

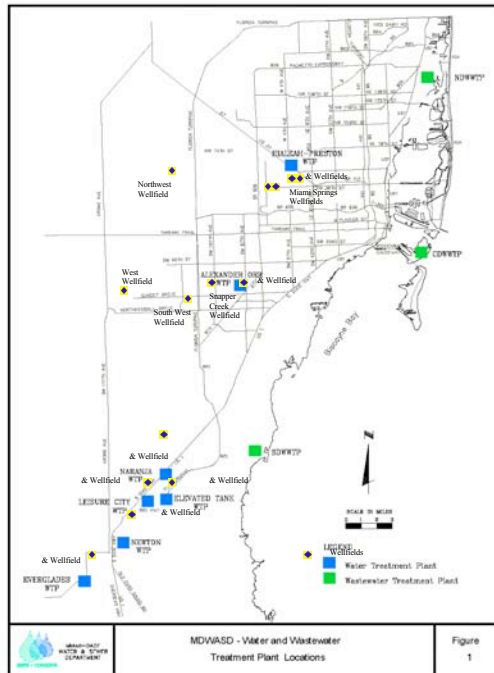


Against A Rising Tide: A Metropolis Plans For Change



Association of Metropolitan Water Agencies
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MDWASD Water & Wastewater Treatment Plants

Water:

- 407,000 retail & 15 wholesale customers
- 94 water supply & 5 ASR wells
- 7,253 miles of water distribution pipe
- 350 MGD production

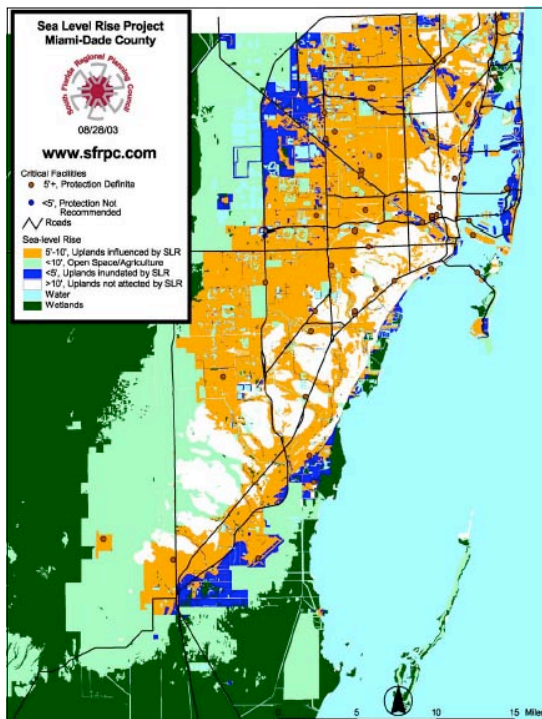
Wastewater

- 322,000 retail & 12 wholesale customers
- 1,006 pump stations
- 5,586 miles of sewer collection pipes
- 352 MGD treatment

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Potential Climate Change Impacts

- Sea Level Rise
 - Salt Intrusion
 - Flooding
 - Inflow & Infiltration
- Tropical Storm Activity
 - Storm Frequency
 - Storm Intensity
- Precipitation Patterns
- Future Demand Forecast
 - Population Growth
 - Tourism Patterns



South Florida Regional Planning Council SLR Map for Miami-Dade County

- Dark Green – wetlands
- Light Green – open space/agriculture
- Blue – 0'-5' – uplands inundated by SLR
- Orange – 5'-10' – uplands influenced by SLR
- White - >10' uplands not affected by SLR



Sea Level Rise Top 10

Exposed Assets (2070)

1. Miami
2. Guangzhou (China)
3. New York
4. Calcutta
5. Shanghai
6. Bombay
7. Tianjin (China)
8. Tokyo
9. Hong Kong
10. Bangkok

Exposed Population

1. Calcutta
2. Bombay
3. Dhaka (Bangladesh)
4. Guangzhou
5. Ho Chi Minh City
6. Shanghai
7. Bangkok
8. Rangoon
9. Miami
10. Hai Phong

What are we doing about Climate Change?

- 1993 – County Commission adopted plan to reduce greenhouse gas emissions – 34 million metric tons avoided to date
- Focus on solid waste, transportation, urban design, energy efficiency
- Reduction goals not met primarily due to transportation
- 2007 – creation of climate Change Advisory Task Force to advise County commission, with focus on adaptation strategies

Task Force Structure

- Members appointed by Mayor and Commission representing cross section of community interests
- Committees on Science; Built Environment; Economic, Social, and Health; Greenhouse Gas Reductions; Intergovernmental Affairs; Natural Systems Adaptation
- Preliminary recommendations presented in April, 2008
- Follow-up work by committees to recommend specific implementation actions
- Joined Chicago Climate Exchange and created a countywide Office of Sustainability

Some Task Force Recommendations

- Expect 1.5' of sea level rise by 2050; 3'-5' by 2100
- Model groundwater, salt intrusion, and drainage/flooding consequences
- Limit development in most vulnerable undeveloped areas
- Accelerate natural system restoration to create greater resilience of the natural system (the Everglades)
- Further reduce GHG emissions across all sectors
- Establish a countywide masterplan element for climate change

Utility-Specific “To Do” List

- More precise estimates of role of sea level rise & tropical storm activity patterns
- Treatment technology to deal with more brackish groundwater
- More energy-efficient treatment technologies to reduce greenhouse gas emissions
- Refining growth projections to account for possible climate change impacts that might reduce demands
- Revising land use and capital plans to adapt to climate change; future financing issues impacting the local economy and capital plan

Observations

- Utilities cannot plan for climate change in isolation
- Utility adaptation strategies may be very capital and energy intensive with long lead times
- Monitoring and verifying conditions attributable to climate change as triggers for implementing adaptation actions has technical, political, and financial dimensions
- Forecasting future habitability on a metropolitan or regional scale is uncharted territory
- Coastal utilities may be at most obvious risk, but all communities will have impacts

