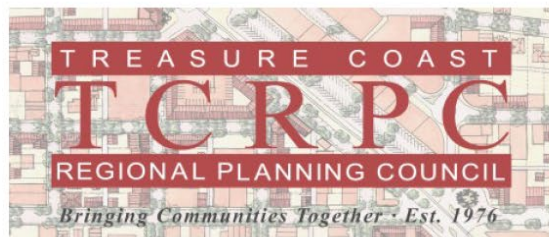




South Florida Regional Planning Council

Proudly serving South Florida since 1974

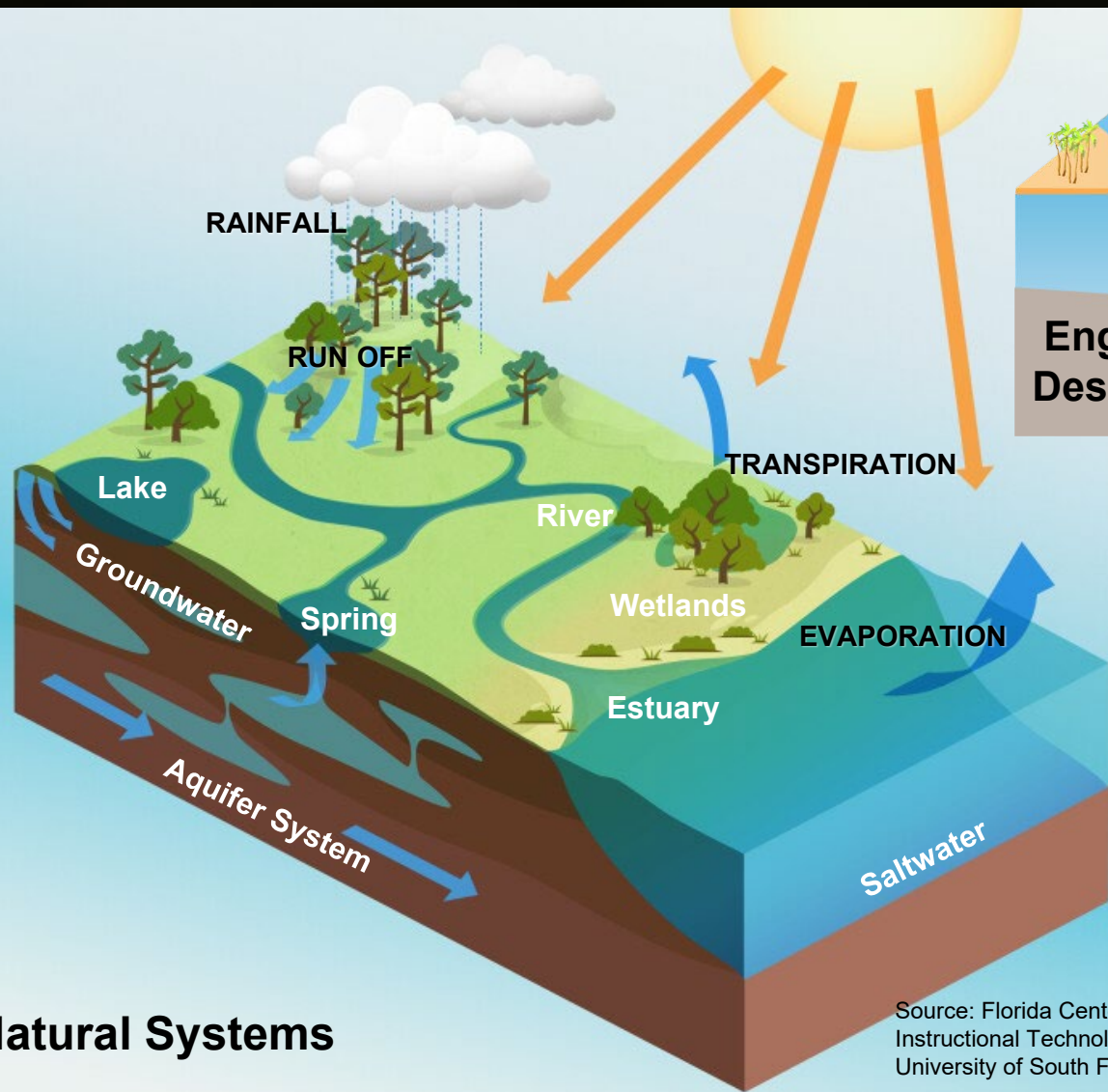


Connecting Southeast Florida's Restoration & Flood Control Planning Studies, Projects, and Timelines

