FIU Sea Level Solutions Center

FLORIDA INTERNATIONAL UNIVERSITY

SFWSC

SOUTH FLORIDA WATER, SUSTAINABILITY, AND CLIMATE

Water, Sustainability, and Climate Change: The use and misuse of water resources

Professor Michael Sukop, PhD, PG, CHg

Department of Earth and Environment

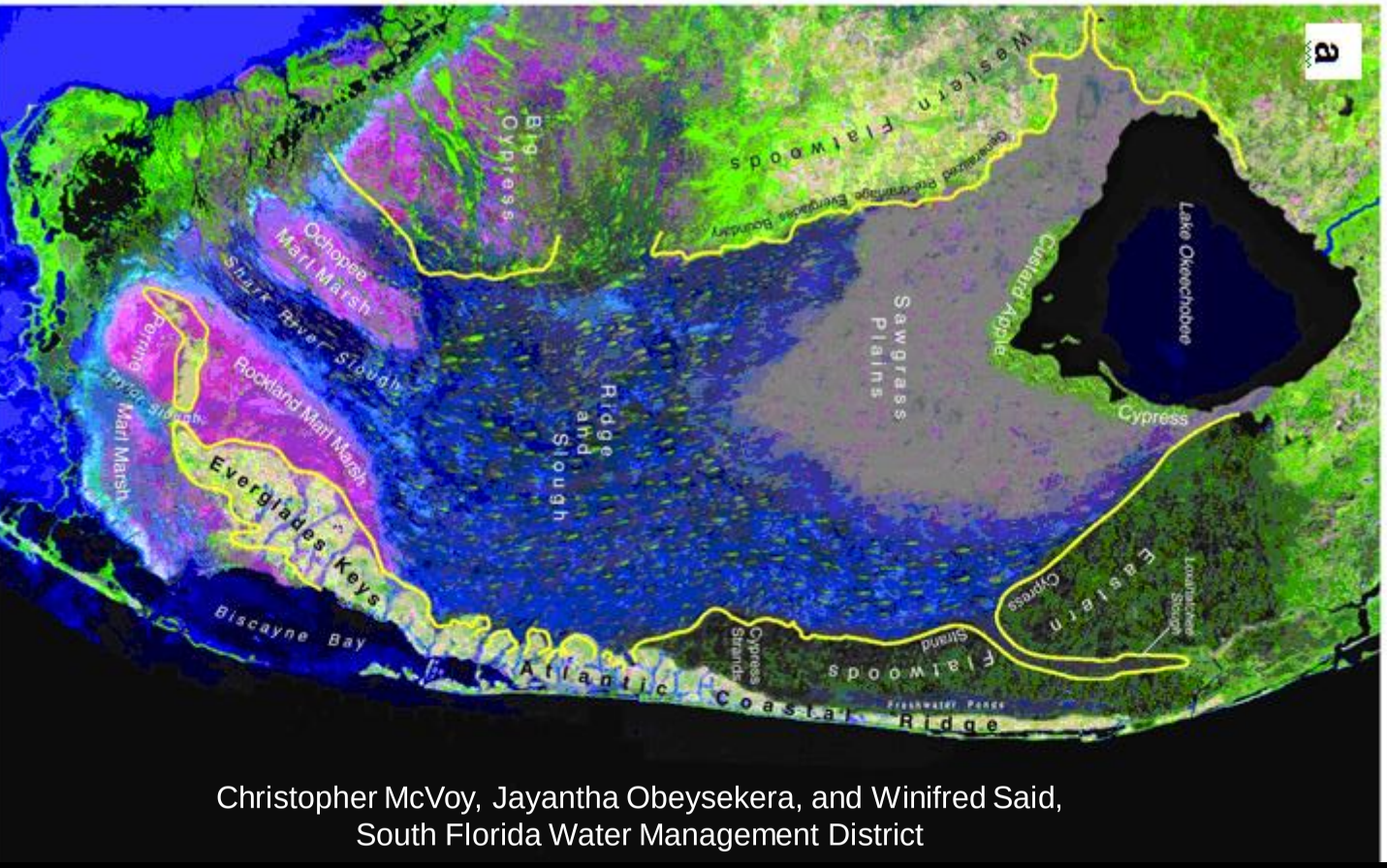
Panel-workshop , Monday, May 2nd | 8:30 a.m. – 10:30 a.m.

FIU FLORIDA INTERNATIONAL UNIVERSITY

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

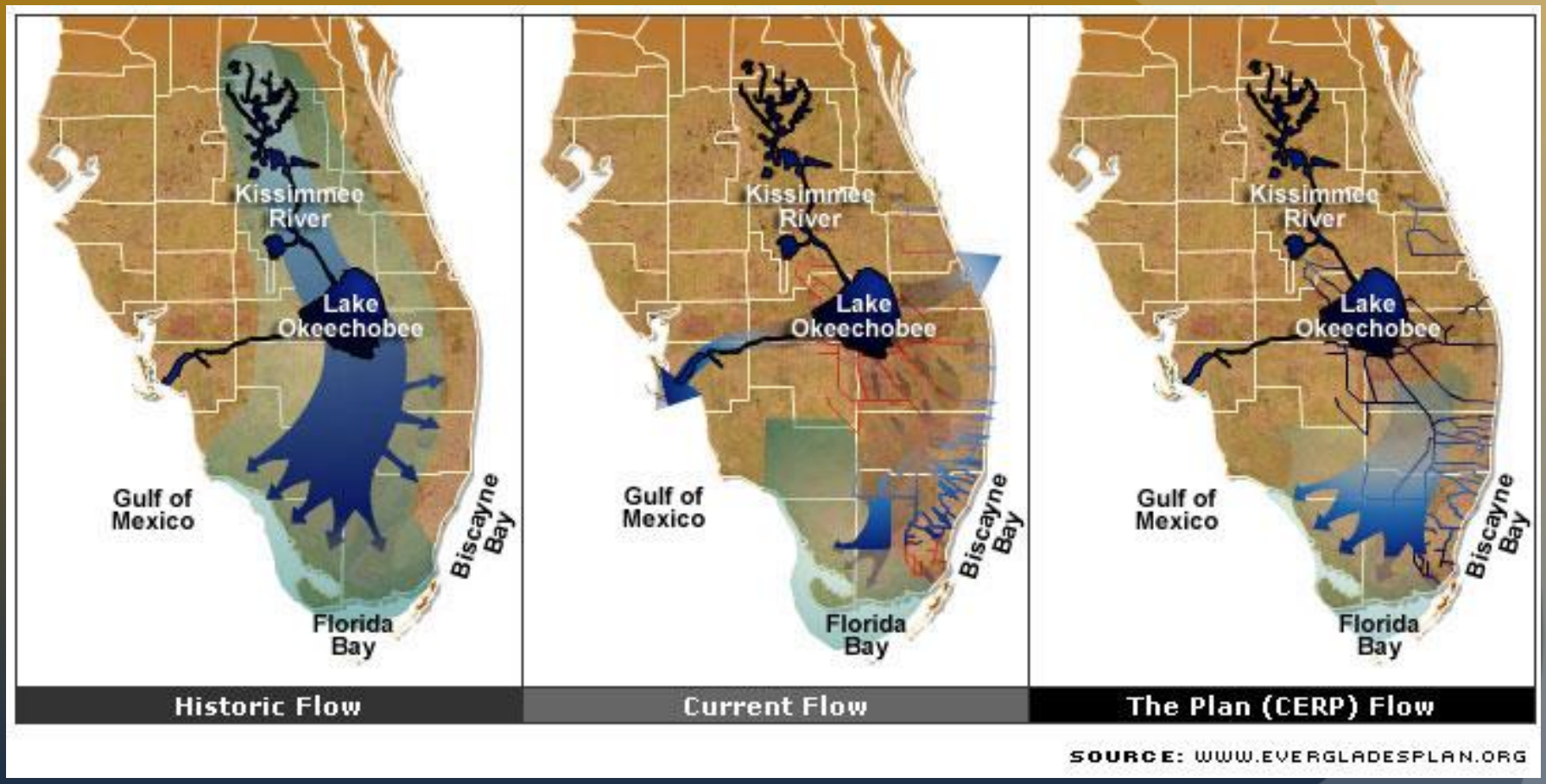
NSF National Science Foundation WHERE DISCOVERIES BEGIN

USDA NIFA United States Department of Agriculture National Institute of Food and Agriculture



Christopher McVoy, Jayantha Obeysekera, and Winifred Said,
South Florida Water Management District

