# Everglades Ecosystem Restoration and Management Under Climate Change

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USGS
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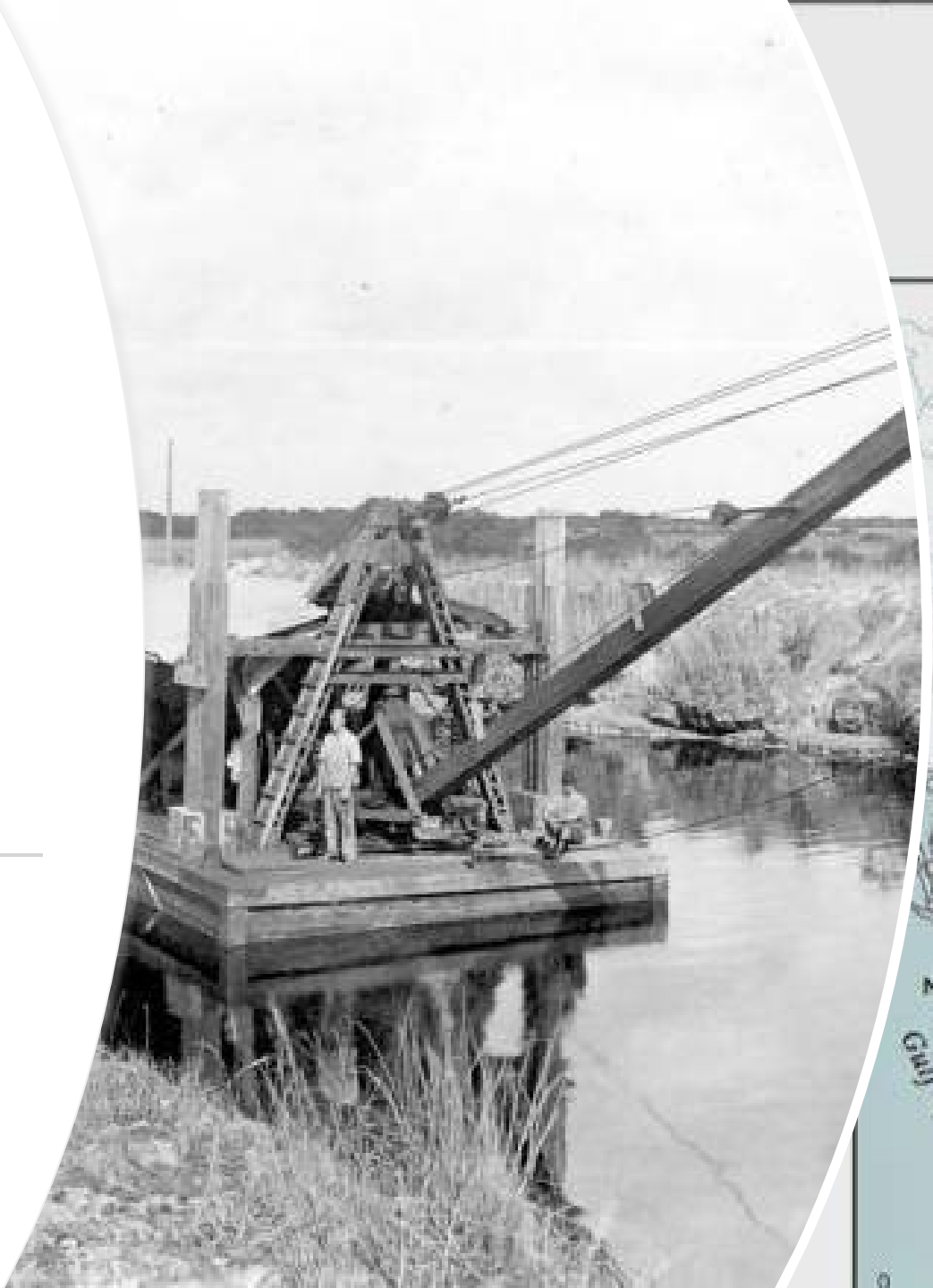
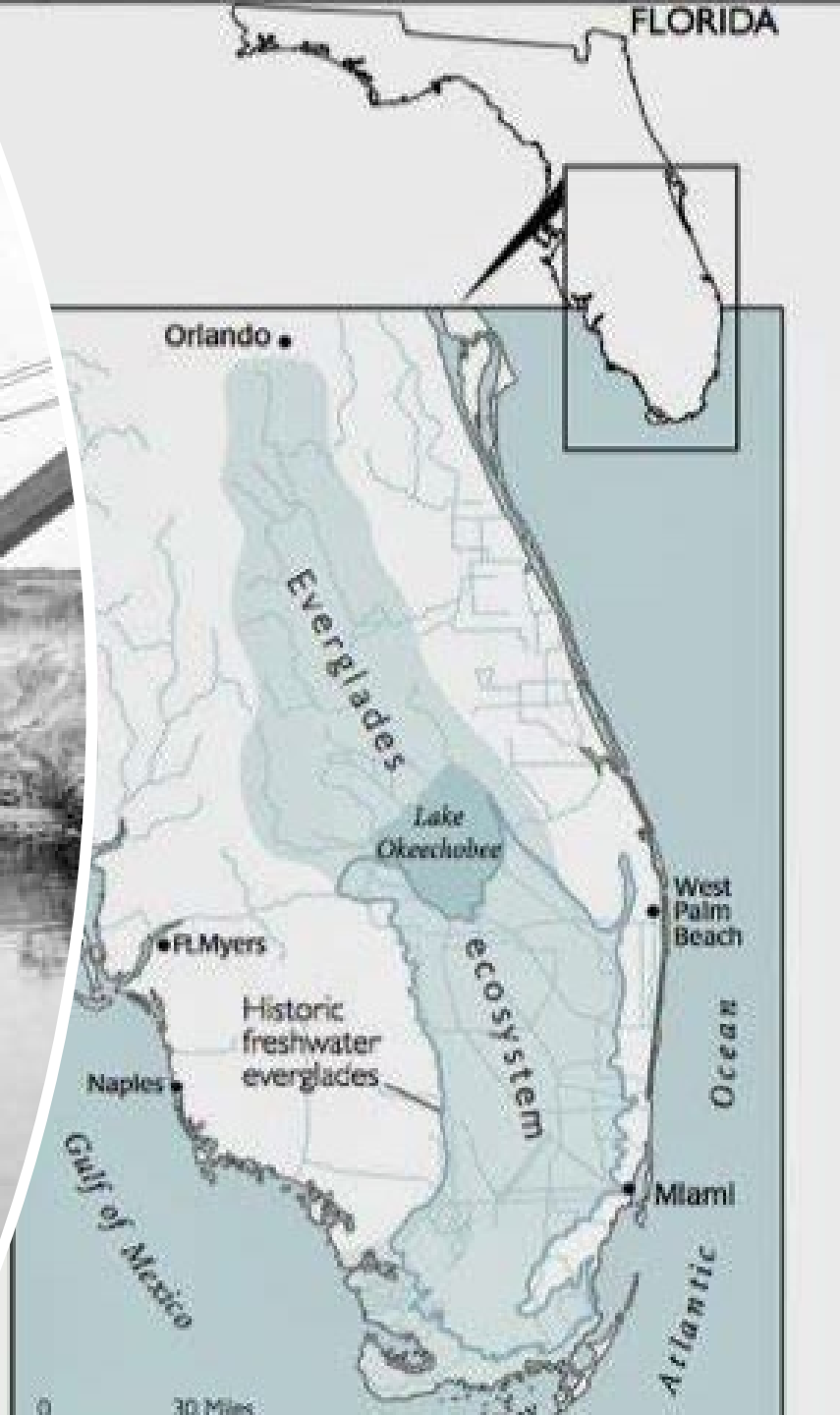
# Draining Florida's Everglades

