

Florida Water and Climate Alliance (Florida WCA)

“Assessment of Sea Level Rise and Storm Surge Impacts”

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MDWASD Overview

Largest water and sewer utility in Florida, serving more than 2.2 million residents

Water System:

- 3 large regional and 5 small water treatment plants
- Supplying an average of 302 million gallons per day (MGD)
 - 90% of the County's public water supply
 - Per capita water use 132 gpcd
 - 14 wholesale customers
 - 424,764 retail customers
 - 100 water supply wells
 - 7,918 miles of pipes
 - 38,204 fire hydrants
 - 126,000 valves



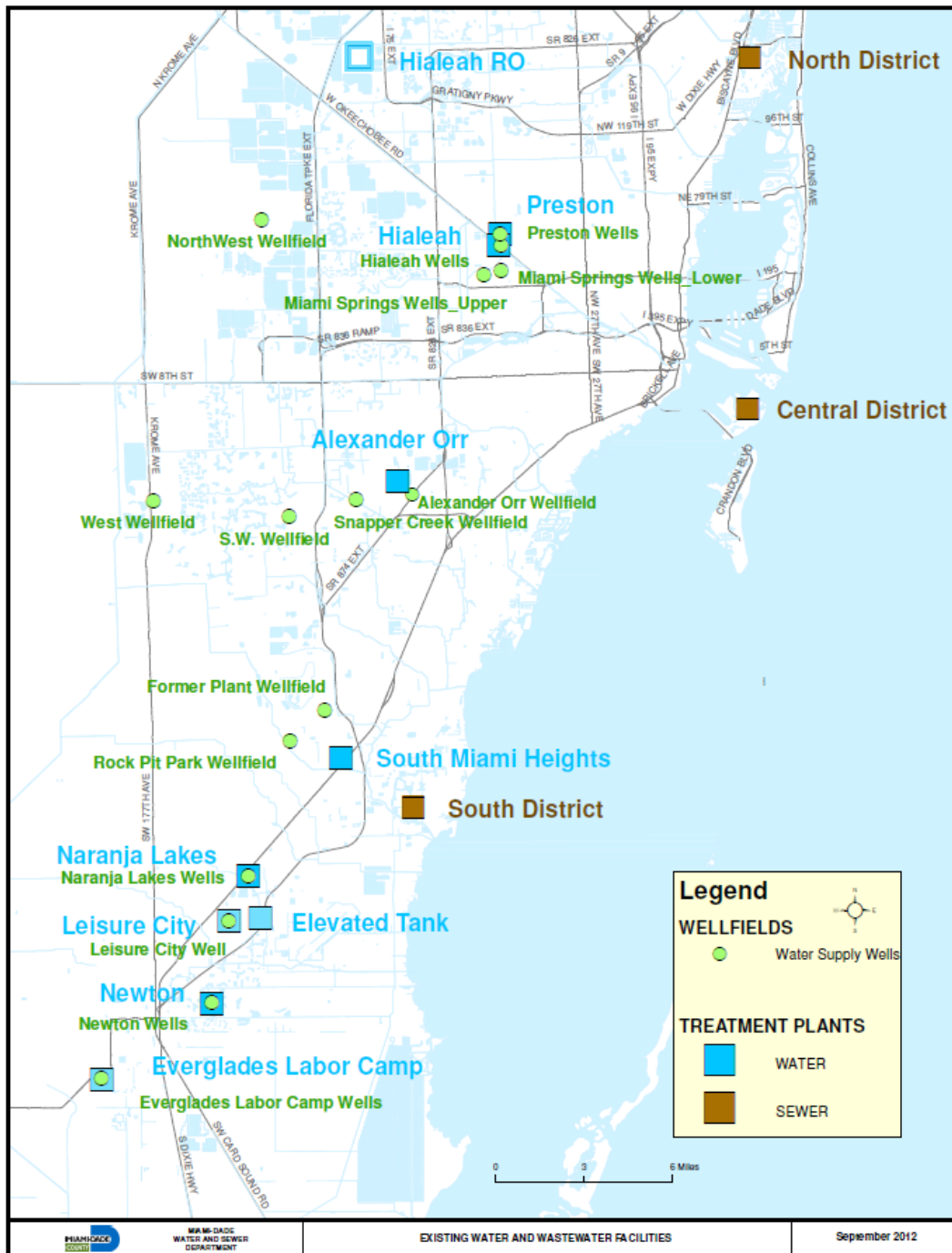
MDWASD Overview (continued)

