



RESILIENT MARTIN

COUNTY PROJECTS UPDATE



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“Resiliency plans can provide a roadmap for localities to strengthen physical and societal infrastructures so they can continue to function and thrive as centers of production, sources of essential services and equitable communities despite short and long-term challenges.”
ResilientVirginia.org

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RESILIENT MARTIN

INTRODUCTION & PROGRAM UPDATE



This report marks the first comprehensive review of Martin County's progress toward the goal of increased community resilience in the face of challenges brought about by a changing climate. This report will provide a summary of recent County projects that have contributed to this goal. The projects contained in this document highlight how adaptation to achieve resilience has been, and continues to be, a steady component of the County's endeavors and accomplishments. Annual updates to this report will document the County's continual commitment to resilience.

Since 2017, the County's Resilient Martin (RM) program has made significant headway in the pursuit of building community resilience by hitting foundational milestones. The RM Sea Level Rise (SLR) Impact & Analysis Report (RM Report), completed between 2018 and 2020, provided a solid base to support a growing program. The RM Report summarized the extensive and detailed analyses performed to identify the County's vulnerability to SLR and suggested adaptive measures available to address these threats from a changing climate. Projects implementing these recommendations will build a healthier and more resilient community.

The goal of the RM program is to address future environmental conditions and the resulting threats to both the natural and the built environment with a coordinated multidisciplinary approach. To do this, the RM staff facilitates regular internal staff communications that foster a unified understanding of and response to the many resilience challenges confronted by the County. As we move forward, this improved communication will maintain a collaborative approach to expected future conditions. As part of this internal process, an inventory of current and prior projects was created. The resulting catalog of projects clearly shows that the county has been incorporating elements of resilience for many years. The information gained from these prior County adaptation projects will help guide the RM program moving forward.

The RM program has also begun to expand and encompass additional challenges such as increased heat and greenhouse gas emissions that fall under the wider umbrella of community resilience. Although focused on sea level rise, the SLR report acknowledges these multiple threats posed by climate change along with the complex synergy between them (as happens when coastal flooding from a rain event is exacerbated by higher-than-normal tides). The report also recognizes that such threats will continue to expose the community to new vulnerabilities in the future.

Looking first at the RM team specifically, the following are some of the recent accomplishments/efforts:

- Applied for and received grant funding from the Florida Department of Environmental Protection (FDEP) Resilient Florida Grant Program for four construction projects (Stormwater Backflow Preventer Installation Program, Twin Rivers Erosion Project, Golden Gate Stormwater Treatment Area (STA) North Outfall Flood Mitigation Project, Indian RiverSide Park Living Shoreline Phase 2, and one planning grant (Update & Compliance of Vulnerability Assessment).
- Incorporated flood risk factors into Capital Improvement Projects process
- Assisted Field Operations with design of outreach materials for two flood prone areas (Mockingbird Lane and Merritt Way).
- Participated in planning and execution of a NOAA 2022 Social Coast Forum focusing the social dimensions of resilience planning.
- Participated in panel discussion at the Treasure Coast Regional Planning Council and South Florida Regional Planning Council joint spring meeting on regional resilience efforts.
- Continued development of outreach efforts with consultants including identification of more local stakeholders and the release of a climate change survey to the public.
- Attended the Tampa Bay Regional Resiliency Leadership Summit in April 2022.
- Managed the Waterfront Parks Condition Assessment project executed by Taylor Engineering.

