A Unified Approach to Recovery for a Healthy & Resilient Biscayne Bay

Biscayne Bay Task Force Report and Recommendations

June 2020

Biscayne Bay Task Force Members

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Acknowledgements

The Biscayne Bay Task Force wishes to thank local, state, and federal agencies, academic institutions and community-based organizations, industry professionals, and members of the public who attended and shared their knowledge, support, and recommendations. The Task Force also appreciates the expertise and support provided by the staff of the Miami-Dade County Department of Regulatory and Economic Resources. Thanks to the Florida Department of Environmental Protection Biscayne Bay Aquatic Preserves for select photographs.

Biscayne Bay Task Force Mission and Activities

On February 5, 2019, the Miami-Dade Board of County Commissioners (BCC) adopted Resolution No. R-165-19 (Appendix A), establishing the Biscayne Bay Task Force (Task Force). The Task Force was established as a nine-member advisory board consisting of appointed professionals representing civil engineers, coastal real estate developers, water quality and ecology experts, coastal managers, environmental regulators, resilience experts, and the community at-large. The Task Force was charged to meet at least four times over a six-month period to review prior studies, relevant data, and evaluations, and management planning and policy documents related to Biscayne Bay (Bay) as well as to receive recommendations related to the health and management of the Bay (Appendices B-H). The Task Force met 18 times and received approximately 35 presentations related to the health and management of Biscayne Bay from local and state regulatory agencies, municipalities, academia, community-based organizations, and other key stakeholders (Appendix I).

Land Acknowledgement

Our proceedings took place and these natural resources occur on the ancestral and traditional lands of the Seminole, Miccosukee, and Tequesta people.

Letter from the Chair

"Whatever the universe is, I believe it is all one. And this fragile shoreline, with its mangroves, coastal hammocks and ancient reef, is a precious part of very little that still survives of our unique environment."
- Marjory Stoneman Douglas

When the members of the Biscayne Bay Task Force convened in June 2019, we had no idea that our final report would coincide with the impacts of the worst global pandemic in recent history. Curiously, due to Miami-Dade County's "stay at home" order, the temporary closings of our beaches and marinas, and the practice of social distancing, Biscayne Bay received a much-needed respite from human activity. Despite the unusual break, the damage to the Bay was already present before the crisis. The health of Biscayne Bay remains in a state of emergency and at a tipping point toward irreversible ecological collapse.

There have been many efforts undertaken in the past to protect and restore Biscayne Bay. In 1974, the Florida Legislature passed the Biscayne Bay Aquatic Preserve Act. Later, in 1981, Miami-Dade County approved the Biscayne Bay Management Plan. The Florida Legislature included Biscayne Bay in the Surface Water Improvement and Management Act 1997, followed by the creation of the Biscayne Bay Partnership Initiative in 1999. In 2019, the Greater Miami and the Beaches Resilient305 Strategy listed restoration of the Bay as a principle action. These past plans have helped to protect and restore parts of Biscayne Bay but they have been sporadic and disjointed. Meanwhile, the watershed continues to be threatened by a lack of fresh water, nutrient pollution from storm-water runoff, sewage pipe breaks, compromised septic tanks, plastic pollution, and other contaminants.

The problems facing Biscayne Bay are serious and complex: Most will require financial investments and a unified and collaborative approach to restoration and recovery. Within this report, the Task Force recommends an overarching governing and administrative structure to implement recommendations under seven policy themes: water quality, governance, infrastructure, watershed habitat restoration and natural infrastructure, marine debris, education and outreach, and funding. These themes are to be inclusive of and prioritize environmental justice and human health.

The Task Force acknowledges that some policies and projects can be implemented immediately to address the areas within the watershed with the most significant water quality issues based on the currently available water quality data, resources, and existing funding sources. It is also important to highlight the infrastructure recommendations that will not only help restore the watershed but can provide a path toward economic recovery and help us get back to work post-pandemic.

Biscayne Bay is Miami-Dade County's most vital quality of life asset and the mainstay of our economy. This report is an urgent and final call to make Biscayne Bay and the protection of the Biscayne Aquifer a county and state priority. We call for a unified and committed effort by Miami-Dade County to work with all municipalities, state and federal agencies, and the public to chart a long-term course towards a healthy and resilient Biscayne Bay.

The members of the Biscayne Bay Task Force are grateful for the opportunity to present this report. We are confident that the Board of County Commissioners and the Mayor will take the bold and necessary actions to restore and protect Biscayne Bay for all and forever.

- Irela Bagué, Task Force Chair

State of the Bay

Of local, regional, national, and international importance, Biscayne Bay is a sub-tropical shallow estuary that is home to two state aquatic preserves, a critical wildlife area, a national park and national marine sanctuary. Due to its unique habitat, Biscayne Bay is designated an aquatic park and conservation area by Miami-Dade County. Cradled by the mainland to the west and barrier islands to the east, its 428 square miles continue to be a source of sustenance and economic vitality, while also providing for countless recreational opportunities enjoyed by residents and visitors alike. Its spectacular natural beauty is widely recognized and enjoyed by nearly 2.8 million residents and millions of visitors every year.

Despite its many layers of county, state, and federal protection for water quality, habitat, and wildlife, Biscayne Bay is at a tipping point. Historically, Biscayne Bay received freshwater along its shoreline as water traveled south and east, mixing with water from the Atlantic Ocean. Today, natural freshwater flows have been replaced by pulsed, point source discharges from dredged canals, intended to offer flood protection and move water away from inland areas. Canals can intercept groundwater, and more than half of the freshwater received by the Bay enters via the northernmost canals where the most notable seagrass losses have occurred. Runoff from the land, impacted by the activities taking place on land, degrade the quality of the water entering canals and Biscayne Bay. The timing, source, and quality of freshwater delivered to the Bay can and has influenced the health, diversity, and distribution of the flora and fauna that comprise the Biscayne Bay ecosystem. While there may be a general awareness in South Florida of the importance of the Biscayne Aquifer and the need to protect the quality of the groundwater in this aquifer as our sole source of drinking water, what is less known is the connection of this aquifer to Biscayne Bay and the Bay's dependence on large volumes of clean, fresh water for its ecological health. Hydrological changes, water management practices, upland development, and aged infrastructure have contributed to degraded water quality, seagrass die-offs and algal blooms as determined in part through data collected via the County's surface water quality and benthic habitat monitoring programs and those data from other agencies and institutions.

Biscayne Bay is in trouble. The County's water quality and seagrass survey data, as well as review of scientific literature and academic studies presented as part of the Task Force's work, indicate that chronic, low-level nutrient loading and/or acute, pulsed nutrient loading is likely linked to seagrass loss in Biscayne Bay. Excess nutrients can lead to a shift from a seagrass-dominated habitat with clear water, low turbidity, and low levels of algae in the water column, to an algae-based ecosystem that is turbid and reduces habitat essential for fish, birds, marine mammals, and other marine species. Sources of nutrients can include pet waste, fertilizers, and yard clippings and can be conveyed by stormwater outfalls. Other sources may include leaky sewer infrastructure and septic tank effluent. Unique challenges presented by storms and sea level rise compound and complicate these existing issues.

Seagrass, the foundation of all life in Biscayne Bay, has declined significantly in several basins. Seagrasses provide habitat for ecologically and economically important fisheries such as shrimp,

lobster, and various fish species and provide services such as stabilizing sediments and attenuating wave energy from storms. Within the past decade, the scientific community began to better understand and quantify the role that coastal and submerged plants such as seagrasses, mangroves and other tidal wetlands play in sequestering and storing carbon, surpassing the capacity of their upland tree counterparts. While notable coverage of seagrasses occurs in central and southern Biscayne Bay, seagrass losses identified over the past decade span the north, central, and southern regions of the Bay. In the South, Barnes Sound and Manatee Bay basins have experienced a decrease in seagrass of approximately 93 percent. In the central portion of the Bay, along the eastern shoreline near Coral Gables, there has been a decrease in seagrass of approximately 85 percent. And in the basins north of the Rickenbacker Causeway, seagrass losses range from approximately 66 percent to 89 percent (Appendix Q).

Despite these setbacks, it is important to know that water quality improvement and seagrass recovery are possible. In Tampa Bay, there was a 90 percent decline in seagrass between 1948 and 1982. Decisive measures were taken, including the formation of a technical team to expressly investigate how to reduce nutrient loading. Following a 57 percent reduction in nitrogen loading between the 1980s and 2002, there was a marked decrease in microscopic algae clouding the water column leading to improved water clarity. This success in meeting water quality targets led to Tampa Bay exceeding their established seagrass recovery goal of 38,000 acres, with 41,655 acres restored by 2016. A similar effort was undertaken in Sarasota Bay that led to a 46 percent reduction in nitrogen loading and subsequent resurgence of seagrass habitat. Thinking beyond restoration of Biscayne Bay to building resilience and long-term health is particularly critical in the face of potential impacts from climate change and sea level rise. The long-term health of our local economy also stands to gain.

Scientists have studied Biscayne Bay's fragile ecosystem and the most recent call to action came from the National Oceanic and Atmospheric Administration (NOAA) in 2019, with a warning of a "regime change" occurring in Biscayne Bay's ecosystem. We, the 2.8 million people who live in and call Miami-Dade County home, must answer that call. In taking action, it is important to acknowledge past restoration and management planning efforts (Appendix E) but also to elevate what makes this effort different. Numerous efforts have focused on restoring the health and economic value of Biscayne Bay. Each of these efforts has been united by three common elements. First, the efforts have been collaborative in that their development involved several relevant agencies, organizations, scientific institutions, and community members contributing their knowledge and fervent support for a healthy Biscayne Bay. Second, they tell a story of Biscayne Bay and its watershed's past and set a plan in motion for the future.[1] Third, they are predicated on the same or similar issues over the years that are imperative to address if the issues

[1] *Watershed*: A land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean. https://oceanservice.noaa.gov/facts/watershed.html

are to be overcome and restoration and long-term health of Biscayne Bay a reality. But many previously identified threats remain unabated. Biscayne Bay's resilience – its capacity to withstand future changes in land use, climate shocks and stressors, and infrastructure failures – will continue to be at risk without bold action focused on watershed restoration through a permanent, unified and transparent approach to manage its recovery. That is why this unified approach to recovery for a healthy and resilient Bay builds on and expands the knowledge and efforts of the past with bold, brave ideas while centering the following core ideas in order to be successful in bringing Biscayne Bay back from the brink:

Water Quality is the focus of the initiatives laid out in this vision. Municipal, County, State and Federal agencies along with community organizations must commit to this work, the fruits of which may take years to be realized.

