Memorandum

MIAMI-DADE COUNTY

Date: October 23, 2015

To: Honorable Chairman Jean Monestime
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor

Subject: Second Quarter Status Report In Response to Multiple Resolutions Pertaining to Recommendations by the Sea Level Rise Task Force (May 1, 2015 – July 30, 2015)

The following report is pursuant to multiple resolutions adopted by the Board of County Commissioners (Board) on January 21, 2015, which support the implementation of the recommendations presented by the Miami-Dade Sea Level Rise Task Force (Task Force).

For ease of review, the individual status reports have been incorporated into one (1) Comprehensive Report, which is attached. Additionally, the final report pursuant to Resolution No. R-44-15 has been finalized and is attached as Exhibit A to the Comprehensive Report.

Background

In July 2013, the Board created the Task Force for the purpose of reviewing current and relevant data, science and reports, and to assess the likely and potential impacts of sea level rise and storm surge on Miami-Dade County over time. On July 1, 2014, the Task Force presented a report to the Board entitled, "Miami-Dade Sea Level Rise Task Force Report and Recommendations," providing the requested assessment along with recommendations on how Miami-Dade County can begin preparing for projected sea level rise impacts. Subsequently, Resolution No. R-451-14 and Ordinance No. 14-79 were approved by the Board in 2014, requiring that planning, design, and construction of County infrastructure consider potential sea level rise impacts. In January 2015, the Board adopted seven (7) resolutions supporting the recommendations of the Task Force, of which one (1) was an urging and six (6) require quarterly reports and a final report to the Board. Additional background details for each of these resolutions can be found in the First Quarterly progress reports transmitted to the Board on August 20, 2015.

In accordance with Ordinance No. 14-65, this report will be placed on the next available Board meeting agenda.

If you have questions concerning the above, please contact Mark R. Woerner, AICP, Assistant Director for Planning, Department of Regulatory and Economic Resources, at (305) 375-2835 or mwoerner@miamidade.gov.

Attachment

c: Honorable Harvey Ruvin, Clerk of Courts, Eleventh Judicial Circuit
Abigail Price-Williams, County Attorney
Office of the Mayor Senior Staff
Department Directors
Lourdes M. Gomez, Deputy Director, Regulatory and Economic Resources
Mark R. Woerner, Assistant Director for Planning, Regulatory and Economic Resources
Charles Anderson, Commission Auditor
Eugene Love, Agenda Coordinator

Comprehensive Report

Sea Level Rise Resolutions
Second Quarter Update (May 1, 2015 - July 30, 2015)

R-44-15: Study the Feasibility of Designating Climate Adaptation Action Areas

This resolution directed the Mayor or the Mayor's Designee to study the feasibility of designating climate change Adaptation Action Areas, as recommended in the Comprehensive Development Master Plan. This resolution requires a status report within 90 days, and a final report within 180 days of the effective date.

The final report for this resolution has been completed and is attached as Exhibit A to this Comprehensive Report.

R-45-15: Prepare an Action Plan and Report to Implement the Miami-Dade County Climate Change Advisory Task Force Recommendations

This resolution directed the Mayor or the Mayor's designee to prepare an action plan and report to implement the Miami-Dade County Climate Change Advisory Task Force Recommendations of (I) establishing departmental oversight for the implementation of the task force recommendations and (II) dedicating sufficient resources and staffing to review, update, and implement the Miami-Dade County Climate Change Advisory Task Force recommendations. This resolution requires quarterly status reports and a final report within one (1) year of the effective date.

The following steps were taken during the Second Quarter in order to prepare the report referenced in this resolution:

- Staff of the Office of Sustainability within the Planning Division of the Department of Regulatory and Economic Resources (RER) is continuing to review the current implementation status of the Climate Change Advisory Task Force (CCATF) recommendations and is approximately 75 percent complete with that review. Currently, the majority of staff time for this effort is dedicated to coordinating with staff in other divisions and departments who manage specific aspects of the CCATF recommendations such as taxi cabs, the county fleet, and procurement. These consultations with other divisions and departments are also serving as the basis for broader conversations about alternative ways climate change considerations might be integrated into these various operations.

- Staff of the Office of Sustainability have fully completed a review to determine where the CCATF recommendations directly overlap with current recommendations in GreenPrint and the Regional Climate Action Plan, drafted by the Southeast Florida Regional Climate Change Compact (Compact). The Office of Sustainability is currently in the process of revising GreenPrint in preparation for the release of the next five year plan in 2016, and has fully integrated the review of the individual CCATF recommendations into that planning process. Staff are currently considering the inclusion of additional CCATF recommendations into the next version of GreenPrint as one component of revising the climate mitigation and adaptation strategies. This internal review is scheduled to be completed this fall. For each recommendation, staff have already begun assessing the resources required for further implementation and efforts in the next Quarter will be focused more heavily on preparing the action plan. Finalizing the action plan and articulating the resources needed for implementation will be developed in consultation with other departments and divisions, and will be the focus of the Fourth Quarter.