And below are examples of ongoing RM efforts:

- Continuing of intra-county discussions regarding sustainability and resilience and integration with past, current, and future projects.
- Initiating a water level sensor network to monitor areas prone to flooding.
- Continuing the *Monitoring the Influence of Land Based Sources of Pollution within the St. Lucie Estuary and Indian River Lagoon to Inform Coral Reef Management* project, which is funded by the Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP).
- Assisting the development of the Ecosystem Restoration Management Division's seagrass restoration program
- Actively commenting on other state/local resilience planning documents and legislation
- Planning with Palm Beach County and Florida International University (FIU) to participate FIU's Sea Level Citizen Science King Tide Monitoring network to start local monitoring in the fall of 2022.
- Advancing the RM outreach program by partnering with internal and external partners

- Updating the County’s vulnerability assessment to meet new state standards
- Preparing multiple implementation grant applications to the Resilient Florida program

As stated, the intra-agency coordination and communication has revealed the ongoing County engagement in adaptation projects that strengthen the County’s resilience to climate change. The following pages will highlight examples of these County projects that play a variety of roles in building resilience.

RESILIENCE IN ACTION

COUNTY PROJECT HIGHLIGHTS



The Resilient Martin program officially started 2017, but adaptation to changing environmental conditions has been a component of project planning since the early 2000s.

The County has been strategically tackling the impacts of flooding and storms through the implementation of a variety of projects. From improving drainage on MacArthur Boulevard, elevating homes in St. Lucie Settlement, restoring and enhancing evacuation routes, to home acquisition in Hobe Heights, the concepts of vulnerability identification and adaptation are not new to Martin County.

The following projects exemplify the diverse strategies employed by the County in building community resilience. From energy efficiency to clean drinking water and green infrastructure, the County’s integrative path to resilience is a leading example in the state of Florida.

 **In Design**
 **In Construction**
 **On-Going**
 **Completed**

Office of Tourism: Resilient Local Economies



The Tourism & Marketing team fostered community economic resiliency during COVID-19 by creating a Digital Marketing Training Program to help local tourism-dependent businesses navigate the ever-evolving digital marketing landscape and sharpen their marketing skills. Over 60 businesses registered for the free program and participants who completed all four trainings received \$500 in advertising funds to help develop new campaigns for their businesses.

Metropolitan Planning Organization(MPO): Resilience Vulnerability



The vision of Martin MPO is to create and maintain a safe, efficient, and resilient multimodal transportation network to meet the needs of residents. In pursuing a vision of resilience, the MPO, and consultant Kimley-Horn and Associates, are currently conducting a vulnerability assessment that addresses the different threats that a changing climate is having, and will have, on our critical transportation networks.

Utilities: Connect to Protect



Martin County's initiative, Connect to Protect, aims to connect residential properties currently on septic systems to the County's wastewater collection and treatment system. This contributes to the resiliency of our lagoon and offshore reefs by decreasing the amount of contaminants that make it into our waterways. This effort also decreases the contaminants that contribute to harmful algal blooms that are highly detrimental to our local ecosystems and economy.

Utilities: Tropical Farms Water Plant



Tropical Farms Water Plant is one of two water plants in Martin County that is constantly striving to use forward thinking approaches to supply safe drinking water. The plant strategically treats the more mineralized waters of the Floridan aquifer, considered an alternative source, to conserve the shallow surficial water source for the future.

Parks and Recreation: Justin Wilson Ball Field Raising



Considering future conditions, the Parks and Recreation Department added 3,461.44 tons of fill to elevate the grade of the Justin Wilson Ball Field to improve drainage. High water table and increased precipitation caused frequent flooding of the park.

Parks and Recreation/Public Works: Waterfront Parks Assessment



Parks and Recreation and Public Works teamed up with Taylor Engineering, Inc. to develop a catalog documenting the current conditions and capital improvement needs at non-beachfront waterfront parks exposed to rising sea levels and increased storm activity. The County's intent is to use this catalog to support budget planning, project prioritization, and to develop and approach to maintain or improve existing waterfront structures and shorelines.

General Services: Energy Savings & Efficiency



Martin County has completed several major energy projects and continues to employ energy saving efforts county wide. An example is the replacement of A/C units throughout the county buildings. This project has significantly contributed to energy savings and avoided carbon emissions. The 1,114 tons of A/C units replaced since 2014 has resulted in 21, 887, 554 kWh avoided of electricity costs and 71, 164 metric tons of avoided CO₂ emissions equivalent.