Carolina Maran, P.E., Ph.D., District Resiliency Officer

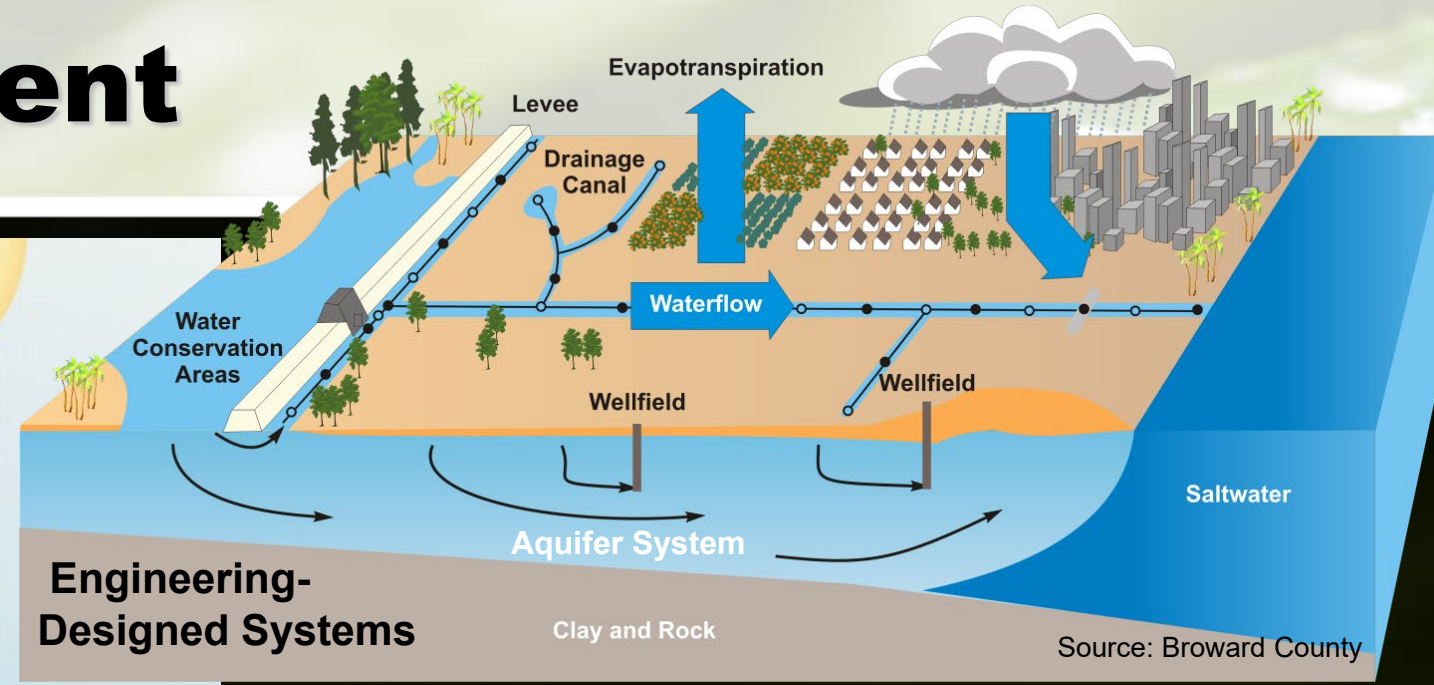
February 17, 2023

Water Management



Natural Systems

Source: Florida Center for Instructional Technology – University of South Florida



Engineering-Designed Systems

Source: Broward County

Safeguard and restore water resources & ecosystems

Meet the region's water needs

Protect our communities from flooding

FLOOD CONTROL: Central & Southern Florida Project



DESIGN REPORT
OF
FLOOD
PASSAGE
FLORIDA
EVERGLADES
DRAINAGE
DISTRICT
1947



1926 AND 1928
DEVASTATING HURRICANES
... LOSS OF 2,500 LIVES

HOOVER DIKE AUTHORIZED 1930

... COMPLETED 1937

An illustration of a long, straight dike cutting through a flooded landscape. The dike is shown in a dark color, contrasting with the lighter, flooded areas. The background shows a horizon line with some distant structures or trees.

Comprehensive Review Study

*Rescuing an Endangered Ecosystem:
The Plan to Restore America's Everglades*



*The Central and Southern Florida Project
Comprehensive Review Study
(The Restudy)*

Central and Southern
Florida Project (C&SF)
Restudy – WRDA 1992

Reconnaissance
Report by USACE -
1994

Governor's Commission for Sustainable
South Florida develops Conceptual Plan –
1996

Comprehensive
Review Study by
USACE - 1999

CERP authorized
by Congress - 2000

CENTRAL AND SOUTHERN FLORIDA PROJECT
COMPREHENSIVE REVIEW STUDY

FINAL
INTEGRATED FEASIBILITY REPORT AND
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT



Everglades Restoration

Goal 1

Get the Water Right

Goal 2

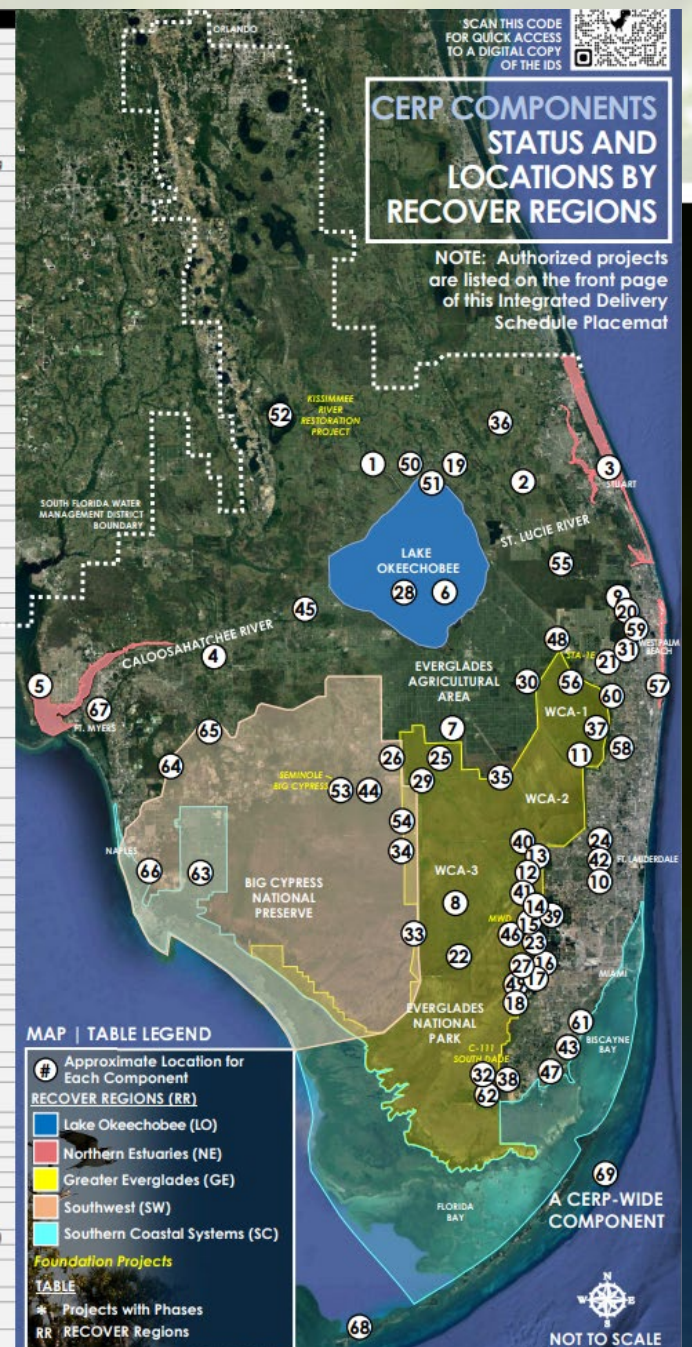
Restore, Preserve, and Protect Natural Habitats and Species

