upon request, the Town's Public Works Department will make free flood zone determinations for properties located within the Town, call (305) 234-4262. It is critical to note that properties located outside of the SFHA are not guaranteed to be safe from flooding.

STEP 2: INSURE YOUR PROPERTY

Flooding is not covered by a standard homeowner's insurance policy. Flood insurance is available to homeowners, condo owners, commercial owners, and all renters. Renters are encouraged to purchase flood insurance for their contents. Note that there is a 30-day waiting period before coverage goes into effect. That means now is the best time to buy flood insurance. Contact your preferred insurance agency for more information. Additional information can be found online at www.floodsmart.gov or by calling 1 (877) 336-2627.

The Town has been keeping Elevation Certificates on file for new construction and substantially improved buildings since 2006. To find out if your property is in a flood zone, to request the Elevation Certificate we may have on file, and for other flood protection information, please call the Town's Public Works Department at (305) 234-4262.

STEP 3: PROTECT YOURSELF AND YOUR FAMILY

- Should a storm threaten South Florida, the Town of Cutler Bay will update its website (www.cutlerbay-fl.gov) based on advisories from the Miami-Dade County Office of Emergency Management.
- Tune-in to local radio stations such as WIOD (610 AM) or WBGG (105.9 FM) and television channels 4, 7 and 10.
- All hazard NOAA Weather Radios (NWR) are available for purchase in local electronic retail or department stores and provide access to the NOAA Weather Radio System.

- If flooding threatens your home, turn off electricity at the main breaker.
- If you lose power, turn off all major appliances.
- Avoid low-lying areas. Seek shelter in the highest areas possible.
- Discuss your family emergency plan. Your family may not be together when disaster strikes, so it is important to know how you will contact one another, how you will get back together, and what you will do in case of emergency.
- Never attempt to drive through flooded roadways. Floodwaters can conceal damage underneath. As little as two feet of running water can carry away most vehicles including SUV's. **Turn Around, Don't Drown!**

STEP 4: PROTECT YOUR PROPERTY

Various methods may be used to minimize flooding. If the first finished floor elevation of your property is lower than the base flood elevation (BFE) established by FEMA, consider elevating your structure. If a flood is imminent, protect your property by sandbagging areas vulnerable to the entry of water. Valuables and furniture may also be moved to higher areas of the dwelling to minimize damages. The Town of Cutler Bay will make site visits to provide one-on-one advice to a property owner regarding flooding and drainage issues on private property. For more information, please contact the Public Works Department at (305) 234-4262.

STEP 5: BUILD RESPONSIBLY

The Town of Cutler Bay's floodplain management regulation includes a rule that is known as the 44% rule. This rule states that if your structure is damaged or improved to an amount greater than 44% of the structure's market value, it will then have to comply with the current floodplain requirements. The Town's ordinance requires that all new construction and substantially improved buildings be built to a finished floor elevation of 1 foot above the BFE.

Before you begin any fill or construction, please contact the Town's Building Department at (305) 234-4193 (located at 10720 Caribbean Boulevard, Suite 110) for the appropriate permit application. If you see construction occurring without permits, call the Town's Code Enforcement Department at (305) 234-4262 to report it.

STEP 6: DON'T POLLUTE—PROTECT NATURAL FLOODPLAIN FUNCTIONS

Floodplains are a natural component of the Town's environment. Understanding and protecting the natural functions of floodplains helps reduce flood damage and protect resources. When flooding spreads out across the floodplain, its energy is dissipated, which results in lower flood flows downstream, reduced erosion of the streambank and channel, deposition of sediments higher in the watershed and improved groundwater recharge. Floodplains are scenic, valued wildlife habitat.

However, poorly planned development in floodplains can lead to streambank erosion, loss of valuable property, increased risk of flooding to downstream properties and degradation of water quality. The function of floodplains can also be disrupted by pollution from the community—like trash, glass clippings, chemical dumping and more. Throwing anything into the lakes, canals, or bodies of water in the Town is illegal—nothing but stormwater is allowed to go to the storm drains located in streets, rights-of-way, and parking lots. **Dumping materials into our waters or drains pollutes our bodies of waters, clogs our storm drains, and leads to flooding in our neighborhoods.** We encourage residents to report any illegal discharges you may witness by calling the Town's Public Works Department at (305) 234-4262, or the Miami-Dade County Call Center at (305) 372-6955.

Residents may take their oil-based paints, pesticides, solvents, pool chemicals, unbroken fluorescent light bulbs (including the older, long-tube fluorescents, modern compact fluorescent light bulbs [CFLs] and other fluorescent types) and other electronic waste to one of the two Home Chemical Collection Centers available throughout the County's Department of Solid Waste Management. The nearest one to Cutler Bay is located in the South Dade Center at 23707 SW 97th AVE Gate-B, Homestead, FL 33032. Hours of operation are 9 AM to 5 PM, Wednesday through Sunday.

The centers also accept latex paints still in liquid form. However, it is recommended that new paints or latex paint that is still in good condition be donated to neighbors or community groups. If you have unusable or poor quality latex paint still in liquid form, dry out any remaining liquid with an absorbent material like newspaper or kitty litter. Once the latex paint solidifies, you can place the paint can in the regular household waste container for collection. Also, propane tanks can be disposed of at one of the two Home Chemical Collection Centers. You can also dispose of empty oxygen tanks. Larger tanks such as those used for RV's, forklifts, or fixed kitchen gas supply are not accepted. The centers are available for non-commercial residents only.

STEP 7: HURRICANE PREPAREDNESS

If required, the Miami-Dade County Office of Emergency Management will order evacuations during the threat of a storm. If evacuations are called, it's imperative you follow instructions in a timely way. The primary evacuation routes in Town are US 1 and the Florida Turnpike.

Miami-Dade County will use radio and TV stations to broadcast emergency information. You may register for emergency notifications via the County's emergency notification system at www.miamidade.gov/alerts.

If a hurricane evacuation is ordered, residents are encouraged to stay with family members or friends in an inland area. Hurricane Evacuation Centers will be opened, but the Centers should only be considered as a last resort. Emergency bus pick-up sites will be activated to provide public transportation to and from designated Hurricane Evacuation Centers. To learn more about designated shelter locations, bus pick-up points and more, visit www.miamidade.gov/hurricane.

STEP 8: GENERAL PREPAREDNESS

Before a storm strikes, inventory and photograph your home's contents and put important papers and insurance policies in a safe place. Keep an emergency supply including non-perishable food, water, batteries, flashlights, manual can opener, and a battery-operated radio. If possible, place the washer, dryer, furnace and water heater above potential flood waters. They should be placed on masonry blocks or concrete at least 12 inches above the projected flood elevation, moved to inside a floodwall or moved to a higher floor. All work must conform to state and local building codes. Get more information at www.miamidade.gov/hurricane and www.nhc.noaa.gov/prepare/ready.php.

STEP 9: REDUCE STORMWATER FLOODING

Install Low Impact Development techniques to help manage stormwater on site instead of allowing it to run off into the stormwater drainage system. Visit www.ready.gov for more information. Install rain barrels under down spouts to extend down spouts away from your home into a rain garden. Don't direct your downspouts into your driveway letting water flow directly into the street.

STEP 10: FLOOD EDUCATION

Teach school children about flooding and the benefits of reduced stormwater pollution through an Enviroscape model (www.envirosapes.com) or similar education tool. Contact the Public Works Department at (305) 234-4262 for additional information.

STEP 11: PROTECTION OF MITIGATION & NATURAL WETLANDS

Help protect the mitigation & natural wetlands located within the Town by reporting any illegal dumping to the Towns Code Compliance Department at (305) 234-4262 during regular business hours (M-F, 8-5 PM) or the Code Compliance Hotline at (786) 573-5551 after hours. To report motorized vehicles illegally riding on natural mitigation lands, contact Town Police at (305) 4-POLICE.

Additional Flood Safety and National Flood Insurance Program Resources:

- ◆ www.cutlerbay-fl.gov/flood
- ◆ www.miamidade.gov/emergency
- ◆ www.floridadisaster.org
- ◆ www.floodsmart.gov
- ◆ www.ready.gov/floods

PUBLIC

"First to Respond, Last to Leave"

WORKS



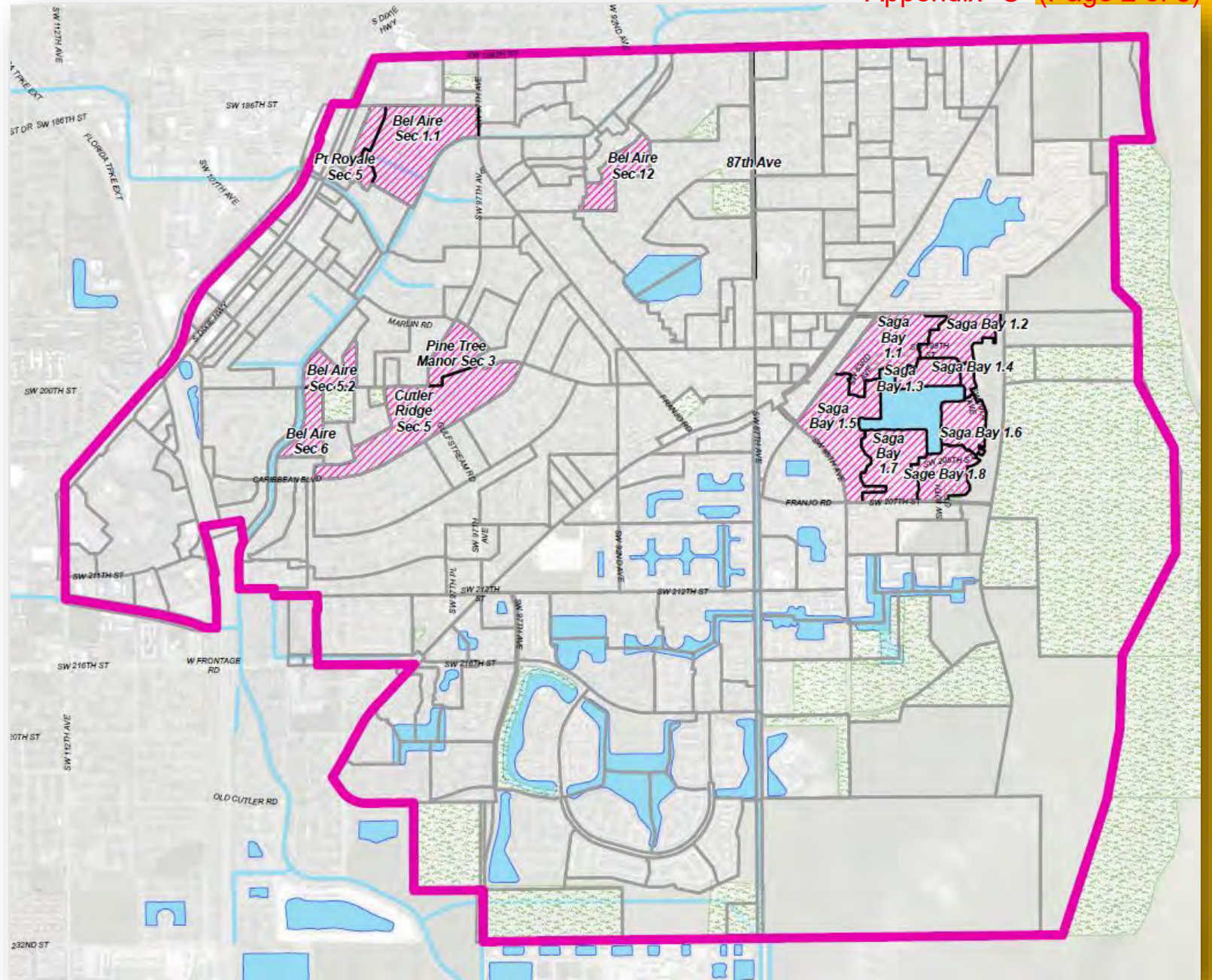
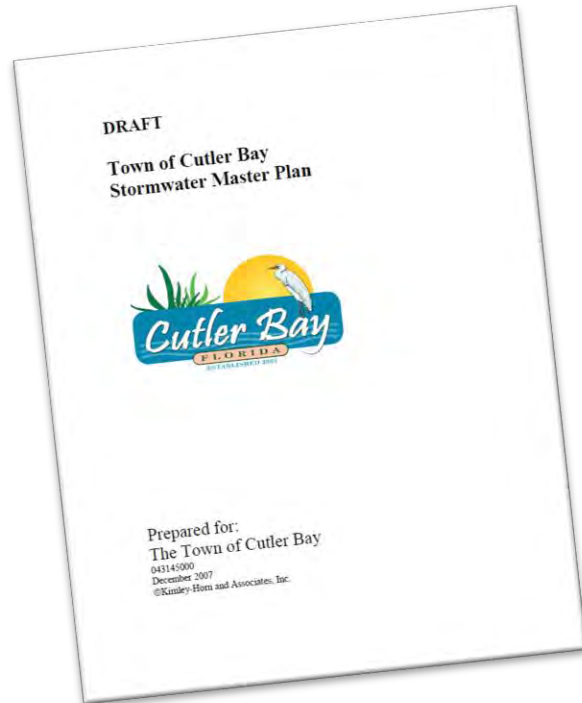
Questions?



