Water Resources Management and Operational Decisions in the Context of Evolving Conditions

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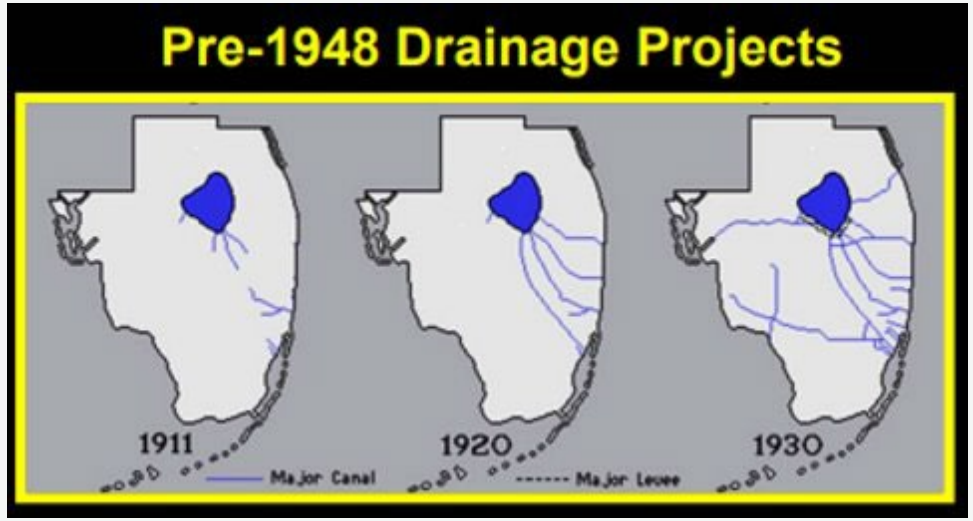
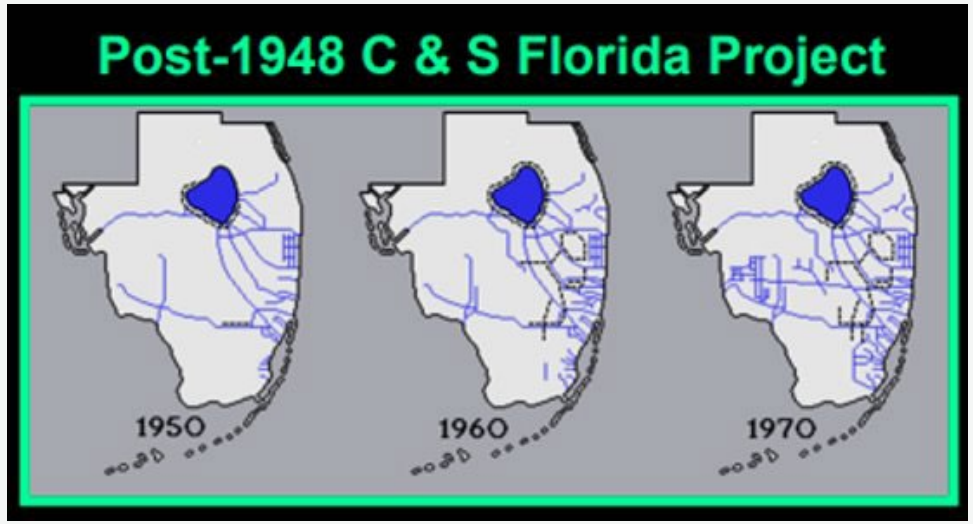
South Florida Water Management District

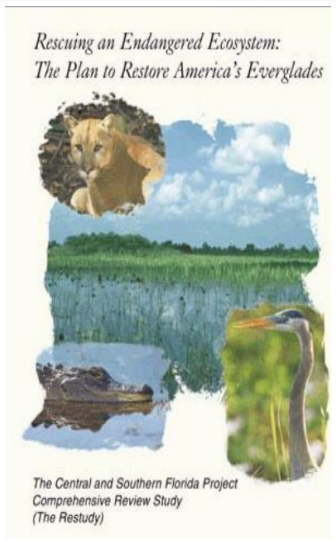
WATER INSTITUTE SYMPOSIUM

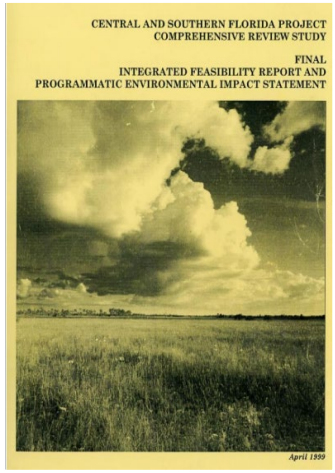
Session: Intersecting Resilience Planning and Decision-Making: Responding to Today's Needs and Future Conditions

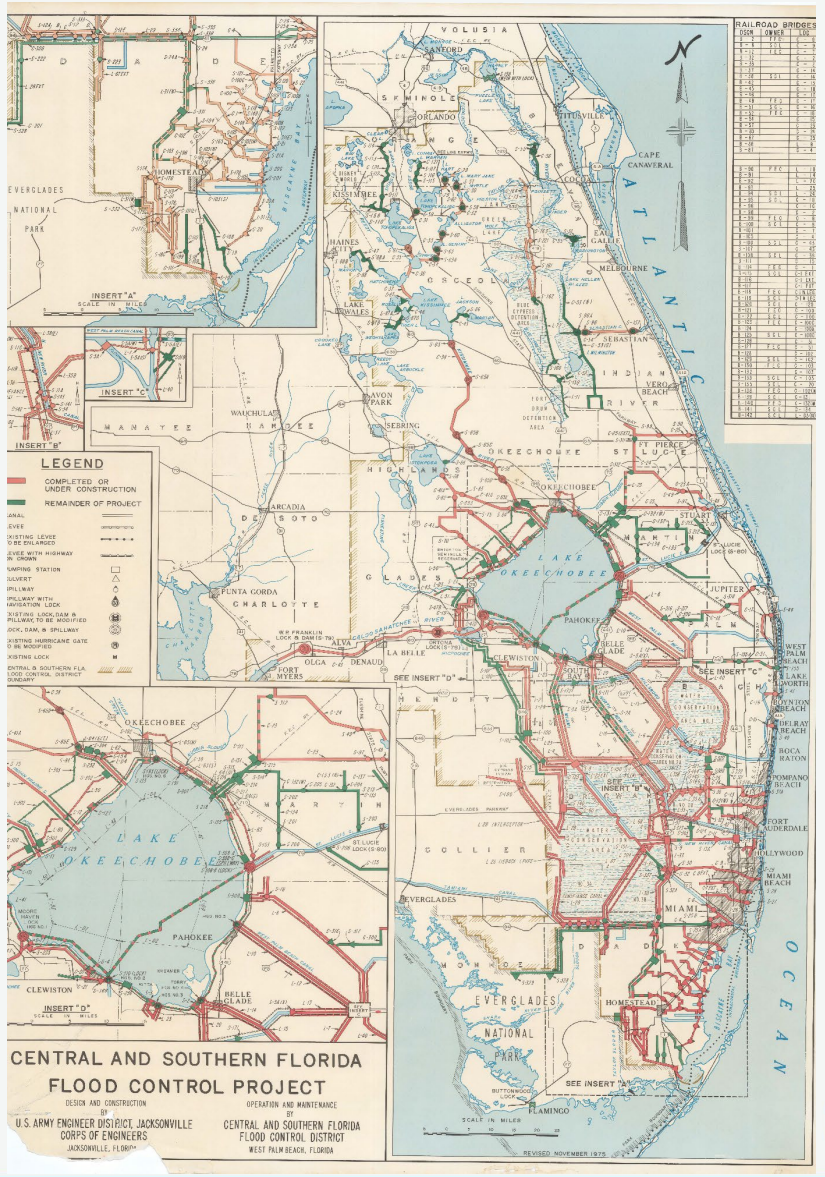
Central & Southern Florida Flood Control Project





