

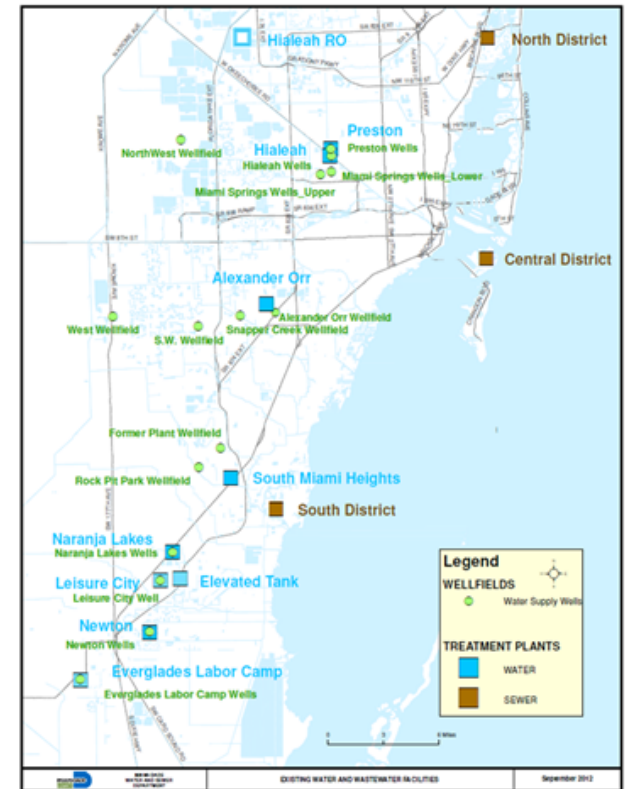
Miami-Dade Water & Sewer Department



**Seventh Annual Southeast Florida
Regional Climate Leadership Summit
December 1-3, 2015**

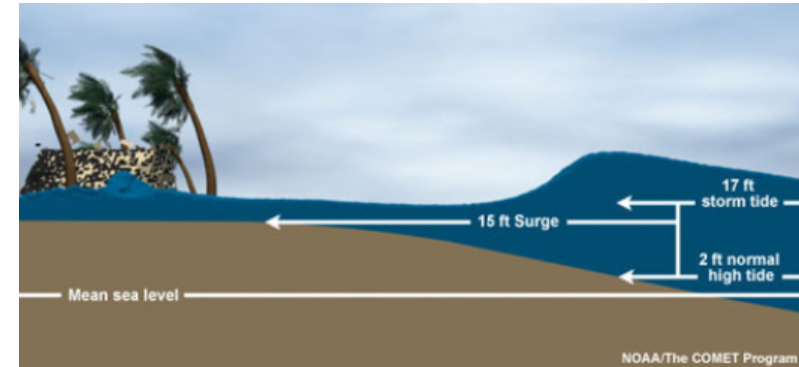
Miami-Dade Water and Sewer Department (WASD)

- Largest Water & Sewer Utility in the Southeastern United States
- Serving more than 2.3 million residents
- FY2015-2016 Budget:
 - Projected Revenues \$732 Million
 - \$13.5 Billion Multi-Year Capital Plan (FY16-21)
- 3 large regional and 5 small water treatment plants (WTP), plus new Hialeah Reverse Osmosis WTP
- 3 wastewater treatment plants



Climate Change Impacts

- Drought conditions
- Sea Level Rise (SLR)
 - Saltwater intrusion in water supply wellfields
- Increased flooding and infiltration and inflow
- Impacts from storm surges on coastal facilities



Water Supply Resiliency

- 20-year Water Use Efficiency Program:
 - Implementation of Water Conservation Incentives
 - Water Loss Reduction Program
 - Legislative Initiatives
 - Public Outreach
- Alternative Water Supplies:
 - Floridan Aquifer



Current water demand 40 mgd less than in 2006

Prepared in cooperation with the Miami-Dade Water and Sewer Department

Hydrologic Conditions in Urban Miami-Dade County, Florida, and the Effect of Groundwater Pumpage and Increased Sea Level on Canal Leakage and Regional Groundwater Flow



Scientific Investigations Report 2014-5162

U.S. Department of the Interior
U.S. Geological Survey

Salt Water Intrusion Impact Assessment

“Over the next 30 years the existing surface-water system can be effectively used to control saltwater intrusion in the Biscayne aquifer in areas where land surface elevations exceed expected high tides”