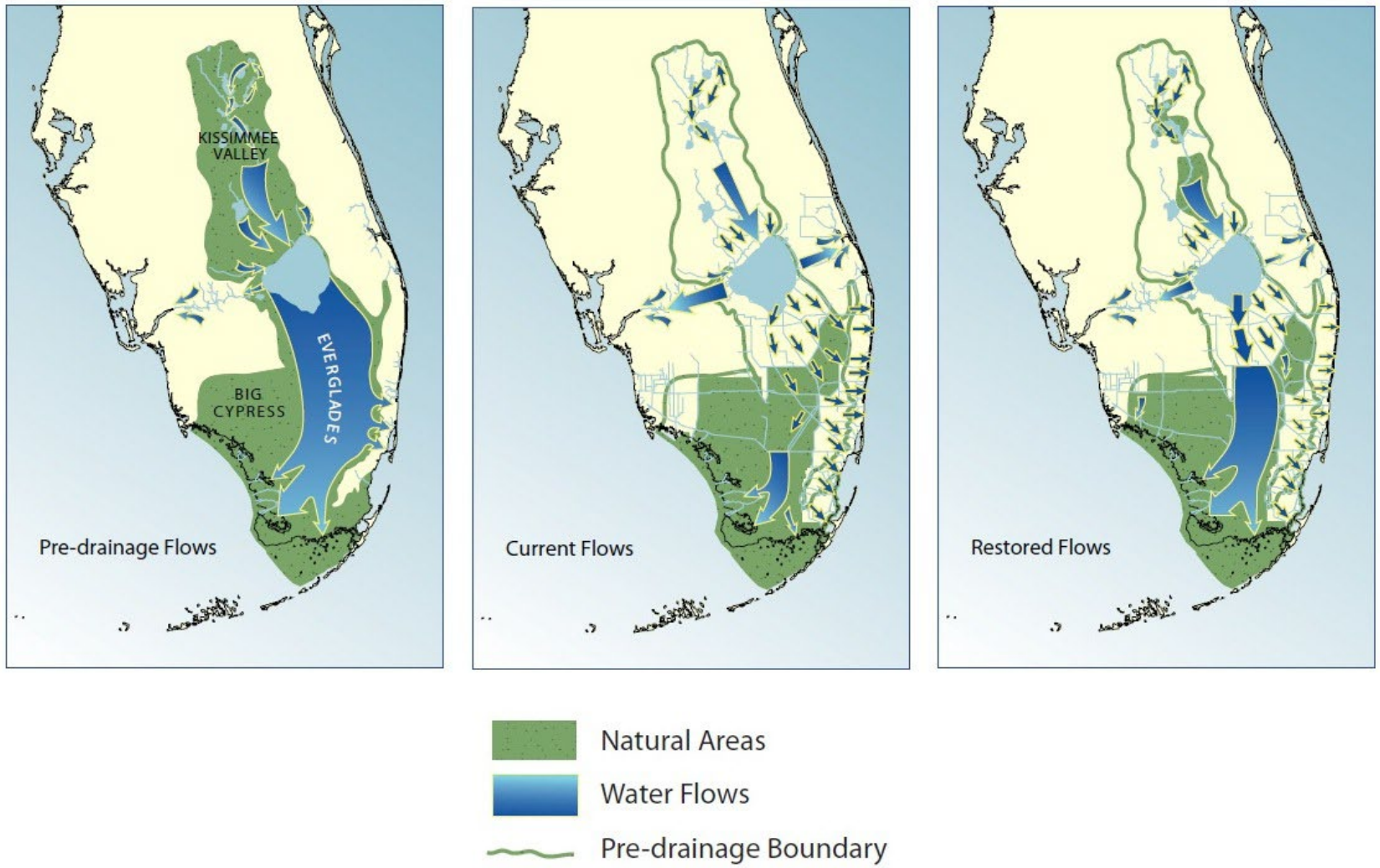




Began in 2000

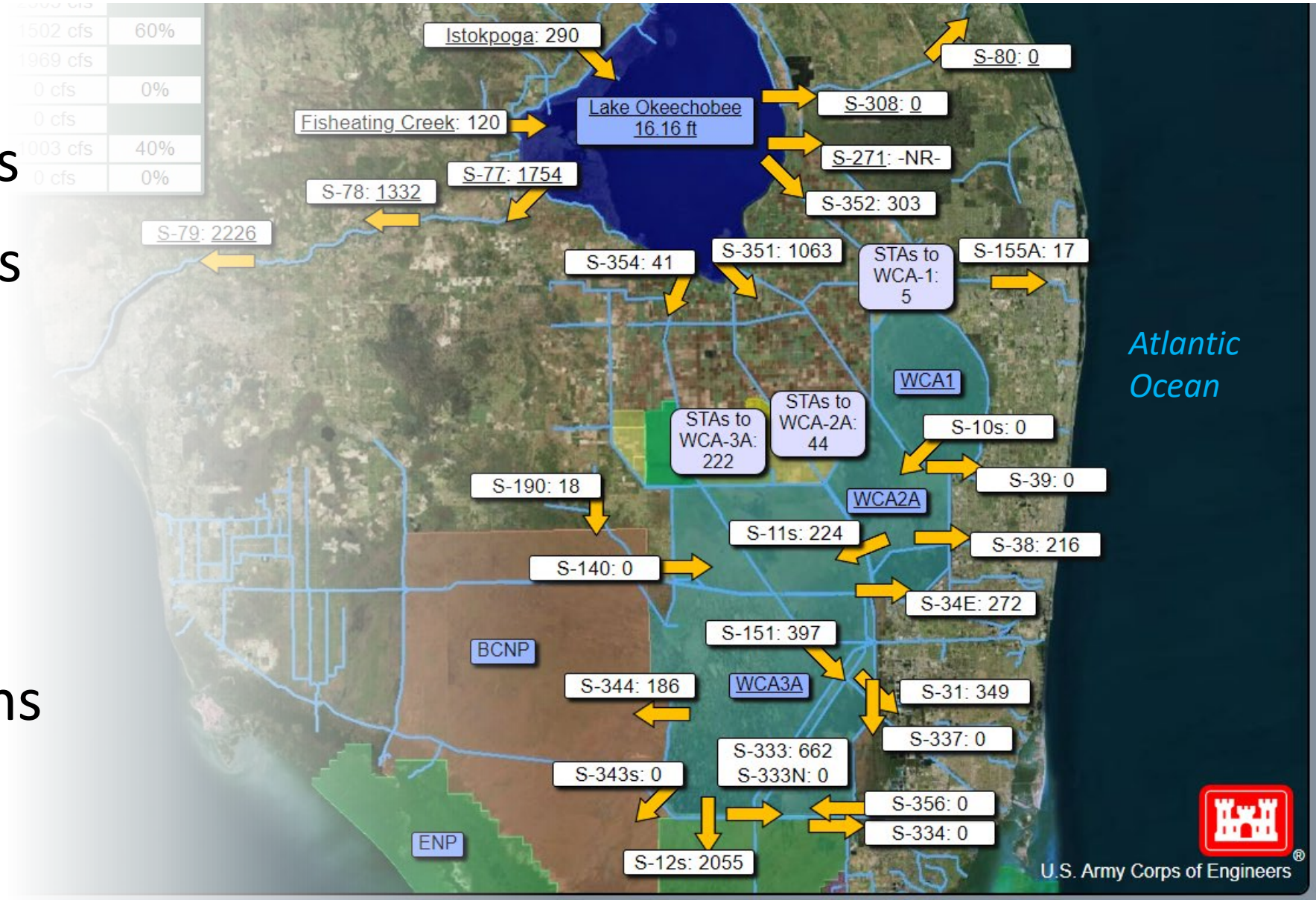
68 projects

$23 billion



# Moving water in a compartmentalized system

- 3,500 km of canals
- 3,428 km of levees
- 915 water control structures
- 89 pump stations
- 3,537 hydro monitoring stations



# Joint Ecosystem Modeling (JEM)

JEM

- Decision support
  - Predictive modeling, data visualization
    - Species and habitat models