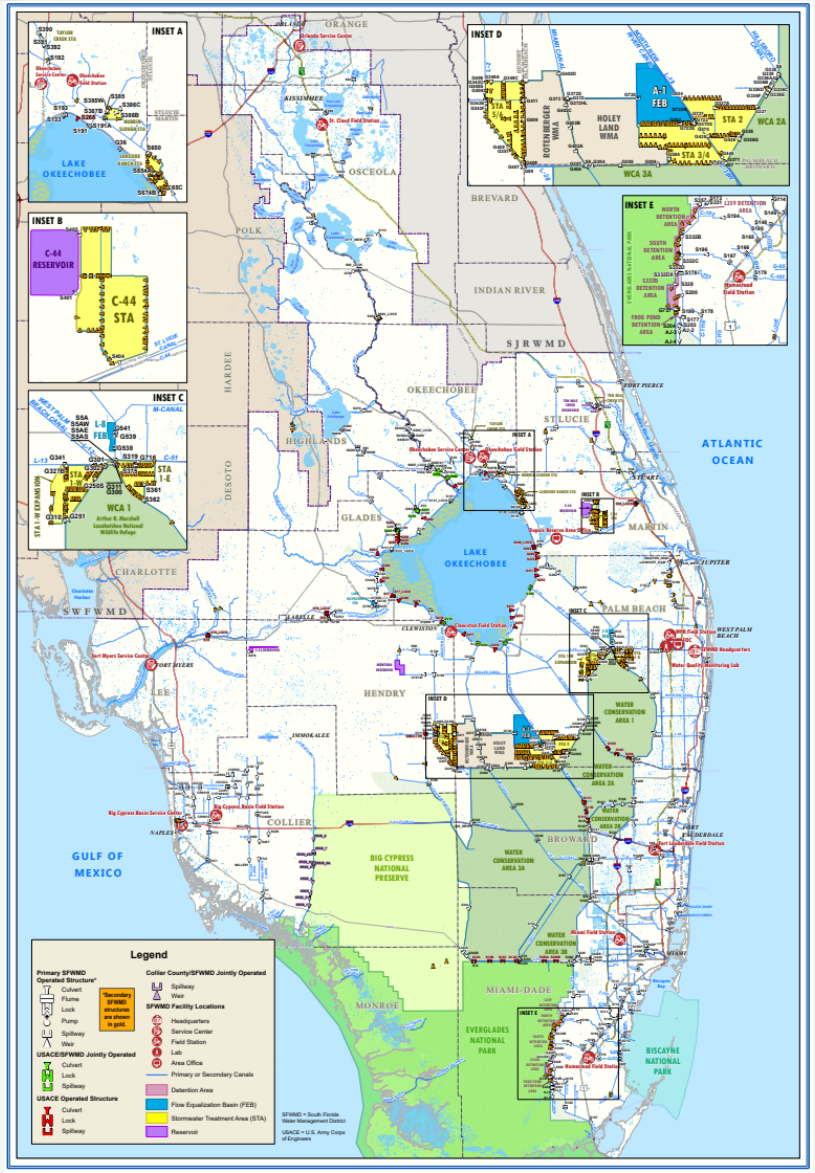


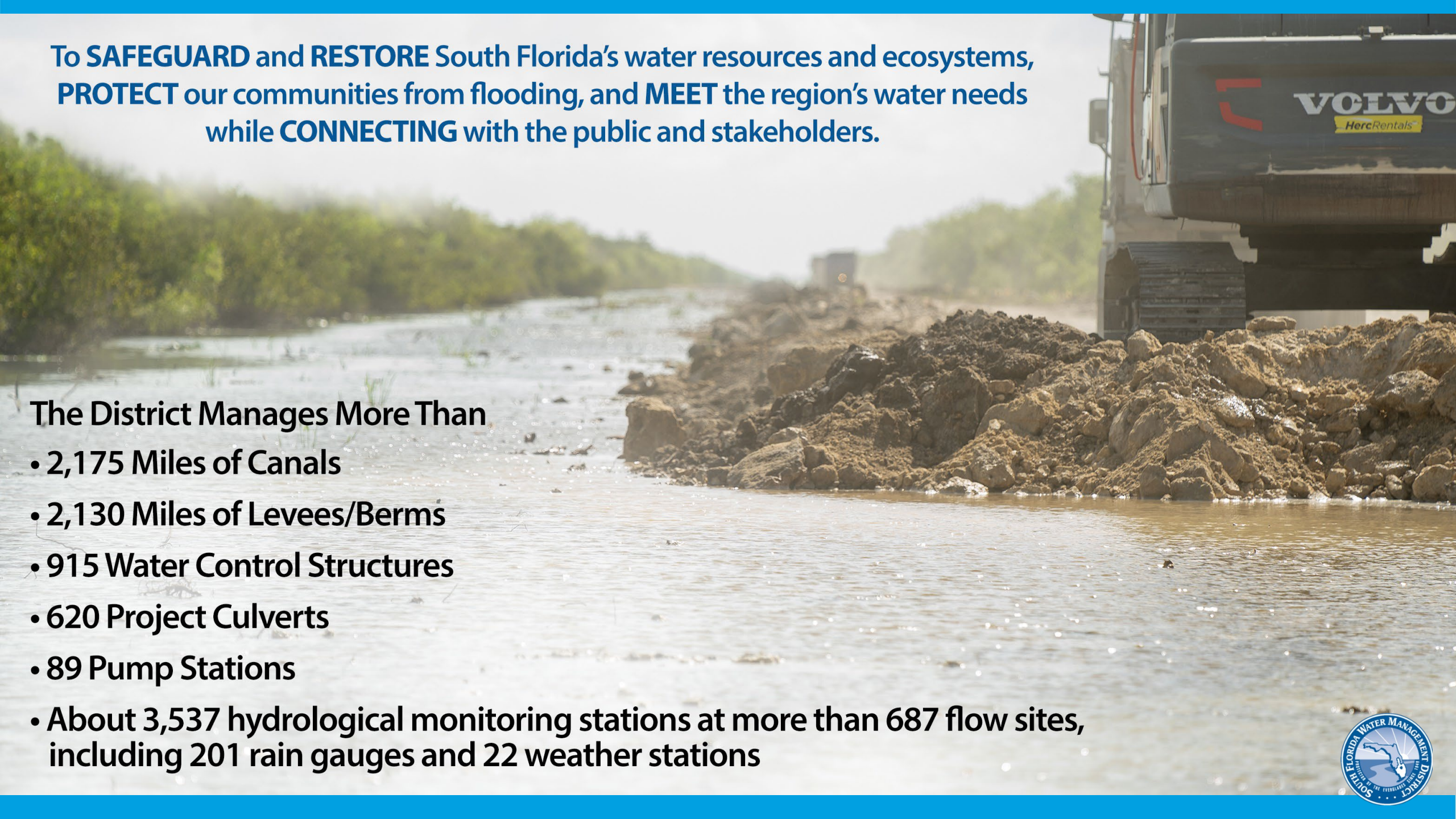




South Florida Water Management District

- Over the past 25 years, the infrastructure has increased significantly since the C&SF Flood Control District
  - Reservoirs
  - Storm Water Treatment Areas
  - Flow Equalization Basins
  - Restoration Projects
- Currently it is the largest and most complex water management system within the United States
- Highly managed system





To **SAFEGUARD** and **RESTORE** South Florida's water resources and ecosystems, **PROTECT** our communities from flooding, and **MEET** the region's water needs while **CONNECTING** with the public and stakeholders.

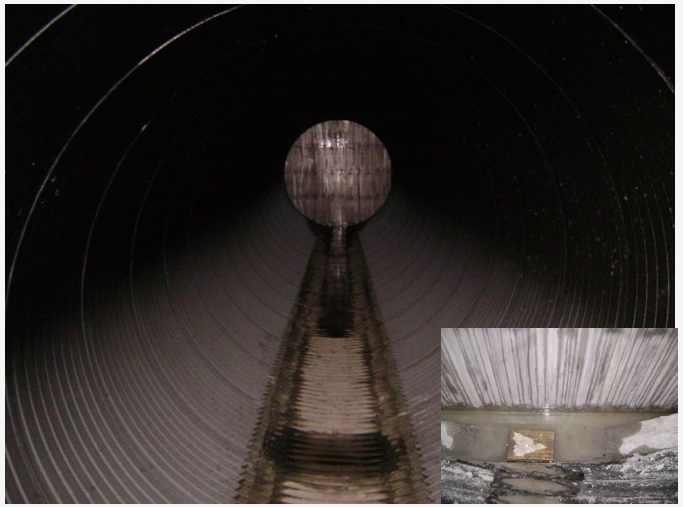
The District Manages More Than

- 2,175 Miles of Canals
- 2,130 Miles of Levees/Berms
- 915 Water Control Structures
- 620 Project Culverts
- 89 Pump Stations
- About 3,537 hydrological monitoring stations at more than 687 flow sites, including 201 rain gauges and 22 weather stations

Operational Readiness