Goal 3

Foster Compatibility of the Built & Natural Systems

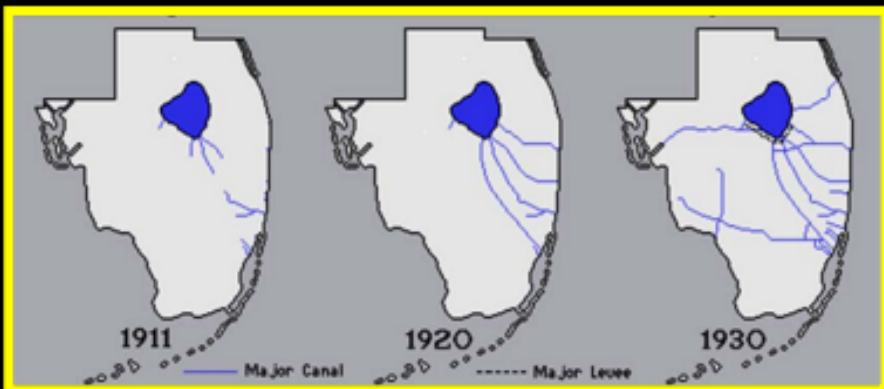
Source: Jacksonville District > Missions > Environmental > Ecosystem Restoration > Integrated Delivery Schedule (army.mil)

#	RR	YELLOW BOOK NAME AND CODE
10	SC	Change Coastal Wellfield Operations (L)
11	GE	Site 1 Impoundment with ASR* (M)
16	GE	C-4 Structures (I)
19	LO	Taylor Creek/Nubbin Slough Storage and Treatment Area* (W)
25	GE	Modified Holy Land Wildlife Management Area Water Management Operations (DD)
26	SW	Modified Roterberger Wildlife Management Area Water Management Operations (EE)
38	SC	C-111 Spreader Canal* (WW) - Phase 2 in Planning
42	GE	Lower East Coast Water Conservation (AAA)
48	GE	C-51* and Southern L-8 Reservoir (GGG)
50	LO	Lake Okeechobee Watershed Water Quality Treatment Facilities* (OPE)
56	GE	Acme Basin B (OPE)
57	NE	Lake Worth Lagoon Restoration* (OPE)
58	GE	Winsberg Farms Wetlands Restoration (OPE)
60	GE	Protect and Enhance Existing Wetlands Systems along Lox (Strazulla Tract) (OPE)
64	SW	Southern CREW Project Addition (OPE)
65	SW	Lake Trafford Restoration (OPE)
66	SW	Henderson Creek/Belle Meade Restoration (OPE)
67	GE	Lake Park Restoration (OPE)
68	SC	Florida Keys Tidal Restoration (OPE)
69	ALL	Melaleuca Eradication and Other Exotic Plants (OPE)
2	NE	St. Lucie/C-44 Basin Storage Reservoir (B)
3	NE	Environmental Water Supply Deliveries to St. Lucie Estuary (C)
4	NE	Caloosahatchee Basin Storage Reservoir with ASR* (D)
5	NE	Environmental Water Supply Deliveries to Caloosahatchee Estuary (E)
7	GE	EAA Storage Reservoir (G)
8	GE	Everglades Rain-Driven Operations* (H)
9	GE	L-8 Project (K)
12	GE	Water Conservation Area 3A and 3B Levee Seepage Management (O)
13	GE	Western C-11 Diversion Impoundment and Diversion Canal (Q)
14	GE	C-9 Stormwater Treatment Area/Impoundment (R)
18	GE	L-31N Improvements for Seepage Management (V)
22	GE	Additional S-345 Structures* (AA)
27	GE	Construction of S-356 A and B Structures*(FF)
29	GE	Pump Station G-404 Modification (I)
32	SC	Modification to SDCS in southern portion of L-31N and C-111 (OO)
33	SW	Decomartmentalization of Water Conservation Area 3* (GG)
36	NE	C-23, C-24, C-25 and Northfork and Southfork Basins Storage Reservoirs (UU)
55	GE	Pal Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE)
61	SC	Biscayne Bay Coastal Wetlands* (OPE) - Phase 2 in Planning
63	SW	Southern Golden Gate Estates Hydrologic Restoration (OPE)
1	LO	North of Lake Okeechobee Storage Reservoir (A)
28	LO	Lake Okeechobee Aquifer Storage and Recovery* (GG)
34	SW	Flow to Central Water Conservation Area 3A (RR)
39	GE	North Lake Belt Storage Area (XX)
43	GE	South Miami Dade County Reuse (BBB)
44	SW	Big Cypress/L-28 Interceptor Modification (CCC)
47	SC	Biscayne Bay Coastal Canals (FFF)
49	SC	West Miami Dade Reuse (HHH)
6	LO	Lake Okeechobee Regulation Schedule* (F)
15	GE	Central Lakebelt Storage Area (S)
17	GE	Bird Drive Recharge Basin(U)
20	GE	C-17 Backpumping (K)
21	GE	C-51 Backpumping to West Palm Beach Water Catchment Area (Y)
23	GE	Dade Broward Levee/Pennsco Wetlands (BB)
24	GE	Broward County Secondary Canal System (CC)
30	GE	Loxahatchee National Wildlife Refuge Internal Canal Structures (KK)
31	GE	C-51 Regional Groundwater ASR (LL)
37	GE	Palm Beach County Agricultural Reserve Reservoir (VV)
40	GE	Divert WCA2 flows to Central Lake Belt Storage (YY)
41	GE	Divert WCA3 flows to Central Lake Belt Storage Area (ZZ)
45	NE	Caloosahatchee Backpumping with STA (DDD)
46	GE	Flows to Eastern Water Conservation Area (EEE)
51	LO	Lake Okeechobee Tributary Sediment Dredging/Phosphorus Removal (OPE)
52	LO	Lake Istokpaga Regulation Schedule Modification (OPE)
54	SW	Miccosukee Water Management Plan (OPE)
62	SC	Restoration of Pineland & Hardwood Hammocks in C-111 Basin (OPE)
35	SC	Re-route Miami-Dade Water Supply Deliveries (SS)
53	SW	Seminole Tribe Big Cypress Water Conservation Plan (East and West) (OPE)
59	GE	Palm Beach County Wetlands-based Water Reclamation (OPE)