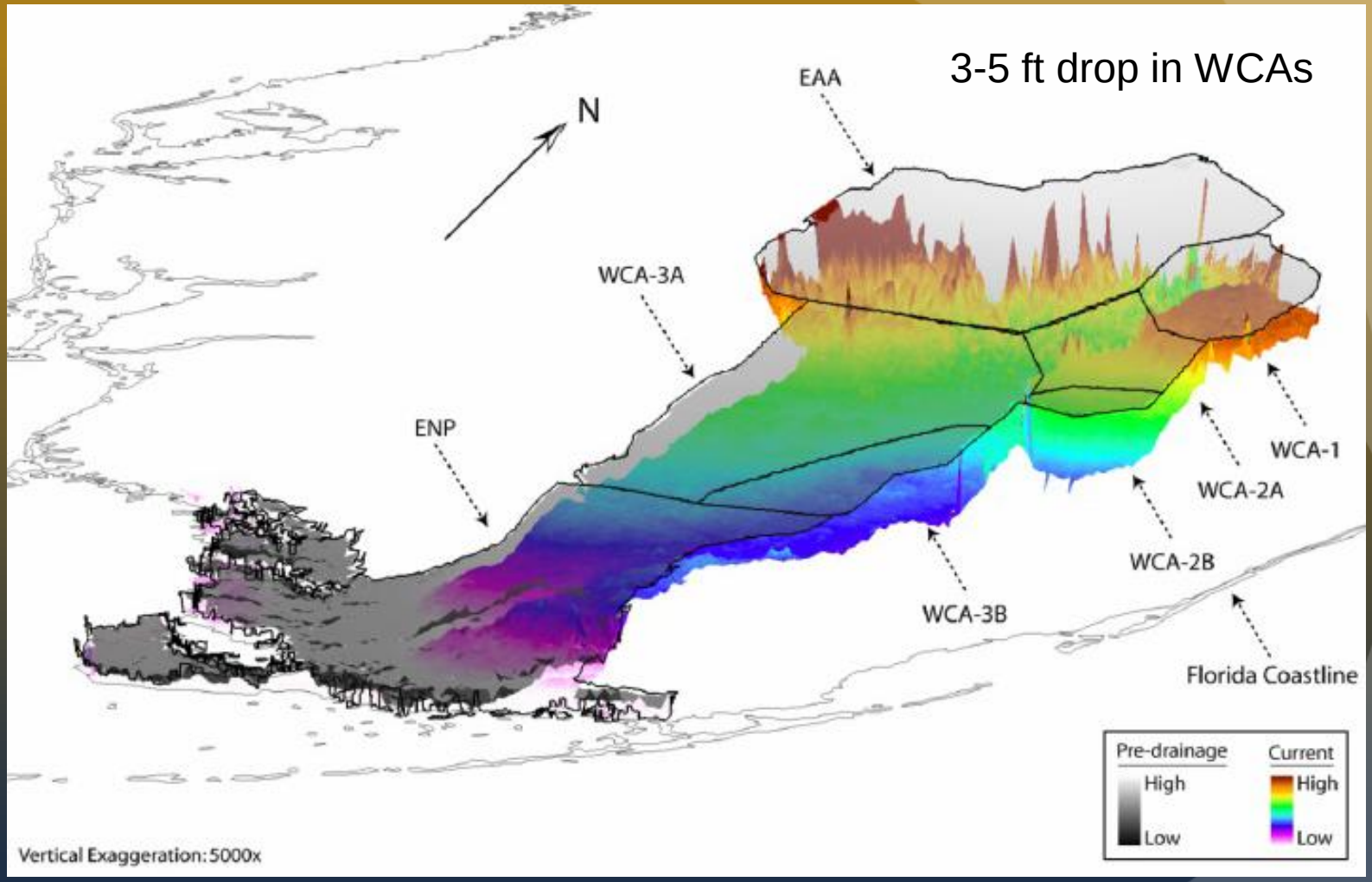
Historic, Current, and Planned Flows



SOURCE: WWW.EVERGLADESPLAN.ORG

FIU FLORIDA INTERNATIONAL UNIVERSITY

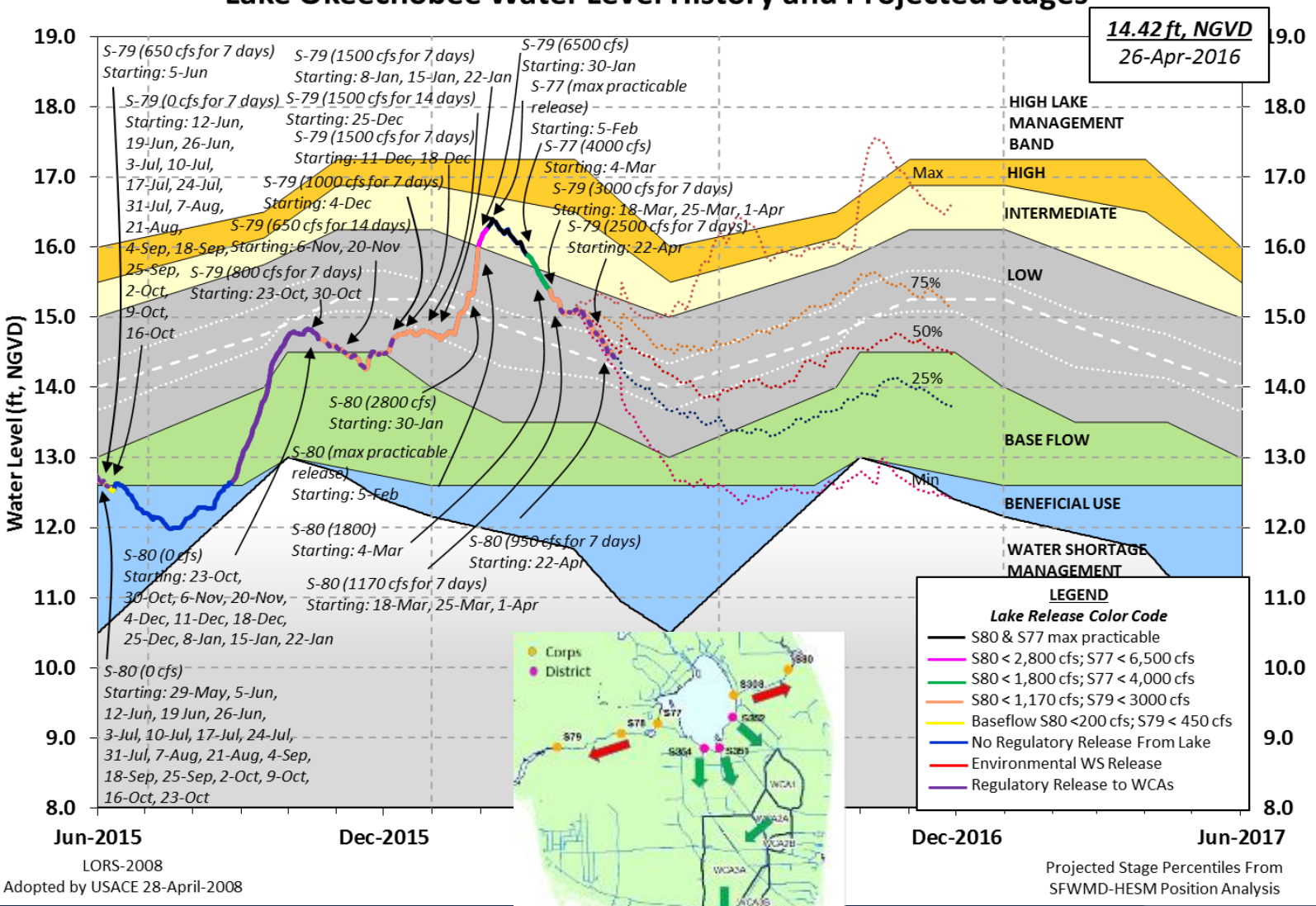
Everglades Agricultural Area Subsidence



FIU FLORIDA INTERNATIONAL UNIVERSITY

Aich, S. and TW Dreschel, 2011, Evaluating Everglades peat carbon loss using geospatial techniques, Florida Scientist 74 (1), 63

Lake Okeechobee Water Level History and Projected Stages



LORS-2008
Adopted by USACE 28-April-2008

Projected Stage Percentiles From
SFWMD-HESM Position Analysis

FIU | FLORIDA INTERNATIONAL UNIVERSITY

South Florida emergency pumping into Lake Okeechobee ends

Four days of emergency pumping dumped about 10 billion gallons of pollution-laden water into Lake Okeechobee to guard against flooding in South Florida. (By Andy Reid)

By Andy Reid · Contact Reporter
Sun Sentinel

February 1, 2016.

Ten billion gallons of pollution-laden water was pumped into Lake Okeechobee during four days of emergency measures to avert South Florida flooding, officials disclosed Monday.

Amid an already rainier-than-usual winter, heavy rains last week triggered the controversial "back pumping" of water from South Florida's vast farming region, the Everglades Agricultural Area, north into the lake.

That helped protect lakeside towns as well as sugar cane fields and vegetable farms from flooding, but at the expense of allowing fertilizers and other pollutants that wash off the land to end up in the lake.

And that back pumping came at the same time officials were starting to discharge water from the swollen lake out to sea for flood control, despite the potential environmental harm to coastal fishing grounds. …

Lake Okeechobee Releases to St Lucie Canal

FIU FLORIDA INTERNATIONAL UNIVERSITY

Polluted fresh water from releases from Lake Okeechobee, near shore reefs off of Stuart and Jupiter Island. http://earthjustice.org/blog/2016-february/south-florida-s-tourist-season-from-hell# JACQUI THURLOW-LIPPISCH/JACQUITHURLOWLIPPISCH.COM

GOV. RICK SCOTT: FOLLOWING STATE OF EMERGENCY DECLARATION, DEO ACTIVATES BUSINESS EMERGENCY OPERATIONS CENTER

On March 2, 2016, in News Releases, by Staff

TALLAHASSEE, Fla. – After declaring a state of emergency in Lee, Martin and St. Lucie Counties last week, Governor Scott announced today that the Florida Department of Economic Opportunity (DEO) will immediately activate a business emergency operations center. DEO will begin to immediately assess the impact the federal government's water releases from Lake Okeechobee are having on businesses. Last week, Governor Scott called on the Obama Administration to fully fund the more than $800 million in needed repairs to the federally operated Herbert Hoover Dike which would safely hold water to prevent these discharges to the Caloosahatchee and St. Lucie estuaries.

Governor Rick Scott said, "By declaring a state of emergency last week, we have added additional flexibility so our state agencies can begin to help families and businesses in those communities. Our business emergency operations center will help businesses assess any damage caused by the federal government's failure to fix the federally maintained Herbert Hoover dike. We need the President to fully fund the $800 million in needed repairs to the Herbert Hoover Dike so discharges are no longer needed."

DEO Executive Director Cissy Proctor said, "Many local businesses near the coast may be adversely affected by the Lake Okeechobee releases. Small businesses are the backbone of Florida's thriving economy and it is critical that they have access to resources during and after a disaster to quickly recover. DEO is committed to assisting businesses with recovery needs."

The program, managed by DEO, will immediately begin surveying businesses affected by the water releases and share the results with various state and local agencies to implement appropriate disaster relief programs. Affected businesses should complete a Business Damage Assessment survey that will be used to determine which emergency support programs might be beneficial to aid recovery efforts in the area. Local and state officials will use this information to provide any needed assistance programs.

The survey can be obtained at http://flvbeoc.org/index.php?action=bda by selecting the "Lake Okeechobee Discharge" event.

###

Contact Governor Scott

Executive Office of Governor Rick Scott
400 S Monroe St
Tallahassee, FL 32399
(850) 488-7146

Click Here to Email Governor Scott

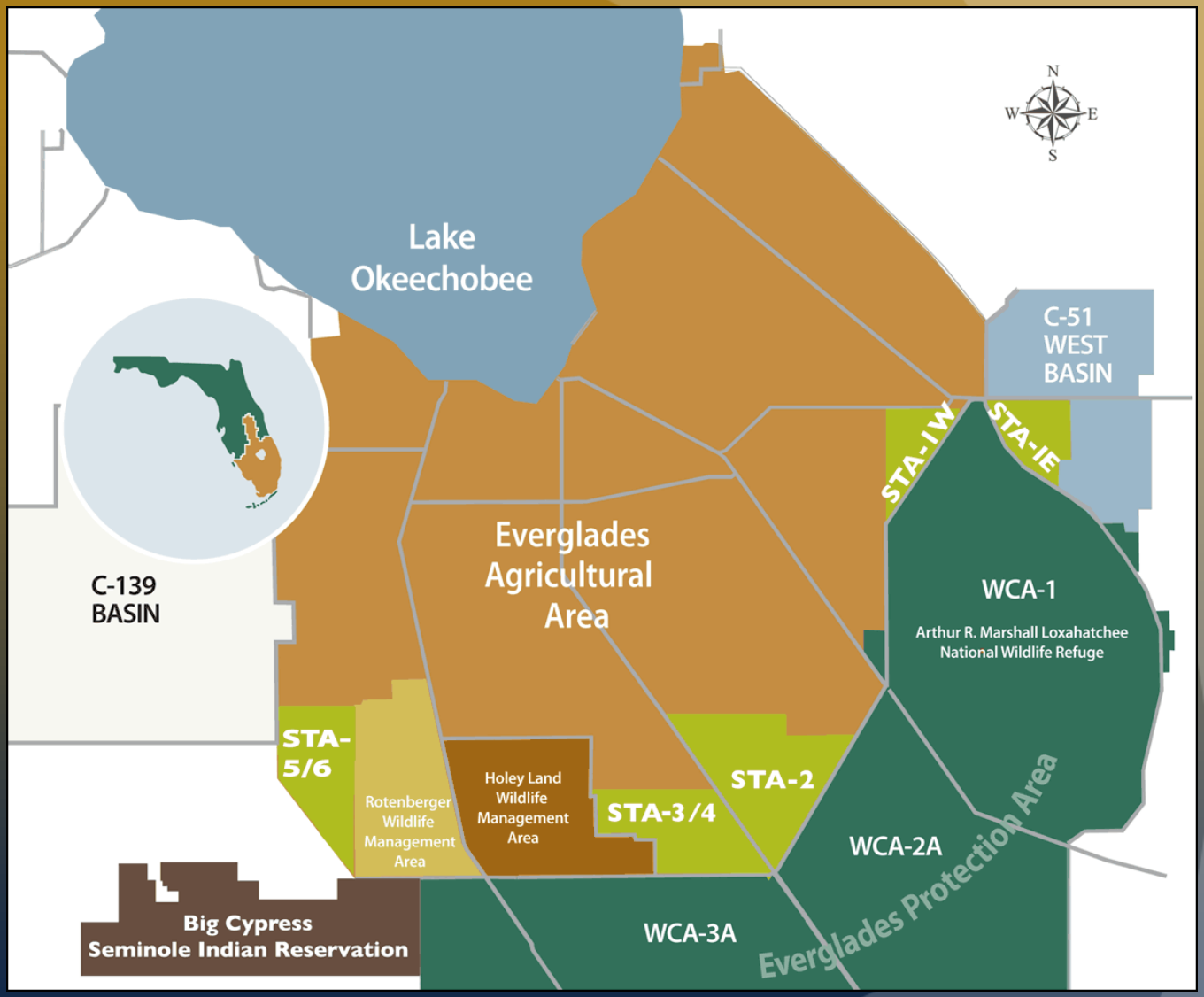
Click Here to Email Lt. Governor Lopez-Cantera