SFWMD continues to invest in the maintenance, repair, and refurbishment of its structures and equipment to ensure each structure in the system is ready to fulfill its part of the District's mission.

- Preventative Maintenance Program (monthly, quarterly, annually)
- Canal and Levee Maintenance
- Structure Inspection Program (5-year cycle)
- Major Gate and Pump Overhaul



SCADA Real-Time System

- Includes 52 microwave towers that are strategically placed throughout the District's 16-county region from Orlando to the Florida Keys
- SCADA transmits real-time operation and hydro-meteorological data to SFWMD 24 hours a day, seven days a week, 365 days a year
- Rainfall totals, water levels, and other environmental data are used to guide important water management decisions

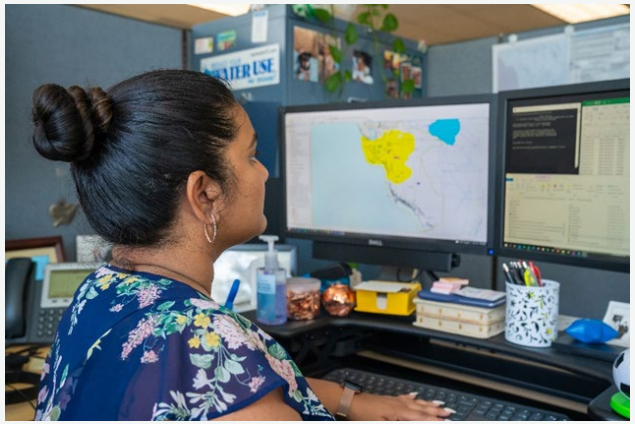
Office of Operations

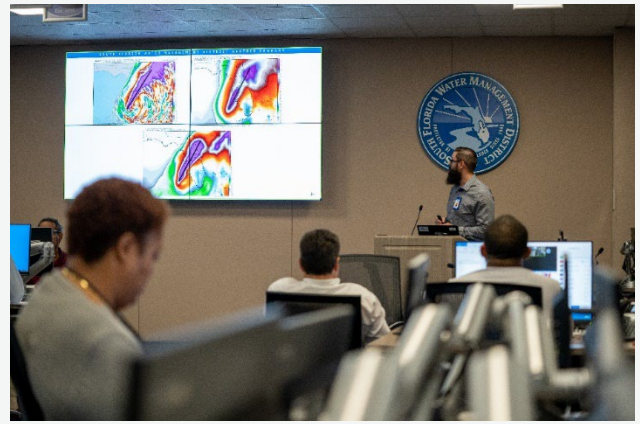
Water manager team comprised of 8 professional engineers that are responsible for operating the system.

On-duty WMs can be reached 24/7 to resolve issues.