Leadership is central to implement the bold changes we need and to hold ourselves accountable over time to bring about the change we are working toward and know we can achieve.

Education is the tool by which our communities and our leaders will remain invested in this work and each other as we gain a clearer understanding of what projects and initiatives must be accomplished to restore Biscayne Bay.

Improving upon the past and empowering our communities to participate in this work also requires that this process uphold the tenets of environmental justice. These tenets demand, among other things, "...that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias" as well as "...the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for...[all] living things."[2] The process of restoring and recovering Biscayne Bay's resources and continuing to work to ensure the Bay is visually and physically accessible for all people is in service of these ideals and in doing so is in service to the people and natural resources of Miami-Dade County. Furthermore, restoration and recovery of the Bay's resources through the infrastructure and technology improvements that stem from the recommendations in this report will help get our community back to work following the economic hardship imposed by the COVID-19 pandemic.

It is the hope and the mission of the Task Force that this unified and collaborative vision, overseen by a body of agencies and stakeholders, will be effective in bringing about tangible and lasting change for the health of our Bay, for the quality of life of our residents and visitors, and the future of our region's economy.

[2] As drafted and adopted at the First National People of Color Environmental Leadership Summit in 1991 in Washington, DC, 1991. http://lvejo.org/wp-content/uploads/2015/04/ej-jemez-principles.pdf

Recommendations

The following section outlines recommendations the County should take to restore water quality in Biscayne Bay. The Task Force recommends the establishment of an overarching administrative structure to implement recommendations under seven policy themes.

Overarching Recommendation

A unified and collaborative approach to watershed restoration is urgently needed. To improve the water quality and the health of Biscayne Bay, the Task Force recommends:

- Miami-Dade County's Board of County Commissioners (BCC) should create a new intergovernmental body called the Biscayne Bay Watershed Management Board (WMB).

- The WMB should be supported by the creation of a new position called the Chief Bay Officer (CBO) in the Office of the Mayor. The WMB and the CBO should be supported by County staff, appropriate technical experts and community input to improve water quality in the Biscayne Bay watershed.

- The WMB will be responsible to develop and, upon approval by the BCC, implement the Biscayne Bay Watershed Restoration Plan (WRP). The WMB, working with the CBO, should ensure that the following recommendations by the Task Force are implemented.

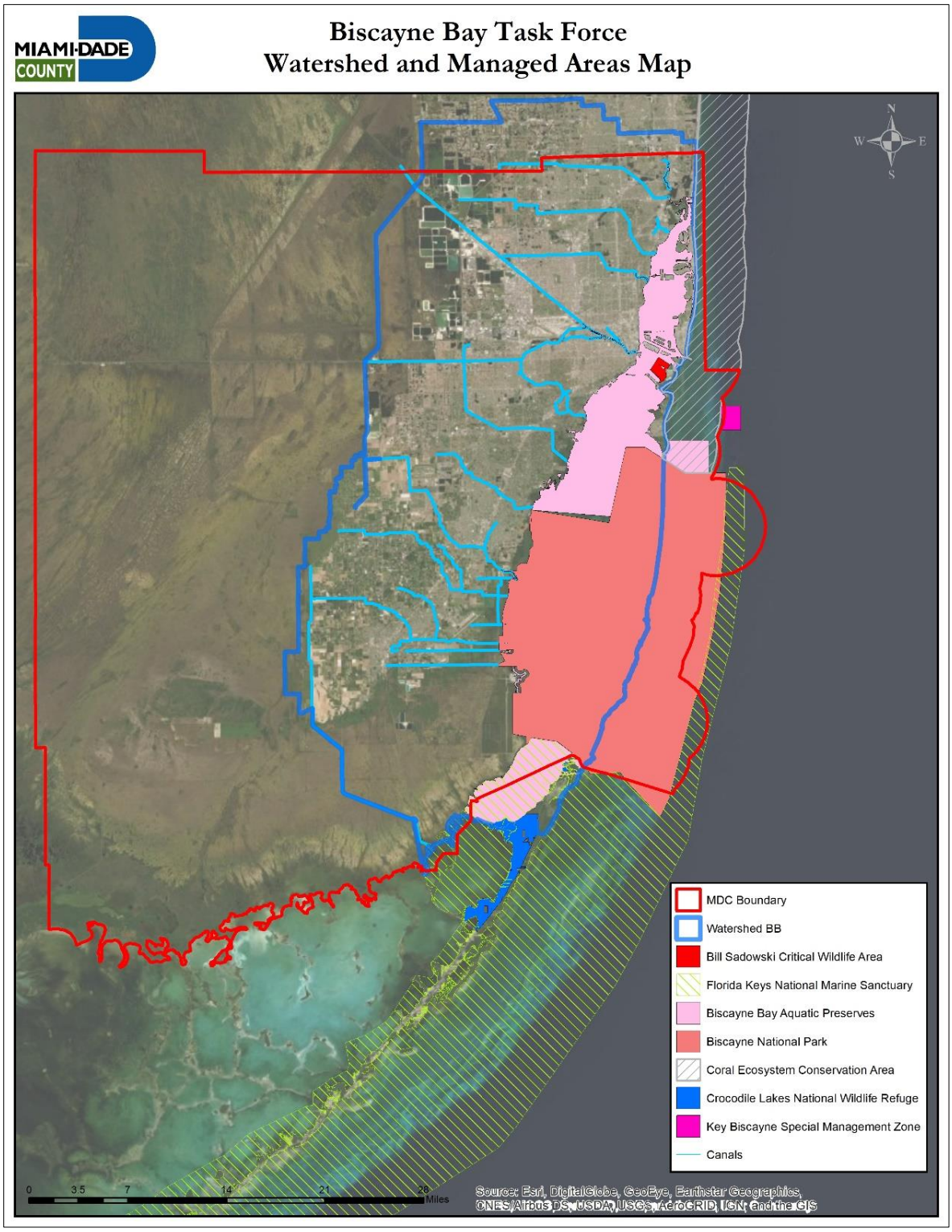
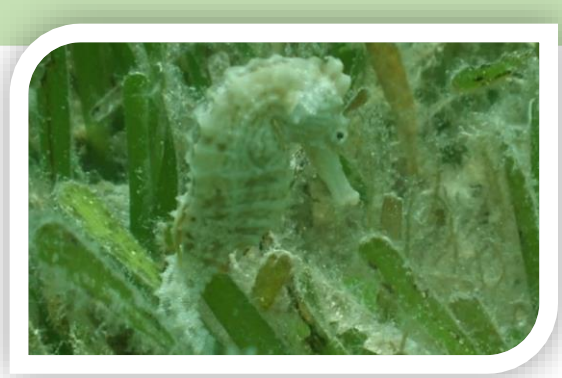


Figure 1. Map of the Biscayne Bay watershed and managed areas within and adjacent to the watershed. NOTE: Watershed layer obtained from SFWMD. These subwatersheds are the smallest units classified in AHED (Arc Hydro Enhanced Database). They were formerly known at the District as Subbasins.

1. Water Quality



Improving Biscayne Bay's water quality will require significant reductions in the levels of pollutants within its watershed. Significant improvements must be made to waters received by the Bay and canals through outfalls and sheetflow. Groundwater quality within the Biscayne Aquifer must also be improved given that the aquifer is the Bay's watershed. Fresh water flows through this highly transmissive aquifer carry pollutants directly into the surface waters of canals and Biscayne Bay. Many actions are urgently needed to restore the Biscayne Bay watershed and protect the Biscayne Aquifer as it is our sole source of drinking water and a carrier of pollutants to the Bay. These actions include pollutant load reduction goals; additional monitoring to measure progress against those goals; leveraging the County's role as a local authority; an open, centralized information data repository; demonstration projects – implemented and monitored; integrated flood risk reduction and water quality planning, policies, and management; a climate change vulnerability assessment; specific studies that fill key knowledge gaps; fertilizer ordinance; and capitalizing on existing County entities to make improvements to the regulatory review process to focus on Biscayne Bay and increase enforcement.

The Task Force recommends that the County:

1A. **Establish science-based, pollutant load reduction goals and interim targets to improve quality of surface water and groundwater and codify these limits in Chapter 24 to achieve deep reduction in pollutant loads for restoration of seagrass meadows to historic coverages consistent with a healthy Biscayne Bay ecosystem as part of a Biscayne Bay Watershed Restoration Plan (WRP)**. Pollutant load reduction goals and interim targets should consider future scenarios of land-use, population, existing and future development, local and South Florida water management infrastructure, and climate shocks and stressors. Nutrient load reduction targets established for surface water and groundwater entering the aquifer and canals should be based on meeting, at a minimum, the chlorophyll-a based criteria, or "protective" criteria for total nitrogen (TN) and total phosphorus (TP) at the point groundwater enters the Bay as well as the locations where groundwater enters canals connected to the Bay. The County should implement similar strategies for other pollutants of concern, including fecal indicator bacteria (FIB), metals, and petroleum-based pollutants, where impairments and other hotspots have been identified to ensure consistent standards that protect public health and our economy.

1B. Develop, implement and continuously monitor and demonstrate progress toward meeting 1A's pollutant load reduction goals and interim targets for surface and groundwater and linked

biological recovery. Updates should be reported to and reviewed by the WMB on a regular basis. Pollutant load reduction and biological recovery targets and goals toward meeting targets should be updated on a regular basis, every two to three years. Targets and goals should be updated based on actual land-use, population, development, local and South Florida water management infrastructure and the Comprehensive Everglades Restoration Plan, and climate shocks and stressors. Monitoring should leverage coastal information and observation system approaches with remote monitoring as necessary, to demonstrate progress toward meeting interim targets and goals. Progress should also be assessed based on measurements made at individual stations or subsets of stations based on their proximity to the shoreline.