Information Center

Scheduling Requests

Click Here to Sign-Up for Our Monthly Newsletter

Stormwater Treatment Areas



FIU FLORIDA INTERNATIONAL UNIVERSITY

http://my.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_gif/map_stas.gif

FIU FLORIDA INTERNATIONAL UNIVERSITY

http://my.sfwmd.gov/portal/page/portal/xweb%20protecting%20and%20restoring/water%20quality%20stormwater%20treatment%20areas

WCA to ENP

- February 15, 2016
- WCA 1 foot high (11.41 vs. 10.21 ft). Need pre-wet season storage for flood protection
- Raise L-29 from 7.5 to 8.5 ft)

JACKSONVILLE DISTRICT

US Army Corps of Engineers

ABOUT | BUSINESS WITH US | MISSIONS | LOCATIONS | CAREERS | MEDIA | LIBRARY | CONTACT

HOME > MEDIA > NEWS RELEASES

News Release Archive

- 2016 (29)
- 2015 (107)
- 2014 (75)
- 2013 (92)
- 2012 (95)
- 2011 (67)

Corps approves request for increased Everglades' flows

SHARE Email Print

Posted 2/15/2016

Release no. 16-015

Contact
John Campbell
904-232-1004
john.h.campbell@usace.army.mil

The U.S. Army Corps of Engineers South Atlantic Division has approved a request from Florida Governor Rick Scott for deviation from its water control plan for a key Everglades reservoir located west of Miami.

The division made the decision to grant the request for deviation based on extensive documentation from within the Corps and multiple partners representing federal, state, and tribal interests.

The deviation raises water levels in the L-29 canal, which runs along the north side of the Tamiami Trail (US Hwy 41) between Water Conservation Area 3 (WCA-3) and Everglades National Park. The WCA-3 water control plan limited those levels to elevation 7.5 feet (NGVD). The deviation raises the levels as high as elevation 8.5 feet, which would allow more water to flow from WCA-3 to Everglades National Park.

"WCA-3 is a foot above its regulation schedule," said Col. Jason Kirk, Jacksonville District Commander. "This action will allow us to get more water out of the conservation area and lower the water level."

Before granting the deviation, the Corps coordinated with tribal staff, while the State of Florida coordinated to obtain the necessary permissions from private property owners who face potential flooding from higher canal levels. The action would allow up to 900 additional cubic feet per second (cfs) to flow through the L-29 canal and into Everglades National Park.

Accessibility | Contact Us | FOIA | Information Quality Act | Link Disclaimer | No Fear Act | Privacy & Security | Public Inquiries | Site Map | USA.gov

