SOUTH FLORIDA WATER MANAGEMENT DISTRICT

2011 Upper East Coast Water Supply Plan Update Review

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UEC Plan Update – WRAC Issues Workshop # 4
SFWMD Martin/St. Lucie Service Center, Stuart, FL
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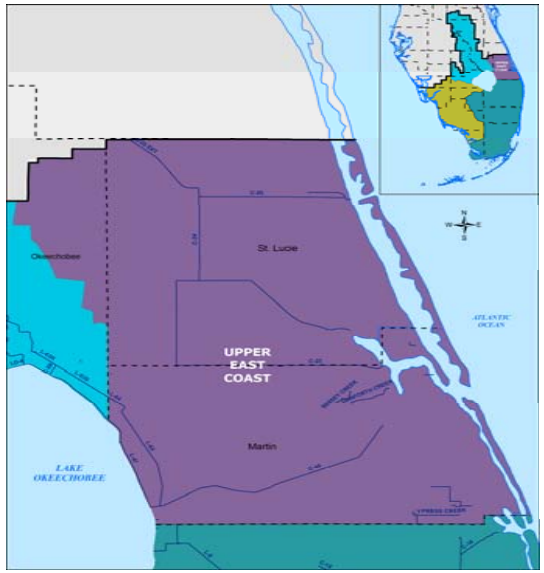
Regional Water Supply Planning



- Required by statute, Section 373, F.S.
- 20 year planning horizon – through 2030
- Updated every 5 years with best available data
- Plan goal and 7 objectives
- Overview of planning area and update process
- Public participation – WRAC Issues workshops
- UEC Water Resources includes groundwater (Surficial & Floridan), surface water (canals, natural systems and wetlands)
- Progress in UEC since 2004
  - Conservation, modeling and studies, regulatory protection & water quality efforts, water storage, water supply development projects
- Climate change

Water Use Categories

- Public Water Supply
- Self-Supply
  - Agriculture
  - Power Generation
  - Recreation/Landscape
  - Industrial and Commercial
  - Domestic Self-Supply

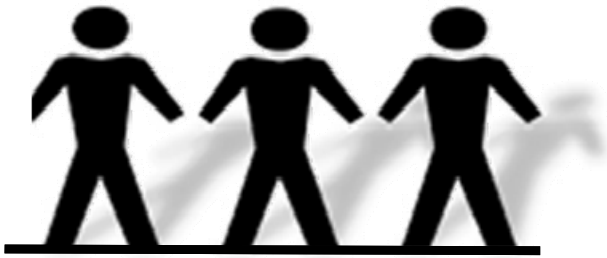
UEC Population

UEC Population						
County	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
St. Lucie	240,039	285,254	342,025	413,043	504,911	595,063
Martin	140,983	150,468	160,590	171,393	182,922	195,138
Eastern Okeechobee	1,302	1,396	1,469	1,534	1,600	1,662
Total	**382,324**	**437,118**	**504,084**	**585,970**	**689,433**	**791,863**