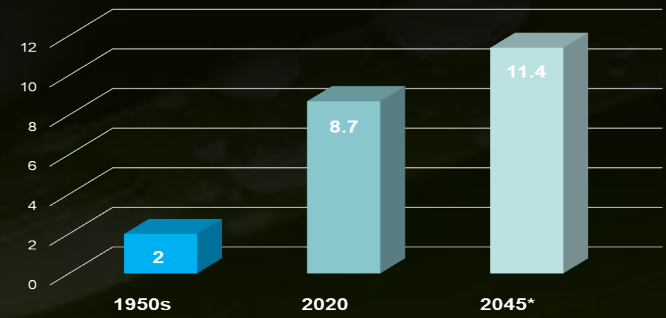
Recognizing Changed Conditions

Pre-1948 Drainage Projects

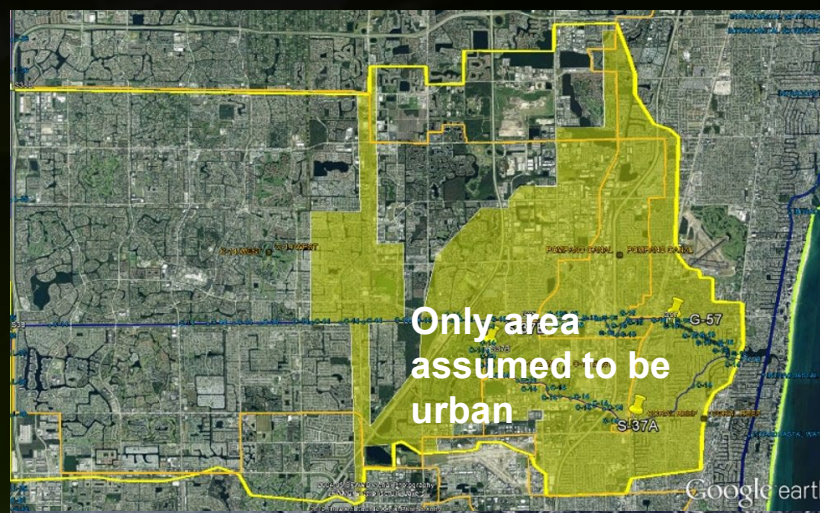


POPULATION GROWTH

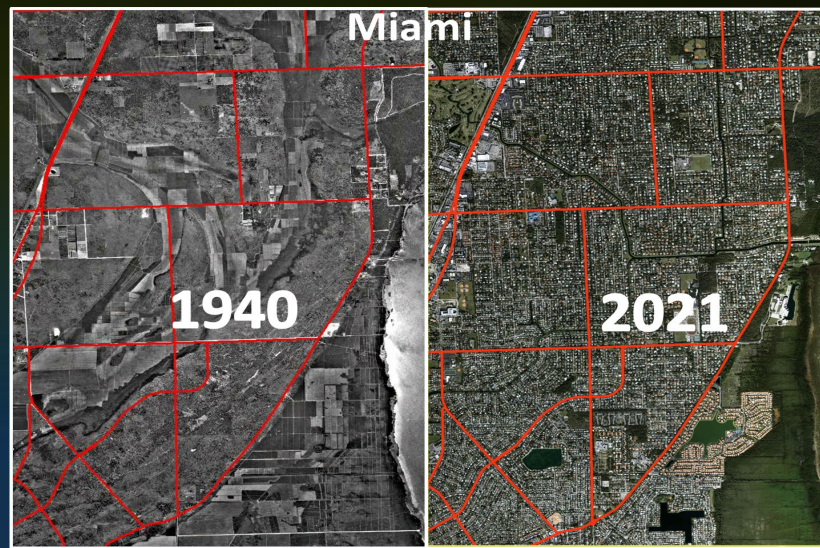
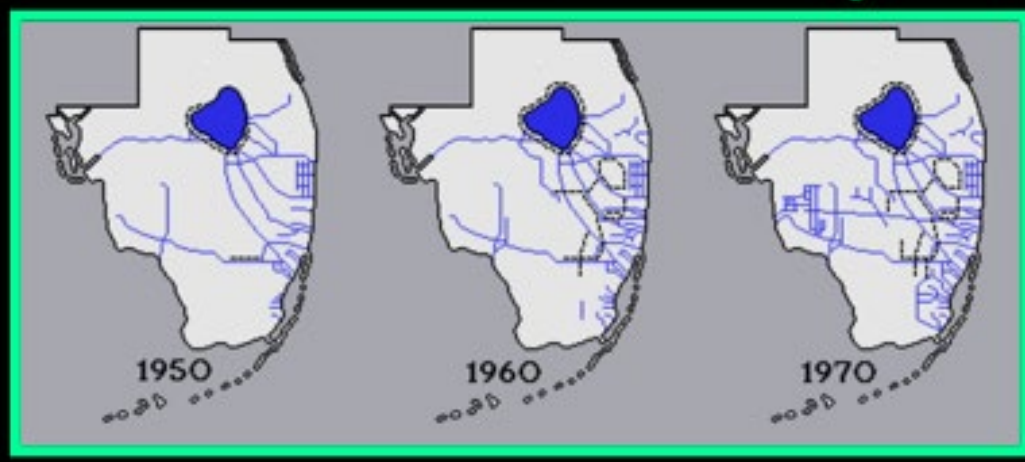
Population (million)