R-46-15: Prepare Action Plan and Report to Accelerate the Climate Change Adaptation Planning Process by Evaluating the Engineering and Other Relevant Expertise Needed to Develop an Enhanced Capital Plan

This resolution directs the Mayor or the Mayor's designee to prepare an action plan and report to accelerate the climate change adaptation planning process by evaluating the engineering and other relevant expertise needed to develop an enhanced capital plan that includes but is not limited to flood protection, salinity structures, pump stations, and road and bridge designs, and to determine the costs of retaining the experts needed. This resolution requires a status report within 90 days, and a final report within 180 days of the effective date.

Staff conducted the following research and interviews during the Second Quarter to address the preparation of the action plan required by this resolution:

- In September 2014, San Francisco's Capital Planning Committee adopted a new policy "Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco." RER staff have consulted with the Climate Program Director from the San Francisco Public Utilities Commission who helped create a consistent and comprehensive review, planning and implementation process to carry out that policy. San Francisco has addressed this challenge by requiring each department with responsibility for implementing capital projects to identify and map project sites included in the 10 year capital plan and verify whether they fall within a "Vulnerability Zone" as defined and mapped by San Francisco's sea level rise committee. For each project exceeding $5 million, departments are required to complete a Sea Level Rise Checklist and submit it for review to the Capital Planning Committee and the City Engineer's Office. Departments are also required to submit specific long-term strategies to specifically address the adaptive capacity of the project. The San Francisco Public Utilities Commission makes its consulting firm (AECOM) available for training and assistance to individual departments who are unsure of how to comply with the requirements. Aspects of the approach adopted in San Francisco may have direct applicability to addressing some of the needs of Miami-Dade County. In particular, this approach may be useful to evaluating routine capital projects across departments.

- RER staff have reviewed the U.S. Department of Transportation Federal Highway Administration's training series "Building a Climate Resilient Transportation System". While it is focused on transportation infrastructure, the methods and tools available for assessing a system's criticality and sensitivity to climate and extreme weather, and therefore its vulnerability, would be applicable across other systems. At a minimum, these tools, as well as tools available from the Florida Department of Transportation, could be immediately useful for informing the capital planning process for future transportation projects.

- The City of Miami Beach has commissioned the engineering firm AECOM to conduct a study focused on performing modelling of the existing stormwater infrastructure to support collection system and conveyance improvements along with stormwater pump stations to mitigate flooding potential for low lying areas. The study also involves elevating roadways, sidewalks, and other public infrastructure. While this study is being conducted at a smaller scale than that needed to assess the vulnerabilities of Miami-Dade County, it serves as a useful precedent and benchmark to estimate the potential resources required for a larger scale study. The City of Miami Beach is also conducting a study to evaluate stormwater utility rates. The study is exploring what changes may be needed to support the necessary major capital improvements required to mitigate flooding. The results of this study will also provide useful information on a potential financing mechanism for future infrastructure investments.

- RER staff are continuing to consult with other county departments - Water and Sewer Department, (WASD); Public Works and Waste Management (PWWM); and Parks, Recreation and Open Spaces (PROS) - which all have various levels of experience integrating flood risks into capital planning and prioritization. This work is being reviewed in consideration of developing a broader process for all County departments.

- RER staff also consulted with City of Fort Lauderdale staff about their approach to incorporating sea level rise considerations into their capital planning process. These considerations have been incorporated through the use of Adaptation Action Areas. They shared their prioritization process with RER staff, but the approach adopted by the City of Fort Lauderdale is not directly applicable to the capital planning and prioritization process employed at Miami-Dade County's scale.

- The Compact's Sea Level Rise Consensus Workgroup has finalized a revised Sea Level Rise Projection for Southeast Florida. This projection differs to some degree from the original sea level rise projection developed in 2011, and will be utilized for planning purposes by Miami-Dade County and the other partners of the Compact. This revised projection and accompanying document are expected to be publicly released in the fall of 2015, and are currently available for internal review.

R-47-15: Continue Strategic Implementation of Miami-Dade County's Environmentally Endangered Lands (EEL) Program and Identify Potential Additional Long-Term Funding Sources

This resolution directs the Mayor or the Mayor's designee to continue strategic implementation of Miami-Dade County's Environmentally Endangered Lands (EEL) program, consistent with program objectives as approved by the voters, and to identify potential additional long-term funding sources for the continued acquisition and management of EEL lands. This resolution requires quarterly status reports and a final report within 364 days of the effective date.

The following actions have been taken to implement this resolution in the second quarter:

- Between April 10, 2015, and July 29, 2015, the EEL Program has acquired 10.00 acres within the South Dade Wetlands EEL Preserve at a total cost of $30,000 (all Building Better Communities General Obligation Bonds Program funds). This acreage includes the purchase of two (2) folios, both five (5) acres in size.