  - Ecologists, hydrologists, modelers, computer programmers

USGS science for a changing world

NATIONAL PARK SERVICE

US Army Corps of Engineers

U.S. FISH & WILDLIFE SERVICE

RECOVER evaluation assessment science integration

UF UNIVERSITY of FLORIDA

FAU FLORIDA ATLANTIC UNIVERSITY

FIU FLORIDA INTERNATIONAL UNIVERSITY

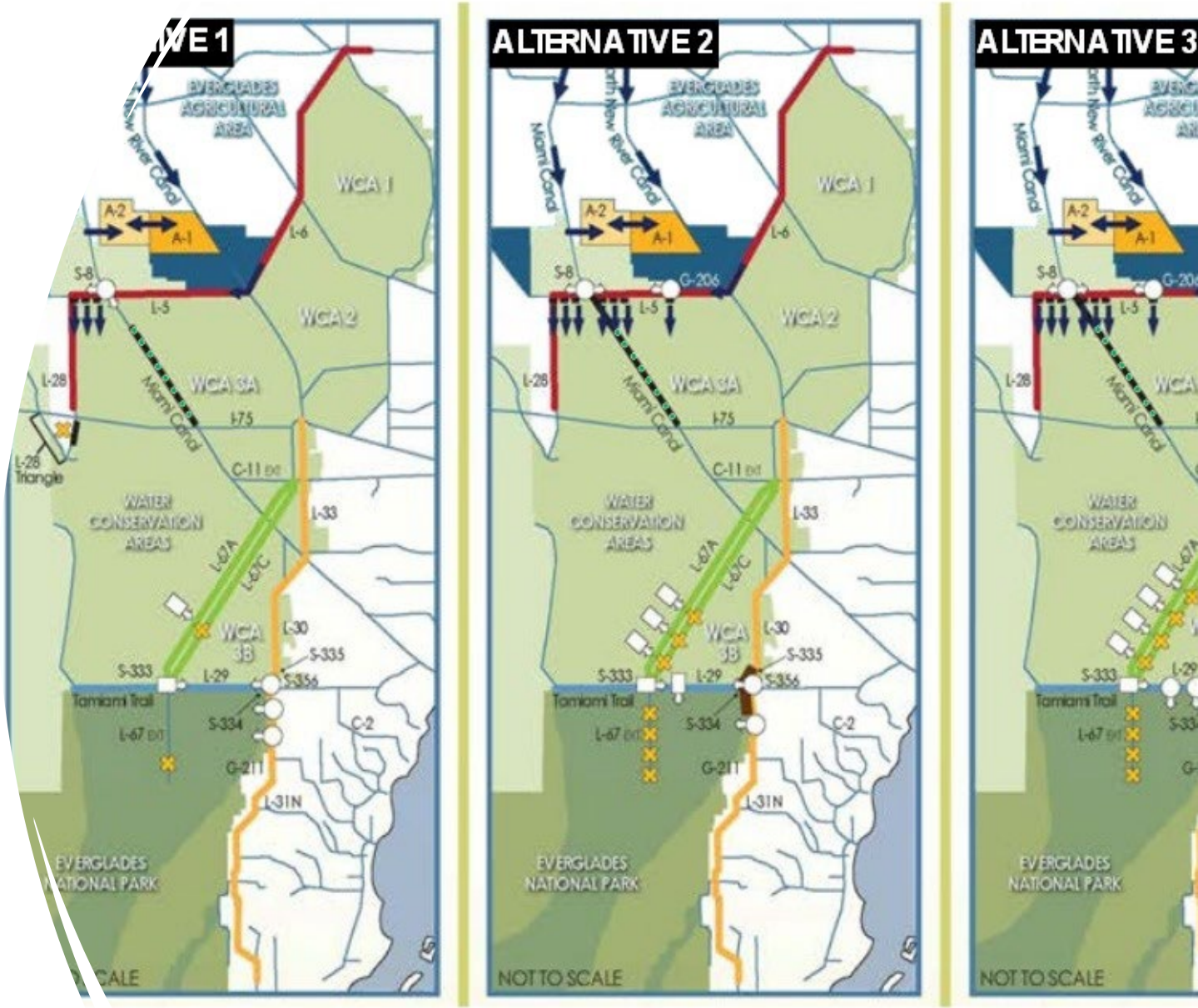
SOUTH FLORIDA WATER MANAGEMENT DISTRICT sfwmd.gov