Wastewater System:

- 3 wastewater treatment plants
- 2 ocean outfalls and 21 deep injection wells
- Collecting, treating, and disposing 307 MGD
 - 342,539 retail customers
 - 13 wholesale customers
 - 6,277 miles of mains and laterals
 - 1,042 sewer pumps stations
 - Reusing 10.2 MGD



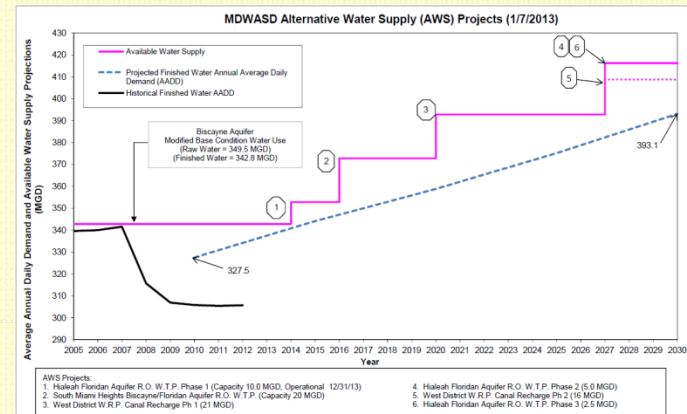
Water & Wastewater Treatment Facilities



Integrated Master Plan

(Water, Wastewater, & Reclaimed Water)

- Updated demand projections to 2035
- Alternative water supply (including reclaimed water)
- Ocean Outfall Compliance Plan (June 2013)
(no ocean discharge after 2025)
- New wastewater treatment plant in the West
- Infrastructure improvements
- Redundancy analysis
- Energy savings projects
- Climate Change impacts

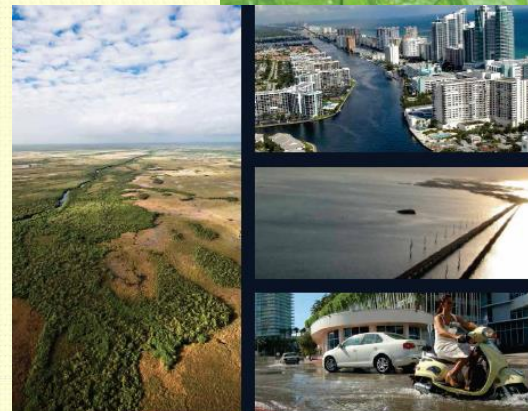


Climate Change References

- Miami-Dade County GreenPrint:
 - Miami-Dade County Climate Change Advisory Task Force
 - The Mayor's Sustainability Advisory Board
- Southeast Florida Regional Climate Action Plan
- EPA's Climate Ready Water Utilities



Adaptive Response Framework for
Drinking Water and Wastewater Utilities



A Region Responds to a
Changing Climate

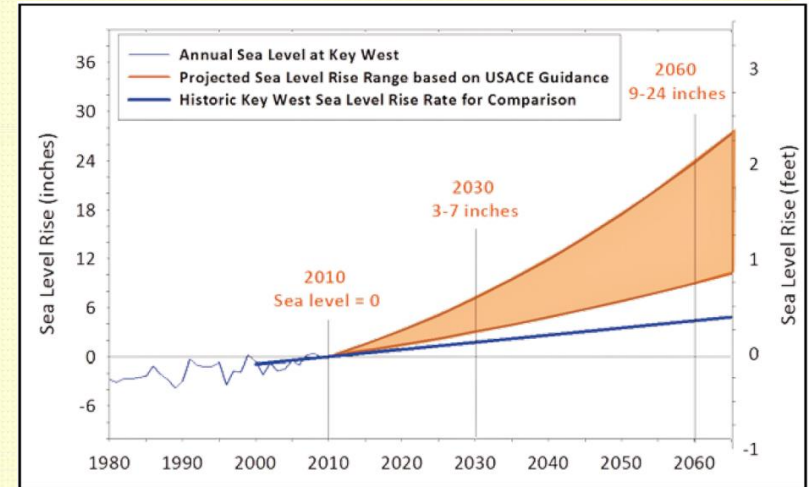
Southeast Florida Regional Climate
Change Compact Counties

