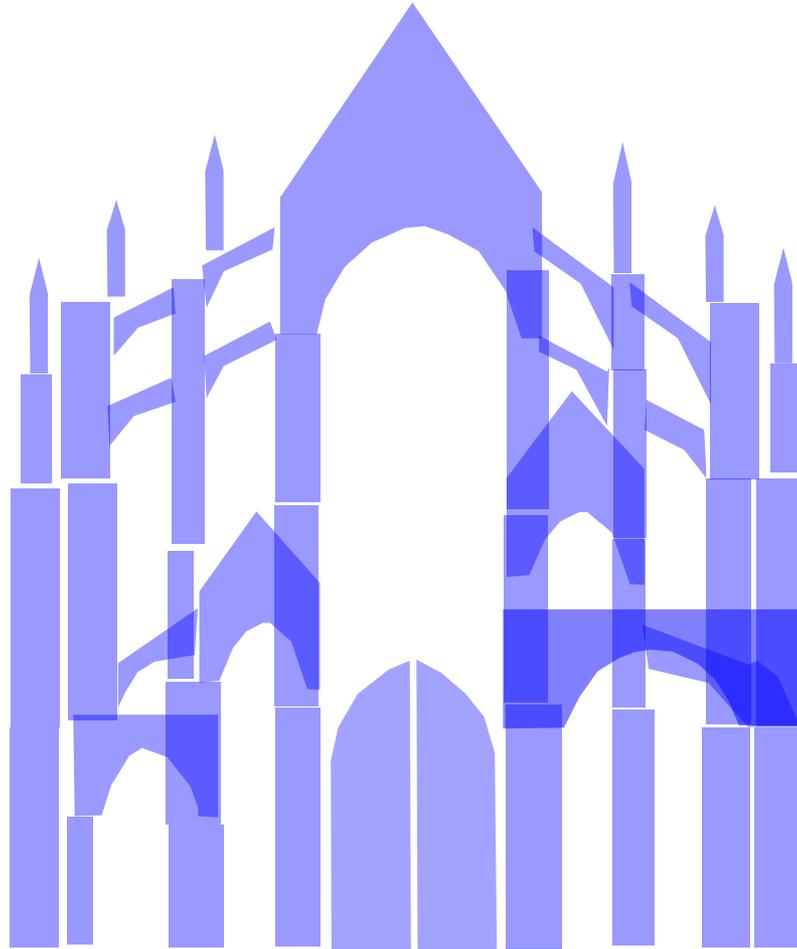
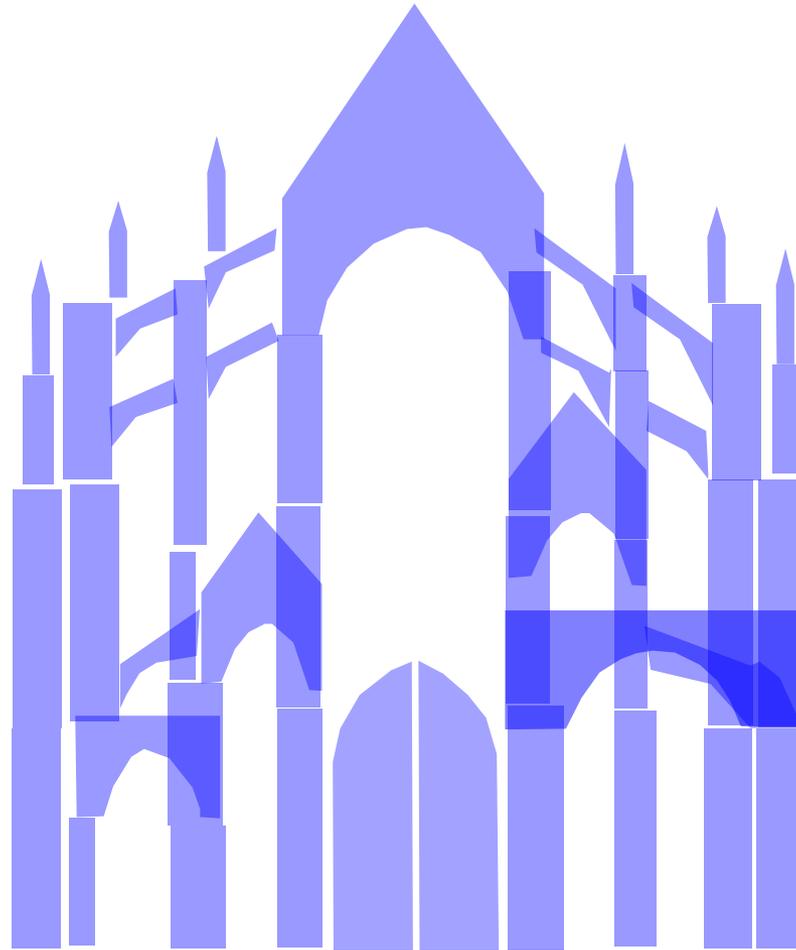


WERP: How an Obsolete Levee and an Abandoned Jetport Hold the Key to a Rain-Driven Swamp

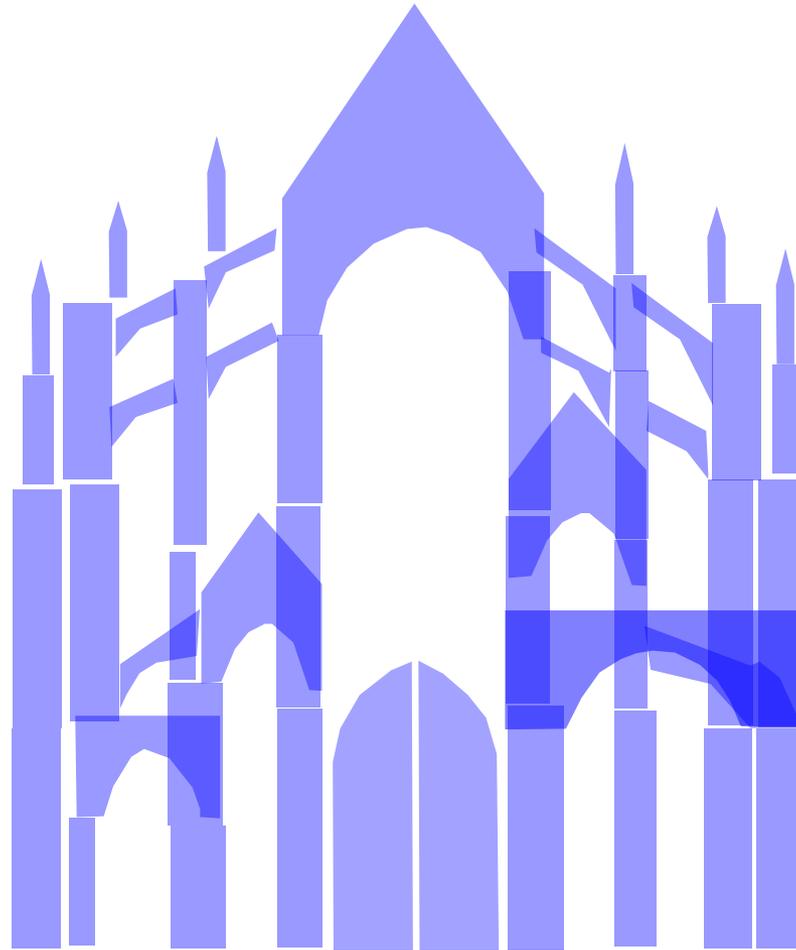


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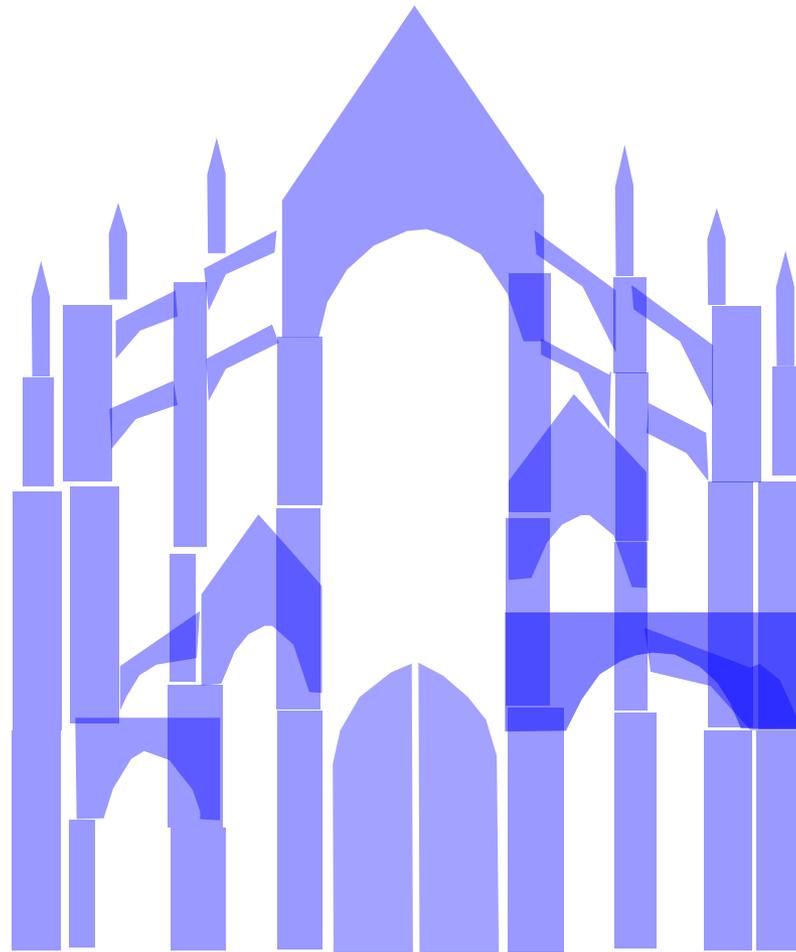
Pen and ink change

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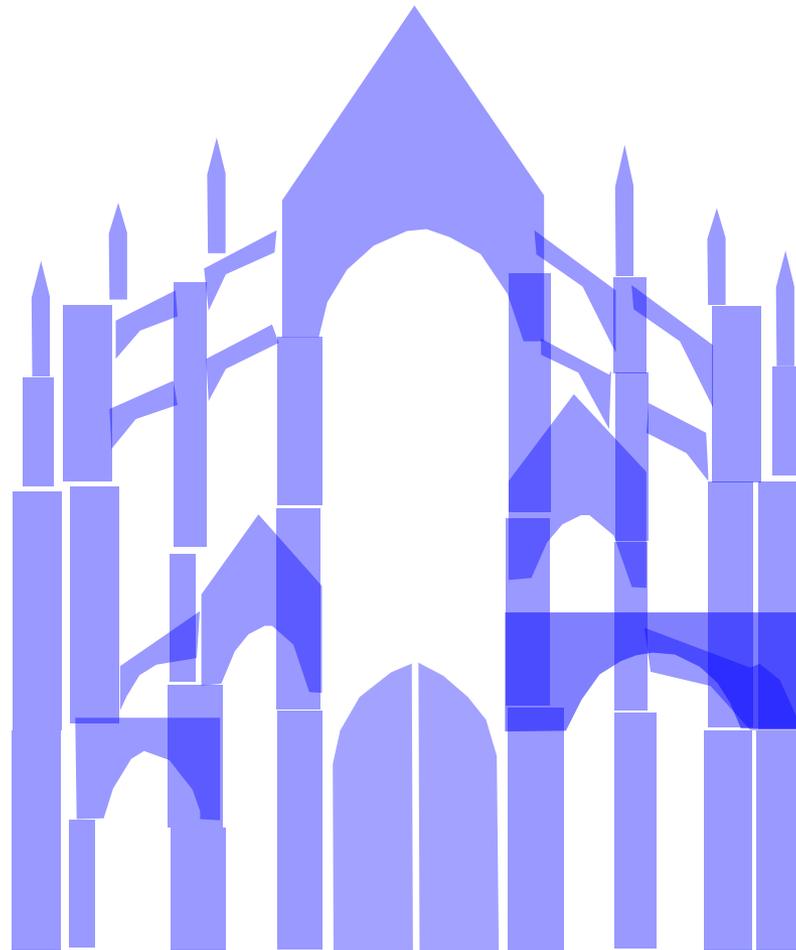
Pen and ink change

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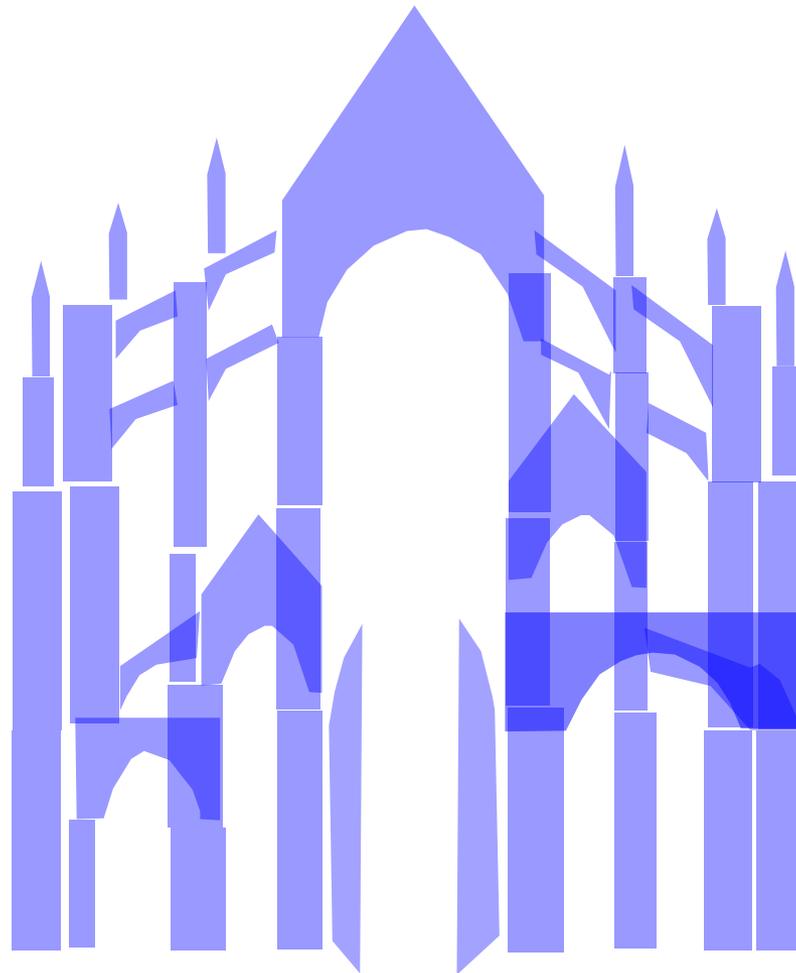
Pen and ink change

WERP: How an Obsolete Levee and an Abandoned Jetport Opened the **Door**



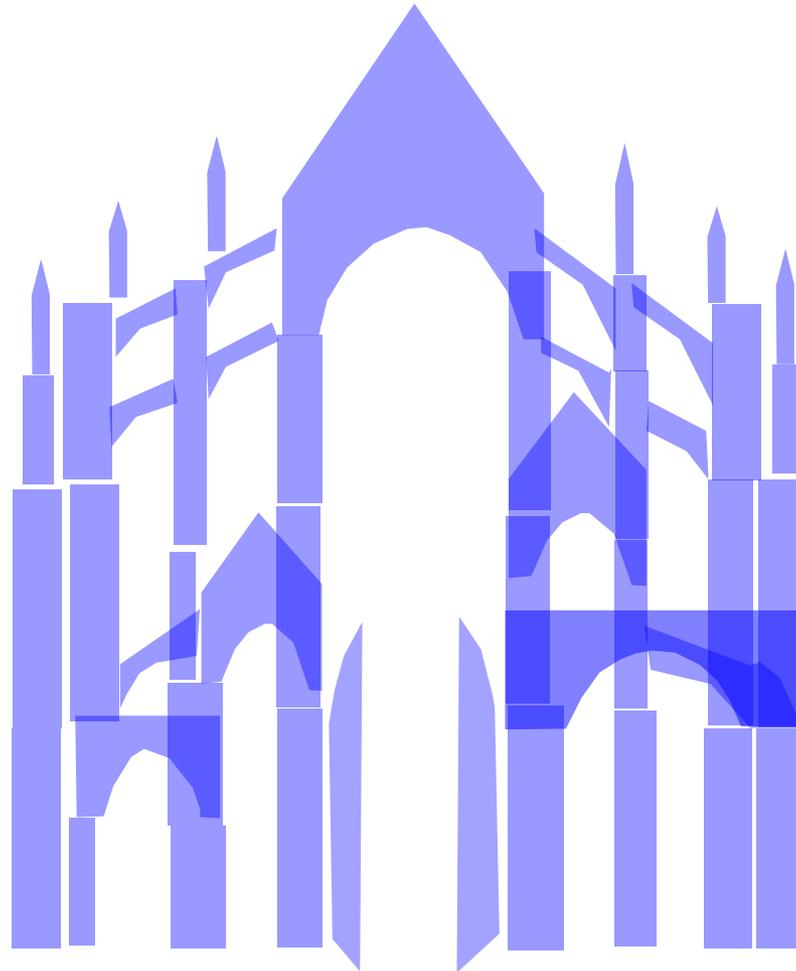
Pen and ink change

WERP: How an Obsolete Levee and an Abandoned Jetport Opened the **Door**



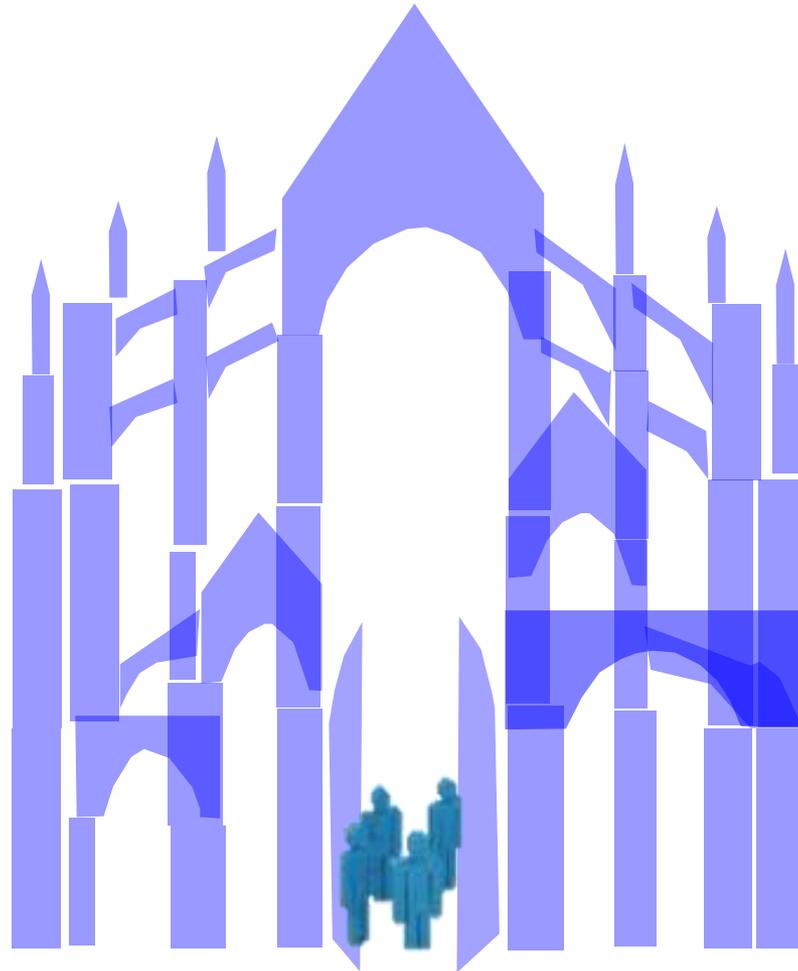
Pen and ink change

WERP: How an Obsolete Levee and an Abandoned Jetport Opened the Door to a **Pre-Drainage** Swamp



Pen and ink change

WERP: How an Obsolete Levee and an Abandoned Jetport Opened the Door to a **Pre-Drainage** Swamp



About the authors



Robert V. Sobczak¹, Michael J. Duever², Kelly J. Keefe³, Antonio J. Pernas¹, John F. Meeder⁴

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²Natural Ecosystems, Naples, FL, USA

³U.S. Army Corps of Engineers, Jacksonville, FL, USA

⁴Southeast Environmental Research Center, Florida International University, Miami, FL, USA



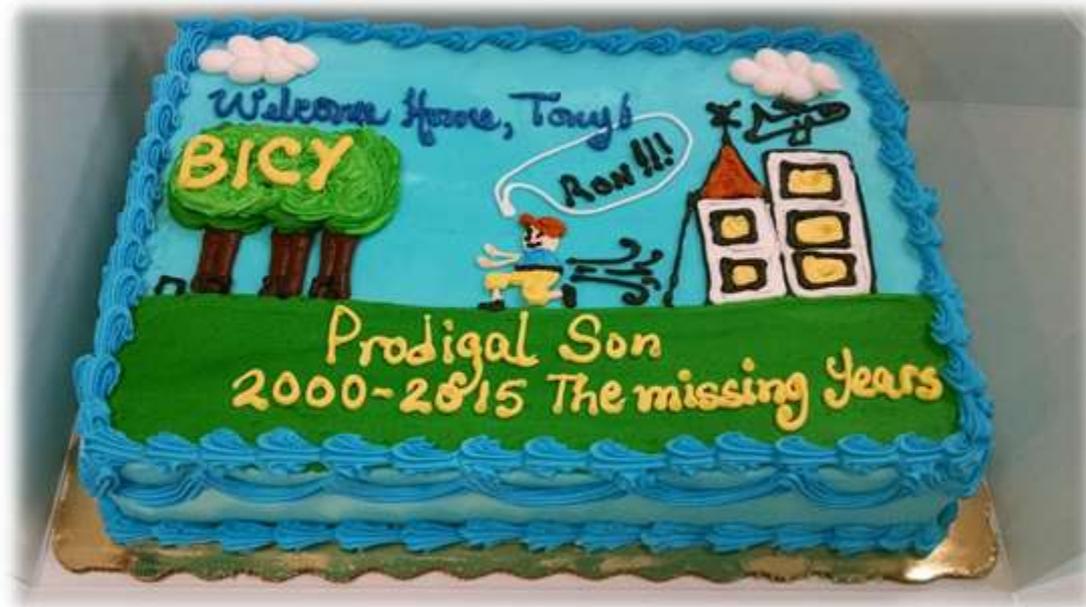
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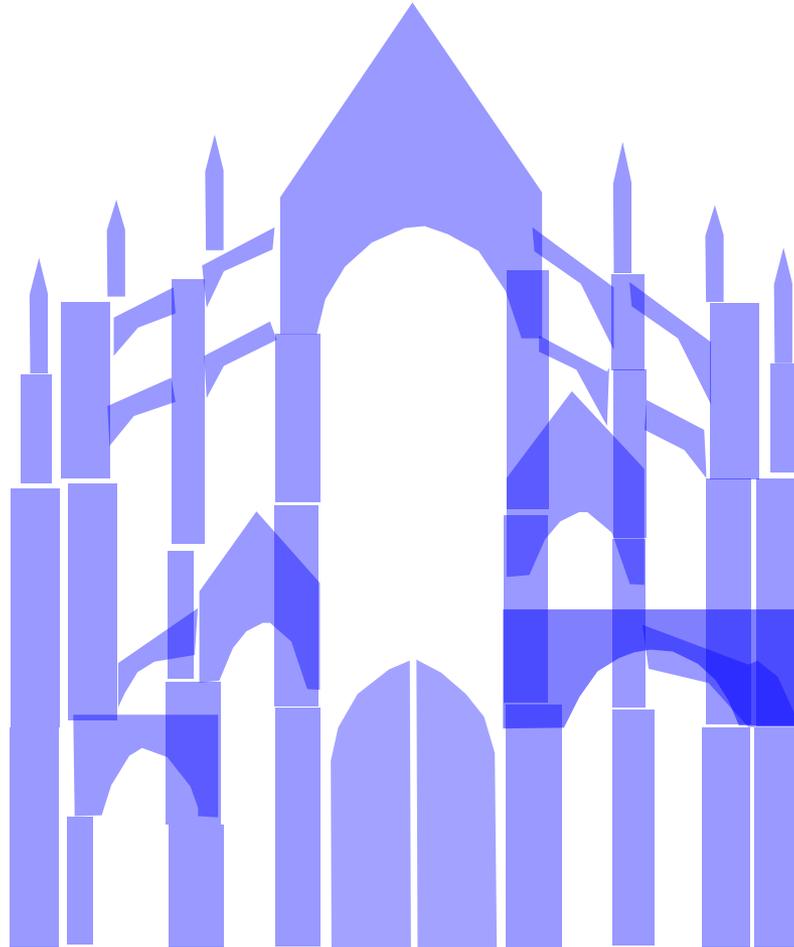
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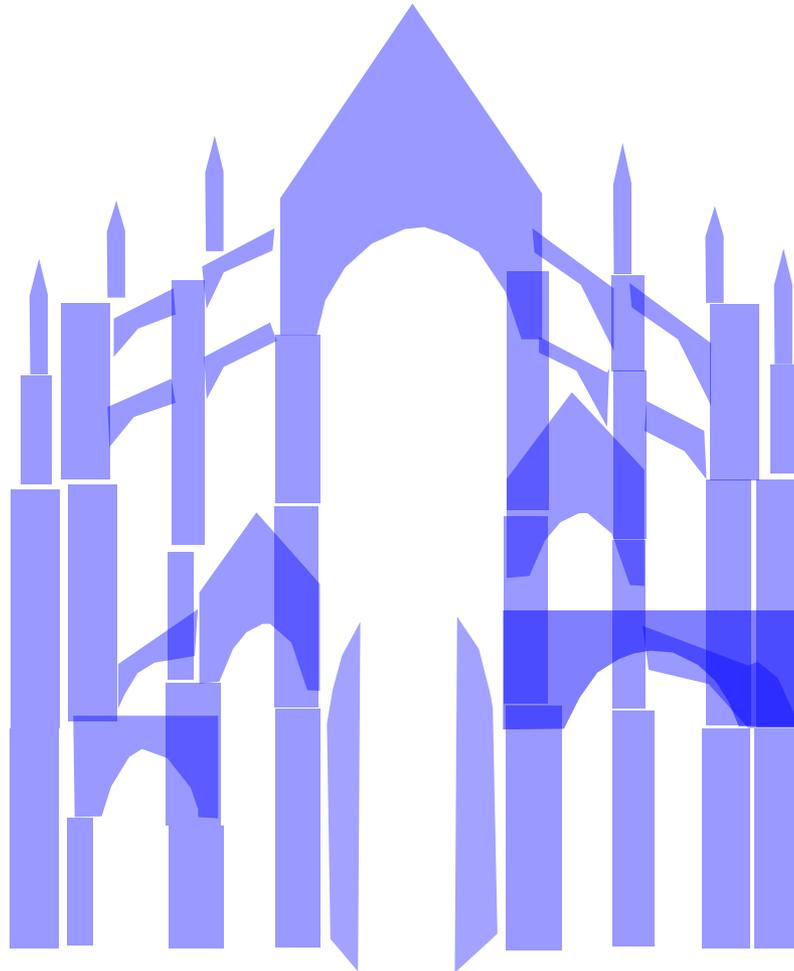
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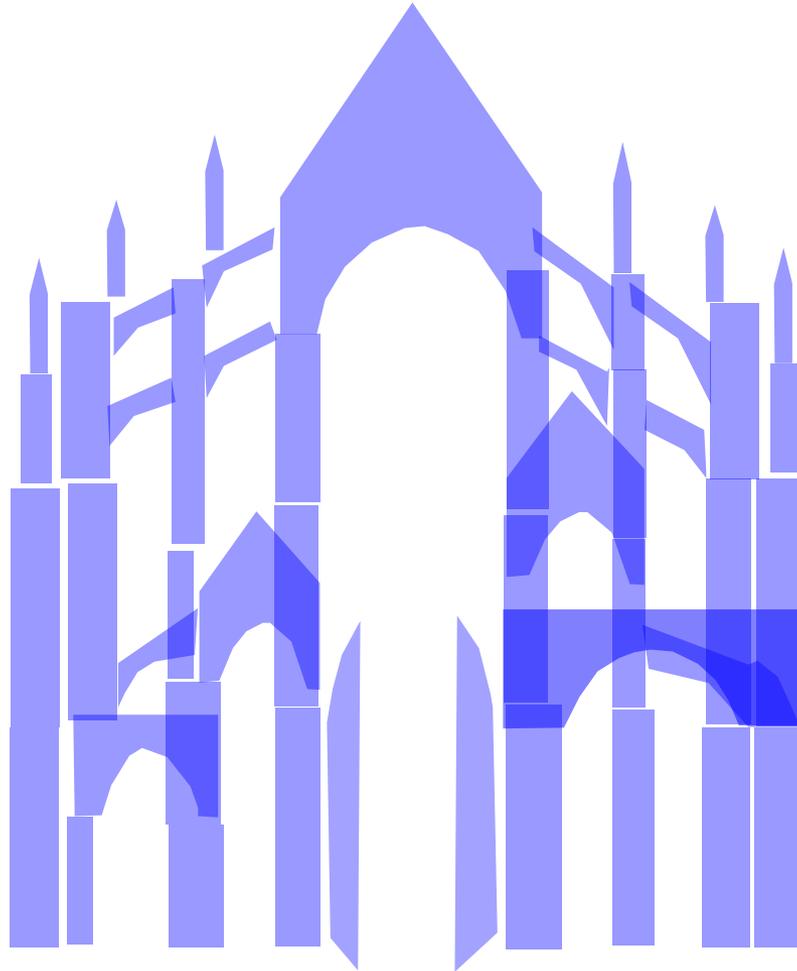
What do we mean **Pre-drainage?**



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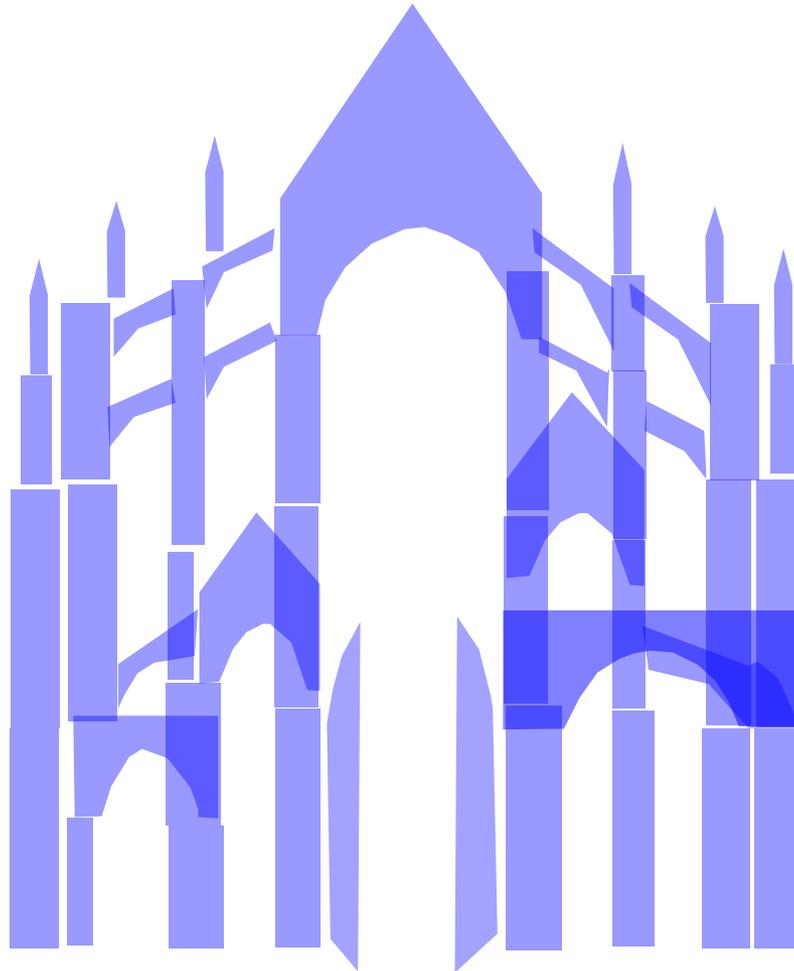


Answer:



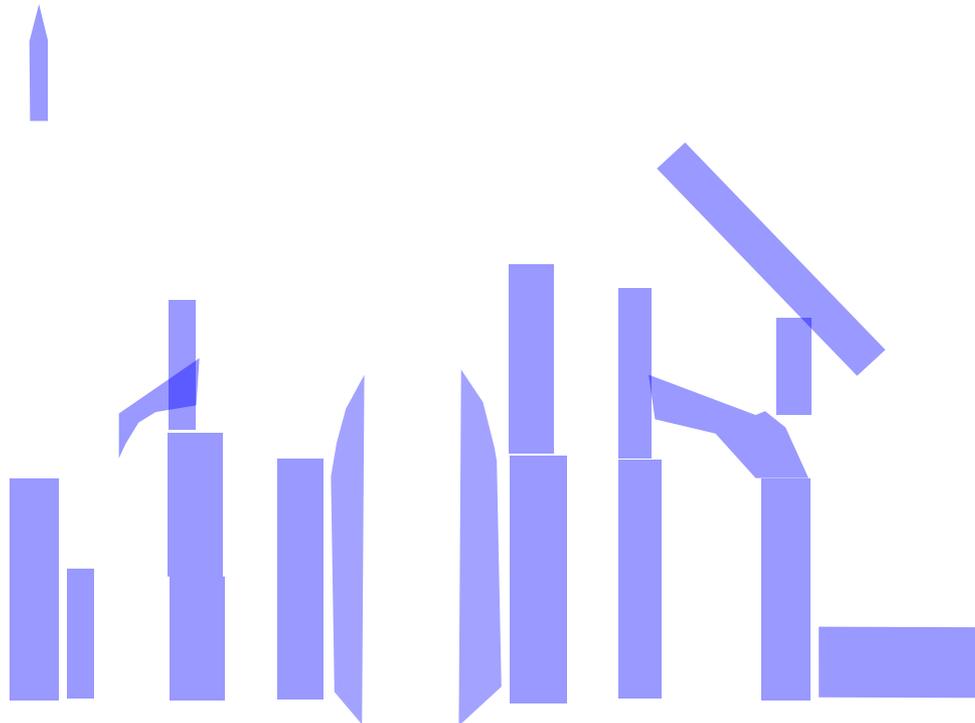
Answer:

Prior to Post-Drainage

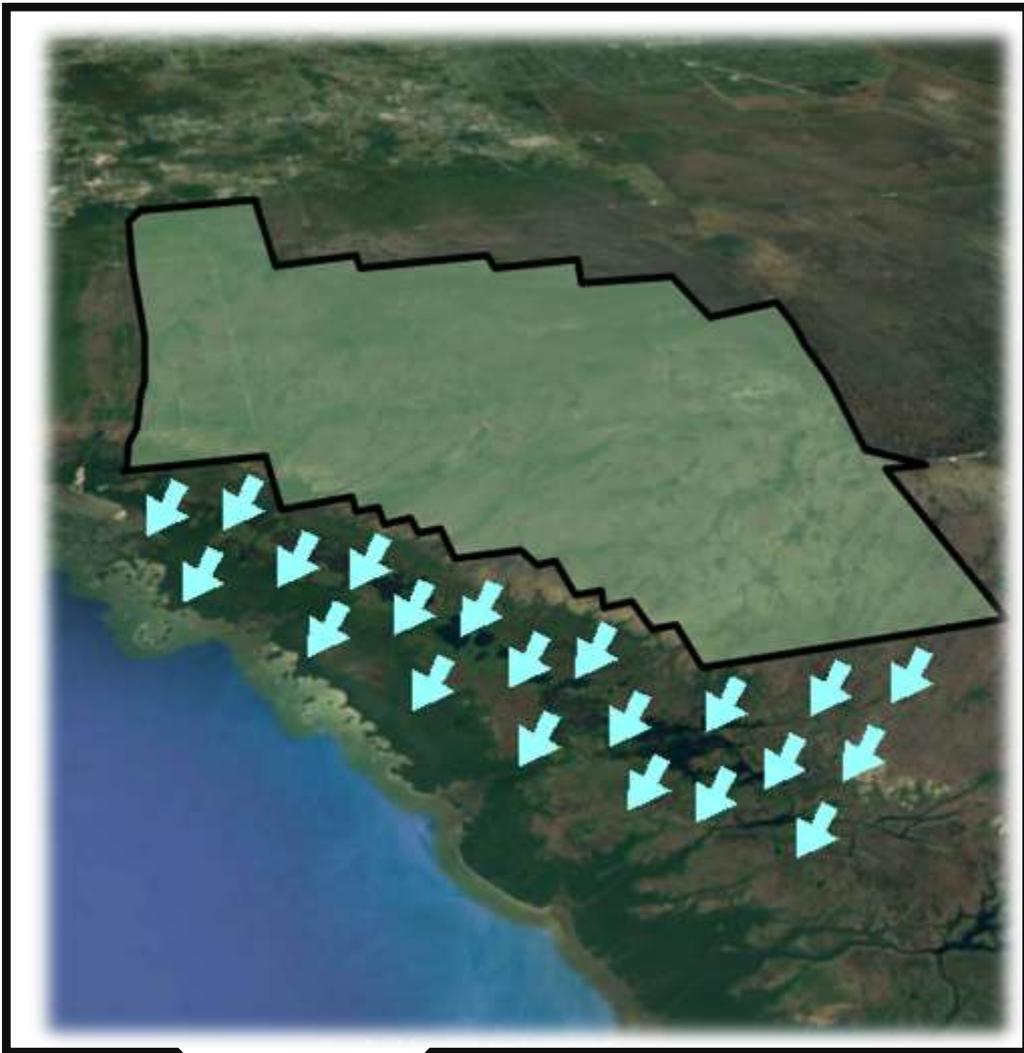


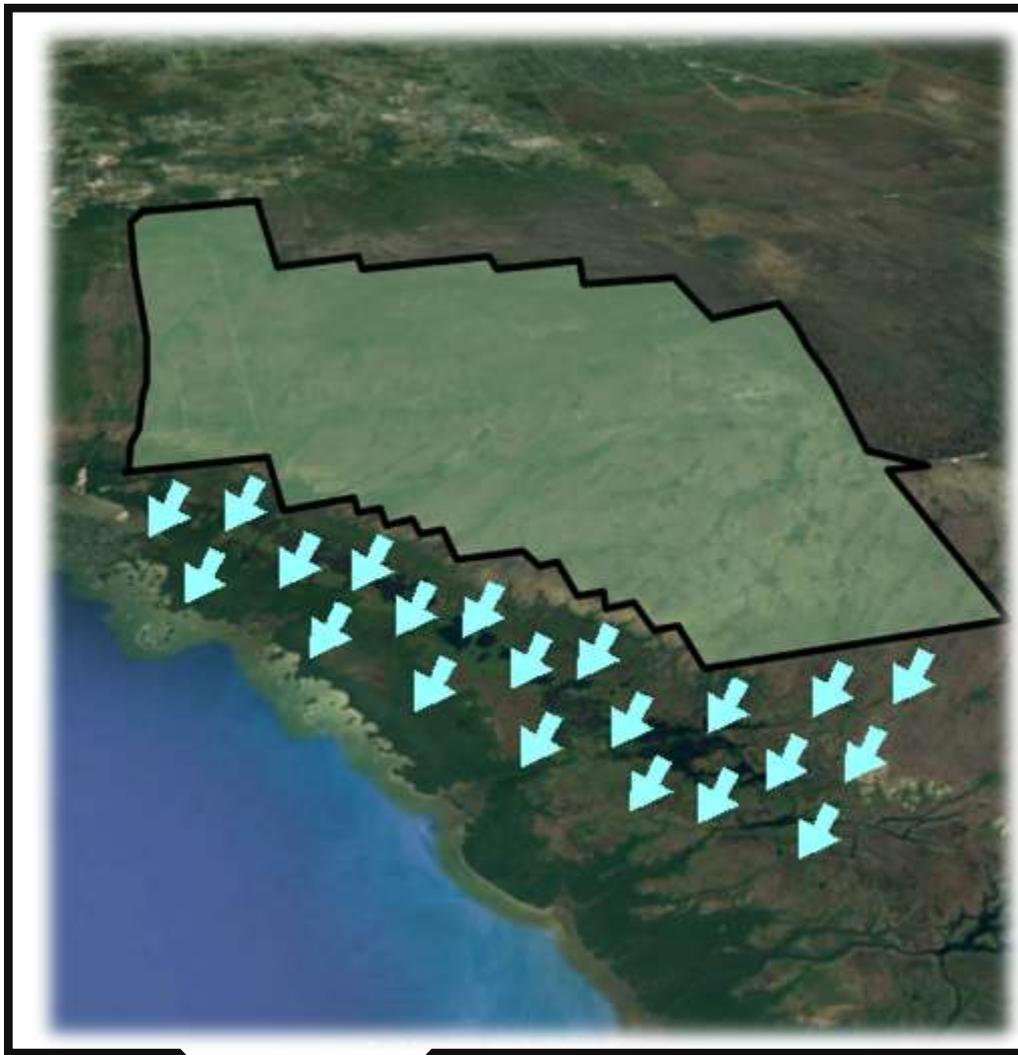
Answer:

Prior to Post-Drainage



1998

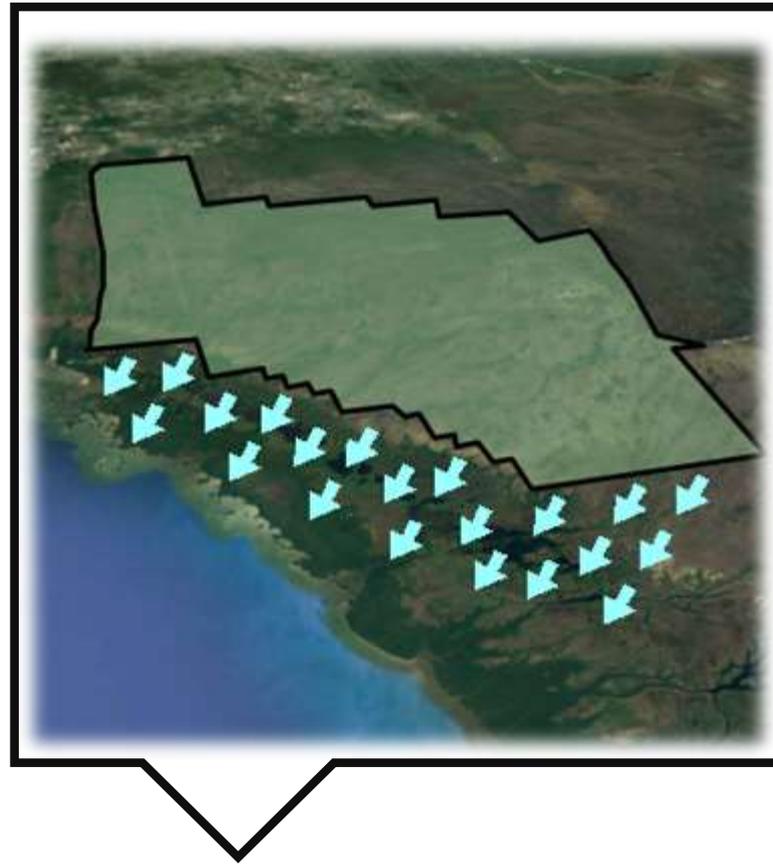


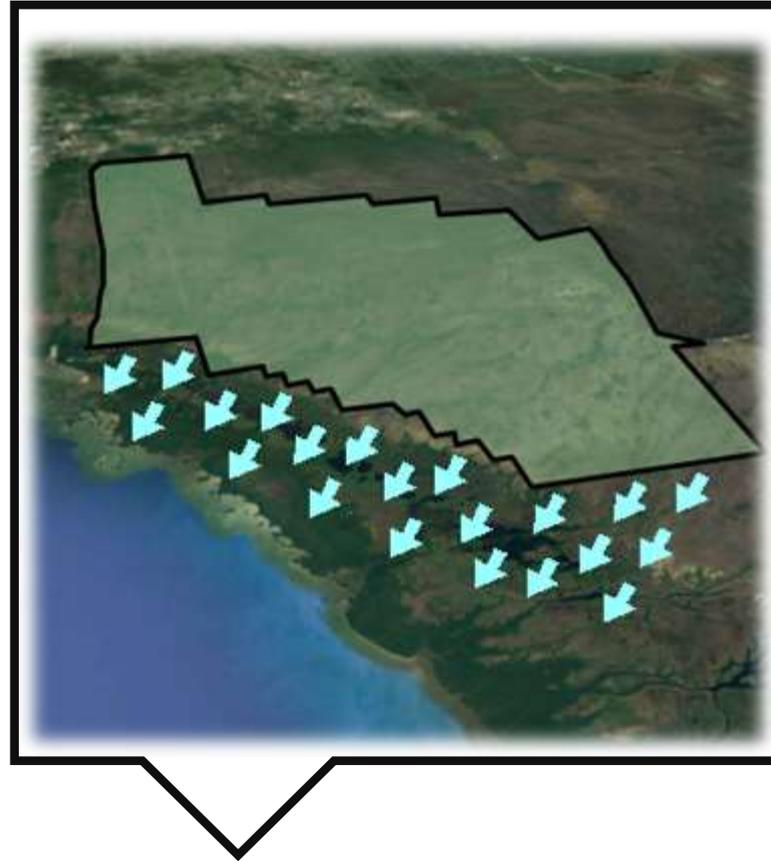


watershed

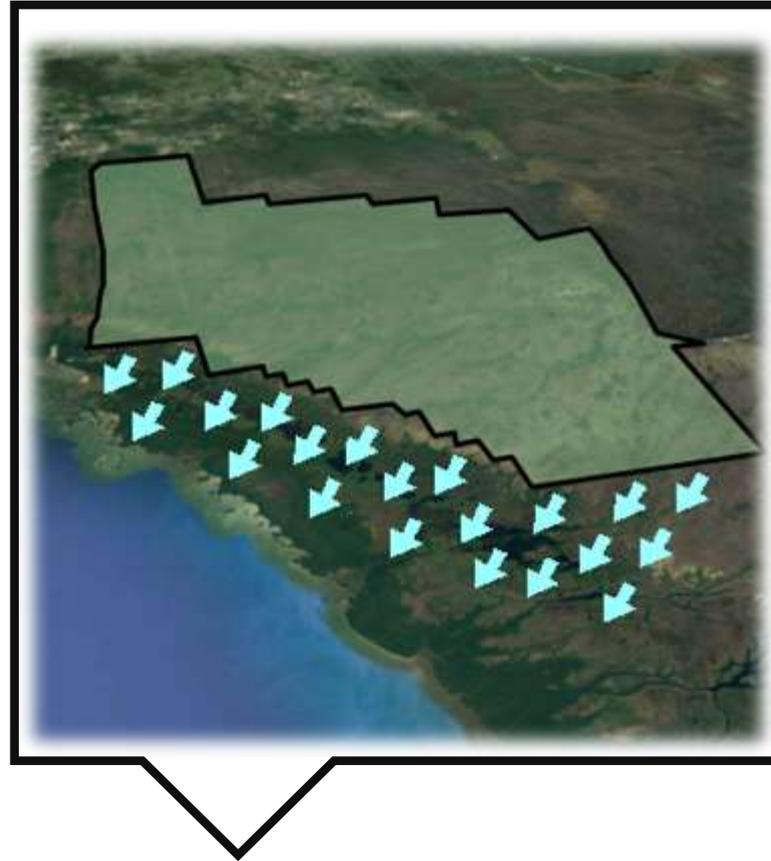
An area of land that drains to a particular point



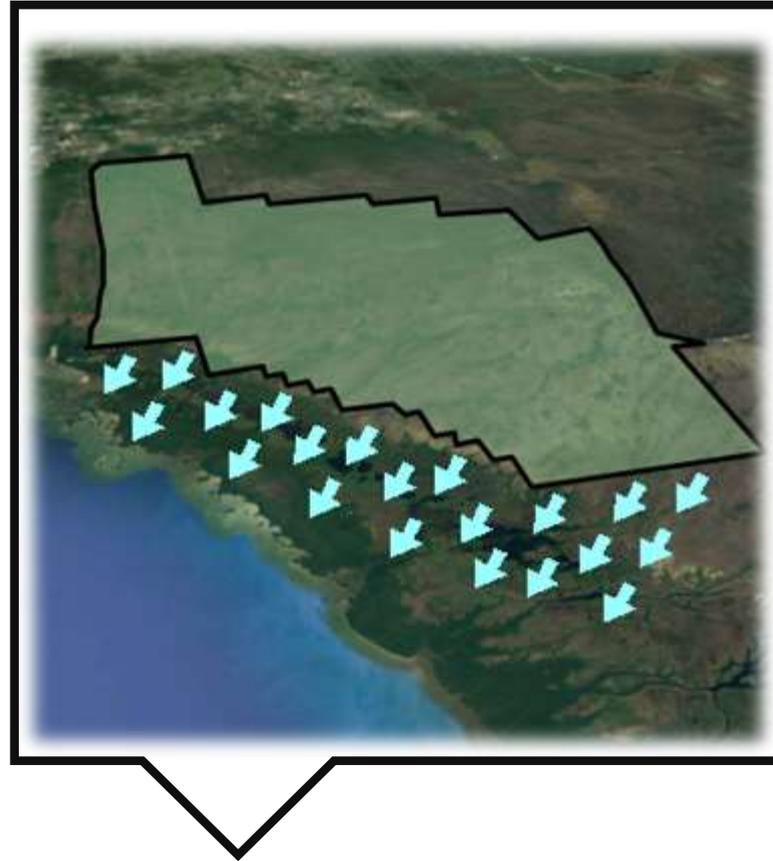




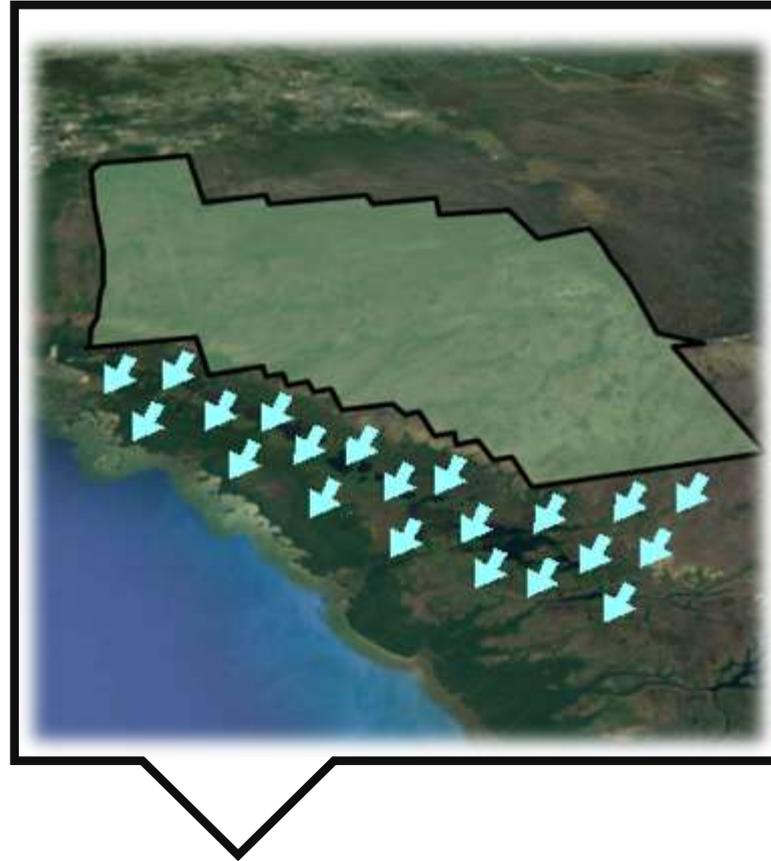
The preserve is a **self-contained**
rain driven watershed that flows
unfettered as sheetflow to the
mangrove coast



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The preserve is a **self-contained** rain driven **watershed** that flows unfettered as **sheetflow** to the mangrove coast



The preserve is a **self-contained** rain driven **watershed** that flows unfettered as **sheetflow** to the mangrove **coast**

Sky view of watershed



sole input: rainfall

Sky view of watershed



sole input: rainfall



sole output: estuarine coast

Sky view of watershed



Rain-driven swamp

Ground view of watershed



Ground view of watershed



Natural flow ways called strands and sloughs flow uncontrolled by gates to estuaries in downstream ENP

Ground view of watershed



Natural flow ways called **strands**
and sloughs flow uncontrolled by gates
to estuaries in downstream ENP

Ground view of watershed



Natural flow ways called **strands**
and sloughs flow uncontrolled by gates
to estuaries in downstream ENP

Ground view of watershed



Natural flow ways called **strands**
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Ground view of watershed



Natural flow ways called **strands** and sloughs flow uncontrolled by gates to estuaries in downstream ENP

Where did
we get this
story?

1974

Origin myth

Everglades Jetport



Illustration by Patrick Faricy

From Miami Times: *Fiery Debate Over Miami Air Show in Everglades*, by Jessica Weiss, 2015

Everglades Jetport



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From Miami Times: *Fiery Debate Over Miami Air Show in Everglades*, by Jessica Weiss, 2015

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Promotional Brochure

We're busy TODAY



...getting ready for TOMORROW!

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THE HONORABLE CLAUDE R. BISS, JR.
Governor of Florida

"What ships did almost exclusively a generation ago, planes do today. Bigger and faster planes will do it better tomorrow. For all recorded history, cities and nations with deep harbors have prospered best. Today it is airports—the harbors of the aviation industry—that have become the new strategic locations. In this new context of the strategic location, South Florida has no equal. . . . With our new supersonic jetport, South Florida is going to become a major gateway to Europe and a jumping-off place for the Pacific as well."



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An Forecast Association of America

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**Miami-Collier
Training and
Transition
Airport (TNT)**

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Intervention by **Conservationists**

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Joe Browder

Intervention by **Conservationists**



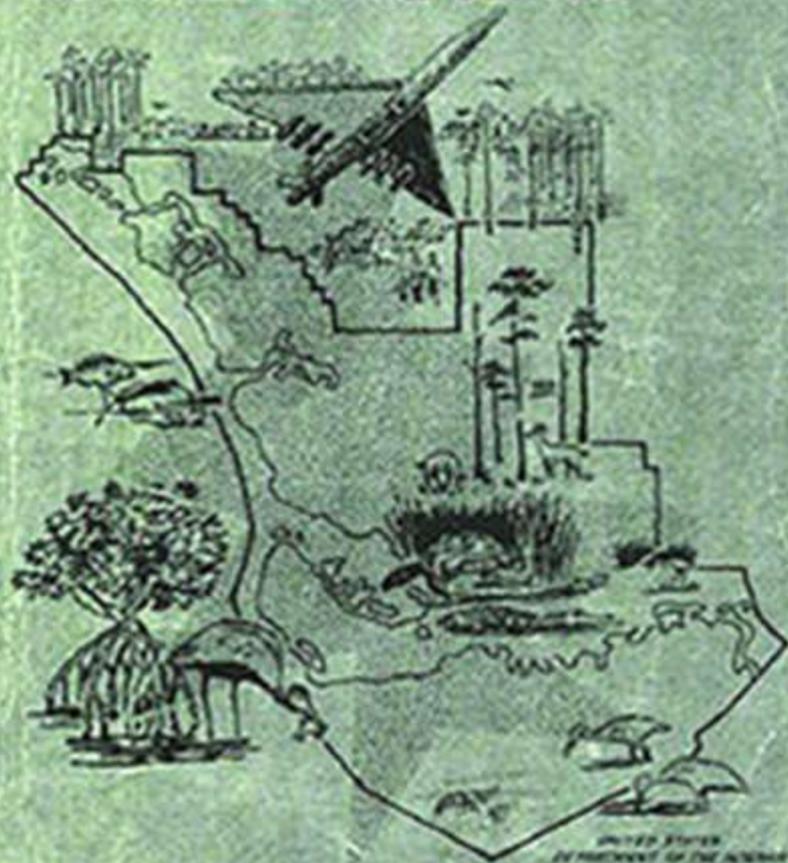
**Marjory Stoneham
Douglas**



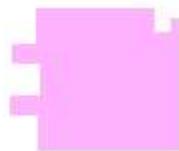
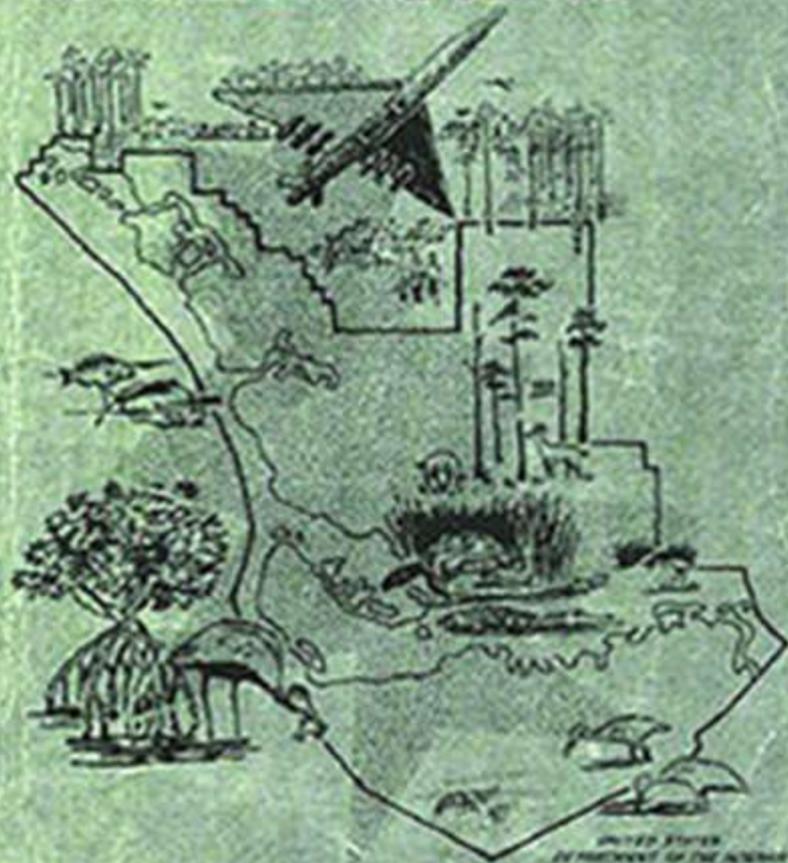
Joe Browder

Carved out as **watershed**
that feeds downstream estuarine
arm of Everglades National Park

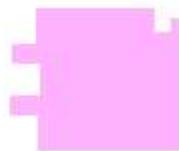
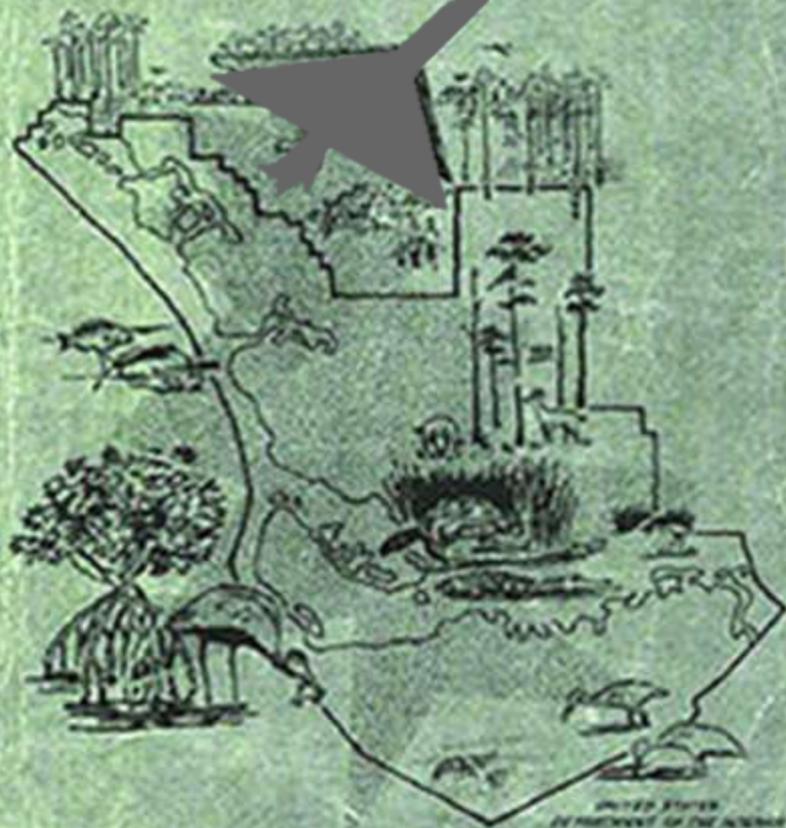
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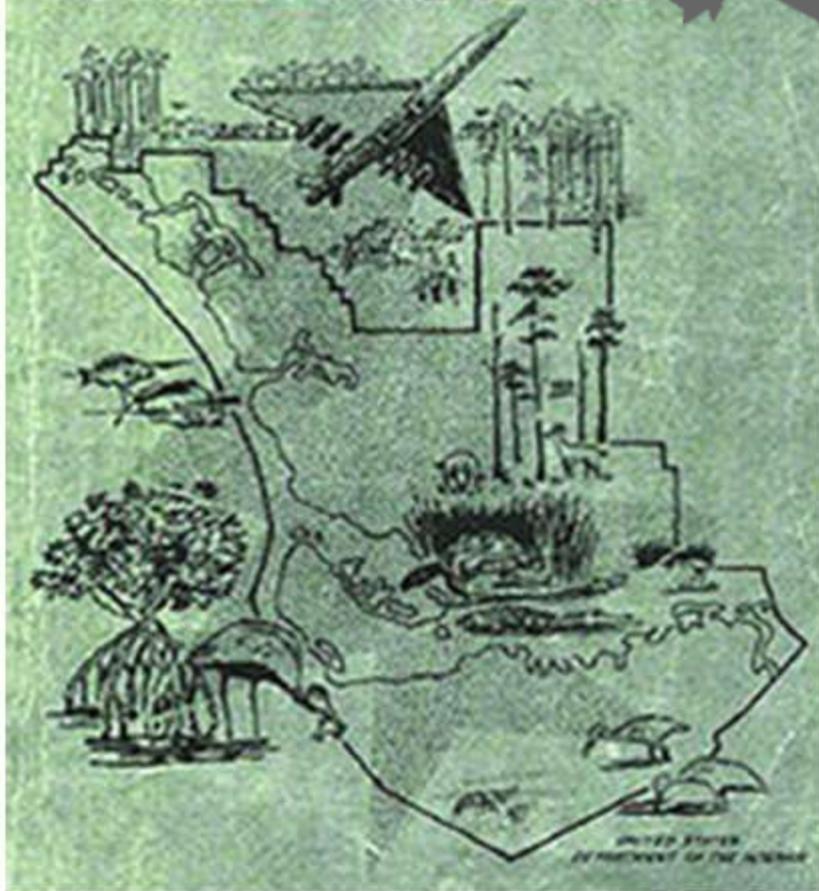
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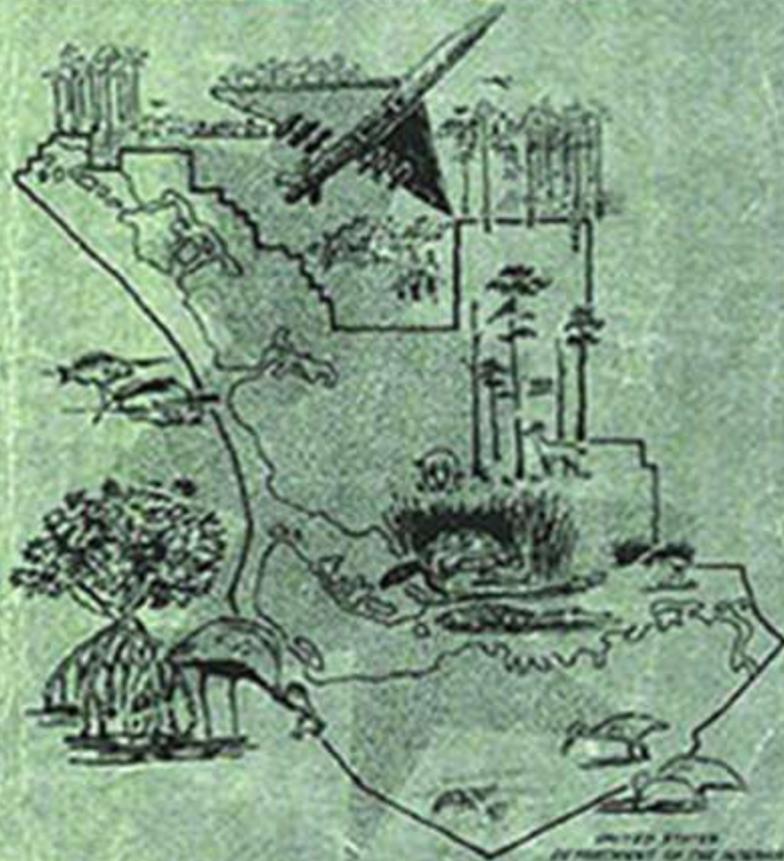
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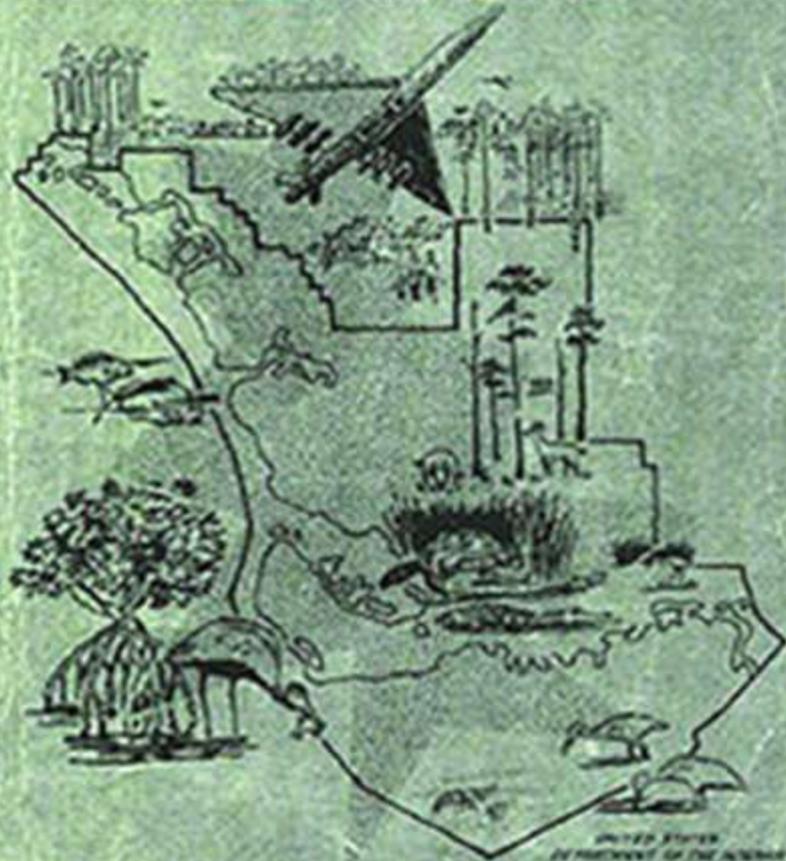
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BIG CYPRESS SWAMP JETPORT**



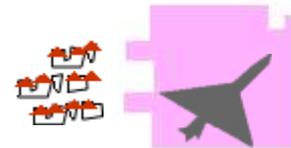
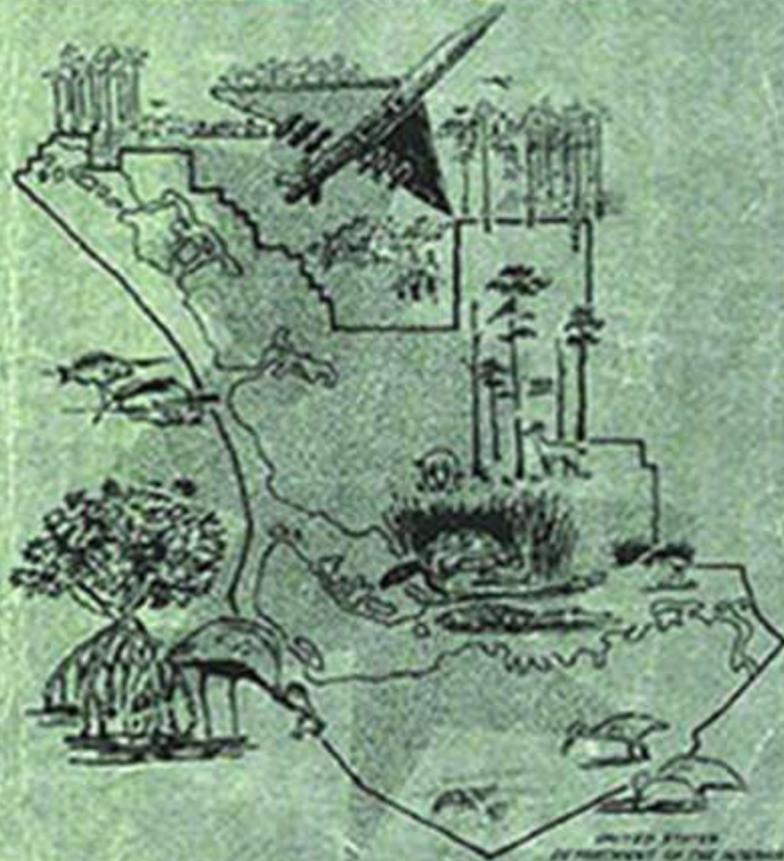
**ENVIRONMENTAL IMPACT
OF THE
BIG CYPRESS SWAMP JETPORT**



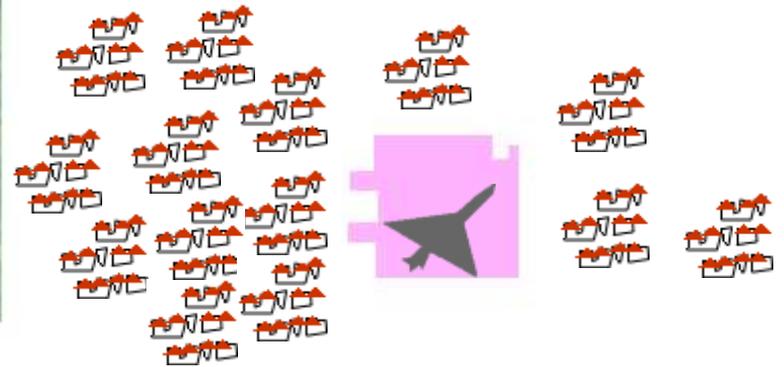
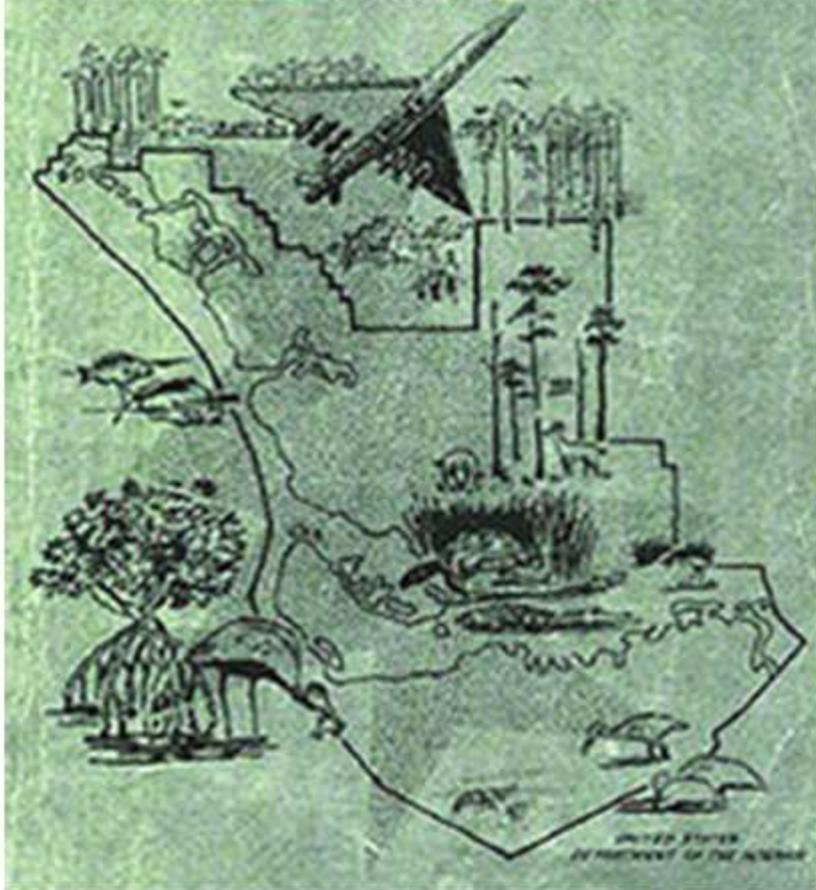
**ENVIRONMENTAL IMPACT
OF THE
BIG CYPRESS SWAMP JETPORT**



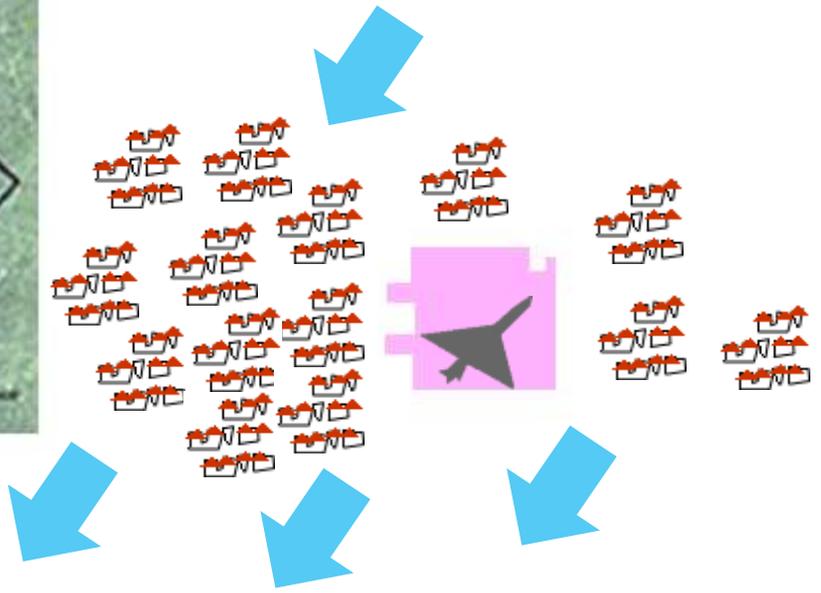
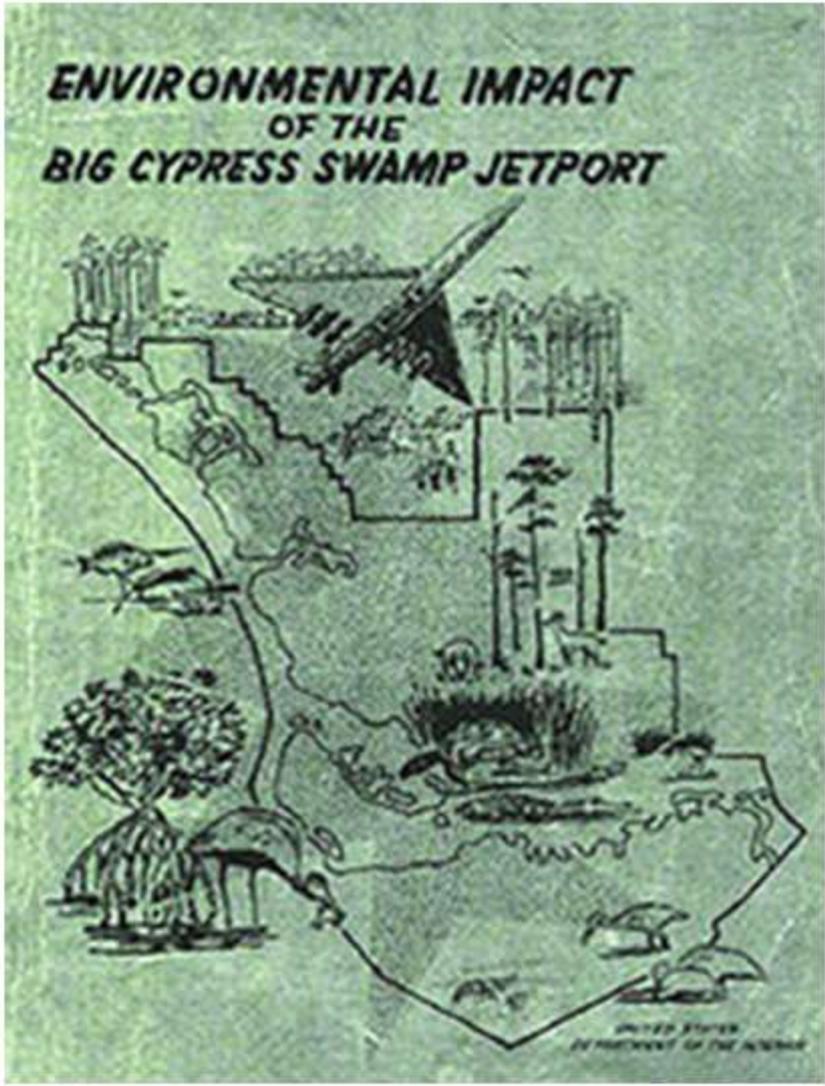
**ENVIRONMENTAL IMPACT
OF THE
BIG CYPRESS SWAMP JETPORT**



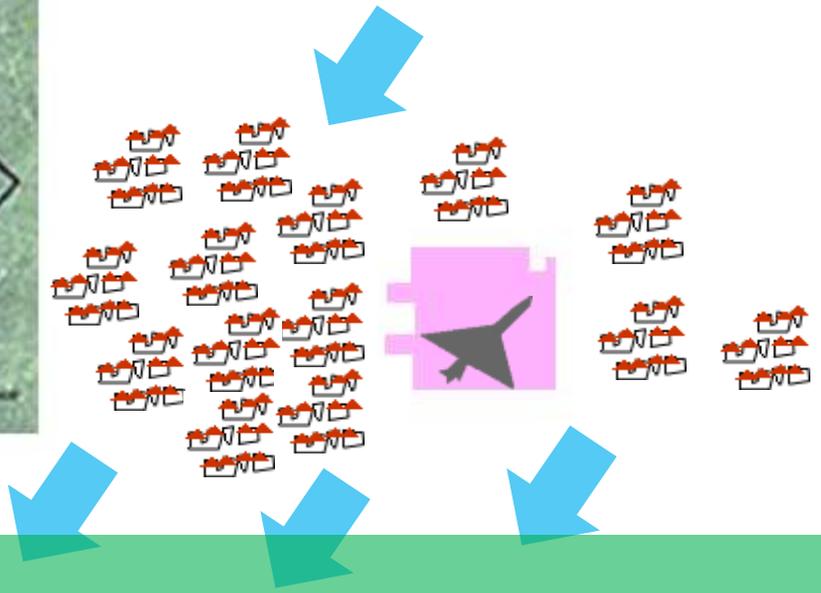
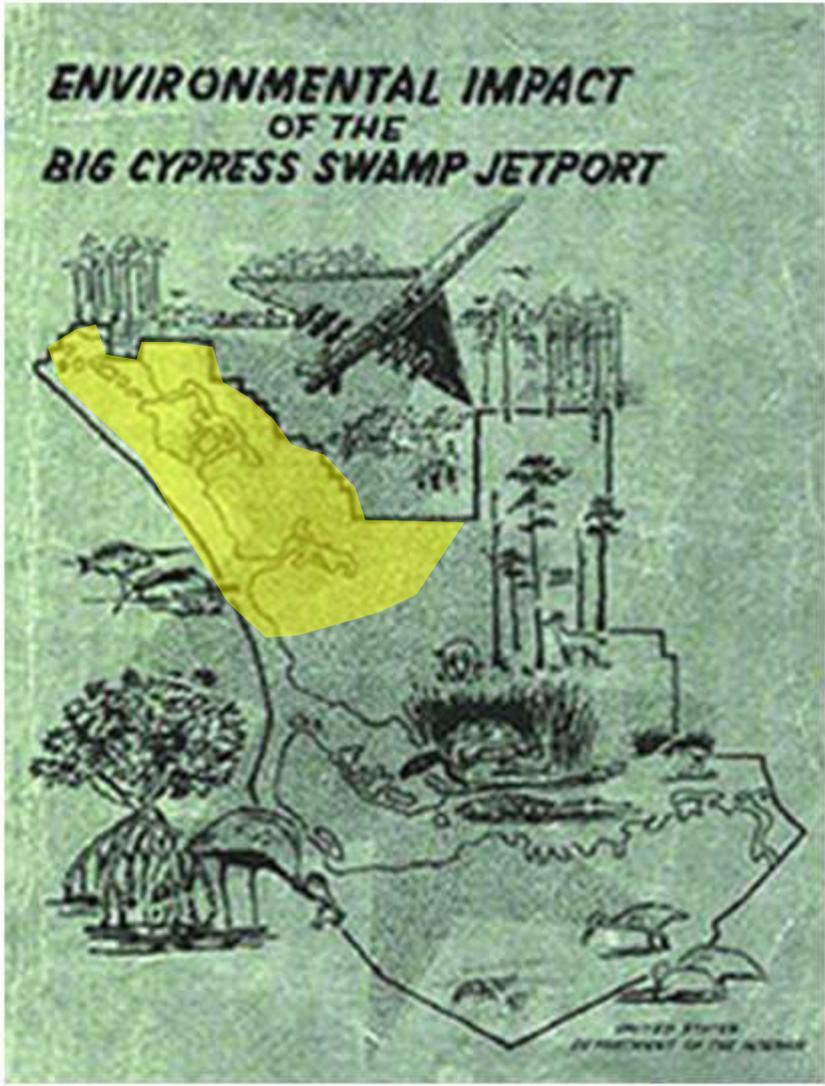
ENVIRONMENTAL IMPACT OF THE BIG CYPRESS SWAMP JETPORT

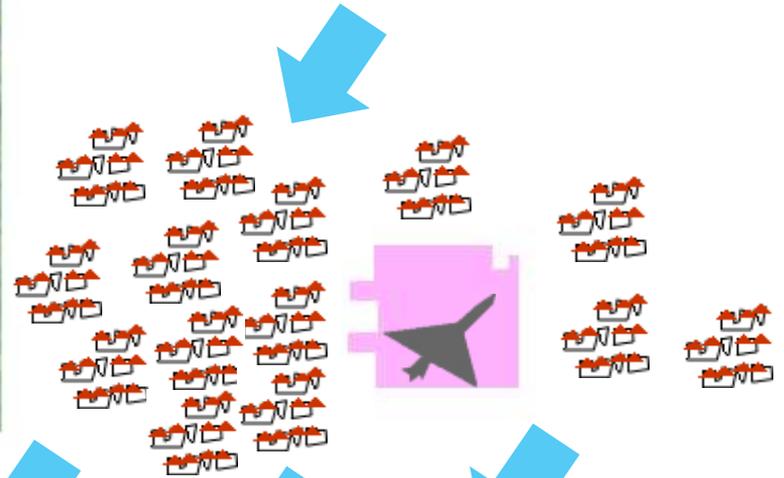
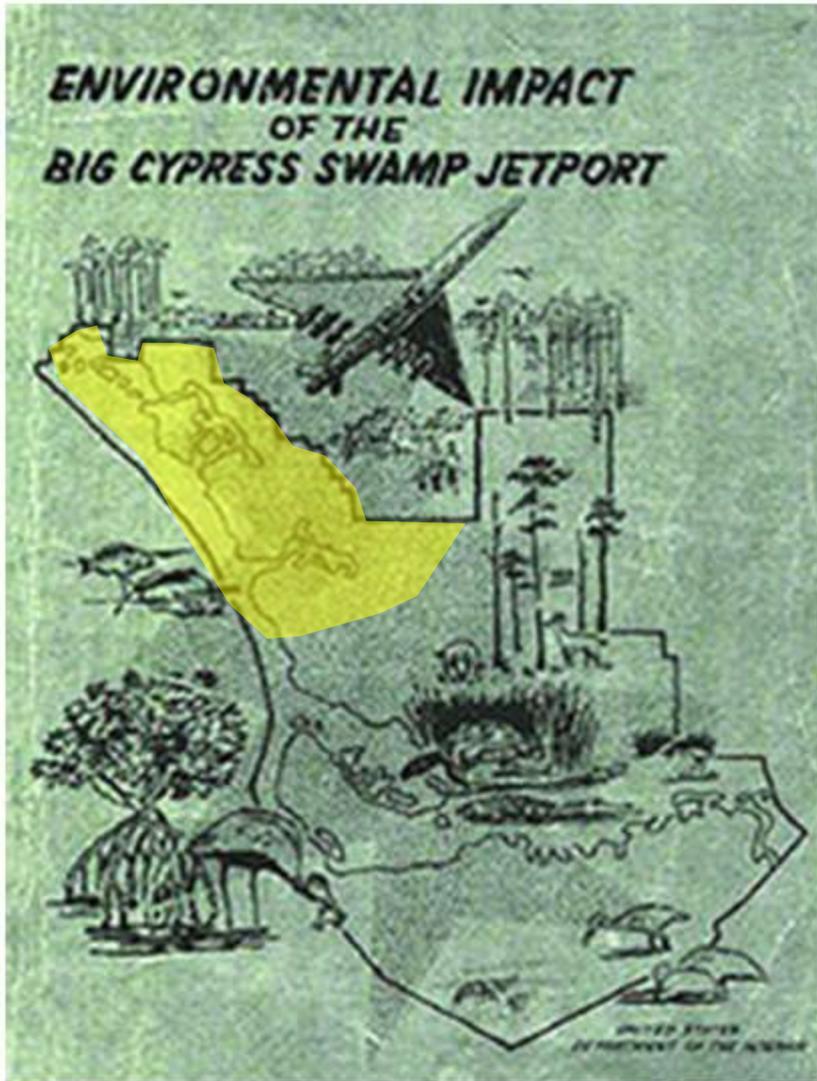