- Through the development of the final report required under this resolution, staff will continue to research and identify any further funding options for this important program.

R-48-15: Conduct a Comprehensive Study and Develop Adaptation Strategies to Address Potential Flood Damage Reduction and Saltwater Intrusion

This resolution requests that the South Florida Water Management District, the United States Geological Survey, and the Southeast Florida Regional Climate Change Compact Partners work with Miami-Dade County on issues of climate change and sea level rise, and directs the Mayor or the Mayor's designee in conjunction with the Office of Intergovernmental Affairs to work jointly with these entities to conduct a comprehensive study and develop adaptation strategies to address potential flood damage reduction and saltwater intrusion associated with sea level rise and put forth a time frame for implementation and potential funding mechanisms. This resolution requires quarterly status reports and a final report within 364 days of the effective date.

The following steps have been taken during the Second Quarter to address the comprehensive study referenced in this resolution:

- WASD is currently evaluating the potential impact of salt water intrusion by monitoring a series of groundwater wells which indicate the fluctuating location of the salt water front line. Several projects such as earthen plugs and salinity control structures are helping to mitigate the potential impact of salt water intrusion on Miami Dade County's water supply. The resources needed to continue to protect freshwater resources are currently being re-evaluated and a final report will be available by the conclusion of 2015, indicating where additional resources are needed. This report will also assess the potential to slow or limit salt water intrusion in the future.

- On July 27, 2015, a full-day workshop was held at the South Florida Water Management District (SFWMD) headquarters with representatives from RER, PWWM, WASD, SFWMD, U.S. Geological Survey (USGS), the Army Corps of Engineers (Corps.), Deltares, Florida Climate Institute (FCI) and the Compact. This workshop brought together practitioners and researchers to review all of the on-going and planned research efforts which are examining flooding risk, salt water intrusion, and adaptation approaches in the region. Participants discussed where informational and analytical gaps exist, as well as other studies or methodologies used in other regions

and countries that could be drawn upon to address those gaps. The group also reviewed potential funding for adaptation measures. The on-going monitoring, modelling, and adaptation measures being taken by PWWM, WASD and the SFWMD were the focus of the afternoon workshop. RER staff is currently reviewing and revising the proposed timeline and draft outline developed from this workshop, which will be used for the final report to be presented to the Board at in January 2016. The group that participated in the July 27th workshop will continue to contribute to the development of that report and will continue to provide expertise on how this analysis can be completed with existing resources, and where additional expertise and resources will be needed.

- RER staff also contacted the Army Corps of Engineers staff members who recently completed the North Atlantic Coast Comprehensive Study. This two-year study was requested by the Obama Administration in the wake of Hurricane Sandy to systematically review and evaluate the coastal flooding risks for the Sandy affected area. The Comprehensive Study detailed coastal storm and flood risks to vulnerable populations, property, ecosystems, and infrastructure in the region. The study was intended to help local communities better prepare for future flood risks and make the latest scientific information available to local planners. While the geographic scope of the study was much larger than what is needed for Miami-Dade County, there are potential lessons that could be learned and methods for modelling coastal storm surge that could be replicated for a local assessment.

- On June 24, 2015, Florida International University (FIU) hosted the kick-off event for the Compact's regional project with the RAND Corporation, known as "Water Management and Adaptation Planning to Address Sea Level Rise and Climate Change in Southeast Florida". At this meeting, members of the Compact, USGS, SFWMD, WASD, the South Florida Regional Planning Council (SFRPC), The Nature Conservancy (TNC), and other academic partners developed the scope of work, schedule, and action plan for the study. Participants reviewed the region's most pressing water management decisions, completed a gap analysis identifying which key decisions currently lack sufficient analytical support, and worked through a prioritization exercise to address those gaps. RAND has previous experience helping policy makers work though complex problems and decision-making processes and has provided research and facilitation support to stakeholders in the Mississippi Delta region. RAND will be able to provide support to the Compact by helping to analyze and connect several existing models. The exact scope of the project is still being determined. It is anticipated that within the next 12-16 months this project will provide a decision support tool to help the region evaluate the economic implications of various water management regimes and infrastructure investments, as well as different land use patterns. A focus of this research will be integrating economic models to identify ways that the economic exposure of regional assets to storms and flooding risks can be minimized.

- One of the most significant factors in determining our regional flooding risk will be future precipitation patterns. Early model runs with the newly developed USGS model used current precipitation patterns, but these patterns may shift in the future. A change in either direction toward drier or wetter conditions would have significant implications of regional water management strategies. On June 22 and 23, 2015, the USGS and the Florida Center for Environmental Studies hosted a two day event at Florida Atlantic University to review the latest science on future precipitation patterns. The event provided a good opportunity for climate modelers and climatologists to interface directly with decision-makers and Compact members. The scientific review of the latest dynamical and statistical climate downscaling techniques revealed the importance of continuing to advance this line of research, particularly given the current uncertainty surrounding future wet and dry season conditions and their potentially significant implications for drinking water resources, agriculture, and ecosystems.