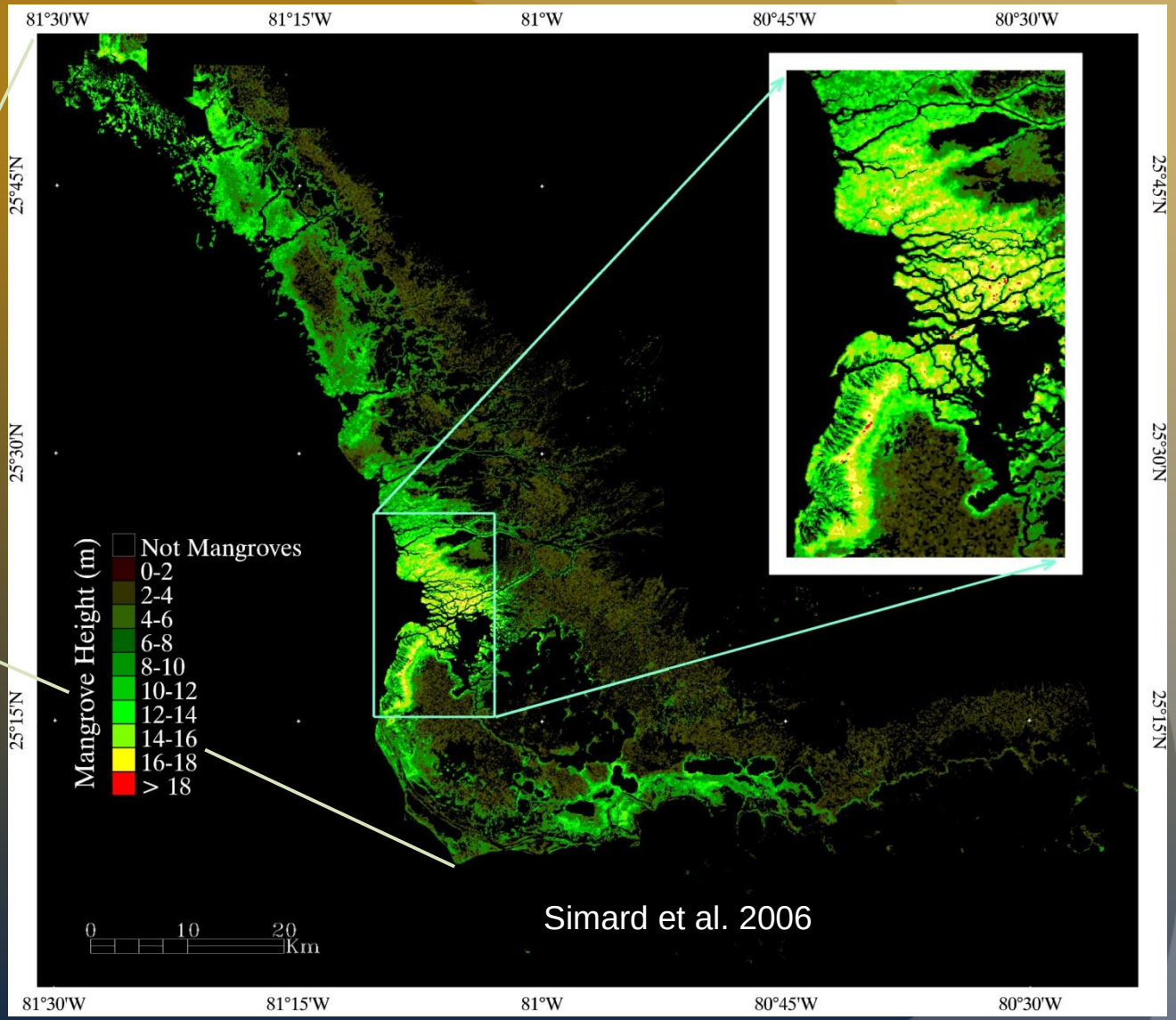
FIU FLORIDA INTERNATIONAL UNIVERSITY

Everglades

FIU | FLORIDA INTERNATIONAL UNIVERSITY

FIU | FLORIDA INTERNATIONAL UNIVERSITY

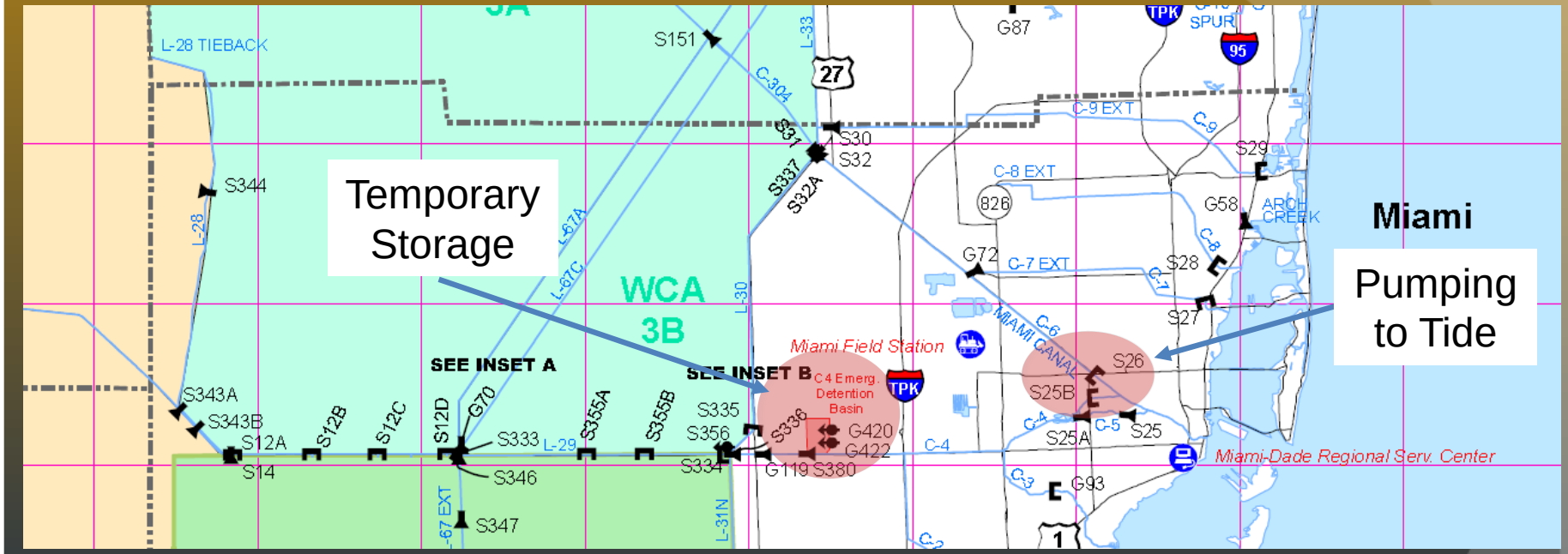
FIU | FLORIDA INTERNATIONAL UNIVERSITY



Simard et al. 2006

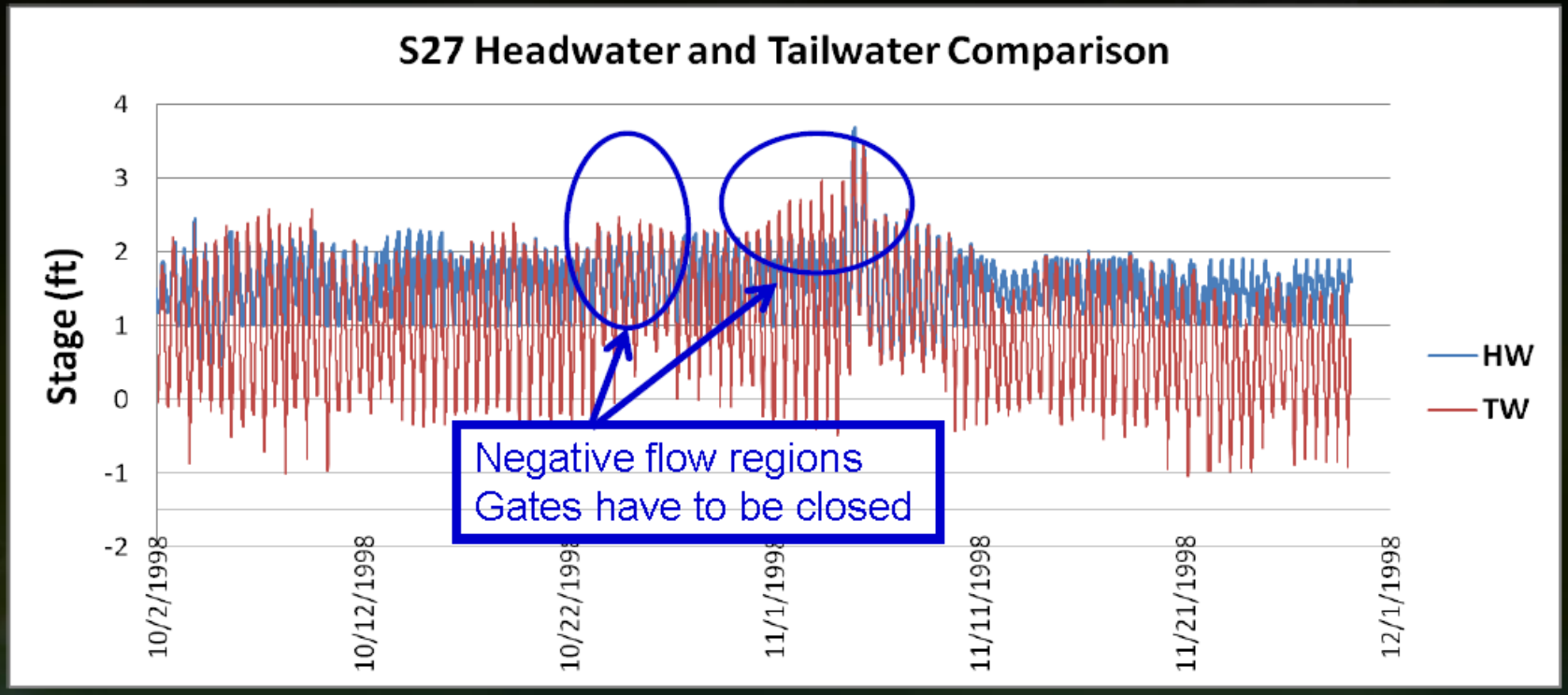
FIU FLORIDA INTERNATIONAL UNIVERSITY

Meanwhile, back in the city…



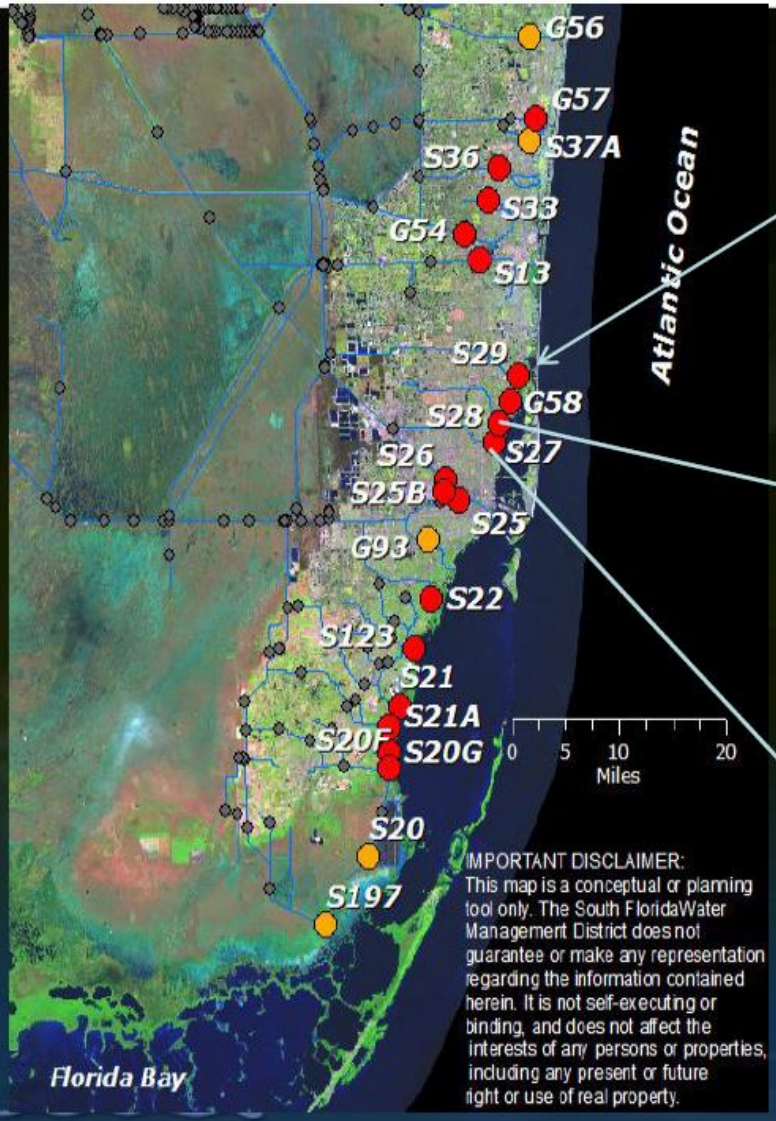
FIU FLORIDA INTERNATIONAL UNIVERSITY

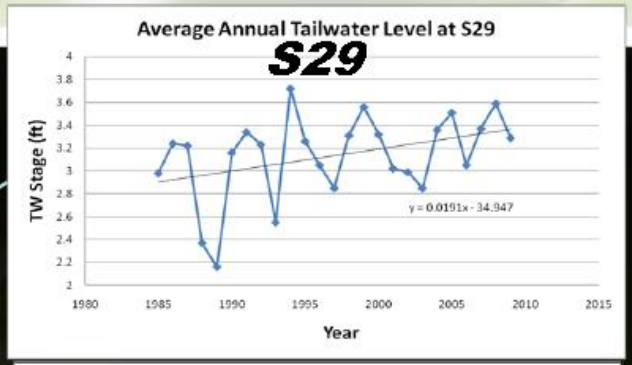
Coastal Spillways Sensitive to Sea Level Rise

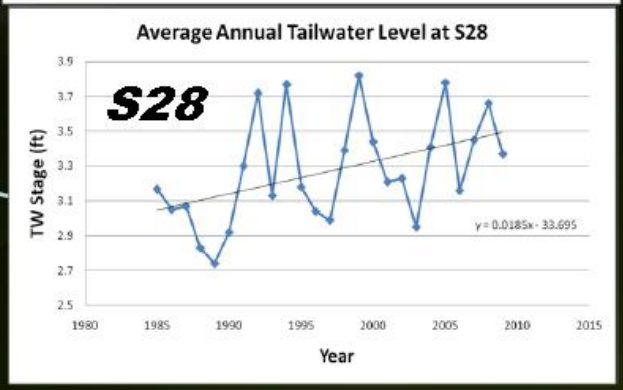


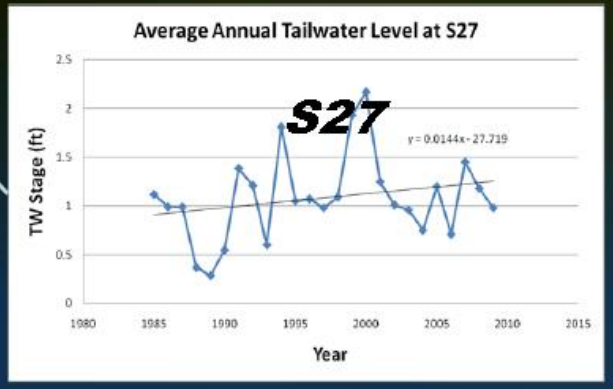
Increasing sea level forces gates to close to avoid negative flow. This significantly reduces coastal spillway's flood discharge capacity particularly during the latter part of the hurricane season (Sep. to Nov.).