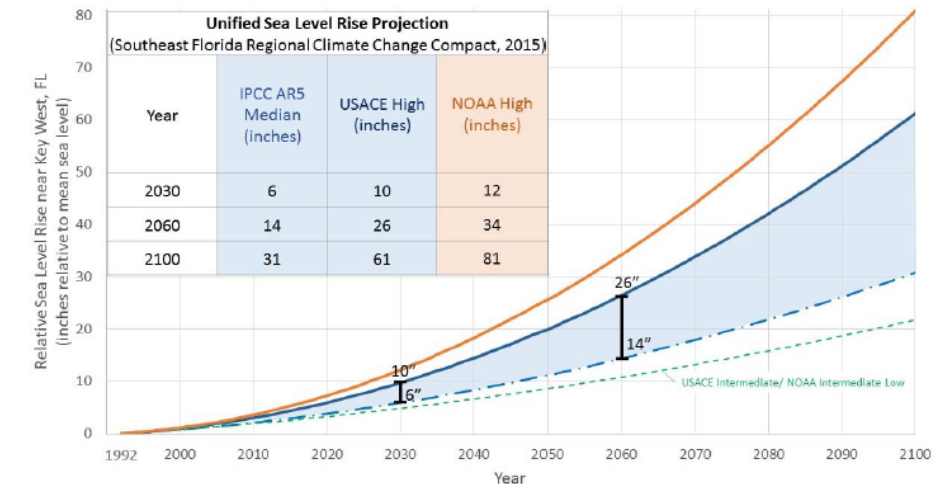
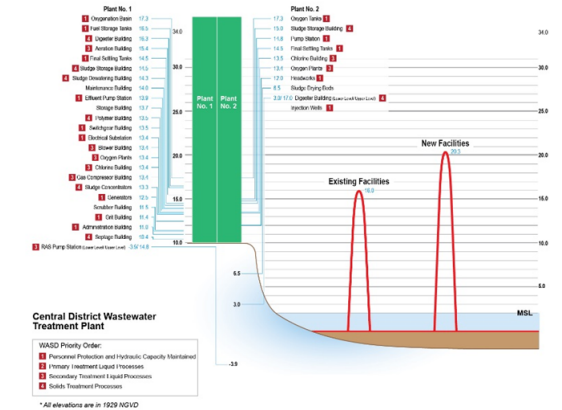
Ocean Outfall Legislation Compliance Program Assessment

- Rainfall and Sea Level Rise Projections
- Preliminary wastewater flow projections, based on population growth, increased groundwater levels (SLR) and rainfall
- Storm surge modeling
- Inundation Mapping
- Extreme Wind Speed and SLR Pressure Change Analysis
- Risk Based Cost-Benefit Analysis of Facility Hardening Design Flood Elevations for Pump Stations and Wastewater Treatment Plants

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Guidance on Key Climate Variables for Scenario Analysis

- **Planning Horizon:**
 - 2075 for Critical Long-Term Facilities (e.g. WWTPs)
 - 2040 selected for pump station flows
- **Climate scenarios:**
 - Greenhouse Gas Scenario: RCP – 8.5
 - GCM ensemble upper bound - 90% non-exceedance
- **Design storms:**
 - 2-year 24-hr
 - 10-year 24-hr
 - 100-year 24-hr
- **Sea Level Rise:**
 - NOAA (High) projection for critical facilities
 - USACE (high) projection for others



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Design Elevations for Existing and New Facilities (WWTPs)

WWTP Summary of Design Criteria for Hardening against Flooding from Surge, Sea Level Rise and Extreme Storm Events.

	<u>Existing</u> WWTP Facility Assets		<u>New</u> WWTP Facility Assets	
	ft NGVD29	Basis	ft NGVD29	Basis
CDWWTP	16.0	FEMA BFE + 3ft SLR from SEFLCC(2011) +FB +SF	20.3	2075 Surge+1.23m(48")SLR + FB +SF +21"(100-yr, 72-hr rainfall)
SDWWTP	16.0	FEMA BFE + 3ft SLR from SEFLCC(2011) +FB +SF	19.0	2075 Surge+1.23m(48")SLR + FB +SF +21"(100-yr, 72-hr rainfall)
NDWWTP	16.0	Same as CDWWTP and SDWWTP	17.1	2075 Surge+1.23m(48")SLR + FB +SF +21"(100-yr, 72-hr rainfall)

FB= Freeboard = 2.0 ft per ASCE Standard 24-05/2010 FBC Category IV

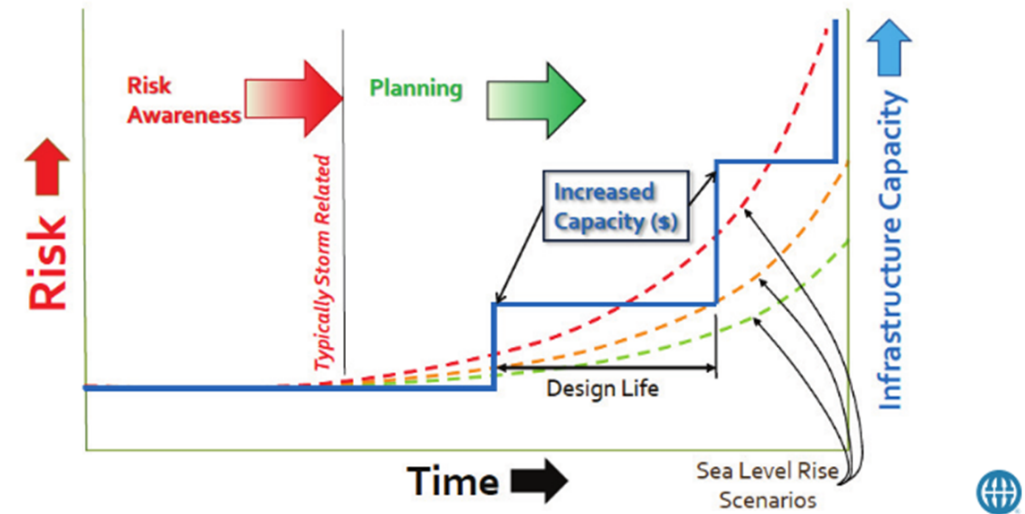
SF= Safety Factor = 1.0 ft per 2014 MWH study at CDWWTP