Town Council Meeting
Tropical Storm Alex

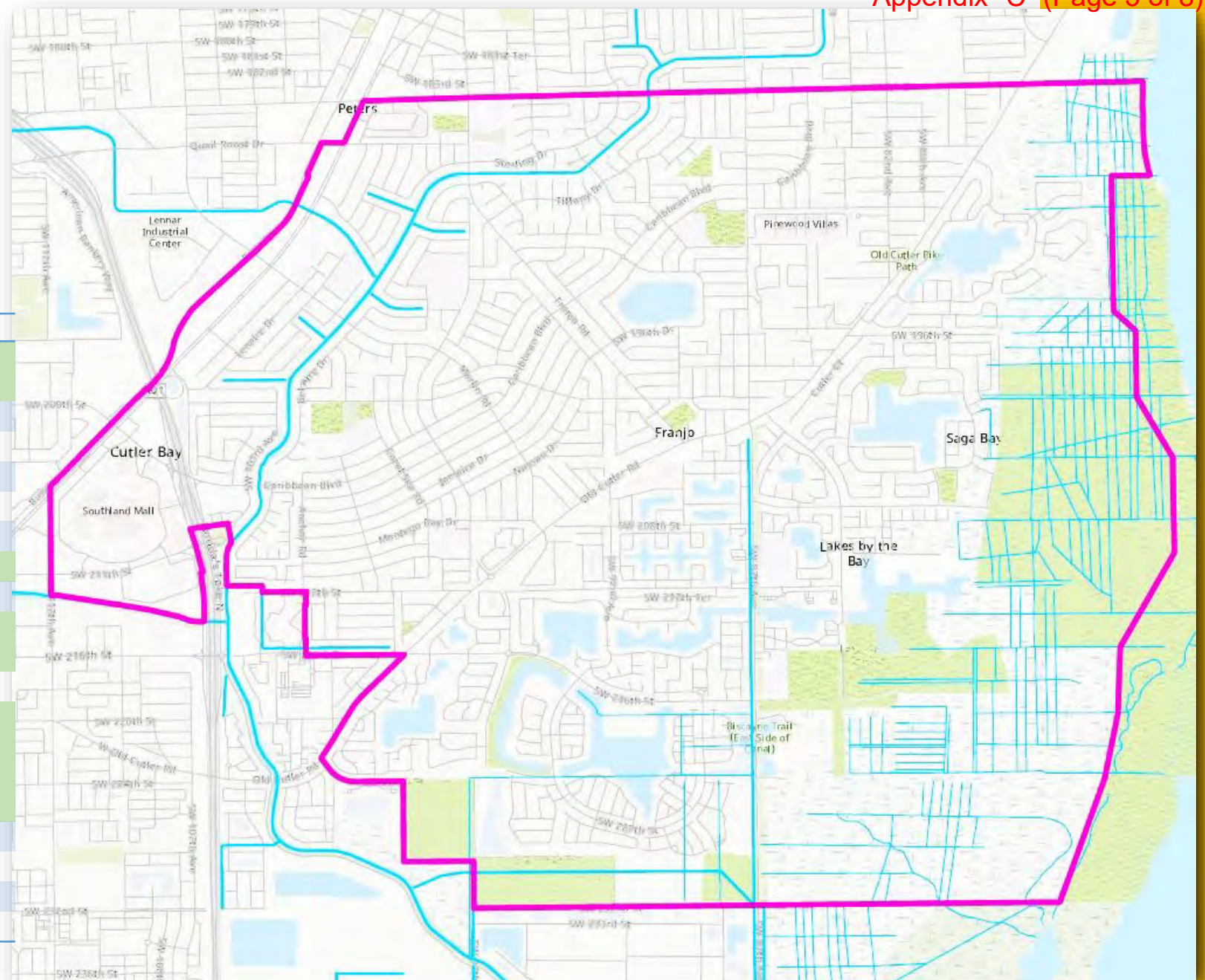
June 15, 2022

SWMP (2008) Priority Basins Identified

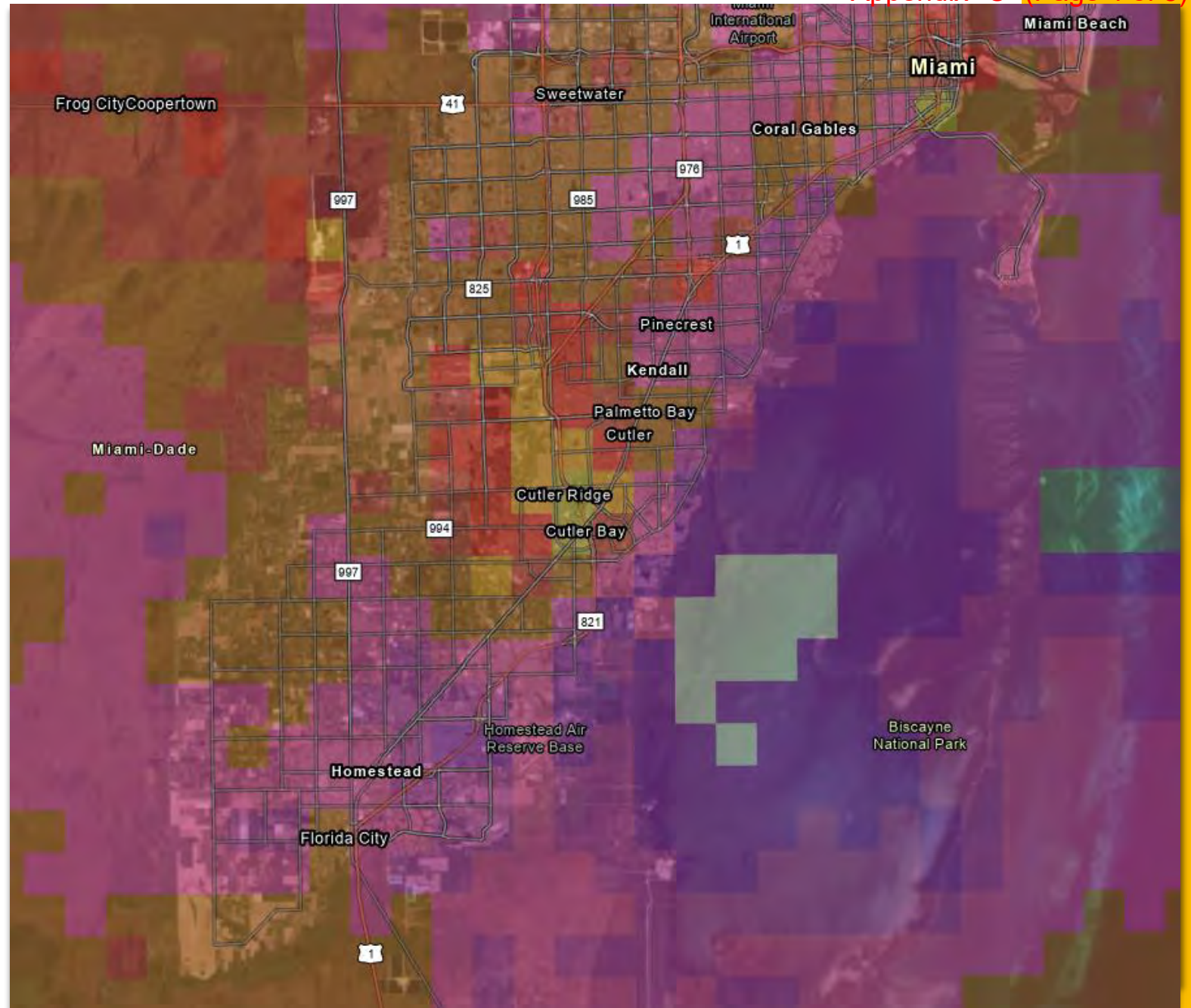


Projects In Progress and Completed

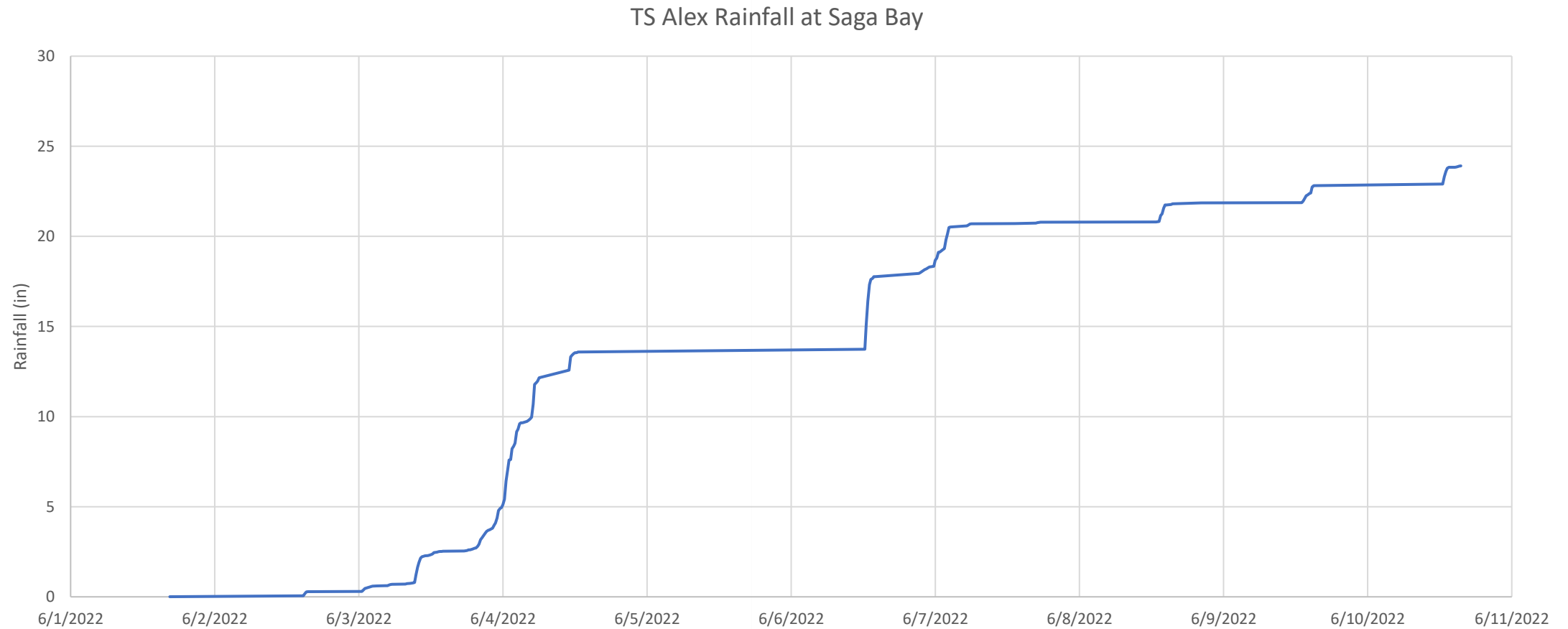
2008 Priority Basin/Project	Status
SW 87th Ave	Complete
SW 97th Ave	Complete
Bel Aire Sec. 1.1	In Progress
Bel Aire Sec. 1.2	In Progress
Bel Aire Sec. 5.2	In Progress
Bel Aire Sec. 6	In Progress
Port Royale	In Progress
Port Royale Sec. 5	Complete
Pine Tree Manor Sec. 3	In Progress
Culter Ridge Sec. 5	Complete
Saga Bay 1.1 (West)	Complete
Saga Bay 1.1 (East)	In Progress
Saga Bay 1.2	Complete
Saga Bay 1.3	Complete
Saga Bay 1.4	Complete
Saga Bay 1.5 (South)	Complete
Saga Bay 1.5 (North)	In Progress
Saga Bay 1.6	In Progress
Saga Bay 1.7	In Progress
Saga Bay 1.8	In Progress



TS Alex Rainfall at Saga Bay



TS Alex Rainfall at Saga Bay



TS Alex Rainfall at Saga Bay

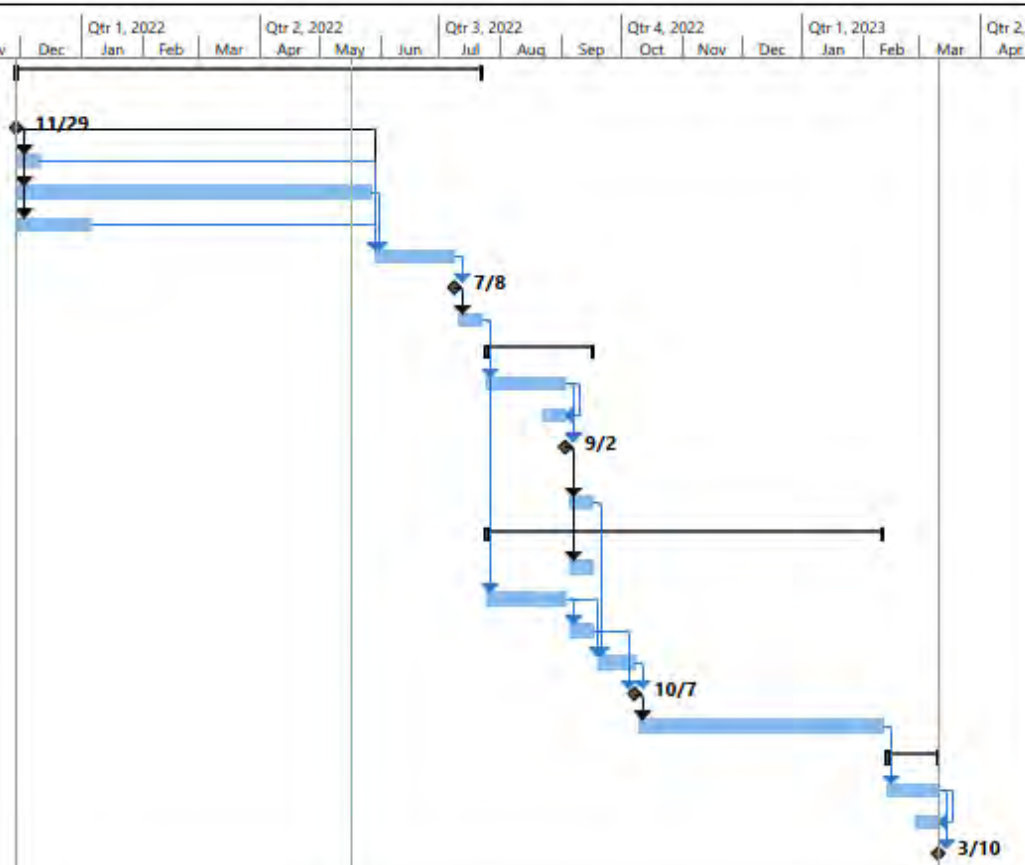
Duration	Rainfall Depth (in)	Start Time	End Time	Frequency (based on NOAA)	Frequency (based on SFWMD)
1-hour	3.87	6/6/2022 12:15 PM	6/6/2022 1:15 PM	5- to 10-year	-
6-hour	7.41	6/3/2022 11:15 PM	6/4/2022 5:15 AM	25- to 50-year	-
12-hour	9.59	6/3/2022 6:00 PM	6/4/2022 6:00 AM	25- to 100-year	-
1-day	11.46	6/3/2022 6:00 AM	6/4/2022 6:00 AM	25- to 100-year	Greater than 100-year
3-day	15.24	6/3/2022 2:00 PM	6/6/2022 2:00 PM	25- to 200-year	Greater than 100-year
4-day	20.01	6/3/2022 6:00 AM	6/7/2022 6:00 AM	100- to 500-year	-
7-day	22.68	6/2/2022 2:45 PM	6/9/2022 2:45 PM	100- to 500-year	-

Various Maintenance Methods!