# Time and space

Weekly to multidecadal planning

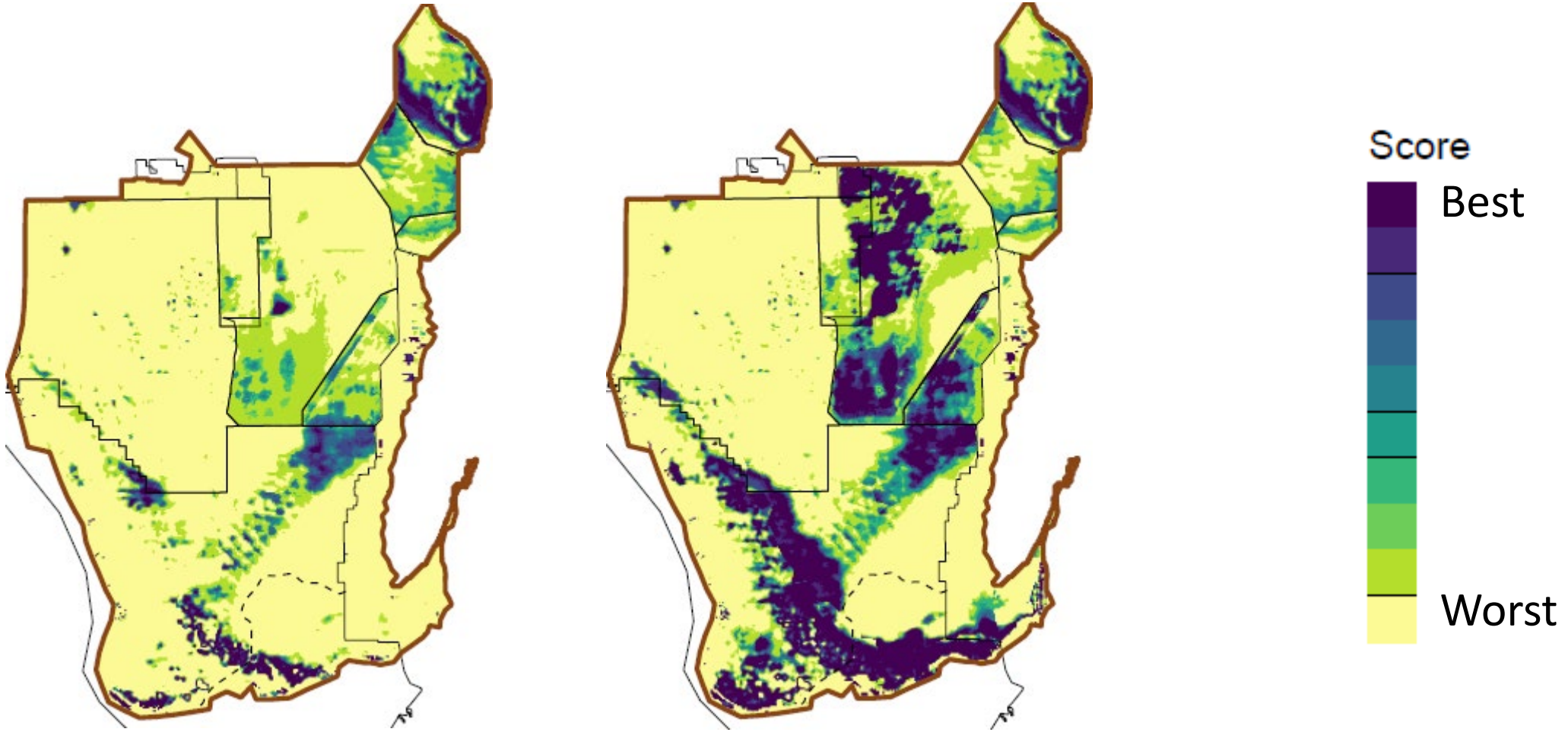
Within a protected area to across many

# RESTORATION PLANNING

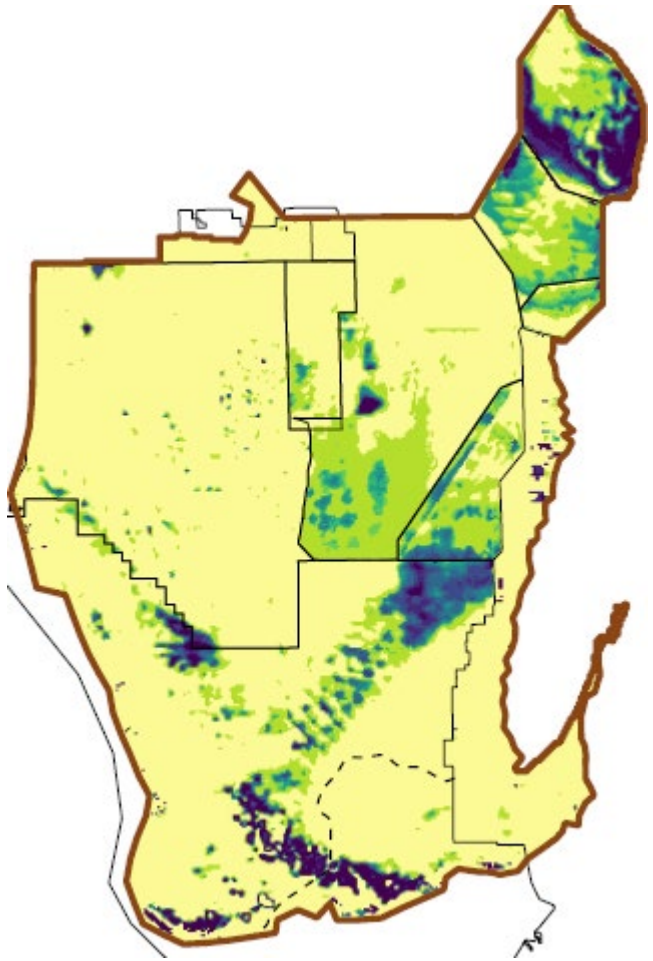


Baseline scenario

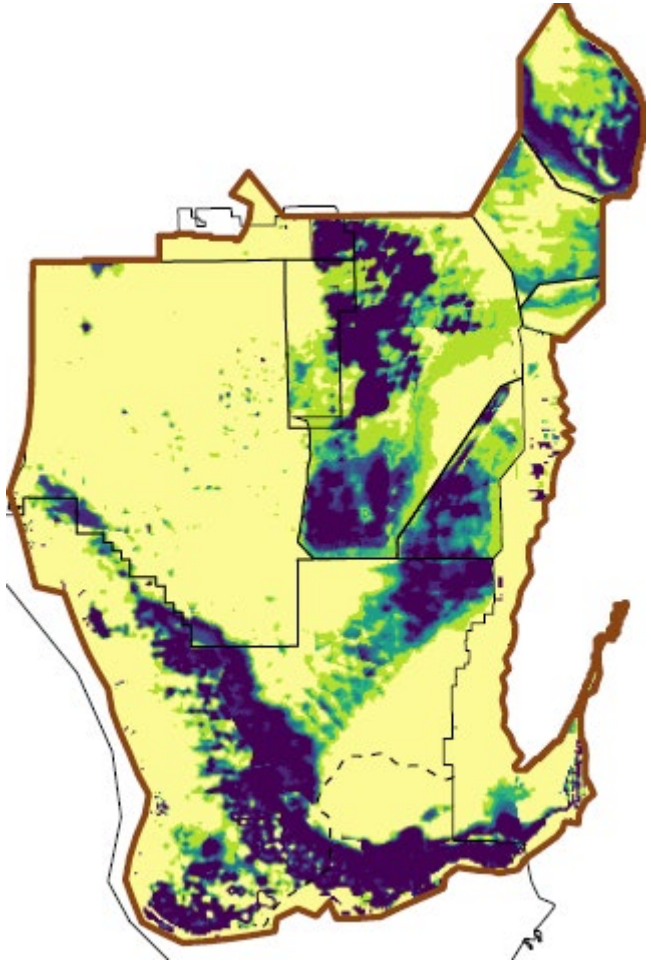
Restoration scenario