- The SFWMD continued to work on its two year National Oceanic Atmospheric Administration funded grant project "Flood and Drought Risk Management under Climate Change: Methods for Strategy Evaluation and Cost Optimization." As mentioned in the First Quarter update report, this work is being conducted jointly with Deltares, an independent research institute which focuses on applied research in the field of water, subsurface, and infrastructure. Deltares is based in Delft and Utrecht in the Netherlands, with a USA branch (Deltares USA) based in Silver Springs, Maryland.

- During this quarter, PWWM continued to advance their flood risk analysis within the C-8 and C-9 basins. The preliminary model runs for the C-8 and C-9 basins have been completed, using the previous Compact sea level rise projections (2012), current land use (2013) and future land use (2030). Inundation limits, and a new floodplain map have been prepared using the 2012 projections and an estimate for the end of wet season groundwater table. Staff are now in the process of preparing the model runs for the updated Compact sea level rise projections (2015), and a new floodplain map will be prepared using the new projections, considering future groundwater table and future land use.

R-49-15: Initiating Discussions with the Insurance and Reinsurance Organizations to Develop Long-Term Risk Management Solutions

This resolution directs the Mayor's or designee, in conjunction with the Office of Intergovernmental Affairs, to initiate discussions related to climate change with private insurance and reinsurance professional organizations, member local governments in the Southeast Florida Climate Change Compact, the Florida Office of Insurance Regulation's Department of Financial Services, and other key stakeholders to develop long-term risk management solutions. This resolution requires quarterly status reports and a final report within one (1) year of the effective date.

The following work has taken place during the Second Quarter in order to prepare the report referenced in this resolution:

- RER staff have developed a list of appropriate stakeholders and candidates to include in meetings to discuss insurance and long term risk management solutions. These stakeholders are drawn from several key sectors including commercial and residential real estate, insurance, reinsurance, and finance. Several risk management experts in the public sector will also be invited to participate. These meetings will serve as listening sessions to understand the concerns and questions of private sector partners and to introduce the work underway within Miami-Dade County and regionally. This will be followed by discussions throughout the fall which will work through the potential for direct assistance and collaboration between the public and private sectors to minimize the uncertainty and potential impact of flooding and severe storms.

- These meetings will also explore the potential impact of a changing insurance market and its implications for the larger economy and development within Miami-Dade County. The intention is that this group can begin to outline the information, stakeholders, and working relationships that will be needed to create more formal public-private partnerships to work to identify financing options for needed investments for adaptation and minimizing flooding risks and economic disruption.

- Staff from RER and Internal Services Department's (ISD) Risk Management Division have evaluated the information provided by The Nature Conservancy regarding their collaborative work with Swiss Re to demonstrate the cost effectiveness of coastal ecosystems in risk reduction. Given the wealth of natural buffer areas throughout Miami-Dade County, this research is very relevant to our long-term adaptation and will be considered as part of a holistic adaptation approach.

Exhibit A

ADAPTATION ACTION AREAS:

Feasibility Assessment

September 2015

Department of Regulatory and Economic Resources

BACKGROUND: THE NEED FOR ADAPTATION

Many communities within Miami Dade County (MDC) are already experiencing the effects of higher sea levels and more frequent flooding. Over the past several years the scientific understanding and ability to model future impacts from climate change and climate variability has improved greatly. As a result, dozens of studies have been published by local universities, regional, national and international organizations which have examined the vulnerability of our region and our economy to the impacts of sea level rise, tropical storms and variations in precipitation levels. While more work needs to be done, these studies have underscored the potential implications of climate change to the Southeast Florida region if proactive steps are not taken to minimize vulnerability. Left unaddressed, these vulnerabilities could affect property values, public safety, and insurance rates, potentially leaving the County more exposed in the event of a storm. Many tested approaches and technologies exist to reduce these vulnerabilities. It is important to move ahead with adapting to anticipated impacts of climate change and sea level rise even as we continue to refine and improve our vulnerability assessments and modeling efforts.

Communities such as Miami Beach have already begun this work and Miami-Dade County departments, such as the Water and Sewer Department, Public Works and Waste Management, Parks and Recreation, and Emergency Management, are already working to ensure our public infrastructure will continue to serve our residents in the face of extreme events and longer-term trends such as sea level rise. There are many adaptation measures that can be taken, such as beach nourishment and dune enhancement, which will have many additional co-benefits between storms and will improve the quality of life for residents and the experience for visitors.