Saga Bay-Schedule
Design Schedule

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Qtr 4, 2021			Qtr 1, 2022			Qtr 2, 2022			Qtr 3, 2022			Qtr 4, 2022			Qtr 1, 2023			Qtr 2, 2023
							Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	Task 1: Project Initiation, Survey, Geotechnical, and Schematic Design	170 days	Mon 11/29/21	Fri 7/22/22																					
2	Kick-Off	0 days	Mon 11/29/21	Mon 11/29/21																					
3	Utility Investigation	10 days	Mon 11/29/21	Fri 12/10/21	2																				
4	Survey	130 days	Mon 11/29/21	Fri 5/27/22	2																				
5	Geotechnical Exploration	28 days	Mon 11/29/21	Wed 1/5/22	2																				
6	Schematic Development	30 days	Mon 5/30/22	Fri 7/8/22	5,4,3,2																				
7	Schematic Plans & Estimate Submittal	0 days	Fri 7/8/22	Fri 7/8/22	6																				
8	Schematic Review	10 days	Mon 7/11/22	Fri 7/22/22	7																				
9	Task 2: Design Development	40 days	Mon 7/25/22	Fri 9/16/22																					
10	Design Development	30 days	Mon 7/25/22	Fri 9/2/22	8																				
11	Estimated Design Development Cost	10 days	Mon 8/22/22	Fri 9/2/22	10FF																				
12	Design Development Plans & Estimate Submittal	0 days	Fri 9/2/22	Fri 9/2/22	10,11																				
13	Design Development Review	10 days	Mon 9/5/22	Fri 9/16/22	12																				
14	Task 3: Drainage Design and Permitting	145 days	Mon 7/25/22	Fri 2/10/23																					
15	Agency Meeting Coordination	10 days	Mon 9/5/22	Fri 9/16/22	12																				
16	Hydraulic Analysis	30 days	Mon 7/25/22	Fri 9/2/22	8																				
17	Drainage Reporting	10 days	Mon 9/5/22	Fri 9/16/22	16																				
18	Permit Plans	15 days	Mon 9/19/22	Fri 10/7/22	16,13																				
19	Submit for Permitting	0 days	Fri 10/7/22	Fri 10/7/22	18,17																				
20	Permitting	90 days	Mon 10/10/22	Fri 2/10/23	19																				
21	Task 4: Final Construction Plans	20 days	Mon 2/13/23	Fri 3/10/23																					
22	Final Design Development	20 days	Mon 2/13/23	Fri 3/10/23	20																				
23	Estimated Final Construction Cost	10 days	Mon 2/27/23	Fri 3/10/23	22FF																				
24	Final Construction Plans & Estimate Submittal	0 days	Fri 3/10/23	Fri 3/10/23	22,23																				



Project: Saga Bay-Schedule
Date: Tue 5/17/22

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			



July 22, 2022

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

To Whom It May Concern,

Thank you for the opportunity to comment on the South Florida Water Management District's June 2022 Draft *Sea Level Rise and Flood Resiliency Plan*. The Everglades Foundation recognizes the vulnerability of our region to climate change, the increasing threat posed by sea level rise, and the complexity of adapting our flood control system through time. We support the District's efforts to develop this plan, using scientifically justified, technically sound, economically feasible, and environmentally minded considerations that target all sectors of south Florida affected by sea level rise. Important among these is ensuring water quality standards that are protective of our coastal wetlands, estuaries, bays, and Everglades. Recognizing that this is a living document, we provide comments that are intended to help guide continued development, advancement, and communication of this plan moving forward.

Understandably, the plan focuses on flood control infrastructure such as gate and pump renovation and replacement. It is nice to see consideration of energy-efficient infrastructure, nature-based solutions, and interactions with adjacent systems that are currently degraded or in some state of ecosystem restoration. However, details are lacking with respect to the latter that would demonstrate an ability to maintain a resilient state in coastal wetlands and seagrasses of Biscayne Bay and Florida Bay, the eastern Everglades, the southern C-111 basin, and in downstream Taylor Slough and Shark River Slough. As sea level rise continues and decisions are made about management of flood water, the fate of these areas remains uncertain. Based on visualization from NOAA's Sea Level Viewer (figure 1), one can see that these areas are highly vulnerable to sea level rise, coastal flooding, and salinization. Sea level rise will not only contaminate these areas with salty oceanic water, but it will also transform them into saline environments unsuitable for freshwater wetland habitat.

It is encouraging to see integration of ongoing restoration planning efforts to address these challenges in in vulnerable coastal areas of south Florida, such as the Biscayne Bay and Southern Everglades Ecosystem Restoration (BBSSER) Project. It will be important for the District's resilience planning group to work closely with the BBSEER Project Delivery Team as this effort proceeds. An example of a potential disconnect with the BBSSEER planning effort is demonstrated by the proposed enhancement of the L-31E Levee, which is not included in the BBSEER planning effort. Also, the BBSEER eco-sub team is

considering an array of ecological measures and indicators in the C-111 basin, while this draft report plans to incorporate the Everglades Mangrove Migration Assessment (EMMA) Pilot Study in the Model Lands area. It is not clear how these efforts will interface.

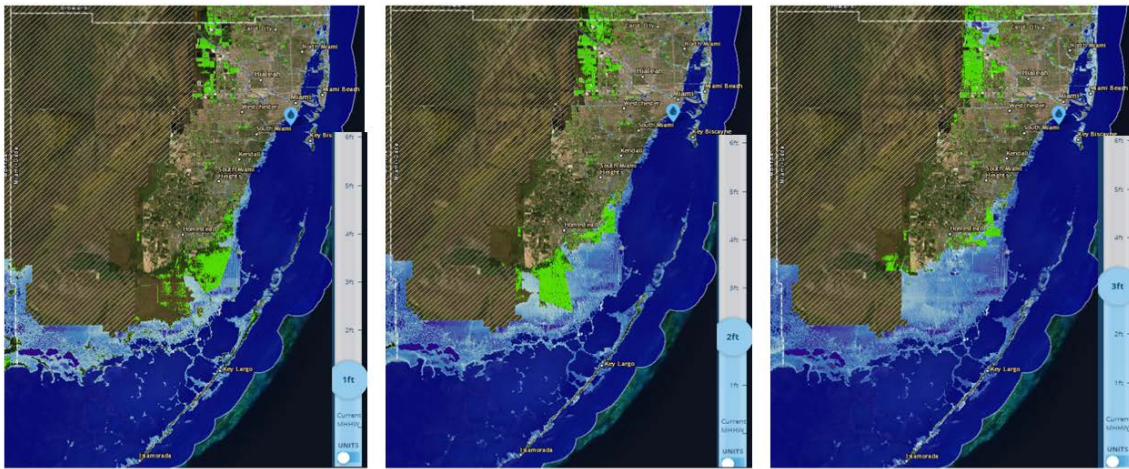


Figure 1: Maps showing increasing vulnerability of the south C-111 basin and Tylor Slough with sea levels rising from 1 foot to 3 foot (maps were processed online from NOAA's Sea Level Rise viewer).

The draft resilience plan contains a wide array of interventions that could benefit south Florida. However, the plan is quite general, and the level of information included is insufficient to evaluate each component considered from a technical perspective. Furthermore, other than the proposed civil infrastructure, the solutions described are not tested in any form so their collective effectiveness or efficiency is uncertain. Therefore, moving forward, we recommend that the document include more detailed information and be divided into different modules, such as a coastal flood control infrastructure resilience plan, a coastal wetlands resilience plan, an estuaries resilience and plan, and a coastal ecosystem resilience plan—each with attention paid to understanding the effect of sea level rise and promoting water quality standards and technically verified remedies. Further, we recommend evaluating the dynamic interaction among planned and ongoing restoration efforts with the proposed resilience plans and applying the findings to develop an integrated management plan. We would also like to see regular public meetings to discuss advancements, implementation, or adaptation of this plan moving forward.

We thank you for addressing this issue that is important to the future of south Florida. The Everglades Foundation's Science Team will continue to be engaged in these resiliency efforts through planning and implementation to ensure new infrastructure and operations will maintain the quality and quantity of flows needed to protect our Everglades ecosystem beyond restoration.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Davis", written in a cursive style.

Stephen E. Davis III
Chief Science Officer

July 15, 2022

Dear Mr. Bartlett,

Thank you for the opportunity to comment on the South Florida Water Management District's Sea Level Rise and Flood Resiliency Plan. We applaud the District's efforts to develop a comprehensive strategy toward addressing threats from flooding and sea-level rise. Audubon Florida commented on the first draft in January, and we thank the District for incorporating our feedback. This Plan represents an important milestone for the state to utilize new funding resources, and as a representative model for other entities and water management districts to use when developing their respective resiliency plans.

We commend the District on this updated Plan which includes many new positive additions such as incorporating energy efficiency and renewable concepts, water quality pilot technology at Little River Basin, carbon storage monitoring and reporting, a flood impact assessment tool, and mentioning the plan to use a social vulnerability index. Audubon Florida trusts the District's leadership to develop sound resilience strategies and recommends the District consider additional elements to further strengthen the plan to ensure a more resilient South Florida in the face of sea level rise and climate change impacts.

- 1) **Nature-based solutions** -- We recommend that the District more closely integrate nature-based solutions into the priority projects, even if small in scale, and expand the benefits to include heat/drought.
- 2) **Social Vulnerability** -- We encourage the District to fully implement a social vulnerability index with added considerations to more comprehensively include at-risk communities.
- 3) **Flood risk and resiliency** -- We recommend expanding the methods for storing water and including dry season modelling, rather than focusing on drainage alone.
- 4) **Saltwater Intrusion** -- We recommend that the District eliminate the agricultural drawdown practice in Miami Dade County as part of this plan.
- 5) **Project Location** -- We recommend expanding the project footprint to include areas north of Miami Dade County and more inland projects, such as the Kissimmee Basin and properties within the Corkscrew Regional Ecosystem Watershed.
- 6) **Energy Efficiency** -- We encourage the District to include specific details like project timelines, a more robust partner list, and measurable goals.

We are encouraged to see the District undertaking resiliency planning and with additional considerations, we feel this Plan will be well-positioned to inform agency decision-making and to achieve resiliency goals across the South Florida region.

Thank you for your time and consideration.

Sincerely,



Kelly Cox, Esq.

Director of Everglades Policy | Audubon Florida | Kelly.cox@audubon.org | (561) 573-8197

Addendum

Nature-Based Solutions

We applaud the District's commitment to implement nature-based solutions (NBS) under this Sea Level Rise and Flood Resiliency Plan. NBS such as mangroves, wetlands, reefs, and living shorelines can help protect communities, wildlife, and the economy from climate change and extreme weather. For instance, one acre of wetlands can hold up to 1.5 million gallons of floodwater and every mile of wetland area can reduce storm surges by 1-2 feet.

In places like Miami Dade County, these benefits are critical to protect coastal communities and improve water quality for Biscayne Bay. With a number of the Plan's projects occurring in Miami Dade County's interior waterways with direct connection to the Bay, it seems prudent to implement nature-based solutions to help clean the water. Audubon is thrilled to have so many projects located in Miami Dade, yet most still contain a list of hardening features, with few green or blended components.

Audubon is impressed with the proposed criteria for evaluating and implementing NBS, however not all nature-based solutions need to be carried out on such a large scale that it requires a lengthy assessment process; smaller scale efforts such as adding green space and native vegetation amongst gray infrastructure, would bring additional benefits. The plan lists out the many uses of NBS but later only acknowledges flood control benefits, thus not properly valuing the other benefits of NBS such as carbon storage, wildlife habitat, and aquifer recharge. In addition, groundwater levels are a useful metric in the face of drought conditions and should also be included as a performance metric in this plan. Likewise, heat and drought should be a category in Table 1 with the inclusion of tree canopy and urban shading to mitigate heat islands. Overall, many of the projects selected in this Plan can be made more resilient with the addition of native plant buffers or wetland features.

We are happy to see a proposal for monitoring the carbon storage capacities of ecosystem restoration projects, albeit in a nascent phase. We would recommend including this monitoring in the priority resiliency projects as NBS elements are added. Natural systems sequester carbon and can be more cost-effective to maintain and their benefits are often not well quantified.

While this Plan commits to invest in NBS, only a handful of the resiliency projects contain any NBS measures. Therefore, we maintain our recommendation for the District to more closely integrate NBS in each of the priority projects to address not only flood mitigation but also to prevent impacts such as drought and wildfires.

Social Vulnerability

Audubon is pleased that this updated Plan mentions a social vulnerability index in the criteria for prioritizing projects so at-risk communities will be protected. However, the District's resiliency criteria and the community-wide infrastructure benefits listed (e.g., regionally significant assets, businesses, public services, etc.) may not apply to financially disadvantaged rural areas which also need resiliency investments. Adopting such criteria frequently and disproportionately affects already vulnerable communities. In addition, the document mentions protecting vulnerable communities in various basins but lacks specificity on how it will protect these communities from sea-level rise (SLR). Some communities have several social vulnerabilities that will be compounded by the impacts of SLR

that must be addressed.

Audubon recommends that a cost-benefit analysis include not just economic benefits, but other benefits such as quantifiable carbon storage capacity and water security. Another guiding criterion listed is “previous state commitment/involvement.” While Audubon understands the intent to focus on ‘shovel-ready’ projects because they can be completed quickly, many areas, including those that are socially vulnerable, need seed funding to begin resiliency efforts, and being hyper-focused on project-readiness may prevent these commonly overlooked areas from being prioritized in the District’s resiliency planning efforts.

In addition to the above considerations, we recommend including a more robust analysis that considers how home elevation, infrastructure hardening, and flood- and drought-proofing of critical infrastructure may exacerbate existing inequalities. This analysis should also include consideration of inland communities that are vulnerable to heat and drought where residents may feel health or occupational impacts.

Flood Risk and Resiliency

This Plan does a great job of addressing adaptation measures to minimize flood risk and considers flood mitigation approaches that address the causes of flooding such as “self-preservation modes,” yet these measures could be made more robust. Often during storms, urban environments drain into natural systems, adding stress to already-stressed environments. The self-preservation mode should consider this to avoid exacerbating natural system impacts.