Public Works: Indian Riverside Park Hybrid Living Shoreline Project



Phase 1 was accomplished with completion of preliminary environmental assessments and project design. This project includes the construction of offshore limestone breakwaters, enhancement of the existing living shoreline and will provide robust protection to the Tuckahoe Mansion, historic shell midden and existing nearshore habitats including oysters and mangroves.

Public Works: Jensen Beach Impoundment (JBI) Hydrological Restoration



During Hurricane Irma, over 50-acres of primarily red mangrove habitat was lost in the JBI due to high water levels and poor water circulation. In response, the county has secured funding to improve water flow in and out of the impoundment by installing four (4) new culvert connections (drainpipes) to the Indian River Lagoon and dredging the existing channels.

Public Works: Culpepper Ranch Restoration



Eradication of exotic species, removal of berms allowing water flow and installing control structures on culverts that over drain wetlands, are all efforts towards restoring the wetland ecosystems of Culpepper Ranch. The restoration of this property is part of a large picture to help restore natural water flow to the Loxahatchee River that is threatened by saltwater intrusion.

Public Works: Mockingbird Lane



Mockingbird Lane experiences recurring flooding events (>20 days per year) during seasonal Perigean tides and storms due to low elevation. The County has received a Federal Hazard Mitigation Grant to address this and is applying for additional funds through the Resilient Florida grants Program. The County will work with contractors to develop different options to address the flooding and to present to the community for review.

Public Works: Water Quality Monitoring for Resilient Ecosystems



To reduce nutrients and achieve Total Maximum Daily Loads (TMDLs), the Ecosystem Restoration and Management Division is actively monitoring water quality in a selection of canals and storm water treatment areas (STAs) throughout the County. Data collected is an important tool to evaluate success of past projects and to identify need for future projects. Information gathered drives an ever-evolving adaptive management process and helps to maximize success to achieve these goals.

Public Works: Golden Gate Stormwater Treatment Area (STA)



Currently, tidal backflow in the STA's north outfall canal results in storage reduction. To address this, the county will construct a new weir structure to protect this outfall as well as restore portions of the outfall canal utilizing nature-based solutions for erosion control and water quality. The overall goal of this project is to reduce saltwater intrusion within the STA, increase stormwater storage capacity, and improve water quality within the basins associated with this outfall.

Public Works: Seagrass Restoration Pilot Project



Photo: FDEP

The health and functioning of the habitats in the Indian River Lagoon (IRL) are intimately tied to the economic resilience, community health and vitality of Martin County. In response to the progressive and devastating loss of seagrass throughout the IRL, Public Works is preparing a pilot study and restoration program to investigate effective ways to restore seagrass considering local conditions and water quality.

Public Works: Hobe Heights Land Acquisition and Drainage Outfalls



This area of Hobe Heights experiences chronic flooding and poor drainage. The County has had to use labor intensive temporary portable pumps to avoid damage to homes and infrastructure during flooding events. The County will be using FEMA HMGP funds to purchase, demolish and restore green areas to thirteen properties at the lowest elevations. This is an example of employing green infrastructure methods to return natural filtration functions to help reduce the impacts of flooding.

Kubin Ave Stormwater Management Project

Plant Schedule

Pink Muhly Grass



Cord Grass



Firebush



Thryallis



Clusia



Bahia Sod



Bioswales

"Bioswales are storm water runoff conveyance systems that provide an alternative to storm sewers. They can absorb low flows or carry runoff from heavy rains to storm sewer inlets or directly to surface waters. Bioswales improve water quality by infiltrating the first flush of storm water runoff and filtering the large storm flows they convey".
-Natural Resources Conservation Services

Project Area



Concept



CRA/Public Works: Rio Bioswale Rehab



Exemplifying the usage of green infrastructure, the Kubin Ave drainage enhancement project consisted of improving drainage along the street with improved swales and a drainage pipe. Phase two of this project aims to construct a bio-swale to assist with water treatment, improve water quality, and increase stormwater capacity before discharging to the St. Lucie River.