While adapting to climate change is a new challenge, preparing for it and building resilience to it will build on many established policies and practices already employed by Miami-Dade County, such as preparing for hurricanes, managing stormwater and regional water resources, and planning for smart growth. However, addressing the complexity of climate change and interdependency of infrastructure networks requires new approaches to coordination and planning. Without this coordination there is the potential that repairs and retrofits will be done independently and/or incrementally, or using outdated approaches and technology, which could result in wasted time and resources and lost opportunities to leverage complementary efforts. For this reason, the Board of County Commissioners adopted Policies LU-3K and LU-3L addressing Adaptation Action Areas in the Comprehensive Development Master Plan and is again recommending their

implementation as one tool to help the County accelerate adaptation and develop best practices which are tailored to our needs and unique geography.

ADAPTATION ACTION AREAS: ONE TOOL IN THE TOOLBOX

Adaptation Action Areas (AAAs), as defined in the box below, have been used as one approach to bridge the gap between vulnerability assessments and implementation. Adaptation Action Areas can be used as a flexible tool to help begin the complicated task of addressing these interrelated risks more holistically. This concept has been recommended because it allows challenges to be addressed on a more manageable scale, creates an environment for testing and development of best practices, fosters collective learning and

The History of Adaptation Action Areas

In 2011 the Florida Legislature created Adaptation Action Areas (S.163.3177 Florida Statutes). This statutory policy tool which is an optional designation within the Coastal Management Element is defined as:

"'Adaptation Action Area' or 'Adaptation Area' means a designation in the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning"

"At the option of the local government, develop an Adaptation Action Area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an Adaptation Action Area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the Adaptation Action Area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have a hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge." Section 163.3177(6)(g)(10), F.S.

Adaptation Action Areas have been recommended as a policy tool by the Southeast Florida Regional Climate Action Plan (recommendations SP 3-6, 8-9 & PP-11), by the Miami-Dade Sea Level Rise Task Force in their final recommendations, and in Miami-Dade County's Comprehensive Development Master Plan, which is explained in more detail subsequently.

The concept of AAAs has also been tested in Fort Lauderdale as part of a larger study led by the South Florida Regional Planning Council and the Florida Department of Economic Opportunity.

facilitates infrastructure investments and prioritization of capital improvement projects. The precise form and purpose of Adaptation Action Areas can be adjusted to the needs of each community.

RESOLUTION R-44-15

On January 21, 2015, the Board of County Commissioners (Board) passed seven (7) resolutions supporting the implementation of a recommendation included in the "Miami-Dade Sea Level Rise Task Force Report and Recommendations." One of these resolutions, R-44-15, directed the Mayor or his designee to study the feasibility of designating Adaptation Action Areas as recommended in the Comprehensive Development Master Plan (CDMP). The relevant policies of the CDMP which were adopted in 2013 are as follows:

> ***CDMP Policy LU-3K**: By 2017, Miami-Dade County shall determine the feasibility of designating areas in the unincorporated area of the County as Adaptation Action Areas as provided by Section 163.3177(6)(g)(10), Florida Statute, in order to determine those areas vulnerable to coastal storm surge and sea level rise impacts for the purpose of developing policies for adaptation and enhance the funding potential of infrastructure adaptation projects.*
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> ***CDMP Policy LU-3L:** Miami-Dade County shall work with its local municipalities to identify and designate Adaptation Action Areas as provided by Section 163.3164(1), Florida Statute, in order to develop policies for adaptation and enhance the funding potential for infrastructure projects.*

Pursuant to R-44-15, the Department of Regulatory and Economic Resources (RER) Planning Division has studied the feasibility of designating Adaptation Action Areas and has determined the adoption is feasible and is recommending initiation of the first pilot project in 2016/2017. This determination was based on the careful review of the AAA pilot project implemented in the City of Fort Lauderdale in partnership with the South Florida Regional Planning Council, the Florida Department of Economic Opportunity, and Broward County. This project produced a comprehensive planning guidebook for local governments that outlined how other jurisdictions could establish adaptation action areas. This report, which is currently available only as a draft, was carefully reviewed by staff, who identified opportunities to adjust AAAs to better fit the County's unique planning needs. Staff consulted with the technical and project leads for the Fort Lauderdale pilot project to understand which program components were successful and which may need to be revised for more effective implementation in Miami-Dade. On the whole, it was the opinion of the Fort Lauderdale staff that the AAA pilot project had been a successful tool for them to facilitate planning and infrastructure investments. Fort Lauderdale staff reported very positive responses from their initial community engagement efforts in designated areas, and they are planning to continue and expand the AAAs in future years.

It is the opinion of the RER Planning Division staff that Adaptation Action Areas are a feasible approach to adopt in Miami-Dade County because they are largely consistent with other designations and planning approaches that have been, and are currently being, used successfully. This includes the Coastal High Hazard Areas and small area studies used by the Planning Division, the priority stormwater basins used by the Public Works and Waste Management Department, and the Resilient Redesign studies conducted by the Southeast Florida Regional Climate Change Compact and participating regional partners. These approaches have successfully helped direct planning resources, prioritize investment and capital improvement projects, and draw out innovative and forward-looking solutions for these unique areas. There are sufficient staffing resources and existing expertise to implement adaptation action areas on a pilot basis within Miami-Dade County. Most importantly, it is the flexibility and inherent ability to tailor and adjust these areas to fit the needs of our communities which makes this approach an appropriate and feasible way to accelerate implementation. There are several potential approaches to designating an AAA which are outlined in the following section.