The Plan largely addresses inland flows from rainfall entering waterways but should more acutely account for storm surge flooding and King Tide events which can disable structures in the short term and contribute to community abandonment in the long term. The District’s plan should also include development of a retreat strategy to account for this potential community abandonment.

It should also consider differences in dry and wet season forecasting when anticipating future conditions; the Plan looks at increasing groundwater levels in light of rainfall and flood risk, while ignoring the likelihood of decreased groundwater levels during dry periods and droughts.

Importantly, the Plan focuses on flood mitigation, however, flood mitigation is often intensified by rising sea levels due to climate change. Flood control that creates more drainage can exacerbate drought severity. We recommend including an additional focus in this Plan on storing water, to simultaneously ameliorate floods and droughts. Some examples are mentioned, such as ASR wells, but additional storage strategies, especially north of Lake Okeechobee or in the Caloosahatchee Basin where lack of storage causes downstream water quality impacts, should also be considered that are outside the scope of ongoing projects. This plan should also consider improving stormwater practices to increase resilience such as low impact development and nature-based solutions.

While this is a Flood and SLR Resiliency Plan, we know that unbalanced flood control infrastructure operation can significantly impact dry season water levels. While this is contemplated in the South Miami Dade Curtain Wall, Audubon recommends dry season modelling and optimizing operations to benefit drought condition water levels. We understand that the District is developing a Water Supply Vulnerability Assessment, to further evaluate drought conditions given funding availability. These documents should be complementary and interact with one another from a planning perspective.

In lieu of “extreme weather,” storminess is a more appropriate term to be used throughout the document, as storms come with added pressure from winds and damage from more than just rain. While safeguarding water supply is extremely important, overall, measurements should be acknowledged and included to protect water quality as well. Therefore, Audubon recommends expanding the definition of resiliency to consideration of impacts beyond flood risk.

Saltwater Intrusion

The District’s Plan contemplates several current and future groundwater impacts, including saltwater intrusion. However, the new iteration of the plan makes no mention of the long-standing agricultural drawdown practice. The District should reconsider the practice of the agricultural drawdown in Miami Dade County as a resiliency measure. Lowering groundwater levels when sea levels are at their seasonal maximum and at the end of the rainy season, increases saltwater intrusion and compromises aquifer integrity. The adverse effects of this practice on groundwater integrity will be further seen as sea levels continue to rise and the saltwater lens pressure from Biscayne Bay increases. What’s more, the agricultural drawdown reduces the region’s protection against saltwater intrusion and threatens the Biscayne aquifer, the primary source of drinking water for Miami Dade and Monroe County. Releasing water also increases vulnerability to drought impacts, which need more consideration in this Plan and we recommend the District eliminate this practice as part of its resiliency strategy.

Project Location

While there are valuable additions to this updated draft Plan, the projects remain focused on Southeast Florida. In fact, most of the projects are located in C-7, C-8 and C-9 basins, Broward, and Miami Dade counties, and the proposed criteria for ranking of the projects includes “total population” which will inevitably result in a high concentration of them in this region. While Miami Dade County is the most populated county within the District’s jurisdiction, the Orlando metropolitan area is also heavily populated and has immediate flooding and water supply challenges. Resolving water challenges in the upper part of the watershed incrementally benefits downstream systems.

Worth mentioning in this discussion is the Planning Study for the Charlotte Harbor Flatwoods Project. This is a valuable collaborative effort that will result in coastal and community resilience as well as wildfire protection due to restoration of the upstream watershed. Audubon encourages the District to move forward with this project in a timely manner, as development makes components of the project difficult to connect. We are pleased that this is occurring in Southwest Florida and would like to see more model projects on the west side of the state in future iterations of this plan.

Since projects are so heavily concentrated in the southeast and on shorelines, the District is missing the added benefits of resiliency efforts in inland areas and basins further north in the District. Notably, the Plan also highlights priority areas such as the Upper Kissimmee Basin, but there is no mention of it in the project lists. We recommend the District provide additional detail as to their timeline for developing projects in these areas.

Most projects are on the coasts and shorelines, and while these are important areas, it is critical that projects to tackle inland flooding are considered and recognize their potential to mitigate flooding and climate impacts downstream. Flooding is already occurring in these zones, and drought, agriculture, and increases in population in these regions will also need to be addressed sooner than

later. Given the financial allocations for these projects, a plan should be in place if these coastal areas become indefensible in the future. By developing a plan for retreat, including timelines, the District can better determine which projects are the most viable.

Energy Efficiency

We are pleased to see new additions to this Plan, including the incorporation of energy efficiency concepts, renewables, and offsetting new energy demands with sustainable sources. To build on these efforts in the plan, it would be helpful to provide timelines and long-term goals for the projects. Audubon also encourages the building of electric vehicle charging stations, cool and green roofing standards, blue and green streets, and solar storage options as these become more widely available. We recommend expanding the list of partners and resources for expertise and funding opportunities including: Florida Gulf Coast University, University of Florida, and the Adaptation of Coastal Urban and Natural Ecosystems (ACUNE).

Evaluating Success

We encourage the District to define what success means under this Plan to create a framework upon which other agencies can rely. We also encourage the District to implement measurable standards and timelines as periodic basin review parameters are further developed and include modelling data in comprehensive land use plans. The plan notes that the basins will be reassessed every 8-10 years for the Flood Protection Level of Service Program, but Audubon recommends a more frequent interval such as every 5 years due to the accelerating nature of climate change.

This updated Plan provides more examples of resiliency components, but many of these are ongoing projects within the Comprehensive Everglades Restoration Plan. The current plan relies heavily on ongoing projects already included in CERP. Audubon recommends that the focus of this plan should be on additional efforts that will be complementary to these projects in order to meet the changing conditions and needs of South Florida communities. By creating a path forward, with timelines and measurable goals, the District will be better positioned to evaluate success of resilience strategies.

Dear Dr. Maran and the District Resiliency team,

First, I would like to commend the team for their work. The proposals that are outlined in the Draft Sea Level Rise and Flood Resiliency Plan represent serious movement forward in adapting the region's water management system to the impacts of increased development pressure, climate change, and sea level rise. As a graduate student who studies climate resilience, I've researched flooding issues in the C-7 and C-9 Basins and wanted to share some considerations with the District.

The District's proposal for upgrading S27, namely by increasing discharge capacity by adding a forward pumping system and raising the control structure, is welcome considering the serious flooding issues affecting communities in the C-7 Basin. A seepage wall and levee system, as discussed in the Appendix A comments, could assist in controlling canal stages and in reducing subsurface seepage. Flooding in the C-7 Basin is not necessarily driven by canal overtopping or direct rainfall. A citizen science study prepared by the Little River Conservancy noted that during peak canal stages, water appears to seep through bedrock into surrounding areas, and flood heights rapidly establish relative equilibrium with canal levels. During peak canal stages, flooding persists until canal levels drop below surrounding ground elevations. As alluded to in Appendix A, as sea levels rise, groundwater seepage is likely to drive even more flooding. Despite the complexities associated with constructing seepage barriers, I hope the District will continue to assess this and other options for mitigating seepage induced flooding. The District should also continue to assess the potential for increasing upstream water storage capacity in the headwater area of the C-7. Working with Miami-Dade County and other local authorities, the District might also support efforts to revise building codes to encourage the use of permeable paving materials wherever possible.

In the C-9 Basin, the area surrounding the Good Neighbor Stormwater Park at 901 NE 144th Street in North Miami, a pocket park featuring a retention basin that occupies a former Repetitive Loss Property site, experienced significant flooding during Tropical Storm Eta in 2020 and, more recently, during Tropical Storm Alex. Although a novel attempt at mitigating flooding at a very flood-prone site, the park's small retention basin appears to be inadequate at mitigating more severe flash flooding events. As groundwater levels and nuisance flooding increase, the City of North Miami, Miami-Dade County, and other authorities could cooperate on drainage system improvements near the Good Neighbor Stormwater Park site, perhaps pushing floodwaters to tide by pumping out to the C-9 through a storm drain system or reducing groundwater levels by injecting stormwater into bedrock. Although a tertiary stormwater management system would likely be outside of the District's direct jurisdiction, the District might support local stakeholders in exploring ways to improve flood mitigation in the vicinity of 901 NE 144th Street.

More broadly, my understanding is that the District presently uses the 2017 NOAA Intermediate Low and Intermediate High SLR scenarios in planning, and one to three feet of SLR in FPLOS modeling. The Resilient Florida Grant criteria that establish the 2017 NOAA Intermediate Low and Intermediate High SLR scenarios as minimum planning standards also encourage applicants to look beyond the 2040-to-2070 time horizon and to consider additional SLR. Following the precautionary principle, in the future, the District, through its FPLOS studies and other analyses, could integrate higher SLR projections into their modeling to better account for inherent uncertainty in SLR forecasting. The 2019 Unified Sea Level Rise

Projections published by the Southeast Florida Climate Change Compact extend to 2120 and include a NOAA High projection of 136 inches of SLR. Given the long operational life of much of the District's infrastructure, which, as noted in the Draft Sea Level Rise and Flood Resiliency Plan, operates a legacy system largely inherited from the C&SF project, it might be worth taking longer planning horizons and SLR scenarios into account to maximize the longevity and durability of new infrastructure.

District Resiliency has done yeoman's work in putting forward such a comprehensive and ambitious set of proposals in the Draft Sea Level Rise and Flood Resiliency Plan. I hope the District will take my comments into consideration.

Sincerely,

Arthur Abrams

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July 14, 2022

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

Subject: Comments on the 2022 Sea Level Rise and Flood Resiliency Plan

Dear Resiliency Plan Team,

In response to the South Florida Water Management District (SFWMD or District hereafter) seeking input on the Sea Level Rise and Flood Resiliency Plan (Draft June 2022- hereafter will be called Plan), **this document provides my comments on the Nature-based Solutions (NbS) and Green Infrastructure (GI) related contents of the Plan.** The opinions are based on my personal research experience and do not necessarily represent the views of Florida International University or other sponsors of my research.

I appreciate the efforts by the project team and including a specific chapter on NbS and GI in the Plan. Table 1 (page 25-26) provides a general list of NbS/GI that may be implementable and effective in south Florida. NbS/GI practices are complex soil-water-plants-climate-human systems with different performances in different climatic regions, geographic locations, and urban settings. Understanding the performance of NbS/GI systems in urban coastal areas is more challenging because of the effects of shallow groundwater levels, sea level rise and sea level rise driven groundwater rise, and extreme rainfall events on these systems. Selecting specific NbS/GI and implementing the process presented in page 26 (Raymond et al., 2017- was not found in References) requires quantitative fundamental knowledge about the performance (e.g., flood volume control and runoff treatment) of different NbS/GI in the region. Such NbS/GI knowledge does not exist in south Florida. For example, infiltration trenches (aka exfiltration trenches) are popular subsurface GI practices in urban areas across the country and the most common used stormwater practices in south Florida. However, there are concerns about the effectiveness of exfiltration trenches in shallow groundwater regions (such as Miami-Dade County) and their impact on groundwater pollution. The best way of evaluating these concerns is looking at the observed performance data (runoff treatment, or quality performance, and runoff disposal, or quantity performance) from these systems but very little observed data is available in south Florida. The limited available data are mostly from old studies by SFWMD, e.g., water quantity monitoring of two tests exfiltration trenches at the SFWMD headquarters in West Palm Beach using simulated runoff tests (not natural runoff events) by Branscome and Tomasello (1987), and one-year water quality monitoring of two exfiltration trench/bioswale sites in Miami-Dade County by McKenzie and Irwin (1988). Both studies stated the insufficiency of existing observed

data and recommended more extensive and long-term field monitoring programs. SFWMD has been pioneer in performance monitoring of GI in the past and continuing the development of GI monitoring programs in south Florida will create a platform (database) that supports important decisions about the integration of green and gray infrastructure in the Plan as well as multiple other initiatives and projects at the district in addition to Counties and Cities in south Florida. The monitoring data can be used to improve the old GI design guidelines in south Florida. Also, the monitoring sites can be used as demonstration sites for professional and public education, promoting successful and equitable NbS/GI implementation programs in our region.

Table 2 (page 28) presents examples of NbS/GI assessment methodologies for flood control projects. In this Table, “standard calculations” are recommended in lieu of modeling for small-scale urban stormwater GI. In the absence of adequate observed data about the performance of different urban stormwater GI in south Florida, these calculations may not provide reliable results for assessing GI performance. Urban stormwater GI are small-scale but complex systems, and their performance can be modeled using dynamic and process-based models (with adequate level of complexity). These models can be calibrated and validated using performance monitoring data. As an example, see my work on modeling dynamic performance of infiltration trenches in Philadelphia (Ebrahimian et al., 2021). If needed, these site-scale models can be incorporated into large scale H&H models. After gaining adequate knowledge about GI performance based on filed monitoring data, even uncalibrated GI models can provide reasonably reliable results. On a side note, it is not clear what “green space” in Table 2 technically means in the context of urban stormwater GI. Also, other urban stormwater GI practices can be added to this Table.

Section 5 of the Plan discusses ecosystem restoration projects resiliency benefits and potential carbon sequestration. This discussion can be extended to NbS/GI projects as well. Most of urban GI implementations in the country are driven by stormwater challenges (flooding and water quality issues). However, urban GIs are multifunctional systems and can provide a wide range of other ecosystem services (aka co-benefits) including, but not limited to, the reduction of greenhouse gas (e.g., carbon dioxide and methane) emissions and urban heat island issues. I would recommend considering these ecosystem benefits of urban GI in the Plan. Also, I would recommend including GI systems in “Carbon Storage Monitoring and Reporting” under the Priority Planning Studies (page 124).

Section 6 of the Plan is about water supply resiliency and vulnerability assessment. As mentioned earlier, there are concerns about the impact of urban infiltration/exfiltration-based GI on groundwater pollution in southeast Florida that is a potential threat to the main water supply source in this region. Field monitoring of these urban GI systems can help with the water supply vulnerability assessment in the region. Also, the Plan encourages the development of new or alternative water sources to increase water supply resiliency. Stormwater harvesting and reuse

are among green approaches that can be considered for improving water supply resiliency. Stormwater harvesting GIs have been used for different applications (e.g., irrigation, flushing toilets, and colling HVAC systems) across the country. Note that stormwater harvesting/reuse GIs usually provide other benefits such as runoff treatment and volume control. I would recommend considering stormwater harvesting and reuse in the Plan.