1C. Leverage the Department of Regulatory and Economic Resources' (RER) role as regulatory agency to activate additional resource management functions. Permits requested from and authorized by County divisions (all divisions in RER and the Water and Sewer Department (WASD)) should be coordinated, rigorously documented and archived for continuous review and evaluation to ensure they meet pollutant load reduction goals (1A). This should include:

i) Evaluation of permit applications including but not limited to water control and coastal and freshwater wetland dredge and fill projects. This information should be quantitative, quality-assured, transparent, documented, archived, and made publicly accessible (1E; data library).

ii) Required water quality monitoring associated with permitted activities to ensure water quality specifications are maintained and Best Management Practices (BMP) are performed as specified to verify that pollutant load reductions goals are being met. Update Chapter 24 as needed to ensure tracking and monitoring of these activities.

iii) Exercising of role as municipal separate stormwater sewer system (MS4) permit-holder to collect MS4 co-permittee information on types and implementation of all forms of BMPs, including a County-wide atlas of stormwater infrastructure systems, with maps of locations and details related to the sizing of stormwater infrastructure, and additional information as needed, to evaluate MS4 activities and compliance with pollutant load reduction goals and biological recovery targets. When reviewing applications related to stormwater, the County should consider the information produced and documented by other MS4 permit-holders and the SFWMD to assess compliance with pollutant load reduction goals.

1D. The County should use the information collected per 1C to conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments. Additionally, each municipality shall evaluate the water quality of each of its outfalls and report outcomes. This information should be employed to support the creation of an ordinance to be

created that requires outfalls not meeting standards to be corrected or eliminated within a certain time period.

1E. **Review, develop (as needed), implement and enforce local ordinances and policies to attain pollution load reduction goals set forth in the Watershed Restoration Plan (WRP)**. Policies and enforcement should emphasize known and emerging sources of pollution to surface waters and groundwater including septic systems, exfiltration trenches, and other sources of stormwater pollution regulated through permits and managed via Best Management Practices (BMPs). The County should seek support as needed, and review, utilize and strengthen enforcement of Chapter 24 to enforce these pollution load reduction goals and measures of the Watershed Restoration Plan with emphasis on pollutant load reductions in the Biscayne Aquifer and through stormwater outfalls.

1F. **Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research collaboration and data management infrastructure** (e.g., searchable data library), including a GIS-based repository integrating groundwater, surface water, external agency datasets, and documentation required from MS4 co-permittees following recommendation 1C. Include information about ongoing city, agency, and university ongoing research and monitoring activities, existing and planned BMPs, watershed restoration, natural infrastructure projects, and infrastructure projects. Update regularly.

1G. **Undertake and secure funding for new pilot projects and research projects focused on reducing pollutant loads**. Projects should include specific, focused *in-situ* monitoring of areas that implement: conversions of septic to sewer and alternative decentralized wastewater systems, stormwater systems based on alternative design criteria and features, living shorelines and seawalls, stormwater easements (e.g. bioswales), and retention ponds to generate the project-specific information needed to implement and improve effectiveness of pollutant load reduction strategies, assess water quality-based performance, and track reductions in pollutant loads. This should include a new program of monitoring the effectiveness of BMPs to improve surface water, groundwater, and stormwater quality before waters enter canals and the Bay and for monitoring of significant stormwater outfalls. Funding sources should be identified and secured.

1H. **Elevate and further amend the Comprehensive Develop Master Plan (CDMP) to further include Biscayne Bay watershed management planning elements**, including Adaptation Action Area planning and other sea level rise planning efforts. Planning efforts should consider alternative design and development criteria in sensitive areas in order to reduce discharge, reduce pollutant loads including loads from the Biscayne Bay watershed and increase watershed pollutant treatment efficiency. The WRP produced by the WMB should include recommended criteria to improve water quality, with a focus on pollutant load reduction, to incorporate into the CDMP and other related planning efforts. Examples include higher standards for projects in the County, such as requiring more stormwater retention through installation of permeable

surfaces, green infrastructure, or other appropriate strategies to allow less pollutants to runoff into the Bay.

1I. **Conduct a climate change vulnerability assessment for Biscayne Bay**. The WMB, working with the BCC and County departments, should determine the scope and the issues that would go into a vulnerability assessment for Biscayne Bay, including land use and population, local and regional water management systems scenarios, and CERP scenarios. Federal, state, and local funds should be leveraged to conduct this assessment.

1J. Initiate and fund studies that illuminate specific knowledge gaps for application toward watershed restoration. Specific studies include:

- Re-assess the north to south and source (canal, stormwater and groundwater) distribution of discharge entering Biscayne Bay and work with SFWMD and other agencies to identify strategies for implementing wetland rehydration projects (e.g. Deering Estate) in other areas of the watershed to improve distribution, timing and magnitude of flows
- Re-generate the circulation modeling output for the Bay, analyze gap-fill monitoring data for robust calibration and validation, and expand domain to northern Biscayne Bay
- Institute source tracking in hot spot areas (bacteria, pharmaceuticals, nutrients, petroleum-based pollutants)
- Update and apportion pollutant loading of primary watershed and Bay sources, incorporating contributions from episodic loadings from natural hazards and infrastructure failures to develop phosphorus and nitrogen budgets that support Biscayne Bay recovery and resilience
- Apply *in-situ* studies to evaluate the following: a) water quality-based performance of alternative decentralized wastewater and stormwater infrastructure treatment approaches over traditional approaches and b) influence on load contributions to stormwater and groundwater
- Re-evaluate "protective" nutrient criteria based on pollutant loads and load reduction goals
- Increase the number of permanent seagrass monitoring sites and allocate additional funding as needed
- Increase the spatial and temporal frequency of water quality sampling in hot spot areas, areas that have experienced significant increase in pollutant loads, including areas defined as impaired waters, and areas that improve the management of benthic resources
- Evaluate the relationship between recreational and commercial fishing activities, food web structure, and Biscayne Bay water quality
- Evaluate facility-level pollutant loading contributions against existing permitted discharges

1K. Pass a county-wide ordinance to prevent the negative secondary and cumulative effects of excess nutrients caused by fertilizer runoff entering Biscayne Bay through groundwater and stormwater entering surface water bodies such as canals. The ordinance should include: public, commercial and noncommercial property; a mandate that fertilizer can only be applied to actively-growing turf; a mandate that fertilizer cannot be applied during the rainy season; a

designation of a fertilizer-free zone of 15 feet from waterways; a focus on the regulation of nitrogen-releasing fertilizer in most forms; and a more rigorous regulation of phosphorus. Additional model ordinances should be developed and codified to reduce use and application of pesticides and herbicides. The County should work with municipalities to adopt the same ordinances.

1L. Increase inspections of all marinas and commercial operations along waterways. Such operations must have containment structures to eliminate direct runoff into waterways. Such containment structures must have treatment equipment especially for oils, grease, and wash water from boat maintenance operations. Impose fines and shutdowns if non-compliance is discovered.

1M. Continue to monitor the progress of the October 7th, 2015 Consent Agreement between FP&L and Miami-Dade County to address impacts associated with the plant, including addressing the hypersaline groundwater plume and elevated levels of chlorides found outside property boundaries including within the L-31E canal. The County should continue to monitor water quality in the areas surrounding the Turkey Point facility including elevated levels of chlorides, as well as nutrients such as ammonia, and take appropriate actions to ensure the environment is protected and that pollutant load reduction goals are met.

2. Governance

In order to establish a permanent and unified approach to the recovery of water quality in Biscayne Bay and future management of the watershed, the Task Force recommends that the County:

2A. **Establish by ordinance or other comparable process that establishes the Biscayne Bay Watershed Management Board (WMB) as a permanent organization.** The Task Force recommends the selection and invitation of participants with diverse backgrounds to the WMB and its committees. It is recommended that the WMB shall be comprised of a total of (11) members as follows:

- (3) members of the Board of County Commissioners (BCC);
- (3) designees of the Miami-Dade County League of Cities;
- South Florida Water Management District Governing Board (member who resides in Miami-Dade County);
- Florida Department of Environmental Protection;
- U.S. Department of Interior;
- Florida Fish and Wildlife Conservation Commission; and
- Florida Inland Navigational District.

Members will have experience with issues related to Biscayne Bay and are expected to leverage the professional and financial resources of their respective organizations to achieve goals of the Watershed Restoration Plan.

2B. **The Mayor should appoint a Chief Bay Officer (CBO) and request funding for the position**. The CBO will advise the Miami-Dade County Mayor and the BCC and manage the WMB and its committees. The CBO will act as liaison with County departments, County boards, external agencies, stakeholder groups, and local, state, and federal governments on water quality issues, policies and appropriations related to the health and recovery of Biscayne Bay.

2C. The WMB will, with technical and community recommendations, review, recommend funding for and implement the Watershed Restoration Plan (WRP) to send to the BCC in order to achieve time-bound and measurable progress toward WRP goals to achieve water quality and seagrass restoration and meet its mandate of Bay health, recovery, and resilience. The WRP should be developed by the end of 2021. While developing the plan, the WMB can concurrently work to implement recommendations in this report. The WMB will be responsible for making recommendations to Miami-Dade County departments and to the Office of Management and Budget to prioritize water quality restoration in the annual budget cycle.

The WMB will work to make recommendations and develop funding strategies for projects to be reviewed and approved by the BCC, incorporate relevant policies in Senate Bill 712 (SB 712) Clean Waterways Act (Appendix K), develop and execute the Biscayne Bay Watershed Restoration Plan, inform the BCC on a regular basis, secure funding for meeting the timeline for pollutant load reduction goals, and update the Biscayne Bay SWIM Plan, as mandated by the SWIM Act per Chapter 87-97 Florida Statutes (Appendix E). The WMB shall collaborate in organizing a biannual Biscayne Bay Marine Health Summit.

The WMB should establish and appoint committees to address specific Bay issues to advise and make recommendations on policies, restoration projects, public information campaigns and water quality monitoring and targets. The Task Force recommends establishing the following committees: Technical Advisory Committee, the Community Advisory Committee, and the Nutrient Reduction Committee.