2005

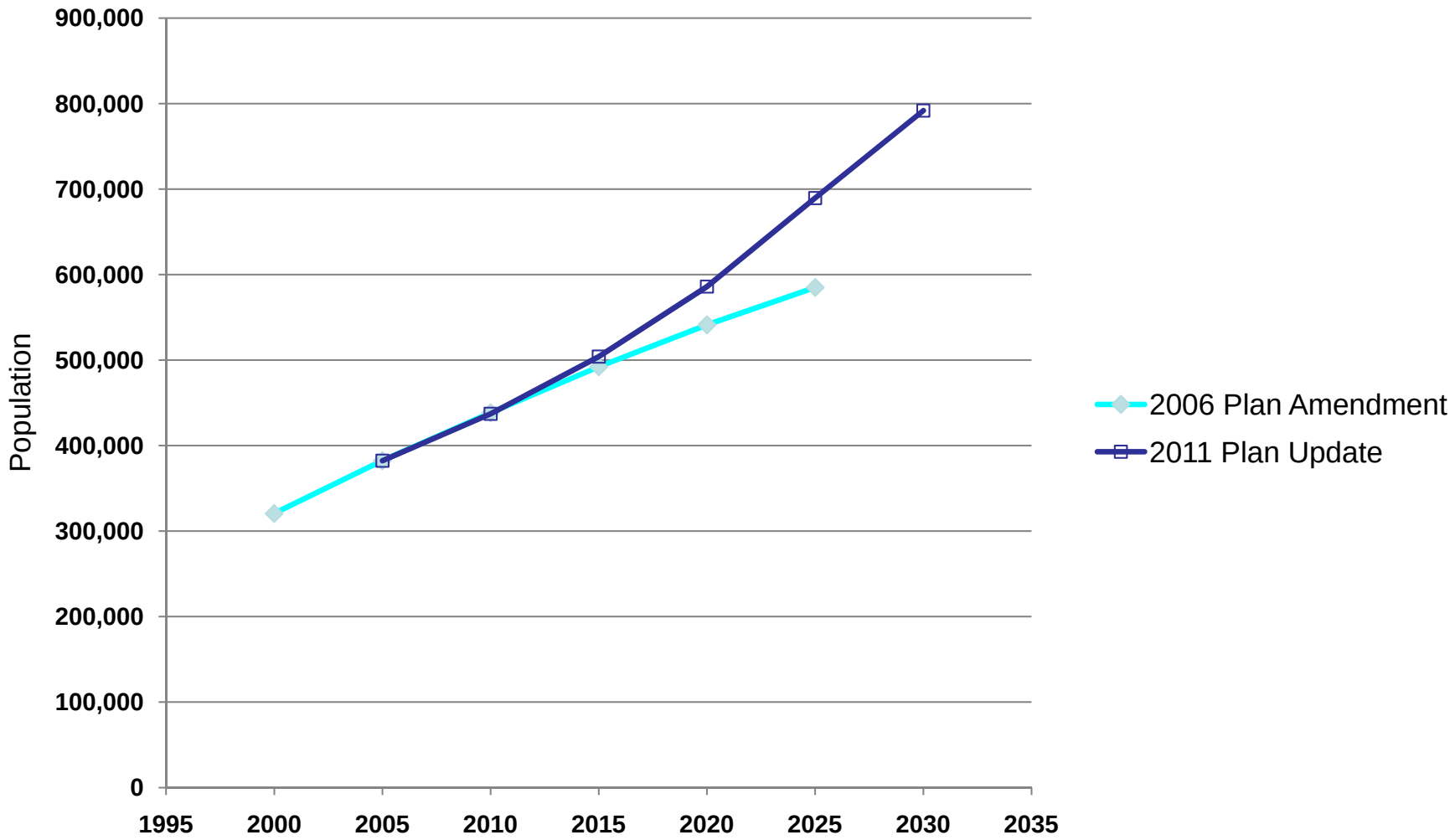
382,324

2030



791,861

UEC Population



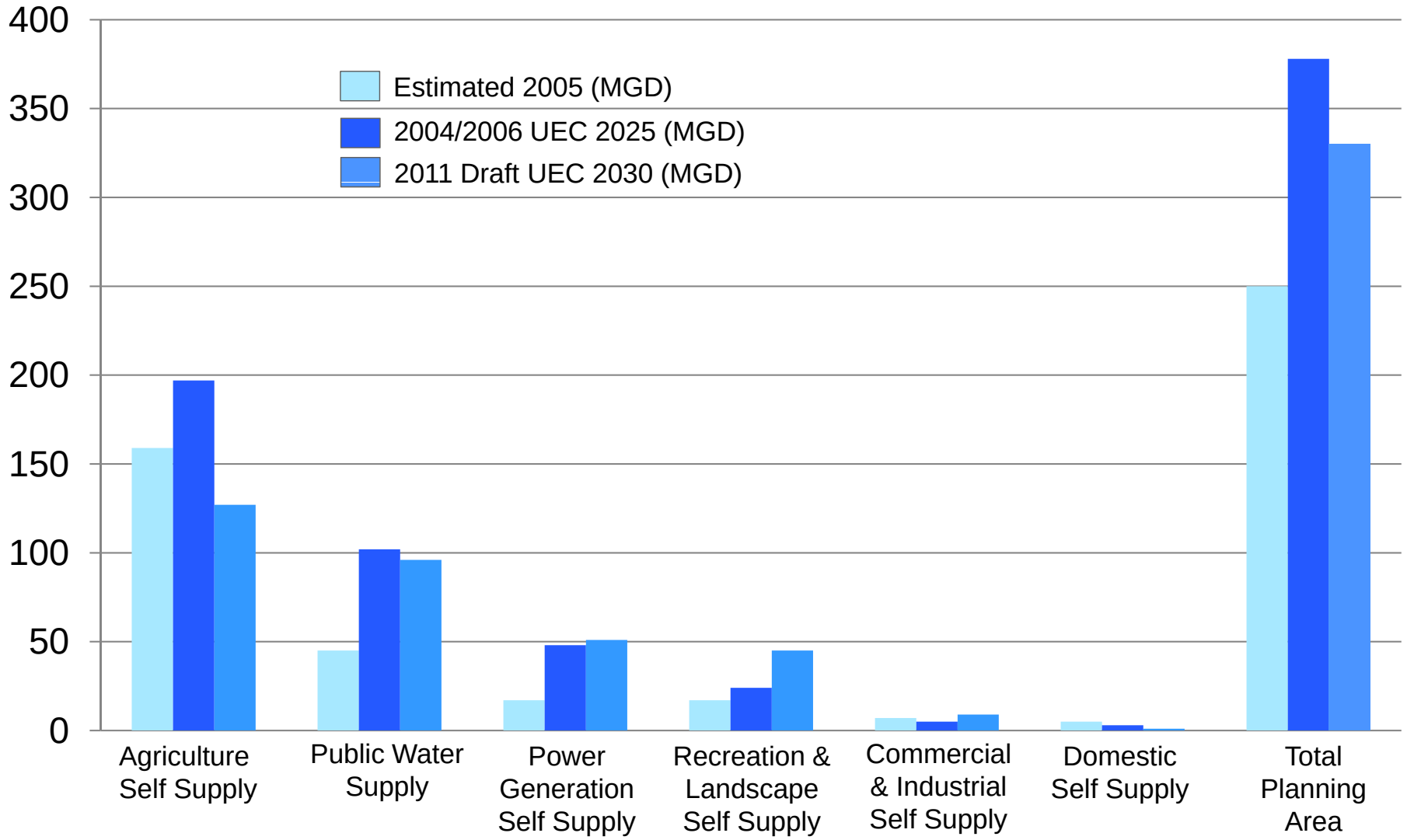
Ag Crop Category & Irrigated Acreage Summary

Crop Category	2005	2010	2015	2020	2025	2030
Citrus	110,500	69,629	66,148	72,762–76,071	73,854–83,678	74,962–92,046
Sugarcane	10,379	10,379	10,379	10,379	10,379	10,379
Vegetables, Melons & Berries	8,252	7,839	7,427	7,015	6,602	6,189
Sod	5,485	5,211	4,937–5,211	4,662–5,211	4,388–5,211	4,114–5,211
Greenhouse/ Nursery	2,045	1,943	1,943	1,943	1,943	1,943
Other Fruits & Nuts	117	115	115	115	115	115
Total	136,778	95,116	90,949–91,223	96,876–100,733	97,281–107,928	97,702–115,883

Water Use Category Demands

Water Use Category	2005	2010	2015	2020	2025	2030
Gross (Withdrawal) Demands for Average Conditions (MGD)						
Agricultural Self-Supply	159	116	112	117–120	117–128	117–137
Public Water Supply	45	52	60	70	83	96
Power Generation Self-Supply	17	20	21	34	35	51
Recreational/Landscape Self-Supply	17	31	34	37	41	45
Industrial/Commercial/ Institutional Self-Supply	7	7	7	8	8	9
Domestic Self-Supply	5	4	4	3	2	1
Total	250	230	238	270–273	287–298	320–340

UEC Demands and Projections



Issues Identified

- Limited expansion of fresh water aquifers
  - Wetland Impacts
  - Saltwater Intrusion
  - Aquifer Protection
- Limited fresh water for irrigation
- Surface water availability
  - C-23, C-24 and C-25 Canals
- Freshwater discharges to estuaries