The Request for Innovation about Waterways Impact Protection Effort (priority planning study-page 116) looks at pilot technologies to be added to District structures or canals to protect the health of water systems and associated natural environments. In addition to end-of-pipe (centralized) solutions like this (that seem difficult for addressing dissolved nutrients), it is important for the study to consider decentralized solutions, such as distributed stormwater GIs across the basin and along the canals. Integrated monitoring and site-to-watershed-scale modeling of GIs is needed to investigate the optimal type and distribution of GIs for water quality and flood control purposes. Plus, social equity criteria need to be considered in optimal distribution of GIs. It is recommended that decentralized GI solutions and their optimal distribution subject to water quality/quantity and social equity criteria be considered in priority planning studies.

In summary, the following items are recommended to be considered by District as priority study areas: 1) Field monitoring programs for evaluating multifunctional performance of urban stormwater GI systems, e.g., runoff treatment, flood control, stormwater harvesting/reuse, and other ecosystems benefits such as greenhouse gas emission and urban heat island reduction, and 2) Process-based site-to-watershed-scale GI models. This will generate observed data and fundamental knowledge that will benefit multiple projects and initiatives at the district in addition to Counties and Cities in south Florida.

Should you have any questions or need additional information, do not hesitate to contact me.

Sincerely,



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References

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July 18, 2022

Carolina Maran (via email only)
Resiliency Director
South Florida Water Management District
3301 Gun Club Rd
West Palm Beach, FL 33406

RE: Letter of Support and Comments on the 2022 Draft Sea Level Rise and Resiliency Plan

Dear Ms. Maran and the broader Project Team,

On behalf of Family Lands Remembered (FLR), I am writing to provide a few comments on the 2022 Draft Sea Level Rise and Resiliency Plan (the “Plan”) released by the South Florida Water Management District (SFWMD or the “District”) last month. This Plan addresses many of the impacts brought on by sea level rise, and we fully support the application of cutting-edge scientific research and engineering to this generational threat. We would also suggest additional efforts on green infrastructure solutions as another strategic component and urge aggressive implementation.

Family Lands Remembered is an innovative land use and environmental consulting firm dedicated to conserving Florida’s natural resources while promoting a more sustainable way of life. Our three main areas of expertise are large-scale conservation, sustainable development, and innovative water resource projects. In all projects, we seek creative solutions - linking economic expansion with the expanded protection of the natural environment for current and future generations. As such, we have been supportive of the recent efforts by all levels of government to address climate issues; these initiatives fall within our ethos - seeking to protect and enhance our natural environment and our economy through creative partnerships.

In addressing climate issues, the use of grey and green infrastructure depends highly upon the problem. When addressing the urgency for structural resiliency, we support the immediate need to improve seawalls, locks, spillways, and other hard infrastructure to protect urban environments. These projects are critical. As we all enter a new phase of resilience planning, we at FLR believe that additional green infrastructure projects should be given more weight in the priority implementation project portion of the Plan.

The Corbett Levee Improvement Project is an excellent example of increasing our capacity for flood management through less intrusive means while contributing to watershed restoration. Primarily through improving an existing earthen levee to reduce the potential for flooding in the downstream residential areas, this project will improve the hydro-period within the Corbett Wildlife Management Area and facilitate increased flows to the Northwest Fork of the Loxahatchee River.

The Charlotte Harbor Flatwoods Initiative is another example of green infrastructure that aims to achieve comparable flood protection and resiliency results by restoring natural storage capacity for the Yucca Pens Unit WMA. By removing blockages in smaller ditches and tributaries, this project would restore a more natural hydro-period to the area and create additional flood management capacity for the City of Cape

FAMILY LANDS REMEMBERED, LLC

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Coral. The benefits of both of these projects greatly outweigh the costs and should be given higher implementation priority in the Plan.

In this same vein, living shorelines have been proven to increase coastal resiliency by strengthening shorelines and reducing storm surges through dissipating wave action, all while providing natural habitat for estuarine and marine species. The living shorelines concept is another nature-based solution with positive externalities that cannot be generated through grey infrastructure alone. Although mentioned many times, there was a lack of living shoreline projects in the priority implementation project section of the Plan. We believe it is important to engage with local government and community leaders, estuary-specific stakeholders, State and Federal agencies, and others to move forward quickly with living shoreline projects. We hope that the final draft of the Plan can give more priority to these types of projects and partnerships for implementation.

The improvement of natural ecosystems can also generate many other positive externalities. The carbon sequestration performed by wetlands is one such externality, as protecting and restoring wetlands has been shown to remove CO₂ from the atmosphere. In December 2016, [researchers from the US Environmental Protection Agency \(EPA\)](#) found that inland freshwater wetlands can store 10 times more carbon than estuarine habitats and that the disturbance of wetlands causes the release of methane – a highly potent greenhouse gas. In March 2021, [researchers from the University of California, Berkeley](#), found that restored wetlands begin to function as net carbon sinks as soon as two (2) years after restoration. Taken together, these two studies suggest that restoration of freshwater wetlands could help to significantly reduce carbon emissions in the atmosphere – a leading cause of climate change. While the Plan's Carbon Storage Monitoring and Reporting project does broach this subject, we believe more focus should be placed on implementing such scientific research to strike at the root cause for our resiliency efforts. The Plan should give more attention to wetland conservation and restoration projects as a means of carbon emissions reduction, explicitly focusing on freshwater environments where CO₂ sequestration is potentially highest. Through collaborative planning and implementation, these efforts would also fit nicely with efforts to protect and enhance the Florida Wildlife Corridor.

The 2022 Draft Plan outlines vital steps toward combatting sea-level rise and increasing flood resiliency, which we believe can be improved with a greater focus on nature-based solutions. These solutions will both enhance the District's structural resiliency and help promote our natural resiliency, as growing our natural spaces will only increase the resiliency of our state.

We appreciate all the work to date and the opportunity to provide comments. If we can help in any way, please let us know.

Warm Regards,



Patrick Iler
Director, Strategy & Policy
Family Lands Remembered

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Friends of Biscayne Bay

1277 NE 79th St,
Miami, FL 33138-4206

July 15, 2022

Dr. Carolina Maran, P.E., Ph.D.
Chief of District Resiliency
South Florida Water Management District
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cmaran@sfwmd.gov
resiliency@sfwmd.gov

RE: Comments on the Updated South Florida Water Management District Draft Sea-level Rise and Flood Resiliency Plan

Dear Dr. Carolina Maran,

We submit the following comment regarding the South Florida Water Management District's Sea Level Rise and Flood Resiliency Plan on behalf of Friends of Biscayne Bay (FOBB). FOBB's mission is to support the continued protection and health of the Biscayne Bay Aquatic Preserves (BBAP). This version of the Sea Level Rise and Flood Resiliency Plan is an improvement on the previous draft, but we still have unaddressed concerns regarding potential unintended consequences that may negatively impact Biscayne Bay.

In our previous comment¹, we expressed that the South Florida Water Management District (SFWMD) "must evaluate the potential impacts on Biscayne Bay for all projects in the Sea Level Rise and Flood Resiliency Plan. This was not addressed in the June 2022 version of this plan. Biscayne Bay is the ecological jewel of Miami Dade County, beloved by residents and tourists for its beautiful clear water, ecological richness, and its recreational boating and fishing opportunities. Biscayne Bay was designated as a state aquatic preserve in 1974, part of which now forms Biscayne National Park. Unfortunately, the bay is currently at an ecological tipping point, facing threats from the impacts of climate change and ongoing human activities. The 2022 Biscayne Bay Report Card developed by Miami Dade County shows that many parts of the Bay are suffering from conditions of degradation².

We once again urge the SFWMD to carefully consider any potential negative impacts on the health and water quality of the BBAP before the projects in this plan are allowed to go forward.

¹ Friends of Biscayne Bay Round One Comments, January 28, 2021 (Attachment 1)

² Miami Dade County 2022 Biscayne Bay Report Card, April 26, 2022 (Attachment 2)



As mentioned in our previous comments, “a healthy Biscayne Bay increases South Florida’s resilience to flooding, storm surge, and sea level rise.” It is in the best interest of South Florida’s residents and the SFWMD to preserve Biscayne Bay so that we mutually benefit from the Bay’s natural ecosystem services that protect against sea level rise and flooding. The SFWMD should consider solutions that incorporate Biscayne Bay restoration into this plan to increase resiliency in Miami-Dade County.

We appreciate the inclusion of additional green infrastructure projects into this plan. Specifically, it is encouraging to see the plans for the C-8 Basin Resiliency Project, combining nature-based solutions and gray infrastructure to improve flood resiliency in South Florida. Green infrastructure projects like these have the potential to increase our resiliency while simultaneously improving water quality. We’d like to see the incorporation of living shorelines and natural water detention areas into the SFWMD’s gray infrastructure projects across South Florida when feasible.

We also appreciate the inclusion of renewable energy projects and other initiatives to increase energy efficiency within the SFWMD. Renewable energy projects increase resiliency by lowering South Florida’s carbon output. Since South Florida is so vulnerable to the impacts of climate change from sea level rise, it is vital that we strive for reduced greenhouse gas emissions. We encourage the SFWMD to continue to pursue plans to expand solar panel construction across South Florida to offset energy demands.

We are pleased to see that the district has incorporated a section on nature-based solutions and outlined methodologies for assessing the functionality of these nature-based solutions. We would maintain that these nature-based solutions often have additional positive externalities for providing wildlife habitat, carbon sequestration³, and potential recreation benefits which should also be incorporated into the district’s assessments.

We are thankful for the inclusion of the “Water Supply Resiliency” section in this plan. This section details the importance of conserving our limited groundwater resources. To further conserve our drinking water, we once again suggest that the Turkey Point cooling canals switch to using reuse water instead of our regional supply or from the Floridan Aquifer. This idea would reduce our reliance on groundwater, thereby greatly increasing the resiliency of our water supply.

FOBB is still greatly concerned about the potential impacts of the South Miami Dade Curtain Wall. In our previous comments, we brought up that “the current version of this curtain wall plan does not address the diminishing flow of fresh groundwater into the Bay.” This concern was not addressed in the current version of the Sea Level Rise Flood Resiliency Plan. As a result of the diminishing flow of fresh groundwater, this project will increase the salinity in Biscayne Bay. **To**

³ Living Shorelines: Coastal Resilience with a Blue Carbon Benefit, Davis et al, NOAA, 2015
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0142595>



prevent the die-off of vulnerable species in Biscayne Bay, the SFWMD must evaluate the impact of the curtain wall on Biscayne Bay's salinity levels long term. We understand the benefits of a curtain wall on the water supply of the Taylor Slough and Florida Bay, but FOBB is opposed to the curtain wall project unless it is made much clearer how the SFWMD intends to mitigate for the consequences of this project on Biscayne Bay.

Both Miami Dade County and the Army Corps of engineers are currently considering multiple overlapping strategies to promote flood resilience and increase the timing and distribution of freshwater discharges to Biscayne Bay, through the ongoing back-bay study and the Biscayne Bay South-Eastern Everglades Restoration Project planning process.

We are disappointed that the updated version of the Sea Level Rise Flood Resiliency Plan includes no mention of the pollution plume emanating from the Turkey Point Nuclear Generating Station's 5,700-acre unlined cooling canal system. As we mentioned in our comments on the last draft of the document, "This plant is also operating at sea level and no mitigation to date has been required to offset decades of impacts to Biscayne Bay." We urge the SFWMD to carefully examine the resulting hypersaline conditions in the Southeastern nearshore and mid-shore sections of Biscayne Bay resulting from the cooling canal system's operations. **A resilient, healthy Biscayne Bay is the best path toward a resilient South Florida.**

In addition, the SFWMD must plan to alter the seasonal agricultural drawdown practice in Miami-Dade County. During the annual agricultural drawdown, canal stages are lowered in the three coastal canals at structures by 0.8 ft below normal rainy season limits starting on October 15, and after Dec 30 are held 0.4 ft below rainy season groundwater levels until Apr 30 each year, also lowering groundwater levels. This practice results in a loss of 63,000 ac-ft/yr on average, and contributes to the loss of estuarine habitat and ecosystem function due to the poor timing of freshwater input, reduces and degrades habitat for pink shrimp, juvenile seatrout, redfish, snook, etc., increases salinities to marine or higher levels injuring juveniles and allowing marine predators far inshore, removes barriers to saltwater intrusion into the Biscayne Aquifer by lowering groundwater levels during maximum sea levels.⁴ The sudden release of freshwater leaves Miami-Dade County more vulnerable to saltwater intrusion. The inconsistent freshwater flow resulting from the agricultural drawdown practice is detrimental to the health of Biscayne Bay. On the contrary, Biscayne Bay needs a gradual flow of freshwater to maintain ideal mesohaline conditions throughout the year. The disruption of flow into the Bay causes an increase in salinity later in the growing season when the Bay would typically be receiving freshwater input. The agricultural drawdown exacerbates the problem of rising salinity in Biscayne Bay.

⁴ Kearns et al, Environmental Impacts of the Annual Agricultural Drawdown in Southern Miami-Dade County, 2008



Overall, this version of the Sea Level Rise Flood Resiliency Plan is an improvement over the previous version. This version includes increased detail on sustainable energy strategies, nature-based solutions, ecosystem restoration efforts, and water supply resiliency. However, the SFWMD must more carefully consider the impacts to the water quality and health of Biscayne Bay from these projects. In particular, the South Miami Dade Curtain Wall project should not go forward until it is made clear specifically how the SFWMD will compensate for decreased freshwater flow into Biscayne Bay because of this plan.

Sincerely,

A handwritten signature in black ink that reads "Bruce C. Matheson". The signature is written in a cursive style and is positioned above a thin horizontal line.

Bruce Matheson
President
Friends of Biscayne Bay

A handwritten signature in black ink that reads "Laura Reynolds". The signature is written in a cursive style and is positioned above a thin horizontal line.

Laura Reynolds
Vice President
Friends of Biscayne Bay



Attachment 1

Friends of Biscayne Bay Round One Comments,
January 28, 2021



Friends of Biscayne Bay

1277 NE 79th St,
Miami, FL 33138-4206

January 28, 2021

South Florida Water Management District
Ms. Carolina Maran, P.E., Ph.D.
Chief of District Resiliency
3301 Gun Club Road
West Palm Beach, FL 33406
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South Florida Water Management District
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RE: South Florida Water Management District Draft Sea Level Rise and Flood Resiliency Plan

Dear Carolina Maran,

We comment on behalf of the Friends of Biscayne Bay (FOBB) regarding the South Florida Water Management District's Sea Level Rise and Flood Resiliency Plan required by Senate Bill 1954. This plan recognizes Florida's vulnerability to sea level rise and flooding which is a step in the right direction but we feel there are potentially unintended consequences that will likely negatively impact Biscayne Bay and it's Aquatic Preserves which we are charged to protect.