Water Managers rely on many different teams for support in managing the system

- Operations Control Center (staffed 24/7)
- Meteorologists
- Field Stations (on-call 24/7)
- SCADA Maintenance (on-call 24/7)
- Infrastructure Management
- Hydrology and Hydraulics



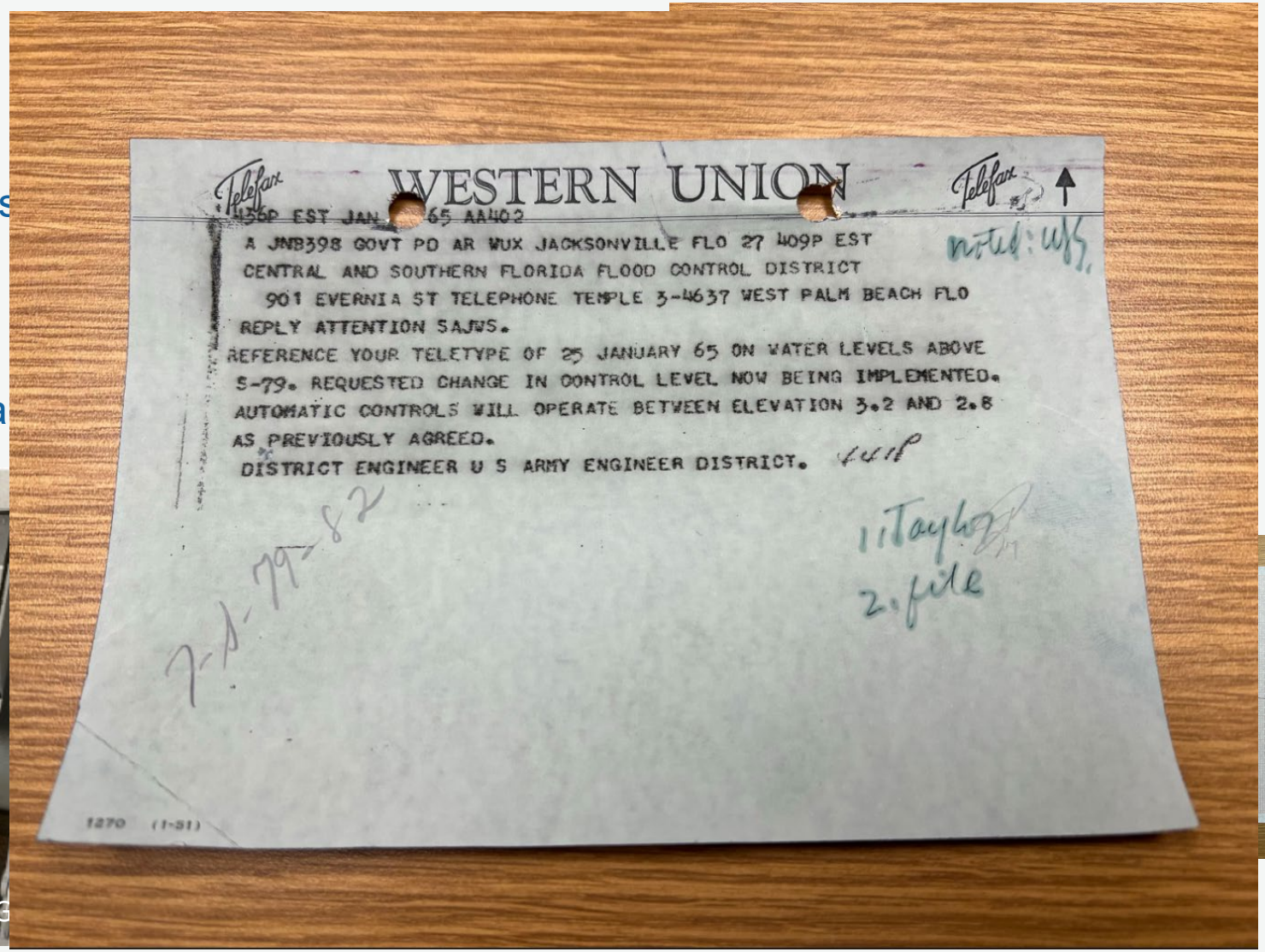


Operations in the Beginning

In the beginning…

- Telefax updates
- Stevens Chart Recorders
- Pedestal Gate Control
- Charting by hand
- Manual stage readings a


Steve Gerner, USG


Telefax

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CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT

901 EVERNIA ST TELEPHONE TEMPLE 3-4637 WEST PALM BEACH FLO

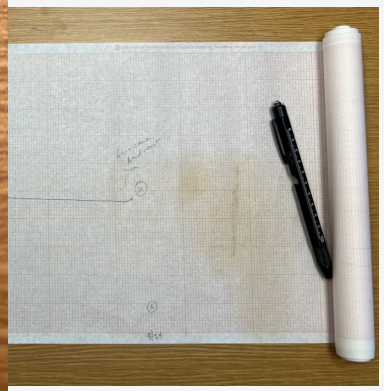
REPLY ATTENTION SAJWS.

REFERENCE YOUR TELETYPE OF 25 JANUARY 65 ON WATER LEVELS ABOVE S-79. REQUESTED CHANGE IN CONTROL LEVEL NOW BEING IMPLEMENTED. AUTOMATIC CONTROLS WILL OPERATE BETWEEN ELEVATION 3.2 AND 2.8 AS PREVIOUSLY AGREED.

DISTRICT ENGINEER U S ARMY ENGINEER DISTRICT.

noted: wfs.