**ENVIRONMENTAL IMPACT
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BIG CYPRESS SWAMP JETPORT**

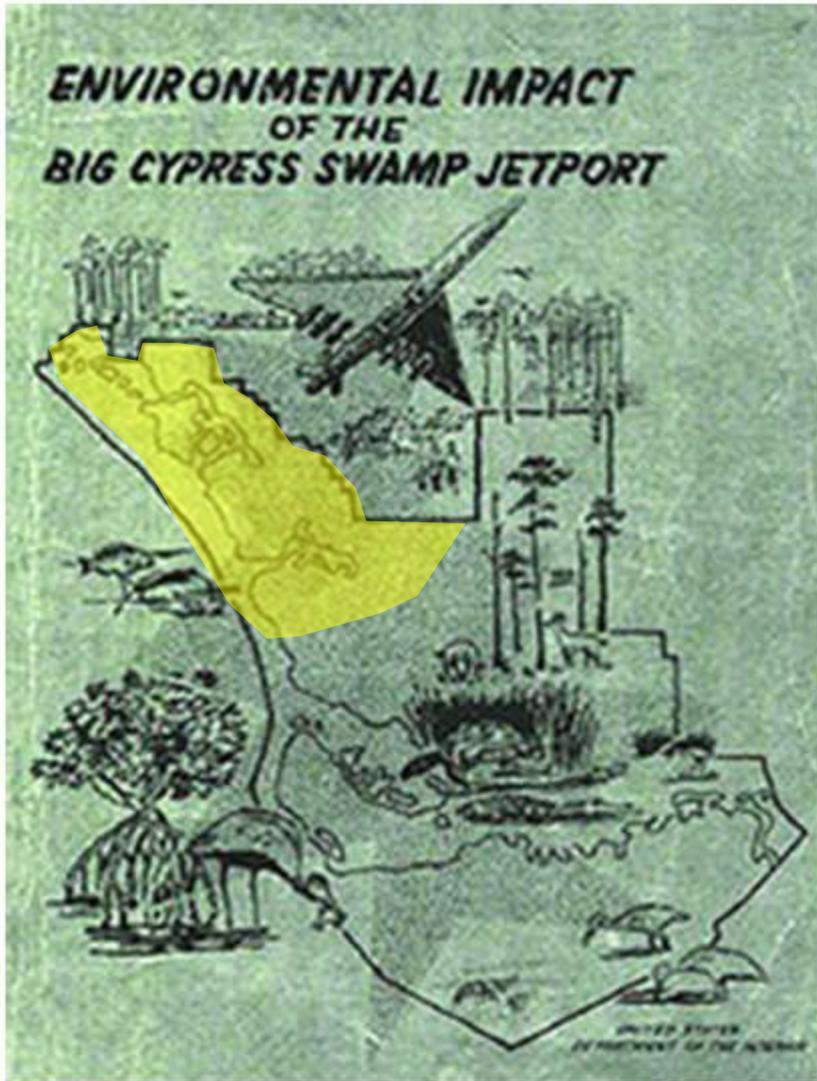


ENVIRONMENTAL IMPACT OF THE BIG CYPRESS SWAMP JETPORT

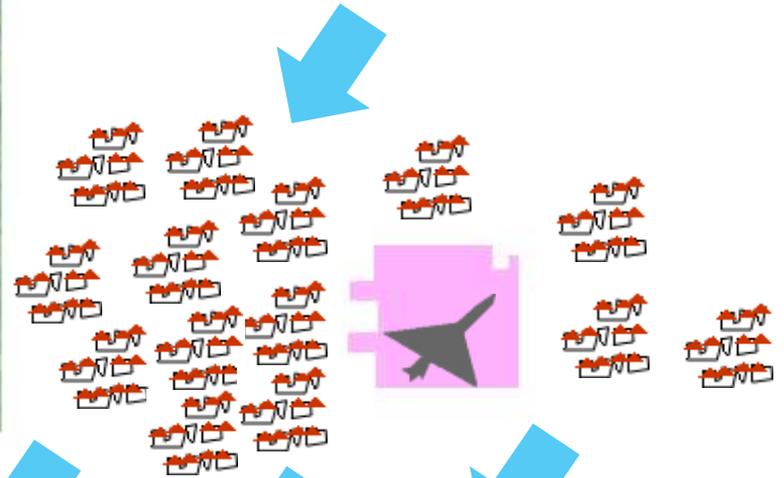




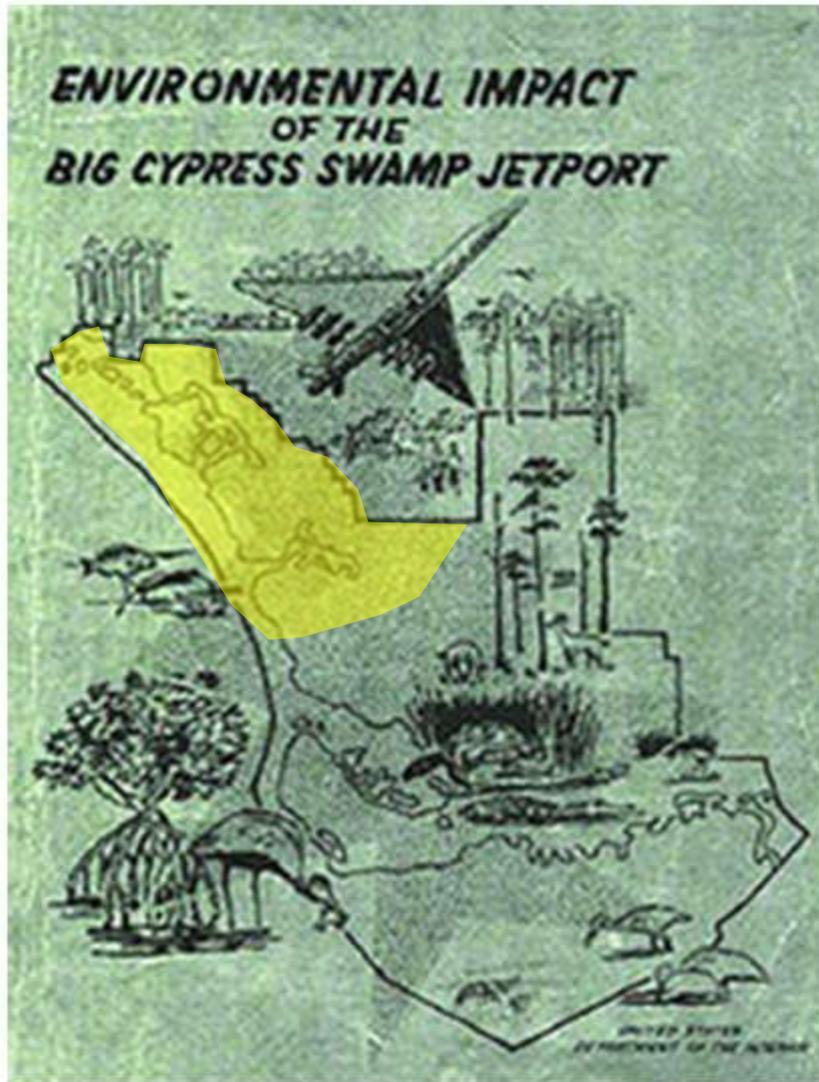
Everglades Nat'l Park



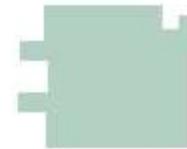
Big Cypress Swamp



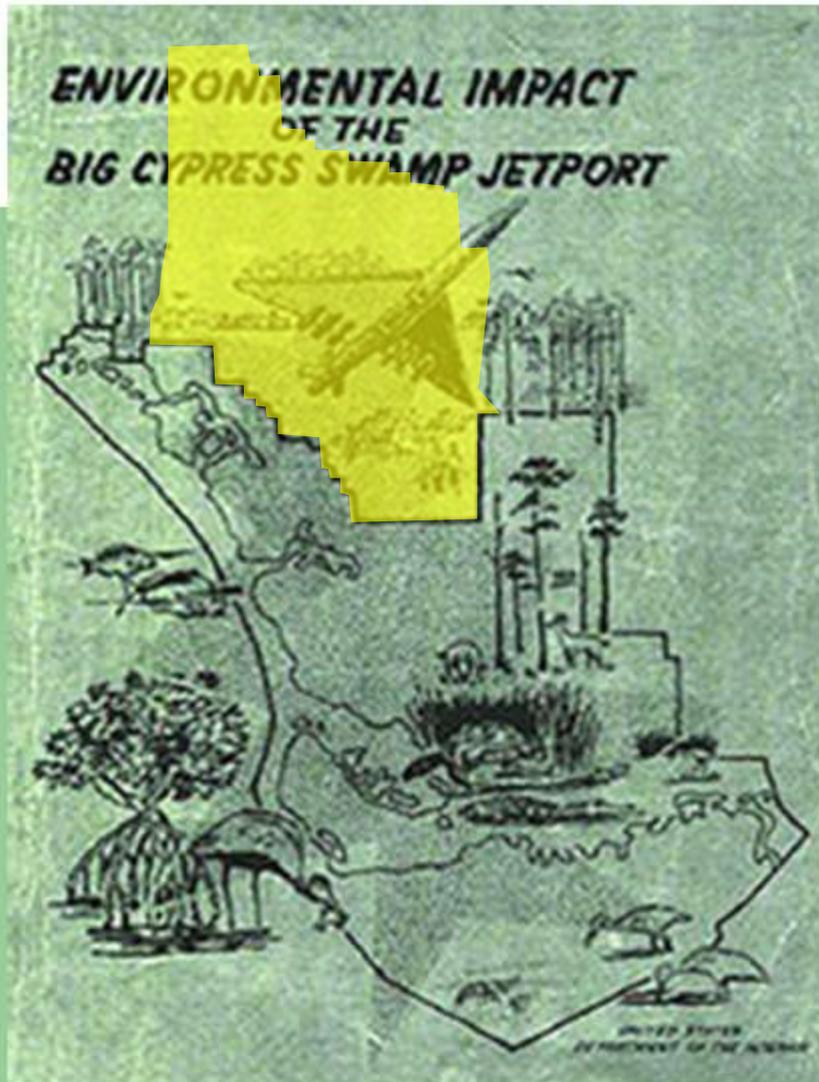
Everglades Nat'l Park



**Big
Cypress
Swamp**

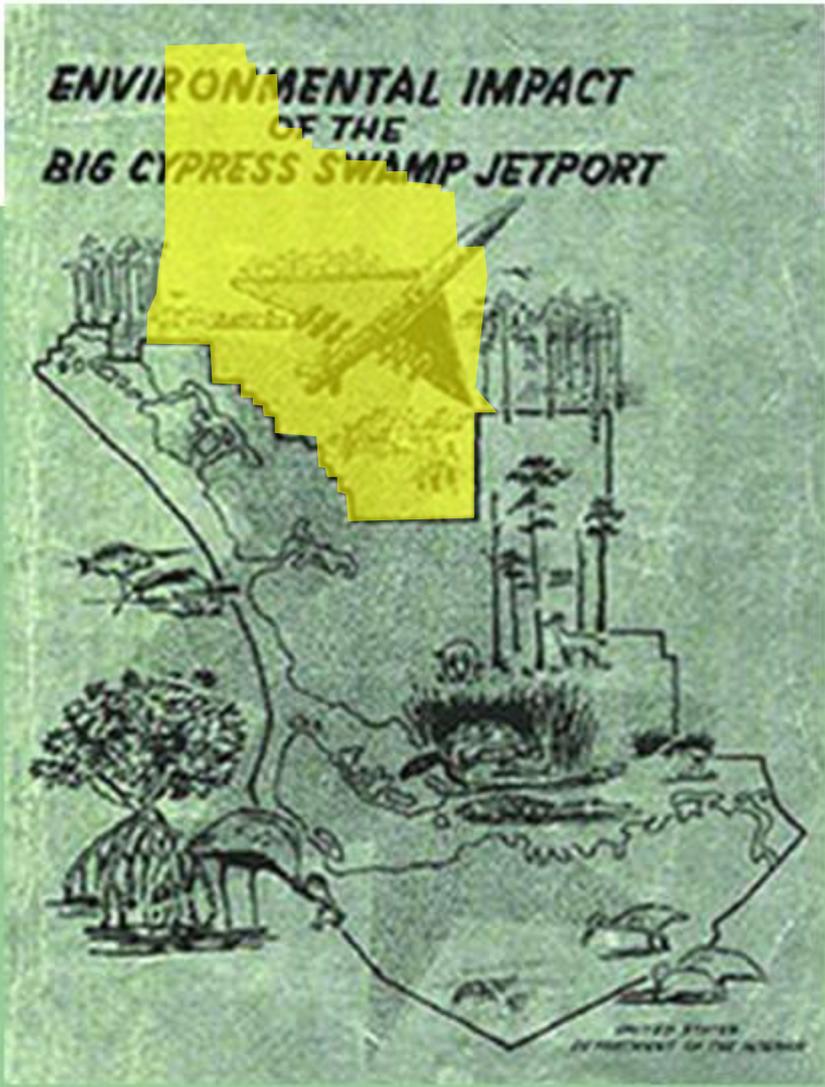


Everglades Nat'l Park



**Big
Cypress
Swamp**

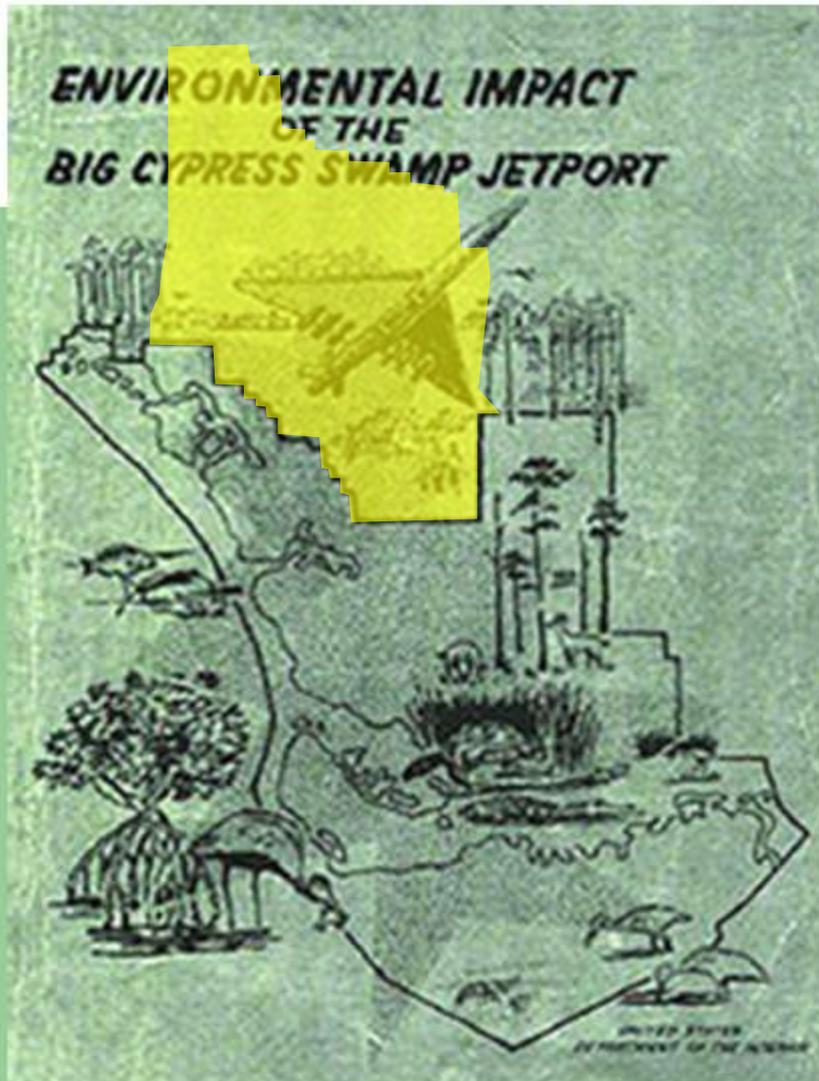
Everglades Nat'l Park



Big Cypress Swamp

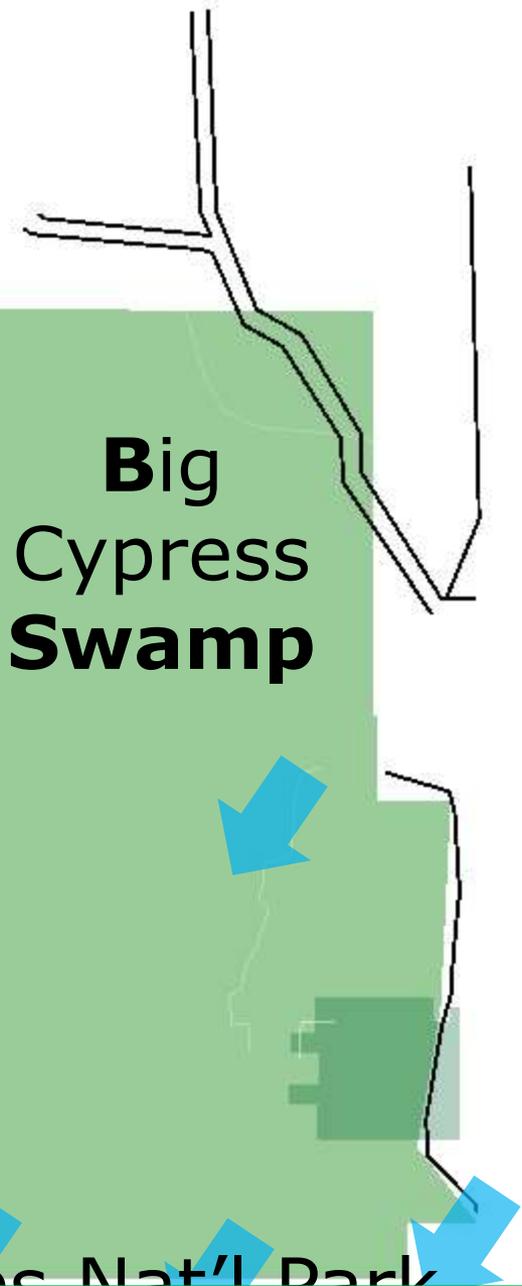
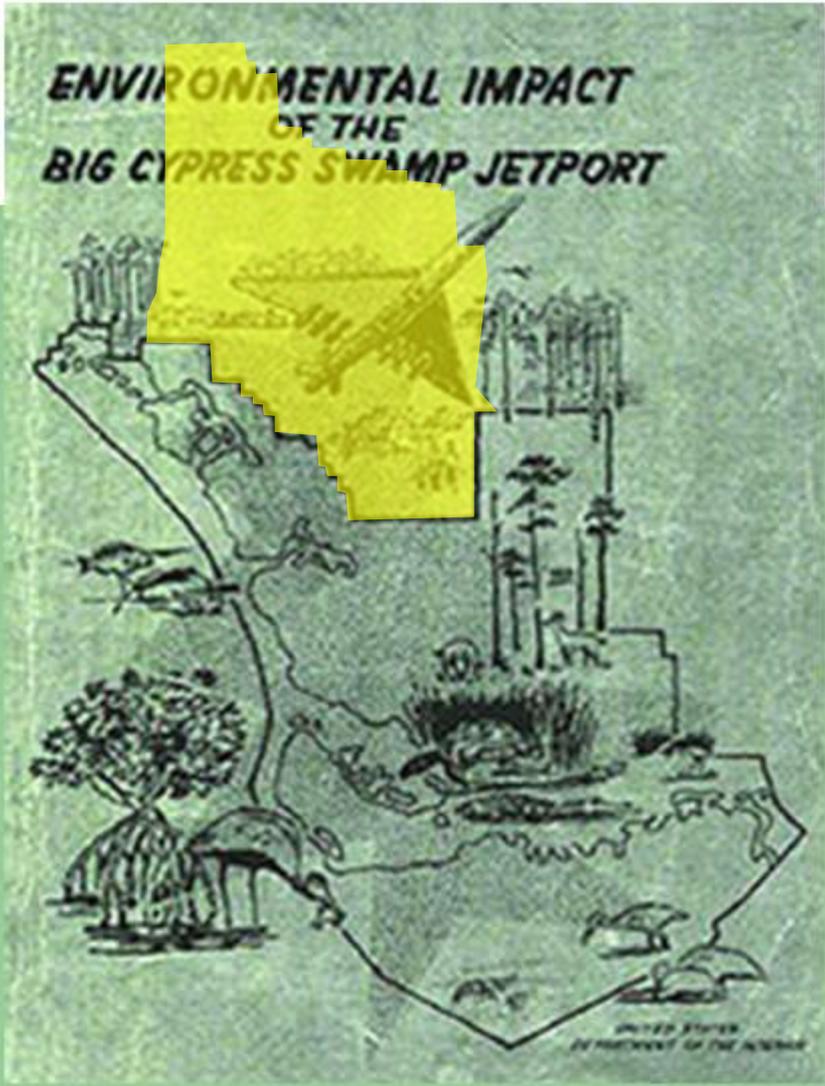
Everglades Nat'l Park

Success,
right?



**Big
Cypress
Swamp**

Everglades Nat'l Park



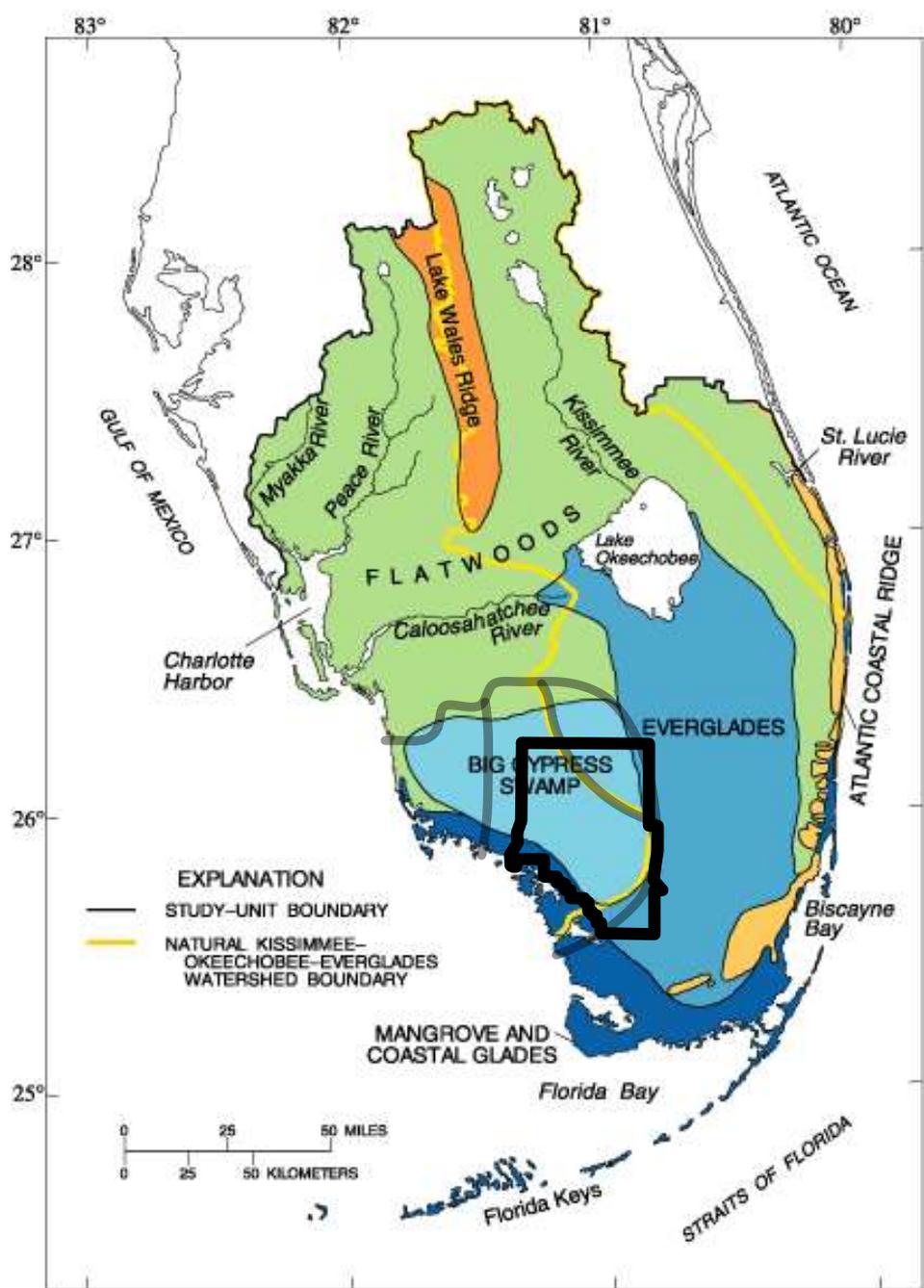
Success,
right?

Big
Cypress
Swamp

Everglades Nat'l Park

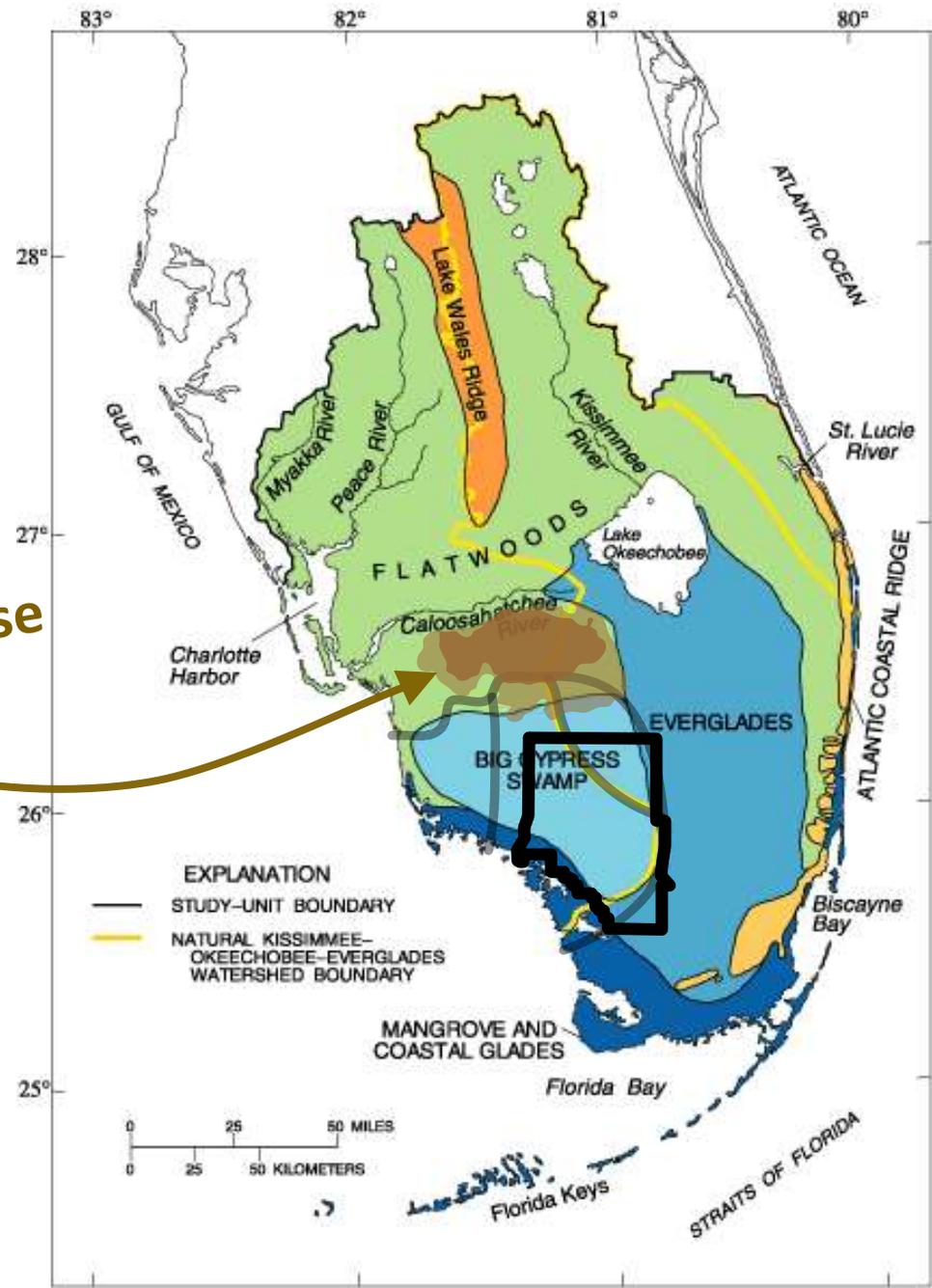
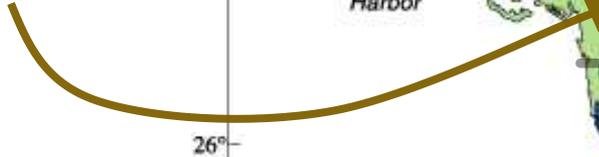
Factors that **fed** the myth

The top of the Big Cypress Swamp's
historic watershed was the southern
toe of the **Immokalee Rise**



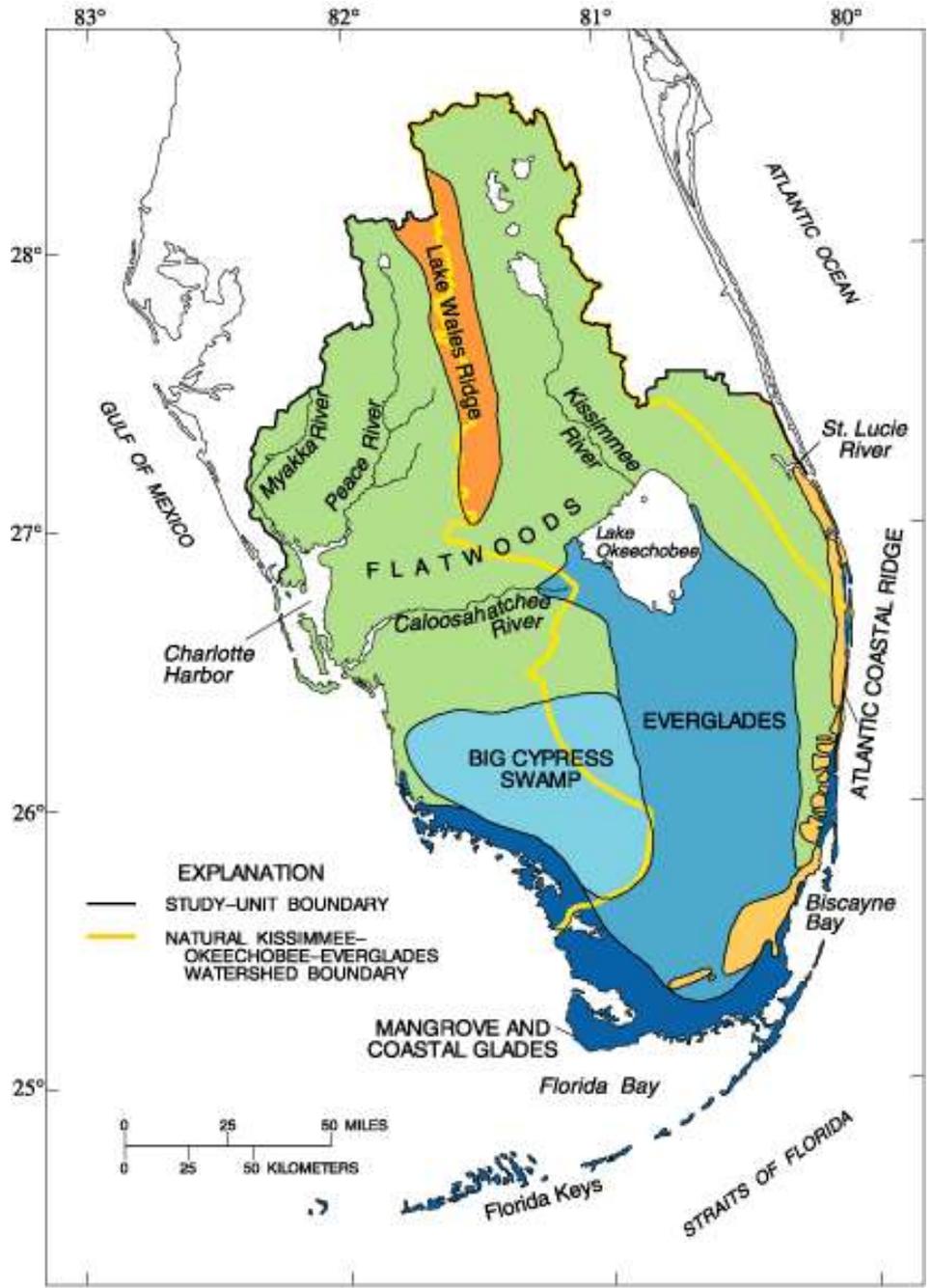
Base from U.S. Geological Survey digital data, 1:2,000,000, 1972
 Albers Equal-Area Conic projection
 Standard Parallels 29°30' and 45°30', central meridian -83°00'

Immokalee Rise

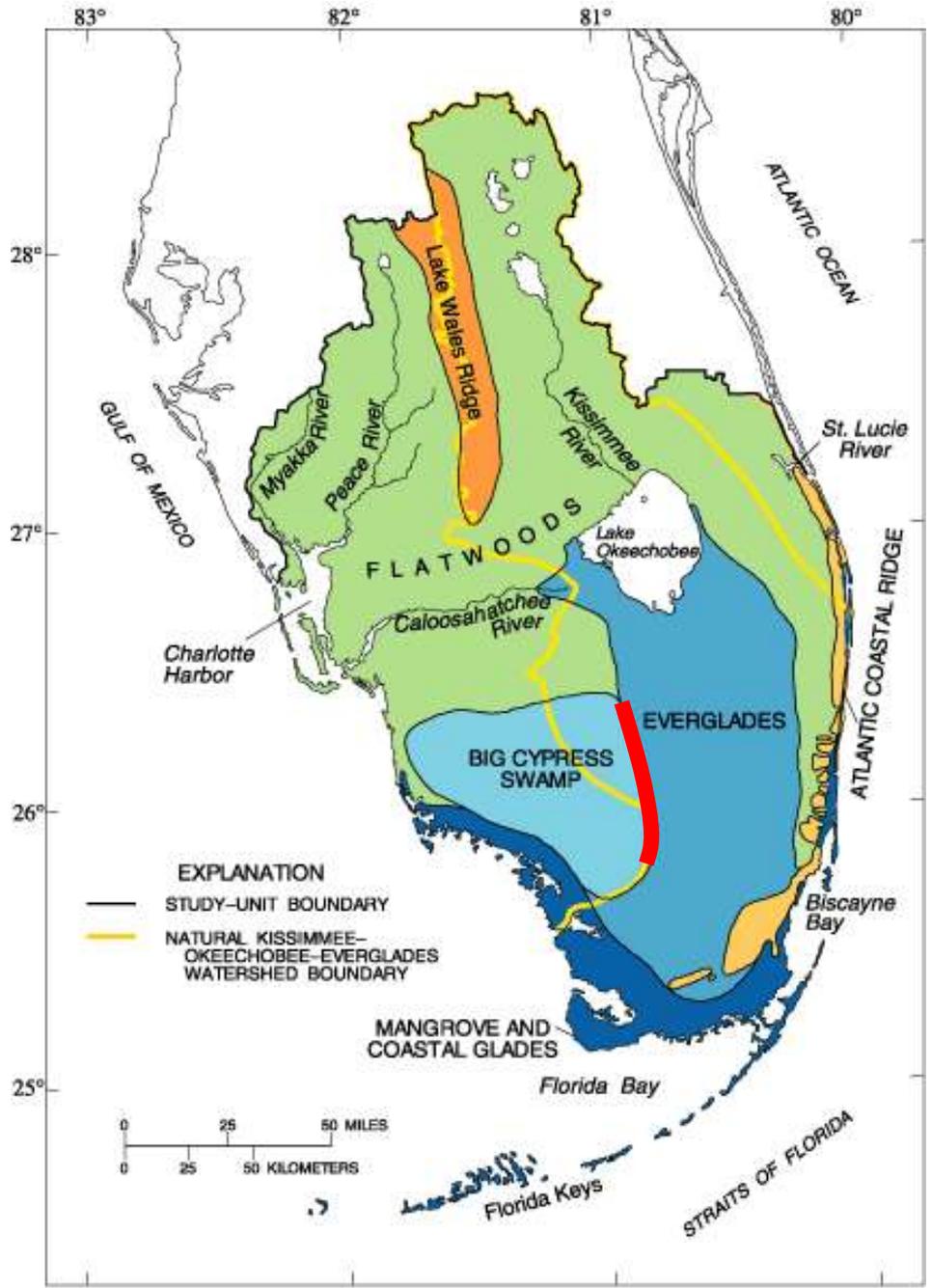


Base from U.S. Geological Survey digital data, 1:2,000,000, 1972
Albers Equal-Area Conic projection
Standard Parallels 29°30' and 45°30', central meridian -83°00'

Geographically separate
from highly-managed
Everglades to the east



Base from U.S. Geological Survey digital data, 1:2,000,000, 1972
 Albers Equal-Area Conic projection
 Standard Parallels 29°30' and 45°30', central meridian -83°00'



Base from U.S. Geological Survey digital data, 1:2,000,000, 1972
 Albers Equal-Area Conic projection
 Standard Parallels 29°30' and 45°30', central meridian -83°00'

Swamp mosaic contains
smaller and less connected
flow systems than the river
of grass