* Estimate taken from BEBR 2017 publication (Median, SFWMD boundaries)



Post-1948 C & S Florida Project

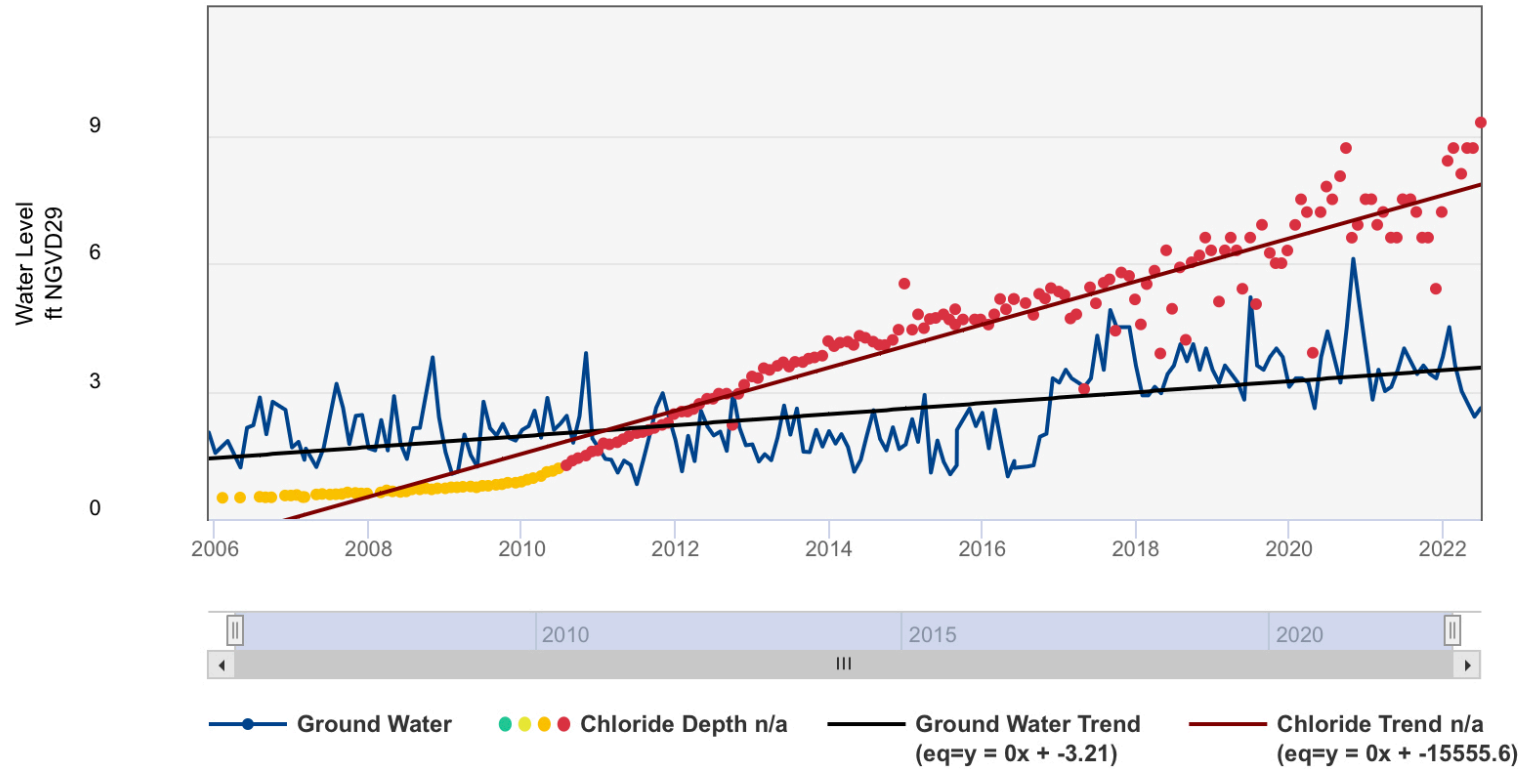


Recognizing Changed Conditions: Emerging Trends in Regional Resiliency

HALLANDALE

As of Thursday, July 28, 2022 at 7:00:49 PM GMT-04:00

Zoom 6m 1y All

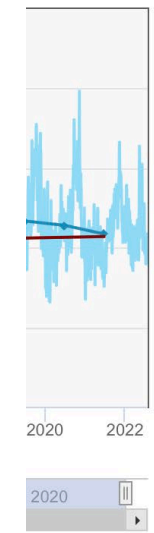


Chloride Concentration mg/L

- < 100
- ≥ 100 and < 250
- ≥ 250 and < 1000
- ≥ 1000



Chloride Level mg/L



SFWM Data and Support

DBHYDR
DBHydro Insights

[DBHydro Insights](#)

DBHYDR is the South Florida Water Management District's corporate environmental database that stores hydrologic, meteorologic, hydrogeologic and water quality data.

[Details](#) [View](#)

SFWM GIS Open Data Hub

[SFWM GIS Hub](#)

Our Open Data site is where our publicly available spatial datasets can be viewed and downloaded. Additional Web Apps and Story Maps are featured to explore and learn more about the data.