Biscayne Bay is currently at a tipping point, facing threats from the impacts of climate change and human activities. Biscayne Bay was designated as a state aquatic preserve in 1974, part of which now forms Biscayne National Park. Biscayne Bay is beloved by residents and tourists for its beautiful clear water, ecological richness, and its recreational boating and fishing opportunities. The variety of ecosystems in Biscayne Bay are vital habitats to countless plant and



animal species that provide invaluable ecosystem services and support Southeast Florida's tourism economy. In fact, a recent study valued Biscayne Bay at over \$3.3 billion in value to the community.¹ **Because of Biscayne Bay's environmental and economic importance to South Florida, the South Florida Water Management District (SFWMD) must evaluate the potential impacts on Biscayne Bay for all projects in the Sea Level Rise and Flood Resiliency Plan.**

FOBB was formed to educate and increase awareness in our communities about the importance of the Bay and to protect the natural resources of the Aquatic Preserve system. Our organization fights to stop the collapse of Biscayne Bay from threats like overdevelopment, nutrient pollution, and the loss of necessary freshwater inflow. We encourage the SFWMD's push for greater resiliency against sea level rise, flooding, and storm surge. However, these projects cannot go forward if they threaten the long-term health of Biscayne Bay. **Resiliency projects should be devised so that they increase resiliency in the region while also supporting and restoring Biscayne Bay.**

Summary

This plan will likely worsen the already dire conditions in Biscayne Bay. We are concerned with the proposed curtain wall cutting off vital flow of fresh groundwater into Biscayne Bay. Groundwater is the most biologically available and mixes the best to provide mesohaline conditions which is the Goal of the BBSEER Everglades Restoration project. An increase in surface water will not necessarily mix as it enters the bay unless it first can percolate into the ground. That will also help provide a filter for the water before it enters the bay. Salinity caused by this plan threatens continued seagrass loss which can contribute to low DO conditions which in turn during summer months have caused fish kills. We question why the curtain wall is in a resiliency plan when it is likely to make Miami Dade more vulnerable to Salt Water Intrusion. Instead this plan needs to address freshwater decisions that would increase the ecological lift of

¹ Armistead, C., Jensen, C., Madsen, T., Kocian, M. 2019. Restoring Biscayne Bay and the Economic Value of Rehydrating Coastal Wetlands. Earth Economics, Tacoma, WA.



BBSEER. Some ideas would be to come out ahead of the delayed timeline of BBSEER with plans to alter the seasonal agricultural drawdown and to better address operations at the Turkey Point Nuclear Plant include the operations of the Mitigation Bank which could be amended to better hold water in the model lands to allow for groundwater recharge. Another idea would be to move ahead with plans to create an FEB in the Bird Drive Basin to ensure recharge to groundwater to offset the impacts to the curtain wall ahead of BBSEER and the Southern Study. Additionally, land in the 102/103 basin could be purchased early to protect these important areas from the many development threats they will face prior to the project construction. Without concrete detail and actions of how impacts will be mitigated to we cannot be supportive of the curtain wall for example.

A healthy Biscayne Bay increases South Florida’s resilience to flooding, storm surge, and sea level rise. Coastal mangrove habitats reduce flooding on our shorelines. Maintaining adequate freshwater flow into the Bay reduces saltwater intrusion into the Biscayne Aquifer, which is Miami’s main source of drinking water. Beyond that, healthy marine and wetland ecosystems in Biscayne Bay sequester carbon, improving resilience by acting as a buffer against sea level rise.² The SFWMD should pursue solutions that incorporate Biscayne Bay restoration into improving resiliency.

Gray Infrastructure

We strongly support the infrastructure upgrades in this plan. The upgrades and retrofits outlined in this plan will improve flood control and resilience for the areas surrounding Biscayne Bay. These infrastructure upgrades were clearly selected with resiliency in mind. We appreciate that many of these infrastructure projects targeted reductions in flooding and saltwater intrusion. We urge the SFWMD to consider the health of Biscayne Bay when selecting canals for infrastructure improvements. Specifically, the SFWMD should prioritize infrastructure upgrades that will allow

² Reynolds, P.L. (2018, April). *Seagrass and Seagrass Beds*. Smithsonian. <https://ocean.si.edu/ocean-life/plants-algae/seagrassandseagrassbeds#:~:text=Seagrasses%20support%20commercial%20fisheries%20and,preceded%20by%20estuaries%20and%20wetlands>).



for more regular input of freshwater into Biscayne Bay and less point source via surfacewater. Current operations, where freshwater is only discharged periodically from a series of surface canals, inhibits the mixing of freshwater and saltwater necessary for a healthy estuarine ecosystem in the Bay.

Green Infrastructure

It is encouraging to see this pilot study using green infrastructure in the form of mangroves to mitigate the impacts of sea level rise. If the Everglades Mangrove Mitigation Assessment (EMMA) plan proves to be successful from this pilot study with minimal impacts to water quality, we encourage the widespread implementation of the plan. To do that water quality must be monitored closely and analyzed to ensure EMMA can be done without impacting the bay. If it can be we propose the SFWMD consider purchasing land along Biscayne Bay now to restore and use this pilot project to expand along the coast. As a form of green infrastructure, mangroves sequester carbon and protect the built environment. Coastal, low-lying area may be valuable to the SFWMD's water management and resiliency plans going forward. We encourage the SFWMD to use resiliency funds to purchase additional land in order to incorporate mangroves as a region-wide flood resiliency strategy. This will have the added benefit of improving ecological conditions in Biscayne Bay.

The green infrastructure from an expanded EMMA plan, will likely overall improve costal water quality on the nearshore area where seagrass has been degraded as well as habitat quality. This will have a secondary effect of seagrass restoration in Biscayne Bay and because BBSEER does not have Water Quality as a goal but rather only a constraint that would be a perfect synergy that would actually make the district more resilient. Improved Seagrass habitat in the Bay provides valuable ecosystem services, including flood protection through wave dampening.³ Seagrass beds are an incredibly effective natural form of carbon sequestration, with one acre of seagrass

³ Nordlund LM, Koch EW, Barbier EB, Creed JC (2016) Seagrass Ecosystem Services and Their Variability across Genera and Geographical Regions. PLoS ONE 11(10): e0163091. doi:10.1371/journal.pone.0163091



sequestering 740 pounds of carbon in a single year.⁴ **Enhancing the ecosystem resistance of seagrass beds in Biscayne Bay will improve resiliency to flooding and storm surge.** It is detrimental to the State's ultimate goal of coastal resiliency to disregard the existing natural solutions offered by seagrass beds in Biscayne Bay.

Curtain Wall

In the past, the SFWMD has participated in initiatives to preserve Biscayne Bay by restoring natural freshwater flow into the bay. For example, the District is a sponsor of BBCW and BBSEER Projects, which recognizes that freshwater discharges have affected the health of mangrove and seagrass habitats in Biscayne Bay.⁵ However, the current version of this curtain wall plan does not address the diminishing flow of fresh groundwater into the Bay. The flow of fresh groundwater is vital to maintain the ideal mesohaline estuarine conditions in Biscayne Bay's nearshore. Currently, groundwater only consists of 10% of freshwater input into Biscayne Bay in the wet season and 5% of input in the dry season.⁶ Any further limitations of this flow would be contrary to restoration plans of current projects like BBSEER that seek to increase freshwater input into Biscayne Bay. Many times surface water is dumped into the bay and never mixes prolonging the persisting lagoonal conditions that impact fisheries and tourism in our area.

FOBB is opposed to the curtain wall project. **The curtain wall proposal would increase the salinity in Biscayne Bay by blocking freshwater recharge.** The rise in salinity has already affected the population of a number of species in the bay, including oyster (*Crassostrea*

⁴ Reynolds, P.L. (2018, April). *Seagrass and Seagrass Beds*. Smithsonian. <https://ocean.si.edu/ocean-life/plants-algae/seagrassandseagrassbeds#:~:text=Seagrasses%20support%20commercial%20fisheries%20and,preceded%20by%20estuaries%20and%20wetlands>).

⁵ US Army Corps of Engineers. (n.d.) *Biscayne Bay and Southeastern Everglades Ecosystem Restoration Project*. US Army Corps of Engineers Jacksonville District Website. <https://www.saj.usace.army.mil/BBSEER/>

⁶ Stalker, J. C., Price, R. M., & Swart, P. K. (2009). Determining spatial and temporal inputs of freshwater, including submarine groundwater discharge, to a subtropical estuary using geochemical tracers, Biscayne Bay, South Florida. *Estuaries and coasts*, 32(4), 694-708.



virginica) beds and red drum (*Sciaenops ocellatus*) species.⁷ To prevent die-off of vulnerable species in Biscayne Bay, the District must evaluate the impact of the curtain wall on Biscayne Bay's salinity levels long-term. We understand the benefits of a curtain wall on the water supply of the Taylor Slough and Florida Bay, but FOBB is opposed to the curtain wall project unless it is made much clearer how the District intends to mitigate for the consequences of this project on Biscayne Bay.

Freshwater Management and Use

The SFWMD must release a detailed discussion of additional measures addressing the plume at Turkey Point. This plant is also operating at sea level and no mitigation to date has been required to offset decades of impacts to Biscayne Bay. The National Park Service and the District have noted a historical increase in salinity in Biscayne Bay.⁸ **In their Ecological Targets for Western Biscayne National Park, the National Park Service stated that water flow decisions should be made specifically to promote the estuarine condition of the area that is necessary to ensure healthy ecosystems.**⁹ In accordance with this, water flow management decisions should take into account Biscayne Bay's resultant salinity levels.

We suggest, just like with Unit 5, the use of reuse water instead of our regional supply or of the Floridan Aquifer. The more we can reduce our reliance on the use of groundwater and replace it with reuse water, the more sustainable we will be. We suggest mechanical draft cooling towers for all cooling activities at the plant, with the use of deep well injection and the placement of those mechanical draft towers well above sea level to increase the plant's resilience to sea level rise and flooding. If done properly, deep well injection will preserve the health of the Biscayne Aquifer and Biscayne Bay. This would allow restoration activities of over 6,000 acres on the

⁷ Stabenau, E. (n.d.). *Freshwater Discharge and Protecting the Coastal Ecosystem in Biscayne National Park*. National Park Service South Florida Natural Resources Center.

https://www.sfwmd.gov/sites/default/files/documents/water_challenges_facing_bisc_np.pdf

⁸ Stabenau, E. (n.d.). *Freshwater Discharge and Protecting the Coastal Ecosystem in Biscayne National Park*. National Park Service South Florida Natural Resources Center.

https://www.sfwmd.gov/sites/default/files/documents/water_challenges_facing_bisc_np.pdf

⁹ National Park Service. (2006, April). *Ecological Targets for Western Biscayne National Park*. Florida International University Libraries. <http://dpanther.fiu.edu/sobek/FI11060807/00001>



coast of Biscayne National Park to work in tandem with BBSEER to achieve shared resiliency goals.

In addition to this action must be taken now to alter the seasonal agricultural drawdown practices in Miami-Dade County. This sudden release of freshwater leaves Miami-Dade County more vulnerable to saltwater intrusion. The inconsistent freshwater flow as a result of the agricultural drawdown practice is detrimental to the health of Biscayne Bay. Biscayne Bay needs a gradual flow of freshwater to maintain ideal salinity levels throughout the year. The disruption of flow into the Bay causes an increase in salinity later in the growing season when the Bay would typically be receiving freshwater input. The agricultural drawdown exacerbates the problem of rising salinity in Biscayne Bay.

Climate Change and human activities have pushed the Biscayne Bay ecosystem to the brink of collapse. Biscayne Bay is valued at over 3.3 billion dollars because of its ecological biodiversity and economic benefits through tourism and fishing. Therefore, the SFWMD must seriously consider the long term impacts of any projects that will alter the water flow to Biscayne Bay, specifically the curtain wall proposal. The SFWMD should prioritize nature-based solutions like seagrass beds that promote resiliency and Biscayne Bay restoration efforts. An increase of fresh groundwater flow to Biscayne Bay will improve the health of the Bay's natural environments and improve South Florida's resiliency. On behalf of FOBB we thank you for taking time to review our comments, we would be glad to meet to discuss them with you in more detail as you finalize this plan.

Sincerely,

Bruce Matheson
President
Friends of Biscayne Bay

Laura Reynolds
Vice President
Friends of Biscayne Bay



Attachment 2

Miami Dade County 2022 Biscayne Bay Report
Card, April 26, 2022

POOR

These regions or indicators are experiencing considerable water quality and/or ecological degradation. Essential ecological functions and species diversity are impacted and not able to perform beneficial functions at optimum levels.

FAIR

These regions or indicators are experiencing water quality and/or ecological degradation. Essential ecological functions and species diversity are limited in performing beneficial functions at optimum levels.



GOOD

These regions or indicators are maintaining ecosystem function. Essential ecological functions and species diversity are largely performing beneficial functions at optimum levels.