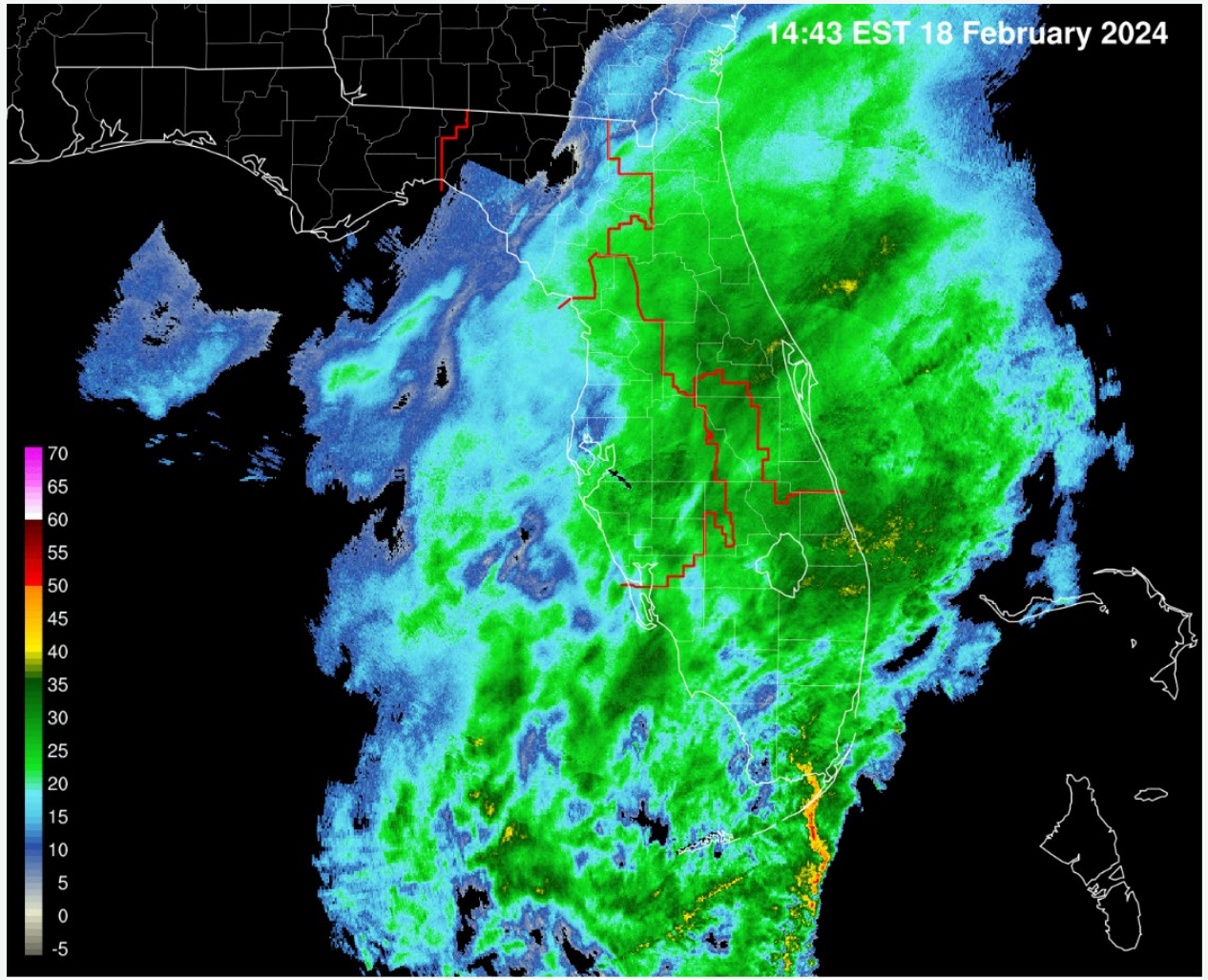
1270 (1-31)



Operations Today

Technological advances have significantly improved how operators manage the system.

- Real-time Telemetry
- Remote Control
- Automation Programs
- Hi-Resolution Weather Radar
- Improved Short-Term Weather Forecasting