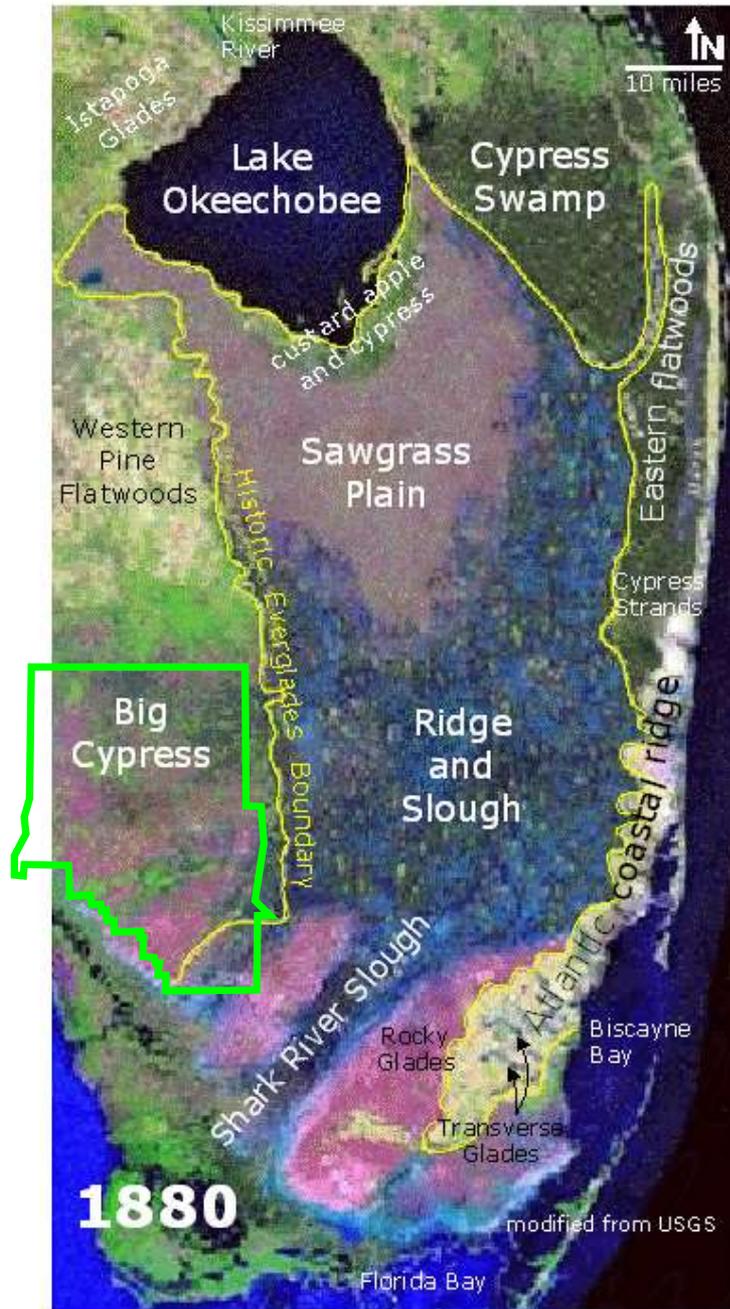
Big Cypress



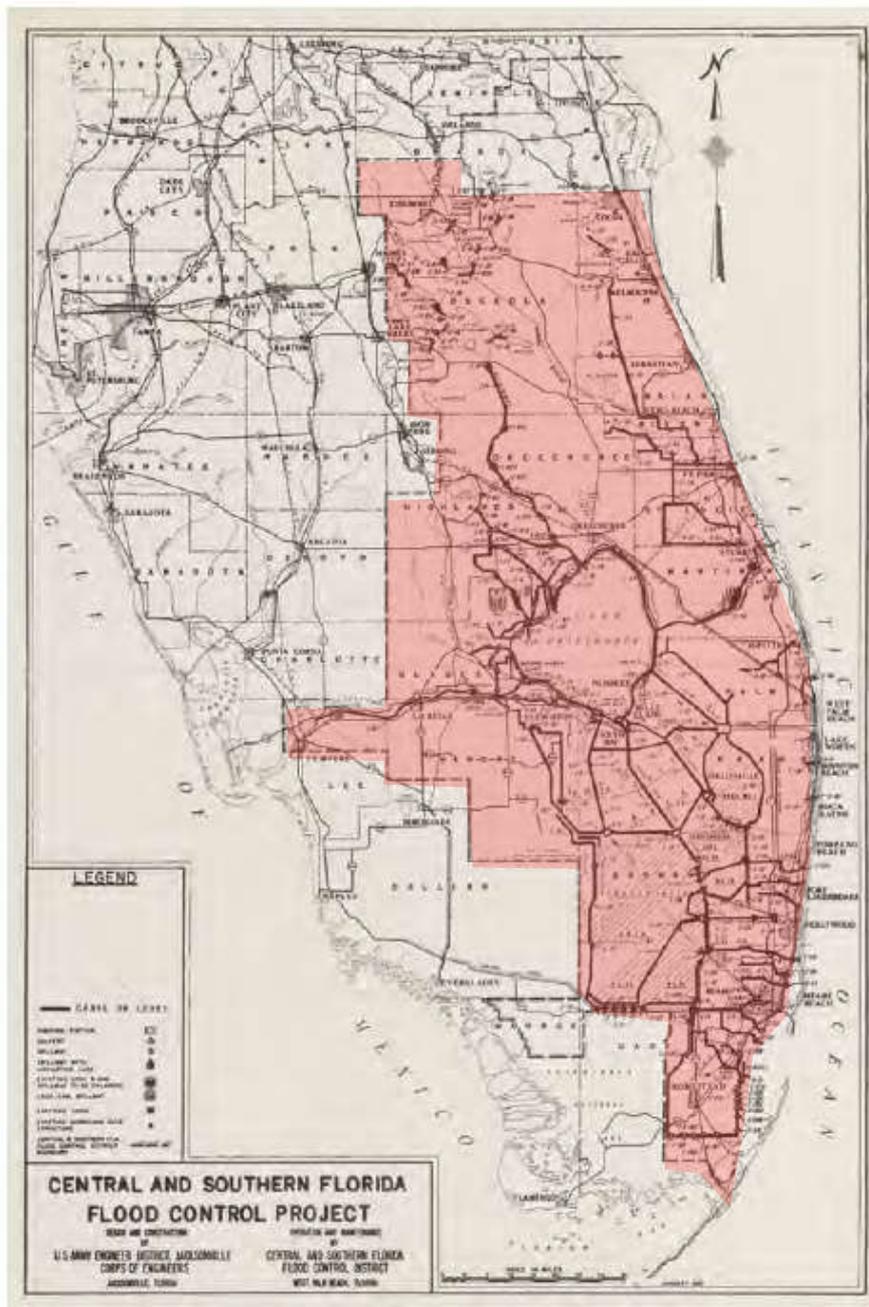
Everglades



Hydrologically much less impacted
that Kissimmee-Okeechobee-
Everglades (KOE) ecosystem



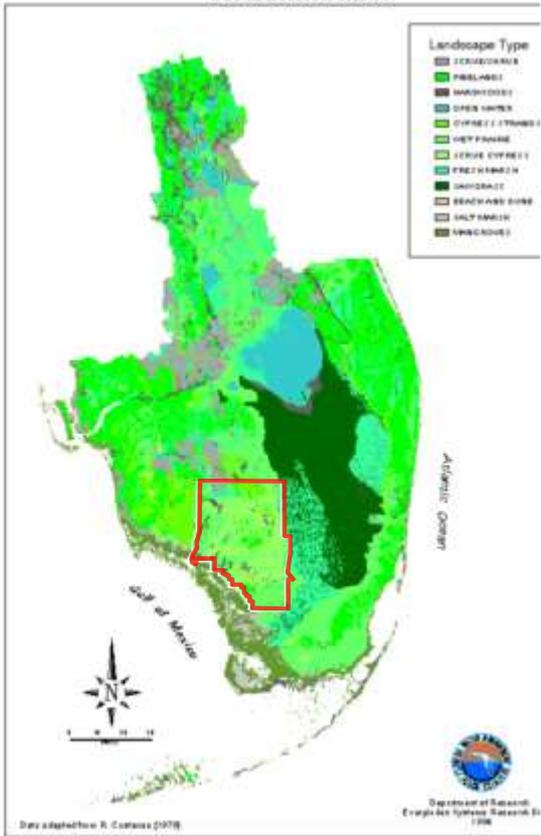
Lies outside the USACE/SFWMD
Central and Southern (C&SF)
project area



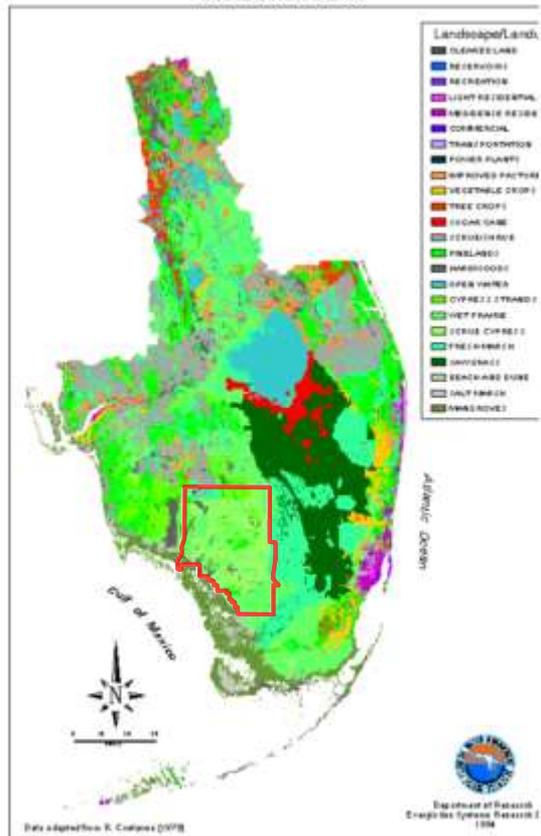
Features of the Central and Southern Florida Flood Control Project. (South Florida Water Management District)

Swamp is as close as you get to a
pre-drainage condition in south
Florida

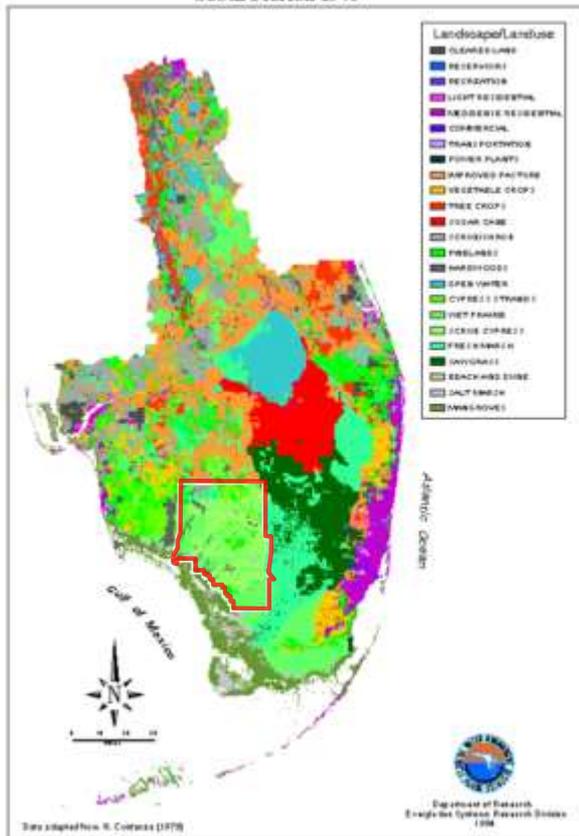
South Florida c.1900



South Florida 1953



South Florida 1973



Psychologically the
myth worked

It made us feel good



It was expedient

*Sometimes we must choose
between what is RIGHT
and what is easy*

{Albus Dumbledore}

It was expedient

*Sometimes we must choose
between what is RIGHT
and what is easy*

{Albus Dumbledore}

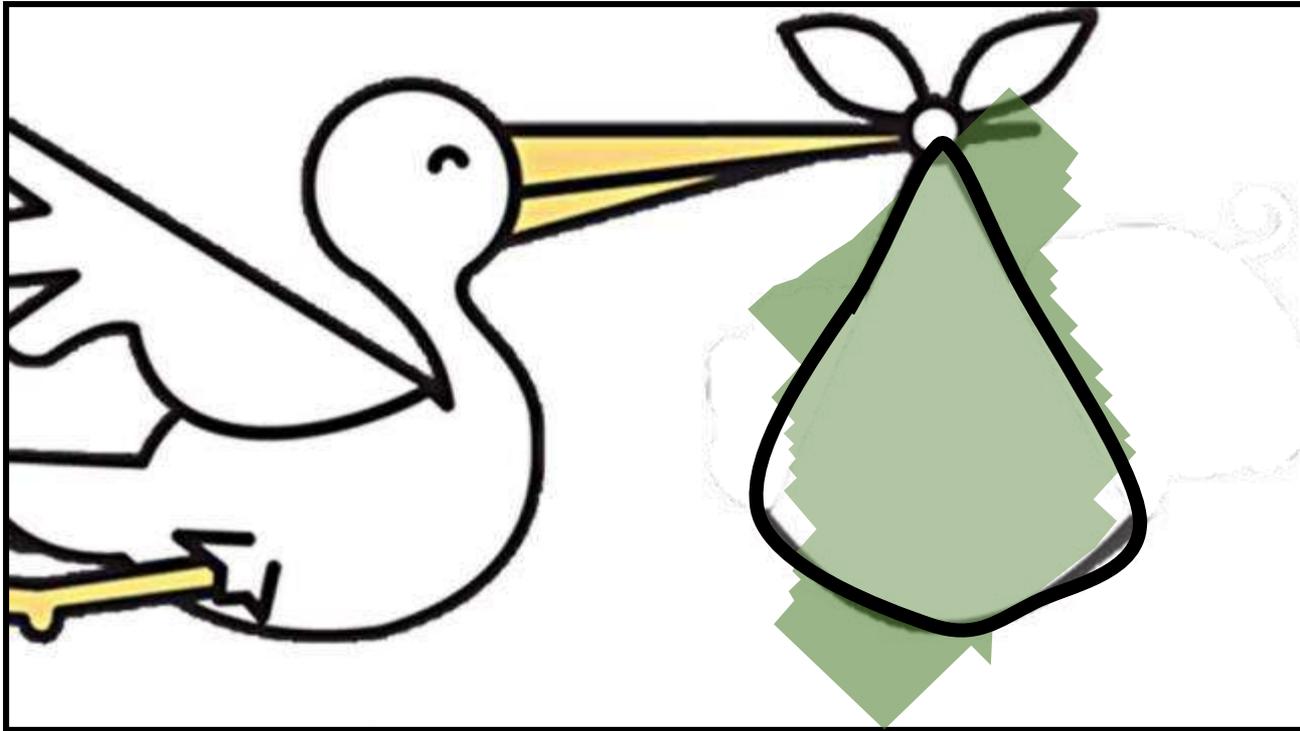
ex·pe·di·ent

/ik' spēdēənt/ 

adjective

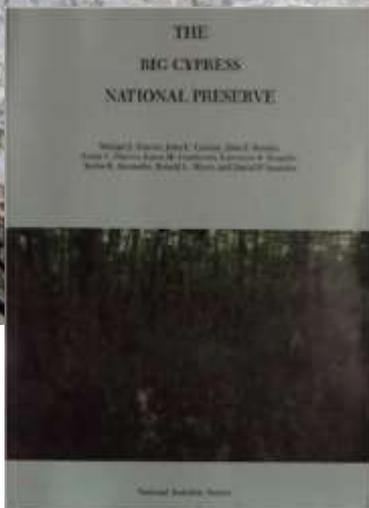
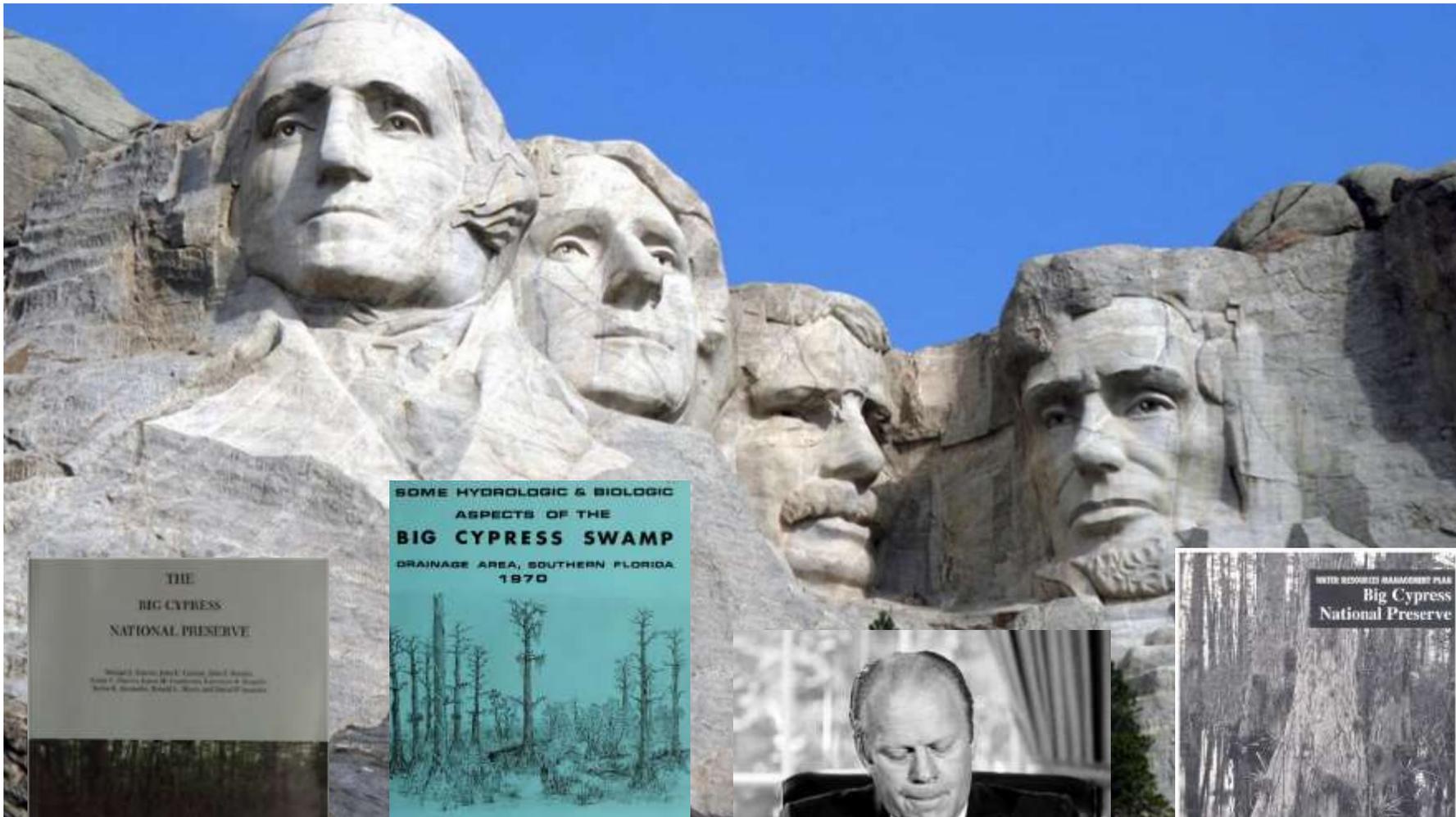
1. (of an action) convenient and practical, although possibly improper or immoral.
"either side could break the agreement if it were expedient to do so"
synonyms: convenient, advantageous, in one's own interests, useful, of use, beneficial, of benefit, helpful; [More](#)

It was what we were told

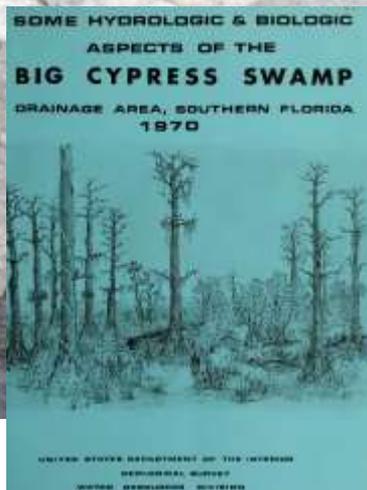


**Who told us
this story?**





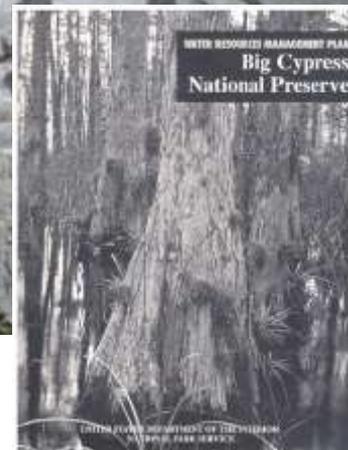
Audubon



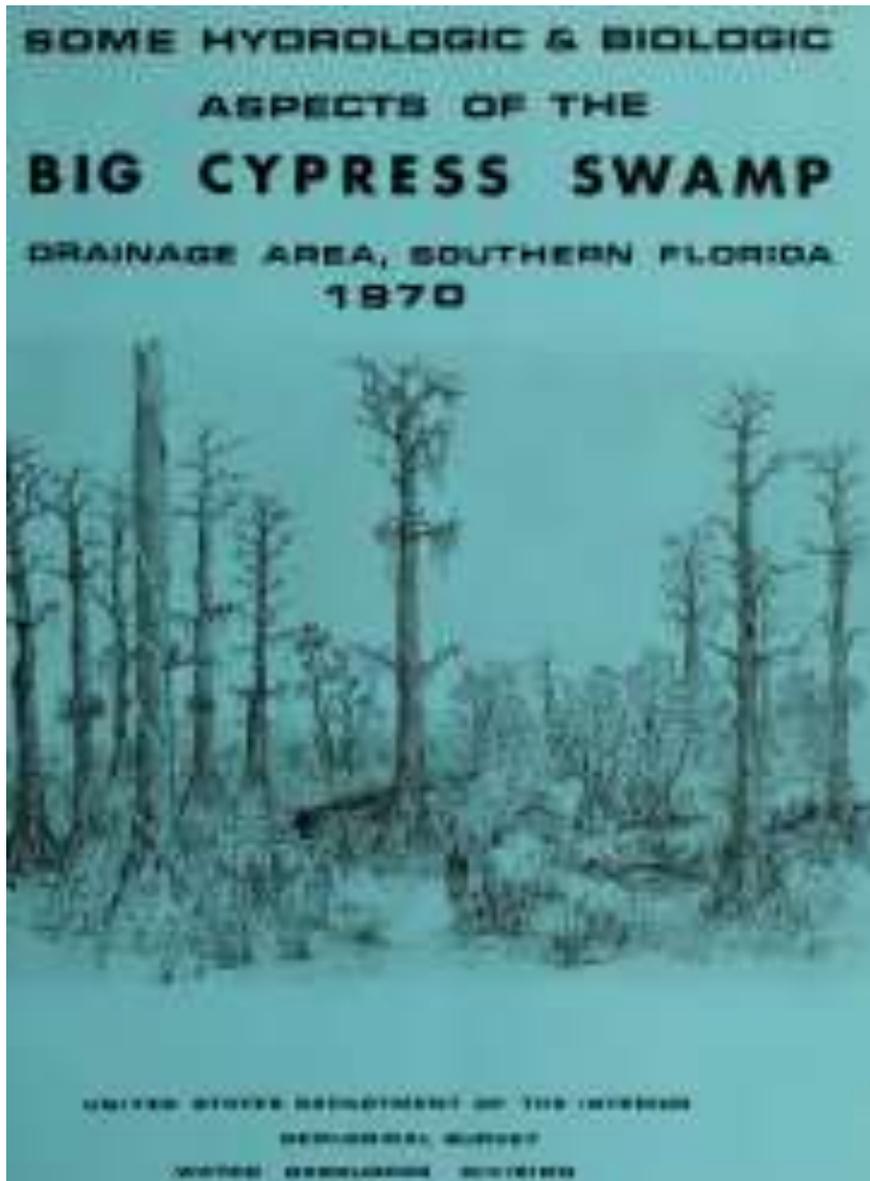
USGS



US Congress

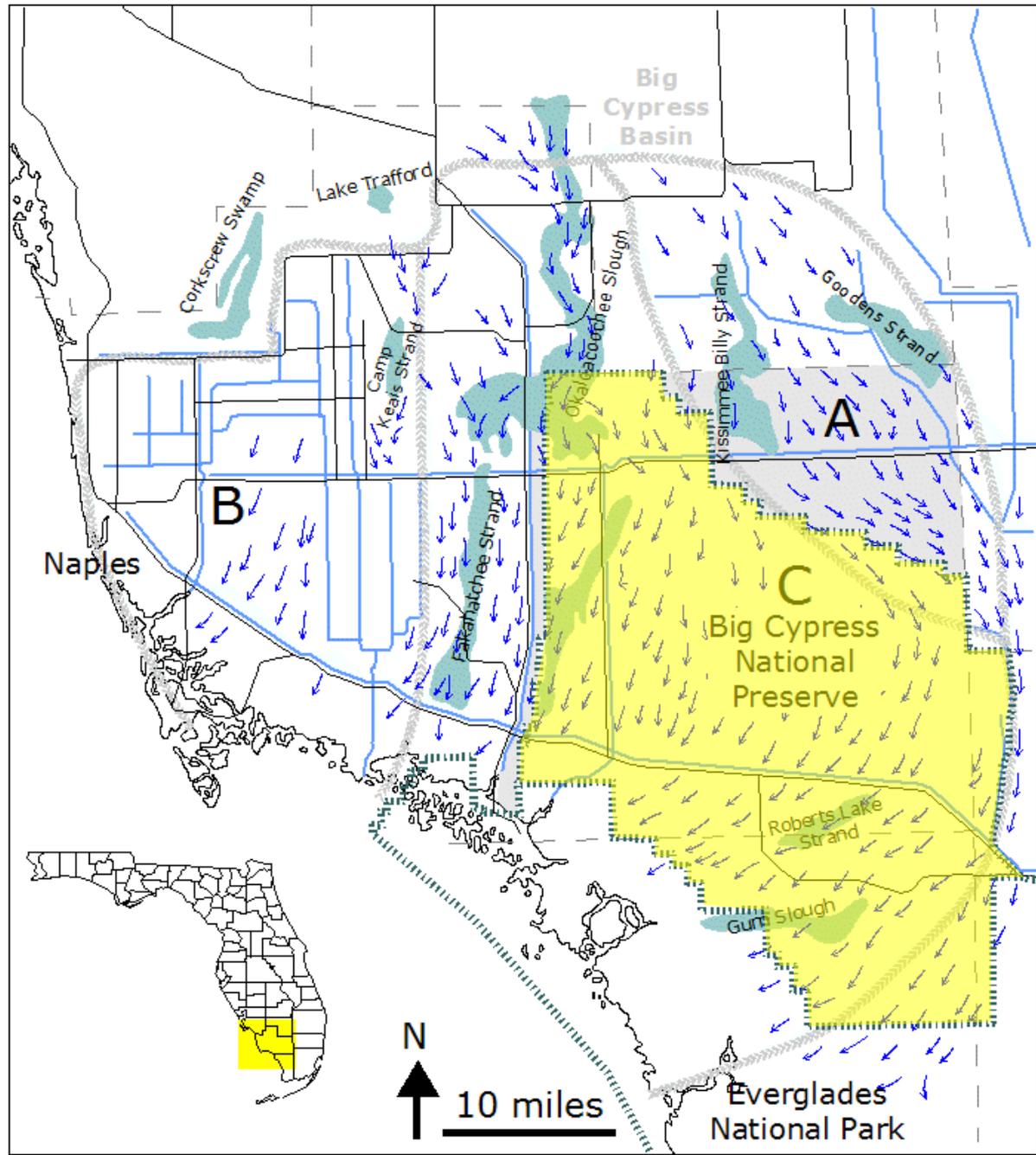


NPS



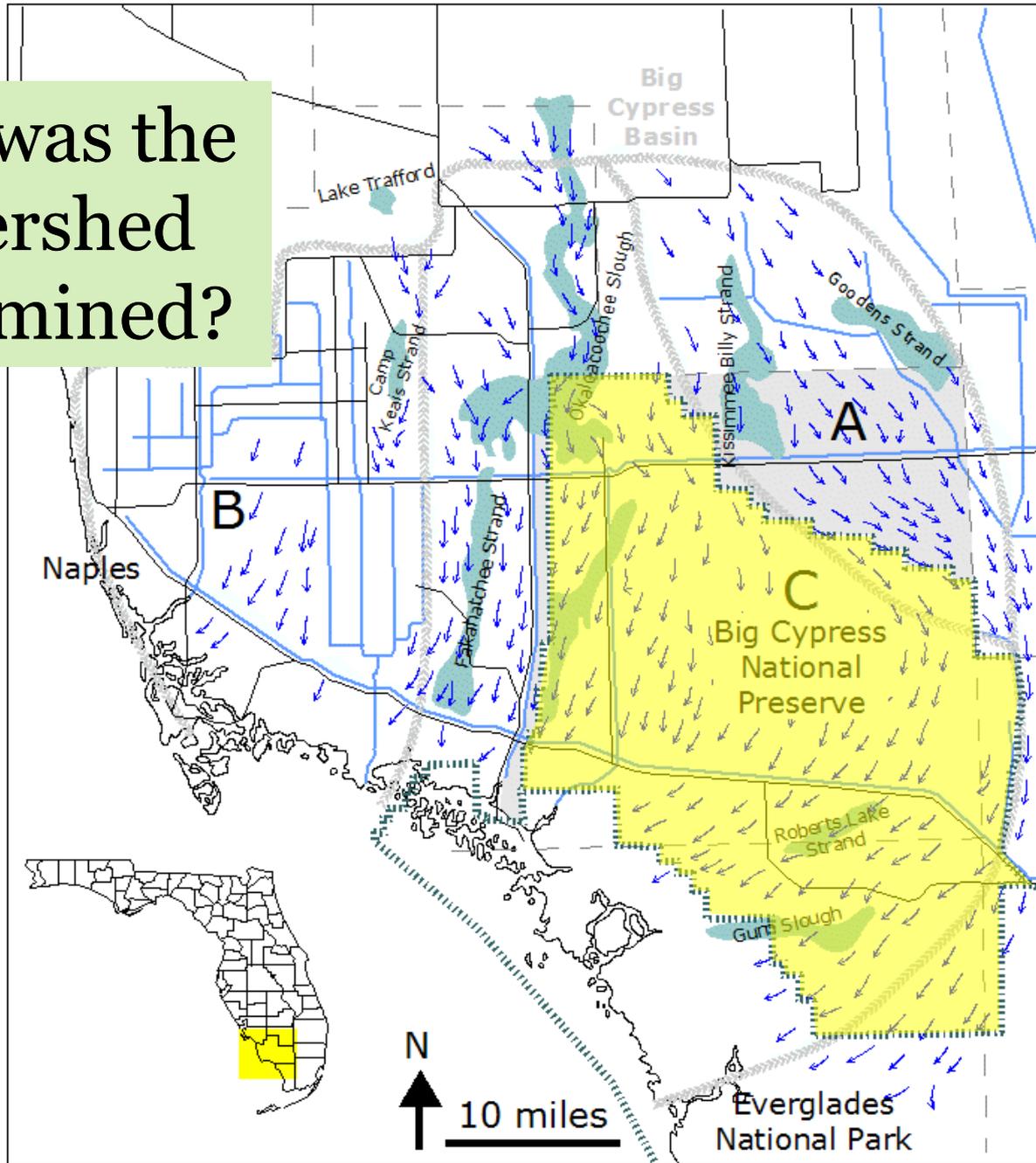
Klein Report, 1970

Klein Report, 1970



How was the watershed determined?

Klein Report, 1970



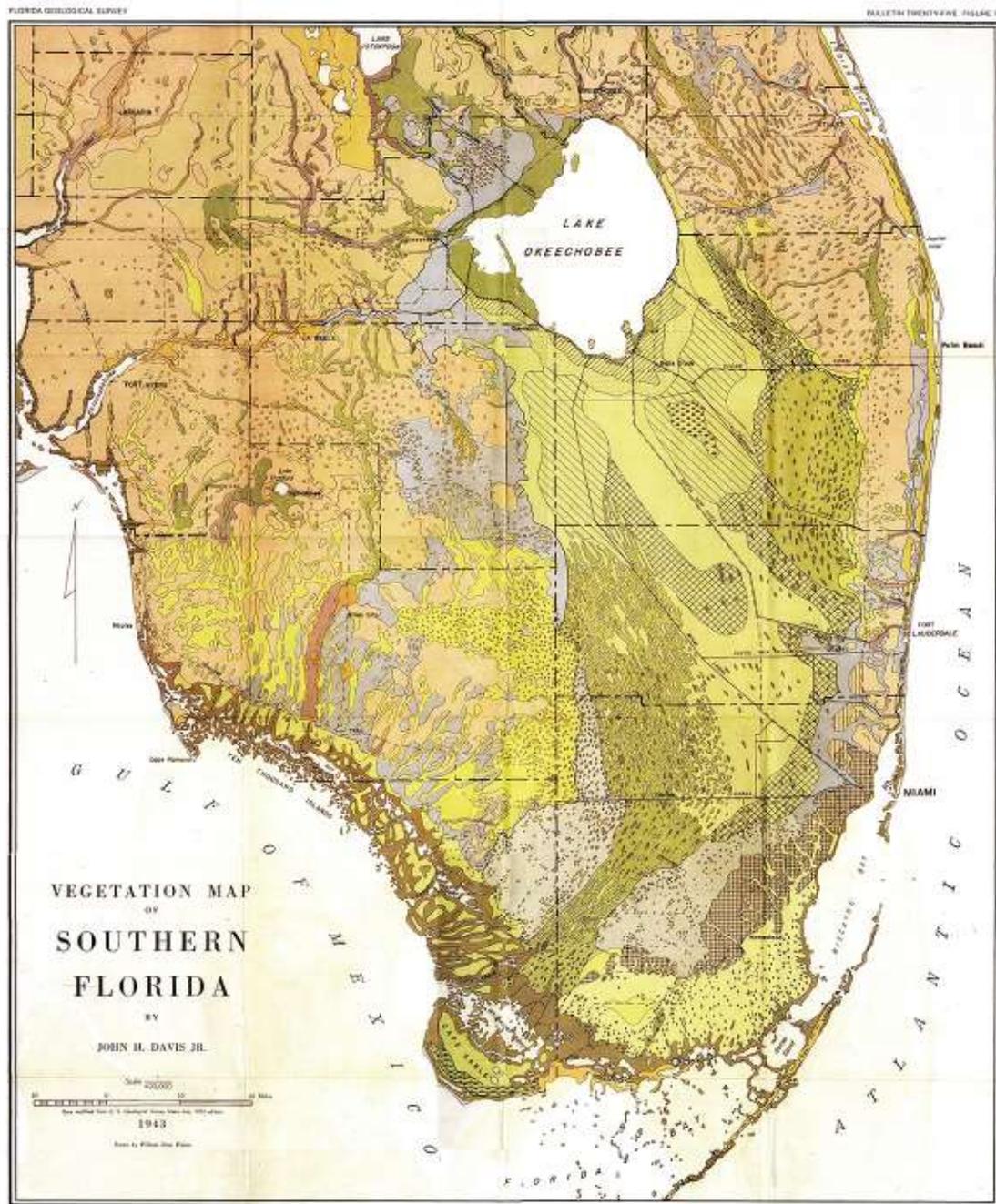
Boundaries and Drainage Patterns

The Big Cypress Swamp is a loosely defined but recognized physiographic province (Davis, 1943, fig. 1) southwest of lake Okeechobee. Some generalized flow patterns through the area were shown by Parker (1955, plate 11). Neither the physiographic boundaries nor the generalized flow patterns, however, are sufficient for the hydrologic interpretations required for this report.

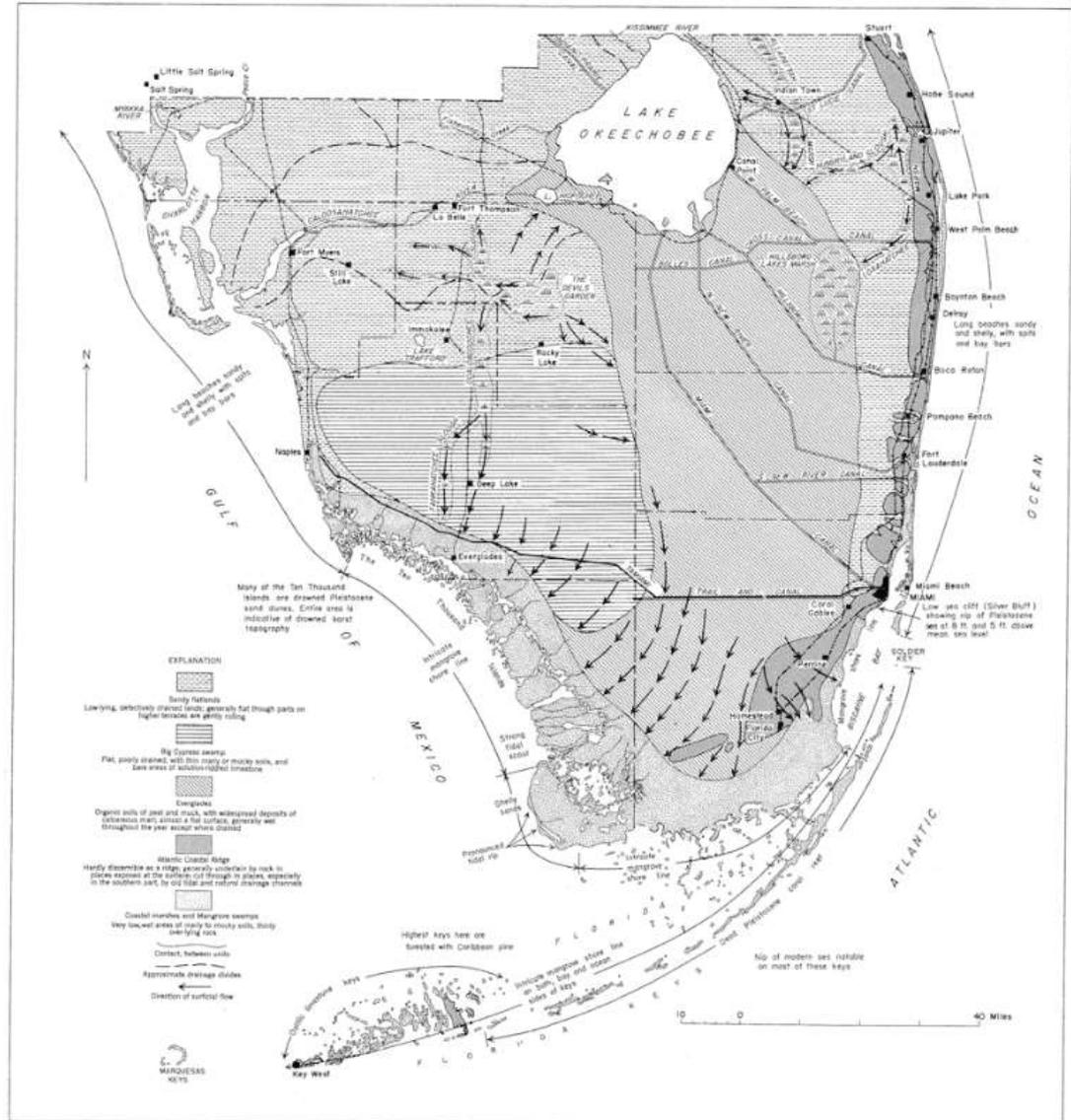
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Davis, 1943

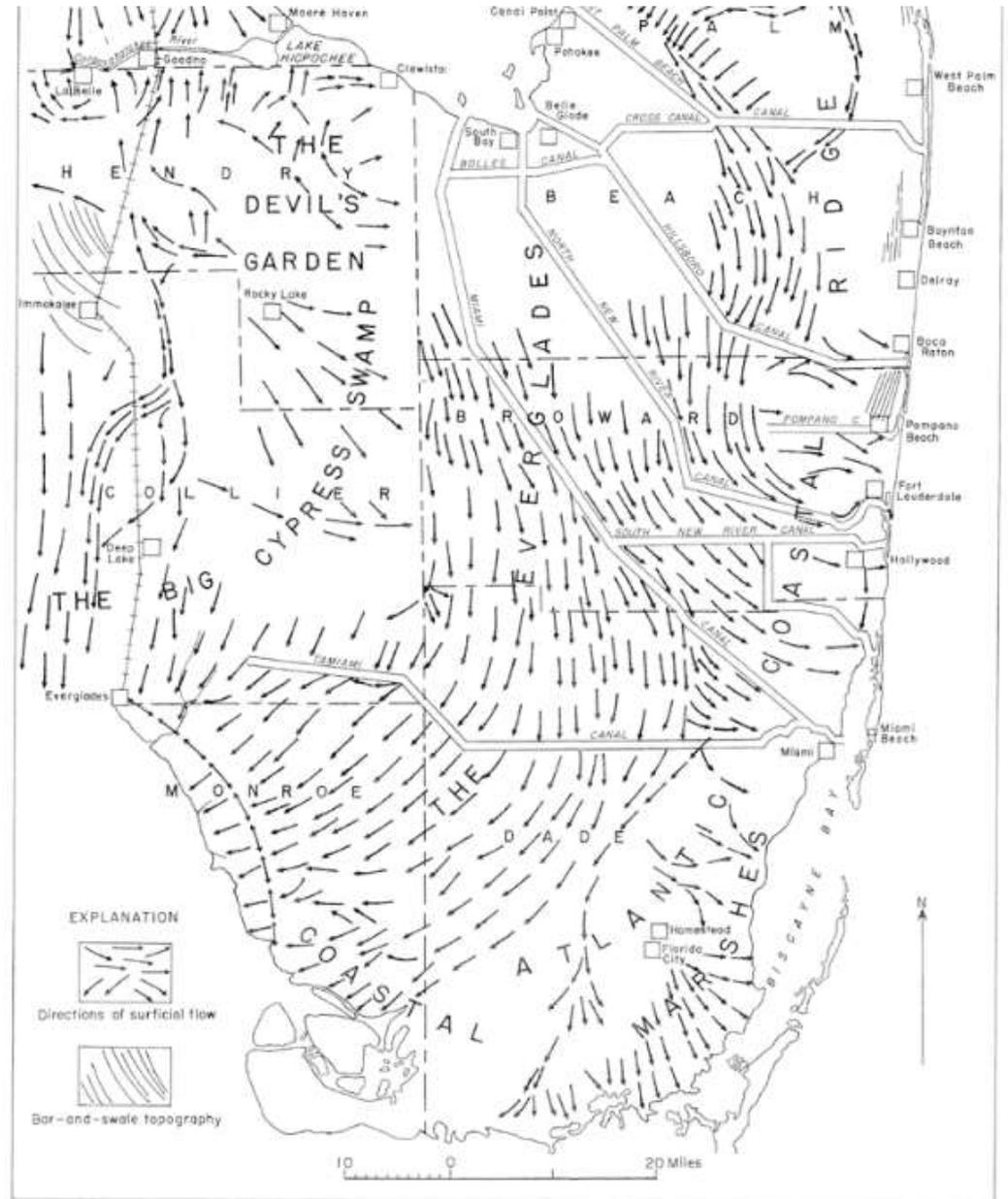


Parker, 1955



TOPOGRAPHIC-ECOLOGIC MAP OF SOUTHERN FLORIDA

Parker, 1955



MAP OF SOUTHEASTERN FLORIDA, SHOWING DIRECTIONS OF SURFICIAL DRAINAGE AND TRENDS OF BAR-AND-SWALE TOPOGRAPHY

Subarea C occupies the central part of the Big Cypress and drains toward the Park. It constitutes about three-fifths of the Big Cypress--1,450 square miles. At present, subarea C is drained naturally except for two canals in the western part, the Barron River and Turner River Canals.