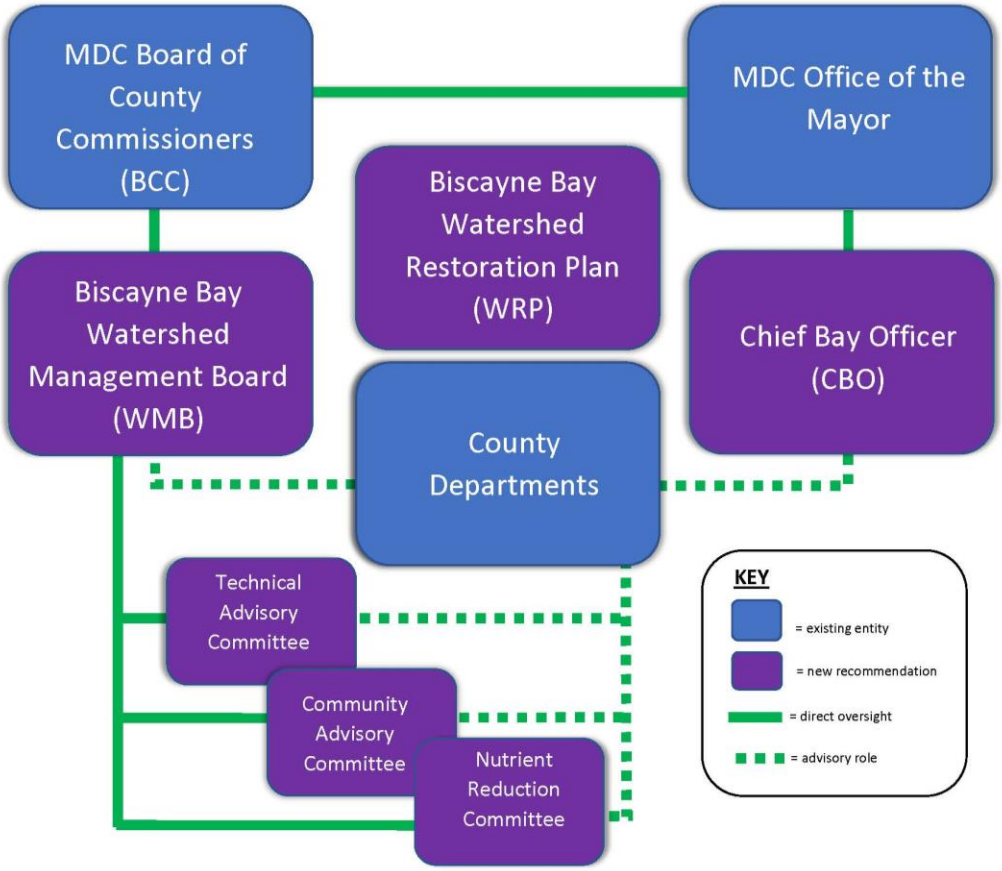


Figure 2. The proposed organizational structure above highlights the working relationship between the BCC, CBO, Office of the Mayor, WMB, and the committees. The description in Appendix J further defines the roles of the entities and Watershed Restoration Plan. Existing entities are shown in blue boxes while new recommendations by this Task Force are shown in purple boxes. Solid green lines mean an entity has direct oversight over a connecting entity. Dotted green lines mean an entity plays an advisory role to another entity.

2D. **Develop a formal partnership in the form of a Memorandum of Understanding (MOU) with the SFWMD to create an internal staff working group in addition to their participation on the WMB.** The CBO will lead this effort. The group will work collaboratively to implement the WRP and manage and fund activities to meet pollutant load reduction goals; determine redundancies and data gaps; focus on canals that show high nutrient loads, and trash pollution and study pollutant loads originating outside the watershed, including agricultural sources; develop BMPs and Outstanding Waters standards and regulations, and enhance adaptation efforts to improve the resilience of the regional water management system to manage saltwater intrusion.

2E. **Enable the alignment and coordination of County departments to ensure a holistic, comprehensive approach is taken for Biscayne Bay recovery and resilience.** Resilient305 directs Greater Miami and the Beaches to Restore and Preserve Biscayne Bay (Action 1), Employ a One Water Approach (Action 54), and Share Bold Integrated Water Models (Action 53) to align County departments in their work on issues that must be dealt with for the Bay's long-term health.[3] Direct departments to prioritize Biscayne Bay recovery and resilience in their budgets and develop performance metrics to assess the effectiveness of this effort and identify funding. Report progress in quarterly updates to the Science/Technical Advisory committee and, as needed, to the full WMB.

2F. Develop a formal partnership in the form of a Memorandum of Understanding (MOU) with the Miami River Commission (MRC) to ensure that the advice and expertise of the MRC is available to the CBO and the WMB. The MRC has 20 years of experience advising public and private interests along the Miami River that will be invaluable in the development of the WRP and in the implementation of many other recommendations.

[3] Greater Miami and the Beaches, Resilient305 Strategy. 31 May 2019. <https://resilient305.com/>

3. Infrastructure

As we grapple with the economic impacts of the global pandemic, turning to infrastructure investments is one strategy to lift our economy. During past national downturns, infrastructure stimulus spending has boosted near-term economic activity. Likewise, improvements to our septic, sewer, and stormwater systems are critical investments that will advance the health of the Bay and prove to be the economic stimulus that our County needs. There is no better time to invest in our County than now. For some of the regulatory driven investments, such as the Consent Decree to fix leaky sewer lines, managing assets and making sure these programs are fully funded and implemented is a priority.

Therefore, creating design standards, establishing construction inspection requirements, and setting operation and maintenance regulations for wastewater collection, including septic systems, water and wastewater, and stormwater collection and drainage system are to be reviewed and updated in Chapter 24 of the Miami-Dade County Code as needed in order to ensure countywide infrastructure is working as intended and not contributing pollution to the Bay.

For Septic Systems:

The State's Blue-Green Algae Task Force Consensus Document[4] recommended "a septic system inspection and monitoring program" to identify "improperly functioning and/or failing systems so that corrective action can be taken to reduce nutrient pollution, negative environmental impacts and preserve human health." The Task Force also noted that "current regulations prohibit permitting of new septic systems on lots of one acre or less…within an Outstanding Florida Spring watershed unless the system includes enhanced treatment." The County drafted a report, Septic Systems Vulnerable to Sea Level Rise, in November 2018, noting the occurrence of improperly functioning and/or failing systems based on current and future groundwater levels (Appendix L).

Florida Senate Bill 712 (Appendix K) takes effect July 1, 2020 and transfers duties and powers from the Department of Health to the Department of Environmental Protection, including to "develop a comprehensive program to ensure that onsite sewage treatment and disposal systems regulated by the department are sized, designed, constructed, installed, sited, repaired, modified, abandoned, used, operated, and maintained in compliance with this section and rules

[4] Blue-Green Algae Task Force Consensus Document #1. 11 October 2019. <https://floridadep.gov/sites/default/files/Final%20Consensus%20%231_0.pdf>

adopted under this section to prevent groundwater contamination, including impacts from nutrient pollution, and surface water contamination and to preserve the public health."

The Task Force recommends that the County:

3A. **Increase compliance with existing laws to result in the immediate connection of ~12,000 properties to the sewer system** and reduction in the number of new septic systems in coastal/waterfront areas.

3B. Develop and enforce septic system design criteria with design parameters, including proximity to canals and Biscayne Bay, elevation relative to groundwater level, sea level rise, sizing, materials, individual and cumulative loading, and basin-specific criteria. Basin-specific criteria should be based on existing (or lack of) infrastructure, land use, loading parameters and other criteria to ensure pollutant load reduction goals are met.

3C. Initiate a mandatory septic system registration and inspection program that will first prioritize those systems identified as vulnerable to shallow groundwater levels, those near (within 1000 feet of) Biscayne Bay and canals, and those for new and substantially improved (50% of market value) developments. The program should then be expanded county-wide. In addition, utilize alternative treatment technologies or conversion to sewer, and identify, create and secure new funding sources. Efforts should build on the State's Task Force recommendations and SB 712 - Clean Waterways Act provisions (Appendix K). All data and records pertaining to such recommendations should reviewed by County staff, and WMB advisory committees, then presented for review by WMB.

For Water and Wastewater Systems:

One Sanitary Sewer Overflow (SSO) is one too many; these are preventable with appropriate policies and enforcement. The County must be proactive and have reliable information on all its underground assets. For water and wastewater systems in Miami-Dade County, the County is the primary system for all jurisdictions. Though some municipalities own and operate their own infrastructure, the main system receiving the effluent is managed by the County. Additionally, all design, operation, and maintenance requirements must include effluent standards for pollutants.

The Task Force recommends that the County:

3D. **Undertake immediate efforts to identify and eliminate all root causes of Sanitary Sewer Overflows (SSO) including inflow and infiltration. Accelerate sewer infrastructure maintenance and upgrades**, with an emphasis on addressing all wastewater sewers that are located within 2,000 linear feet from Biscayne Bay shorelines and further West (inland) near Canals, Creeks, Rivers and Lakes to reduce the potential for and impacts of SSOs, should they occur. All plans are to be certified by letter/report, that is signed, and sealed by a Florida Registered Professional

Engineer. Ensure the County institutes its authority to implement proactive management and have reliable information on all underground assets. Ensure adequate funding is authorized to accelerate these activities. Use the County's authority to institute stiffer penalties for SSOs, understanding that SSOs harm the economic prosperity, health and quality of life of its residents and businesses – referencing SB 712 (Appendix K) and increasing fines for unpermitted activities over SB 712 (sanitary sewers, maintenance, etc.).

3E. **Develop and expedite a Condition Assessment and Asset Management Action Plan to document the condition of the County's wastewater system assets and certify all historical "As Builts" and/or those not already certified with a focus on identifying horizontal and vertical locations of main wastewater transmission lines**. As-builts must be certified, signed and sealed by a Florida Professional Surveyor and Mapper qualified and registered to do work in Miami-Dade County. In addition, a Florida Professional Engineer, qualified and registered to do work in Miami-Dade County shall inspect and document the condition of these assets, to prioritize their condition based on risk of failure and expedite rehabilitation and/or replacement or lining following mandates in the WASD consent decree.

For Stormwater Systems:

Actions to improve stormwater systems should leverage cost- and maintenance-effectiveness of technologies and should be holistic in order to address stormwater quality concerns at all levels, both for public and private systems countywide. It is important to note that stormwater systems in Miami-Dade County are controlled by jurisdictions. The County only has control over the stormwater system in the Unincorporated Municipal Service Area (UMSA), so working with municipalities to coordinate improvements is critical.