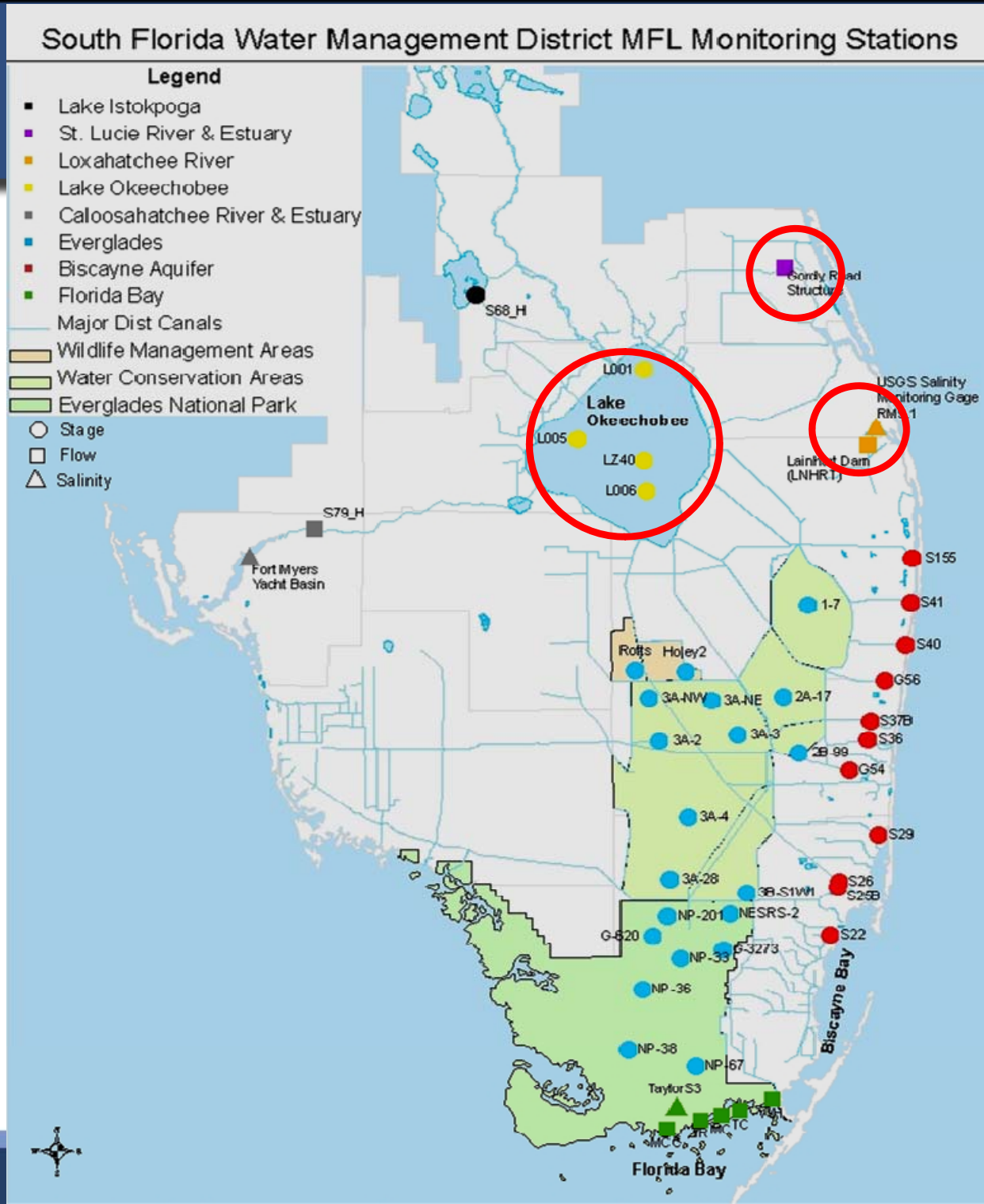
Resource Protection Overview

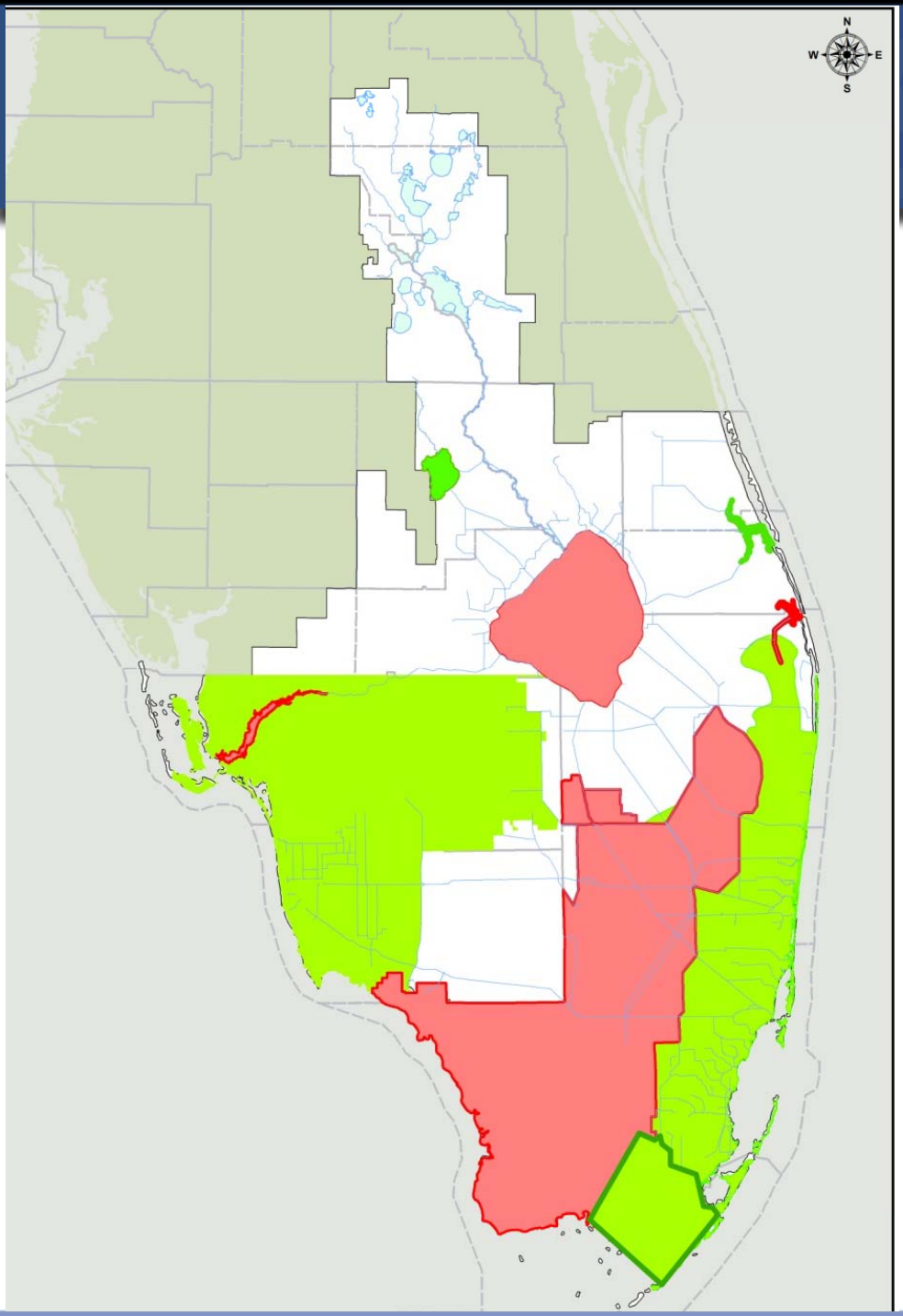
- **Consumptive Use Permitting Process**
  - Balances needs of the water users with the public's interest in protecting the resource for many other uses
- **Water Shortage Rules**
  - Restricts water use when there is temporarily insufficient groundwater or surface water available to meet user needs or when conditions require temporary reduction in use to prevent harm to the water resources
- **Minimum Flow & Level Criteria**
  - Defines the point at which additional withdrawals will result in significant harm to the water resources or ecology of an area (science-based)
- **Water Reservation**
  - Legal mechanism to set aside water for protection of fish and wildlife or public health so that it cannot be allocated for consumptive use (science based)
- **Restricted Allocation Area Rules**
  - Specific geographic areas and/or canal conveyance systems from which allocations are restricted (policy-based, consistent with public interest)

MFLs, Water Reservations & RAAs

- **Minimum Flow & Levels**
  - North Fork of St. Lucie River, N.W. Fork Loxahatchee River, Lake Okeechobee
- **Water Reservation**
  - North Fork of St. Lucie River
- **Restricted Allocation Areas**
  - Prohibits the use of surface water in the C-23, C-24, and C-25 canals, or any connected canal systems that derive water from these canals above existing allocations. See Section 3.2.1(B) of the *Basis of Review for Water Use Applications* (SFWMD 2010a)