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Myth of rain driven
swamp is born

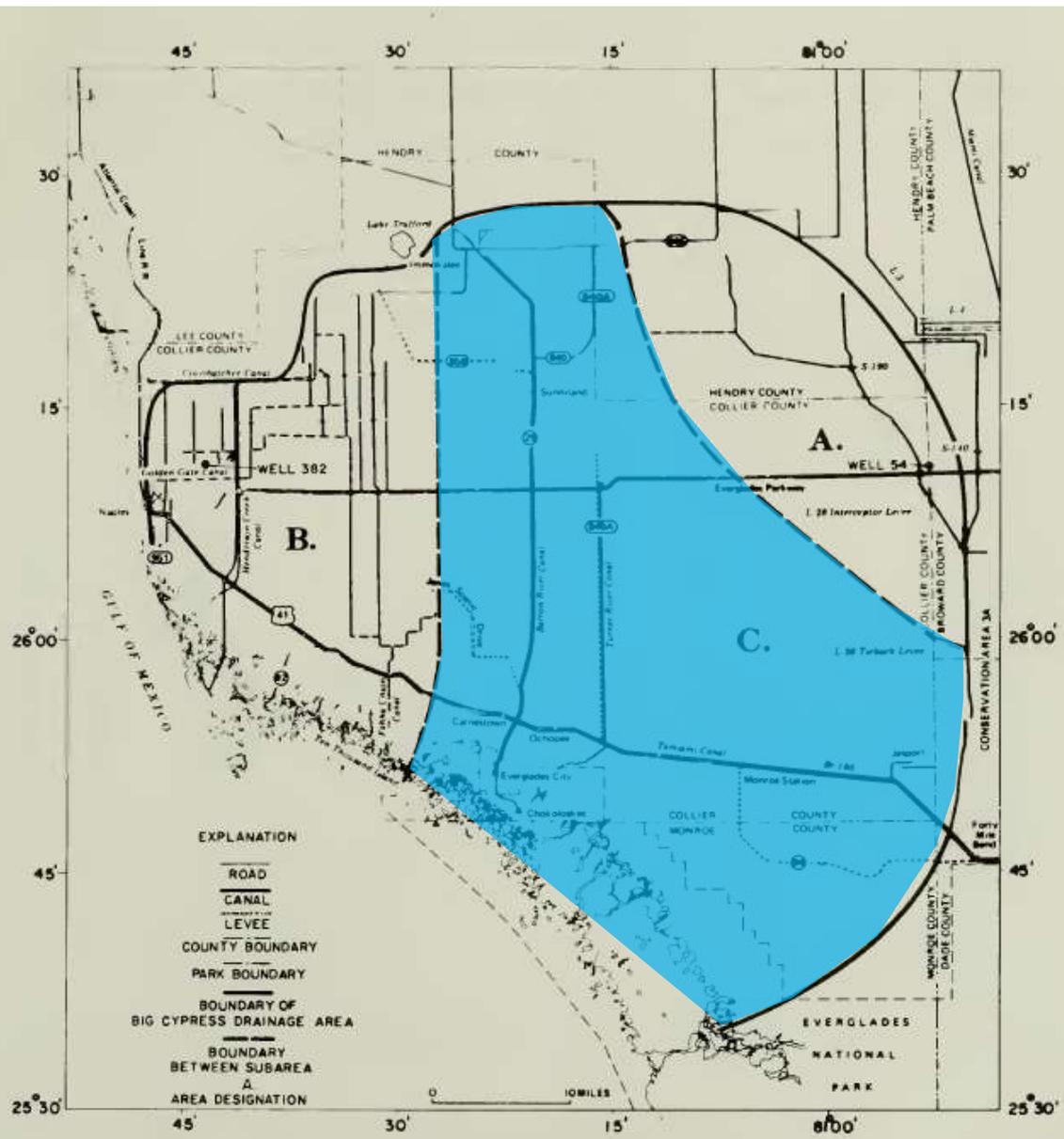
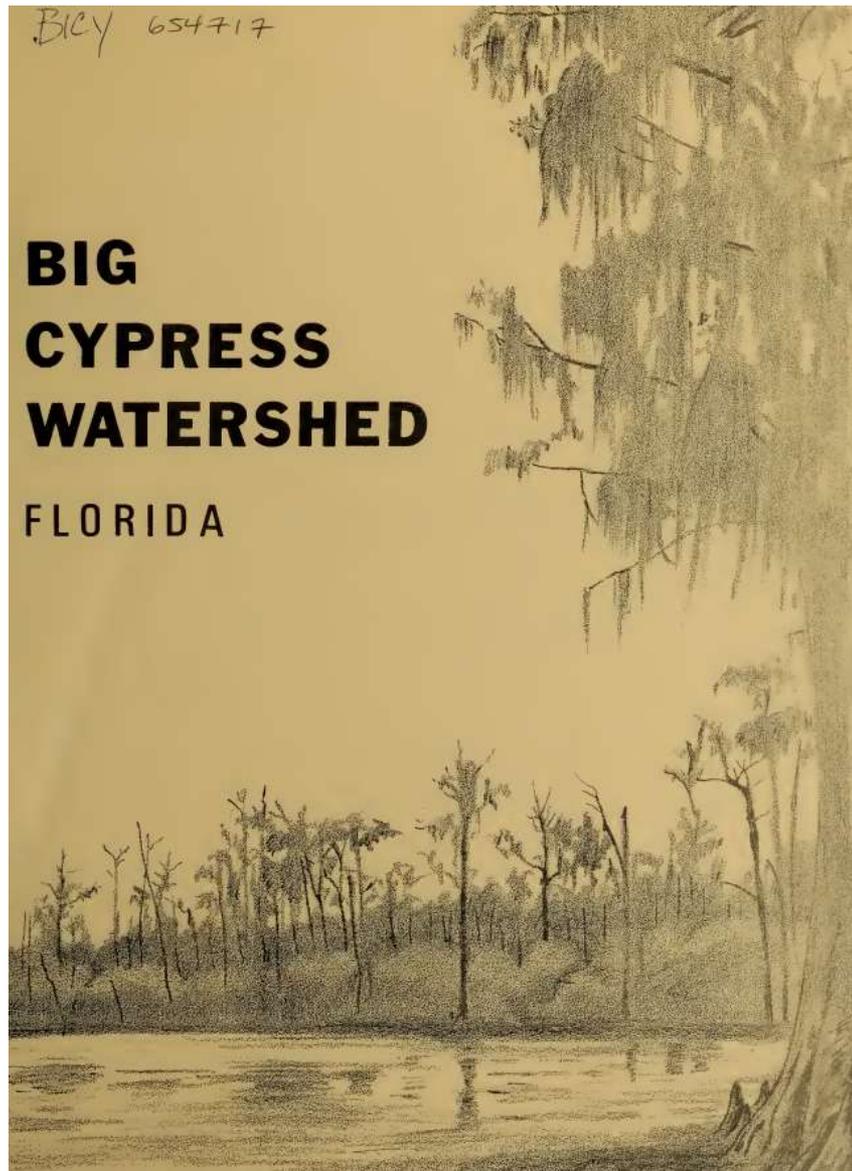
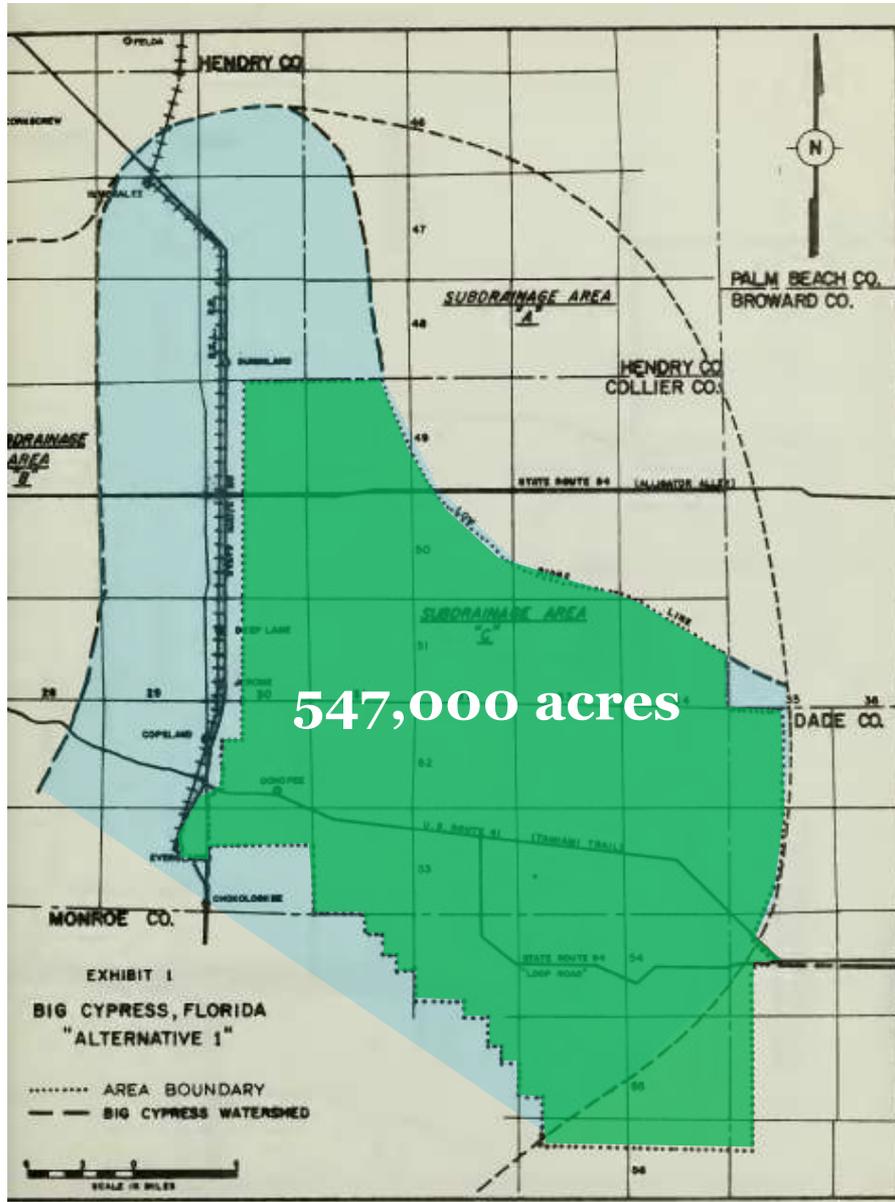
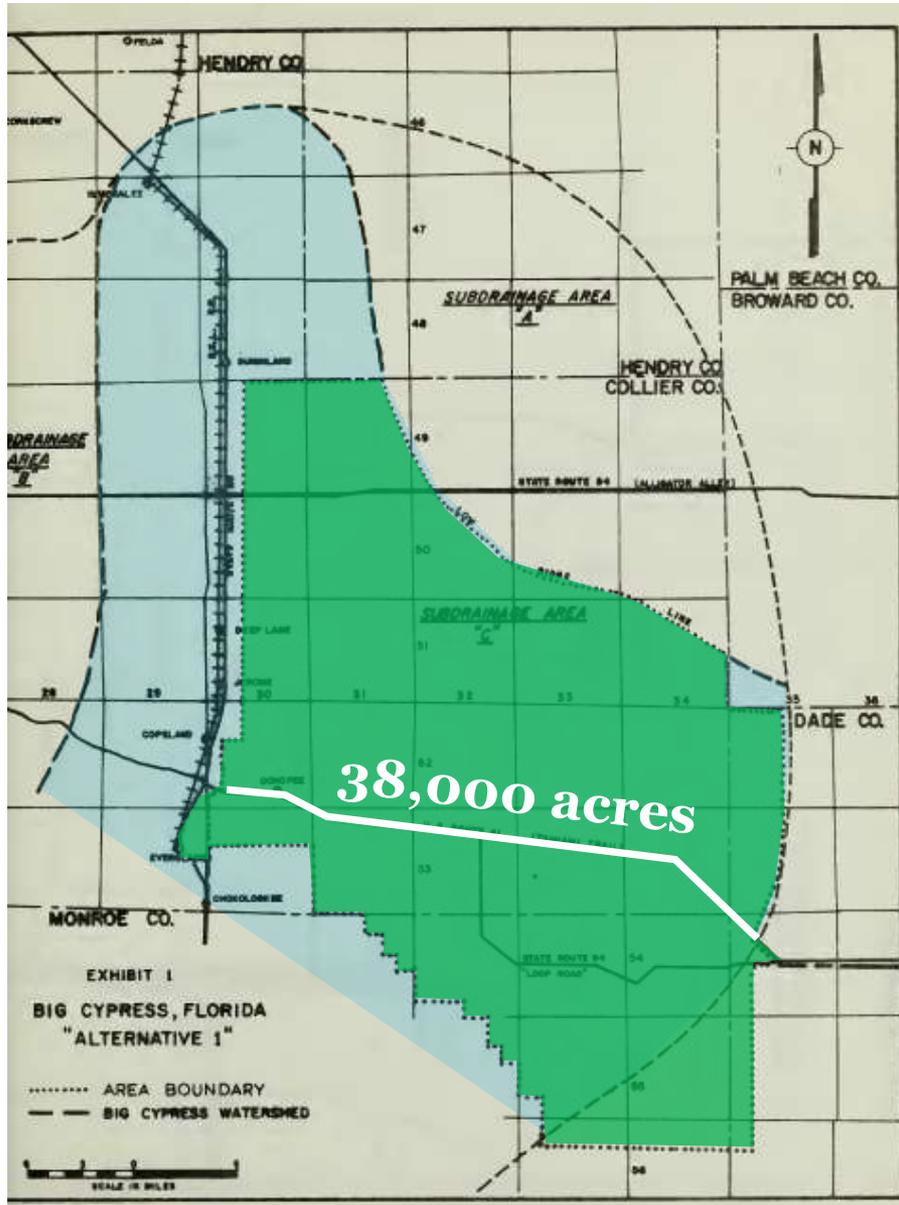


Figure 1.--Map of the Big Cypress showing the delineations of the drainage area and the subareas.

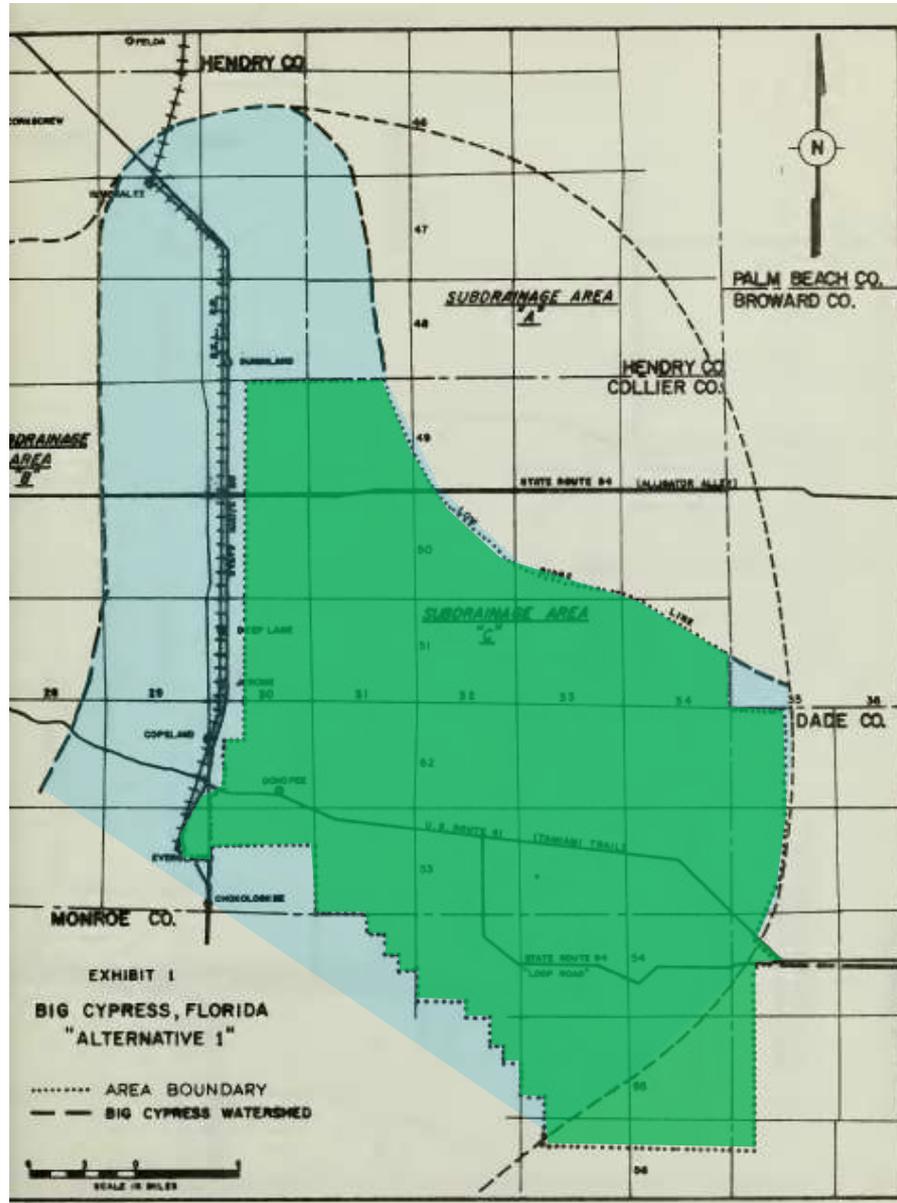


Jetport Advisory Board Report, 1971

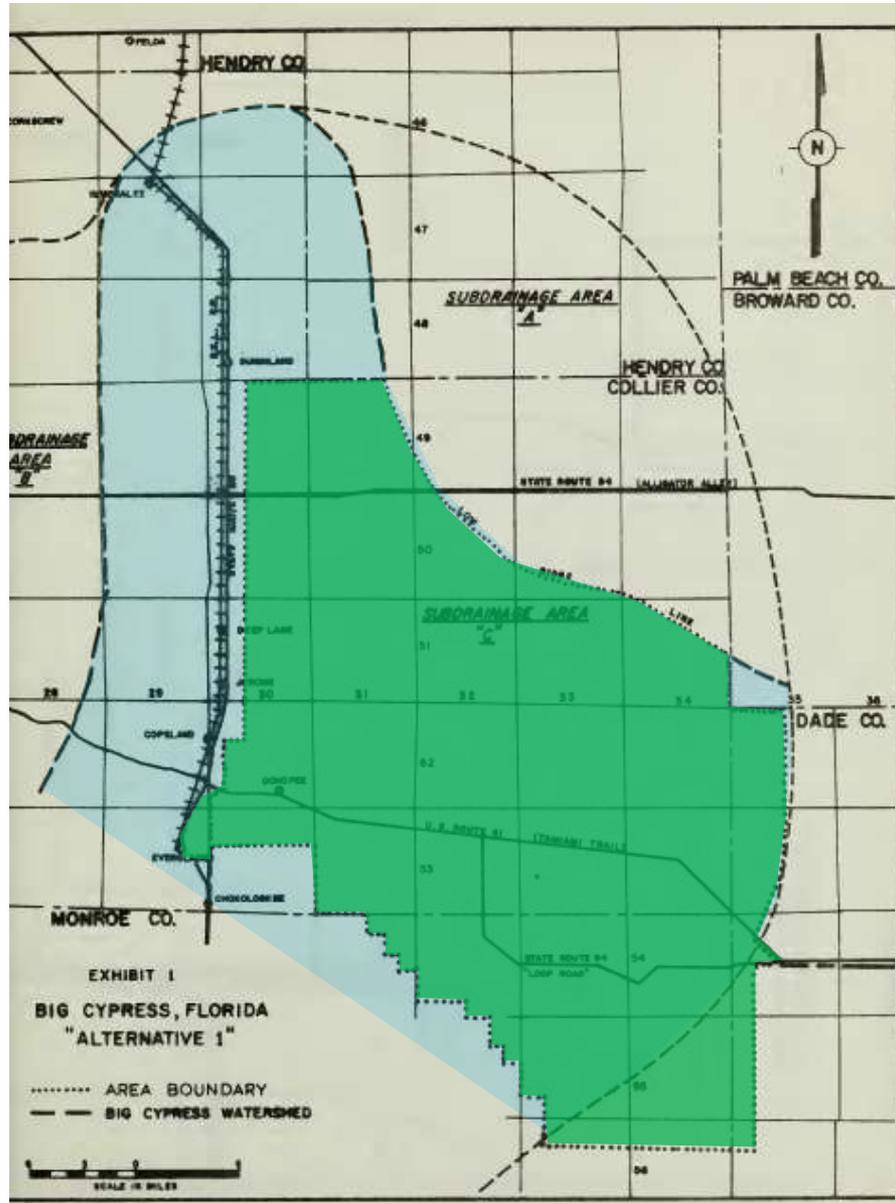




Tamiami Trail National Parkway



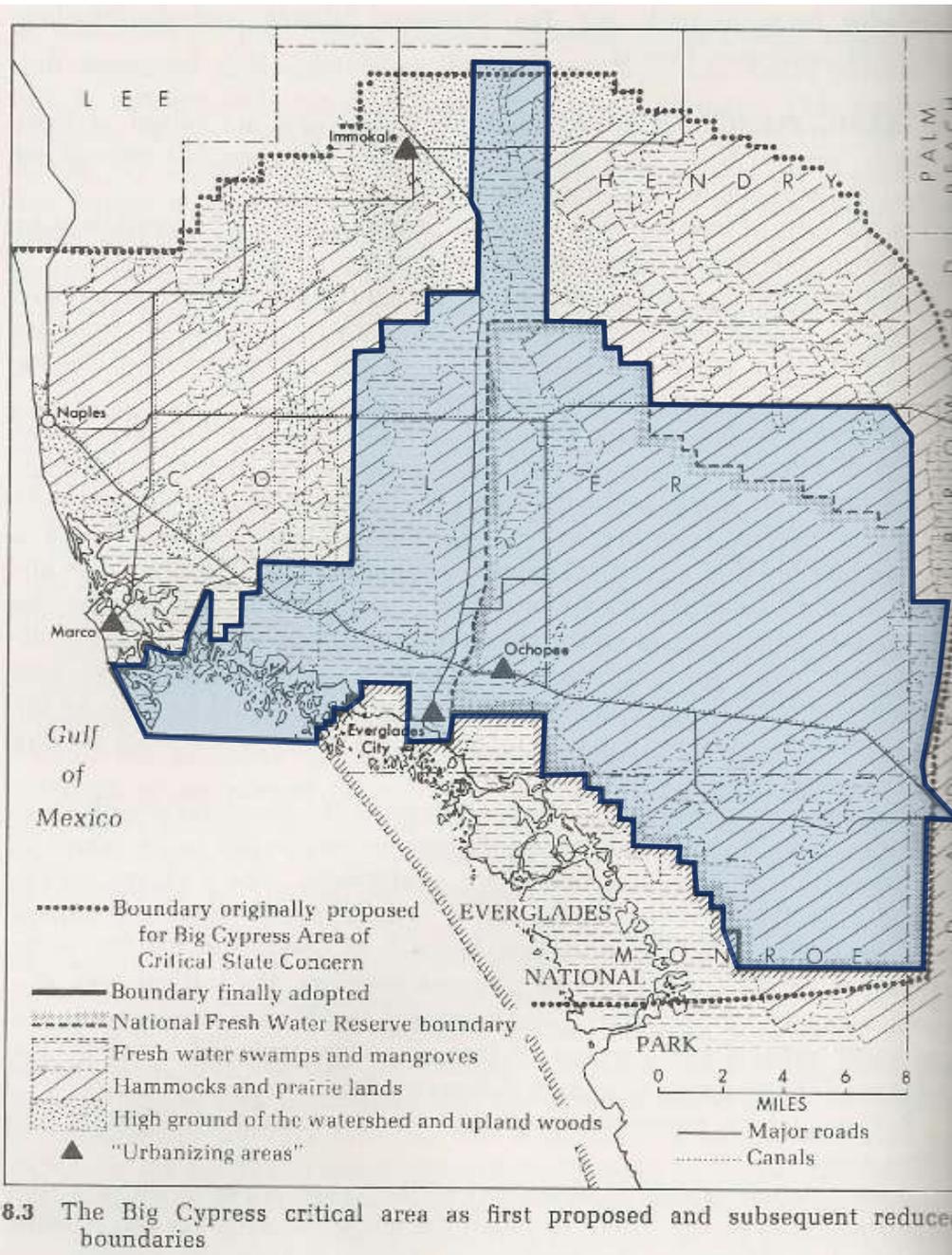
Everglades-Big Cypress Recreation Area



Big Cypress National **Freshwater** Reserve



Big Cypress Conservation Act, 1973

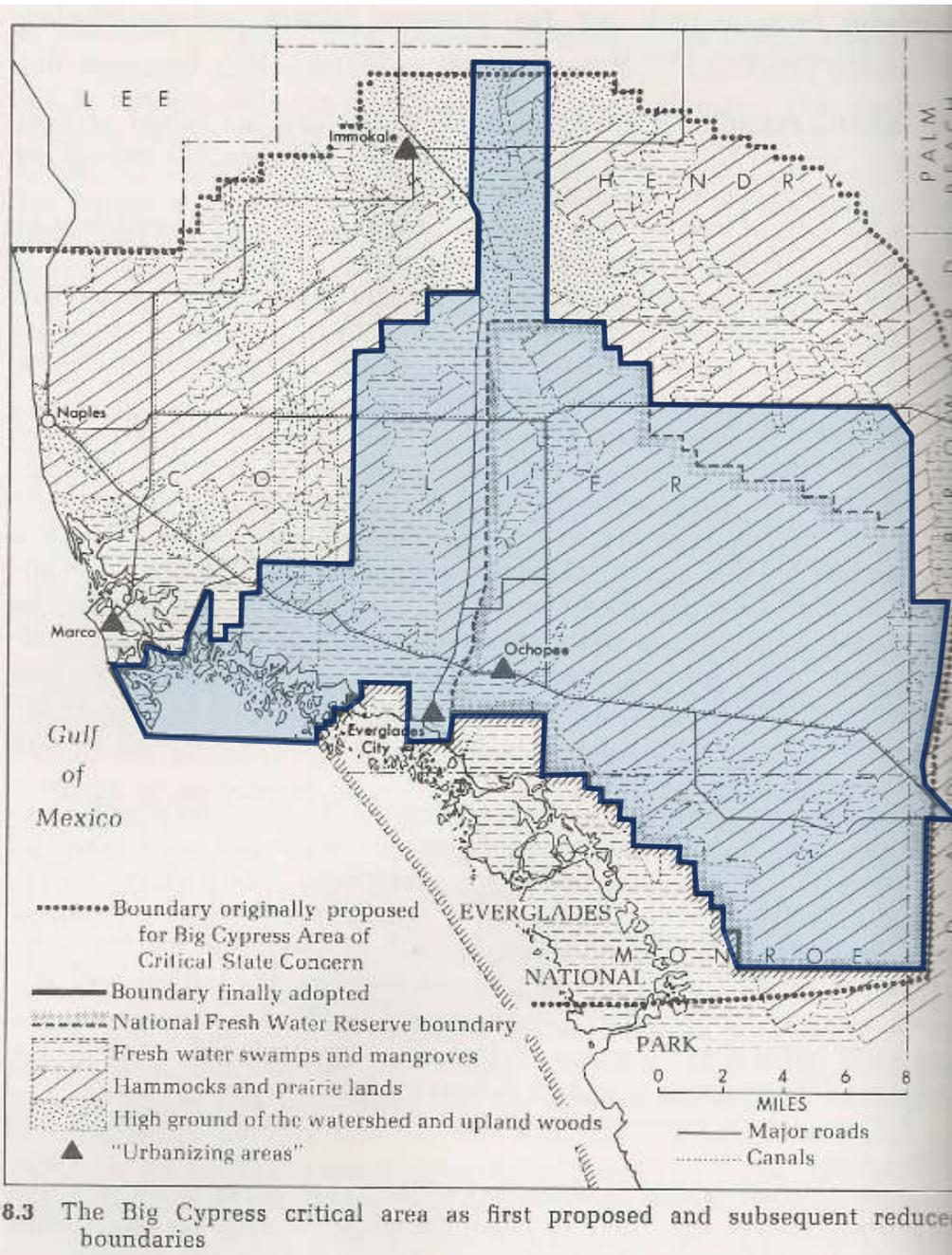


Big Cypress Area of Critical Concern (state law)

8.3 The Big Cypress critical area as first proposed and subsequent reduced boundaries



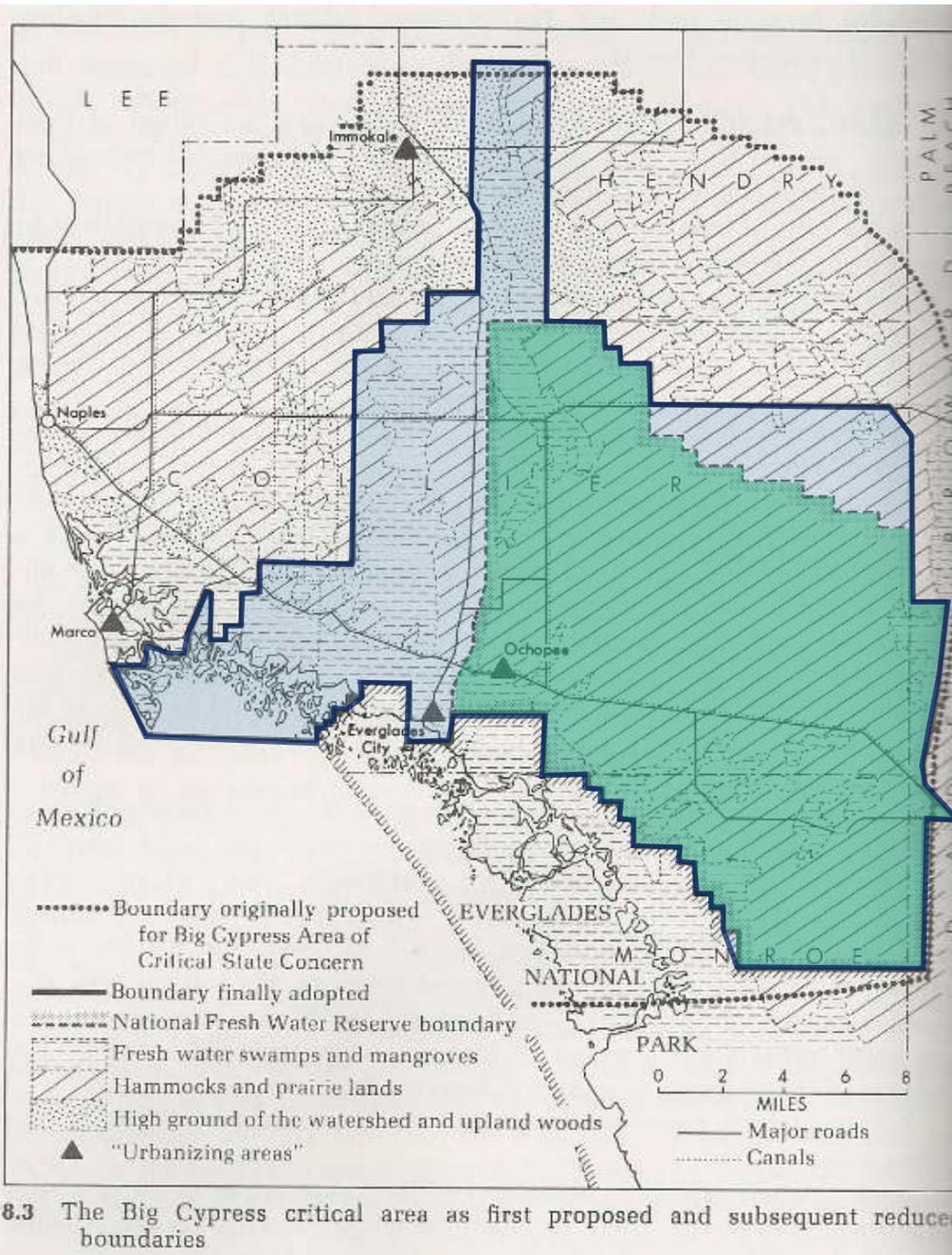
Public Law 93-440, 1974



Big Cypress Area of Critical Concern (state law)

Big Cypress National Preserve (federal law)

8.3 The Big Cypress critical area as first proposed and subsequent reduced boundaries



■ Big Cypress Area of Critical Concern (state law)

■ Big Cypress National Preserve (federal law)

8.3 The Big Cypress critical area as first proposed and subsequent reduced boundaries

Enabling Legislation

An Act to establish the Big Cypress National Preserve in the State of Florida, and for other purposes. (88 Stat. 1255) (P.L. 93-440)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) in order to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof, the Big Cypress National Preserve is hereby established.

Legislative History of Public Law 93-440

01 18111.

Basically, the watershed can be divided into three subbasins. The central subbasin, however, remains relatively undisturbed by man. Here, except for two canals, water feeds naturally from the Big Cypress Swamp through the western portion of the Everglades National Park. It is in this subbasin that the entire Big Cypress National Preserve will be located if authorized as recommended by the Committee on Interior and Insular Affairs.

More Legislative History

P.L. 93-440

C. The Big Cypress National Preserve

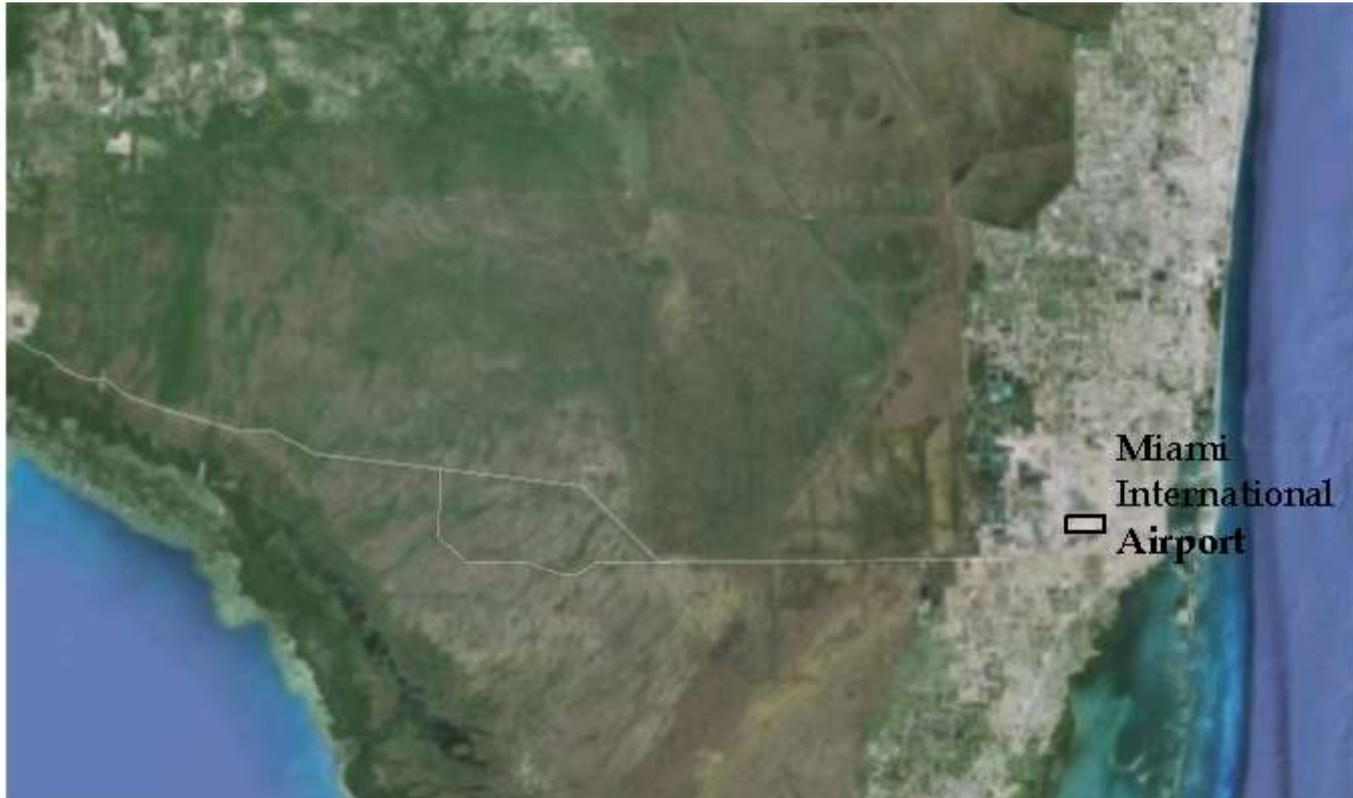
The proposed Big Cypress National Preserve is a large, complex, mostly undeveloped portion of the original watershed. Coupled with the contiguous northwestern portion of the Everglades National Park and its estuary, it is said to form a nearly complete hydrologic unit. Although the preserve is characteristic of the entire watershed, it is