Biscayne Bay Report Card 2022

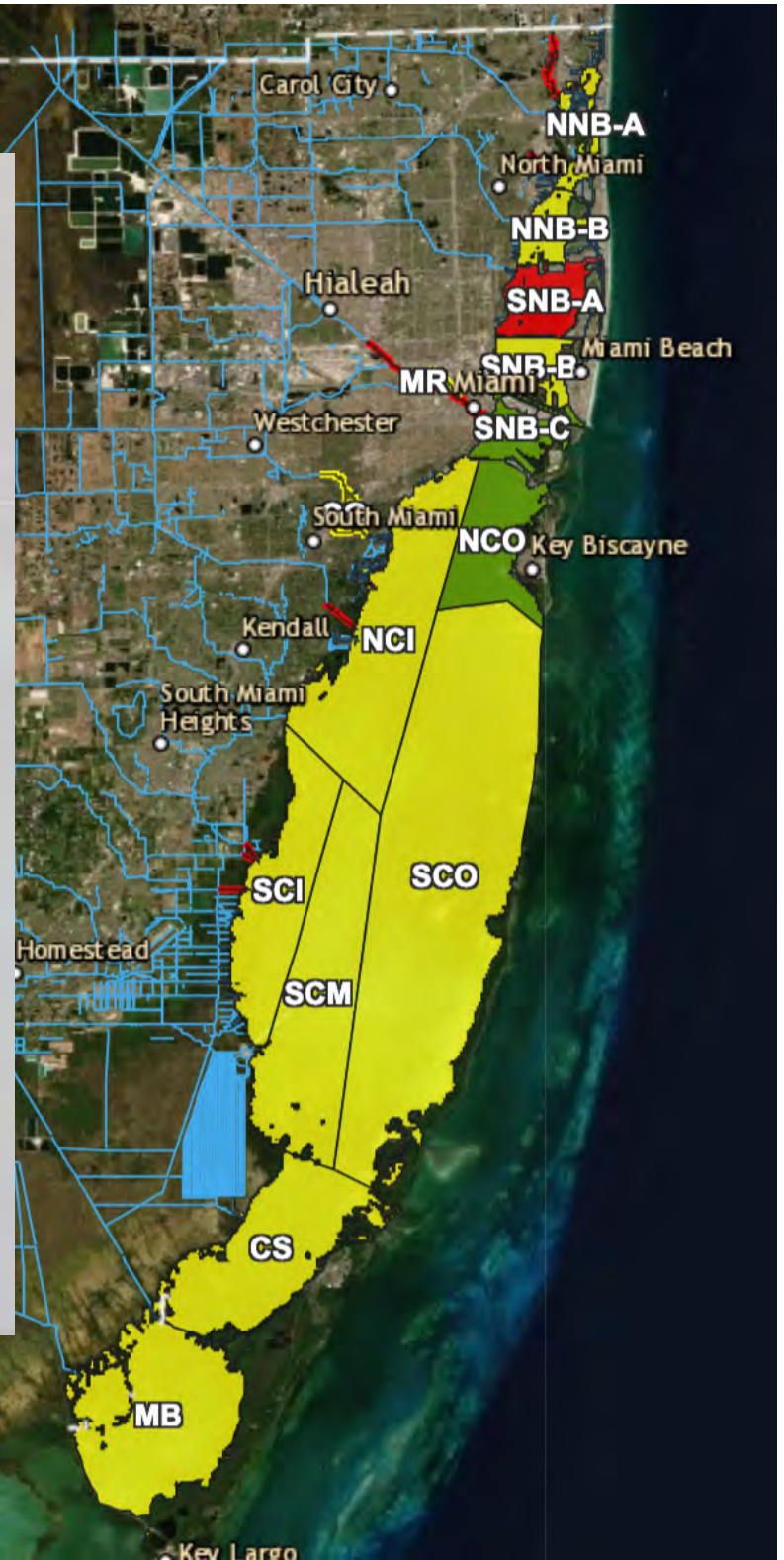
-  Good
-  Fair
-  Poor

BBRC Tributaries

-  Fair
-  Poor

Canal

- 



From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: 2022 Draft Sea Level Rise and Flood Resiliency Plan
Date: Friday, July 22, 2022 12:05:03 PM

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: mikegrim@outlook.com <mikegrim@outlook.com>
Sent: Wednesday, July 6, 2022 1:57 PM
To: Resiliency <resiliency@sfwmd.gov>
Subject: 2022 Draft Sea Level Rise and Flood Resiliency Plan

Some people who received this message don't often get email from mikegrim@outlook.com. [Learn why this is important](#)

[Please remember, this is an external email]

Hello,

Why isn't there more to address the upstream Lake Istokpoga? It has been in dire straits for many years after the large spraying operation that killed off most of the aquatics in the lake and the last big hurricane, creating muck and a water quality problem, this all flows down to Lake Okeechobee. There also hasn't been a study on the yearly draw down of the lake level every year sense 2005, it looks like the lake is being drawn down based on a 2005 Draft. I am a member of The Friends of Lake Istokpoga, and there is very little info we are being provided to understand why Lake Istokpoga is being excluded from these documents and projects.

Thanks for your attention, I can be reached at the following:

Mike Grim

513 Dragonfly Ln

Lorida Florida (Lake front property owner)

540-903-9588

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: Additional Comments from FDOT
Date: Friday, July 22, 2022 3:09:19 PM

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Carver, Jennifer <Jennifer.Carver@dot.state.fl.us>
Sent: Friday, July 22, 2022 2:56 PM
To: Resiliency <resiliency@sfwmd.gov>
Cc: Hayden, Mary Jane <MaryJane.Hayden@dot.state.fl.us>; Green, Jennifer <Jennifer.Green@dot.state.fl.us>
Subject: Additional Comments from FDOT

[\[Please remember, this is an external email\]](#)

Hello –

I know you received some comments previously from FDOT District 6. I'm including below some additional comments from FDOT District 6 that I don't believe were included in the earlier email.

1. There are 9 possibly 10 locations proposed for priority improvements/enhancements that lie near or within FDOT R/W. Any potential impacts to FDOT R/W may require further coordination on these locations as each project moves forward. Those locations are: S-27, S-26, S-29, S-28, G-58, G-93, S-25B, S-25, S-197, and the South Miami-Dade Curtain Wall.
2. Any potential flood impact to FDOT R/W may need further coordination. Please provide FDOT any information that may be available relative to whether the proposed improvements will cause flooding to FDOT R/W.
3. Please provide FDOT a general schedule of when these priority improvements/enhancements will take place to assist with coordination of water projects and transportation projects between the different agencies.
4. Understanding the USACE Miami-Dade Back Bay Coastal Storm Risk Management Feasibility Study proposed storm surge barriers that may involve transportation corridors, please advise how these improvements may relate to the USACE Miami-Dade Back Bay Coastal Storm Risk Management Feasibility Study.

Please contact us if you have any questions or need clarification.

Thank you very much.
Jennifer

Jennifer Z. Carver, AICP
Statewide Community Planning Coordinator
Office of Policy Planning
Florida Department of Transportation
605 Suwannee Street, M.S. 28
Tallahassee, Florida 32399-0450
(850) 414-4820
Jennifer.carver@dot.state.fl.us



The FDOT D6 is supporting the plan projects of South Florida Water Management District (SFWMD). These projects will benefit FDOT since their facilities are dependent on the District's structures (canals, levees, pump stations, locks). FDOT facilities which include roads, bridges, and drainage systems by all predictions will be affected by SLR events.

The importance of implementing these projects will avoid/delay costly improvements to FDOT facilities. In the event that these projects are delayed or not funded, the effects on FDOT facilities will require:

1. Raising of road elevation to meet base level clearance
2. Raising of critical roads that are used for evacuation
3. Raising or reconstruction of bridges
4. Reconfiguration of dry ponds to wet ponds
5. Replacement of exfiltration trenches by gravity pipes tied to pump stations
6. Construction of flood barriers
7. Construction of pump stations designed for phased increments of pumping capacity as SLR warning signs come in play

It is also suggested that the district facilities adjacent to FDOT facilities that are being planned for hardening projects be jointly coordinated.

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: Comments on Sea Level Rise Flood Resiliency Plan
Date: Monday, July 25, 2022 9:15:18 AM

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Zhu, Yibing <kezhu@sfwmd.gov>
Sent: Sunday, July 24, 2022 5:47 PM
To: Resiliency <resiliency@sfwmd.gov>
Subject: Comments on Sea Level Rise Flood Resiliency Plan

Overall, the report language is easy to read, clear, concise, excellent job!

1. The titles of Chapters and their sub-sections better get bold and darker fonts.
2. Fig. 4 – Can we get the fonts clear to be readable?
3. Table 3 – It missed the frame lines.
4. Page 36 – (a) Can we get the two figures larger and clearer to read the words? (b) STA1 and STA1-W were both mentioned in one short paragraph, and the 70% number is referred to the STA1 (which includes STA1-E as well) – confirm the number is for the entire STA1, if it is, there is no need to mention STA1-W, otherwise, confusing.
5. Fig. 8, Fig. 9 and Fig. 10 – Larger and clearer to be readable on the texts.
6. Fig. 12 – Can the secondary Y-axis (%) keep the same scale among the four charts?
7. Fig. 13 and Fig. 14 – They need vertical axis lines to confine the charts, and they probably also need some explanation to help understand what they were meant to message.
8. Fig. 15 – The texts on the chart are too small and blur to read.
9. Fig. 20 – The legend is missed.
10. A combination of green solutions: Desalination + solar power.
11. Sea Level Rise – Is there a guideline for planning and design purpose regarding the SLR? Or in other words, how many feet of SLR in how many years do we expect?
12. Do we have any feedback or input from the local residents regarding the flooding frequency? i.e. How many years of flood return can they tolerate? From the perspective of a resident, insurance premium is also a big concern, besides the potential property damage, as the former occurs every year.
13. If the SLR is much to some low lands, is there any retreat plan for relocating the residents and their properties?

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: Comments on SLR Resilience Plan
Date: Friday, July 22, 2022 3:09:26 PM

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Hopkins, Todd <todd_hopkins@fws.gov>

Sent: Friday, July 22, 2022 3:09 PM

To: Resiliency <resiliency@sfwmd.gov>

Subject: Comments on SLR Resilience Plan

Some people who received this message don't often get email from todd_hopkins@fws.gov. [Learn why this is important](#)

[Please remember, this is an external email]

To Whom it concerns,

Below are my comments after reviewing the [Draft Sea Level Rise and Flood Resilience Plan](#). This draft is written at a very high level and lacks significant specific detail for a detailed review.

Here are some examples of issues and shortcomings that should be addressed in the final document:

- Does this document reflect the new Florida Public Financing of Construction law? Does the SLR analysis in this document reflect or parallel that in the new law. If not, why not?
- The level of SLR is “low, medium or high” but never assigned an actual value.
- Ecosystem restoration is not discussed in sufficient detail.
- Southwest Florida is missing from the Ecosystem Restoration portion of the document.
- Will the DOI agencies, and especially RECOVER, be allowed to weigh in on proposed metrics? (When, what will the process be?)
- Water Supply section does not mention the legal need to reserve water for the environment.
- The ACOE has an acclaimed nationally recognized program, *Working with Nature*, and it is not even mentioned in the nature based solutions section. Significant cost savings could be achieved by working with this program.
- Will this document be reviewed by the National Academy reviewing progress on Everglades restoration (CISRERP)?
- Tribes and effects on Tribal Nations are not even mentioned in the document despite having two tribes within the District

Sincerely,

Todd Hopkins

=====

Todd E. Hopkins, Ph.D. (*he/him*)
Coastal Resilience Coordinator: Southeast & Gulf

U.S. Fish and Wildlife Service
Vero Beach, Florida 32960
Cell/Text: (772) 584-2594

I respectfully acknowledge
that [I live and work on](#) the
occupied homeland of the Ais,
Seminole, and Miccosukee Nations.



=====

All correspondence and attachments are
subject to the **Freedom of Information Act**
(FOIA), and may be disclosed to third parties.

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: Flood Plans
Date: Tuesday, July 26, 2022 2:32:05 PM

I did not previously forward this one. It is also on SP now.

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Copley Smoak <omnirodman@gmail.com>

Sent: Saturday, July 16, 2022 8:30 AM

To: Resiliency <resiliency@sfwmd.gov>

Subject: Flood Plans

Some people who received this message don't often get email from omnirodman@gmail.com. [Learn why this is important](#)

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Dear SFWMD,

One of the most important features and detriments to the flood resiliency plans is population growth and developing housing accommodations which complicate and add to an already overburdened natural environment here in southern Florida. And the political will to do what is necessary to quell this major threat is not in place.

You have some good ideas and plans and I wish you the best of luck, but under the basic status quo here as far as development goes, the future will be fraught with many additional problems. It's too late to stem sea rise which will eventually cause untold problems.

Respectfully,

Copley H. Smoak, Naturalist, Bonita Springs

From: [Maran, Ana Carolina](#)
To: [Colangelo, David](#); [Pena Guerra, Francisco](#)
Subject: FW: Questions on the new Flood resiliency Plan
Date: Wednesday, July 6, 2022 5:18:18 AM

Comment

Ana Carolina Coelho Maran, P.E., Ph.D.

District Resiliency Officer

Phone 561-682-6868 • Cell 561-779-3763

www.sfwmd.gov/resiliency

Florida enjoys a broad public records law. Any emails sent to or from this address will be subject to review by the public unless exempt by law.

From: mikegrim@outlook.com <mikegrim@outlook.com>
Sent: Wednesday, June 29, 2022 11:43 AM
To: Resiliency <resiliency@sfwmd.gov>
Subject: Questions on the new Flood resiliency Plan

You don't often get email from mikegrim@outlook.com. [Learn why this is important](#)

[Please remember, this is an external email]

Hi,

I live in Highlands county on Lake Istokpoga, I don't see anywhere in the plan to address the Lake's issues in this plan, not sure how this Lake issues are not in the plan as it is upstream of the areas you are looking at in this plan.

Lake Istokpoga is one of the upstream Lakes that the water flows through virtually unchecked due to most the vegetation has been killed off, so there is little to no filtration.

The residents around the lake are plagued by the rapid draw of the lake in the summer and the results are we have no access to the lake or the muck build up is so extreme, you cannot enjoy the Lake.

This has not always been the case on this lake, it is well known that Lake Istokpoga, the states 5 largest lake was once one of the most beautiful lakes in the state, that is no longer the case.

Please save our Lake.

Mike Grim
513 Dragonfly Lane
Lorida FL 33857
540-903-9588

From: [Cortez, Nicole](#)
To: [Colangelo, David](#)
Subject: FW: SFWMD-SLRFRP Draft 2022
Date: Monday, July 25, 2022 9:15:11 AM
Attachments: [image001.png](#)

Nicole A. Cortez

District Resiliency Coordinator

Office (561) 682-2597 | Mobile 561-254-4380

www.sfwmd.gov/resiliency

From: Sheila McNamara <smcnamara@cfrpc.org>
Sent: Friday, July 22, 2022 6:36 PM
To: Resiliency <resiliency@sfwmd.gov>
Cc: Jennifer Codo-Salisbury <jcodosalisbury@cfrpc.org>
Subject: SFWMD-SLRFRP Draft 2022

Some people who received this message don't often get email from smcnamara@cfrpc.org. [Learn why this is important](#)

[Please remember, this is an external email]

The Central Florida Regional Planning Council (CFRPC) appreciates the opportunity to review the SFWMD's Draft Seal Level Rise and Flood Resiliency Plan 2022. This plan, proposed tools, data, and related resources will be of value to the efforts of the newly formed Heartland Resiliency Coalition. We look forward to collaborating with the District on resilience strategies for the Heartland region.