MFLs Established within the Upper East Coast Planning Area





Existing Minimum Flows and Levels Water Bodies

MFL Prevention Waterbodies

- St. Lucie Estuary
- Biscayne aquifer
- Lower West Coast aquifers
- Lake Istokpoga
- Northeastern Florida Bay

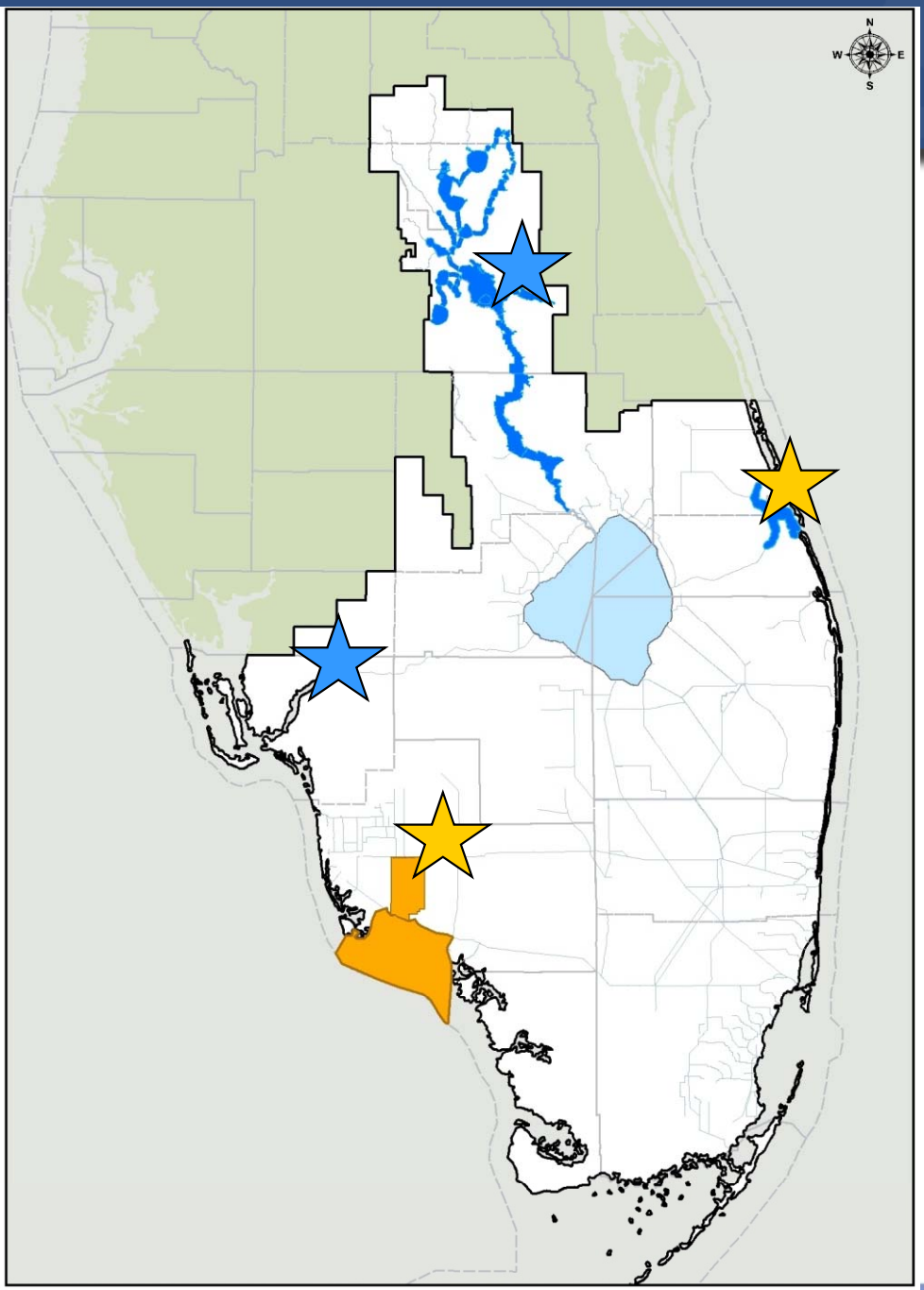
MFL Recovery Waterbodies

- Northwest Fork of Loxahatchee River
- Lake Okeechobee
- Everglades
- Caloosahatchee River

MFL Prevention Strategy

St. Lucie Estuary Prevention Strategy

- Discharges from the North Fork will be managed within the operational protocols of Ten Mile Creek Project (2004)
- Flow targets will be consistent with the CERP performance requirements for Indian River Lagoon-South Project
- A research and monitoring strategy for the North and South Forks of the St. Lucie River will be developed and implemented in coordination with the UEC Water Supply Plan