[Details](#) [View](#)

SFWM SFER 2021

[SFWM SFER 2021](#)

As the South Florida Water Management District works to Achieve More Now For Florida's Environment, we are pleased to present the 2021 South Florida Environmental Report (SFER).

[Details](#) [View](#)

Local Agencies' Information

Local Agencies are using their resources to help us understand the potential risks that come with Coastal Resiliency efforts.

BROWARD COUNTY
IDA

[Resiliency](#)

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[Main Page](#)

305

[Miami-Dade County Sea Level Rise Strategy](#)

Miami-Dade County faces an unprecedented challenge in the coming decades to adapt to climate change and sea level rise.

[Details](#) [Main Page](#)

Palm Beach County Office of Resilience

The Office of Resilience (OOR) works to ensure that Palm Beach County remains a great place to live, work, and play while addressing physical, social, and economic challenges including climate change.

[Details](#) [Main Page](#)

Federal and State Agencies' Information

Using their resources to help us understand the potential risks that come with Coastal Resiliency efforts.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

[FDEP](#)

[Florida Resilient Coastlines Program](#)

The Florida Department of Environmental Protection is committed to marshaling resources to prepare Florida's coastal communities and habitats for the effects of climate change, especially rising sea levels.

[Details](#) [View](#)

NOAA

[NOAA Resilience HUB](#)

This page is a hub for NOAA-related resilience resources. Here you can peruse the agency's related assets, explore ELP-funded resilience projects, and learn more about our grantee community. The ELP Community Resilience Education Theory of Change can also be found on this hub.

[Details](#) [View](#)

NOAA Global Climate Dashboard

NOAA Climate.gov provides timely and authoritative scientific data and information about climate science, adaptation, and mitigation.

[Details](#) [Explorer](#)

District Resiliency Planning

Reducing the risks of flooding, sea level rise and other climate impacts on water resources and increasing community and ecosystem resiliency in South Florida

SEA LEVEL RISE AND FLOOD RESILIENCY PLAN

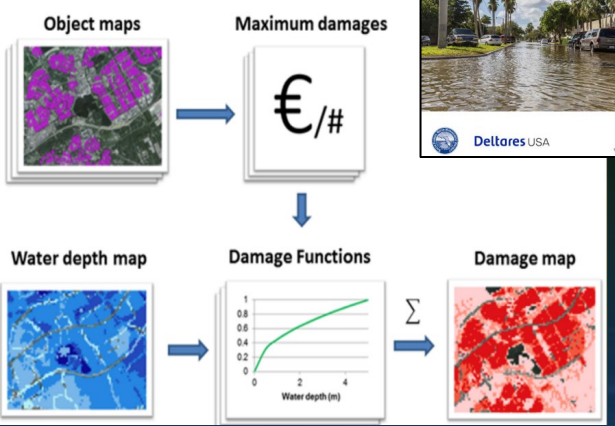
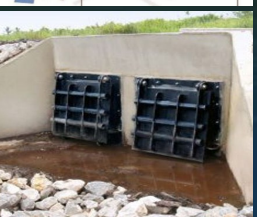
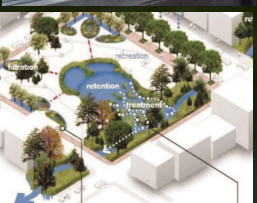
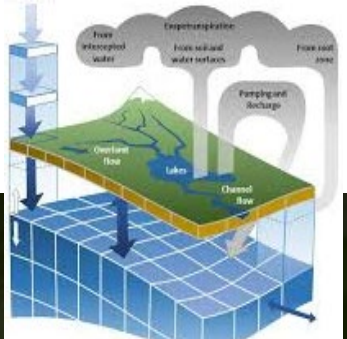
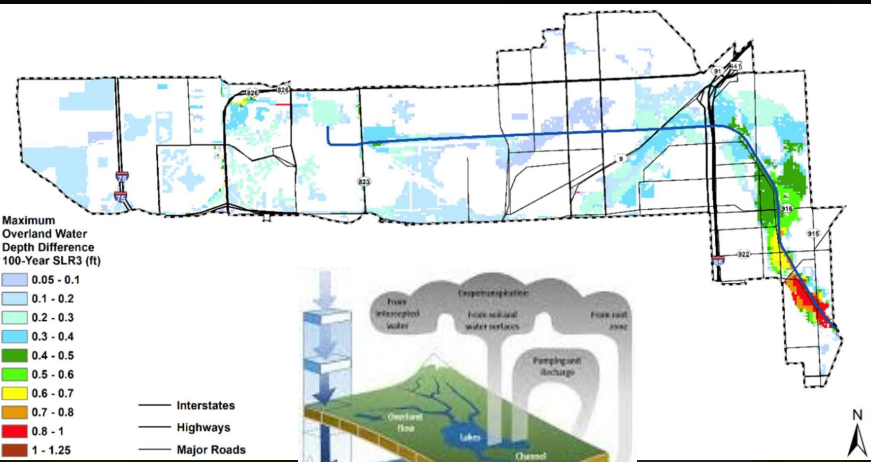
Building Resilience and Mitigating Risks on South Florida Water Resources