Public Works: MacArthur Boulevard



MacArthur Blvd. and Bathtub Beach experience excessive erosion and flooding due to rising seas and stronger storms. Significant wave energy on the beach cause dune erosion leaving no buffer between the volatile sea and the parking lot, sidewalks, utilities, and the roadway. In fact, severe erosion has resulted in the protective dune systems' total loss on many occasions, the complete flooding of the road and loss of park amenities. The goal of the MacArthur Blvd. Project is to protect the park and the roadway and to eliminate the need for costly emergency sand placement activities. The county will do this by stabilizing the shoreline, elevating the roadway, and constructing a hidden sheet-pile wall. This project is partially funded through the Federal Emergency Management Administration's Hazard Mitigation Grant Program.

These projects are a just a few examples of many that are included in the County's resilience project catalogue. This effort has enabled staff to have cross department dialogue regarding what community resilience is and how it relates to County projects now and into the future. The cascading impacts of climate challenges will demand collaboration and innovative approaches to deal with predicted future conditions and to address the specific needs of the community. Tracking the County's resilience activities has several benefits:

- Promote and maintain Intra-agency communication and collaboration regarding community sustainability and resilience planning moving forward
- Promote consistency in resiliency concepts
- Aid in project identification for grant opportunities and any state/federal planning needs
- Establish a database that will inform a County Resilience Plan



BY THE NUMBERS



8 GRANTS AWARDED TOTALLING \$3,556,458

425 ACRES OF STORMWATER TREATMENT AREA &
WETLAND DETENTION AREAS

27 REUSABLE WATER BOTTLE FILLING UNITS INSTALLED
ACROSS MARTIN COUNTY PARKS

5 MARTIN TRANSIT ROUTES TO OFFER ALTERNATIVE
TRANSPORTATION & REDUCE CARBON FOOTPRINT

52,613 TOTAL METRIC TONS OF CO2 EQUIVALENT
SAVED THROUGH MARTIN COUNTY'S ENERGY
PROGRAM WITH TRANE

2 HYBRID VEHICLES IN THE MARTIN COUNTY FLEET

4,000 ACRES OF WETLAND DOMINATED HABITATS
RESTORED AT CULPEPPER RANCH

ENERGY UPDATE



Energy savings projects, in collaboration with TRANE technologies, provide the County with detailed data on the energy saved over time. Below are the most recent values produced through the County’s energy savings programs and projects.

Programs:

- 1- General Services Project (completed 2009)
- 2-Parks Sports Lighting (completed 2012)
- 3-Jail (completed 2020, *Construction period savings and first year guarantee reporting in process*)
- 4-Health Department (completed 2019, *not part of energy savings guarantee program*)
- 5-A/C Replacements (2013-current-years vary, *not part of energy savings guarantee program*)

Savings:

Total Electricity Saved (kWh): **94,453,236**
Total Cost Saved: **\$9,847,543**
Total Metric Tons of CO₂ Equivalent saved: **71,164**

The savings alone of projects 1-4 (not including the A/C replacements) = **52,613 Metric Tons of CO₂** equivalent. This is equal to the following:

Greenhouse Gas Emissions From:

- 5,920,221 gallons of gasoline consumed
- 696 tanker trucks of gasoline
- 58,211,508 pounds of coal burned
- 10,237 homes’ electricity use for one year
- 11,336 gasoline powered passenger vehicles driven for one year



Greenhouse Gas Emissions Avoided:

- 62,264 acres of U.S. forests for one year
- 869, 960 tree seedlings grown for 10 years
- 18,205 tons of waste recycled instead of landfilled

Equivalents are calculated using the EPA’s Greenhouse Gas Equivalencies Calculator.