Water Reservation Waterbodies

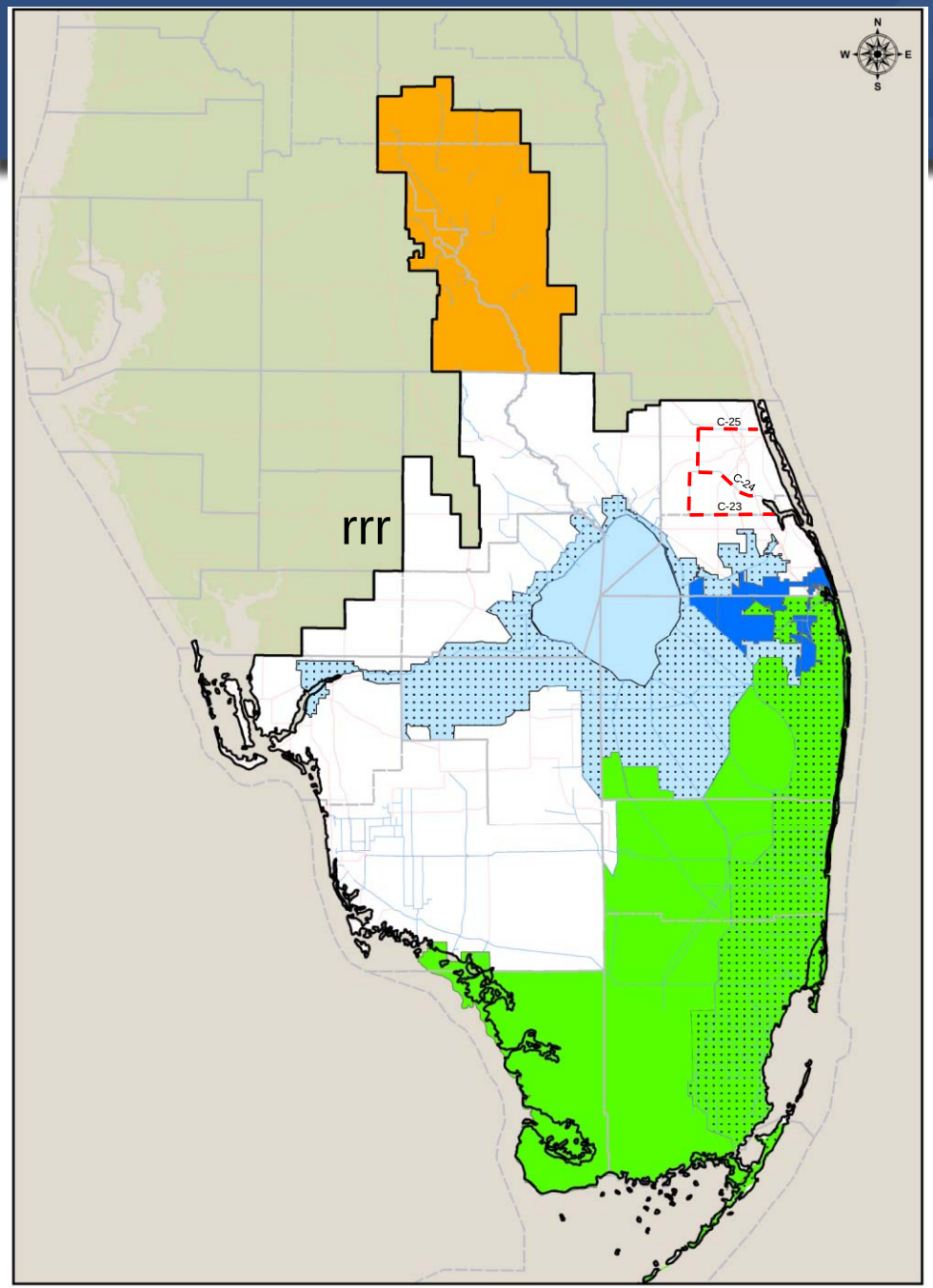
Rules in place

- North Fork of the St. Lucie River
- Picayune Strand and Fakahatchee Estuary

Rules in development

- Kissimmee Basin Chain of Lakes and River
- Caloosahatchee Estuary

Restricted Allocation Areas



- C-23, C-24 & C-25 Canals
- North Palm/Loxahatchee River Watershed
- Everglades and Lower East Coast
- Lake Okeechobee Service Area
- Central Florida Coordination Area

Protection of St Lucie River/Estuary: Example of Multiple Tools

Minimum Flow and Level

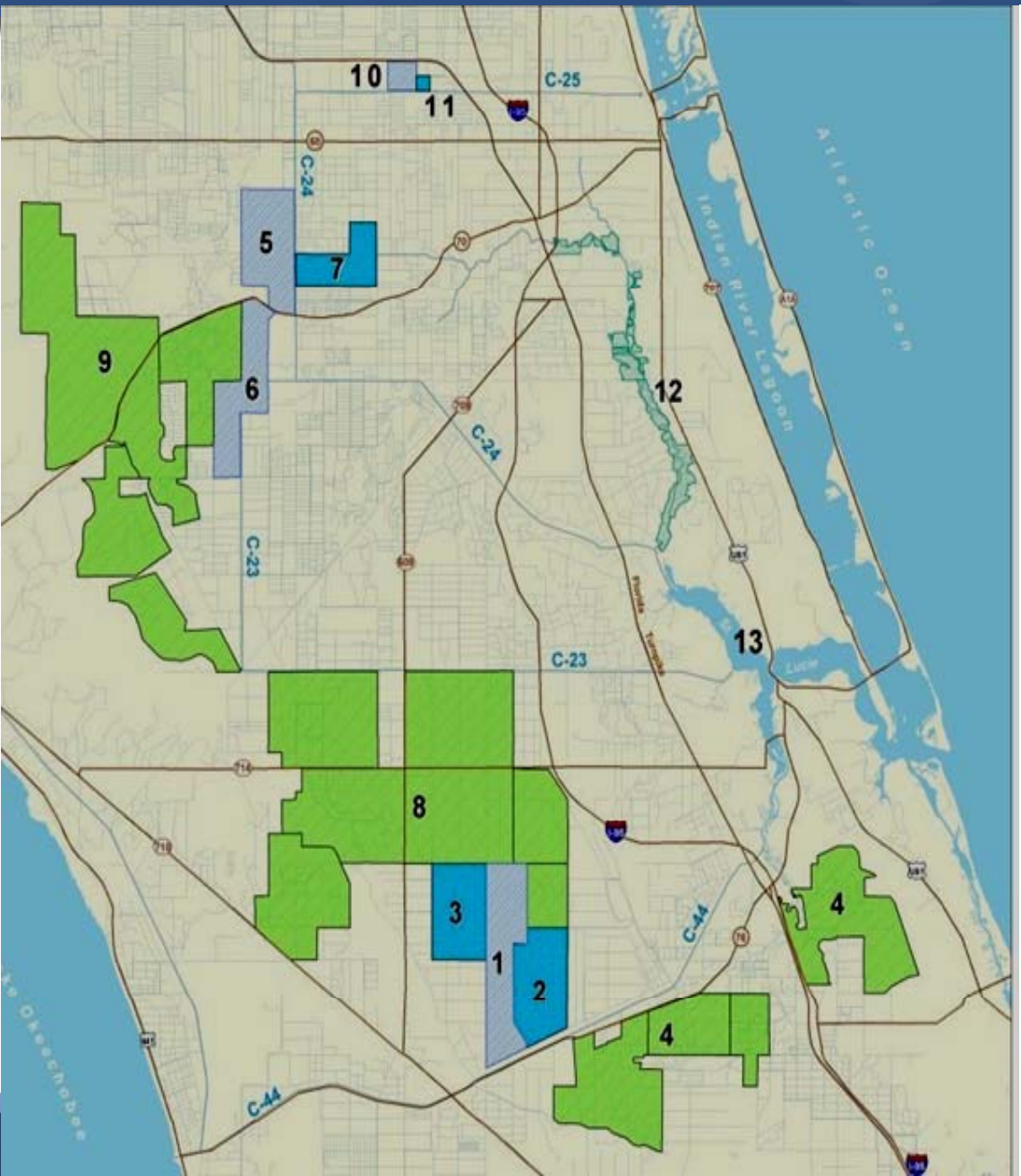
- 28 cfs at Gordy Road for two consecutive months in one year (SFWMD 2002)

Water Reservation

- Maintain 1 ppt isohaline between the Prima Vista and Kelstadt bridges during the dry season for the North Fork of the St. Lucie River
- Equates to maintaining a mean monthly flow rate of 130 cfs at the Gordy Road structure (SFWMD 2009)

Gordy Road Structure, North Fork, St. Lucie River

Indian River Lagoon-South Recommended Plan



C-44 Basin

1. C-44 Reservoir
2. C-44 Stormwater Treatment Area (East)
3. C-44 Stormwater Treatment Area (West)
4. Palmar Complex – Natural Storage and Water Quality Area

C-23/C-24 Basins

5. C-23/C-24 - North Reservoir
6. C-23/C-24 - South Reservoir
7. C-23/C-24 - Stormwater Treatment Area
8. Allapattah Complex – Natural Storage and Water Quality Area
9. Cypress Creek/Trail Ridge Complex - – Natural Storage and Water Quality Area

C-25, North Fork & South Fork Basins

10. C-25 Reservoir
11. C-25 Stormwater Treatment Area
12. North Fork Natural Floodplain Restoration
13. Muck Remediation & Artificial Habitat