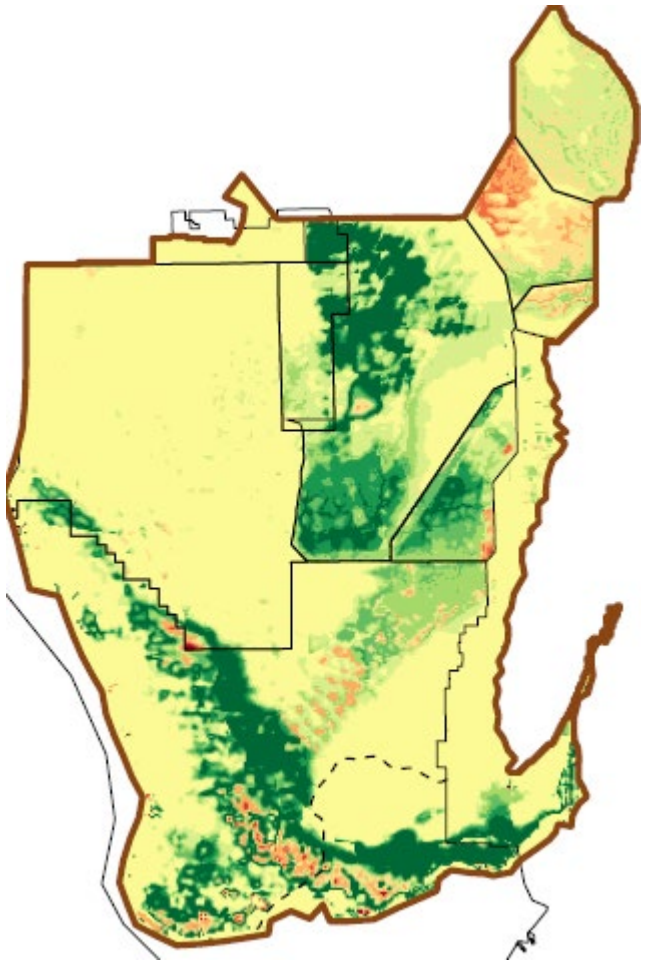
Baseline scenario



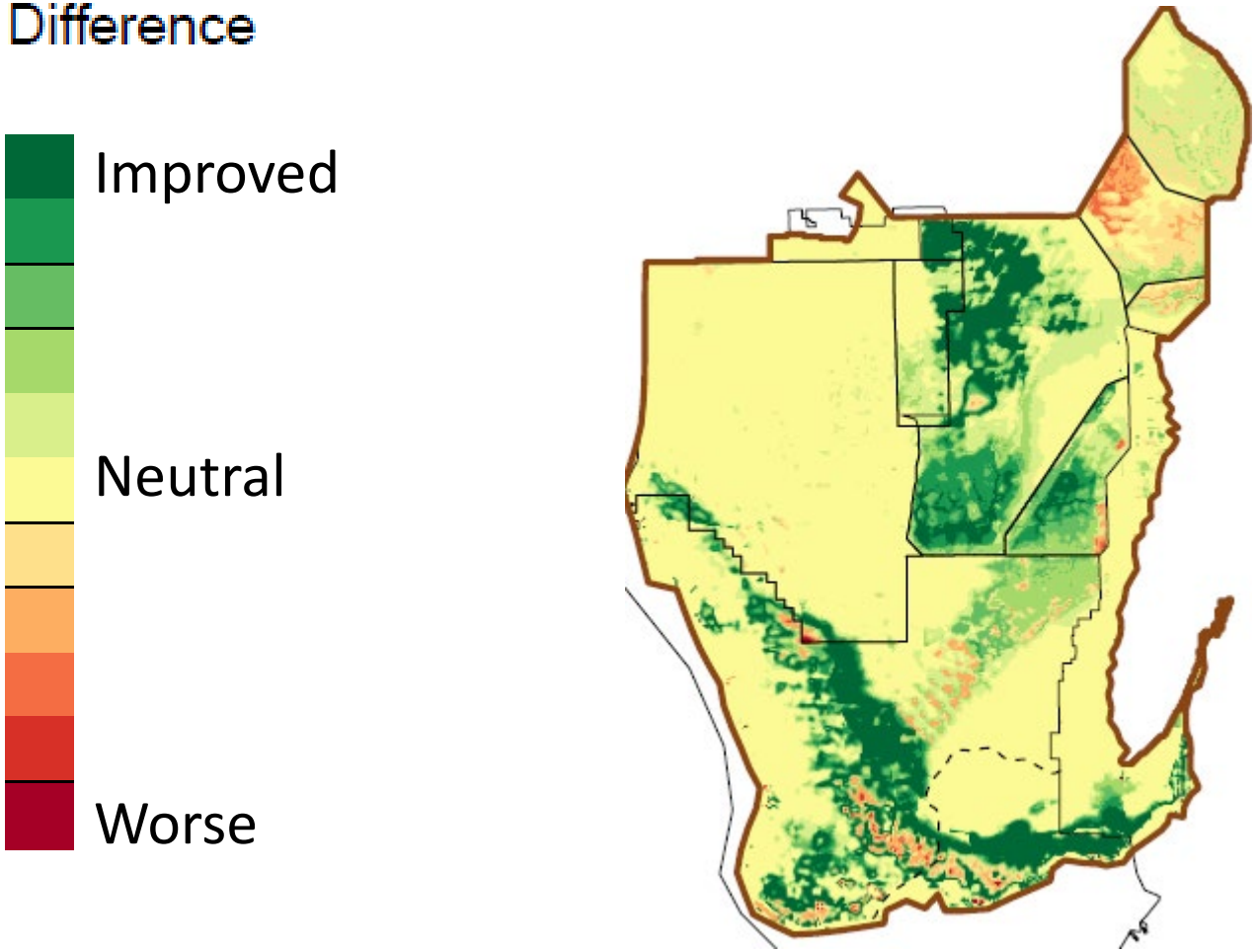
Restoration scenario



Restoration difference



# Restoration difference



2,200 km of coastline

Low elevation

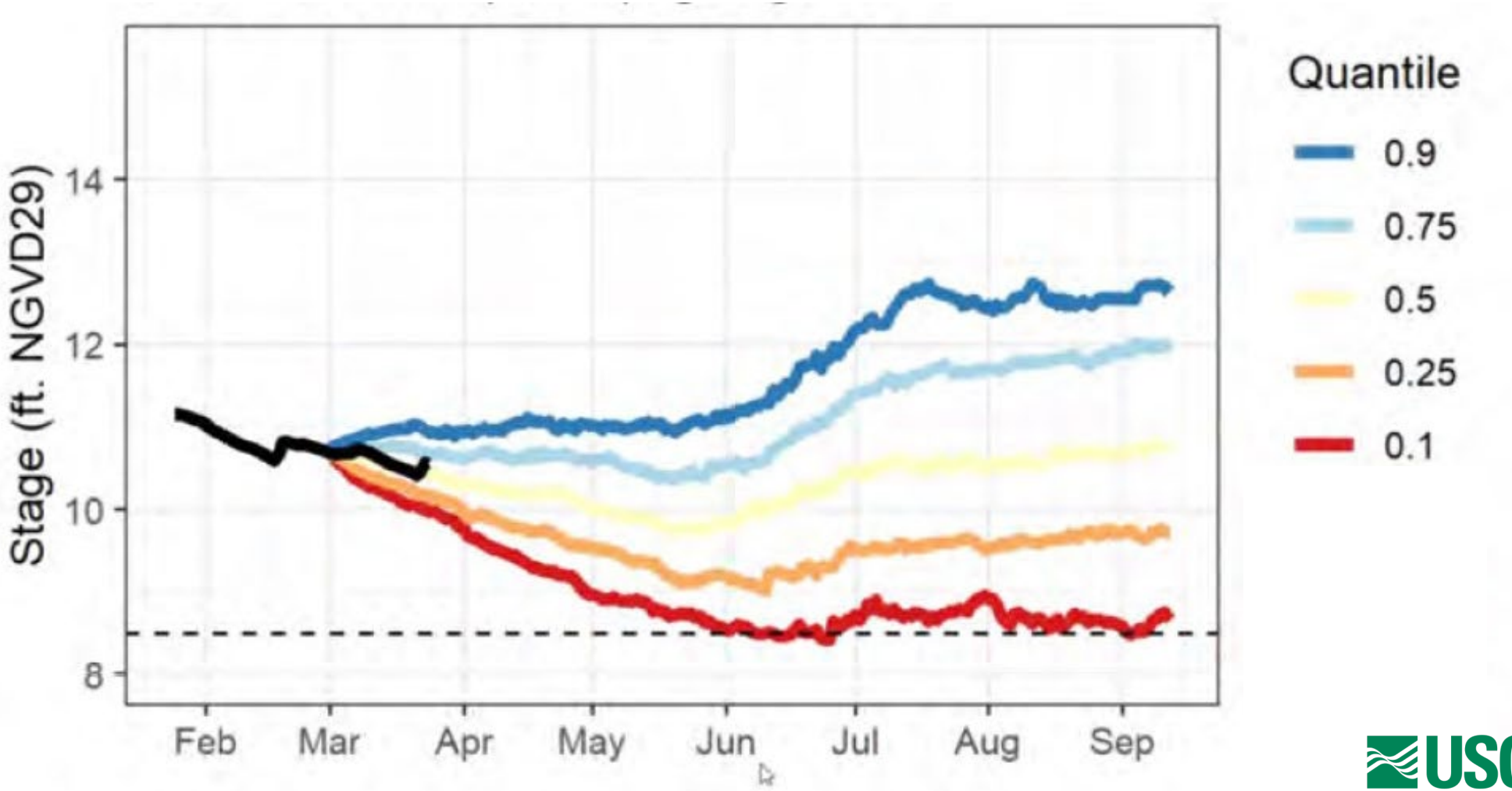