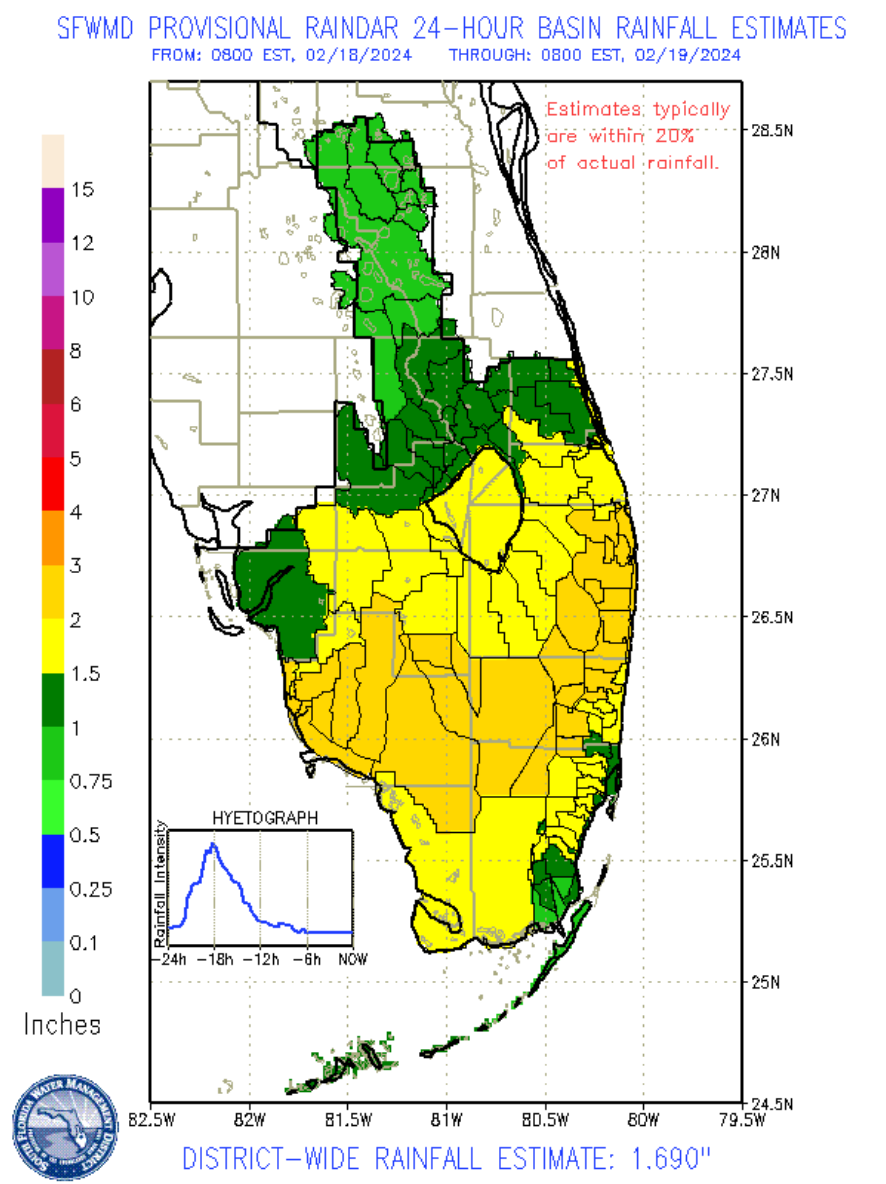
Assessment and Response

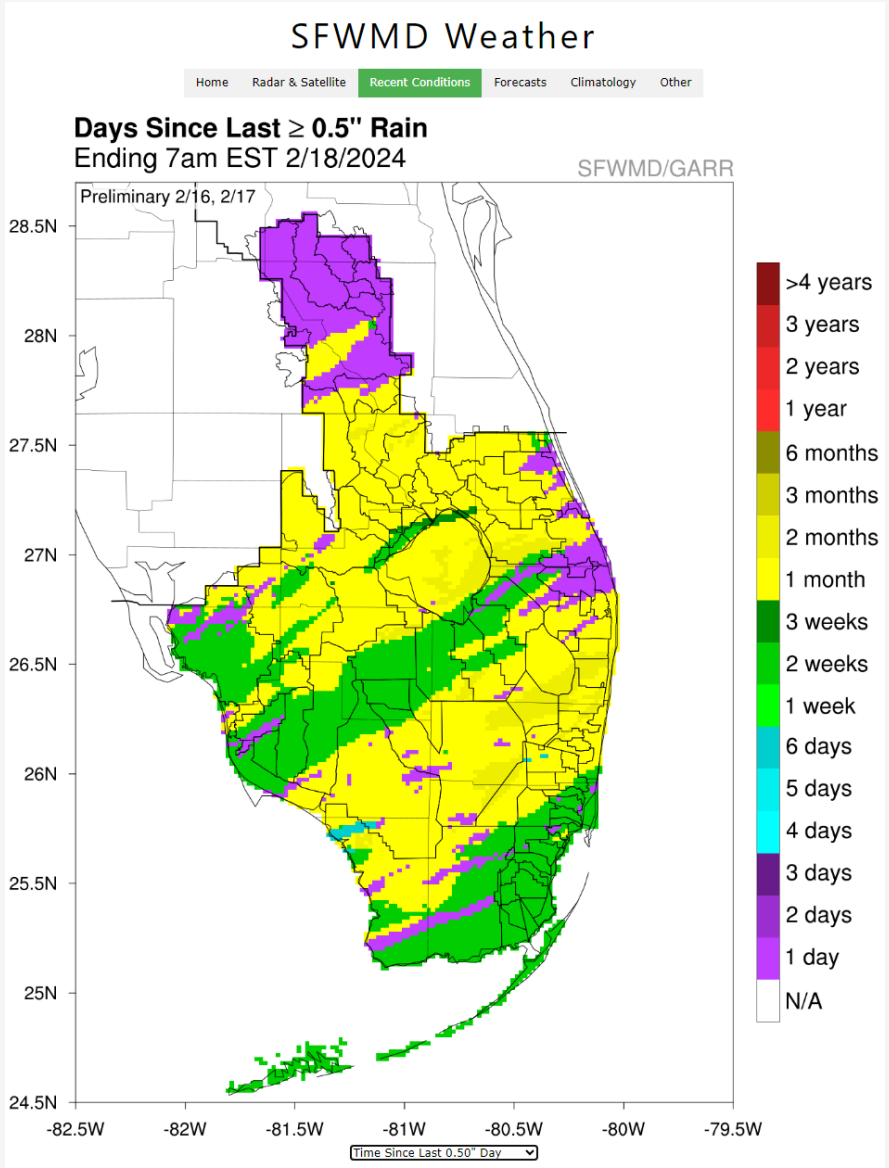
During significant rainfall event and major storms, operation decisions are often time-critical and require immediate responsiveness before conditions worsen.

SCADA system provides the ability to assess conditions quickly and fine-tune operations to the system in near real-time.

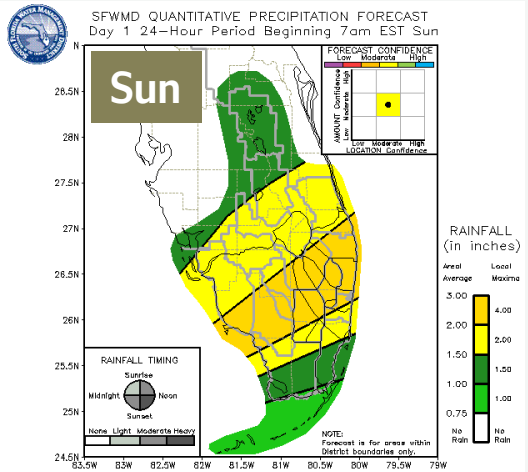
WM respond to the immediate needs of the system and evaluate exit strategies to return operations that are in line with the current longer-term objectives.

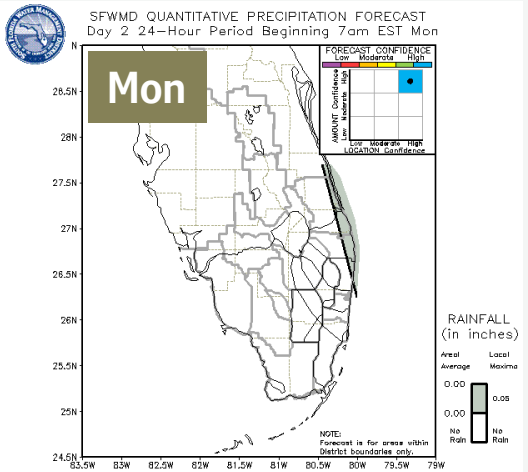
Forecasting Tools

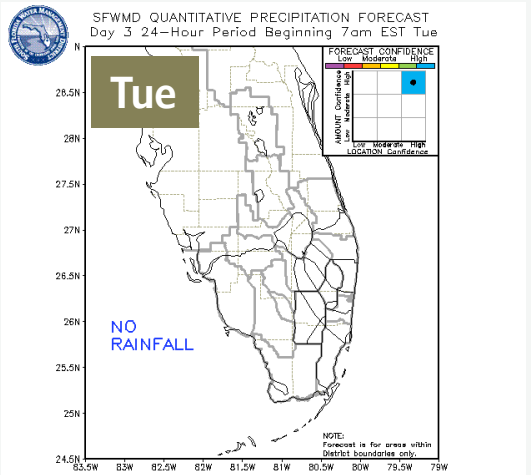


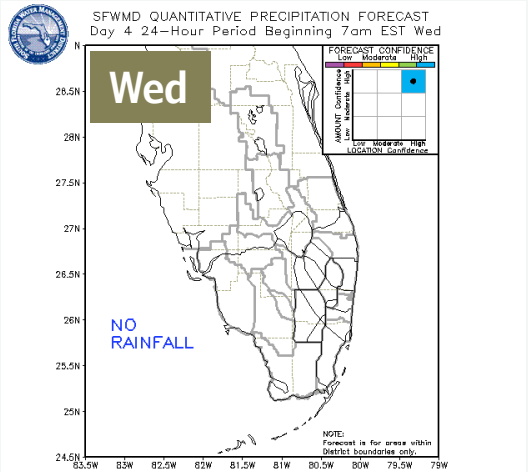


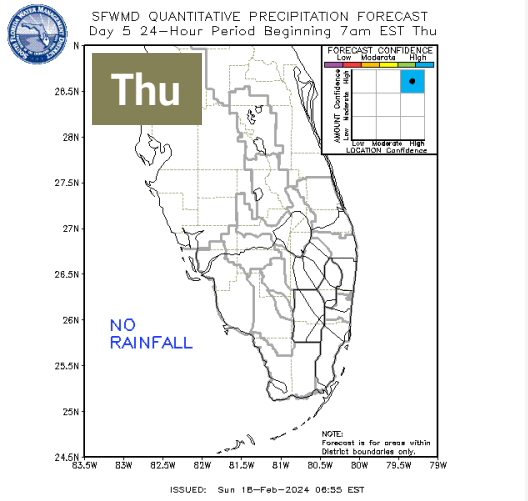
Short-, Medium-, & Extended-Range Outlooks