1974

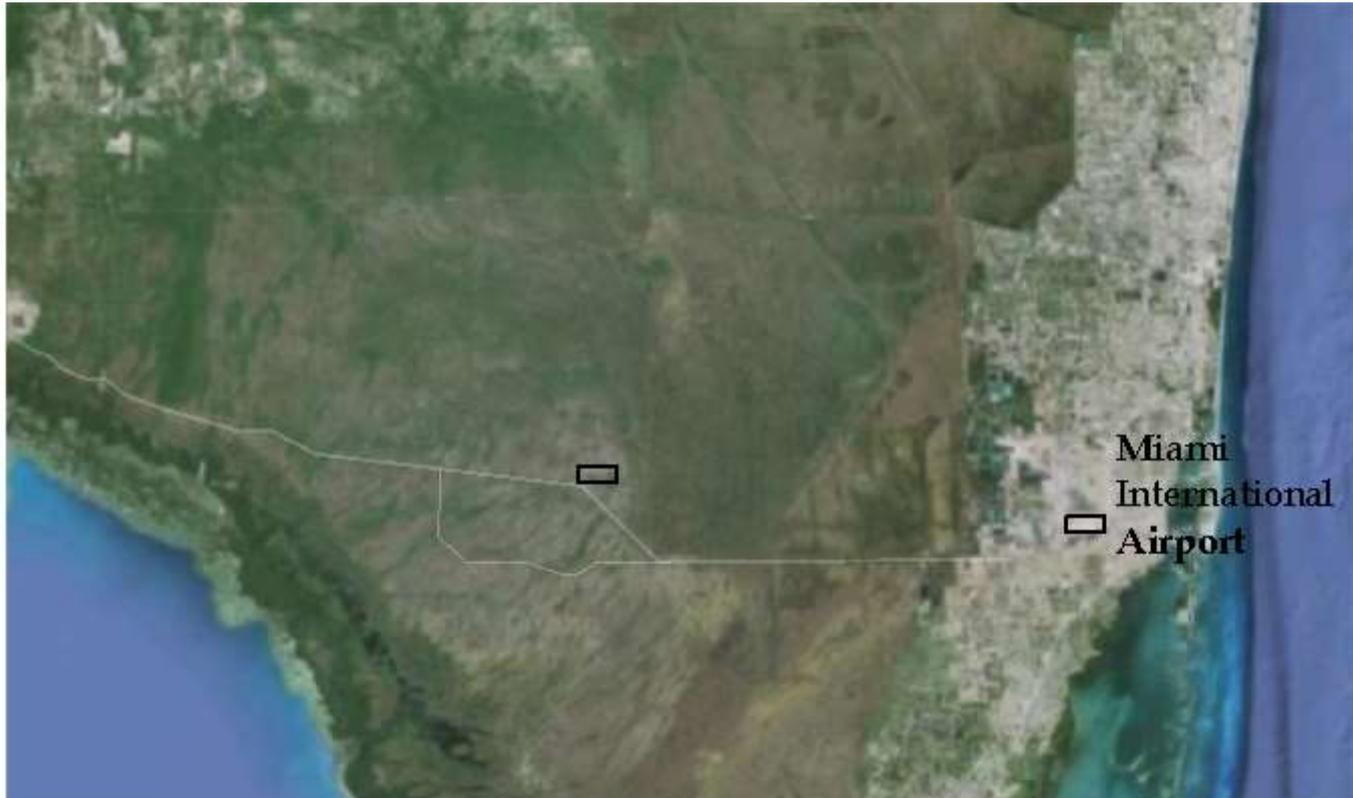
Reality

What actually
happened

Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



Construction Chronology



1968

Big Cypress **inherited** an altered Landscape



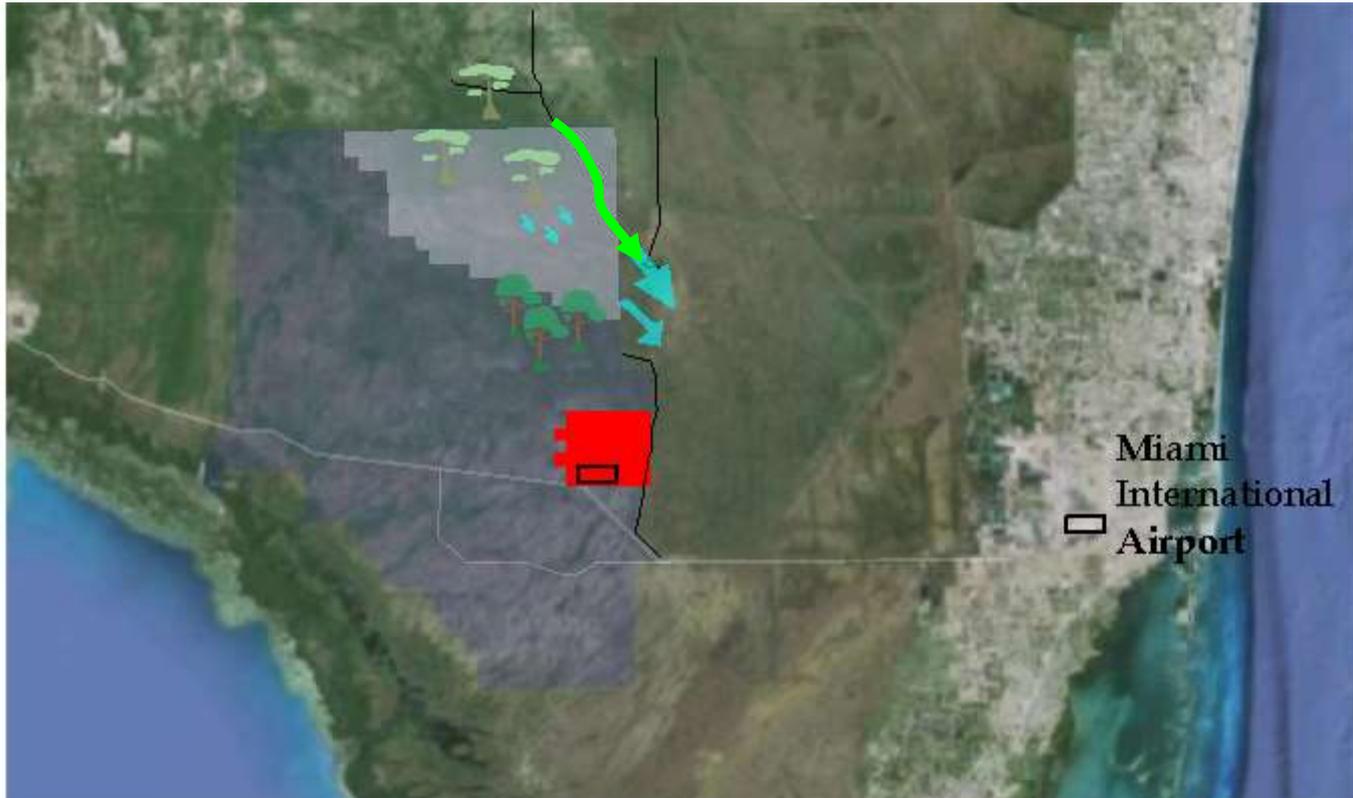
Map View

Big Cypress **inherited** an altered Landscape



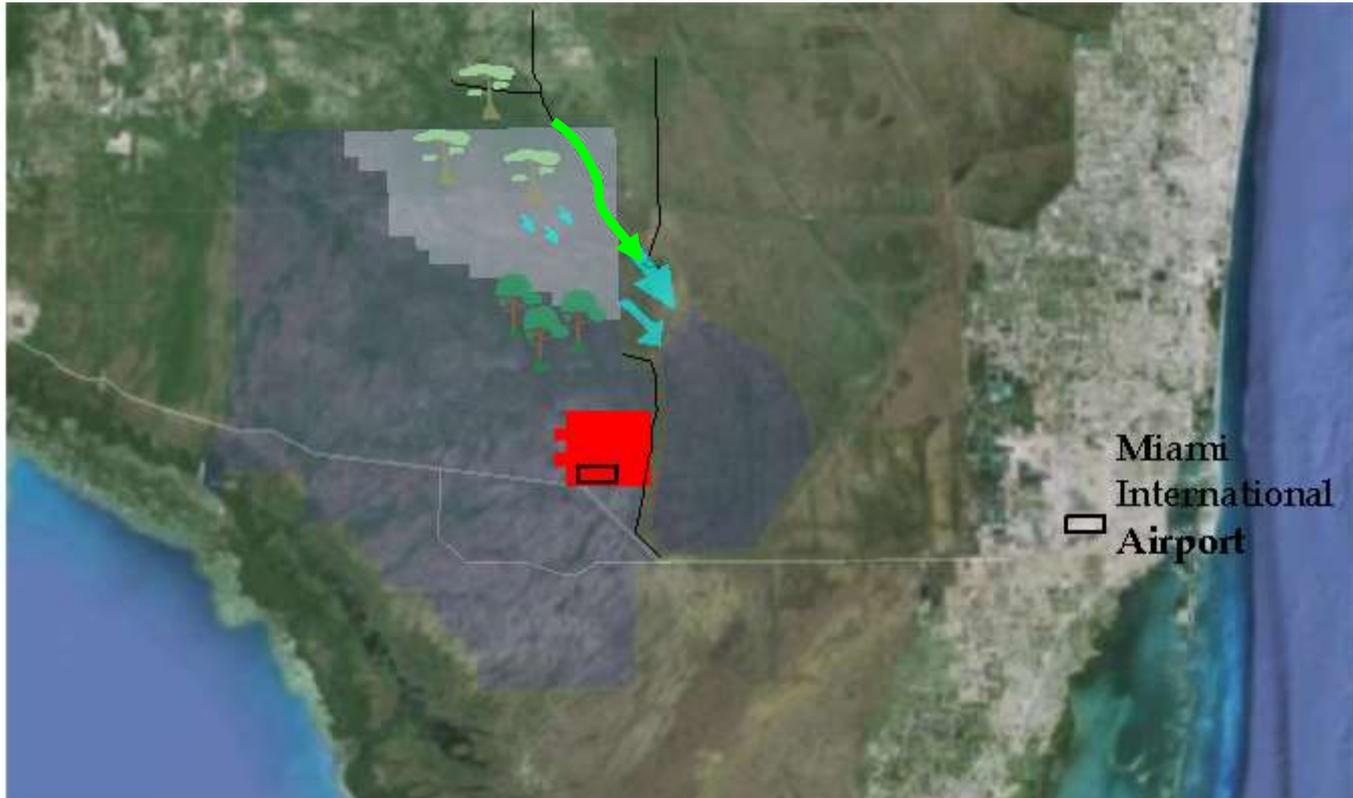
Map View

Big Cypress **inherited** an altered Landscape



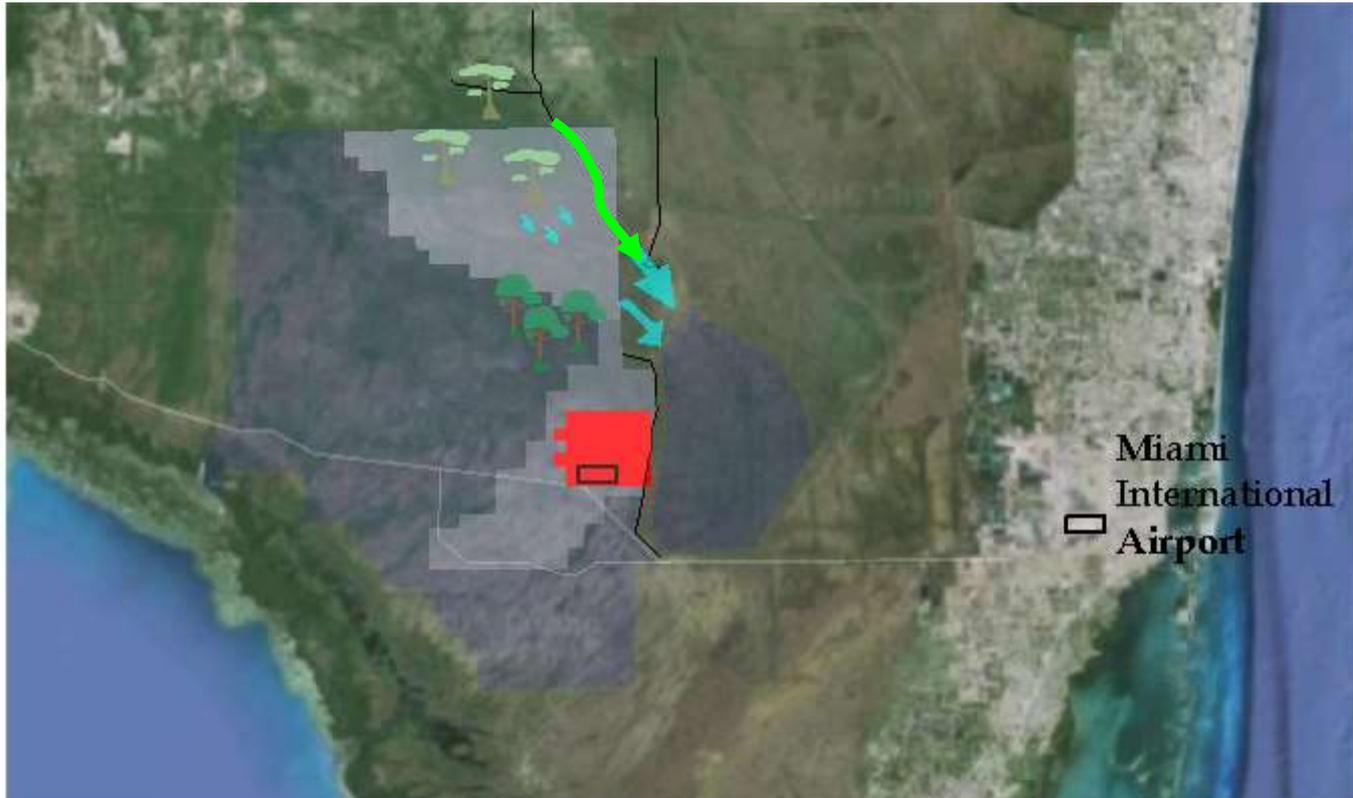
Map View

Big Cypress **inherited** an altered Landscape



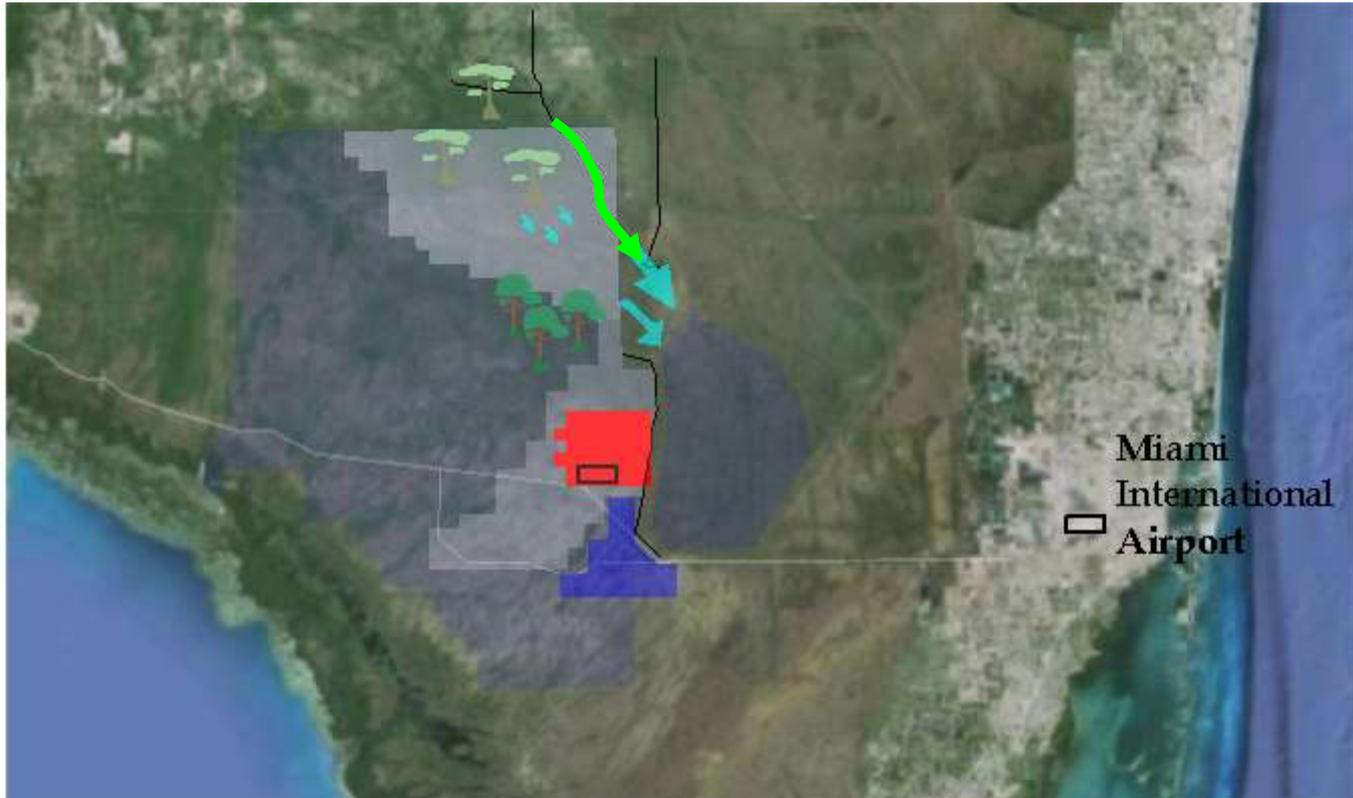
Map View

Big Cypress **inherited** an altered Landscape



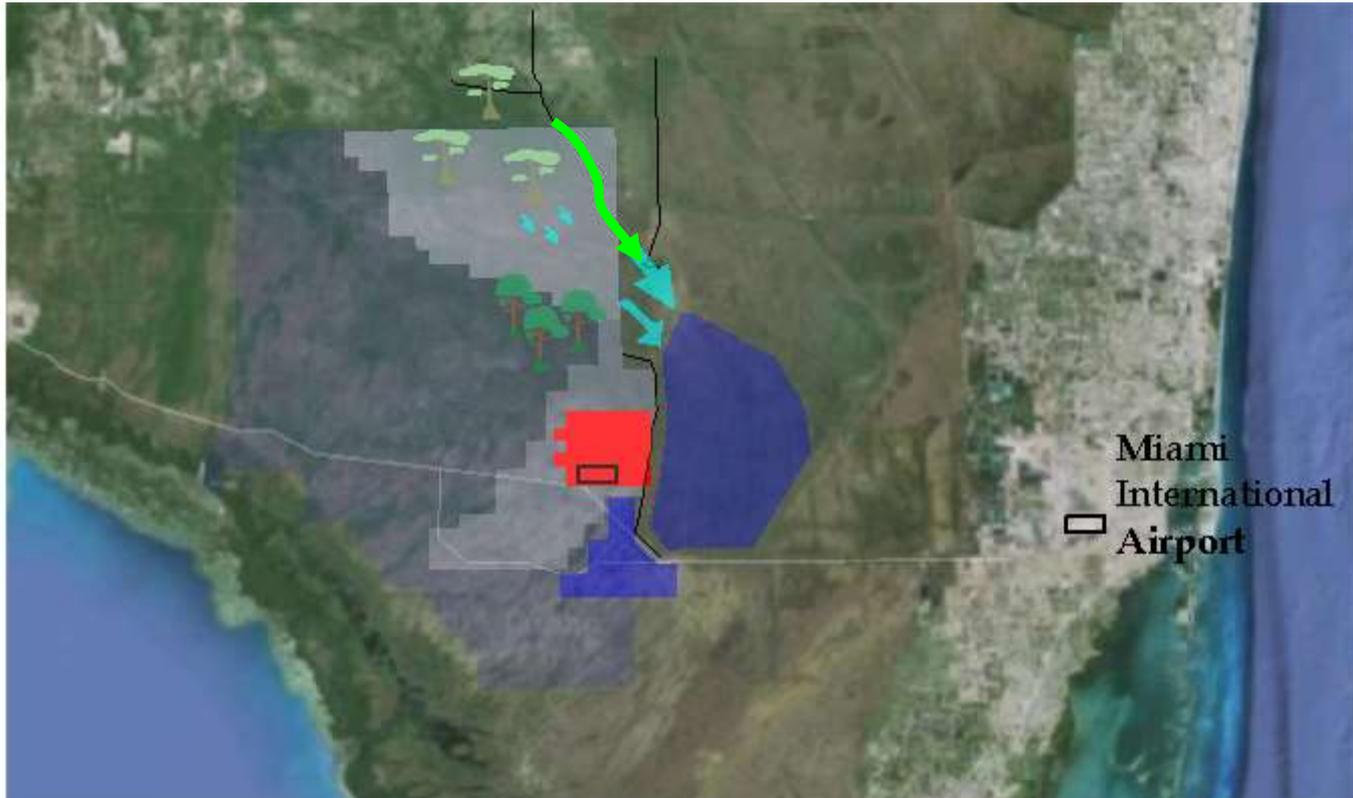
Map View

Big Cypress **inherited** an altered Landscape



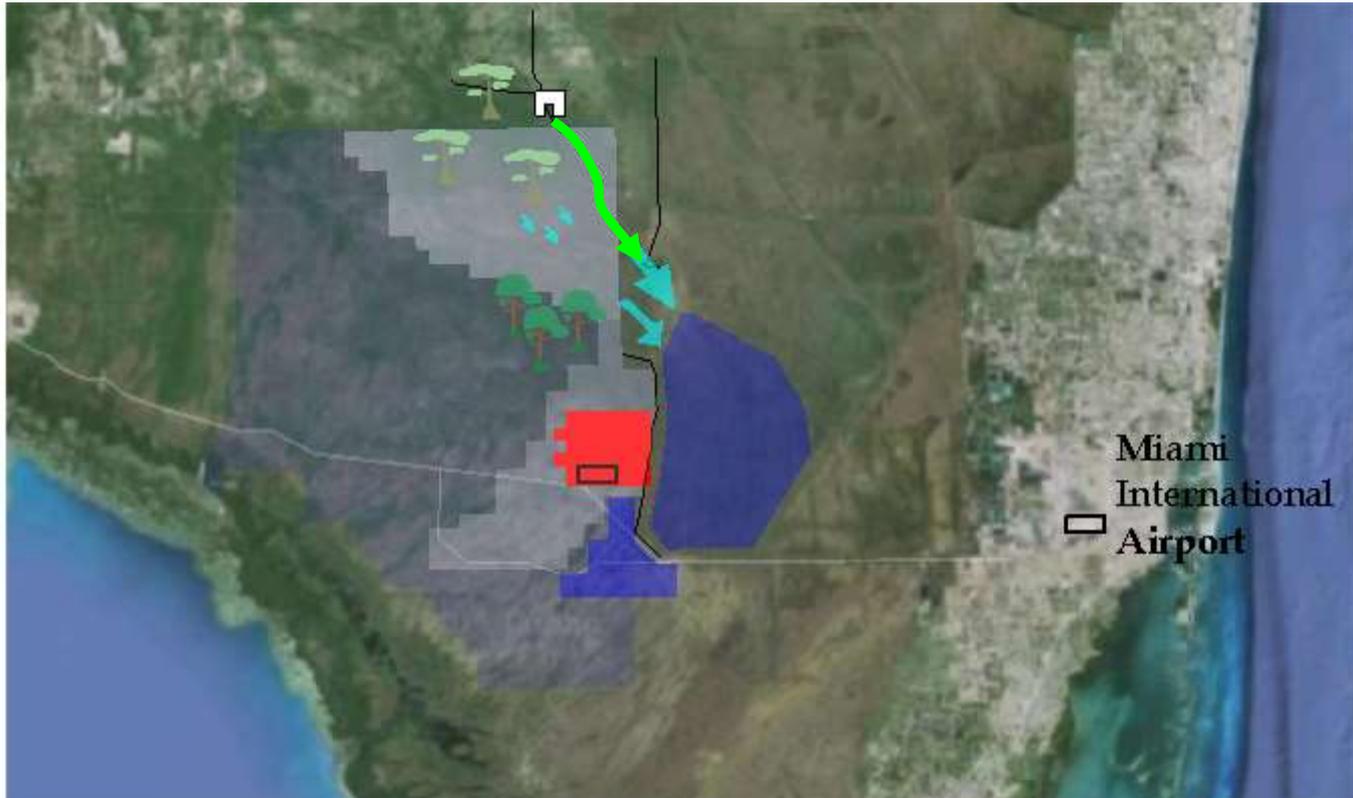
Map View

Big Cypress **inherited** an altered Landscape



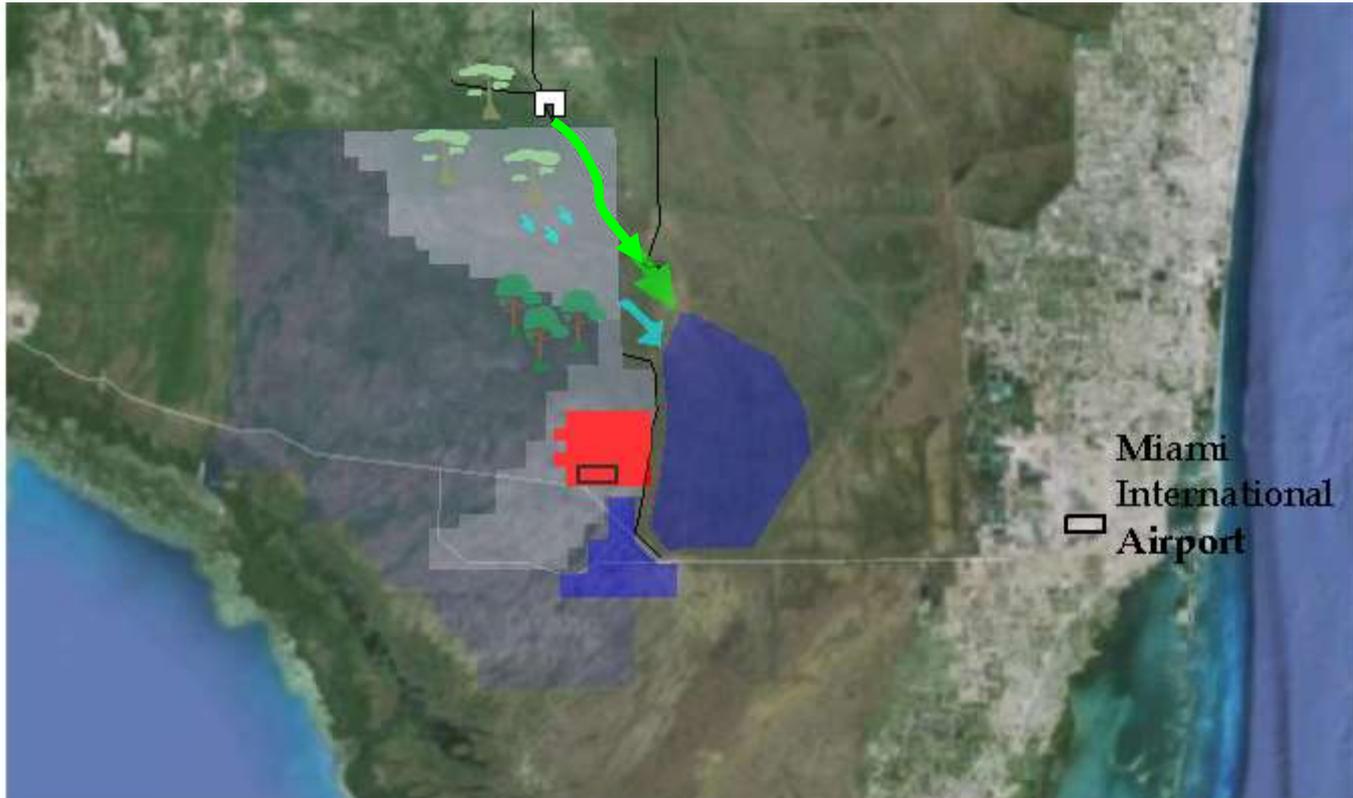
Map View

Big Cypress **inherited** an altered Landscape



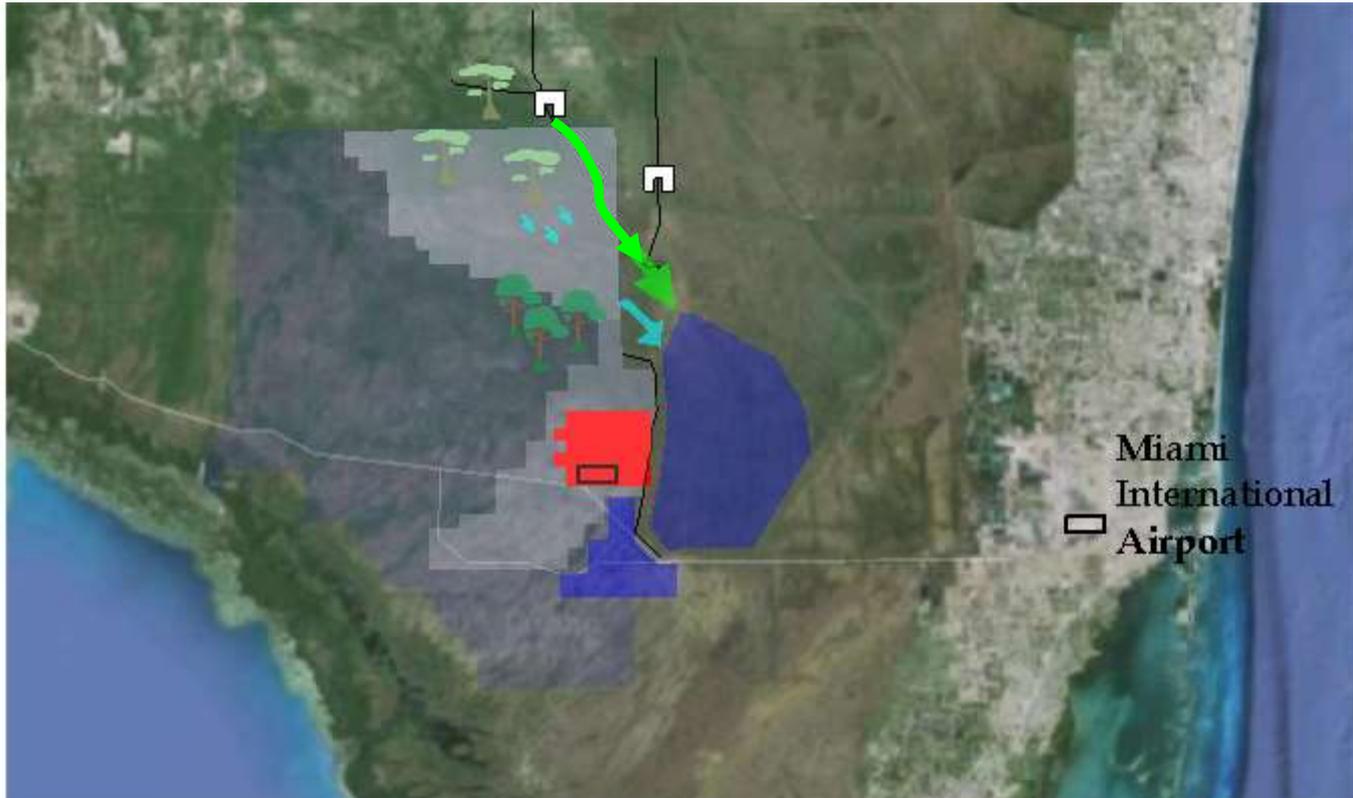
Map View

Big Cypress **inherited** an altered Landscape



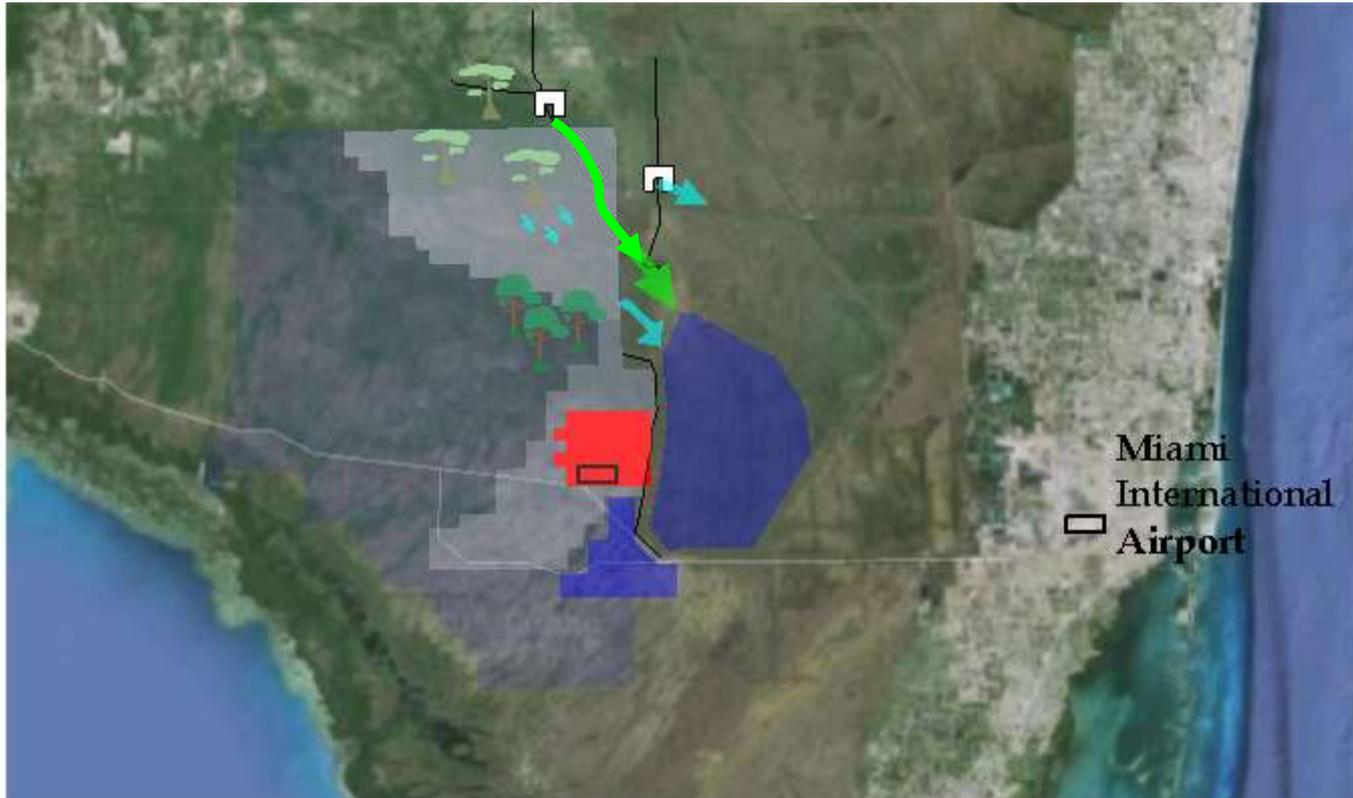
Map View

Big Cypress **inherited** an altered Landscape



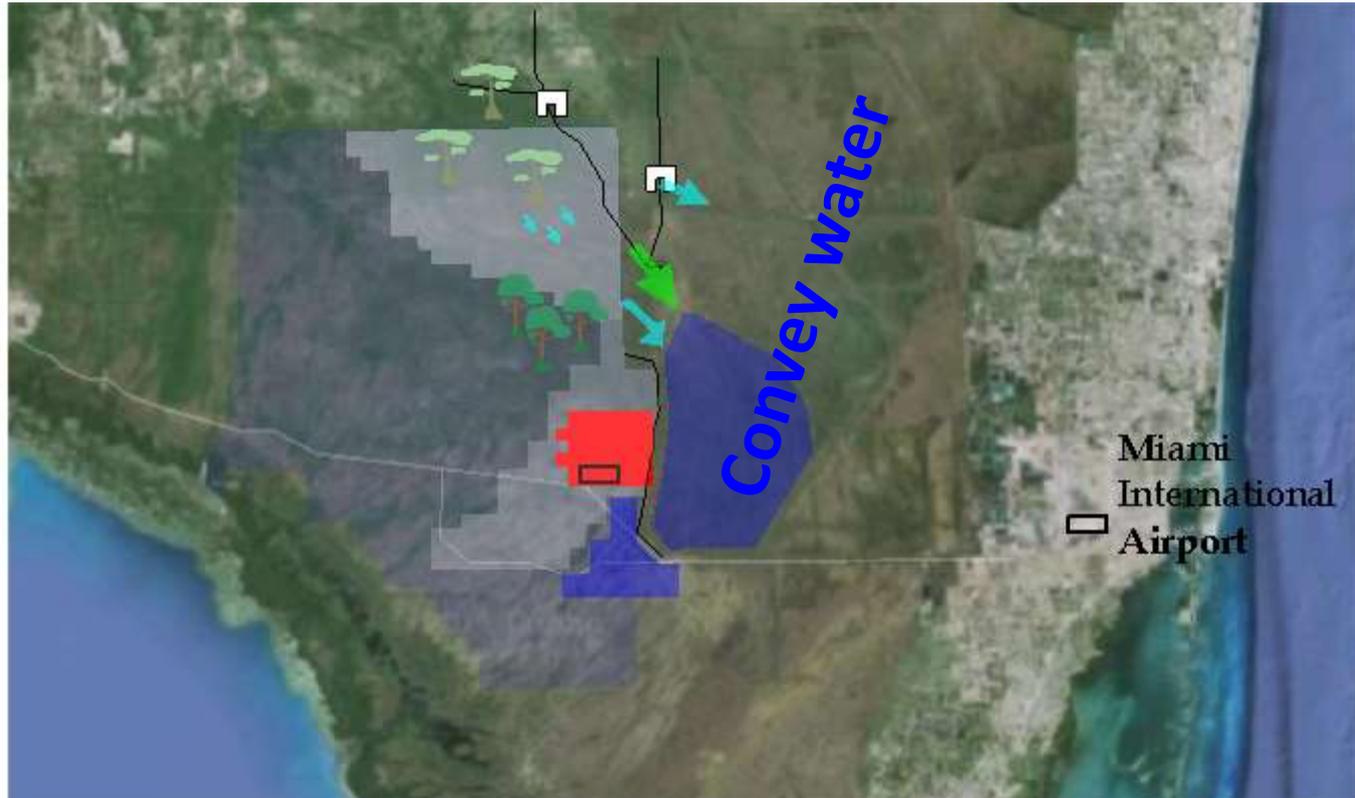
Map View

Big Cypress **inherited** an altered Landscape



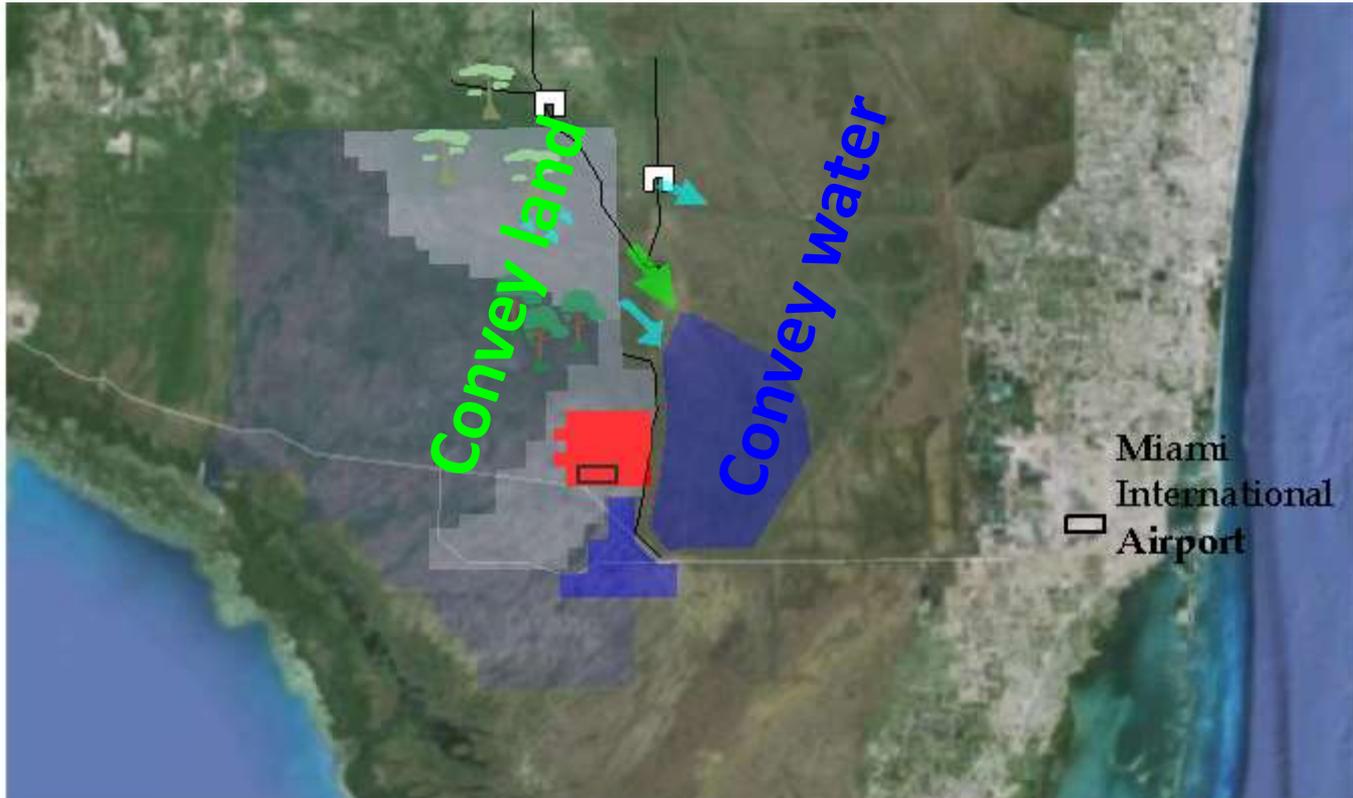
Map View

Big Cypress **inherited** an altered Landscape



Map View

Big Cypress **inherited** an altered Landscape



Map View

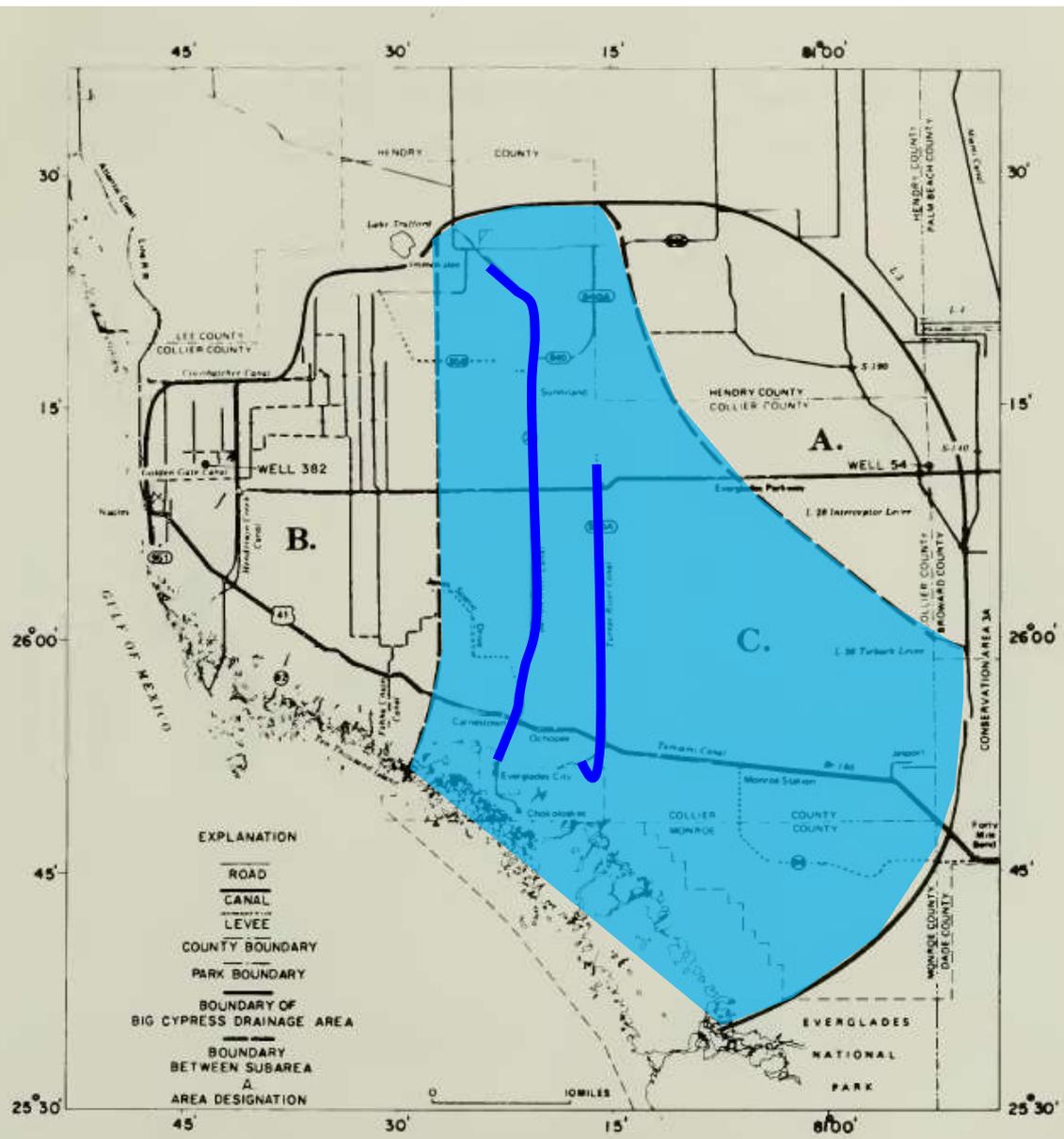


Figure 1.--Map of the Big Cypress showing the delineations of the drainage area and the subareas.

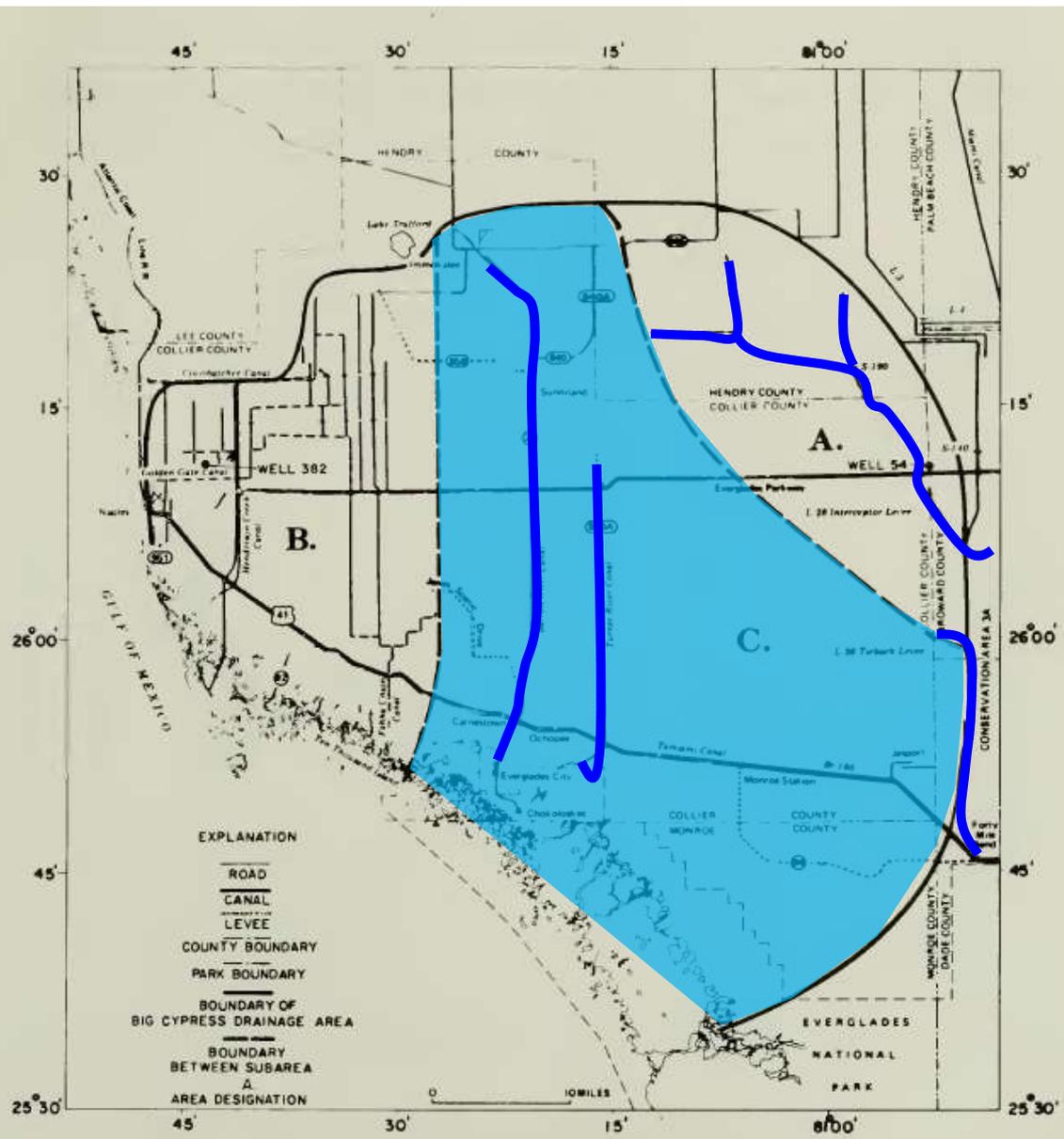


Figure 1.--Map of the Big Cypress showing the delineations of the drainage area and the subareas.