SLR projections
50 years:
- 0.24 m (int)
- 0.74 m (high)

STOP
THE MARK
ON BRICKELL BAY
1155
1155
1155
NO OUTLET

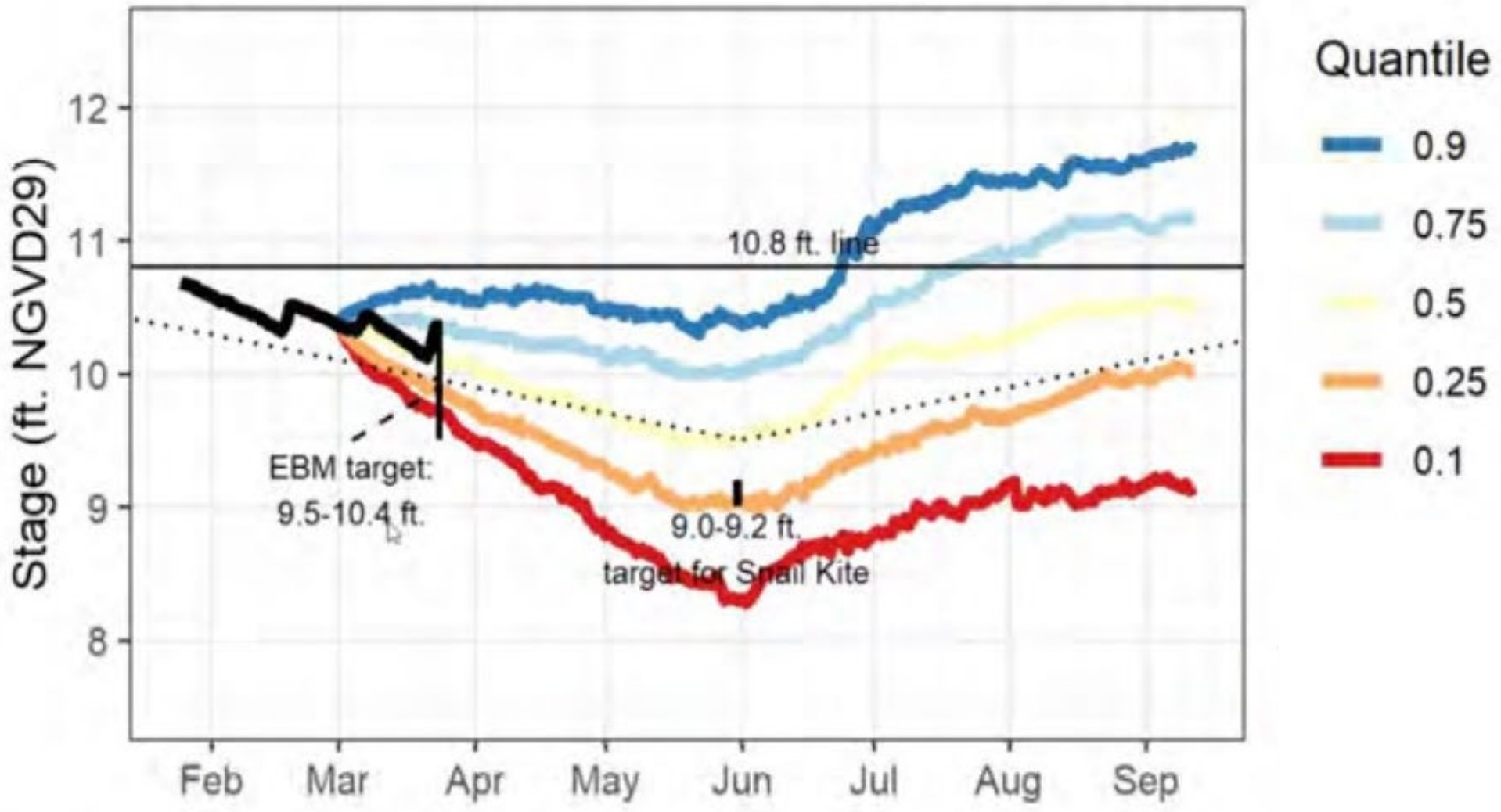
# EverForecast

- Hydrologic conditions for next 6 months
- Incorporation of climate forecasts
- Species responses