SLR = 1.23m = 48" per NOAA High projection for 2075 (USACE High projection is 0.93m)

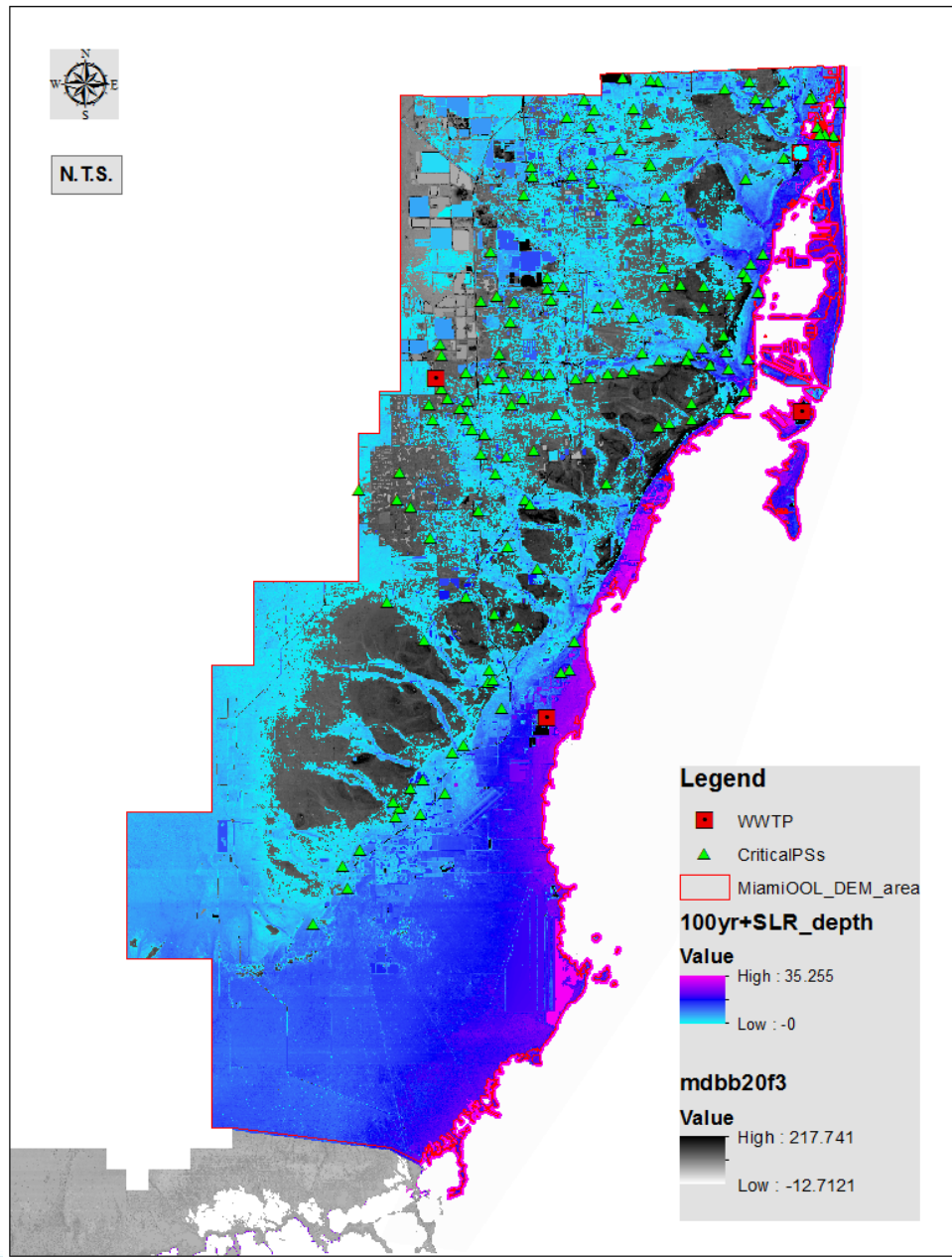
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Level of Service Priorities for Facility Resilience during Extreme Events

1. Personnel protection and hydraulic capacity maintained.
2. Primary treatment liquid processes
3. Secondary treatment liquid processes
4. Solids treatment processes



Focusing on Design Life



Facility Hardening Design Elevations and Prioritization of Critical Facilities for Pump Stations.

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“Focus on Design Life”

Miami-Dade Water and Sewer Department:

<http://www.miamidade.gov/water/>

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