The Task Force recommends that the County:

3F. Enforce the existing code and update the stormwater design criteria to improve effectiveness and include advances in stormwater treatment technologies such as stormwater catch basins, stormwater filtering systems and smart stormwater system technology that can also take into account future hydrologic conditions related to CERP and climate change. Existing Code should be updated to establish an annual operating permit for all municipal and private stormwater systems to include regular inspections and monitoring to address performance such as during heavy rainfall events. Stormwater design criteria should be updated for science-based effectiveness of water quality treatment and consider the multitude of impacts that sediment erosion, leaves, litter and other items have on stormwater systems. These can include costs of cleanups, floods caused by clogged stormwater catch basins and pipes, and groundwater and surface water pollution caused by stormwater runoff. Evaluation of technologies should be holistic in order to address stormwater runoff concerns at all points, from the street level through the outfalls. All design, operation, and maintenance requirements must include effluent standards for pollutants. Develop and implement guidelines for stormwater dry retention ponds

and swales that maximize watershed pollutant retention. Allocate funding for pollutant monitoring to improve design of dry and wet retention ponds for Miami-Dade County and areas within the SFWMD regional system.

3G. Develop a plan to prioritize the retrofitting of stormwater infrastructure within basins with the most substantial water quality and/or habitat degradation issues. All stormwater systems should be upgraded to maximize protection of water quality and municipalities should be urged to provide updates of storm water improvements to the County for inventory.

3H. **Eliminate direct and indirect stormwater discharges to Biscayne Bay** through a combination of infrastructure modifications (e.g., treatment technologies) to retain more stormwater at the property-level via increased stormwater management in retention and infiltration and to conduct monitoring to verify, identify and secure funding through community based and/or public private partnerships while leveraging private working capital for implementation. Eliminate discharge of untreated stormwater into canals, creeks, rivers, and lakes, including from the streets. Conduct monitoring to verify, identify and secure funding to implement. Ensure basic design criteria for stormwater system management are met and documented to include : 1) grates to block debris from entering the storm drains and smart water sensors, 2) more regular maintenance of stormwater systems to prevent discharge of debris and sediment, 3) more regular cleaning of storm drainage system, and 4) standards that account for higher groundwater levels and the reduced efficacy of exfiltration systems. Specify a minimum stormwater system management schedule for MS4 co-permittees for stormwater discharged into canals, creeks, rivers, and lakes, conduct monitoring to verify, identify and secure funding to implement. Implement a regular review process to update design criteria to take future conditions into account.

For Design and Construction Methods:

3I. **Set policy that all As-Builts/Record Drawings are done and certified by a Florida Professional Surveyor and Mapper qualified and registered to do work in Miami-Dade County**.

3J. **Set policy to require during the design phase of future construction that all existing utilities are designated and located vertically and horizontally** based on American Society of Civil Engineers (ASCE) Standard 38-02 (Appendix M) utilizing nondestructive subsurface utility engineering methods, such as soft digs and 3-D ground penetrating radar. Survey grade Mobile or Static LIDAR shall be used for mapping above ground features and utilities conducted by a Florida Professional Surveyor and Mapper qualified and registered to do work in Miami-Dade County. During plans review process, Miami-Dade County shall ensure design complies with the policy prior to final approval or issuance of any construction permit.

For Coastal Flood Management Systems:

3K. Ensure that new infrastructure projects to address coastal flooding and storm surge that are cost-shared by the County adhere to the recommendations of this Task Force and prioritize Biscayne Bay health and resilience. This includes such information as USACE Back Bay Coastal Storm Risk Management (CSRM) Feasibility Study and any future flood control projects.

4. Watershed Habitat Restoration and Natural Infrastructure

Biscayne Bay's health is dependent on the activities that happen within its watershed. Improving and restoring habitat countywide has multiple benefits, including diversifying plant and animal species, providing habitat for fisheries, and increasing green spaces that absorb and filter water before it reaches our waterways and the Bay. Depending on the project, natural infrastructure is just as beneficial: It can provide additional water filtration services, can act as habitat for fisheries and other wildlife that help support our economy, and can protect the shoreline from coastal erosion and storm surge. To utilize watershed habitat restoration and natural infrastructure to improve the health of the Bay, the Task Force recommends that the County:

4A. **Develop ecologically acceptable living shoreline design options that are consistent with the existing Biscayne Bay Aquatic Preserve Act**. The County shall create "A Living Shoreline Guide" and conduct workshops with municipalities, developers, coastal engineers, and other industry experts to provide the appropriate guidance on design and regulations. The County should develop incentives for living shoreline installation.

4B. **Raise awareness of the value of mangroves through a homeowner education campaign.** Mangroves are the first line of coastal defense and a natural barrier protecting coastal communities from storm surge, flooding, and sea level rise. Mangroves provide carbon storage which helps lower carbon emissions.

4C. **Increase enforcement of existing rules for protecting existing mangroves and mangrove shorelines** to improve their future health and maintain the appropriate amount of canopy. Existing culverts that provide water to existing mangroves must be inspected and repaired.

4D. Identify vulnerable properties along the coastline and partner with municipalities to focus on public properties and private property owners to create a voluntary Mangrove Protection and Restoration Zone Program (e.g., mangrove planter box initiative) in flood-prone coastal communities to designate protection zones, plant mangroves based on the "A Living Shoreline Guide," and monitor and report progress after storm events. In this effort, the County should include: data collection, review and consideration of opportunities for converting flood-damaged properties from willing sellers participating in current and future buy-out programs; and increasing buffer areas via vegetated easements or as projects for listing in the Miami-Dade County Local Mitigation Strategy (LMS).

4E. **Prioritize existing and identify new green and blue infrastructure approaches and restoration projects**, including projects identified in existing plans like the Miami-Dade County Department of Parks, Recreation, and Open Spaces *Parks and Open Space System Master Plan,* using data to help inform projects with significant potential for improving water quality. Retain a pool of environmental engineering firms with qualifications that include green infrastructure projects to assist staff in designing and implementing these projects. Create mechanisms for expanding research and monitoring capacity by local universities to include adequate studying and tracking of funds as a proportion of project financing to ensure water quality improvements. Increase incentives for green infrastructure, such as green walls and roofs, for new development, substantially improved/damaged structures, and retrofitting projects to decrease pollutant runoff. In addition, each new seawall permit application should be evaluated for natural and hybrid alternatives. Review existing County regulatory process and policies as necessary to promote the installation of natural shorelines and green infrastructure consistent with protection and enhancement of Biscayne Bay.

4F. Continue to work with SFWMD and to have the State of Florida allocate the funds necessary to ensure the timely commencement of construction of the Cutler Flow Way in accordance with the project timeline in the Integrated Delivery Schedule. The County has been a significant investor of funding and resources for the Comprehensive Everglades Restoration Plan (CERP) Biscayne Bay Coastal Wetlands (BBCW) Project by providing land acquisition, staff resources, data sharing, and directly funding a portion of the costs for the redesign of the Cutler Flow Way for Phase 1 of BBCW. Funds must be allocated from the State of Florida in a timely manner to ensure commencement of construction of the Cutler Flow Way and to allow for completion and operation under the current Integrated Delivery Schedule without further delays.

4G. **Continue to advocate for funding to support the Biscayne Bay Southern Everglades Ecosystem Restoration (BBSEER) project (also known as the BBCW / C-111).** The County should continue to actively participate and coordinate as part of the Project Delivery Team during the planning process with the USACE and SFWMD and other agencies of the Program Delivery Team (PDT) to ensure that the quantity, quality, timing and distribution of water are adequate for the complete, full scale salinity restoration of the portions of the Bay proposed for restoration under the BBCW and BBSEER projects.

4H. **Establish seagrass growth and maintenance requirements** based on pollutant loading and reduction targets (nutrients, sediments/turbidity), influence of temperature and dissolved oxygen, carbon dioxide, changes in food web structure, Bay recreational use, and resulting influence on water clarity and seagrass health.

4I. **Accelerate green infrastructure solutions for flooding, resiliency and water quality** that include a review of watershed habitat restoration opportunities in repetitive loss areas and future flood hazard areas. Evaluate and allocate cost savings of Community Rating Systems (CRS) benefits into the Biscayne Bay watershed water quality restoration plan.

5. Marine Debris

Marine debris is one of the most widespread problems stressing the world's oceans, waterways, and coastlines. It can travel long distances and traverse territorial borders, and there are many difficulties in identifying its sources. There are two common sources of marine debris: the actions that take place on land (land-based sources), and the actions that take place in waterways and the marine environment (water-based sources). It is estimated that 80% of marine debris is from land-based sources. To reduce marine debris and its impacts to the stormwater system, the Task Force recommends that the County:

5A. **Create a comprehensive marine debris prevention, reduction, and removal program within DERM and adequately fund and staff the program**. The primary goal of the program would be to prevent, reduce, and remove the amount of marine debris entering Biscayne Bay and its tidal tributaries, thereby reducing the impact of marine debris on the Bay's flora and fauna while enhancing the quality of life for the County's residents and visitors. To accomplish this goal, program activities should include, at a minimum, marine debris related project planning, implementation and obtaining funding; public outreach and education; and enforcement action when necessary and appropriate. The program should establish annual targets for the prevention, reduction, and removal of marine debris entering the Bay.

5B. **Establish a marine debris working group to promote collaboration on ways to reduce marine debris**. The working group may include, but not necessarily be limited to, representatives of County, state and municipal resource agencies, including the SFWMD, law enforcement agencies, stormwater utilities, solid waste and public works departments, recreational and commercial boaters and fishers, and NGOs. Among the purposes of the working group should be to share information, coordinate efforts, and develop a plan to prevent, reduce, and remove marine debris. The plan should address marine debris emergency response and define annual targets for the prevention, reduction, and removal of marine debris entering the Bay. The marine debris working group could also make recommendations to the County and municipalities regarding policy and legislation for the prevention and reduction of marine debris.

5C. Through the Miami-Dade County Police Department, direct the Marine Patrol Unit to prioritize its commitment to the enforcement of all applicable laws having a nexus to the environmental health of the Bay and its tributaries, including but not limited to those related to fisheries, derelict and at-risk vessels, vessel marine sanitation devices, vessel speed zones, vessel groundings and mooring restrictions. The BCC should urge state and municipal marine law enforcement agencies to do the same.

5D. Conduct an analysis of marine debris in Biscayne Bay to identify primary sources of marine debris, the routes by which it is introduced into the Bay, and the areas of most significant accumulations, including within stormwater catchment basins, to guide prevention efforts and target removal.

5E. **Adopt a target maximum input level policy for trash**. Work with municipalities to decrease the amount of trash pollution entering Biscayne Bay from land-based trash sources and stormwater systems.