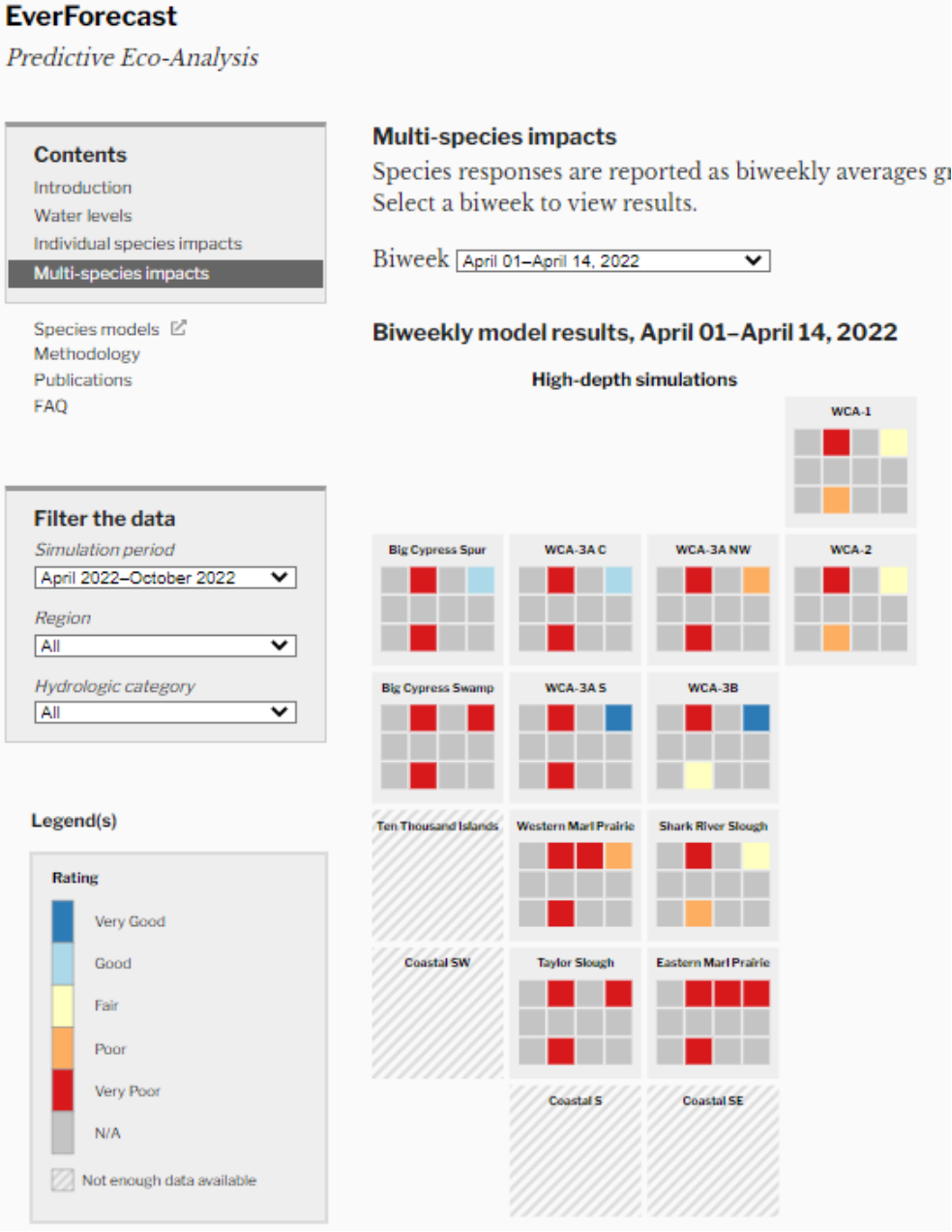
# Used weekly, Ecosystem Based Management



# Meeting targets

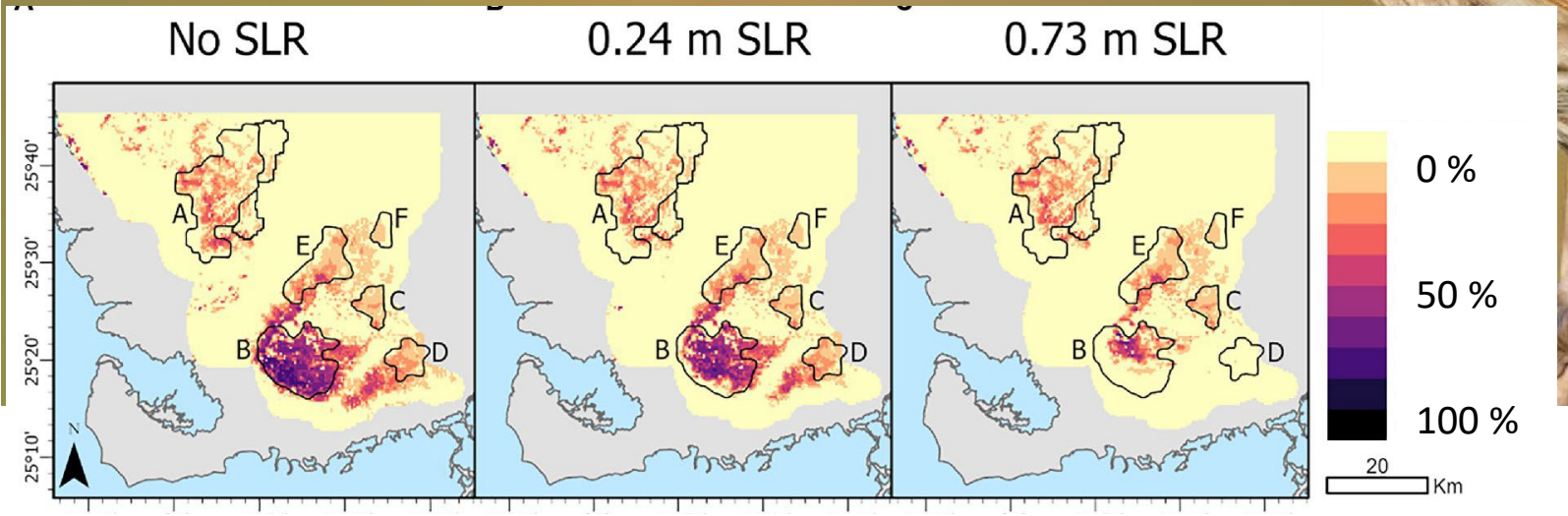


Multi-species



# Cape Sable Seaside Sparrow

- Federally endangered
- Endemic to marl prairie
  - 6 subpopulations
- Shift from marl prairie to mangrove
- 10 - 50 % probability of presence with SLR