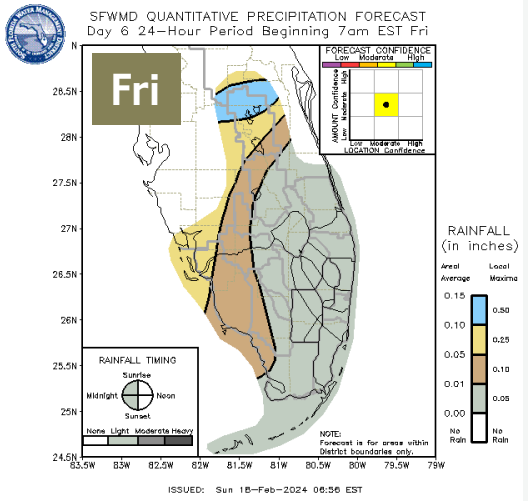


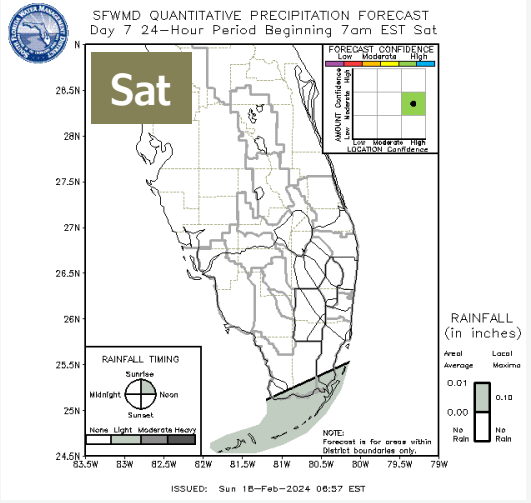


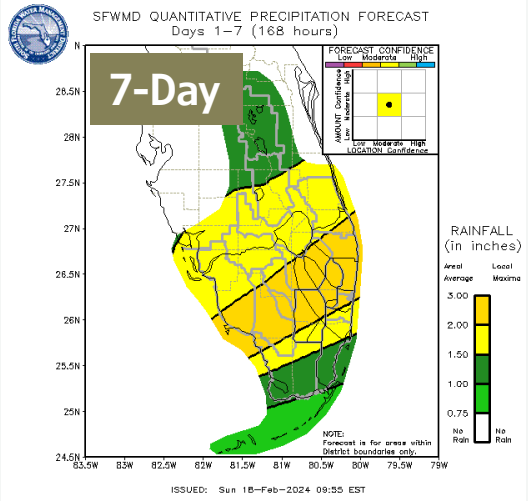










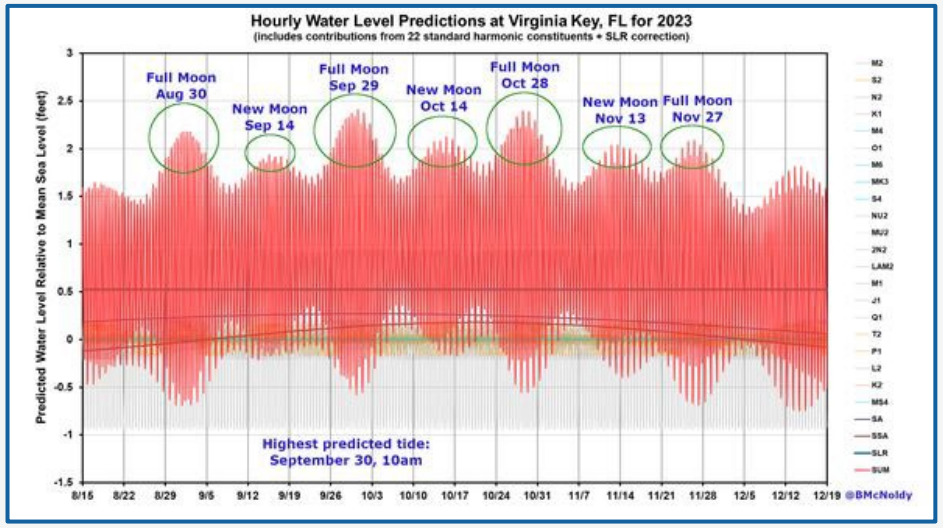


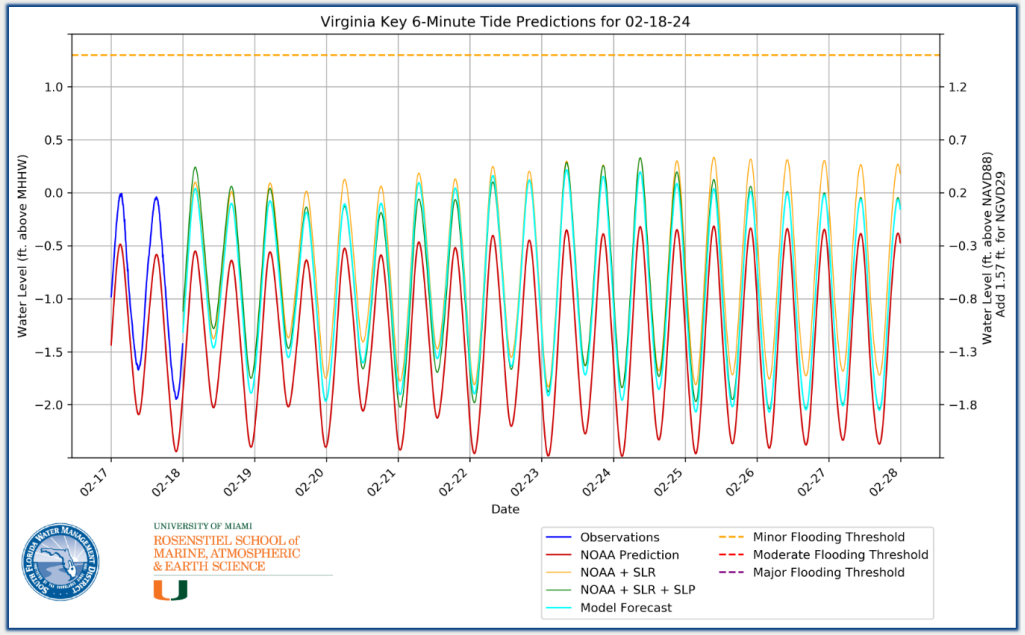
Weekly Summary

Week 1 (Historical Avg: 0.49”): Above to much above normal

Week 2 (Historical Avg: 0.49”): Below to much below normal

Forecasting Tools





Changing Climate Conditions

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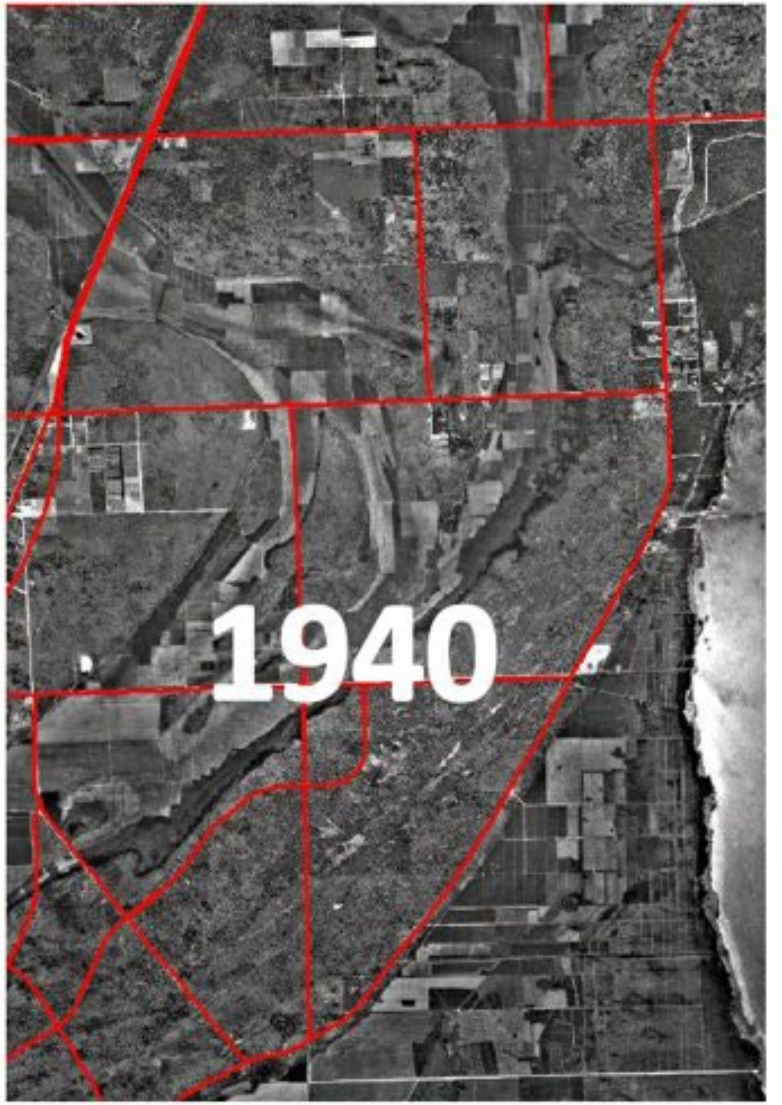
Changing Conditions – Land Use & Development