Sheila McNamara, SFP

Resiliency Manager



[Central Florida Regional Planning Council](#)

555 E. Church Street

Bartow, FL 33830

352-678-7015

smcnamara@cfrpc.org



July 15, 2022

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

Subject: Sea Level Rise and Flood Resiliency Plan comments

Dear Mr. Bartlett,

Miami Waterkeeper is pleased to present its comments to the South Florida Water Management District regarding its revised draft Sea Level Rise and Flood Resiliency Plan, dated June 2022. Our previous comment letter on the District's September 2021 draft is attached.

Priority ranking – Miami Waterkeeper continues to express its support of the District's priority ranking of resiliency projects in urban Miami-Dade County.

Sustainable and clean energy – Miami Waterkeeper appreciates that the District has created a new Section 3: Energy Efficiency/Renewable Energy. In addition to the commitments in the draft plan, we suggest that the District transition its fleet vehicles to hybrids.

Nature-Based Solutions (NBS) – We greatly appreciate that the District has created a new Section 4: Nature-Based Solutions section. We strongly encourage adoption of NBS over grey infrastructure where possible and practical. We believe that Table 1 and the subsequent processes that the Plan identifies (Process for Assessing and Implementing NBS; Process for Evaluating NBS; Performance Metrics) should, going forward, be used by the District to foster a paradigm shift away from business-as-usual grey infrastructure. We believe that the SFWMD should proactively identify areas where NBS could be implemented. Hiring expertise, such as a landscape architect, to identify suitable locations in urban areas would both manage water quality and water quantity within densely populated communities while providing an array of health and social benefits. Miami Waterkeeper would be pleased to work with the District on nature-based resiliency projects in Miami-Dade and Broward counties. Please also refer to our previous letter.

Canal Maintenance Strategy: We do not see this addressed in the June 2022 Plan. Please see our attached letter. We continue to urge a paradigm shift in the District's approach to control algae growth. Chemical spraying of herbicides confers toxic substances into the environment that can harm humans and wildlife while degrading water quality conditions.

Proposed South Miami-Dade Curtain Wall: Please see our previous comment letter, attached. We do not see our concerns directly addressed. Stakeholders need assurance that the curtain wall will not exacerbate the already limited groundwater flow to Biscayne Bay or be contrary to the Bay's restoration goals.

Thank you for the opportunity to comment on the Plan. The District's efforts to keep sea level rise and increased flooding and abeyance represent some of the most important projects in the region. We look forward to many more nature-based resilience projects beyond traditional grey infrastructure that will improve the environment while keeping our community safe.

Sincerely

A handwritten signature in black ink, appearing to read 'RS', with a long horizontal flourish extending to the right.

Dr. Rachel Silverstein
Executive Director and Waterkeeper
Miami Waterkeeper
PO Box 141596
Coral Gables, FL 33114-1596

Attachments:

1. Miami Waterkeeper comment on SFWMD Draft Sea Level Rise and Flood Resilience Plan (January 28, 2022)



SCCF
SANIBEL-CAPTIVA
CONSERVATION FOUNDATION



Growing Climate Solutions
Path to Positive™
Southwest Florida

July 19, 2022

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

Letter submitted electronically via: resiliency@sfwmd.gov

Re: Comments on the District Sea Level Rise and Flood Resiliency Plan June 2022 Draft

Dear South Florida Water Management District,

Both the Sanibel Captiva Conservation Foundation and Growing Climate Solutions appreciate the opportunity to review the most recent draft of the District's Sea Level Rise Flood Resiliency Plan and provide feedback.

We want to highlight improvements the District has made that address many of the comments submitted in response to the 2021 draft of the plan. We are pleased that:

- The District acknowledged that is equally as important to work towards mitigating the causes of climate change as it is to take adaptive actions, and thus added a new section highlighting renewable energy use within current District infrastructure and a commitment to its use in future projects.
- The District anticipates incorporating green infrastructure/nature-based features within the projects it designs and manages. We think the District has laid out a very reasonable plan for assessing the function of these components in pilot form before scaling up to wider basin-wide applications.
- The District has acknowledged that their phased approach includes engaging with “partners and stakeholders with responsibility for the secondary and tertiary flood control systems to identify the best course of action to mitigate any identified deficiency.” We encourage the District to clarify and continue their process of working with these and other stakeholders including members of the public to make holistic efforts around flood control and other water needs more successful across the whole region.

We also want to submit the following suggestions and concerns, as the District refines its future resilience plans.

- During a recent webinar, the District indicated they would assess any proposed flood control projects for impacts to downstream communities and would only pursue those changes that had neutral or positive downstream impacts. We recommend this be made explicit in written form within the plan and with the acknowledgement that downstream impacts refer not just to flood control, but also to water quality, storage, and other concerns. For example, flood control efforts should not adversely affect the environmental benefits that LOSOM and CERP will provide surrounding regions including the Caloosahatchee and St. Lucie watersheds.

Regarding the District's efforts to protect existing water supply:

- The current plan suggests the District “develops [saltwater-interface] maps at five-year intervals in our coastal aquifers.” We recommend that the spatial and temporal variability of the saltwater interface be evaluated to ensure a 5-year window is suitable for risk assessment. Or, if this has already been done, it be clarified within the plan.
- Several options for creating new water supplies are outlined. We recommend careful continued evaluation of these methods weighted against factors like the sustainability of the method and resource and associated operational cost. Reverse osmosis of brackish water sources is less costly and energy, and thus carbon, intensive than desalination of high salinity sea water, which the plan seems to acknowledge. However, the assertion that reverse osmosis “has almost no adverse impact on the natural environment” seems to downplay that this method can still be associated with [negative environmental effects from entrainment of aquatic organisms to improper management of brine waste by-product \(Missimer and Maliva 2018\)](#).
- Also, while the plan states “[the Floridan Aquifer’s] brackish water quality is not at risk from climate-related stressors,” climate change could decrease the total yearly rainfall or increase high rain-fall events ([Abiy et al 2019](#)) resulting in more runoff and less aquifer recharge. The potential longer-term restriction to water supply and pressure placed on the Floridan Aquifer should be considered when planning additional reverse osmosis facilities.
- Because of these previous points, we urge the District to continue to prioritize the more effective water-supply approaches focused on conservation and re-use of existing water supplies along with storage of surplus water.
- Lastly, as part of their longer-term vision, we ask that the District consider ways they might be able to use their land holdings to deliver benefits beyond the District’s mission. For example, with the introduction of nature-based solutions or the restoration projects the District adopts, increasing public access could be a strong source of public engagement that results in stakeholders being more connected to their local water supplies.

Thank you for the opportunity to engage with you during this process.

Sincerely,



Carrie Schuman Ph.D., Sanibel Captiva Conservation Foundation Coastal Resilience Manager



Paul Julian Ph.D., Sanibel Captiva Conservation Foundation Hydrologic Modeler



Ana Puszkina-Chevlin Ph.D., Growing Climate Solutions Regional Director

South Florida Water Coalition

July 12, 2022

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

RE: 2022 Draft Sea Level Rise and Flood Resiliency Plan Public Comment

To the relevant parties at the South Florida Water Management District:

The South Florida Water Coalition (SFWC) is happy to provide a public comment on this very important issue for our state and local communities, and appreciates the SFWMD for extending the ability to comment publicly on the matter.

For the last four years, the SFWC has expressed support for a number of causes regarding regional water resources: its protection, availability, and management. Advocating for solutions that better the ongoing sea level rise crisis is one such cause. During the most recent legislative session, the SFWC worked closely with elected officials who have also pushed for measures to raise attention to sea level rise, and implement strategies to better prepare not for what is coming, but for what is already here.

Having reviewed the 2022 Draft Sea Level Rise and Flood Resiliency Plan that the SFWMD has released, I am confident that the complexities of this crisis are being adequately prepared for. Moving a step further, the SFWC has spent a great deal of attention on the Water Supply Resiliency section of the report, and is satisfied to see that “*sea level rise, changing rainfall, and drought*” are rightly acknowledged as impacts to the water supply of over 7 million residents on our Lower East Coast. In addition, the section also considers population increases and saltwater intrusion for water supply scenarios and simulations. These, together, are the right approach to ensuring supply is available in the best and worst of times.

However, I would encourage the SFWMD to consider other factors to our water supply for the final version of this report. Page 35 includes the section titled “Protecting Our Existing Water Supply”, and states:

Protecting our existing water supplies is an adaptation resiliency strategy that ensures continual and safe water supply. In South Florida, our water supply strategy is to maintain canal and groundwater levels in the system, which allows the District to manage water and ensure water supply availability during the dry season.

While this strategy is phrased correctly, there should be other considerations to the strategy itself, including ensuring that our backup water supply resources – such as Lake Okeechobee – are not wrongly managed – particularly for the parts of Palm Beach County that are closely dependent on the availability of these resources. The SFWC hopes that the SFWMD will 1) make these considerations and acknowledge the impact of these resources on the Lower East Coast water supply system, and 2) work with the appropriate entities to ensure that these are managed to the benefit of South Florida residents while alternative options are developed in the future. It is difficult to separate this ever-important fresh water resource from its role in providing backup water supply to residents, as well as providing fresh

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water to recharge our aquifers and the Everglades – both of which help fight saltwater intrusion caused by sea level rise.

The SFWC remains optimistic that we are working toward developing sustainable, functional resiliency plans that take into consideration the many stakeholders that will inevitably be impacted by sea level rise as this issue becomes more and more prevalent in South Florida. Millions of residents are counting on you to ensure their water is protected as our area faces this critical climate crisis.

With much gratitude,



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July 9, 2022

Nicole A. Cortez, Resiliency Coordinator
South Florida Water Management District
3301 Gun Club Road, WPB

RE: Comments on SFWMD Draft SLR Plan (9/2021) and PPT Presentation to Board (6/2022)

Dear Ms. Cortez,

Having reviewed the reference documents which you sent to me, I have the following comments for SFWMD's consideration. I really appreciate the opportunity to provide my thoughts on this critical program.

1. The Draft Plan has only a one-line comment on page 9 about possible clean energy considerations to help defend against SLR. Yet, the PPT presentation in June contained an entire section about "SolarVantage presented by FPL and mentioned SFWMD/FPL Pilot Projects. As presented, it was a sales pitch, not part of the SLR mission.

If SFWMD is serious about solar energy to help power its future needs to combat SLR impacts, then reach out to all interested, qualified parties for help, instead of immediately jumping into a joint venture with an energy monopoly that has not been an ally to a progressive, decentralized solar program in Florida.

2. Seepage Wall – Really?

CERP's Goal 1 - ***Get the Water Right***

"Water is the lifeblood of the Everglades and of the vibrant urban, tourist, recreational and agricultural economies of south Florida. At its core, Everglades Restoration is about "getting the water right" again in the massive Everglades watershed for people and for ecosystem. Getting the water ***right means changing the configuration and operation of our infrastructure to restore the Quality, Quantity, Timing, and Distribution of water as it moves through south Florida***. The nickname for this approach is "Restoring QQTD" and it is the first, and most ambitious, goal of the Everglades Restoration effort. Our hypothesis is that if we get the water right by restoring QQTD, the ecosystem will respond positively", National Park Service and Office of Everglades Restoration Initiatives - May 27, 2022.

Placing a 30-mile underground dam across the Biscayne Aquifer in western Dade County has no resemblance to any natural water feature restoration element of the Everglades pre-drainage days. What could possibly go wrong with this mega project that started as a simple slurry wall to block off flooding in the 8.5 Square Mile, Las Palmas Community caused by a prior district project to enhance the movement of water.

Lots of fancy modeling results are dished-out to provide a Goldilocks' scenario showing for how a wall isn't really a barrier. Reminds me - ***We don't need a weatherman to tell us which way the wind blows*** – from Bob Dylan's Subterranean Homesick Blues.

If you try to justify the dam in the war against SLR instead of part of CERP, your thesis is weak. One of the beneficial elements of maintaining and even restoring the flows of the Biscayne Aquifer is the total dynamic head (TDH) it provides as it journeys to the coastline and discharges into Biscayne Bay. This TDH helps hold back saltwater intrusion as a natural barrier to SLR. The damn seepage wall will be a barrier to the natural flow of groundwater from west to east and lower the TDH and thereby exacerbating SLR.

Figure 2.1 does not provide overland flow rates. And it would stand to reason that the added flow to Shark River and Taylor Sloughs should equal the loss of flow to Biscayne Bay. The numbers do not represent such a balance.

This expensive solution now paraded as a solution to improve southern flow and SLR. It's not a good idea for either challenge. Not as bad as the ASR solution for LOWRP, but one that will be difficult to remove once the damage is done once a thick, nonhomogeneous clayey slurry wall is placed into our extremely porous aquifer. How about the construction process of squirting hundreds of tons of a fluidized mix 30 feet deep into this precious, porous aquifer? As a result, there will be tons of molecules of bentonite and SEBS polymers drifting forever in our fragile water supply.

If an applicant came to the SFWMD to build a barrier wall into the heart of the Biscayne Aquifer to combat SLR on their property, would you issue them a permit?

3. The plan has good technical ideas and protocols that will be useful if followed. Yet, the Executive Summary lists "FLOOD AND SLR RESILIENCY **ACTIONS** BEING PROPOSED IN THIS DOCUMENT", and none of the actions mention the people side of major public work programs, and in the case of SLR, many options are not technical in nature. Gaining understanding and willpower of stakeholders is undescribed yet vital. A strong, ongoing customer/public information and interaction program is needed to work both directions to move things off the ground floor or move people to higher ground, for safety or best cost/benefit option.
4. There will be mostly losers in the slow motion SLR train wreck that has already been making havoc. Being in a reactionary position to deal with a staggering problem needs committed consensus, teamwork and building blocks for all to stand on when the sea moves up a notch and then another. The winners in this dynamic will need to share the wealth and help others stay afloat, as a submerged LEC won't be good for business. Your guidance, resources and power are critical in handling this epic challenge.

To the best of your wisdom, perseverance, commitment, and luck,

Tom G. Walker