**Not a self-
contained
rain-driven
watershed**

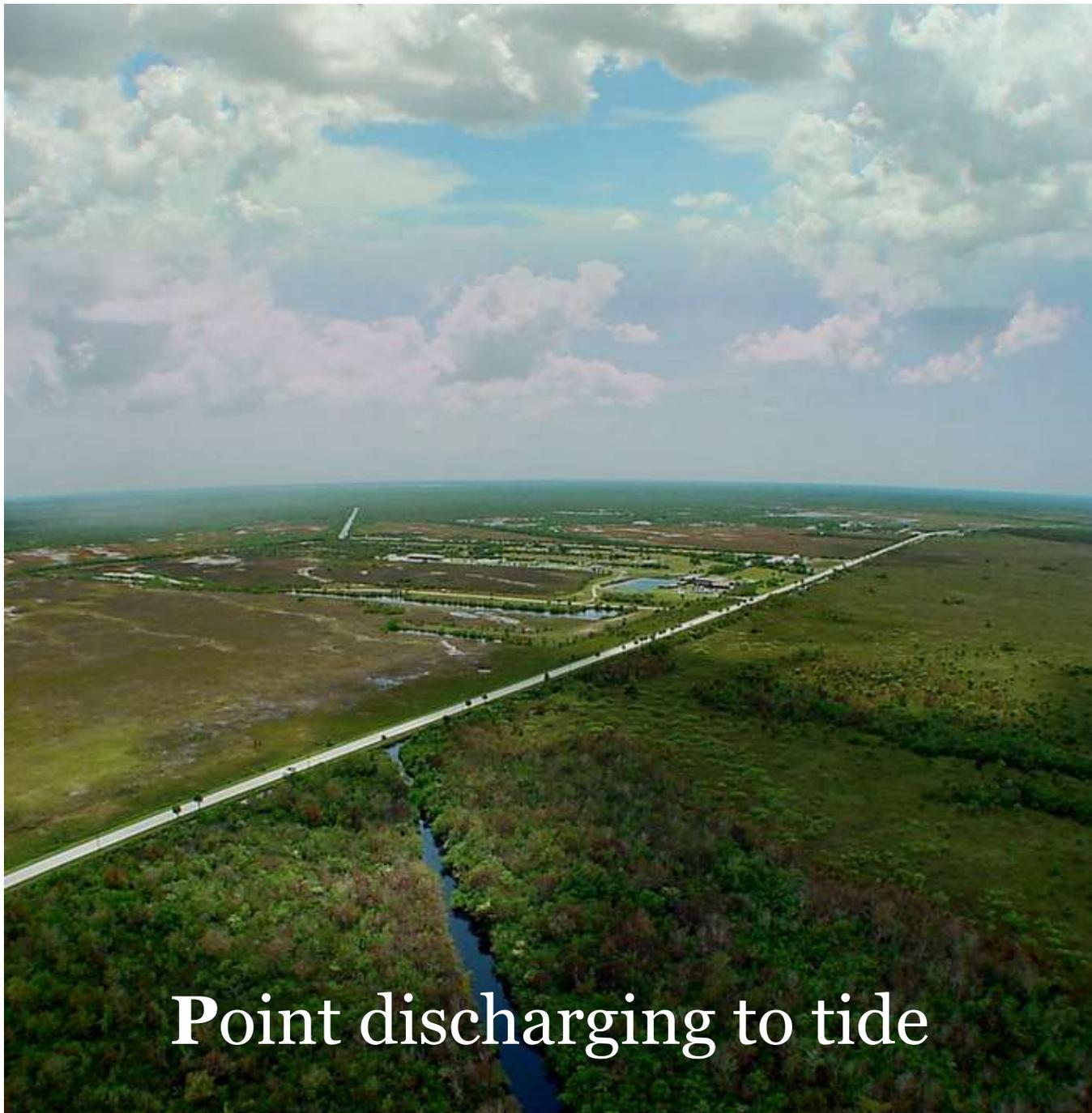


**Truncated and
canal-drained
watershed**

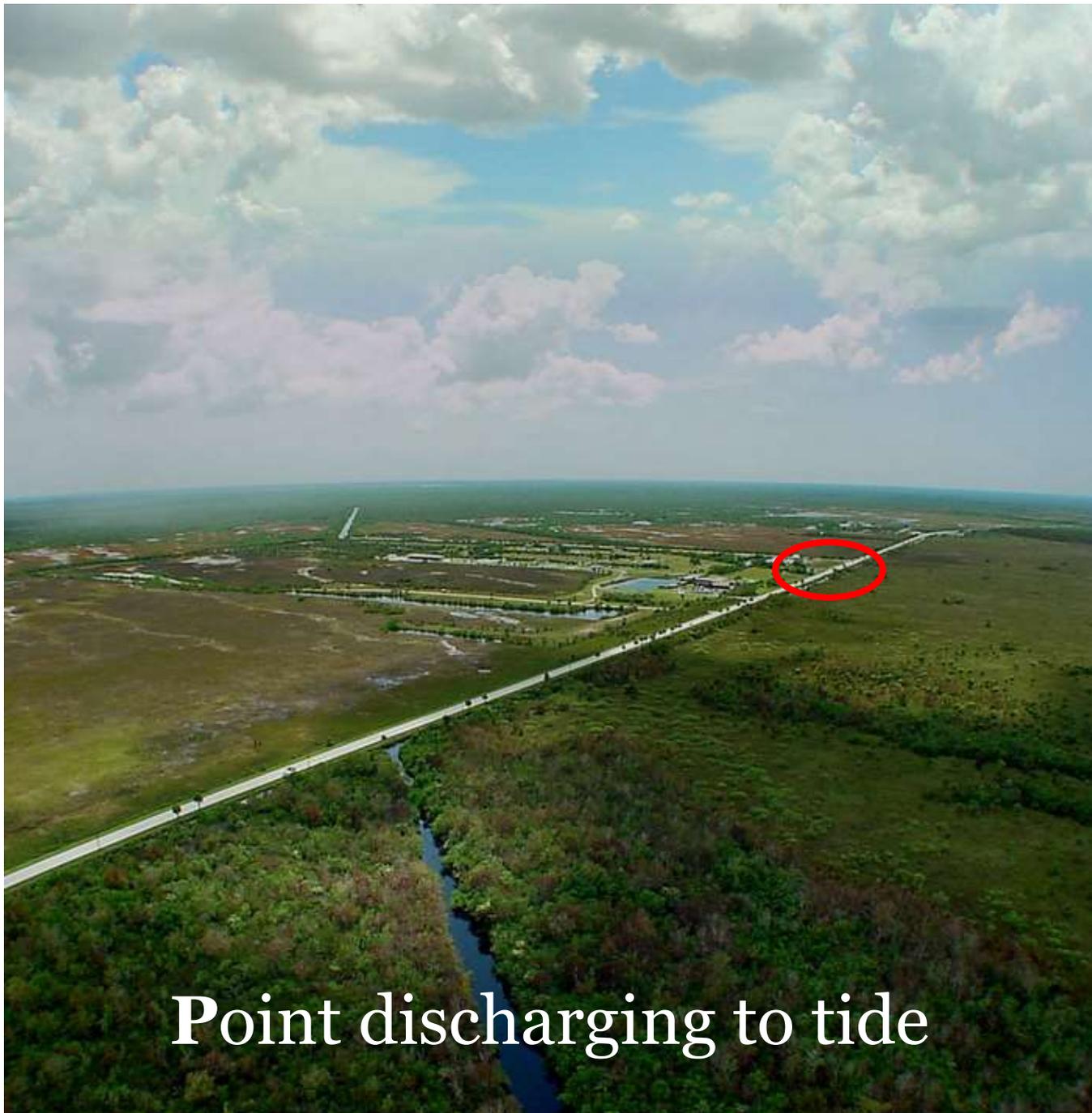
**But that's not
what's surprising!**



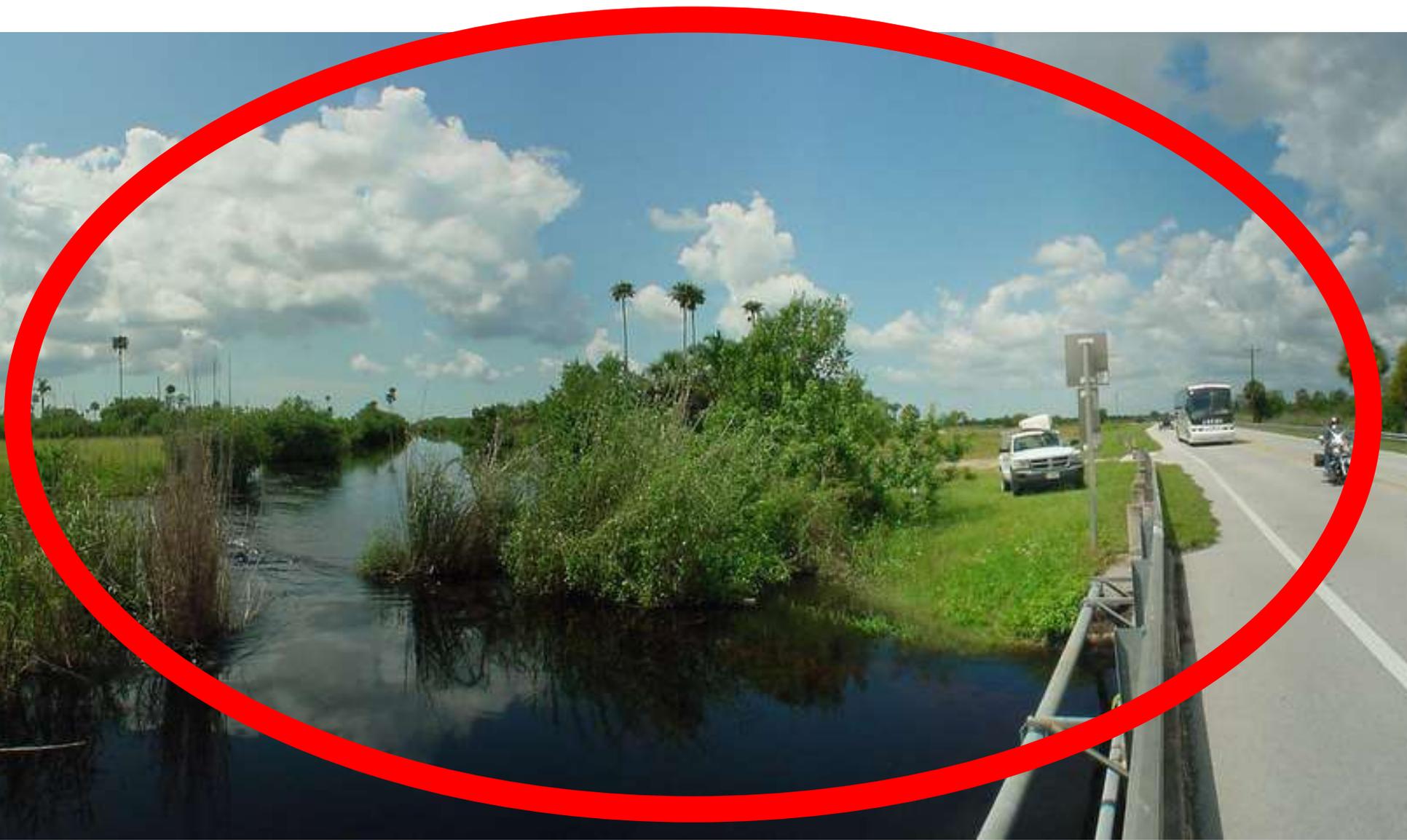
Crisscrossed with canals



Point discharging to tide



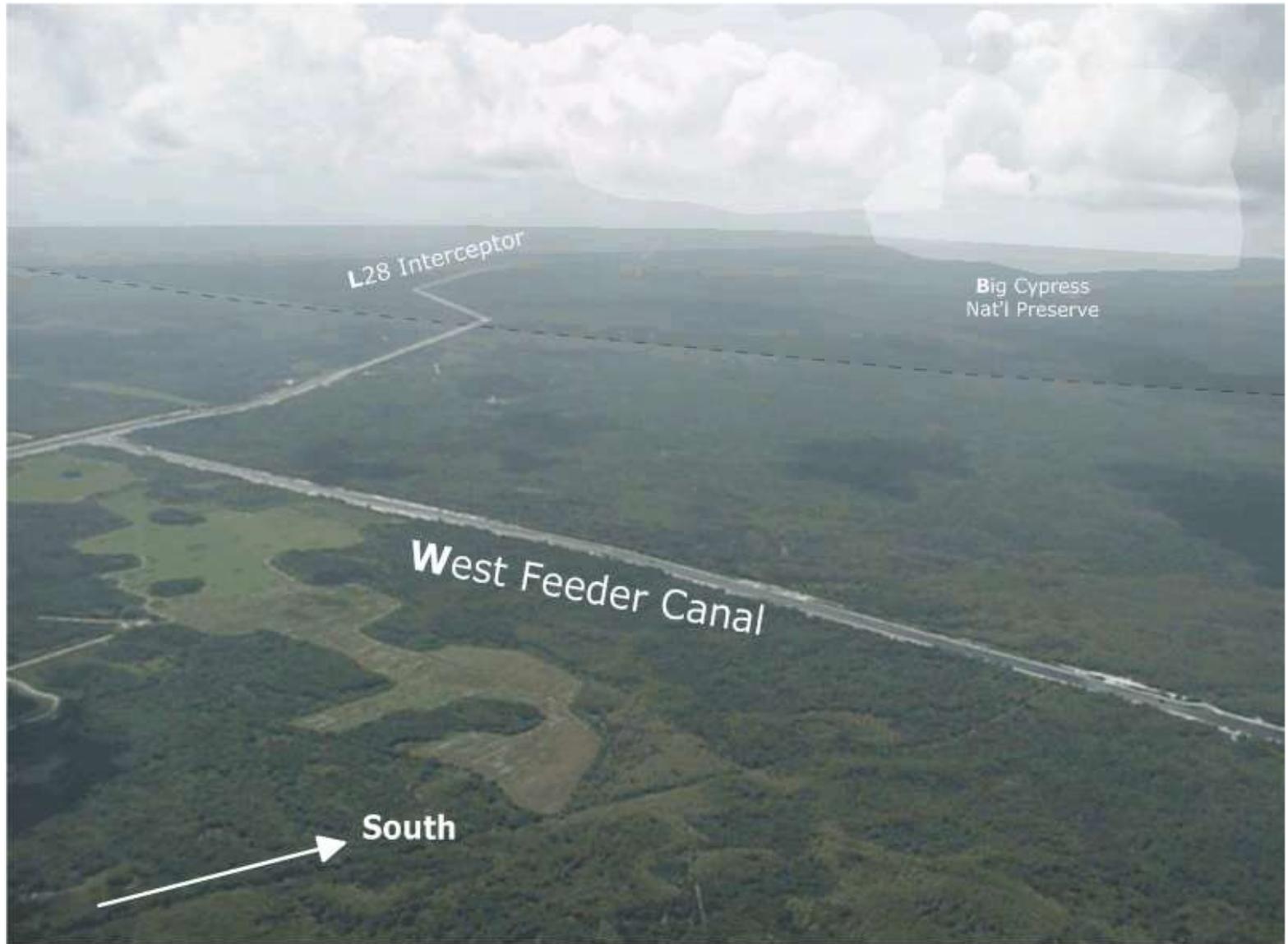
Point discharging to tide



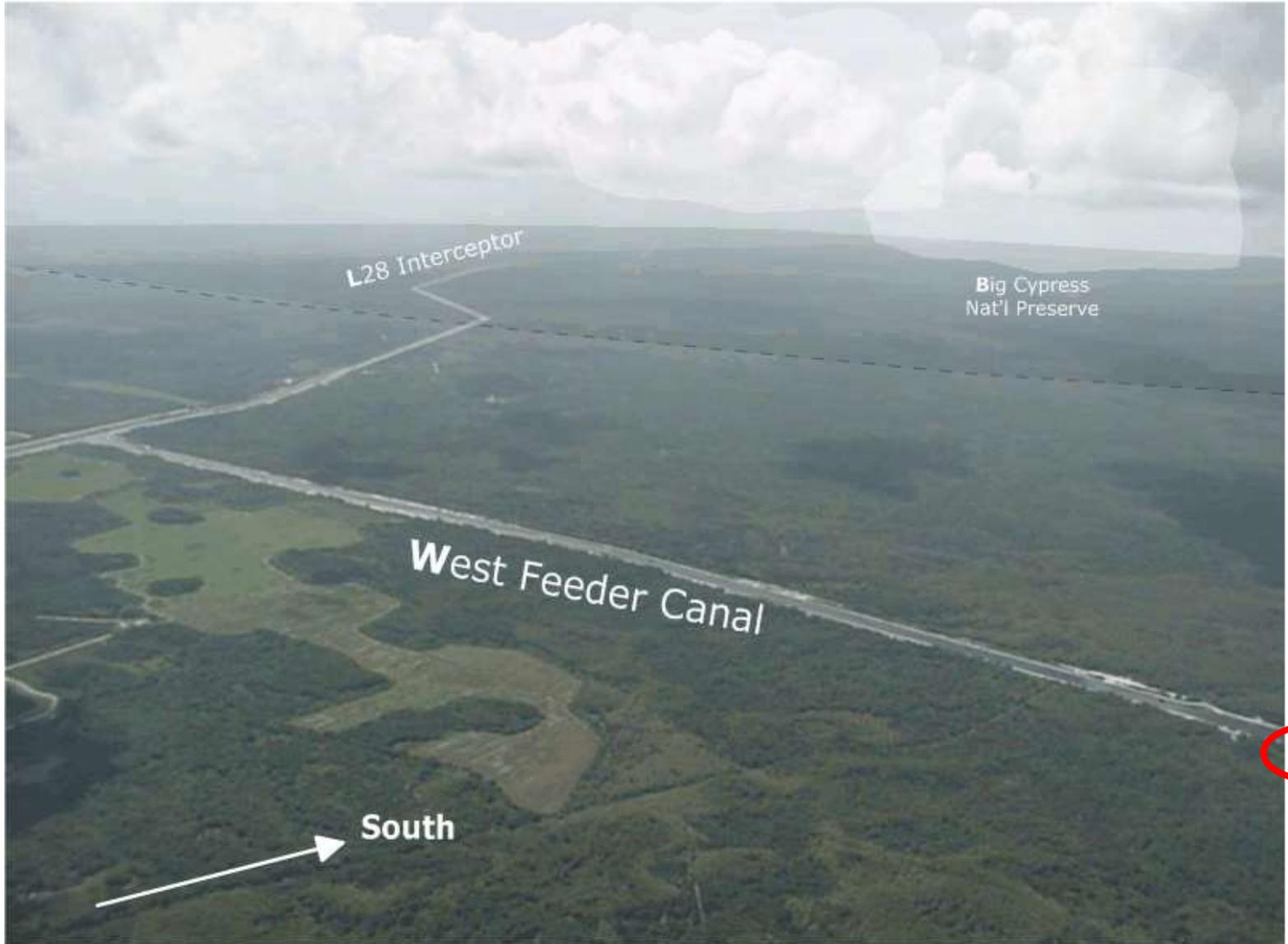
Dry Season



Exacerbates saltwater intrusion



Headwater flows have been severed



Headwater flows have been severed

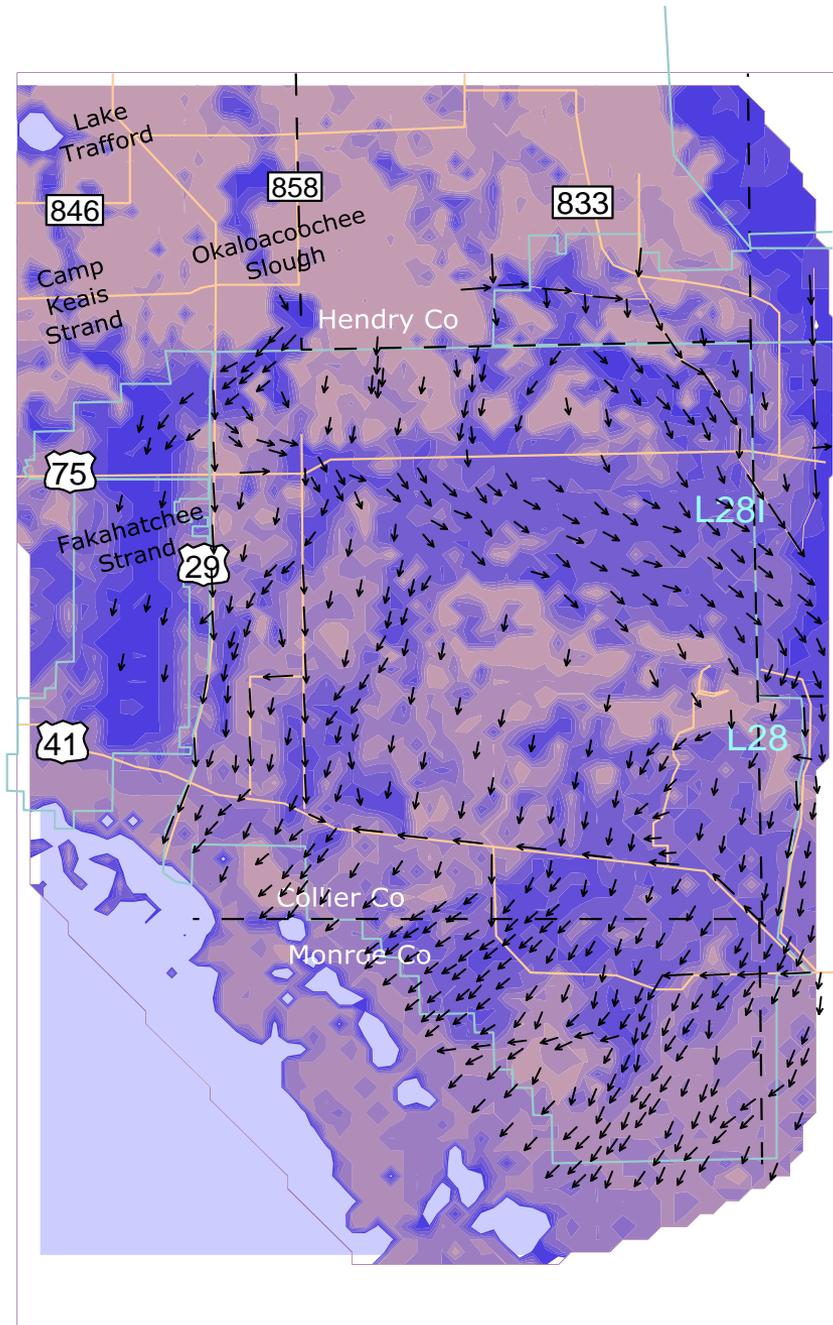


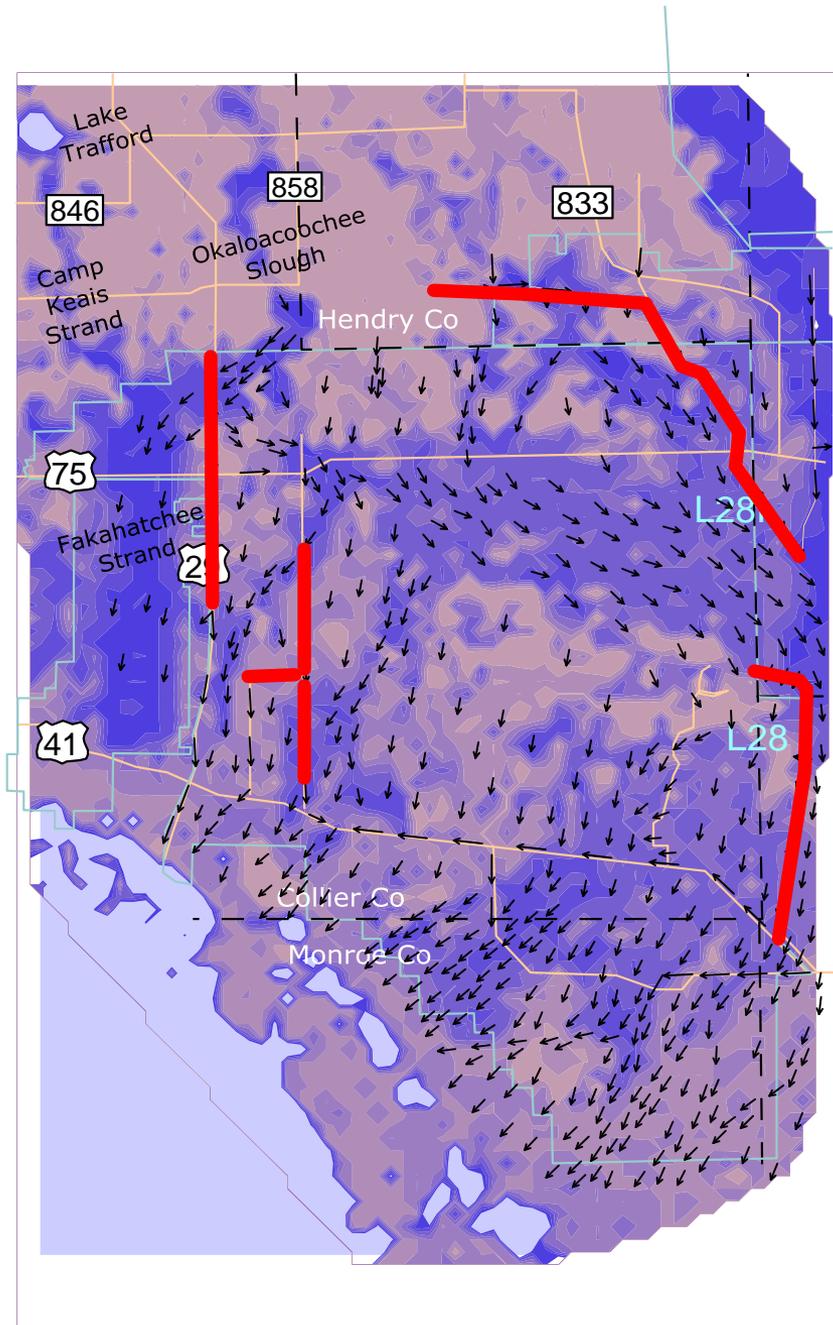
East

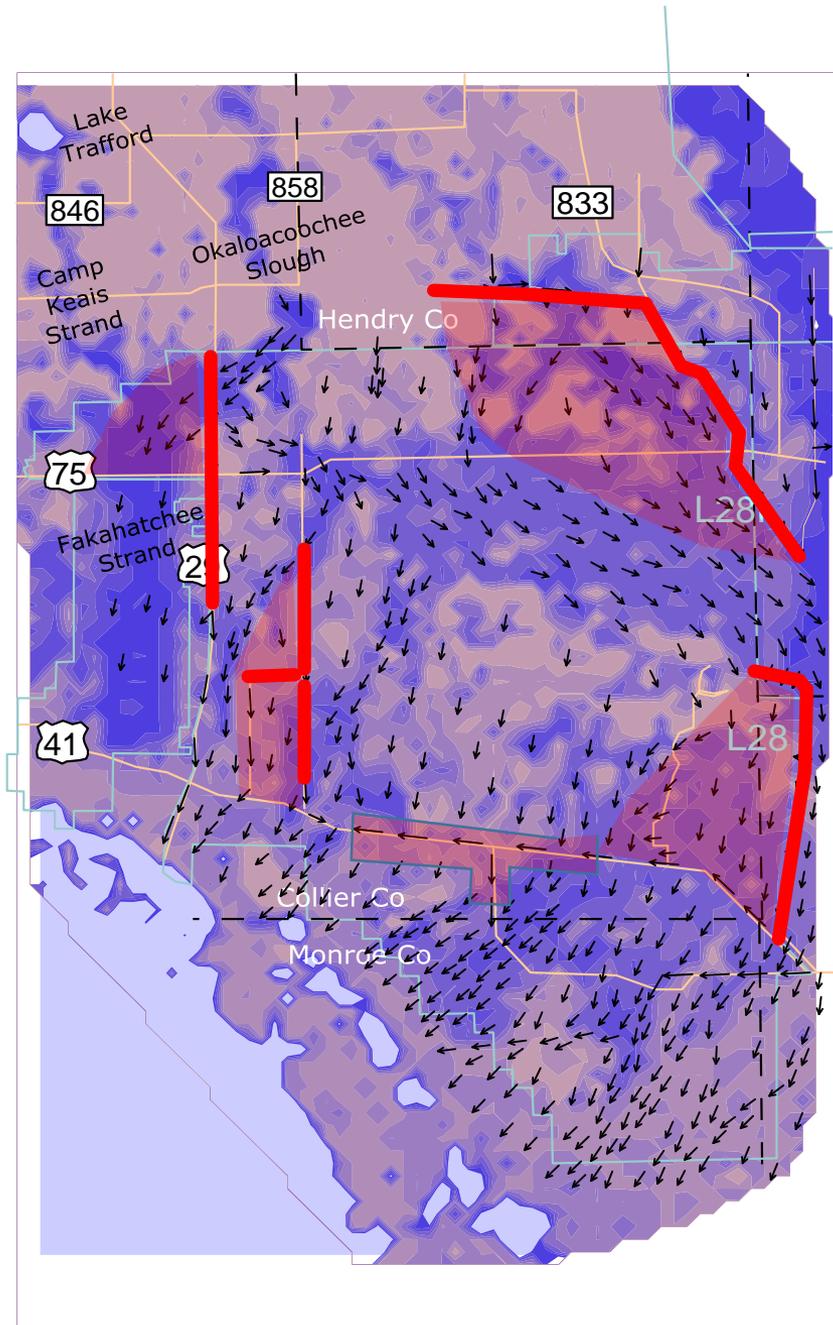
West Feeder Diversions

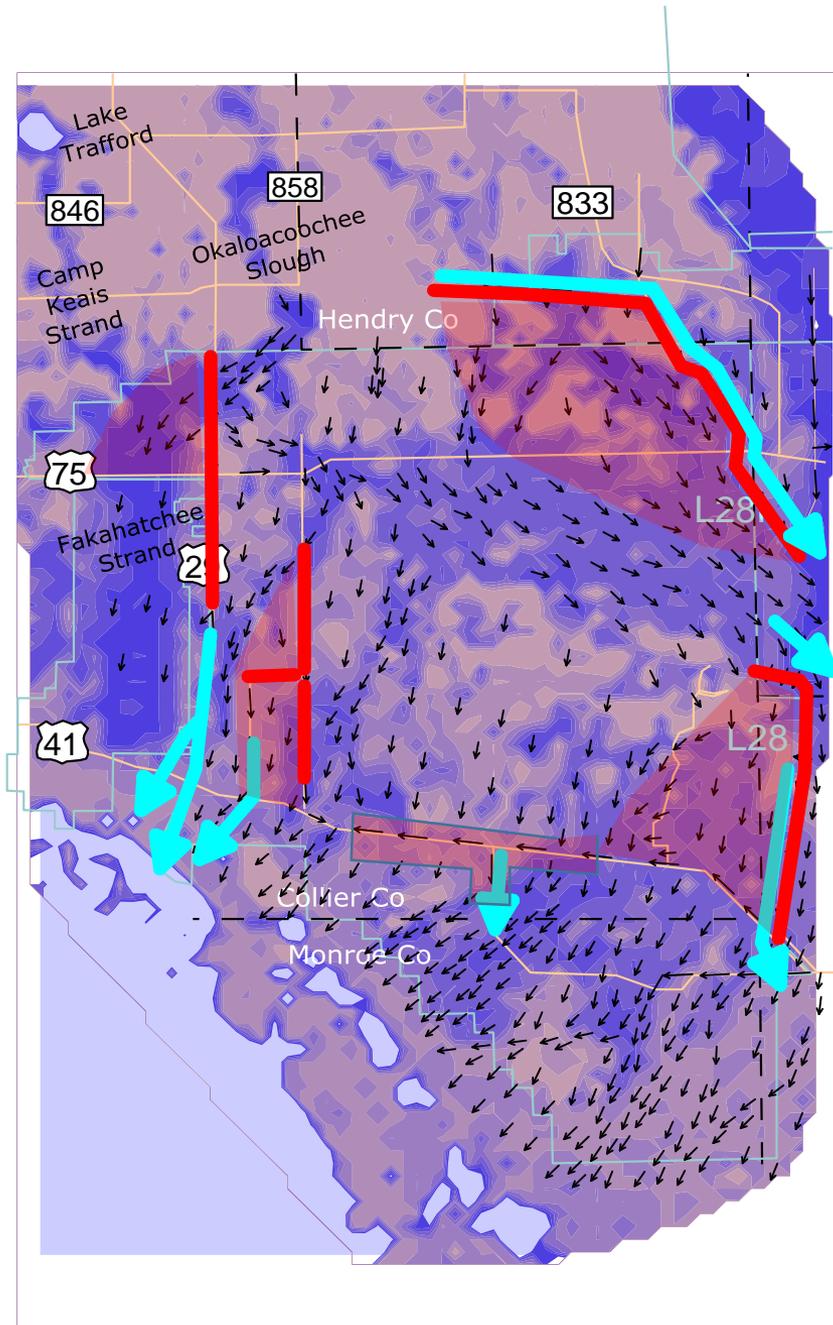


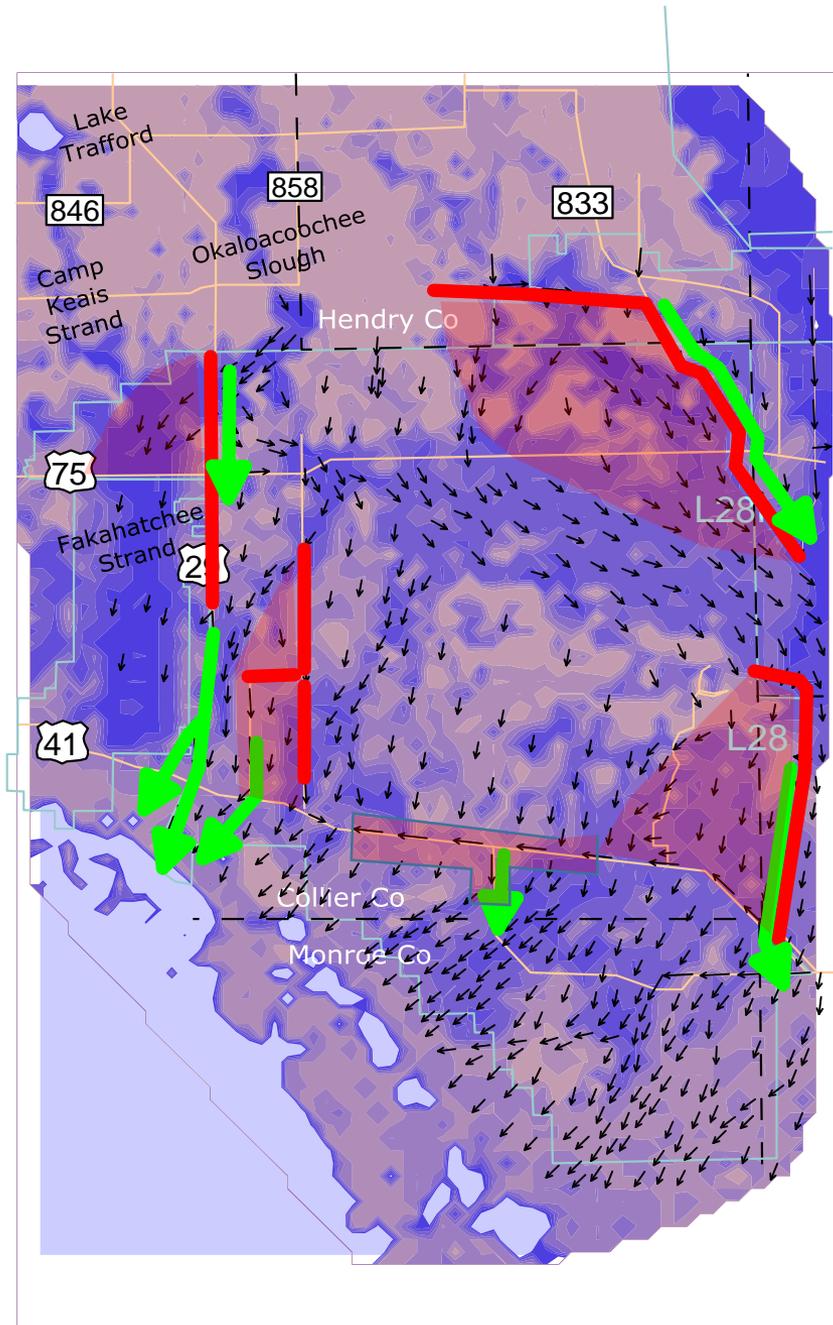
Including OK Slough











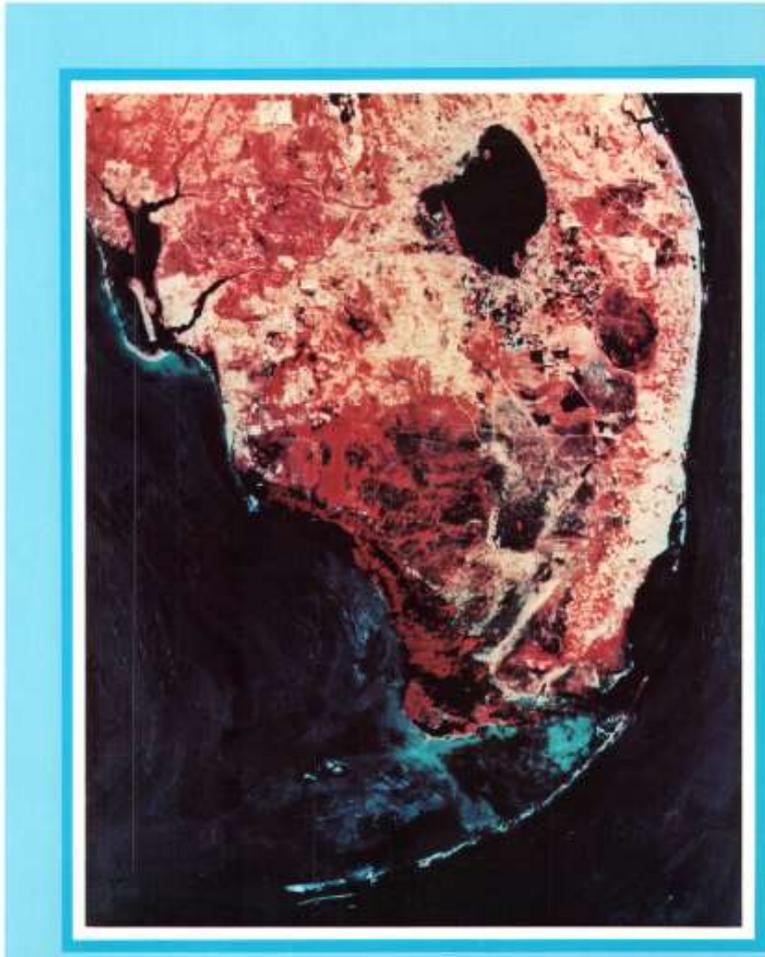
Again, not
surprising!