Regional Climate Action Plan
October 2012



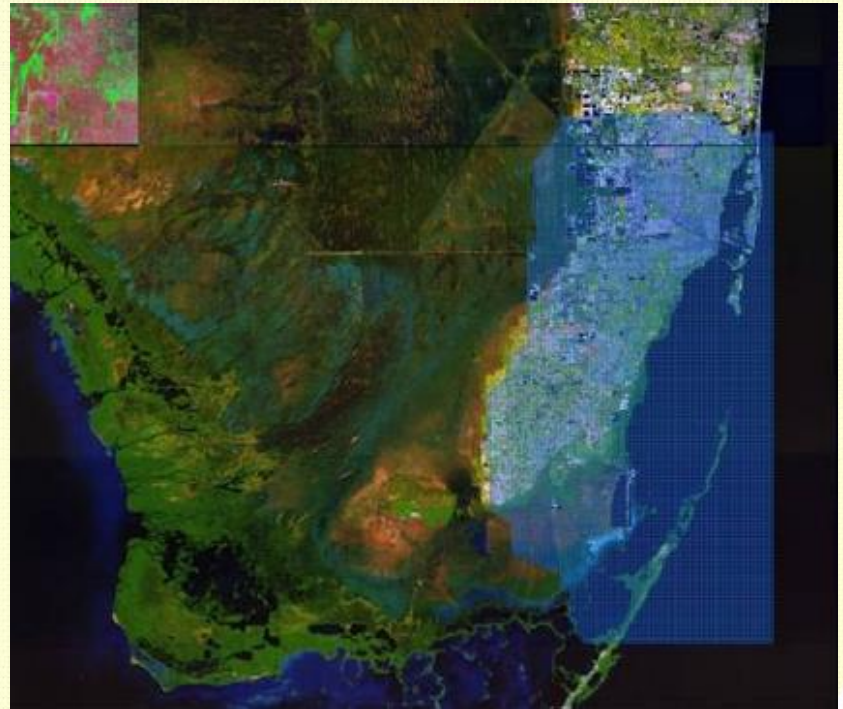
Assumptions on Climate Change Impacts

- 3 ft SLR by 2075
- Saltwater intrusion in water supply wellfields
- Increased flooding and infiltration and inflow
- Impacts from storm surges on coastal facilities
- Drought conditions