5F. **Evaluate the various existing stormwater outfall systems throughout the County to determine their effectiveness at preventing debris from entering Biscayne Bay**. This evaluation should include any recommendations for alternative designs and maintenance as well as any changes in policy or regulations regarding installation of stormwater outfall systems.

5G. **Identify and establish dedicated and recurring funding sources to pay for marine debris prevention and removal activities** and to use as matching funds for supplemental grant opportunities. Such sources may include, but not be limited to, vessel registration fees and stormwater utility fees.

6. Education and Outreach

Every citizen and visitor must be informed and educated about water quality impacts related to littering and pollution. They must be given ample opportunities to create a personal connection to, and responsibility for, the health of Biscayne Bay. To educate citizens and visitors, the Task Force recommends the County:

6A. **Create a multilingual, multimedia campaign and educational outreach program** to promote and improve awareness of the economic, commercial, and recreational opportunities of Biscayne Bay.

6B. **Leverage the funding in the Community Based Organization grant program to create a special focus on Biscayne Bay education**. Encourage greater coordination with local environmental education organizations, including the Environmental Education Providers, and work together with related NGOs, municipalities, agencies, public/private schools, academic institutions, environmental organizations, business organizations, and marine and tourism industry organizations to increase impact and avoid duplication of efforts.

6C. Conduct an educational campaign to inform the public on the proper and improper ways to dispose of trash and the impacts of littering and marine debris to the health and management of Biscayne Bay as recommended by the Grand Jury Report dated August 8th 2019 (Appendix D), and instructed by Resolution R-1260-19 adopted on November 11th, 2019 (Appendix O). Include promoting native landscapes and xeriscapes and education on the vulnerability of the Biscayne Aquifer and watershed to pollutants among other key topics. As part of the campaign, increase signage in public areas and include storm drain signage as adopted in Resolution R-1335-19 (Appendix P).

6D. Implement policies to reduce the amount of locally generated plastic marine debris by restricting or banning the use and/or sale of single-use plastic items at County buildings, parks, beaches, and other facilities, and at County-sponsored events.

6E. **Build upon and increase volunteer clean-up activities county-wide** to support the "Keep Miami-Dade County Beautiful" initiative with the Departments of Solid Waste Management and Parks, Recreation and Open Spaces, through "Neat Streets Miami."

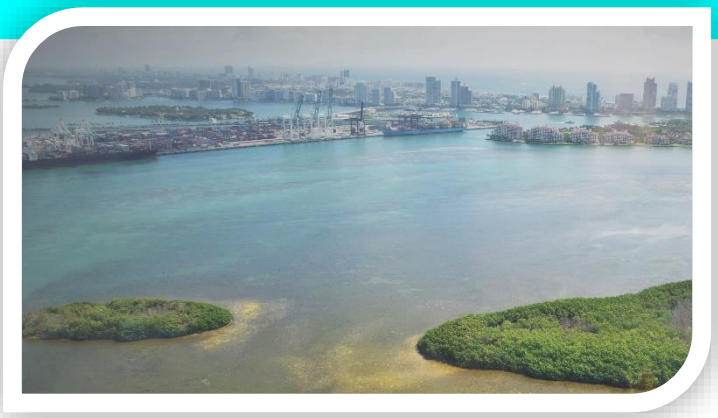
6F. **Develop environmental sustainability and "plastic free" best practices** for commercial businesses and all public events and county-owned properties. Incorporate "Leave No Trace" principles in public education campaign.

6G. **Support a "Living Laboratory for Bay Health"** in conjunction with local universities, NGOs, and private sector partners to train and inspire the next generation of scientists, eco-engineers and environmental stewards through sustainable and resilient policies and business practices. Develop partnerships with academic, business and industry associations.

6H. **Develop and implement a contractor and lawn care industry training program** for contractors that do business with the County and all MS4 co-permittees, including County and city staff. Include an educational campaign specific to the landscaping industry about proper disposal of yard waste and the detrimental water quality impacts resulting from fertilizer use.

6I. **Expand the scope of Baynanza to add year-round activities and collaborate on Biscayne Bay Marine Health Summit activities**

7. Funding



Since all governmental levels have a role in the management of the Bay, funding needs to come from all levels: federal, state, and local as well as public private partnerships. Adequate external funding will be necessary to preserve, protect and revitalize the habitat and watershed for long-term, meaningful results. To ensure funding for projects and programs, the Task Force recommends the County make water quality restoration of Biscayne Bay an annual budget priority. The Task Force also recommends that the County:

7A. Collaborate with the Miami-Dade Legislative Delegation and the Congressional Delegation to secure annually appropriated funds to support Biscayne Bay watershed restoration, possibly through mechanisms such as legislative budget requests that may include support for a National Estuary Program and other programs that support the Biscayne Bay-based economy and quality of life in Southeast Florida.

7B. Immediately engage in the legislative process to designate a Biscayne Bay License Plate drawing from regional examples of related, successful specialty plates for Indian River Lagoon and the Tampa Bay Estuary. Funds from the sale of the license plate should benefit habitat restoration, pollution prevention and environmental education initiatives.

7C. Immediately enter into a cost-share partnership with SFWMD which has allocated funds to update the 2005 Biscayne Bay Economic Study. The purpose of the Biscayne Bay Economic Study 2019 Update is to estimate the economic contribution of the Bay from 2005 to 2019 as it is used for real estate development, recreation, shipping, cruising, commercial fishing and to update the recreational uses and intensity of use of Biscayne Bay. The study will employ the same methodology as was used in the original 2005 Biscayne Bay Economic Study that evaluated the Bay's economic contribution from 1980 to 2004 so that comparisons may be made.

7D. Collaborate with Florida Inland Navigational District (FIND) to immediately identify projects that will improve water quality and restoration of the Biscayne Bay watershed.

7E. **Leverage municipal financial resources through interlocal agreements to supplement County funds** in order to accelerate projects that improve the water quality of Biscayne Bay.

7F. Develop a mechanism to collaborate with municipalities and work with the development community to enhance development rights in exchange for substantial capital investments in protecting Biscayne Bay.

7G. Direct the preparation of a report of potential funding sources by the Office of Management and Budget and the Office of Intergovernmental Affairs that would potentially be used for long-term support of the restoration of Biscayne Bay. The report should include a review of the following~~:~~

- All Stormwater utilities - fees for stormwater infrastructure. The County should consider working with the cities to agree to adopt the BBMP;
- Evaluate existing revenues to determine if they are adequate to update their stormwater infrastructure to improve water quality;
- Evaluate and engage in community-based partnerships and public-private partnerships
- Senate Bill 712 (Appendix K)– analyze the matching grant program to upgrade septic systems or hook a septic tank to a municipal sewage system;
- Evaluate potential of a voluntary contribution on WASD or municipal stormwater bills would be revenue positive, and add a voluntary contribution to fund priority septic conversions and elimination of direct stormwater outfalls
- Explore other grant programs to help upgrade outdated municipal sewage treatment plants;
- NOAA marine debris grant funding;
- Bond program for Biscayne Bay funding;
- EPA urban water program;
- Future FDEP funding for septic system upgrades and/or conversion to sewer;
- PACE program funding;
- Water quality trading;
- Mitigation credits

The Future of the Bay

The decline of the Biscayne Bay ecosystem will persist long after our community recovers from the crisis brought on by the COVID-19 pandemic. The Bay faces a multitude of complex problems impacting water quality throughout the watershed. As water quality declines and we lose seagrasses and document degradation of other habitats, the health and resilience of the Bay and our beaches will continue to decline, impacting tourism, recreational and commercial fishing, and boating. Losing the jewel that is Biscayne Bay could severely affect our tourism-driven economy and depreciate waterfront property values.

Local and regional canals drain into Biscayne Bay, bringing pollution from stormwater runoff, sewage pipe breaks, compromised septic tanks, plastic, marine debris, and other contaminants. Furthermore, the channelization of our waterways has led to a lack of historic freshwater flows that have contributed to changes in the Bay ecosystem.

As our region grows and welcomes new residents and visitors, pollution prevention will be critical to improving water quality in the watershed and Biscayne Bay. However, through a unified, coordinated approach to improving water quality in the short and long-term, we can ensure the recovery and preservation of Biscayne Bay for its ecological functions, economic importance, and natural splendor.

The Task Force believes many long-term solutions to improve and manage water quality resides in the upland watershed and will require collaboration and partnership with the State of Florida,

Miami-Dade County, municipalities, and the private sector. Many of the solutions provide opportunities for stimulating our economy post-pandemic.

Land-use changes, behavioral changes, and infrastructure improvements can prevent pollution from reaching our waterways and the Bay. Locally, we must re-examine our County budget and municipal budgets to prioritize projects to advance our pollution reduction goals. At the same time, we must continue to advocate for funding at the state and federal levels. Sustained funding sources at every level will be critical to implement the recommendations in this report and to advance future guidance from the Water Management Board.

The creation of a permanent governing entity and the appointment of a Chief Bay Officer by the Mayor will provide the coordination and needed oversight of the Bay and act as the mechanism for addressing the short and long-term issues that lie ahead. Making the Bay's health a priority now and providing additional staff, resources, and expertise will bolster our economy and increase the long-term resilience of Biscayne Bay for our families, visitors, and future generations living, working, and playing in Miami-Dade County.