ADAPTATION ACTION AREAS: A FLEXIBLE TOOL

Adaptation Action Areas are inherently flexible and can be adjusted to meet the needs of each community. As part of this feasibility assessment, staff considered several alternative approaches to adopting AAAs to best address the specific needs of Miami Dade County. The following section outlines four of these approaches, which are not necessarily entirely distinct. Elements from each approach can be selectively adopted into a final approach, if desired. These potential approaches can be further refined or adjusted depending on priorities and resources available.

1 PROJECT-BASED

Description:

To designate AAAs, appropriate staff could review the list of planned County projects that are designed to reduce flooding risks, improve drainage or otherwise reduce vulnerability to storms, sea level rise or climate disruptions. Those planned or on-going projects could be used as the 'anchor' for AAAs. The boundaries of the AAAs could be delineated by the area benefiting from the project and/or improvement. For example, if a new pump station was being installed, a boundary could be drawn around that area benefitting from the new pumps. This "designation" could be temporary and the areas could be reviewed periodically. In areas where the projects have addressed the identified vulnerabilities, the AAA designation could be dropped from the list and those areas needing further

improvements could continue to be designated as AAAs. Every review period would revise the map of AAAs and new areas could be added to the list as new investments and projects are planned for that area. The process for identifying AAAs would be reliant on existing mechanisms for prioritizing investments and projects. This approach is very similar to the approach used in Fort Lauderdale.

Advantages:

- Relatively quick process to designate AAAs because it would utilize an existing list of planned projects
- No new process needed to suggest "solutions" because the infrastructure projects have already been vetted and approved to address flooding or other risks
- The process would be no more and no less equitable than the existing planning and investment decisions
- This approach could draw directly from the experience of Fort Lauderdale

Disadvantages:

- Heavily focused on infrastructure and engineering solutions and does not explicitly include space for non-structural solutions or spatial planning
- May miss opportunities to improve community design, quality of life, or further economic or community development or goals
- May be better at addressing acute short-term challenges and less able to address longer-term slower changes such as rising sea levels
- May miss other community needs such as rising insurance costs, failing septic systems, business disruptions, or other challenges
- Would require careful management of expectations to ensure that the public did not mistakenly believe that the completion of one drainage project or other improvement within an AAA would mean that the area was no longer vulnerable to storm surge or sea level rise. In many neighborhoods, a sustained investment over several years will be required and even with these investments it will be impossible to completely reduce the risk from storm surge, coastal flooding, and sea level rise
- Working on a project-by-project basis may miss opportunities to provide more innovative, comprehensive, or effective solutions because it might miss opportunities to solve several issues simultaneously (such as integrating resiliency with planned road works or redevelopment projects)
- May miss areas that have not had historic problems but may likely be vulnerable to future changes

2 ENHANCED ADAPTATION PLANNING FOR PREVIOUSLY IDENTIFIED AREAS

Description:

While climate change will exacerbate existing hazards, many of the challenges it will present are already partially known and understood, such as flooding due to heavy rains, storm surge from tropical storms, beach erosion, etc. Therefore, climate adaptation planning has significant overlap with on-going efforts such as the stormwater management planning, hazard mitigation planning, and maintaining compliance with the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program requirements and the Community Rating System. The County could take advantage of this overlap and use one of these existing plans as a starting point and expand upon it. For example, FEMA flood zones could be sub-divided into smaller neighborhood scales and then existing hazard mitigation plans could be rounded out with other considerations. For example, key stakeholders could be brought in to review the transportation, economic development, and drinking water vulnerabilities within these existing boundaries. Alternatively, the Stormwater Master Plan could be used as the starting point and particular stormwater basins that have already been identified as a priority by the Public Works and Waste Management Department (PWWMD) could be identified as the first AAAs. These priority basins could be identified as the boundaries of the AAAs and then a subsequent planning process could be used to enhance the Stormwater Master Plan with other considerations such as the vulnerability in other infrastructure systems (transportation, healthcare), or community and economic development goals.