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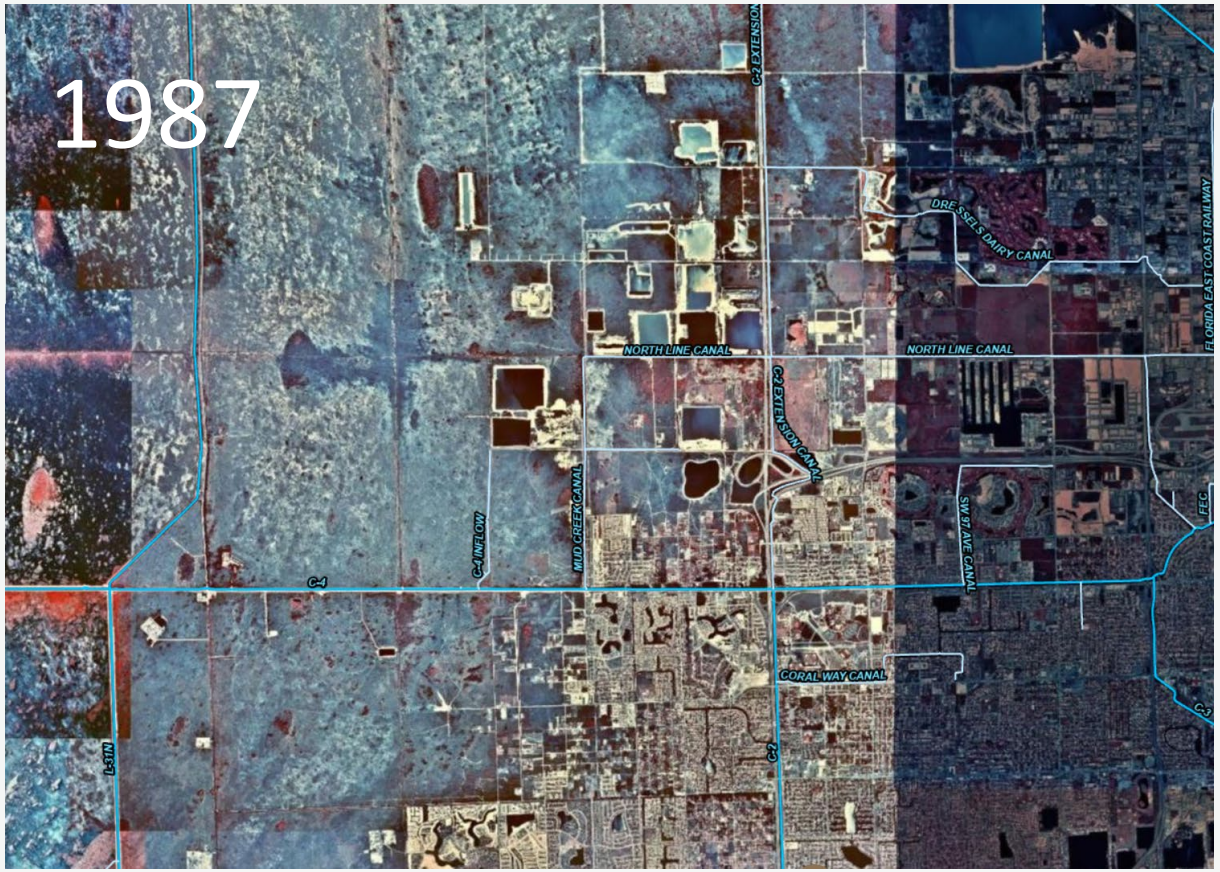

Final Highlights

- C&SF: highly managed and complex regional water management system
- Respond to current needs with best available information
- Strategic importance of Water Managers knowledge and experience
- Challenges posed by evolving conditions: land development and changing climate
- Balance immediate response needs with long-term planning and preparedness
- Adaptive and flexible system operation that can accommodate the associated uncertainties

Thank You