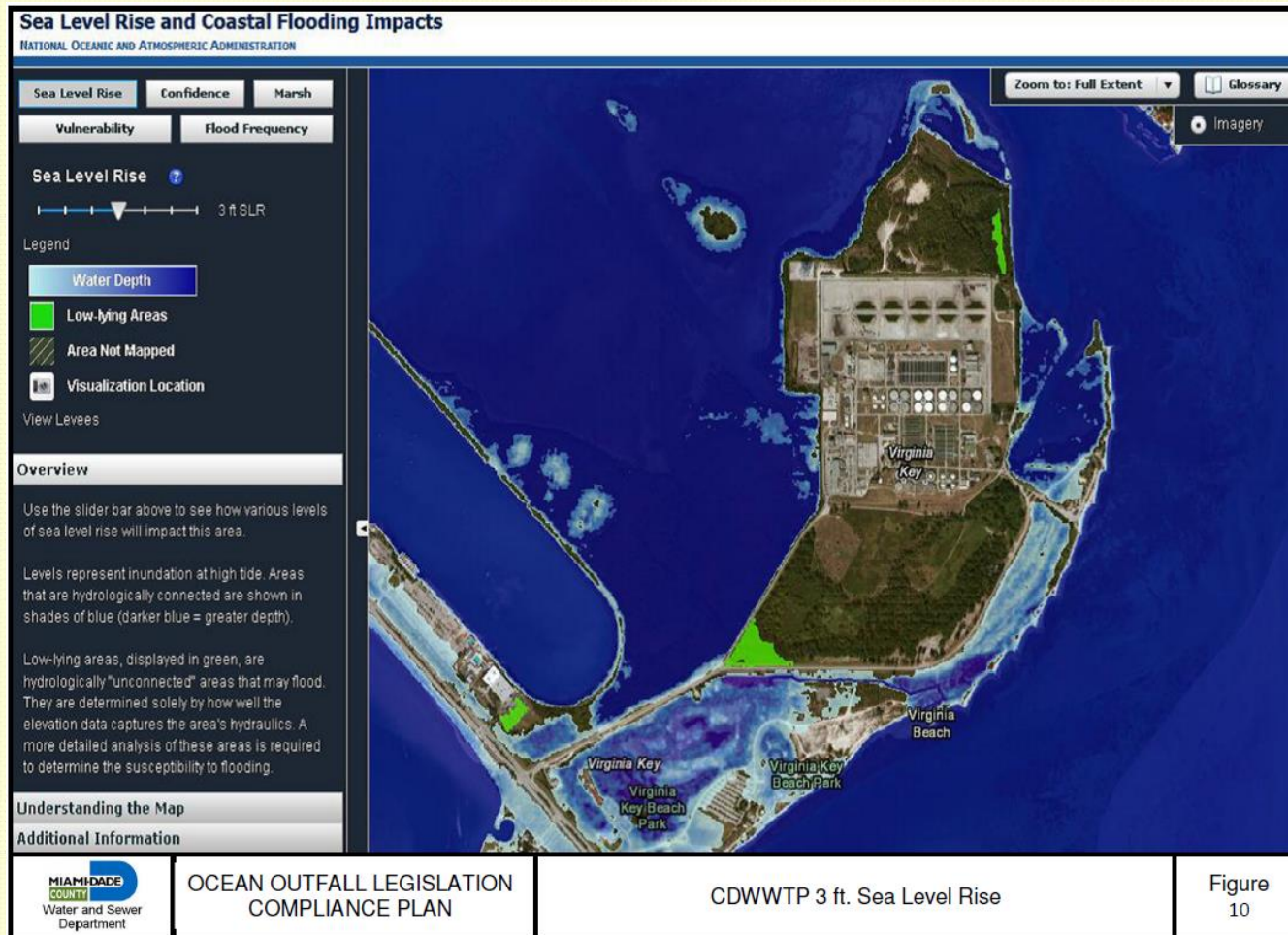


Tools to Assess Climate Change Impacts

- Integrated surface/groundwater model for Biscayne aquifer
- Sea Level Rise NOAA Viewer
- Storm surge assessment for coastal facilities
(preliminary assessment by Hazen and Sawyer, Feb 2013)