Reservoir

Stormwater Treatment Area

Natural Storage & Water Quality Area

Stormwater Management & Water Quality Efforts

Dispersed Water Management Program

- **Florida Ranchlands Environmental Services Program**
  - Alderman-Deloney Ranch located within the C-25 Basin of the UEC Planning Area and provides 138 acre-feet of on-site retention, which retains 40 pounds of phosphorus on an annual basis.
- **Water Farming**
  - A pilot project is underway for intensively managed agricultural lands, including fallow citrus
- **Indiantown Citrus Growers Association Project**
  - A multi-agency cost-share project located in Martin County will provide 3,550 acre-feet of water storage

Water Source Options

Conservation

Reclaimed Water

Surficial Aquifer System

Aquifer Storage & Recovery

Reservoirs

Surface Water

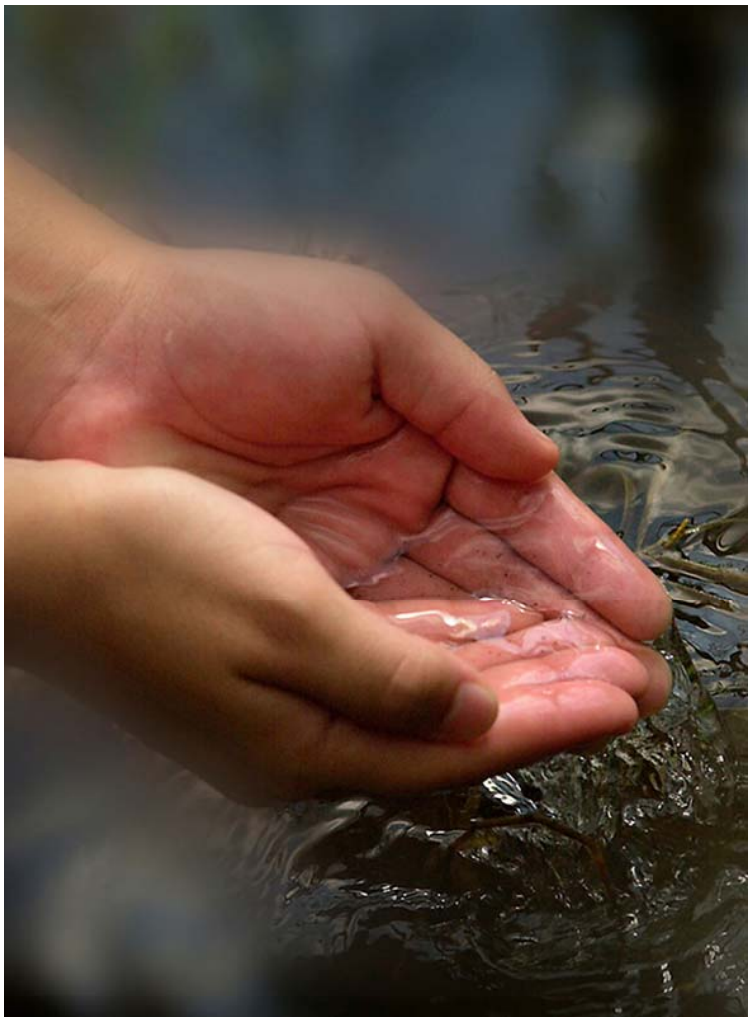
Floridan Aquifer System

Ocean Water

Comprehensive Water Conservation Program

Designed to:

- Instill a year-round conservation ethic
- Bring about a permanent reduction in individual water use over the next decade
- Build on and complement successful conservation initiatives at the local, state and national levels
- Be adaptable and flexible



Water Conservation Program

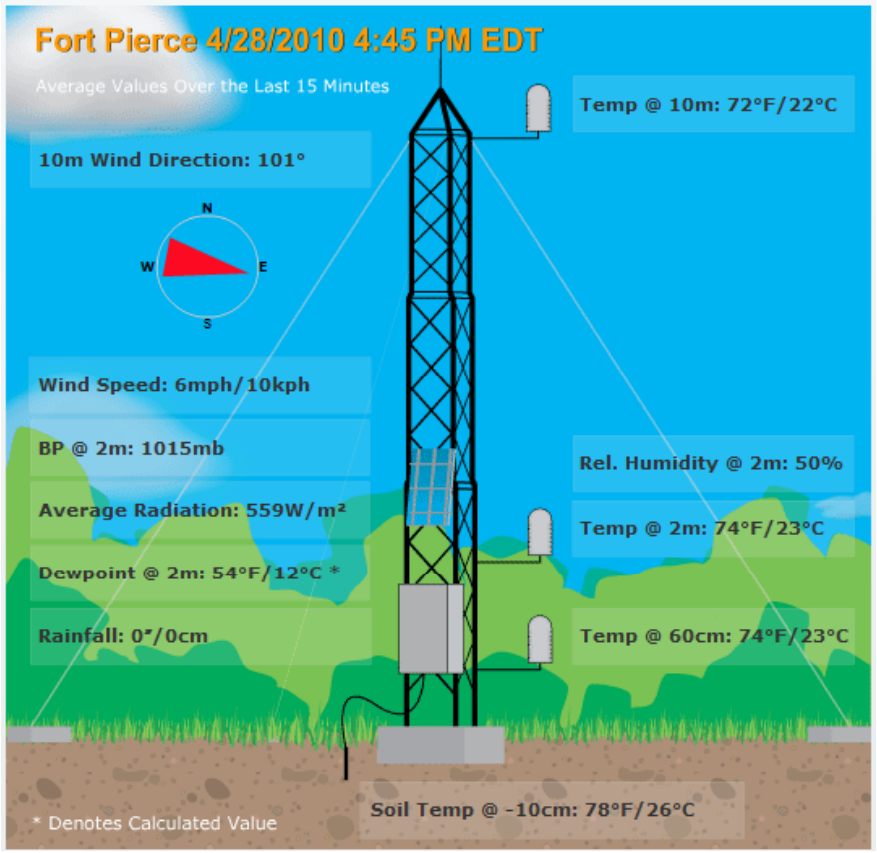
- Fixture retrofits
  - Water Savings Incentive Program
- Goal based approach
  - Conserve Florida Clearinghouse
    - EZ Guide
- Water Champ
- Florida Water Star
- Leading by Example
- FAWN

Florida Water SM

Water C•H•A•M•P Conservation Hotel And Motel Program

Agricultural & Golf Course Industry

Florida Automated Weather Network - extensive data gathering initiatives to establish water use benchmarks, support public information efforts