Rising Water Levels on Oceanside





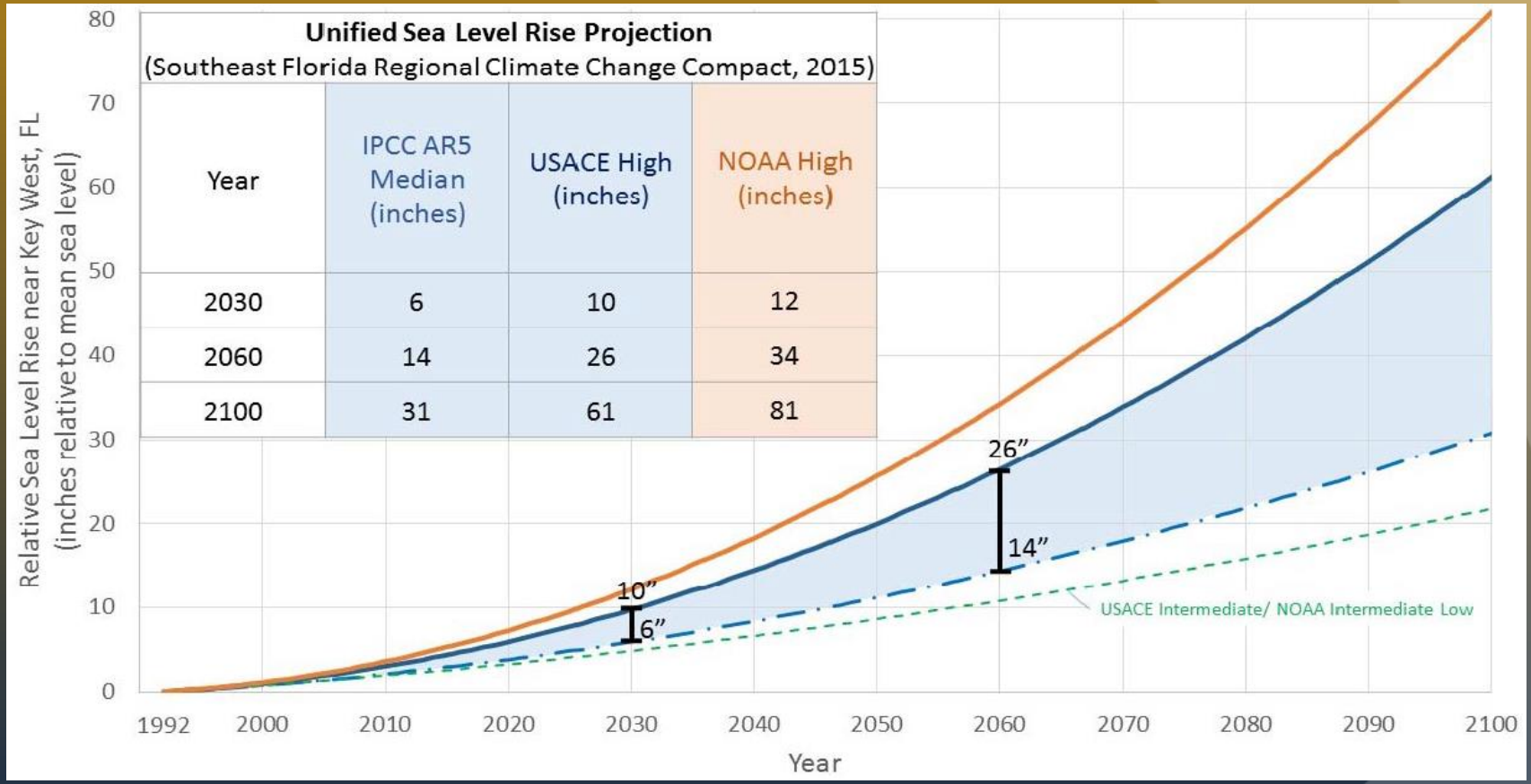




Southeast Florida Regional Climate Change Compact Unified SLR Projections

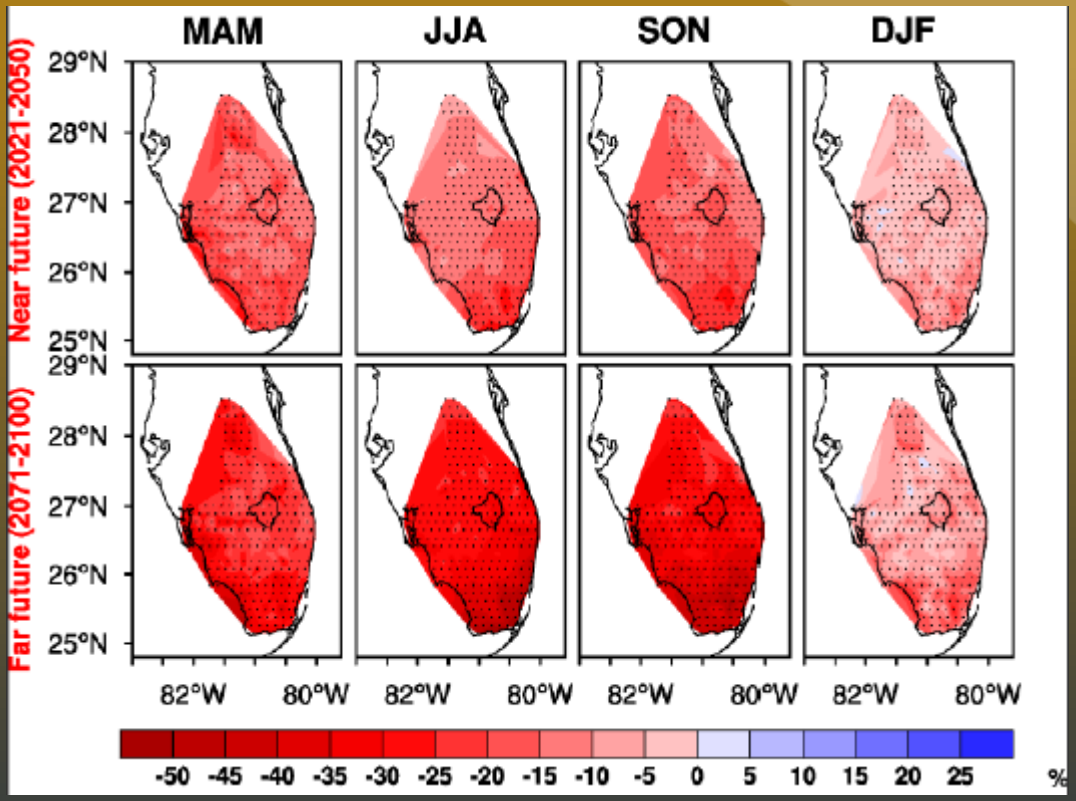
Unified Sea Level Rise Projection
(Southeast Florida Regional Climate Change Compact, 2015)

Year	IPCC AR5 Median (inches)	USACE High (inches)	NOAA High (inches)
2030	6	10	12
2060	14	26	34
2100	31	61	81



FIU FLORIDA INTERNATIONAL UNIVERSITY

Downscaling Precipitation for Southern Florida



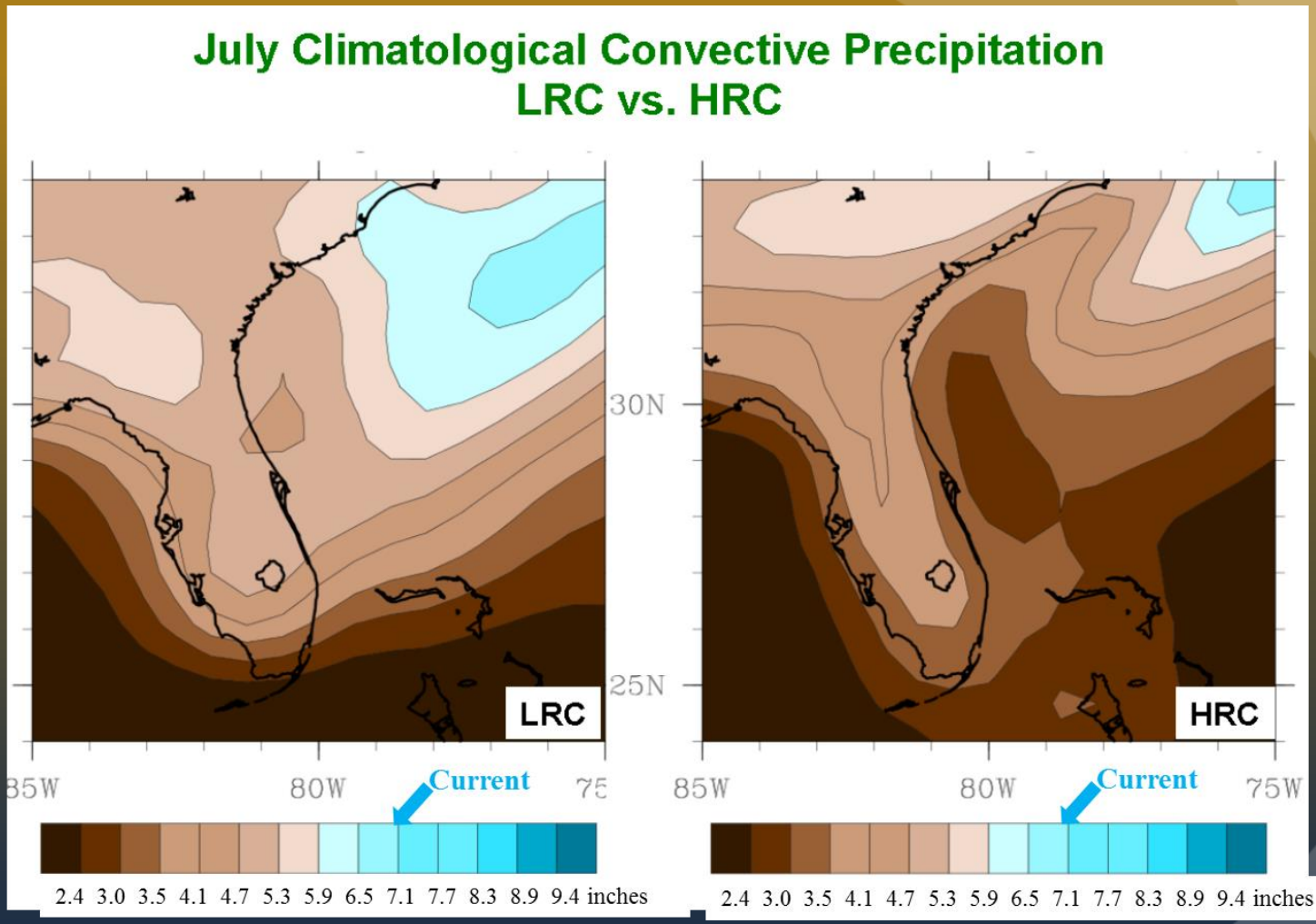
Downscaled precipitation – CMIP5 ensemble