Appendices

Appendix A- Resolution R-165-19 creating the Biscayne Bay Task Force

Appendix B - Miami-Dade County Report on the Decline of Seagrasses and Hardbottom (February 2019)

Appendix C – NOAA Report on Trends in Chlorophyll and Biscayne Bay Increasing in Nutrients

Appendix D- Miami-Dade State Attorney Grand Jury Report on the Health of Biscayne Bay

Appendix E- Historical Biscayne Bay Management Planning Documents

Appendix F- Additional Submissions to Biscayne Bay Task Force

Appendix G- Biscayne Bay is dying, Miami's economy will die with it if we don't come to the rescue, Op-Ed by Irela Bagué, Miami Herald

Appendix H- Biscayne Bay-related Resolutions of the Miami-Dade County Commission

Appendix I- Presentations and Speakers received by Biscayne Bay Task Force

Biscayne Bay Task Force Presentations				
Meeting	***BBTF Meeting Date***	***Title/Subject***	***Presenter(s) Name and Title***	***Affiliation***
#1	Monday, June 15, 2019	*Miami-Dade County Commission on Ethics*	Robert Thompson, Community Affairs Specialist	Miami-Dade County COE
#2	Monday, July 15, 2019	DERM-RER Natural Resources Programs Overview	Lisa Spadafina, Chief, RER-DERM Natural Resources Division	Miami-Dade County RER-DERM
		Biscayne Bay Water Quality and Seagrass Report Summary	Pamela Sweeney, Manager, RER_DERM Restoration and Enhancement Section	Miami-Dade County RER-DERM
		Biscayne Bay Habitat Restoration and Enhancement Program	Josh Mahoney, ERPS, RER-DERM Restoration and Enhancement Section	Miami-Dade County RER-DERM
		Septic Tank Vulnerability to Sea Level Rise Report	Virginia Walsh,P.G., Ph.D., Chief Hydrology Section	Miami-Dade County Water and Sewer Department
#3	Monday, July 29, 2019	Resilience and Sea Level Rise Strategy	James Murley, Chief Resilience Officer	Miami-Dade County RER- Office of Resilience
		Stormwater Regulatory- DERM Water Control Section	Maria Molina, P.E. RER-DERM Water Control Section	Miami-Dade County RER-DERM
		Managing Stormwater…The Miami-Dade County Experience	Marina Blanco-Pape. P.E., Chief, RER-DERM Water Management Division	Miami-Dade County RER-DERM
		Marine Debris Removal: DERM Coastal Resources Section	John Ricisak, ERPS, RER-DERM	Miami-Dade County RER-DERM
		Volunteer Clean Up Organization	Dave Doebler , Co-founder	VolunteerCleanup .org
#4	Monday, August 12, 2019	RER-DERM Water and Wastewater	Carlos Hernandez, P.E. Chief, RER-DERM Water and Waster Water Division	Miami-Dade County RER-DERM
#5	Monday, August 26, 2019	Miami-Dade County Land Use Changes	Kimberly Brown, AICP, Supervisor Planning Section,	Miami-Dade County RER-Planning Division
		Miami-Dade WASD Consent Decree Program	Lynnette Ramirez, P.E. Senior Advisor Capital Projects and Compliance	Miami-Dade County Water and Sewer Department
		Miami-Dade WASD Capital Improvements and Operations	Dr. Douglas Yoder, Deputy Director for Operations	Miami-Dade County Water and Sewer Department
#6	Monday, September 9, 2019	The Role of Municipalities in Protecting Biscayne Bay: Miami Beach Rising Above	Susanne Torriente, Assistant City Manager, Margarita Kruyff, Assistant Director, Environment & Sustainability Department, Roy Coley, Public Works Director, Eric Carpenter, Assistant City Manager	City of Miami Beach
#7	Wednesday, October 2, 2019	Water Management in the City of Miami	Alan Dodd, P.E. Director Resilience and Public Works	City of Miami
		Biscayne Bay Task Force: What's Killing the Bay?	Rachel Silverstein, Ph.D., Executive Director	Miami Waterkeeper
#8	Tuesday, October 15, 2019	RER-DERM Environmental Monitoring & Restoration Division	Wilbur Mayorga, P.E., Senior Division Chief	Miami-Dade County RER-DERM
		Macroalgae in Biscayne Bay Different Issues, Causes, and Challenges	Dr. Ligia Collado-Vides, Senior Lecturer, Florida International University	Florida International University
		Water Quality of Biscayne Bay	Dr. Henry O. Briceno, Professor, Florida International University	Institute of Water and Environment, Southeast Environmental Research Center, FIU.
#9	Monday, October 28, 2019	Restoration Alternatives to TMDLs	Julie Espy, Program Administrator	Florida Department of Environmental Protection
		Biscayne Bay Aquatic Preserves	Laura Eldredge, Manager, BBAP	Florida Department of Environmental Protection
#10	Monday, November 18, 2019	The Formation of the Tampa Bay Estuary Program & Recovery of Tampa Bay	Ed Sherwood, Executive Director	Tampa Bay Estuary Program
		Biscayne Bay Habitat Focus Area	Joan Browder, Ph. D.	NOAA National Marine Fisheries Science Center

Appendix I- Presentations and Speakers received by Biscayne Bay Task Force, con't.

#11	Monday, December 2, 2019	Biscayne Bay Marine Health Summit	Luiz Rodrigues, Founder and Coordinator	Biscayne Bay Marine Health Summit
#12	Monday, January 13, 2020	SFWMD: Operations of C&SF Water Control Structures Discharging to Biscayne Bay	Matahel Ansar, Ph.D., P.E. Section Chief	SFWMD Applied Hydraulics Section, Hydrology & Hydraulics Bureau
		Biscayne Bay Water Quality: SWIM Plan to CERP	Lawrence Glenn, Director	SFWMD Water Resources Division
		Port Of Miami	Becky Hope, Chief of Planning and Property Development	Port of Miami
#13	Monday, January 27, 2020	WASD Sanitary Sewer System Performance & Asset Management	Jose Cueto, Assistant Director	Miami-Dade County Water & Sewer Department
		Coral Gables: Sustainability & Resiliency	Matt Anderson, Senior Sustainability Analyst and Jorge Acevedo, P.E. Utilities & ROW Division Chief	City of Coral Gables
		Coral Gables Tidal, Wetland and Water Quality Monitoring Project	Tiffany Troxler, Ph.D.	FIU Center for Aquatic Chemistry and Environment
		NOAA Biscayne Bay Water Quality Trends	Dr. Christopher Kelble, Oceanographer	NOAA Atlantic Oceanographic and Meteorological Laboratory Ocean Chemistry & Ecosystems Division
#14	Monday, February 10, 2020	FPL- Turley Point	Wilbur Mayorga, P.E. Senior Division Chief, Environmental Monitoring & Restoration Division	Miami-Dade County RER-DERM
		Biscayne Bay Shoreline Development Review Committee	Gilbert Blanco, Supervisor-LEED AP, and Maria Cedeno, Principle Planner- SDRC Coordinator	Miami-Dade County RER-Development Services Division

Appendix J- Proposed Organizational Structure of Water Management Board Illustrating the Relationships Between Entities

- MDC Board of County Commissioners (BCC): Receives reports from WMB for progress updates, requests for funding through contracts, grants and disbursements, requests to collaborate, etc.
- Biscayne Bay Watershed Management Board (WMB): Comprised of 11 members outlined in 2A of the *Governance* section, the WMB will serve as a clearinghouse for the technical and community outreach work. Members will have experience with issues related to Biscayne Bay and are expected to leverage the professional and financial resources of their respective organizations to effect goals of the Watershed Restoration Plan.
- Chief Bay Officer (CBO): The CBO will advise the Miami-Dade County Mayor and the BCC and manage the WMB and its committees. The CBO will also act as liaison with County departments, County boards, external agencies, stakeholder groups, and local, state, and federal governments on water quality issues, policies and appropriations related to the health and recovery of Biscayne Bay.
- Biscayne Bay Watershed Restoration Plan (WRP): WMB will, with technical and community recommendations, review, recommend funding for and implement the Watershed Restoration Plan (WRP) to achieve time-bound and measurable progress towards WRP goals to achieve water quality and seagrass restoration and meet its mandate of Bay health, recovery, and resilience. The WMB should establish and appoint committees to address specific Bay issues to advise and make recommendations on policies, restoration projects, public information campaigns and water quality monitoring and targets:
- Technical Advisory Committee: Will serve as the technical experts to address those issues outlined in the restoration plan and are expected to conduct work that will include but not be limited to engaging with outside experts as needed, design and implement special studies, research and propose innovative designs, standards, and best management practices. Sub-committees may be created and chaired as designated by the Chief Bay Officer or County leadership. This committee communicates with other committees and sub-committees as needed.
- Community Advisory Committee: Will serve to implement the education and outreach restoration goals and objectives and will be comprised of members of the community as designated by the WMB or Chief Bay Officer. This committee communicates with other committees and sub-committees as needed.
- Nutrient Reduction Committee: Will serve as the technical experts whose mission is specific to the identification (i.e., load, fate, and transport) and reduction of pollutant loading into surface waters of the County. This committee communicates with other committees and sub-committees as needed.

Appendix K- Senate Bill 712 – Clean Waterways Act

Appendix L- Miami-Dade County Report on Septic Systems Vulnerable to Sea Level Rise

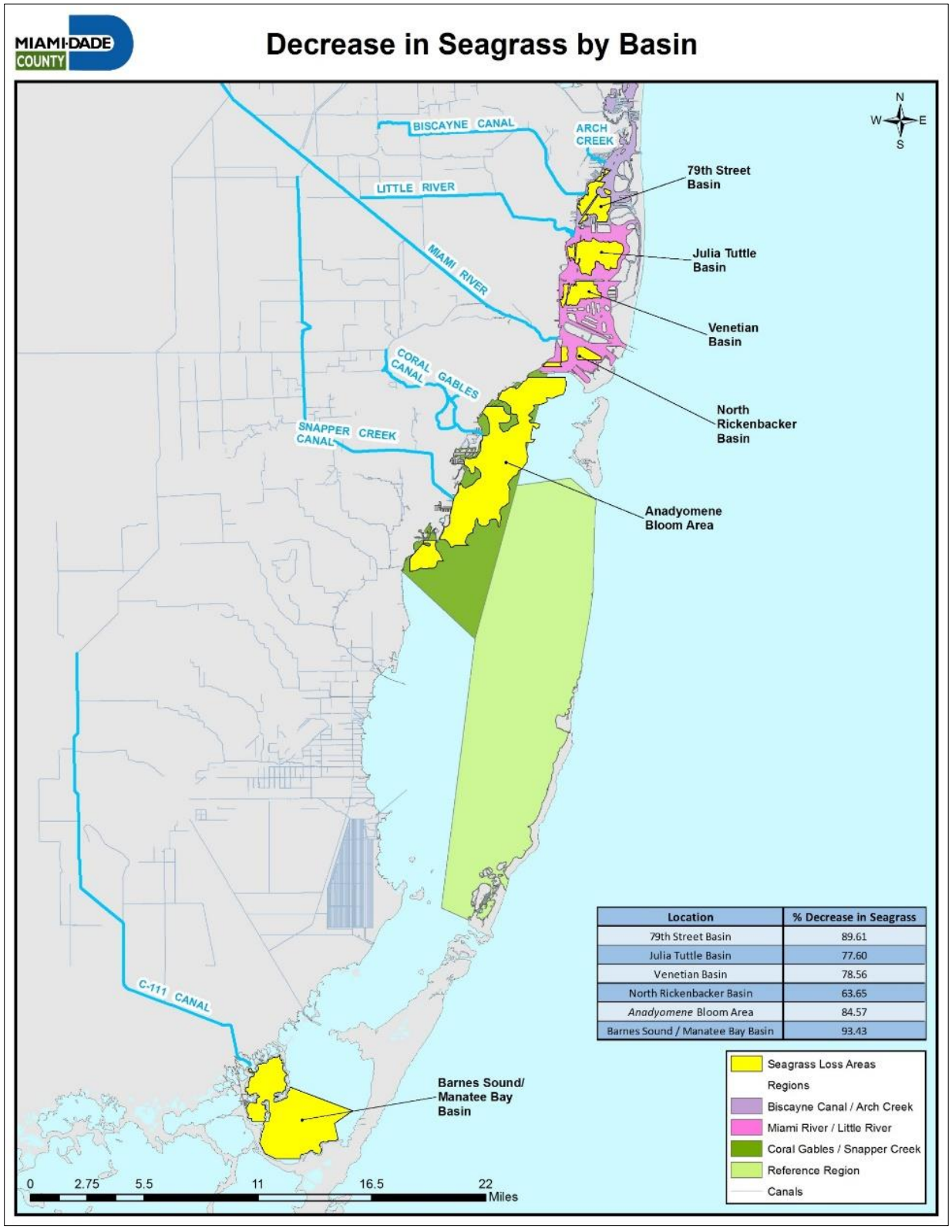
Appendix M- American Society of Civil Engineers (ASCE) Standards 38-02