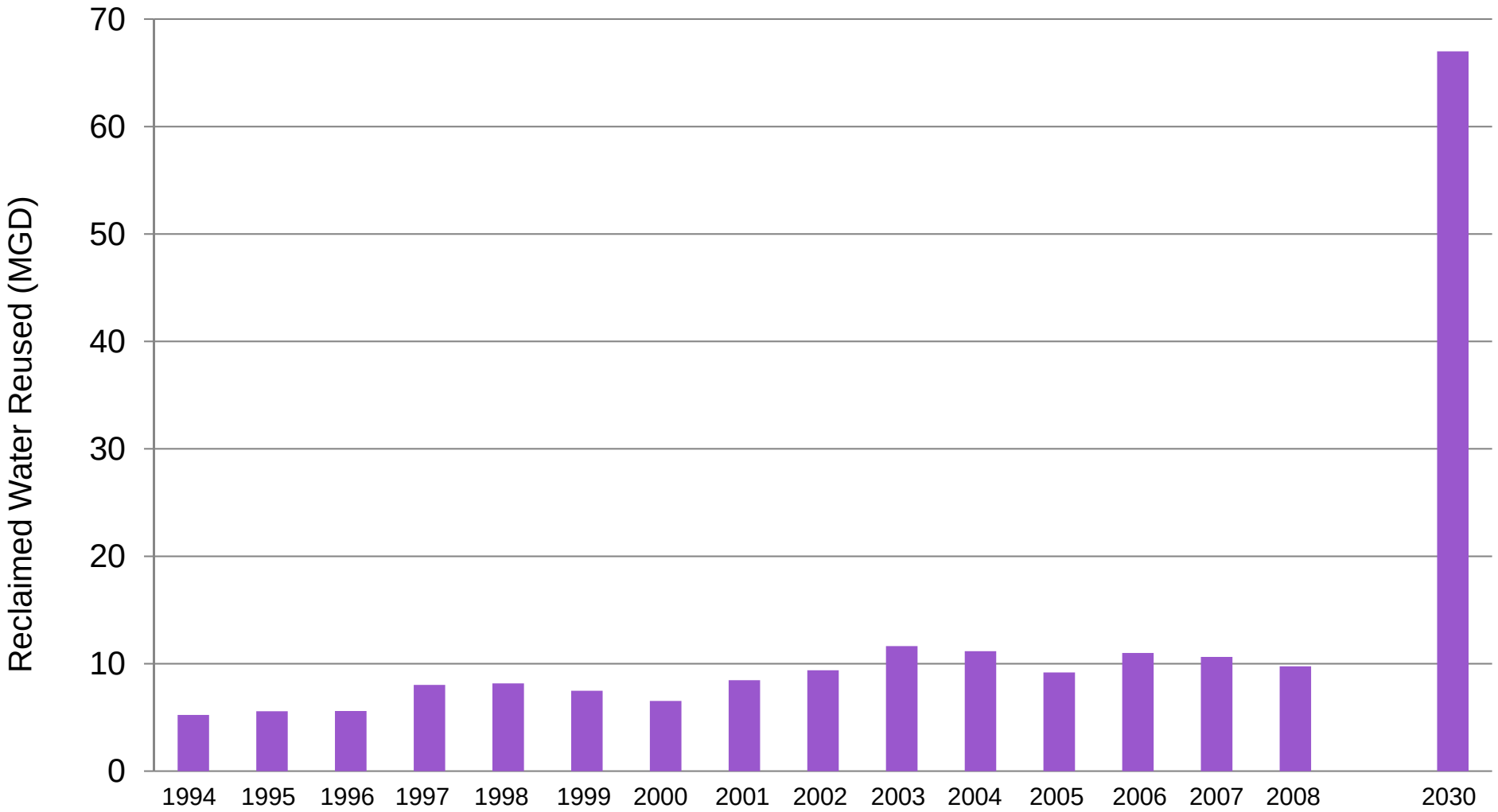


Reclaimed Water

- Water that has received at least secondary treatment and basic disinfection
- Reused after flowing out of a domestic wastewater treatment facility
  - Conserves resources and is an environmentally sound alternative to traditional disposal methods, such as deep well injection
  - Nearly all wastewater facilities reuse all or a portion of their wastewater in this region
  - Wastewater flows are projected by the utilities to increase from 23.7 MGD to about 67.0 MGD by 2030




Historical & Future Water Reuse



Future Reclaimed Water Facilities

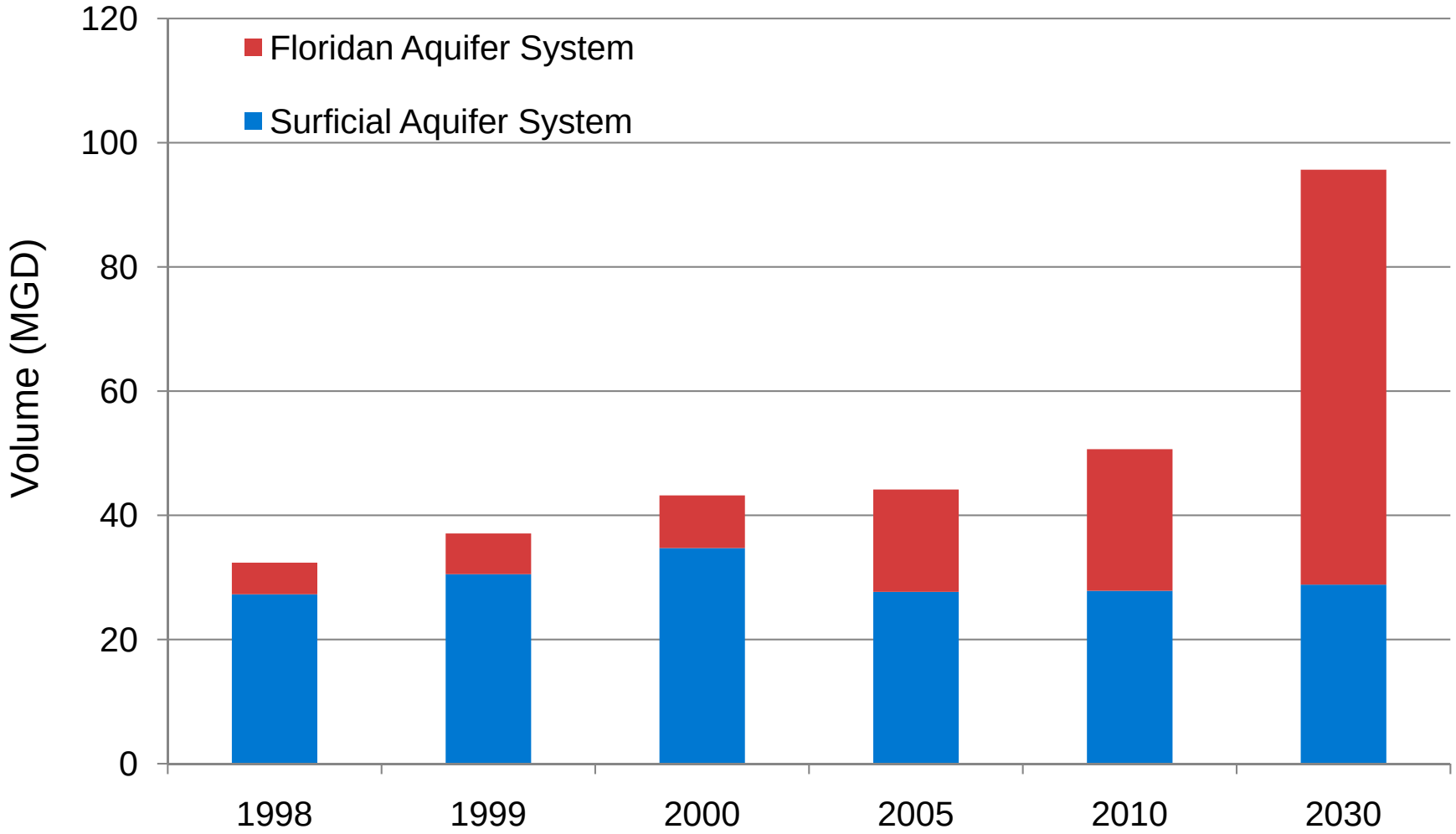
- The use of reclaimed water as an alternative resource is projected to increase significantly over the next 20 years
  - Port St. Lucie is consolidating and regionalizing its wastewater systems, and is planning to incorporate additional storage and supplementation
  - Martin County and the City of Stuart are cooperating to maximize water reuse
  - Fort Pierce Utilities Authority is planning to construct its Mainland Water Reclamation Facility by 2018 and has plans to provide more than 11 MGD of cooling water to the Treasure Coast Energy Center, in addition to public-access irrigation




