FLOODING & SALTWATER INTRUSION

The report in brief

This report provides a summary of the major efforts, complete or underway, to understand the implications of sea level rise on increased risks for flooding and saltwater intrusion. This report also explores potential funding mechanisms for adaptation measures and details research gaps and next steps.

Flooding and saltwater intrusion

This report was developed in partnership with multiple agencies including the U.S. Geological Survey, The South Florida Water Management District, and The Army Corps of Engineers. The County has worked with these entities and many others to conduct a comprehensive review of the studies and adaptation work going on to address flooding and saltwater intrusion. This report presents only a partial snapshot of the extensive on-going efforts as millions of dollars have, and are being directed to answering and addressing these questions. Multiple entities are engaged in this research including local and state universities, multiple federal, state, regional and local agencies, the private corporations, non-profits, and the Southeast Florida Regional Climate Change Compact. The County is fortunate to have the support of many world-class entities dedicated to understanding the issues.

This report also provides a roadmap to where updated information can be found. Many institutions, including the National Aeronautics and Space Administration, The National Climate Assessment, the South Florida Water Management District, National Oceanographic and Atmospheric Administration, and many non-profit groups have helped synthesize the existing information and made it into publicly accessible, user-friendly webpages.

This report also includes a review of on-going efforts to understand and mitigate the risks of flooding and saltwater intrusion. The amplifying impact of sea level rise on these risks is an active area of study; however, the available information on sea level rise is being incorporated into on-going programs. For example, to improve their ability to reduce the risks of flooding, the South Florida Water Management District is working to evaluate the current and future levels of flood protection to identify and prioritize long-term infrastructure needs. The agency is conducting studies to identify hazards and possible mitigation activities, and is collaborating with Dutch experts to share expertise, strategies and information. The County is also partnering with the U.S. Geological Survey to analyze groundwater flows and map changing groundwater levels. A partnership with the RAND Corporation is allowing the County and Compact partners to study the interactions of new infrastructure and land use changes on future water management needs and potential flooding damages. The County is also assisting the Federal Emergency Management Agency in revising and updating the County's Flood Insurance Rate Maps to more accurately reflect current conditions. Some projects are bringing together several partners like the U.S. Army Corps of Engineers, the U.S. Geological Survey, and the Nature Conservancy, to study risk mitigation alternatives and assess the potential for nature-based coastal defenses. Miami-Dade is also working with local and national universities through

research initiatives like the Sustainability Research Network-Urban Resilience to Extremes. It is worth underscoring the contribution the Compact has made to coordinating a regional approach and attracting additional resources.

Re-evaluating complex water management systems (Figure 3) and evaluating the appropriate adaptation measures for different components of the system is underway, but will take years to fully complete. The process could be expedited with additional funding or could be accelerated by prioritizing investments in known mitigation needs. For example, there are more than 1,000 projects that are part of the Local Mitigation Strategy that could reduce the community's vulnerability to known hazards.

Potential funding sources

The report also includes a summary of potential adaptation measures and funding mechanisms. One of the primary mechanisms for supporting adaptation measures will likely be grants and special assistance programs from federal, state, regional and private entities. The report includes a preliminary list of grants that may be suitable for certain project types. In addition to grants and government-based funding, resiliency measures may require innovative sources of financing. Though funding opportunities explicitly for climate adaptation are relatively new, there are resources and best practices that can help guide communities as they explore new sources.

Relevant research from local universities

Finally, the report includes a snapshot of the relevant research being conducted at area universities.
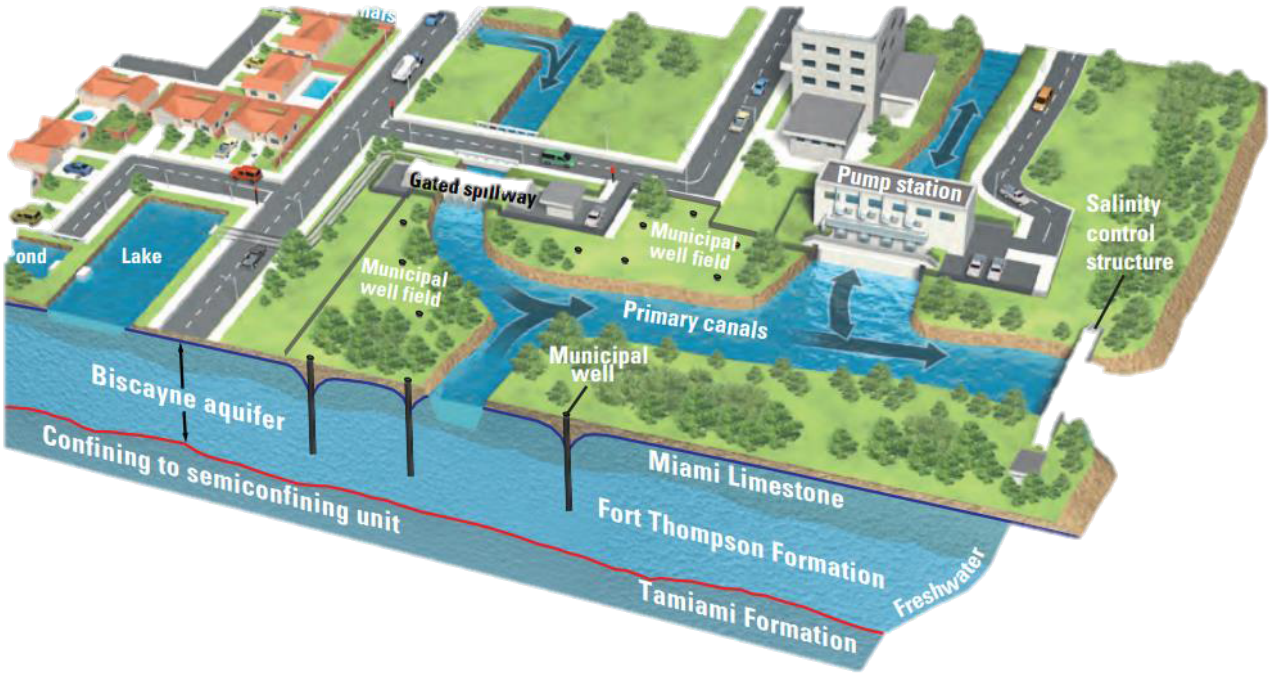
Figure 3: Conceptual diagram of the components of the surface water management system in Miami-Dade County