Advantages:

- Baseline planning has already been completed. For example, planning efforts would be able to take advantage of the fact that flood depths have already been mapped within the FEMA flood zones, stormwater basins have already been prioritized, and capital projects identified in stormwater basins
- Baseline regulations may exist for these zones. For example, enhanced building requirements already exist for properties in FEMA flood zones (i.e. requiring certain building materials, prohibiting basements, specifying specific elevations for the first floor, etc.)
- Boundaries already exist, and in some cases, already carry additional legal requirements
- Additional review processes may already exist for planned projects within these areas

Disadvantages:

- May be difficult to subdivide existing boundaries into a manageable planning scale
- May be difficult to align existing boundaries with other existing neighborhoods and planning areas

- May not fully benefit from the most recent research and integrated modeling efforts (groundwater/surface water modeling) indicating which areas will be most vulnerable to the impacts of sea level rise and climate change

3 SYSTEMS-BASED ADAPTATION PLANNING

Description:

The County could work systematically through critical systems (water, sewer, power, transportation, health care, etc.) and identify areas of the highest vulnerability within each of these systems. Much of this information could likely be pulled from existing hazard mitigation plans, individual sector plans or through targeted meetings with key stakeholders familiar with each system. Meeting with stakeholders familiar with each system could reveal future projects and/or existing challenges and vulnerabilities that are known and may not be publicly discussed. The County could then identify areas where there is significant clustering of risk across major systems and designate these areas as Adaptation Action Areas. The County could then work with those same stakeholders to reduce the vulnerability to the major systems and potentially identify multi-purpose solutions to these vulnerabilities.

Advantages:

- Would highlight areas where there are potential synergies between sectors. For example, this approach could reveal where establishing a micro-grid could support a new healthcare facility, or where raising utilities could be combined with road work or new housing developments, to reduce total project costs
- Would also highlight areas where significant investment will be needed to just maintain the status quo and existing levels of service. This might allow the County to better prioritize resources and more efficiently allocate future resources and capital improvement projects
- May be easier to convene relevant stakeholders, develop adaptation solutions, and secure implementation funding because each individual is vested in their own system and is aware of potential funding sources
- May be easier to secure engagement and support from key decision-makers because adaptation would be addressing issues that have already been identified as key issues and priorities by various groups

Disadvantages:

- Might be more difficult to integrate community priorities and less tangible needs into the planning and infrastructure prioritization process

- Might be a more subjective and/or political process to identify the "risk clusters" that should be prioritized first
- This approach might have "blind spots" and wouldn't necessarily identify all vulnerable areas. For example, this approach might miss areas of low population density, areas with fewer redevelopment projects, beaches, or natural areas, etc.
- May be more difficult to coordinate with private companies that are responsible for maintaining key infrastructure systems

4 AREA PLANNING FOR NEWLY-IDENTIFIED VULNERABLE AREAS

Description:

The County could use the best-available science on vulnerable areas (including the USGS integrated surface/groundwater modeling results) to designate Adaptation Action Areas on the basis of their vulnerability to climate change. These physical boundaries based on future inundation and groundwater heights could be smoothed to more closely conform to existing neighborhood and planning boundaries. Within these boundaries the County could do a comprehensive assessment of adaptation needs. All of the vulnerable areas could be designated as AAAs at the beginning of the program or they could be designated on a rolling basis. If they were to be selected on a rolling basis, pilot sites could be chosen with different existing conditions, growth forecasts, and demographic characteristics to inform broader deployment of the designation. The AAA designation could be temporary and removed if the vulnerabilities were substantially reduced.

To begin the planning process the County could hold an "in-house" charrette and bring together key personnel with expertise in stormwater, floodplain management, hazard mitigation, planning, economic development, redevelopment, transportation planning among others. These in-house charrettes could be used to understand what projects are in the pipeline and how they might be amended to better serve multiple purposes and be more robust in the face of future changes. These charrettes could also be used as a learning experience for the County to identify which key players would be needed for future planning efforts and to build up internal capacity. They could also help identify existing barriers to better decision making (for example where incentives are misaligned, where regulations are outdated, or conflicting mandates exist across agencies that may be encouraging vulnerable development). Subsequent public charrettes could identify ways to better incorporate and facilitate economic and community development objectives into the process.

Identifying the barriers in these AAAs would benefit the planning process by facilitating more effective recommendations for the adaptation planning procedure needed countywide, and could help identify the policy changes needed. The first round of AAAs could also be distributed between the unincorporated areas and within municipal boundaries to strengthen working relationships with municipal partners.

Advantages:

- Utilizes the best available science to identify the areas that will be most at risk to sea level rise and storm surge
- Facilitates a comprehensive review of community needs within a given area and may help identify ways to address multiple issues at once (for example, a coastal berm can reduce wave damage during storms and also serve as a linear park and bikeway between storm events)
- Utilizes an area planning approach (as opposed to an infrastructure project-based approach) which could create more opportunities to identify innovative ideas rather than just relying on off-the-shelf technologies
- Helps develop internal technical capacity to address the challenges of flooding and sea level rise which may reduce the need to contract with external experts in the future
- Illuminates policy barriers and misaligned incentives which are impeding more effective decision making and planning
- Facilitates grant applications for designated AAAs

Disadvantages:

- May be a more difficult and/or subjective process to choose pilot areas among all the vulnerable areas identified
- May require a phased approach with priorities identified first and implementable projects identified after

Recommended Next Steps

As highlighted in the previous section, there are multiple approaches to designing the Adaptation Action Areas which can build upon existing processes, internal expertise, and the best available science. All four of the approaches above could feasibly be adapted and implemented with existing staff and resources. However, the fourth approach, area planning for newly-identified vulnerable areas, is the most desirable approach to begin implementing AAAs. This approach would allow for a more accurate assessment of vulnerability, a more comprehensive assessment of potential adaptation measures, and can help develop internal technical capacity and working relationships across departments, as well as the community. The intention is to partner

with select municipalities to work in tandem on AAAs within the incorporated and unincorporated areas of the County.