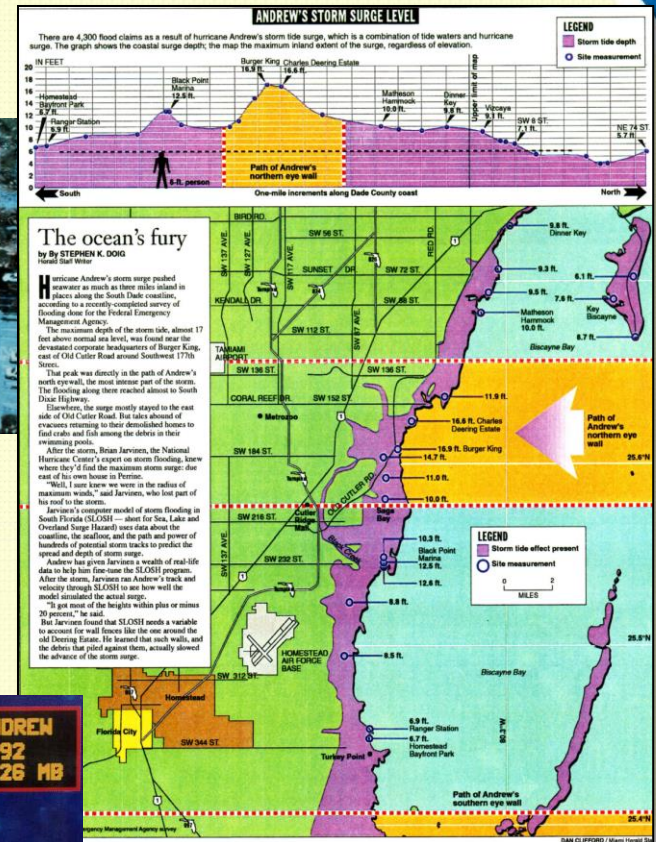
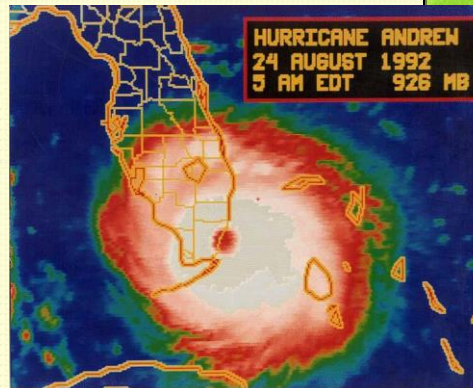
Sea Level Rise NOAA Viewer



Previous Experience with Storm Surge

Hurricane Andrew,
August 1992:

- 16 ft. storm surge
- 140 mph winds
- SDWWTP Impacted (12.5 ft surge), back in service in approximately 30 days