Dubi Shapiro

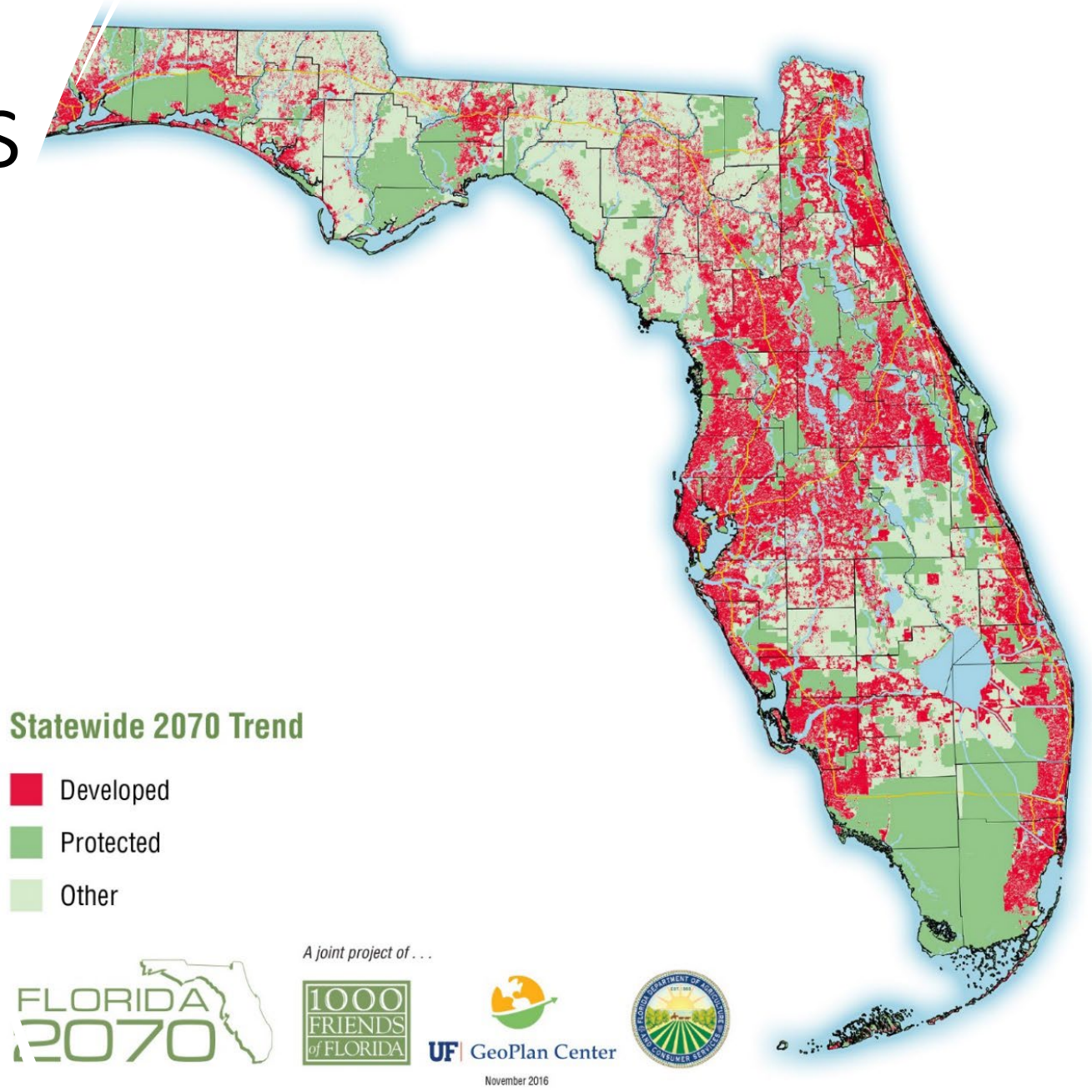
# Statewide impacts to critical habitats

Sea level rise

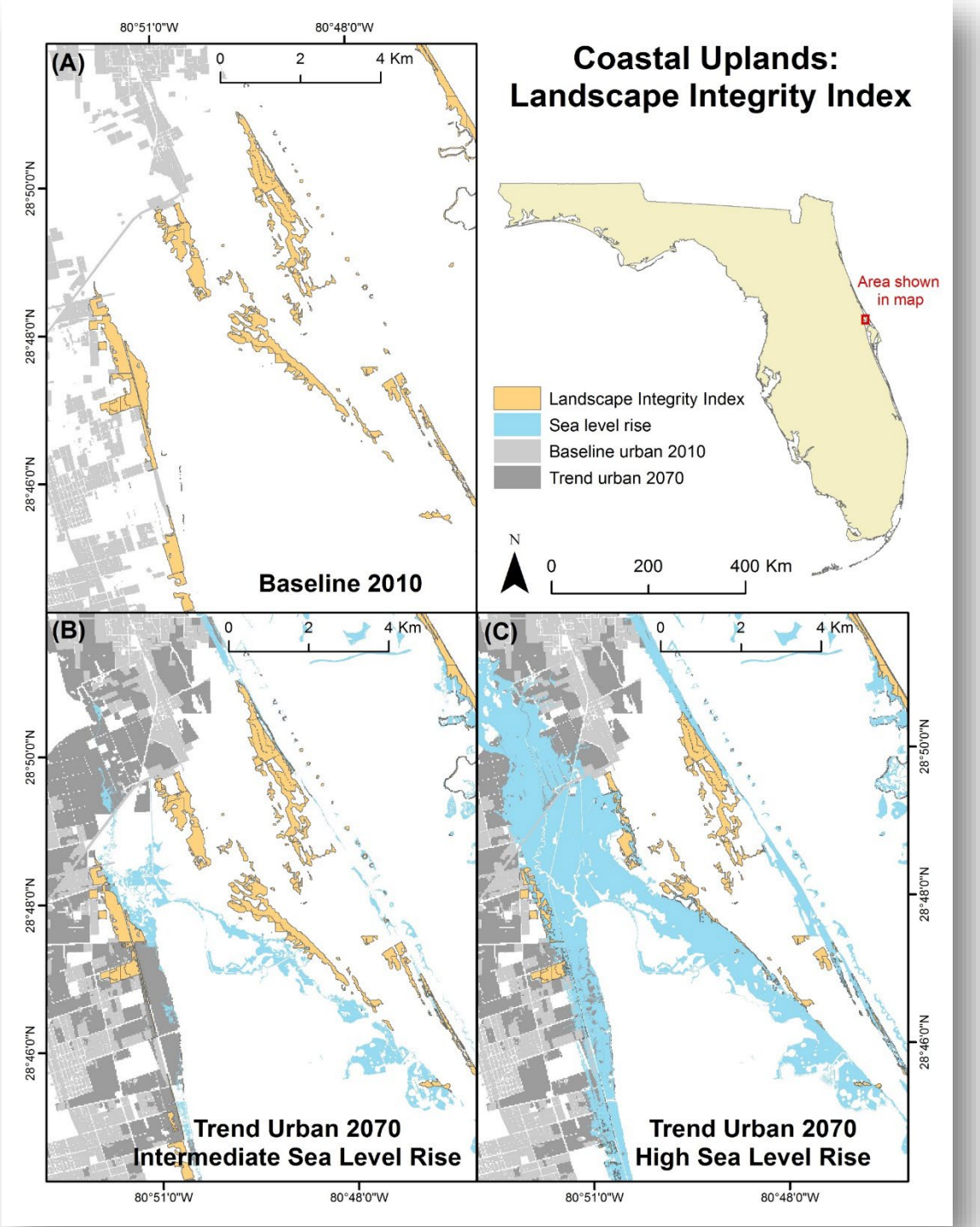
- Intermediate SLR (0.15 - 0.21 m)
- High SLR (0.82 - 0.91 m)

Urbanization

- 2040 scenario
- 2070 “sprawl” & “compact”



In Coastal Uplands SLR is projected to cause greater losses than Urbanization



Thank you
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