SEPTEMBER 2022

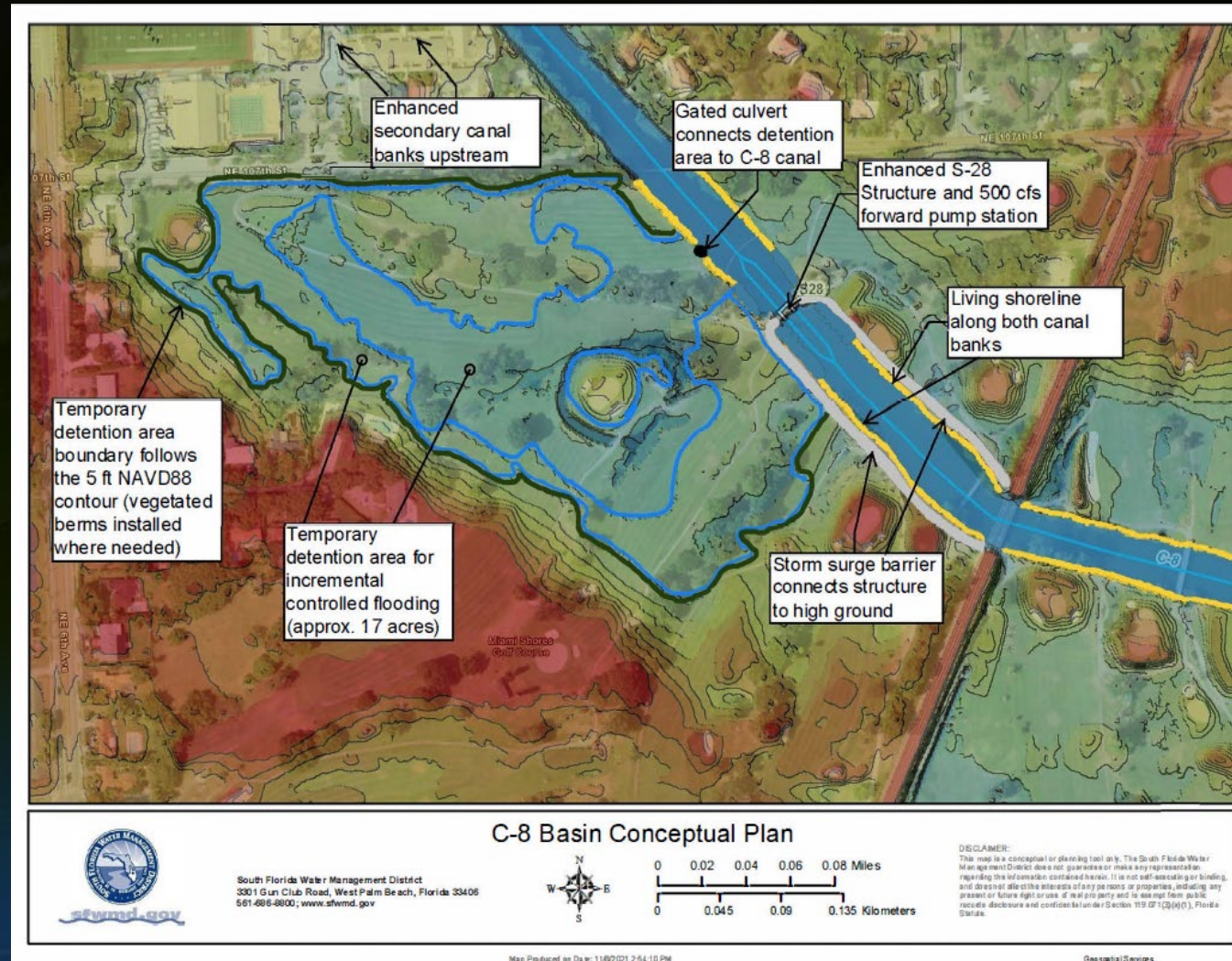


<https://www.sfwmd.gov/our-work/sea-level-rise-and-flood-resiliency-plan>



Moving into Implementation: C-8 Basin Resiliency

- Recent Award Recommendation from FDEM/FEMA BRIC
- Currently Advancing Design
- Basinwide strategy to reduce flood risks due to sea-level rise and extreme rainfall; protect water resources and water supply sources
- Combination of Green and Gray Infrastruct.
- Increasing water management flexibility
- Restore S-28 Structure discharge capacity
- Increase the basin's flood protection level of service, including Miami Dade's secondary canal enhancements
- Enhance quality of life in the region



Coastal Structures Hardening and Self Preservation Mode

Additional Programing; storm resilient Back Up Controller instrument and platform	Install Backup Controller and other automation features	Modify gates for added high tide protection against reverse flow	Modify Structure by adding seals	Other automation and floodproofing needs	Control Panel Upgrades / Hardening
---	---	--	----------------------------------	--	------------------------------------

- Recent Award from Resilient Florida Program – 20+ Coastal Structures
- Urgent need to optimize and harden operation of structures during storm surge and higher tide events, addressing Hurricane Irma/Matthew/Dorian/Ian gate-open lockouts
- Water Supply exposure to saltwater intrusion: wellfield protection zones vulnerability – **Regional Significant Assets (RSA)**
- Exacerbated upstream flood risks
- Focus on enhancing electronic/mechanical components, modifying gates, remote automation and floodproofing of RSAs



Governor DeSantis' Executive Order 23-06: Achieving Even More Now for Florida's Environment



Exec. Order further advances the protection of Florida's environment and water quality.

Ramps up efforts to accomplish even more by securing \$3.5 billion over four years for:

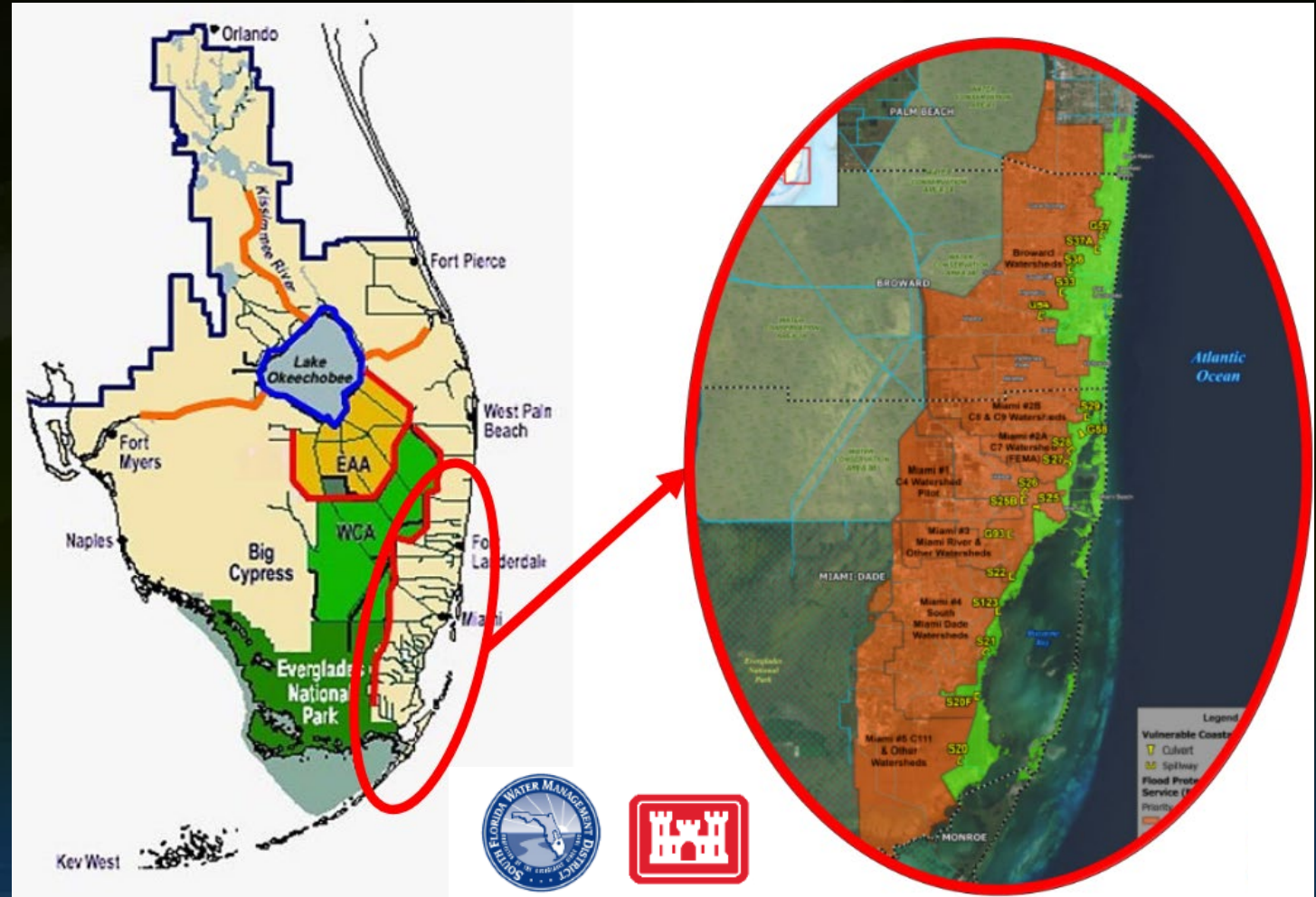
- Everglades restoration and the protection of water resources
- Continuing to expedite the Comprehensive Everglades Restoration Plan projects
- Strengthening resiliency efforts, through the Resilient Florida Program (Section 3)

C&SF Flood Resiliency Study

Under the Authority of Section 216 of the Flood Control Act of 1970

- Reduce flood risk and increase flood resiliency in high-risk urban watersheds in southeast Florida, while looking to enhance the overall benefits of the multipurpose C&SF Project
- Improve the C&SF Project and enhance SEFL Communities' quality of life
- Ongoing study phase: Round 1 Development of Alternatives
- Inviting all stakeholders to provide contributions to this ongoing study

www.sfwmd.gov/C&SF



Resiliency Actions on the Horizon

- There is a problem and there are opportunities
- It will take time, money and dedication to solve
- Collaboration is key: solutions span multiple boundaries
- SFWMD is strongly committed to resilience



Photo by Paul Krashefski

Stakeholder and Public Engagement: Resiliency Coordination Forum

- **Fact-finding forum** to engage partners on water and climate resilience topics
- **Promote collaboration** among the South Florida Water Management District, **local, state, federal and tribal partners** on water management initiatives related to resiliency
- Hold **proactive discussions**, leveraging technical knowledge and exchanging information
- Discuss tangible asset-level solutions and support decision making on water resource management.

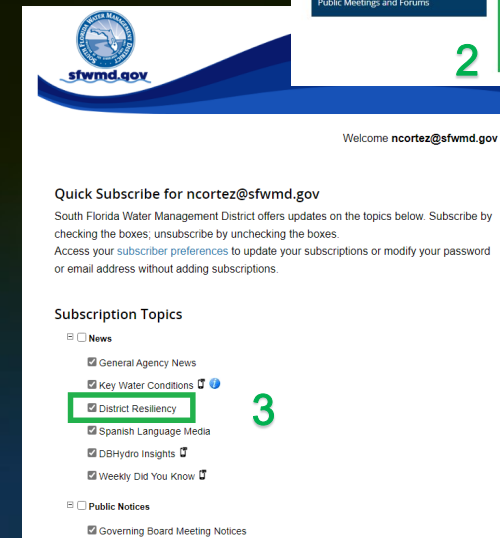


Upcoming Meeting on March 1st, 2023

<https://www.sfwmd.gov/our-work/resiliency-coordination-forum>

How can you be involved?

- Sign-up for our updates by visiting <https://www.sfwmd.gov/news-events> and following these steps:
 - 1 - Click on the “Subscribe for Email” icon
 - 2 - Enter your email address
 - 3 - Select “District Resiliency” under Subscription Topics / News
- Contribute on our initiatives and send us an email to resiliency@sfwmd.gov
- Visit www.sfwmd.gov/resiliency to get updated information
- Visit www.sfwmd.gov/meetings to attend and participate at District events



Questions?

Carolina Maran, Ph.D., P.E.,
cmaran@sfwmd.gov
District Resiliency Officer

South Florida Water Management District
www.sfwmd.gov/resiliency

Thanks!