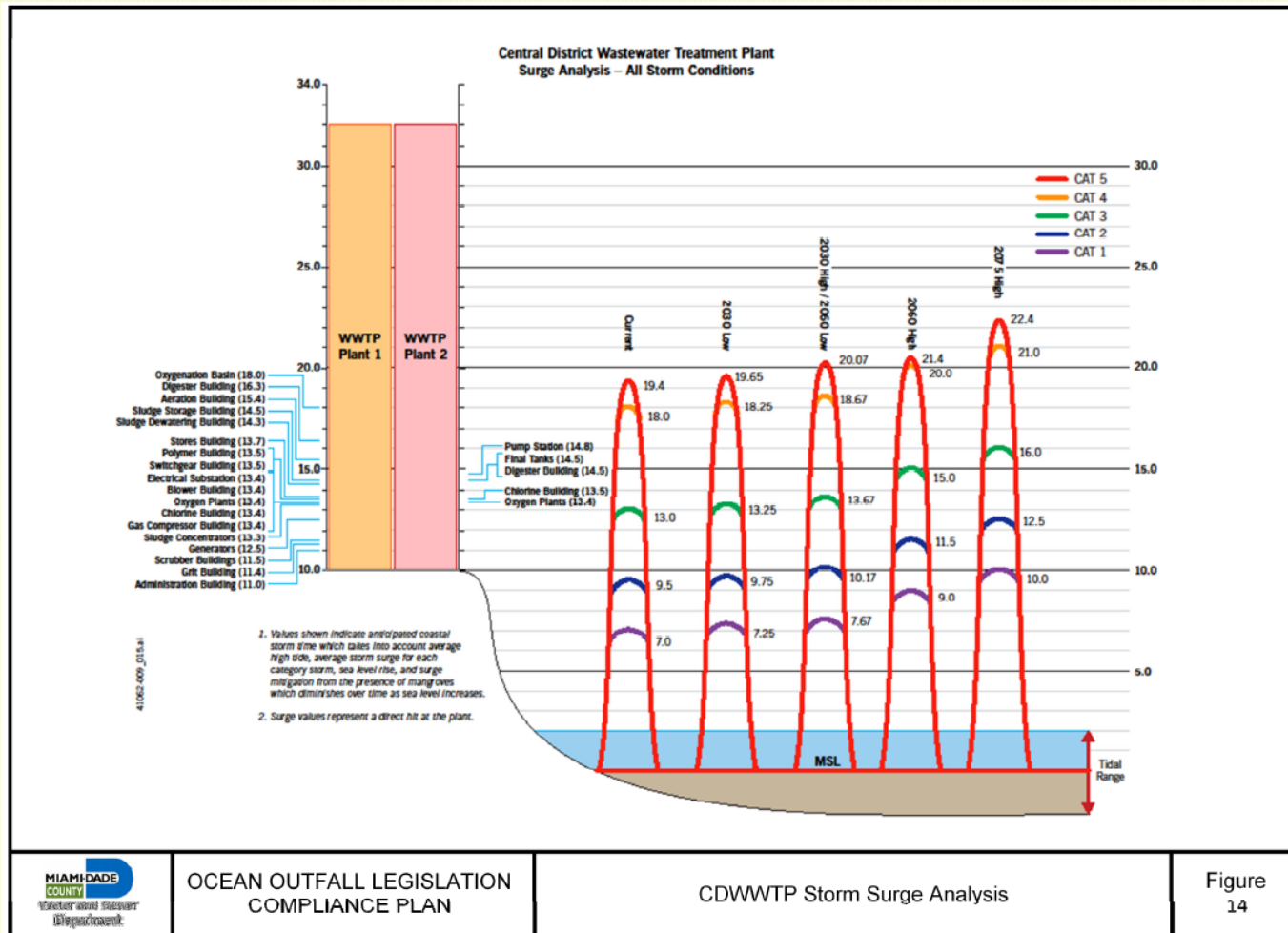
Coastal Storm Tide Evaluation

Category	Surge Range	Surge Value	High Tide	Coastal Storm Tide				
				Current (no SLR)	2030 Low (0.25 ft SLR)	2030 High/2060 Low (0.67 ft SLR)	2060 High (2 ft SLR)	2075 High (3 ft SLR)
1 - Minimal	4 - 5 feet	4.5	2.5	7	7.25	7.67	9	10
2 - Moderate	6 - 8 feet	7	2.5	9.5	9.75	10.17	11.5	12.5
3 - Extensive	9 - 12 feet	10.5	2.5	13	13.25	13.67	15	16
4 - Extreme	13 - 18 feet	15.5	2.5	18	18.25	18.67	20	21
5 - Catastrophic	> 18 feet	16.9	2.5	19.4	19.65	20.07	21.4	22.4

Notes:

- 1) Storm categories are based on wind speed and central pressure - surge is estimated
- 2) Hurricane Andrew (Category 5 storm) resulted in a measured surge of 16.9 feet

Storm Surge Analysis



Cost Estimates

- Full Plant Replacement - \$7.5 billion
- Total estimated loss (electrical, instruments & controls) from storm - \$1.7 billion (23 %)
- Hardening of facilities (partial walls, flood logs, watertight doors) - \$20 million

Existing Adaptation and Mitigation Measures

- Water conservation
- Emergency backup power
- Standby pumps in all pump stations
- SCADA at all major plants, pump stations w/malfunction alarms
- 24/7 Emergency Call Center
- Parallel trains at all wastewater treatment plants
- Large inventory of portable power generators, piping, valves, and fittings
- Contracts with construction firms for emergency repairs
- New design criteria (higher elevation)



Next Steps

1. Refine Storm Tide Criteria
2. Perform more detailed asset analysis
3. Evaluate mitigation alternatives
4. Continue hardening program
5. Develop design criteria for new development

Miami-Dade Water and Sewer Department:
<http://www.miamidade.gov/water>

Water Conservation Program:
<http://www.miamidade.gov/waterconservation>

Ocean Outfall Compliance Plan
<http://www.miamidade.gov/water>

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