Projected Change in Rainfall

Mann: USGS-FAU Precipitation Downscaling Technical Meeting, June 22 - 23, 2015

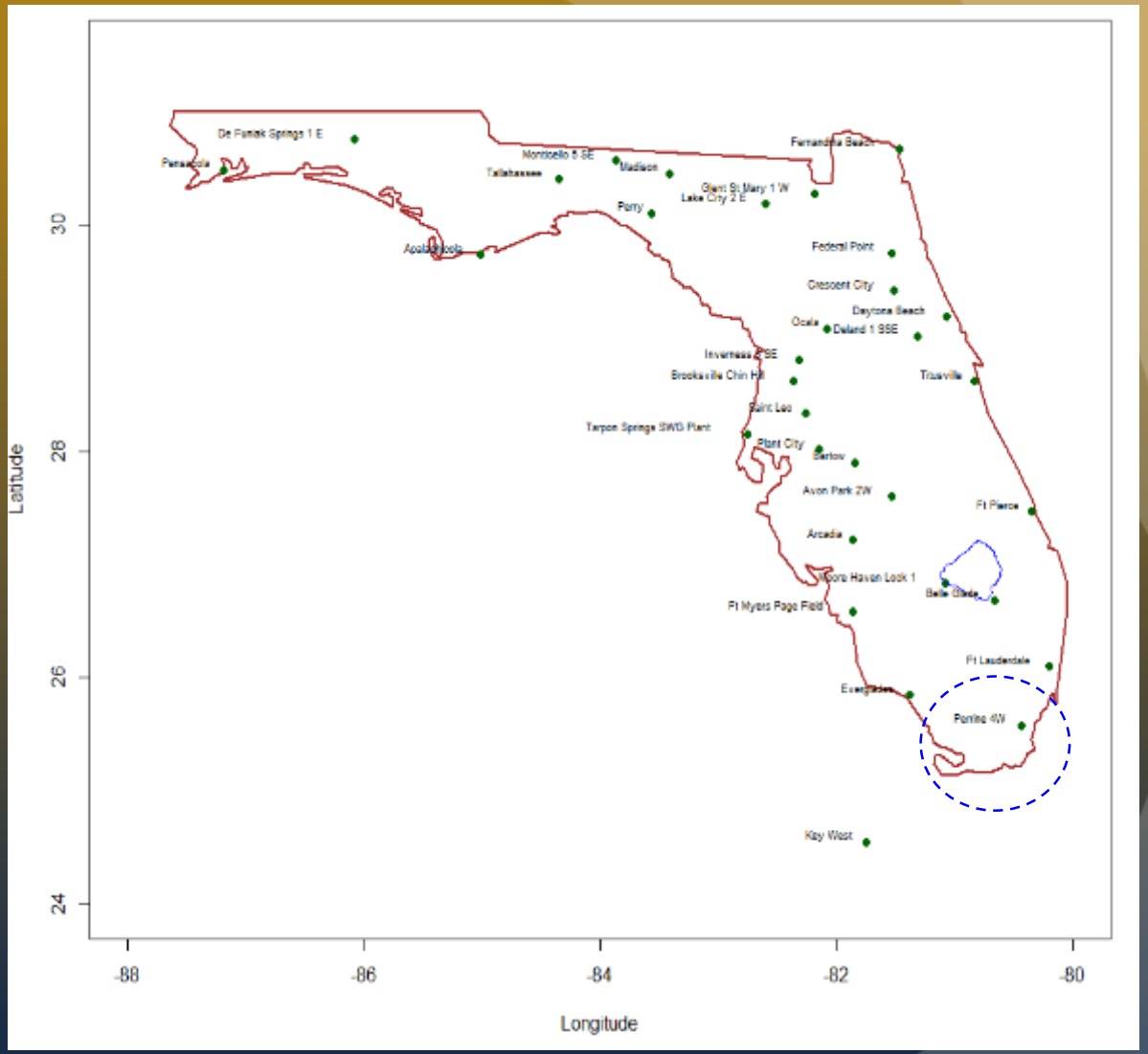
FIU | FLORIDA INTERNATIONAL UNIVERSITY

Downscaling Precipitation for Southern Florida

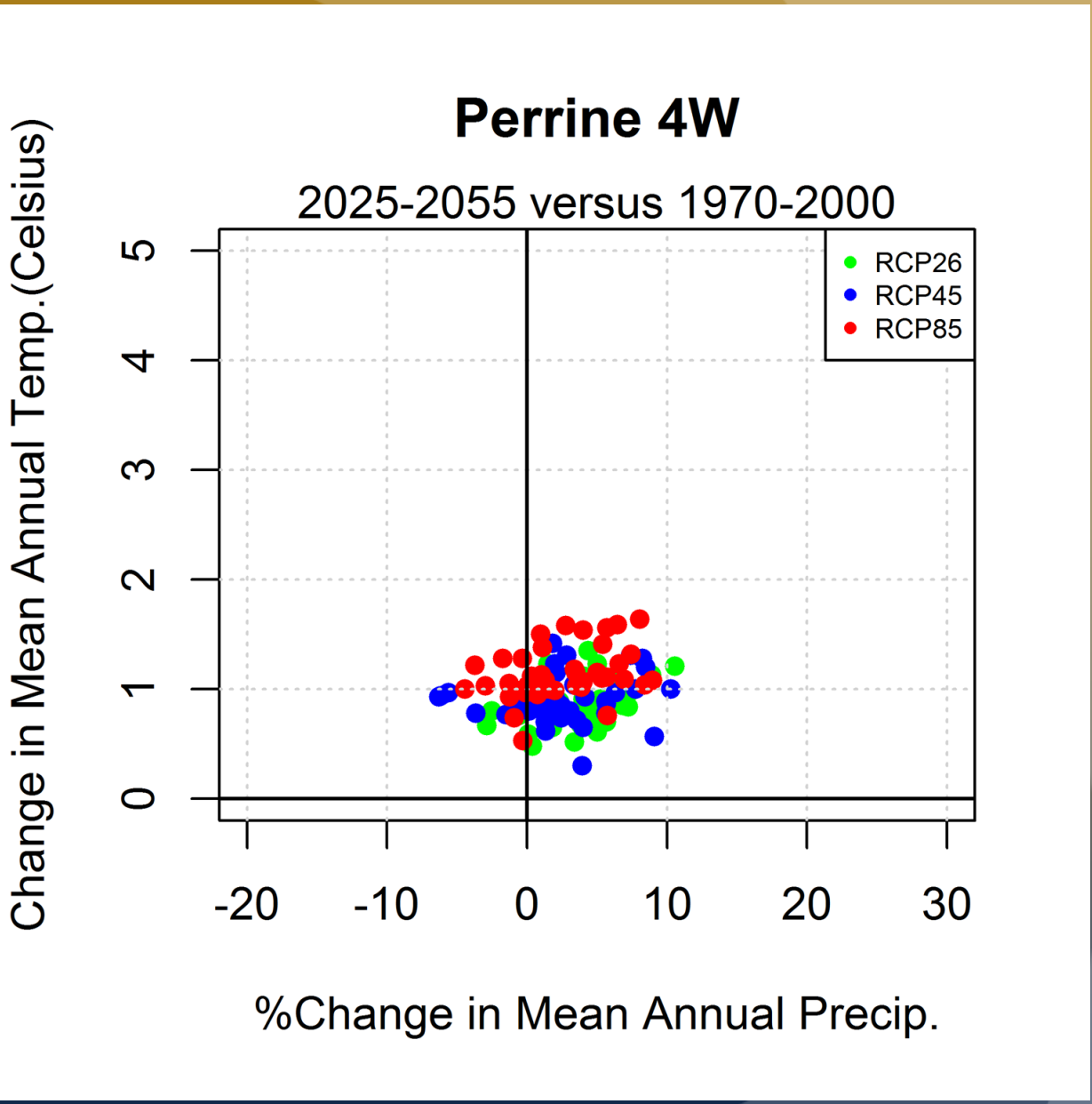


FIU FLORIDA INTERNATIONAL UNIVERSITY

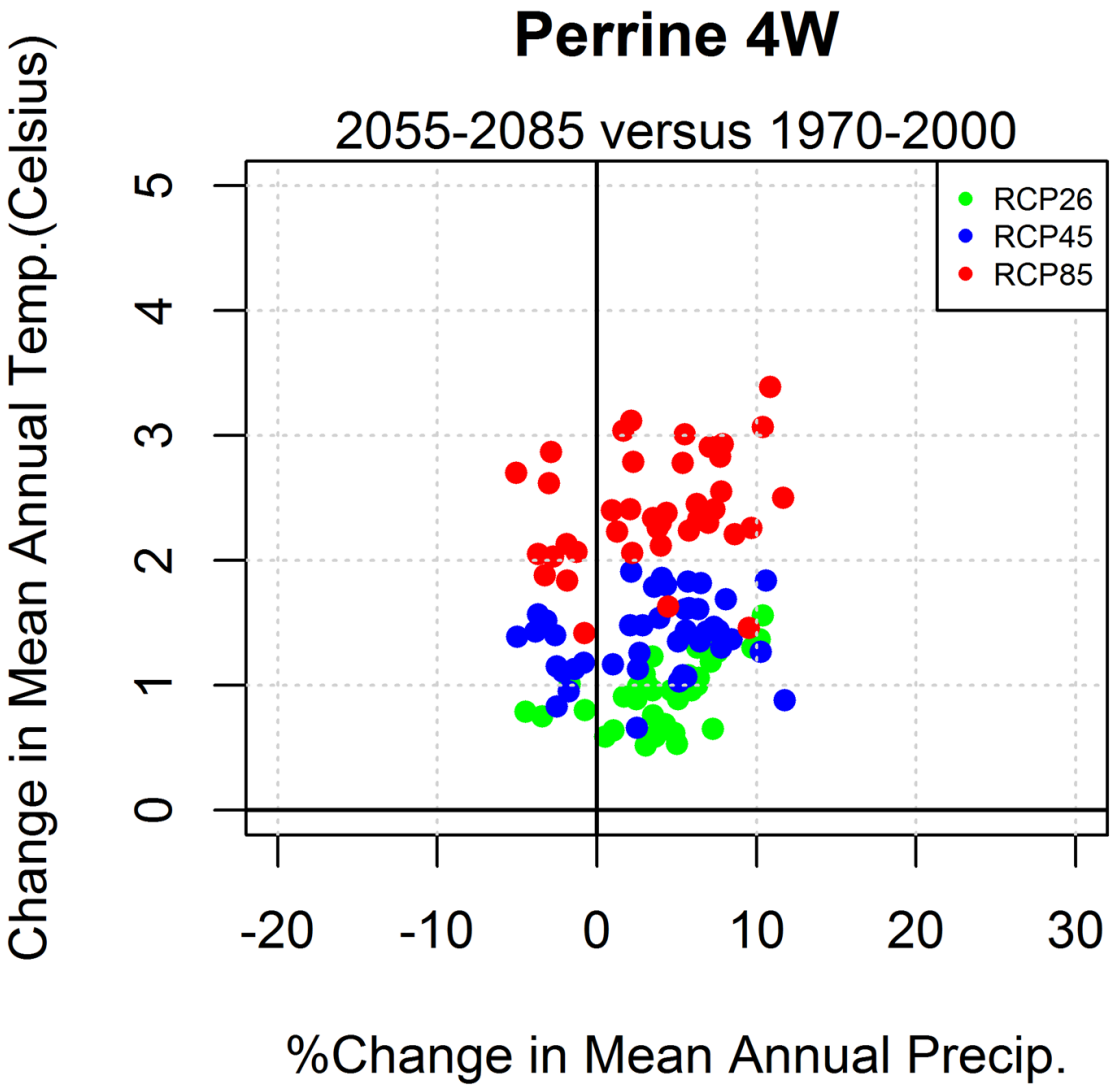
SFWMD Downscaling: Gage locations



FIU FLORIDA INTERNATIONAL UNIVERSITY

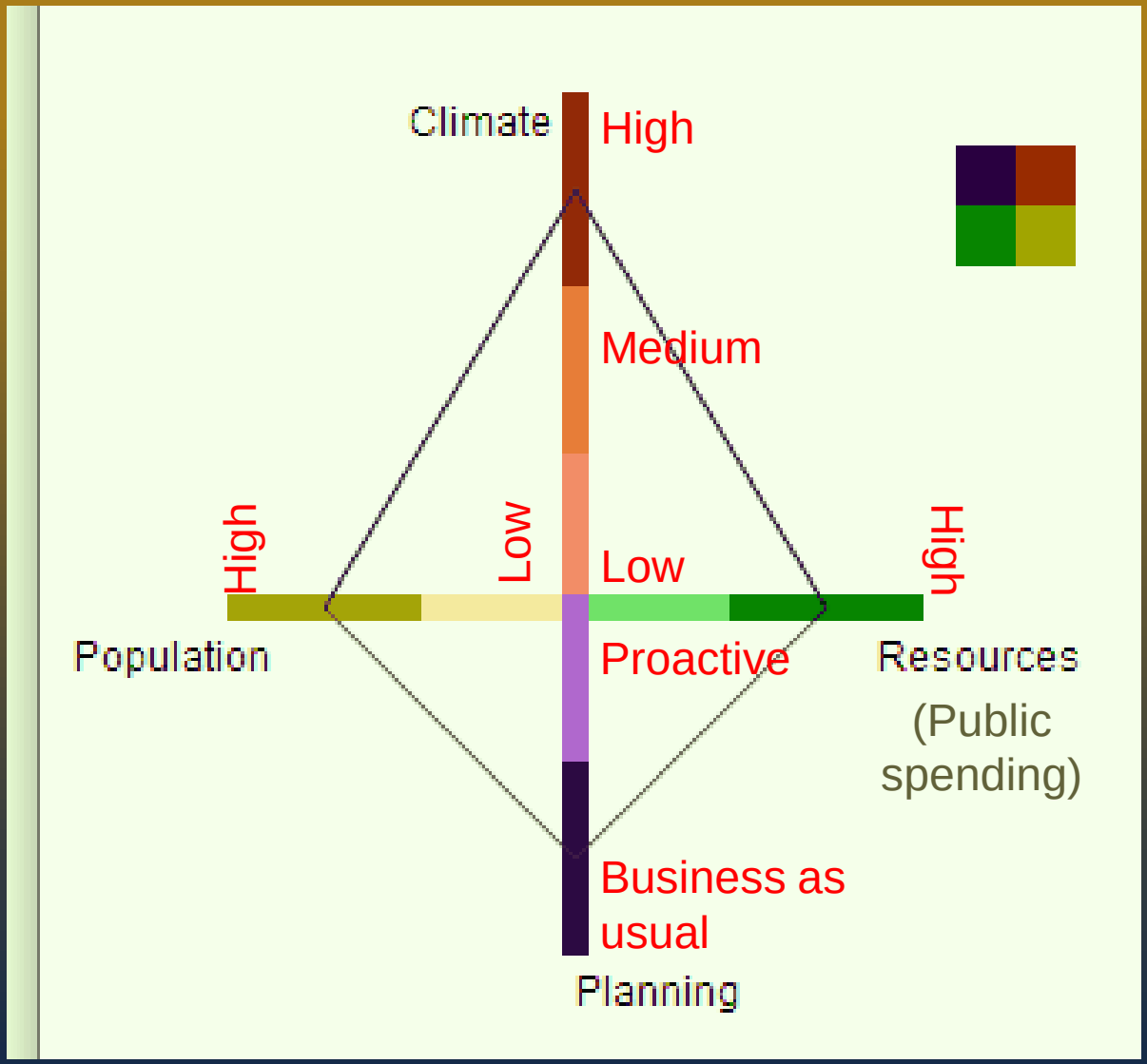


FIU FLORIDA INTERNATIONAL UNIVERSITY



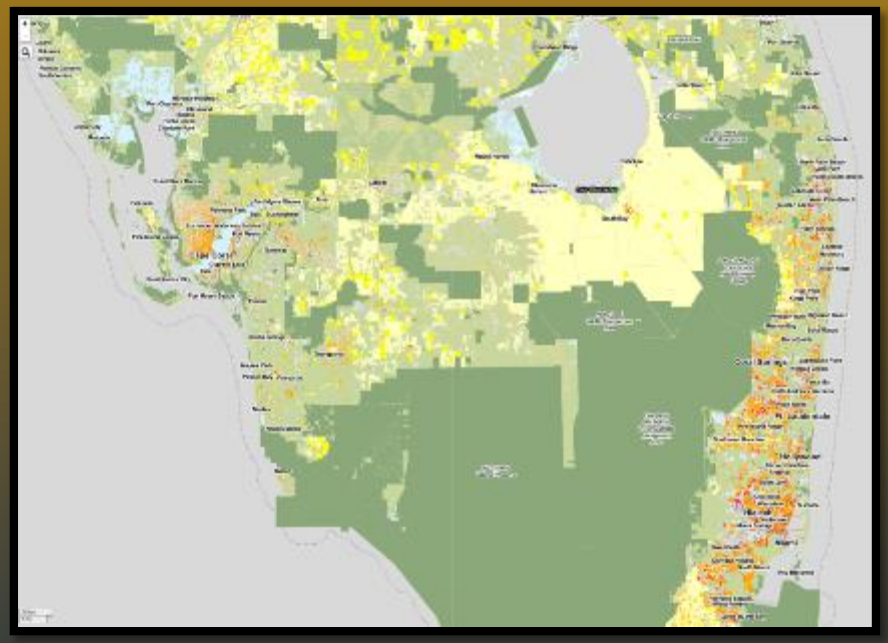