This approach will likely need to be adjusted and refined with time, therefore staff recommend beginning the AAAs with a pilot project in 2016. The USGS integrated surface/groundwater modeling outputs are currently pending and will be used by The Stormwater Master Planning staff to develop new inundation maps to highlight vulnerable areas. While the preliminary information is expected to be available to the RER Planning Division staff in the fall of 2015, it would be premature to use this information in lieu of a more comprehensive vulnerability analysis. A complete vulnerability analysis will require several months to a year to prepare. Nevertheless, pilot AAAs can be selected based on available information. This pilot phase will provide valuable experience and, most importantly, will help accelerate the development of innovative, cost-effective adaptation options appropriate to the unique geology and land use patterns of Southeast Florida.

The Planning staff will work with WASD and PWWMD staff during the fall of 2015 to obtain the preliminary map of areas vulnerable to sea level rise and storm surge. It is important to note that due to the County's geology, hydrology, and regional water management system, changing sea levels will have cascading impacts throughout the County, and not only on the coast. Areas in the western part of the County are expected to be affected by changing groundwater levels and by changes in the management of the regional water resources network, therefore AAAs may be designated in interior areas of the County as well.

This information about vulnerable areas will serve as the basis for the selection of initial pilot locations. The pilot location(s) in the unincorporated area of the County will be selected in early 2016. For vulnerable areas within incorporated areas, County staff will contact municipalities to solicit two (2) to four (4) partner communities that are willing to pursue a parallel planning process for an AAA within their municipality. County staff resources would be concentrated on organizing the meetings and planning efforts for the unincorporated areas while the municipalities would be expected to provide that support for their own communities. However, pursuing these efforts in parallel would allow County and municipal staff to gain insights and lessons from the other AAA sites, and would facilitate a more comprehensive and effective planning process.

Collaboration with municipalities is an important component of the AAA process because it will allow County staff to work in a variety of urban conditions and develop solutions that cross jurisdictional boundaries. Both the problems of, and the solutions to, climate change and sea level rise will be closely tied to the urban condition and will vary substantially across the County. For example, lower density areas may be more challenged by failing septic tanks, whereas more densely populated areas may be more impacted by flooded and impassable roadways, while more densely populated areas may be challenged to find the space to

accommodate protective structures and pump stations, and less densely populated areas may be more challenged to secure the needed funding for infrastructure improvements. Similarly, the social and economic conditions of different communities will strongly influence which solutions will be more appropriate, and/or more feasible. Therefore, it is important that AAAs span a representative range of conditions to help the County develop appropriate adaptation approaches which can be applied to the various urban conditions across the County.

After pilot AAA locations and partnerships with the municipalities are secured in early 2016, research can begin on the pilot sites through early 2016. During this phase, staff will gather information on the vulnerability of the area, existing infrastructure and critical facilities, demographic and community information, as well as compile existing area plans such as plans for redevelopment and capital projects. This phase will likely focus on identifying the key public and community sectors' stakeholders to participate in the in-house charrette. The charrettes would be scheduled in a staggered manner from late spring to early fall of 2016. The fall of 2016 would be used as a time for municipal and County officials to come together to finalize the products of the charrettes, exchange lessons learned, and develop recommendations for the final form of the Adaptation Action Areas. By then it is expected that a more detailed vulnerability assessment should be available to help support the designation of the next round of AAAs.

This approach is recommended because adapting to sea level rise will require extensive collaboration, coordination, and collective learning. Small changes in average sea levels will have cascading impacts throughout the system because of the interconnected nature of our regional water management systems. Addressing these changes often requires more than simple upgrades of the water and sewer infrastructure and therefore it is desirable to work across departments and directly with residents to find multi-purpose and cost-effective solutions. In many instances, it will be possible to find solutions that also enhance the quality of life in these neighborhoods between storms. For example, increasing the buffer areas along our canals, rivers, and the ocean can reduce the vulnerability to flooding while also creating an opportunity for new linear parks and green spaces. By creating Adaptation Action Areas and working with an interdisciplinary team to develop a suite of solutions for each area, it will be possible to continue to build the County's internal capacity to respond creatively to the challenges of climate change and changing sea levels.