WHAT'S HAPPENING

AROUND THE STATE & BEYOND



Miami-Dade appointed the Country's first-ever Chief Heat Officer, Jane Gilbert, in April of 2021. Along with this appointment, the County and the Resilient 305 network announced that they joined the City Champions for Heat Action (CCHA) Initiative. Gilbert leads the Heat Health Task Force that focuses on developing a comprehensive heat plan, educating the public about higher temperatures, planning for "cool" pavement installation, advancing shade structure at bus stops and a framework for community "cooling" centers. **Extreme heat is the deadliest weather-related risk in the United States.** (NOAA-Climate Program Office)



The National Oceanic and Atmospheric Administration (NOAA) released their 2022 Sea Level Rise Technical Report with updated projections available through 2150 for all U.S. coastal waters. This report emphasizes the regional variation in sea level rise, the importance of lessening emissions, the increasing frequency of damaging flooding and the importance of continual tracking. NOAA also recently released the application guide for this report that provides key messages and detailed technical information on the data, modeling, and analysis behind the report's findings.



Photo: O'Neil/Florida Trend Magazine

Monroe County has instituted a pilot project in the two communities in the Florida Keys. The two locations, Key

Key Largo and Big Pine Key community of Sands are bordered by wetlands and canals and are subject to frequent flooding during king tides and other weather-related events. The County and consultants partnered to develop innovative solutions including elevating roads and installing a pretreated, pressurized drainage system. The gravity collection drainage systems incorporate a pump station that discharges into several injection wells. Runoff is designed to be routed to the pump station using trunk lines along the main roads.

APPENDIX



Appendix 1. The County resilience activity/project log includes the following categories.

Resilience Activities Categories
Monitoring & Mapping Resources (Data) <ul style="list-style-type: none">• Projections & Mapping• Built Environment and Critical Infrastructure (Energy, Communication, Transportation, Water Utilities, and Stormwater)• People and Communities (Buildings & Homes, Community Planning, Public Health & Services, Social Vulnerability)• Physical Environment & Vulnerable Habitats (Shoreline & Saltwater; Inlands & Freshwater)• Working Landscapes (Agriculture & Working Waterfronts)
Adaptation & Mitigation (Projects/Programs) <ul style="list-style-type: none">• Built Environment (Infrastructure)• People & Community Health (Health, Economy, Housing & Quality of Life)• Natural Environment (Habitats, Species, Open Spaces, and Waterfront)• Preparedness & Hazard Mitigation
Awareness <ul style="list-style-type: none">• Public Outreach & Education

Appendix 2. Below is a table showing resilient grants awarded to Martin County

Martin County Resilient Grants (all grants awarded by the Florida Department of Environmental Protection)				
	Project Name	Grant ID Number	Status	Grant Amount
1	Vulnerability Assessment	CM933	Completed	34,000
2	Resilience and Watershed Management Plan	R1911	Completed	75,000
3	Indian RiverSide Park Living Shoreline Permitting and Design (Phase 1)	R2225	Completed	150,520
4	Indian RiverSide Park Living Shoreline Construction (Phase 2)	22SRP07	Awarded/Pending Contract	1,863,938
5	Twin Rivers Living Shoreline Restoration	22SRP05	Awarded/Pending Contract	862,000
6	Golden Gate Stormwater Treatment Area North Outfall Flood Mitigation	22SRP06	Awarded/Pending Contract	180,000
7	Stormwater Backflow Preventer Installation Program	22SRP04	Awarded/Pending Contract	200,000
8	Vulnerability Assessment Update & Compliance	22PLN13	Awarded/Pending Contract	191,000
				3,556,458

RESOURCES



1. <https://www.wsp.com/en-US/projects/florida-keys-resilient-infrastructure-pilot-project>
2. <https://southeastfloridaclimatecompact.org/news/a-first-of-its-kind-role-miami-dade-county-appoints-a-chief-heat-officer/>
3. <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report-sections.html#application-guide>