Floridan Aquifer System

- Brackish groundwater
  - Used by public water supply, agriculture and some golf courses
  - Requires desalination or blending to meet potable drinking water standards
  - Meets the supplemental water needs of agricultural users during a 1-in-10 year drought event without exceeding the resource protection criteria

Surficial & Floridan Aquifer Use Chart



Surficial Aquifer System

- Historically, primary source of drinking water and urban irrigation
- Development maximized over time
- Potential increases in production limited
  - Limited by potential impacts to natural resources or other water users
  - Reviewed on a permit-by-permit basis

Surface Water

- C-23, C-24, C-25 and C-44 canals
  - Primary surface water sources
  - Restricted Allocation Area Rule
    - Established to prohibit use of surface water from the C-23, C-24, and C-25 canals, or any connected canal system that derives water from these canals, above historic allocations
  - Agricultural users
    - Primary users of surface water for crop irrigation

Reservoirs

- Provide storage of water
  - Primarily during wet-weather conditions, for use in the dry season
- Projects to Capture, Treat, and Store Water
  - CERP Indian River Lagoon-South
    - Four reservoirs (C-44, C-23/C-24 North, C-23/C-24 South, and C-25)
    - Three stormwater treatment areas (STAs) (C-44, C-23/C-24, and C-25)
    - Three natural storage and water quality treatment areas (Allapattah, Palmar, and Cypress Creek/Trail Ridge)
  - Ten Mile Creek

Aquifer Storage & Recovery Seawater

- Aquifer Storage & Recovery
  - Underground storage of injected water into an acceptable aquifer
  - Aquifer acts as an underground reservoir for the injected water, reducing water loss to evaporation
  - Potable water, surface water, groundwater, or reclaimed water can be stored using ASR technology
  - No existing ASR wells in the UEC Planning Area
- Seawater Desalination
  - Unlimited source but removal of salt required
  - Costs to remove salt remain moderately higher than brackish water desalination

Water Resource Development

Water Resource Development Project

- Regional in nature and generally the responsibility of a water management district
- Meets the formulation and implementation of regional water resources management strategies

Hydrogeology

- Groundwater and Wetland monitoring
- Groundwater assessments
- Evapotranspiration assessments
- Drilling and testing

Modeling

- East Coast Floridan Aquifer System Model
  - Development

Water Supply Development Projects

Local in nature and generally involve public or private facilities for water collection, production, treatment and transmission

UEC Public Water Supply Projects
New Capacity - FY 2006 - 2009

33 Projects

- 10 Brackish 49 MGD
- 23 Reclaimed 26 MGD

UEC Proposed Public Water Supply Projects Potential New Capacity - FY 2010 - 2030

- Traditional 1 MGD*
- Brackish 58 MGD*
- Reclaimed 34 MGD

*45 MGD New Capacity needed by 2030

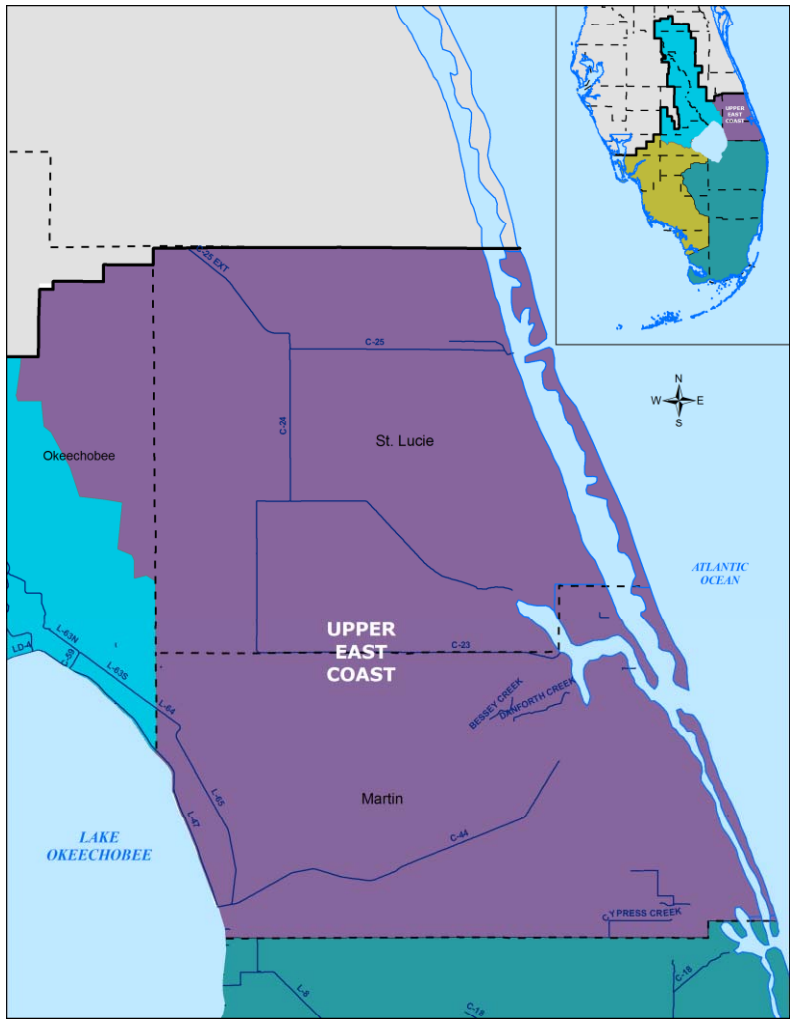
Requirement: Link Land Use with Water Supply Planning

- After the District updates the Water Supply Plan:
  - All local governments must amend their comprehensive plan to incorporate a water supply facilities work plan for at least a 10 year period within 18 months of water supply plan update
  - Utilities identify the projects to be developed
  - Annual Progress Reports
    - Utilities

Additional Future Direction

- Complete East Coast Floridan Aquifer model
  - Collaborate with local users for data
- Continue aquifer monitoring program
- Implement CERP
- Continue to encourage and promote water reuse and conservation measures
- Continue to identify the impact of sea level rise on utility wellfields at risk of saltwater intrusion
- Continue to coordinate with local governments and utilities on water supply related elements such as the water supply facility work plan that is due within 18 months of adoption of the UEC Plan Update

2011 UEC Water Supply Plan Update Overall Conclusion



The needs of the region can continue to be met with appropriate management and diversification of water supply sources during a 1-in-10 year drought condition through 2030.