Appendix N- Miami-Dade County Parks and Open Spaces Master Plan

Appendix O- Resolution R-1260-19 - Creating an Educational Campaign Related to Proper Disposal of Trash

Appendix P- Resolution R-1335-19 - Design and Place Signage to Education the Public about Proper Disposal of Trash and the Impact of Littering on Biscayne Bay

Appendix Q- Seagrass Loss by Basin - 2019



Biscayne Bay Recovery At-a-Glance

Action Type	
	Actions that can be accomplished administratively within the County
	Actions that require additional policy considerations
	Actions that require further collaboration at the municipal, state, or federal level

Benchmark	
Immediate (I)	Less than one year
Short-Term (S)	Between one and three years
Mid-Term (M)	Greater than three years

WATER QUALITY		
1A	Establish science-based, pollutant load reduction goals and interim targets	Short-Term (S)
1B	Develop, implement, and continuously monitor and demonstrate progress toward meeting 1A's pollutant load reduction goals and interim targets	Short-Term (S)
1C	Activate additional Department of Regulatory and Economic Resources' (RER) resource management functions	Immediate (I)
1D	County should conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments	Immediate (I)
1E	Review, develop (as needed), implement and enforce local ordinances and policies to attain pollution load reduction goals set forth in the Watershed Restoration Plan (WRP)	Short-Term (S)
1F	Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research coordination and data management infrastructure	Immediate (I)
1G	Undertake and secure funding for new pilot projects and research projects focused on reducing pollutant loads	Immediate (I)
1H	Elevate and further amend the Comprehensive Develop Master Plan (CDMP) to further include Biscayne Bay watershed management planning elements	Mid-Term (M)
1I	Conduct a climate change vulnerability assessment for Biscayne Bay	Short-Term (S)
1J	Initiate and fund studies that illuminate specific knowledge gaps for application toward watershed restoration	Immediate (I)
1K	Pass a county-wide fertilizer ordinance	Short-Term (S)
1L	Increase compliance of all marinas and commercial operations along waterways	Immediate (I)
1M	Continue to monitor the progress of the October 7th, 2015 Consent Agreement between FP&L and Miami-Dade County	Immediate (I)
GOVERNANCE		
2A	Establish by ordinance a Biscayne Bay Watershed Management Board (WMB)	Immediate (I)
2B	The Mayor should appoint a Chief Bay Officer (CBO) and request funding for the position	Immediate (I)
2C	The WMB will, with technical and community recommendations, review, recommend funding for and implement the Watershed Restoration Plan (WRP)	Short-Term (S)
2D	Develop a formal partnership in the form of a Memorandum of Understanding (MOU) with the SFWMD	Immediate (I)
2E	Enable the alignment and coordination of County departments that takes a holistic, comprehensive approach to Biscayne Bay recovery and resilience	Immediate (I)
2F	Develop a formal partnership in the form of a Memorandum of Understanding (MOU) with the Miami River Commission	Immediate (I)
INFRASTRUCTURE		
3A	Increase compliance with existing laws to result in the immediate connection of ~12,000 properties to the sewer system	Short-Term (S)
3B	Develop and enforce septic system design criteria with design parameters	Short-Term (S)
3C	Initiate a mandatory septic system registration and inspection program	Mid-Term (M)
3D	Undertake immediate efforts to identify and eliminate all root causes of Sanitary Sewer Overflows (SSO) including inflow and infiltration. Accelerate sewer infrastructure maintenance and upgrades	Short-Term (S)
3E	Develop and expedite a Condition Assessment and Asset Management Action Plan to document the condition of the County's wastewater system assets and certify all historical "As Builts" and/or those not already certified with a focus on identifying horizontal and vertical locations of main wastewater transmission lines	Short-Term (S)
3F	Enforce the existing code and update the stormwater design criteria to improve effectiveness and include advances in stormwater treatment technologies	Short-Term (S)
3G	Develop a plan to prioritize the retrofitting of stormwater infrastructure within basins with the most substantial water quality and/or habitat degradation issues	Short-Term (S)
3H	Eliminate direct and indirect stormwater discharges to Biscayne Bay	Mid-Term (M)
3I	Set policy that all As-Builts/Record Drawings are done and certified by a Florida Professional Surveyor and Mapper qualified and registered to do work in Miami-Dade County	Short-Term (S)
3J	Set policy to require during the design phase of future construction that all existing utilities are designated and located vertically and horizontally	Short-Term (S)
3K	Ensure that new infrastructure projects to address coastal flooding and storm surge that are cost-shared by the County adhere to the recommendations of this Task Force and prioritize Biscayne Bay health and resilience	Short-Term (S)

Biscayne Bay Recovery At-a-Glance, con't.

WATERSHED HABITAT RESTORATION AND NATURAL INFRASTRUCTURE		
4A	Develop ecologically acceptable living shoreline design options that are consistent with the existing Biscayne Bay Aquatic Preserve Act	Immediate (I)
4B	Raise awareness of the value of mangroves through a homeowner education campaign	Short-Term (S)
4C	Increase enforcement of existing rules for protecting existing mangroves and mangrove shorelines	Short-Term (S)
4D	Identify vulnerable properties along the coastline and partner with municipalities to focus on public properties and private property owners to create a voluntary Mangrove Protection and Restoration Zone Program	Short-Term (S)
4E	Prioritize existing and identify new green and blue infrastructure approaches and restoration projects	Immediate (I)
4F	Continue to work with SFWMD and to have the State of Florida allocate the funds necessary to ensure the timely commencement of construction of the Cutler Flow Way in accordance with the project timeline in the Integrated Delivery Schedule	Immediate (I)
4G	Continue to advocate for funding to support the Biscayne Bay Southern Everglades Ecosystem Restoration (BBSEER) project (also known as the BBCW / C-111)	Mid-Term (M)
4H	Establish seagrass targets and maintenance requirements	Short-Term (S)
4I	Accelerate green infrastructure solutions for flooding, resiliency, and water quality	Short-Term (S)
MARINE DEBRIS		
5A	Create a comprehensive marine debris prevention, reduction, and removal program within DERM and to adequately fund and staff the program	Short-Term (S)
5B	Establish a marine debris working group to promote collaboration on ways to reduce marine debris	Short-Term (S)
5C	Through the Miami-Dade County Police Department, direct the Marine Patrol Unit to prioritize its commitment to the enforcement of all applicable laws having a nexus to the environmental health of the Bay and its tributaries	Short-Term (S)
5D	Conduct an analysis of marine debris in Biscayne Bay	Short-Term (S)
5E	Adopt a target maximum input level policy for trash	Short-Term (S)
5F	Evaluate the various existing stormwater outfall systems throughout the county to determine their effectiveness at preventing debris from entering Biscayne Bay	Mid-Term (M)
5G	Identify and establish dedicated and recurring funding sources to pay for marine debris prevention and removal activities	Immediate (I)
EDUCATION AND OUTREACH		
6A	Create a multi-lingual, multi-media campaign and educational outreach program	Immediate (I)
6B	Leverage the funding in the Community Based Organization grant program to create a special focus on Biscayne Bay education	Short-Term (S)
6C	Conduct an educational campaign to inform the public on the proper and improper ways to dispose of trash and the impacts of littering and marine debris to the health and management of Biscayne Bay	Immediate (I)
6D	Implement policies to reduce the amount of locally generated plastic marine debris	Short-Term (S)
6E	Build upon and increase volunteer clean-up activities county-wide	Immediate (I)
6F	Develop environmental sustainability and "plastic free" best practices	Short-Term (S)
6G	Support a "Living Laboratory for Bay Health"	Short-Term (S)
6H	Develop and implement a contractor and lawn care industry training program	Short-Term (S)
6I	Expand the scope of Baynanza to add year-round activities and collaborate on Biscayne Bay Marine Health Summit activities	Immediate (I)
FUNDING		
7A	Collaborate with the Miami-Dade Legislative Delegation and the Congressional Delegation to secure annually appropriated funds to support Biscayne Bay watershed restoration	Immediate (I)
7B	Immediately engage in the legislative process to designate a Biscayne Bay License Plate	Immediate (I)
7C	Immediately enter into a cost-share partnership with SFWMD	Immediate (I)
7D	Collaborate with Florida Inland Navigational District (FIND) to immediately identify projects that will improve water quality and restoration of the Biscayne Bay watershed	Immediate (I)
7E	Leverage municipal financial resources through interlocal agreements to supplement County funds	Short-Term (S)
7F	Develop a mechanism to collaborate with municipalities and work with the development community	Short-Term (S)
7G	Direct the preparation of a report of potential funding sources by the Office of Management and Budget and the Office of Intergovernmental Affairs	Immediate (I)