FIU FLORIDA INTERNATIONAL UNIVERSITY

Scenario generation

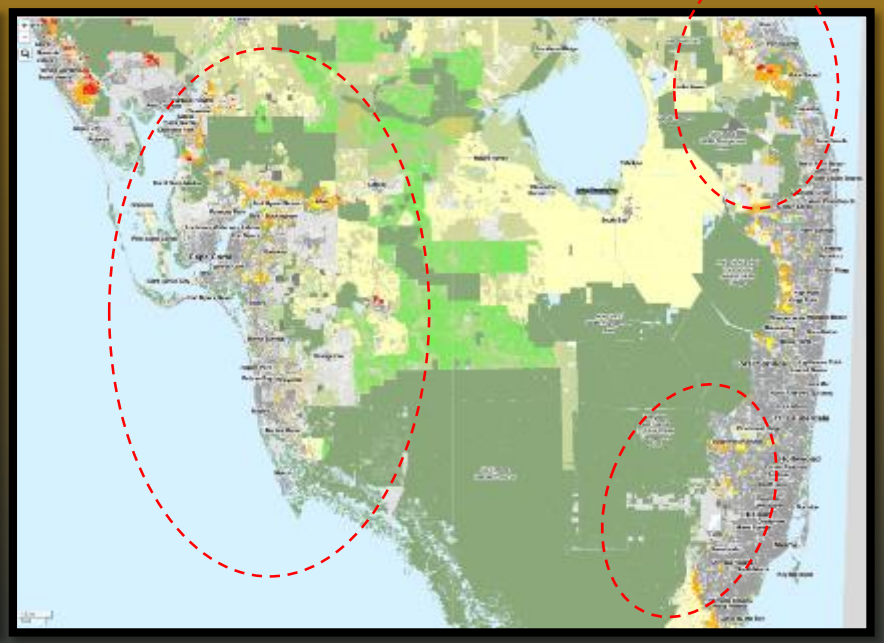


Scenario generation

Land use change



2015



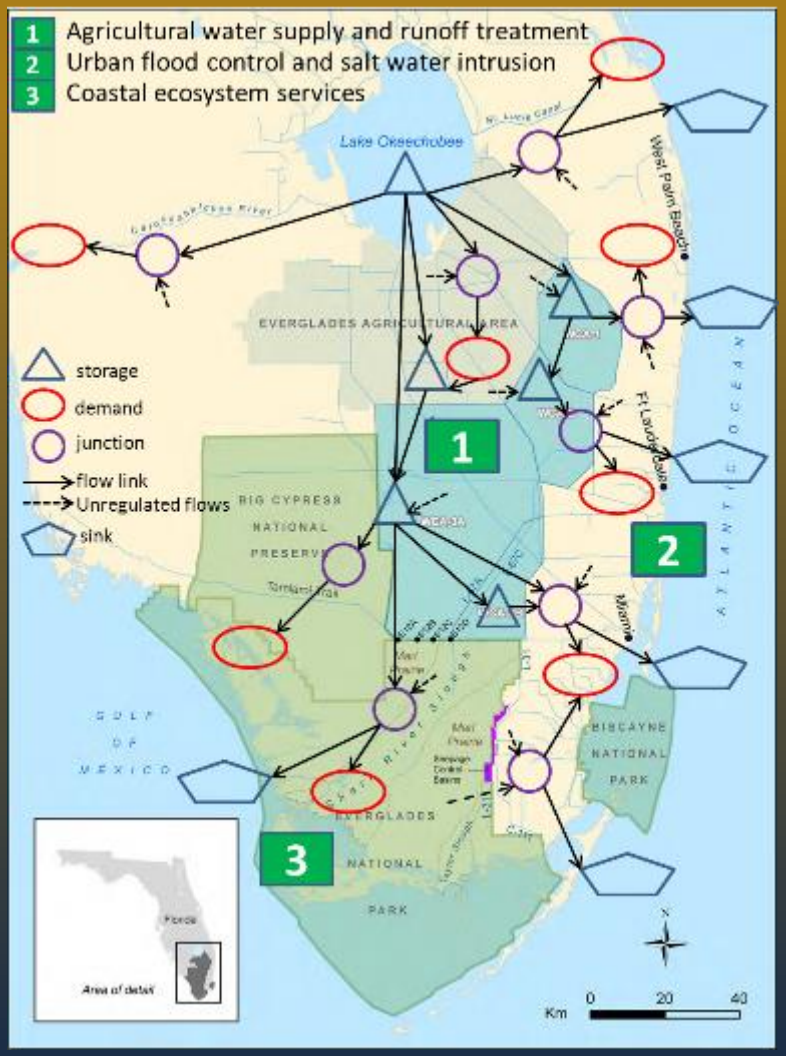
2050

- Low Intensity Urban
- High Intensity Urban
- Agriculture
- Ranching
- Fee-simple Conservation
- Private Conservation
- Urban
- New Suburban

- New Rural Residential
- Seminatural Private
- Water
- Zoned for Development
- Extractive Uses
- Forestry
- Public Lands

FIU FLORIDA INTERNATIONAL UNIVERSITY

Hydro-economic optimization



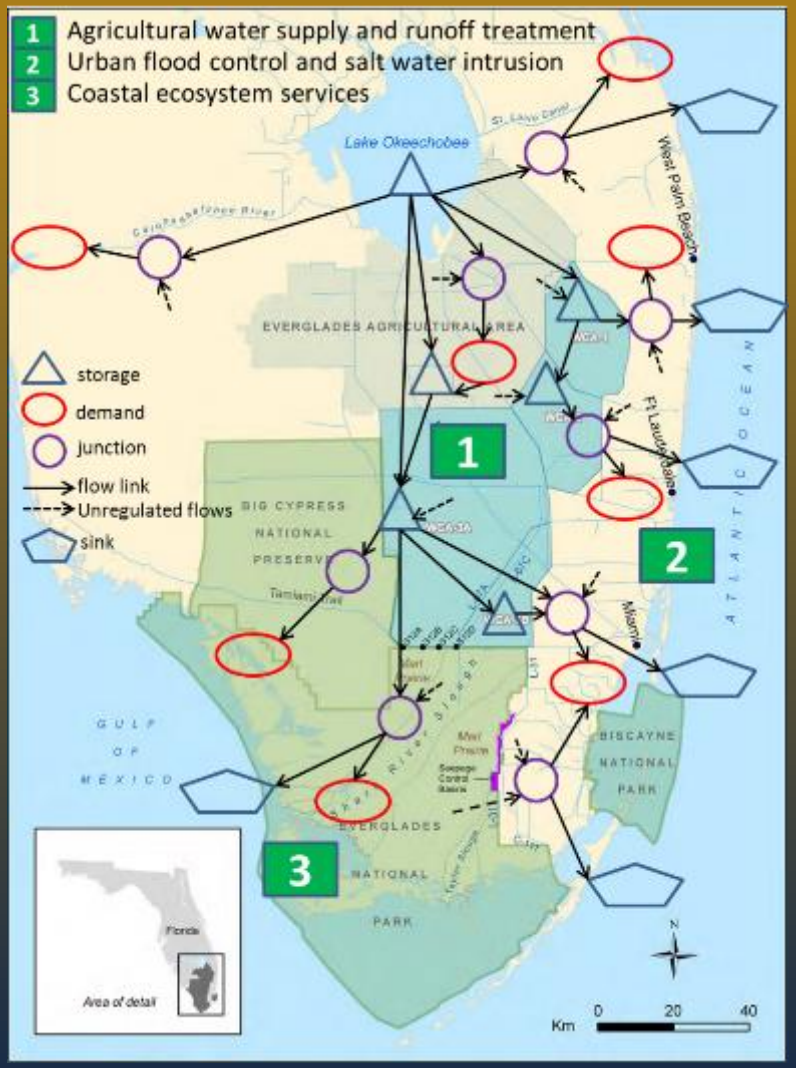
Objectives:

- Develop regional scale linked-node network model
- Optimize ecological and economic value of water allocations
- Quantify regional-level trade-offs
- Examine long term "robustness" of optimized solutions under different scenarios

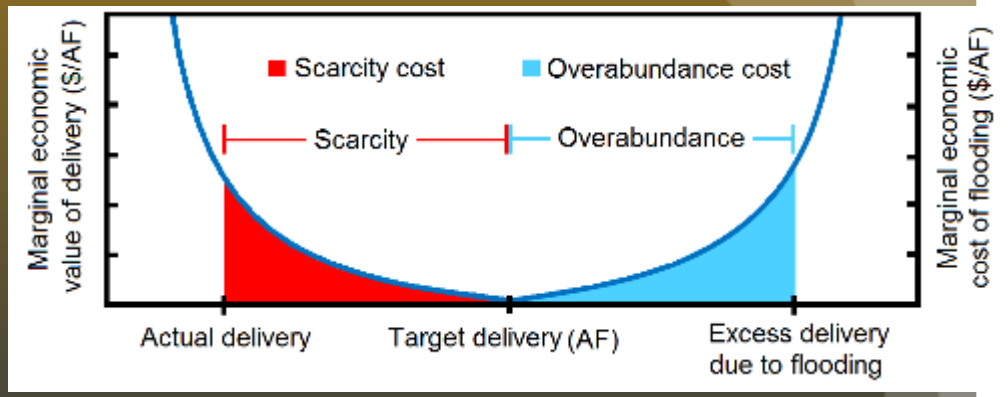
Watkins, D., Kirby, K., and Punnett, R. (2004). "Water for the Everglades: Application of the South Florida Systems Analysis Model." J. Water Resour. Plann. Manage., 130(5), 359–366. doi: 10.1061/(ASCE)0733-9496(2004)130:5(359)

FIU FLORIDA INTERNATIONAL UNIVERSITY

Hydro-economic optimization

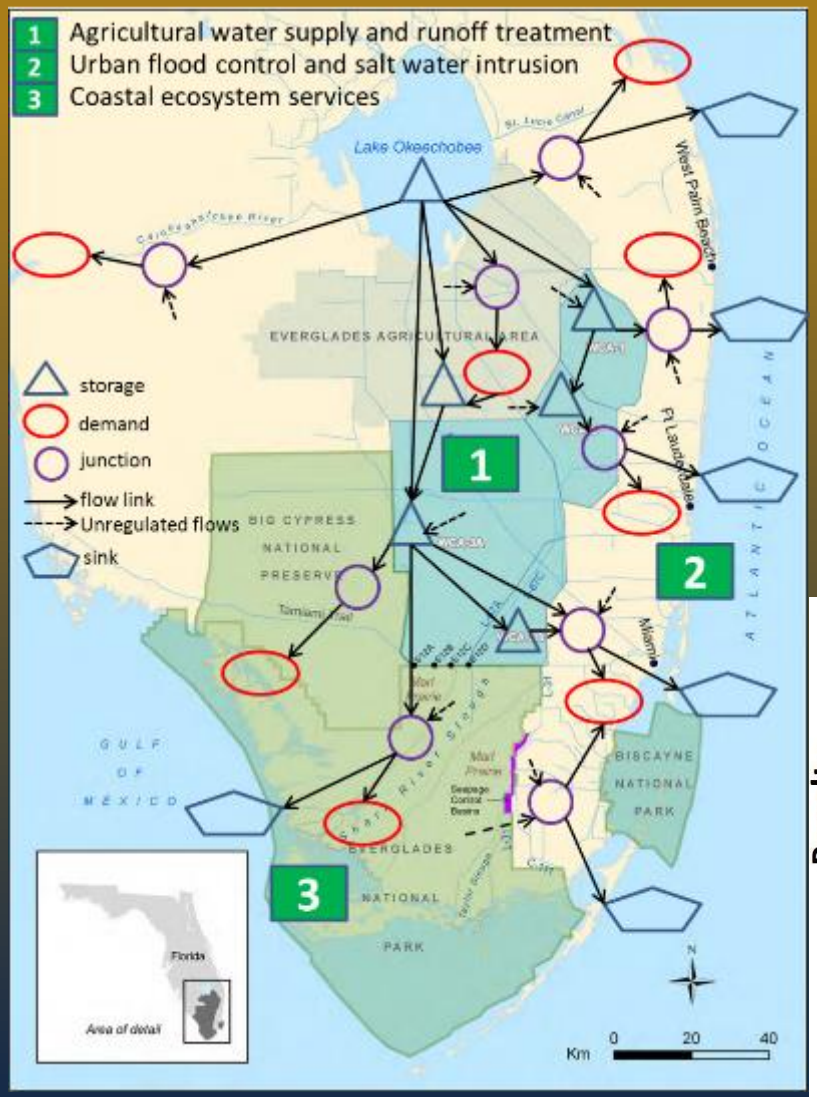


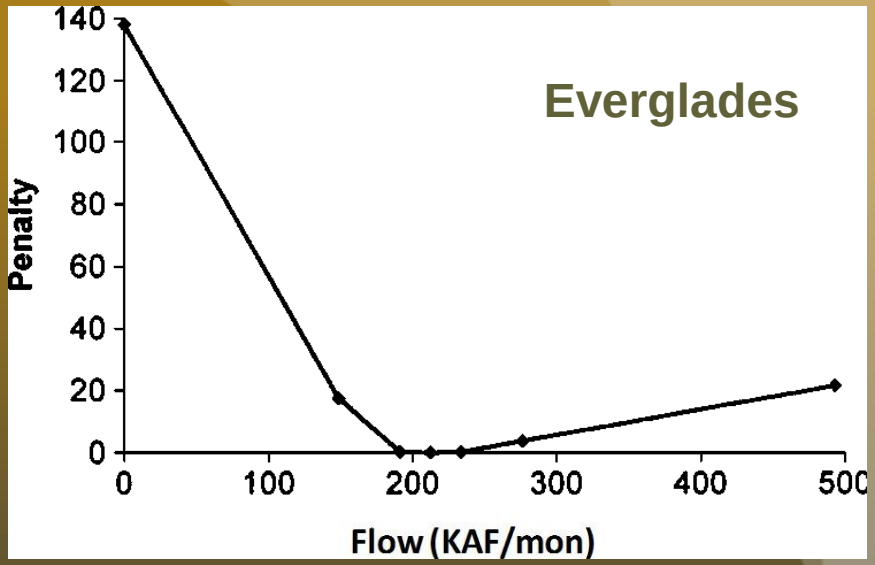
"Trade-off' or "Penalty" functions at each node

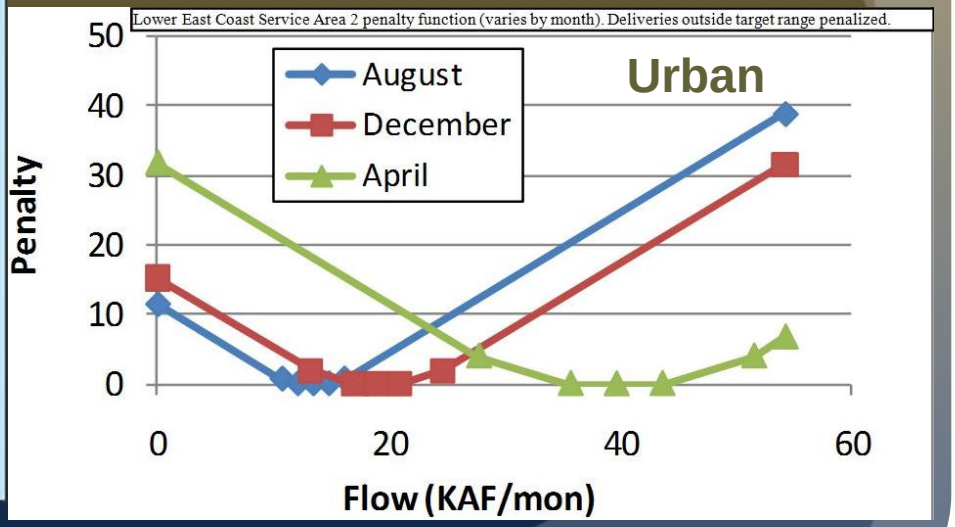


FIU FLORIDA INTERNATIONAL UNIVERSITY

Hydro-economic optimization







FIU FLORIDA INTERNATIONAL UNIVERSITY

Watkins, D., Kirby, K., and Punnett, R. (2004). "Water for the Everglades: Application of the South Florida Systems Analysis Model." J. Water Resour. Plann. Manage., 130(5), 359–366. doi: 10.1061/(ASCE)0733-9496(2004)130:5(359)

Decision Acceleration

Back Next

OCTOBER 12, 2040

The New York Times

Whole Brain Emulation gives doctors the ability to extend human consciousness through artificial neural network

United Nation's SMPAG Asteroid Deflection efforts a huge success

Mazda Aerobike wins 2040 vehicle of the year at New York Int'l Auto Show

Introducing Nevada's first NBA team: The Las Vegas Aces

Google's Virtual Time Travel Machine: The gadget on everyone's wish list

Royal Caribbean launches Endless Sunshine Cruise above the Arctic Circle

http://nodejs-hazsim.rhcloud.com/#!/sim/C5k0JZOZSf?redirectURL=http:%2F%2Fwww.cesp.miami.edu%2F

Back Next

Miami in 2050

Miami-Dade County's population is over 4 million

Miami continues to grow, attracting new wealthy immigrants from China

Canals around the city have been surrounded with parks to buffer against flooding and the County is asking for $3 billion for other flood protections

You are about to enter your living room in 2050

Close your eyes and imagine what your life is like for 10 seconds then click "next"

FIU FLORIDA INTERNATIONAL UNIVERSITY