THE ENVIRONMENT OF SOUTH FLORIDA,
A SUMMARY REPORT

GEOLOGICAL SURVEY PROFESSIONAL PAPER 1011

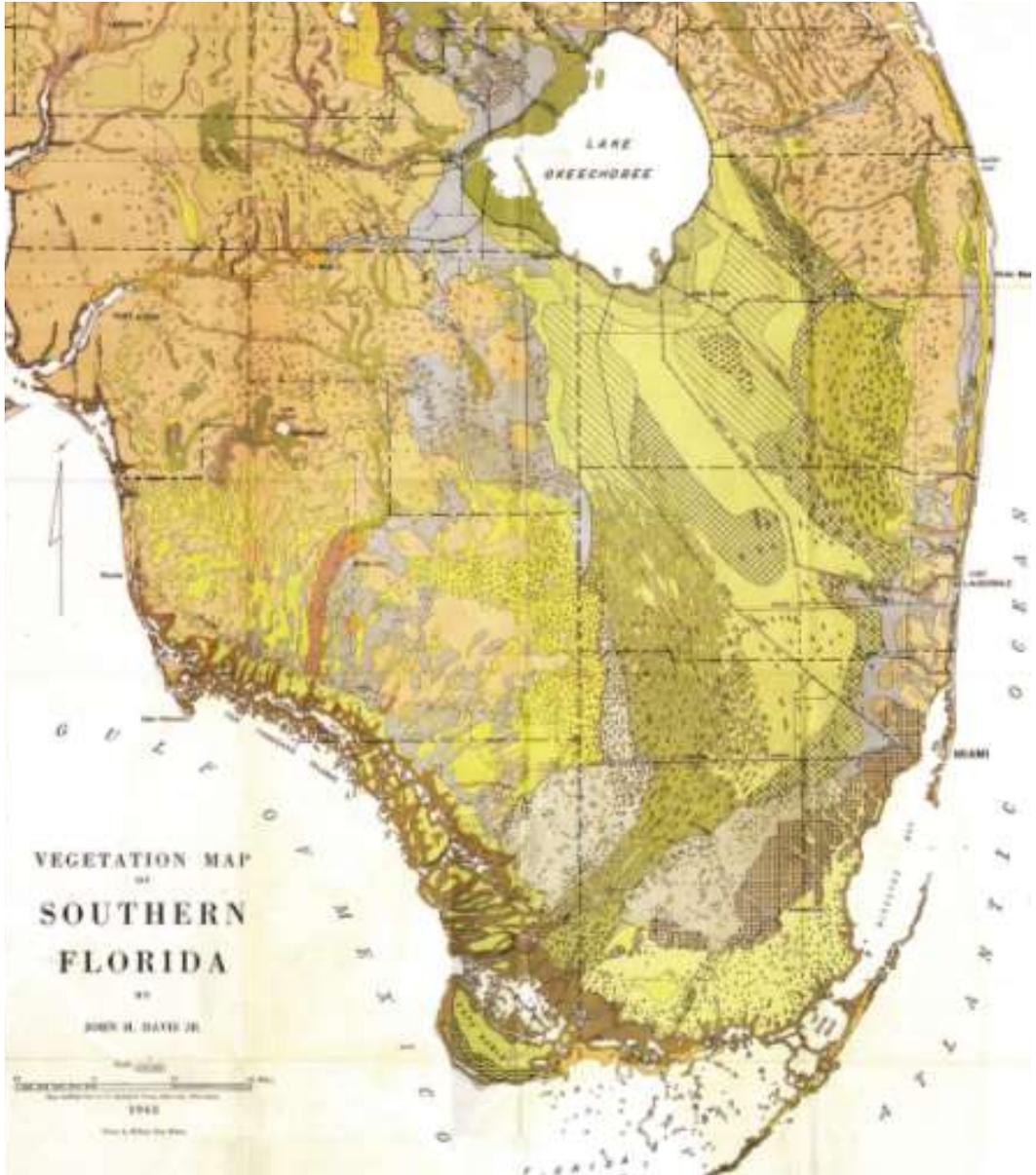
U.S. DEPARTMENT
OF THE INTERIOR

Resource and
Land Investigations
(RALI) Program

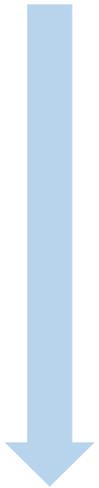


McPherson et al, 1976

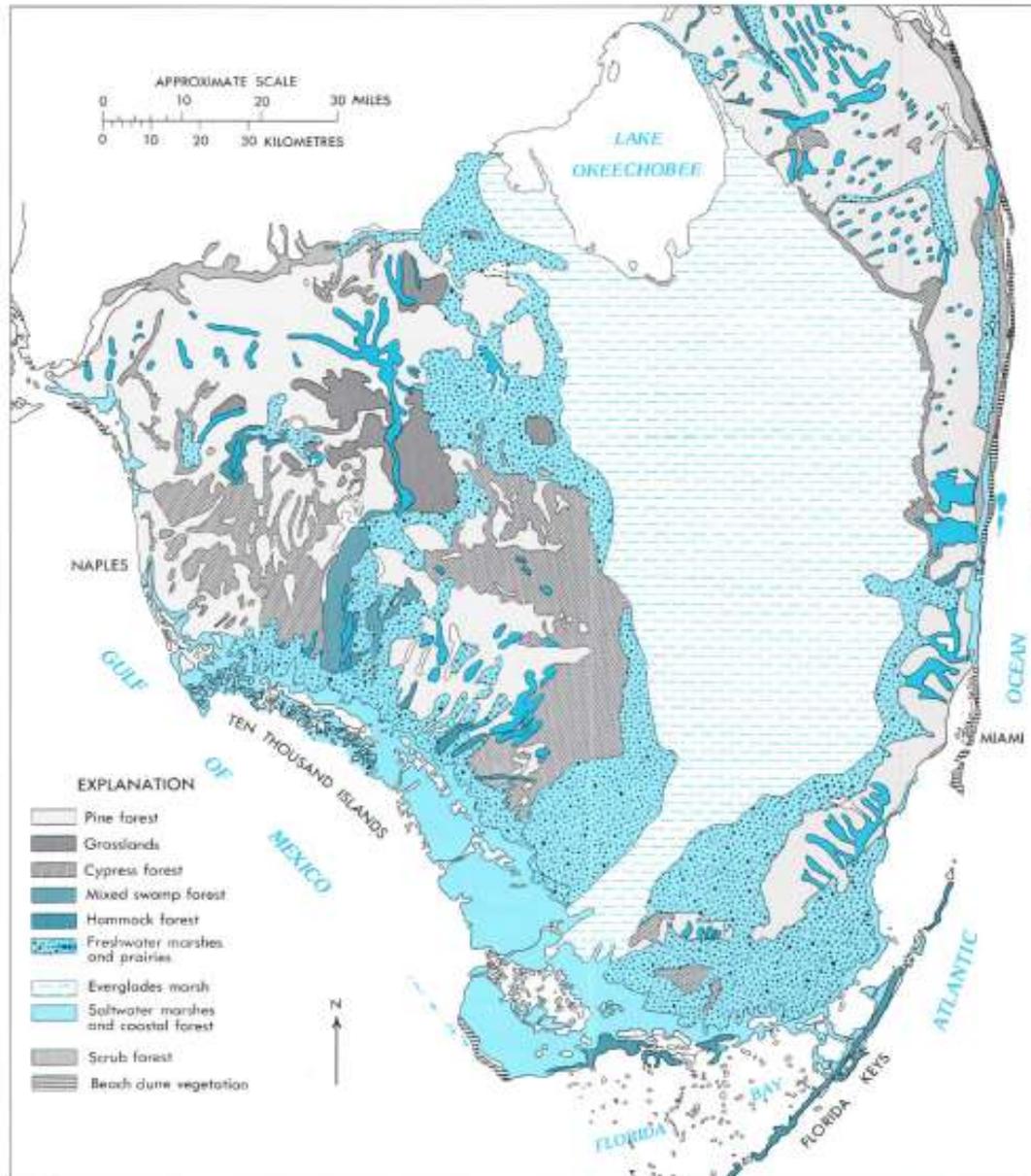
Vegetation
Map from
Davis, 1940



Vegetation
Map from
Davis, 1940



Hydrographic
Interpretation
of 1940 map



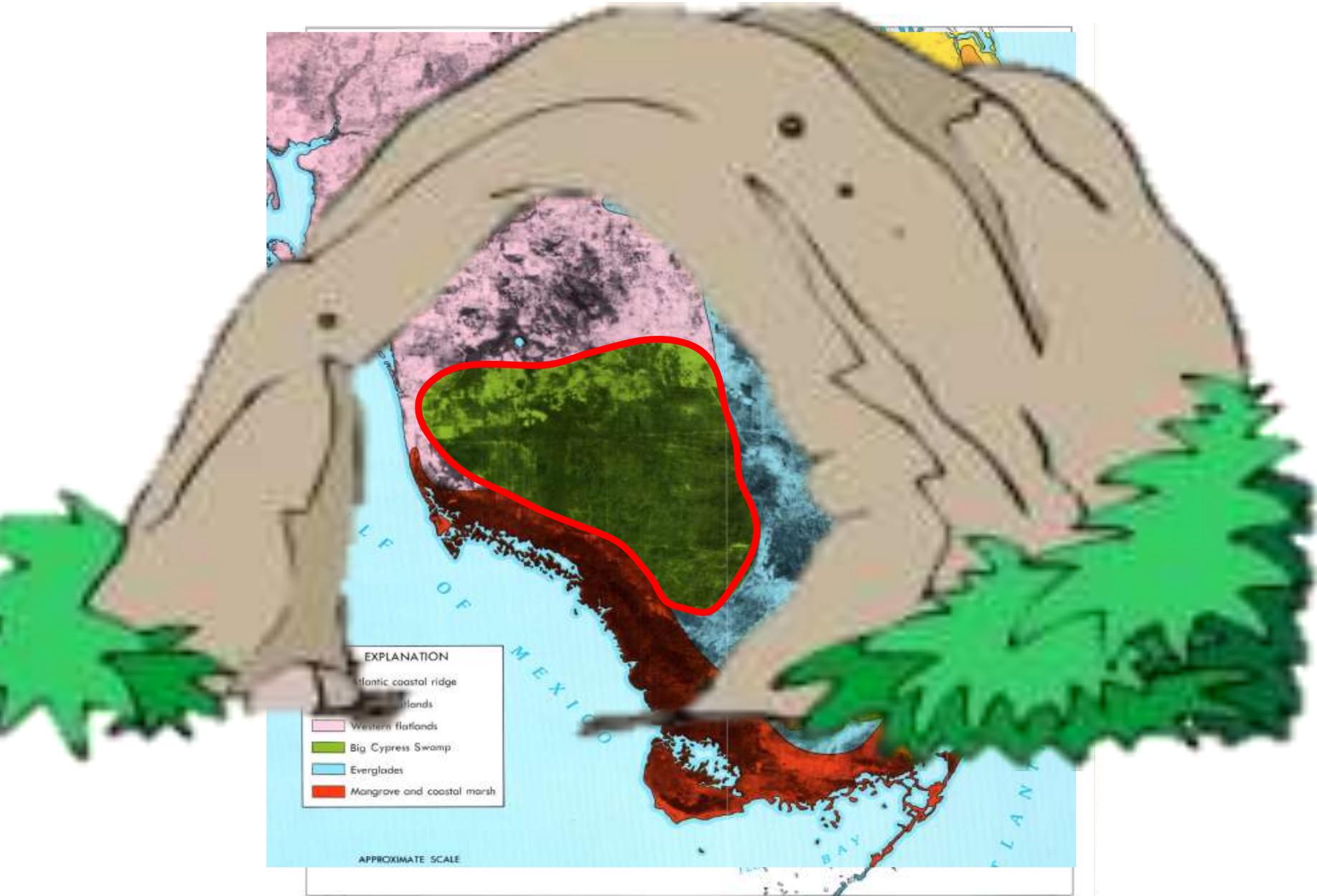
Castle of pre-drainage enlightenment



Castle of pre-drainage
enlightenment

Dragon's den of
self-contained
watershed





EXPLANATION

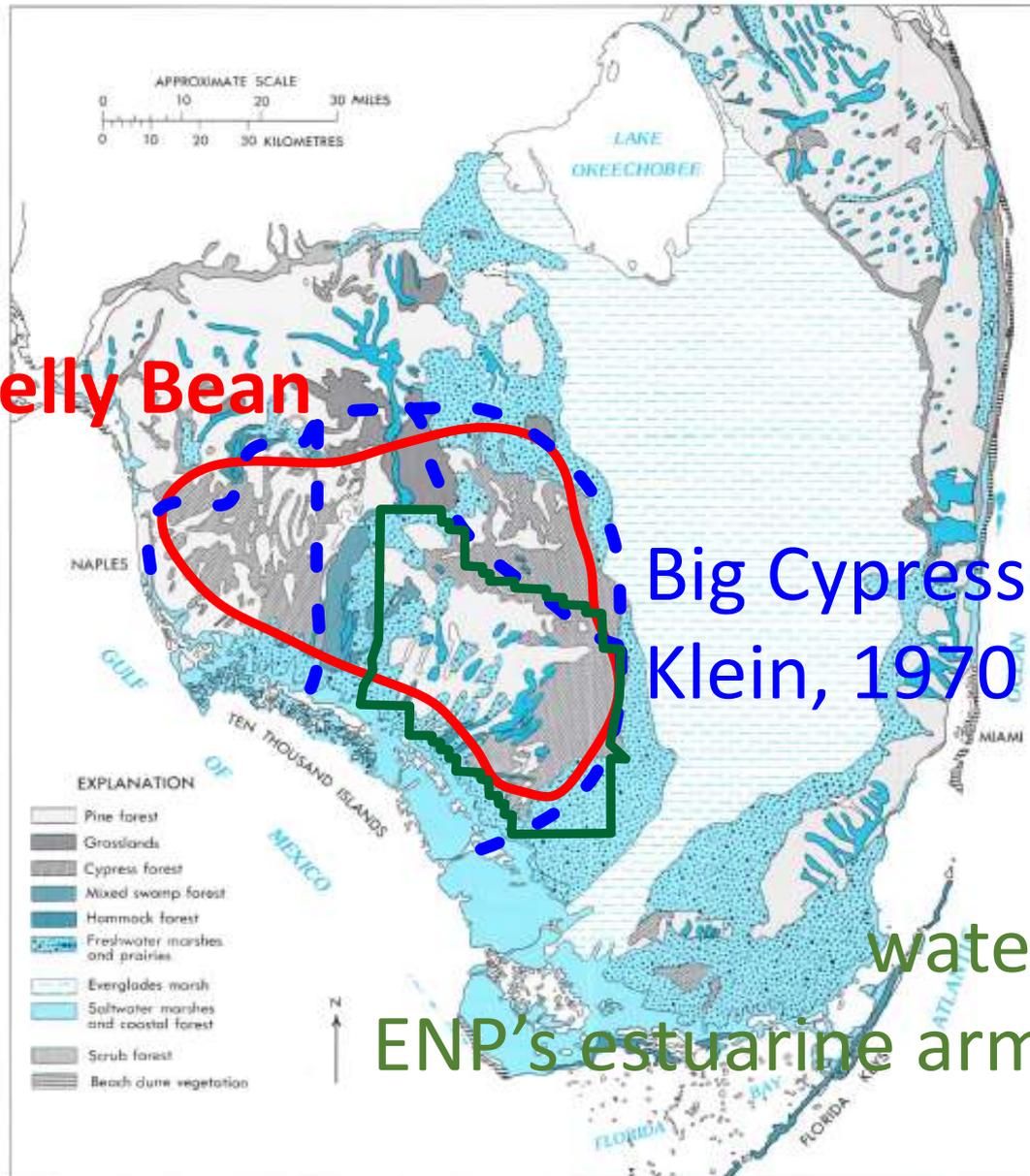
- Atlantic coastal ridge
- Western flatlands
- Big Cypress Swamp
- Everglades
- Mangrove and coastal marsh

APPROXIMATE SCALE

The Jelly Bean



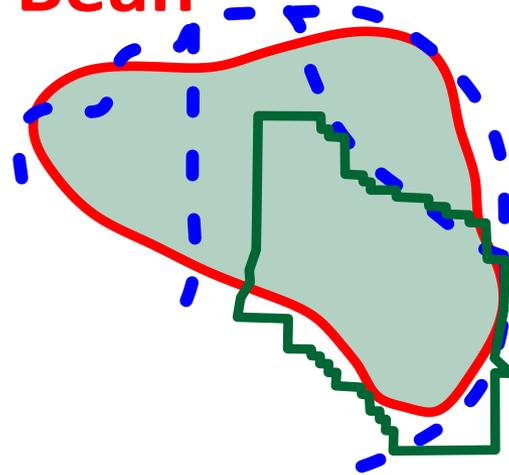
The Jelly Bean



Big Cypress watershed
Klein, 1970

watershed to
ENP's estuarine arm, 1974

The Jelly Bean

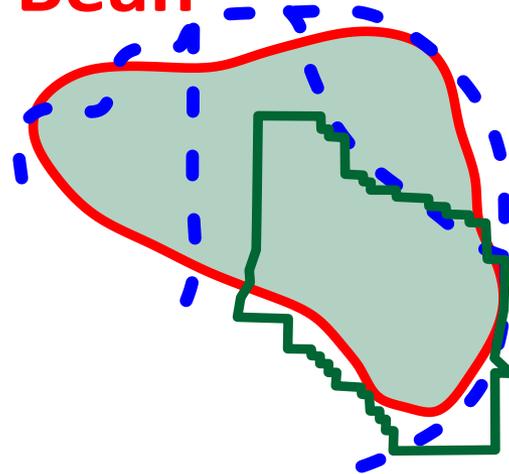


Big Cypress watershed
Klein, 1970

watershed to
ENP's estuarine arm, 1974



The Jelly Bean

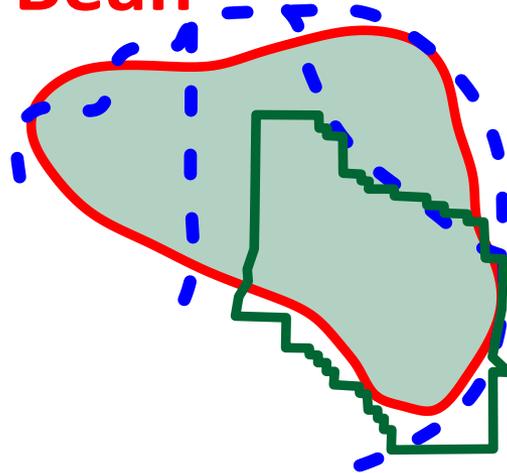


Big Cypress watershed
Klein, 1970

watershed to
ENP's estuarine arm, 1974



The Jelly Bean



Post-drainage

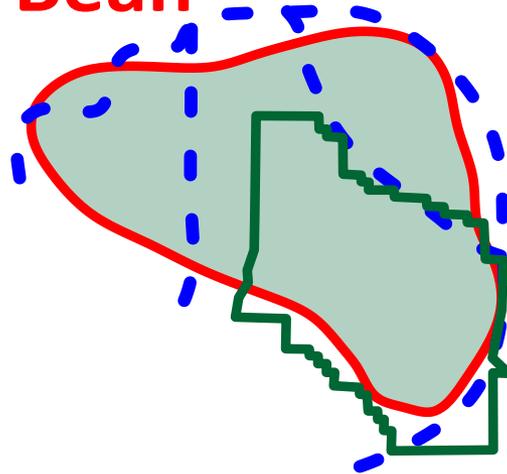
Big Cypress watershed

Klein, 1970

Post-drainage watershed to
ENP's estuarine arm, 1974



The Jelly Bean



Post-drainage

Big Cypress watershed

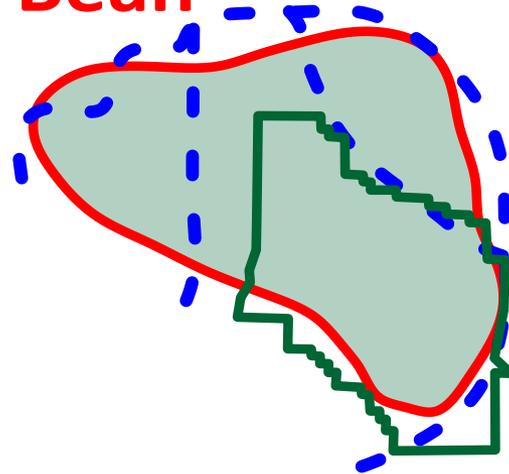
Klein, 1970

Post-drainage watershed to
ENP's estuarine arm, 1974



Pre-drainage?

The Jelly Bean



Post-drainage

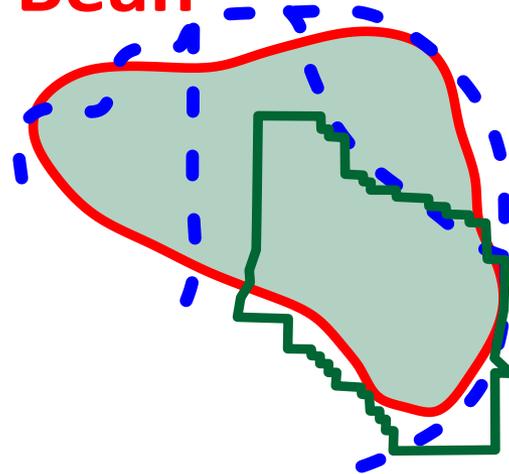
Big Cypress watershed
Klein, 1970

**Post-drainage watershed to
ENP's estuarine arm, 1974**



Pre-drainage?

The Jelly Bean



Post-drainage

Big Cypress watershed
Klein, 1970

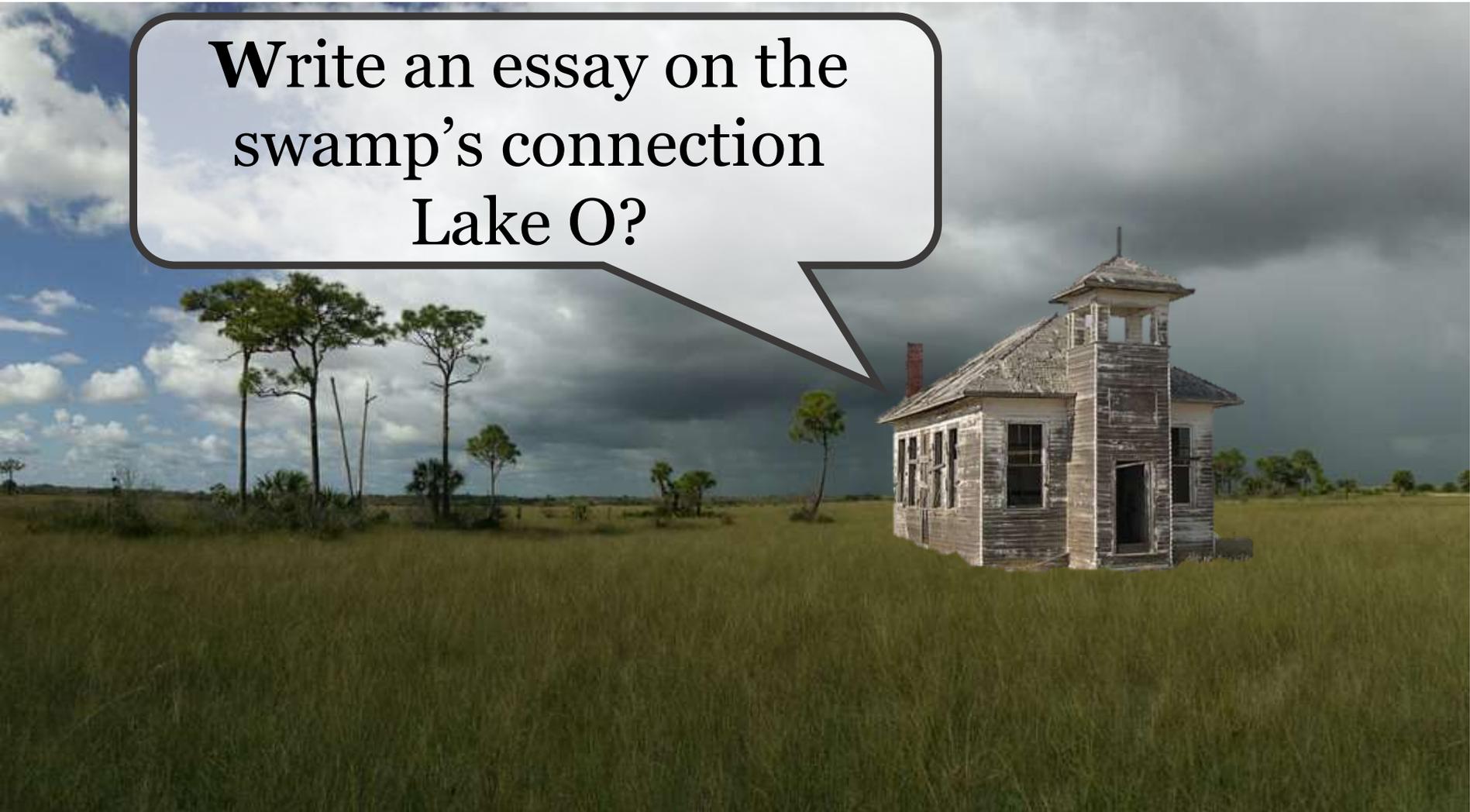
**Post-drainage watershed to
ENP's estuarine arm, 1974**





**Kelly's assignment
to WERP class:**

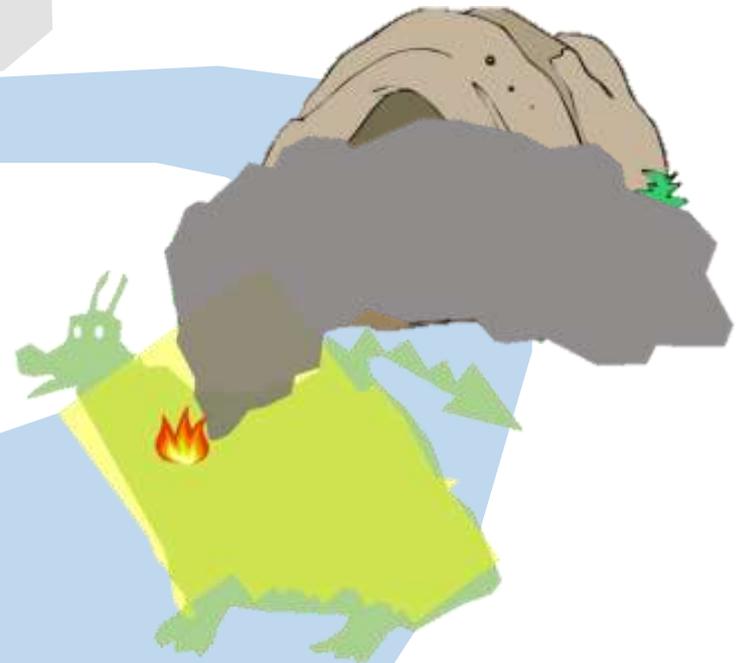
**Write an essay on the
swamp's connection
Lake O?**



Castle of pre-drainage
enlightenment



**Dragon's den of
self-contained
watershed**



Castle of pre-drainage
enlightenment



**Dragon's den of
self-contained
watershed**



Castle of pre-drainage
enlightenment

Dragon's den of
self-contained
pershed





Loss of headwaters to north



Loss of headwaters to north



Not just Okeechobee



10 ft

Not just Okeechobee



10 ft



Ft Thomson Falls



Ft Thomson Falls



Lake Flirt

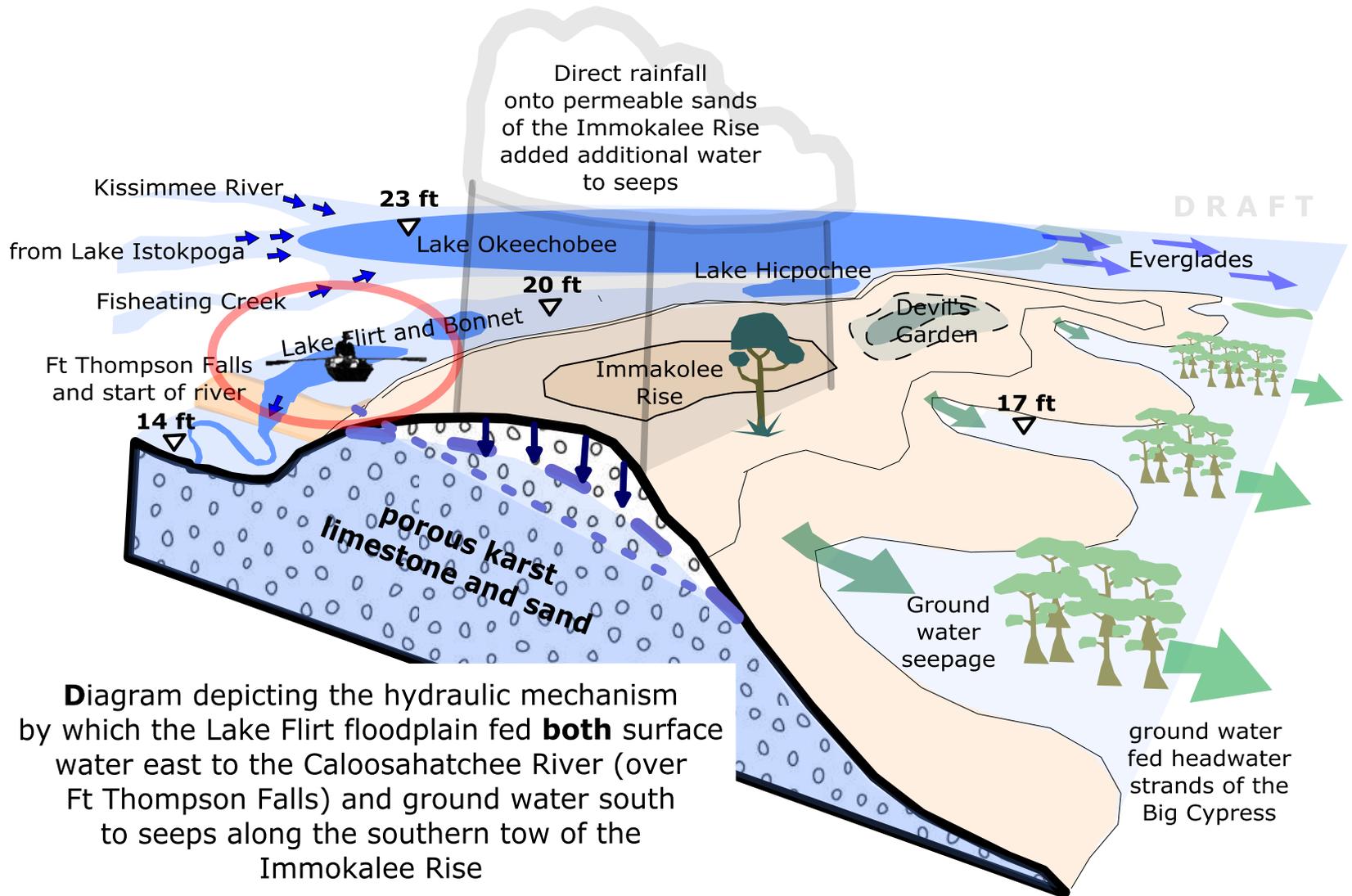
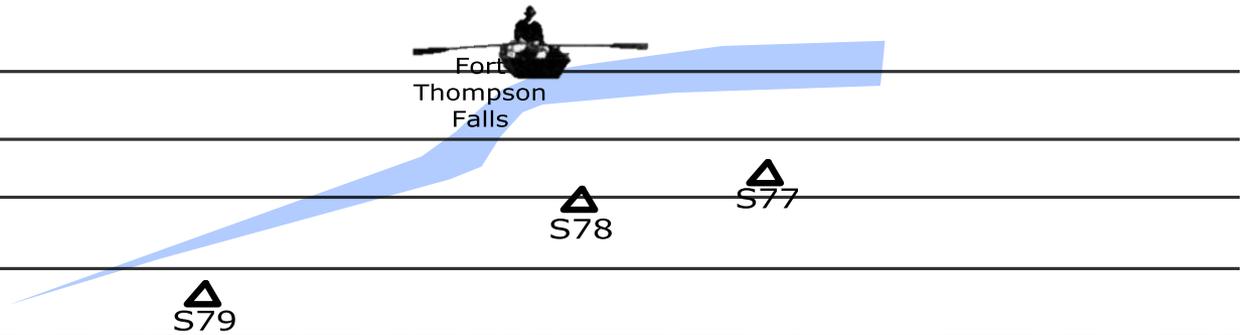
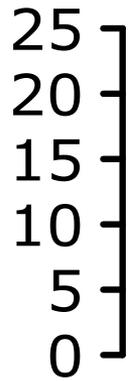


Diagram depicting the hydraulic mechanism by which the Lake Flirt floodplain fed **both** surface water east to the Caloosahatchee River (over Ft Thompson Falls) and ground water south to seeps along the southern tow of the Immokalee Rise

Source: personal communication with Jack Meeder
Go Hydrology!

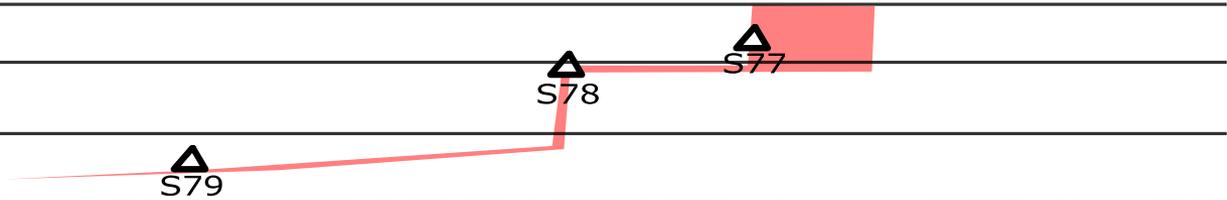
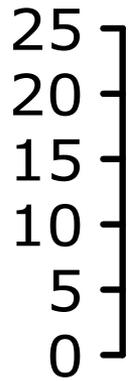
feet above
sea level

Caloosahatchee cooridor stage, **pre-drainage** and now



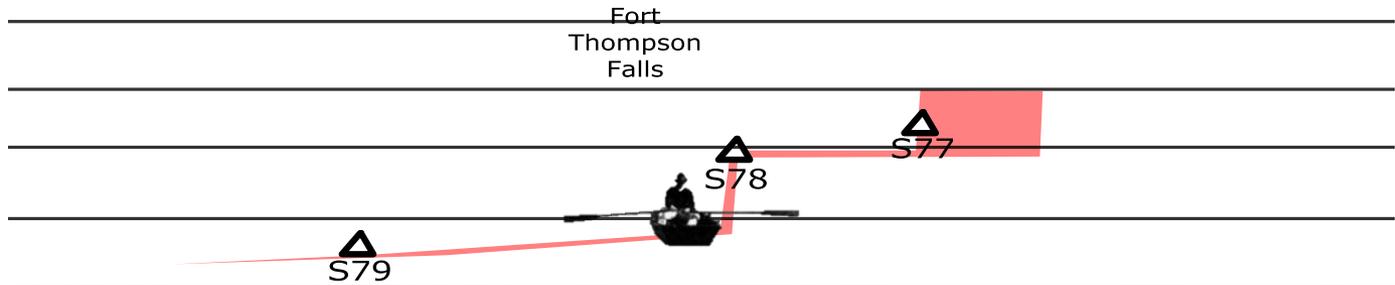
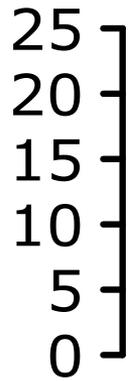
feet above
sea level

Caloosahatchee cooridor stage, pre-drainage and now



feet above
sea level

Caloosahatchee cooridor stage, pre-drainage and **now**



Subsidence to the **East**

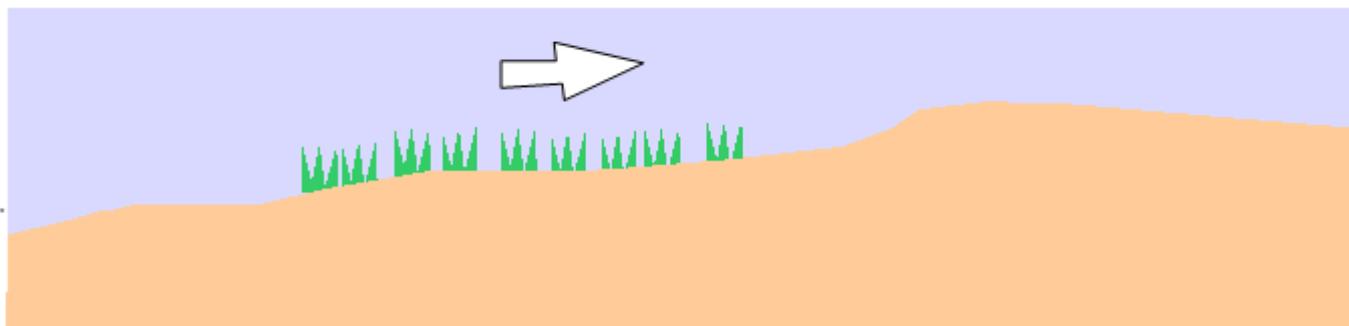


Usually think of **just** EAA



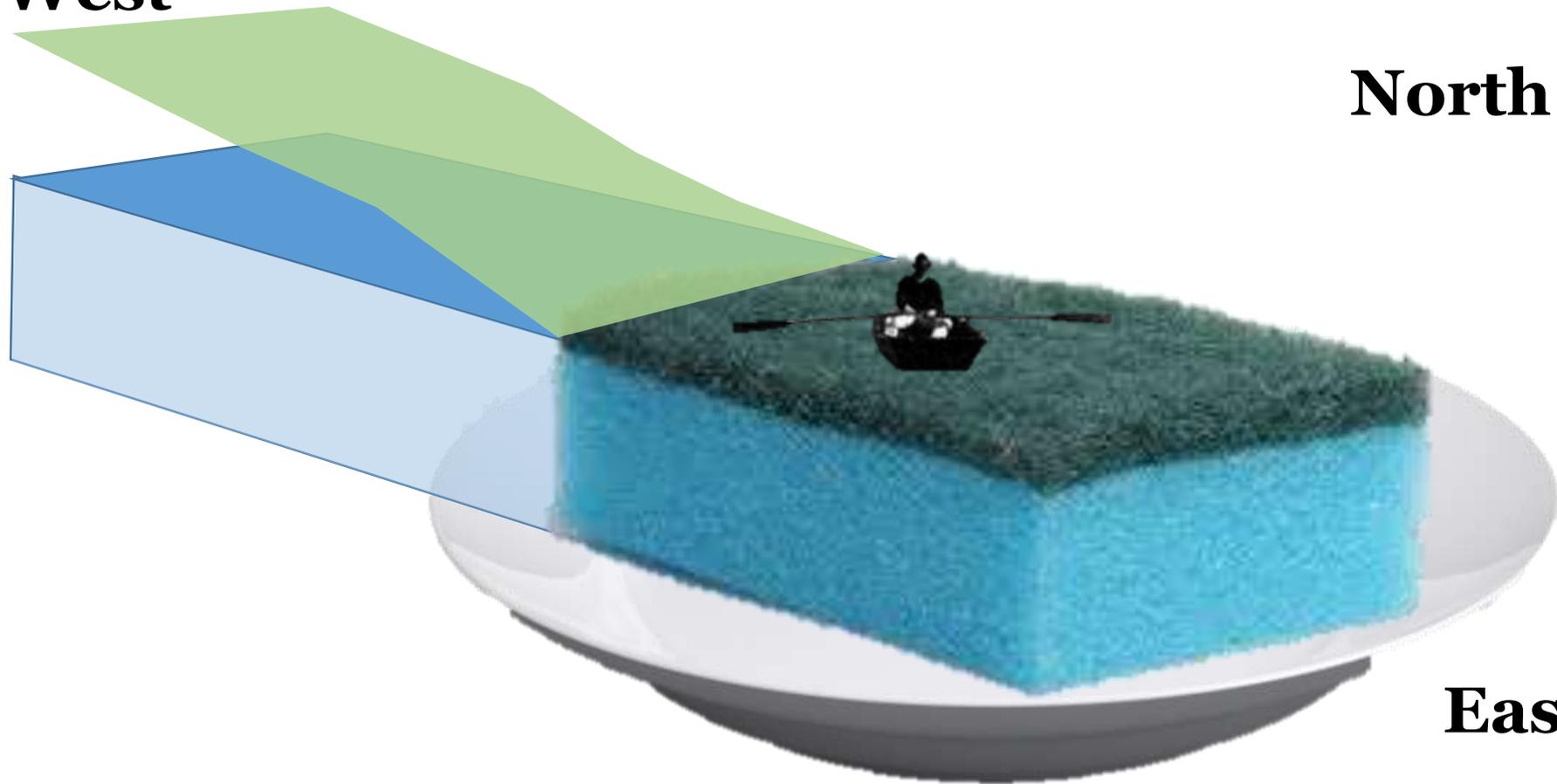
Lake O

Everglades



West

North

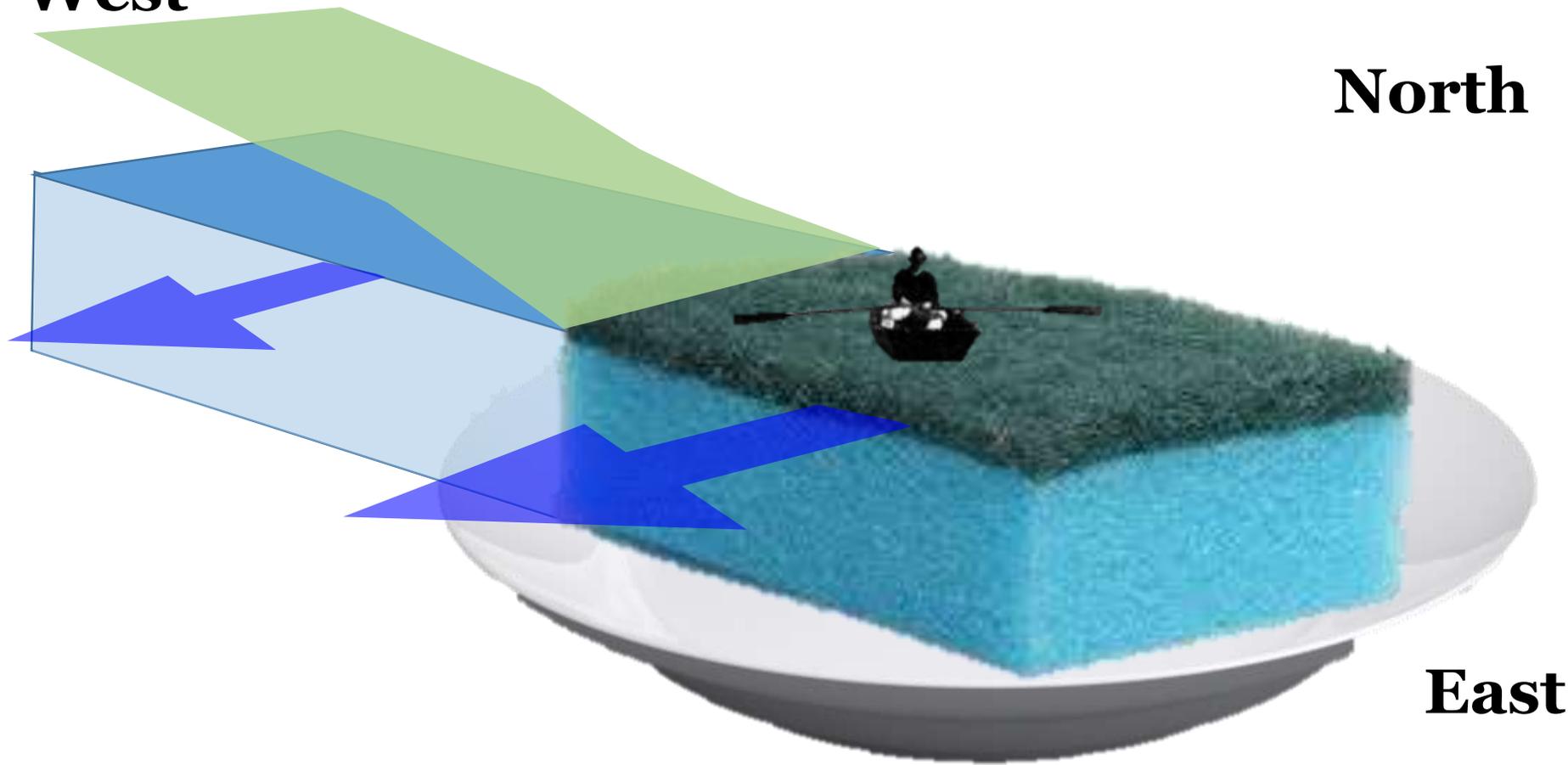


East

South

West

North



East

South

West

North



East

South

West

North



East

South

West

North



East

South

West

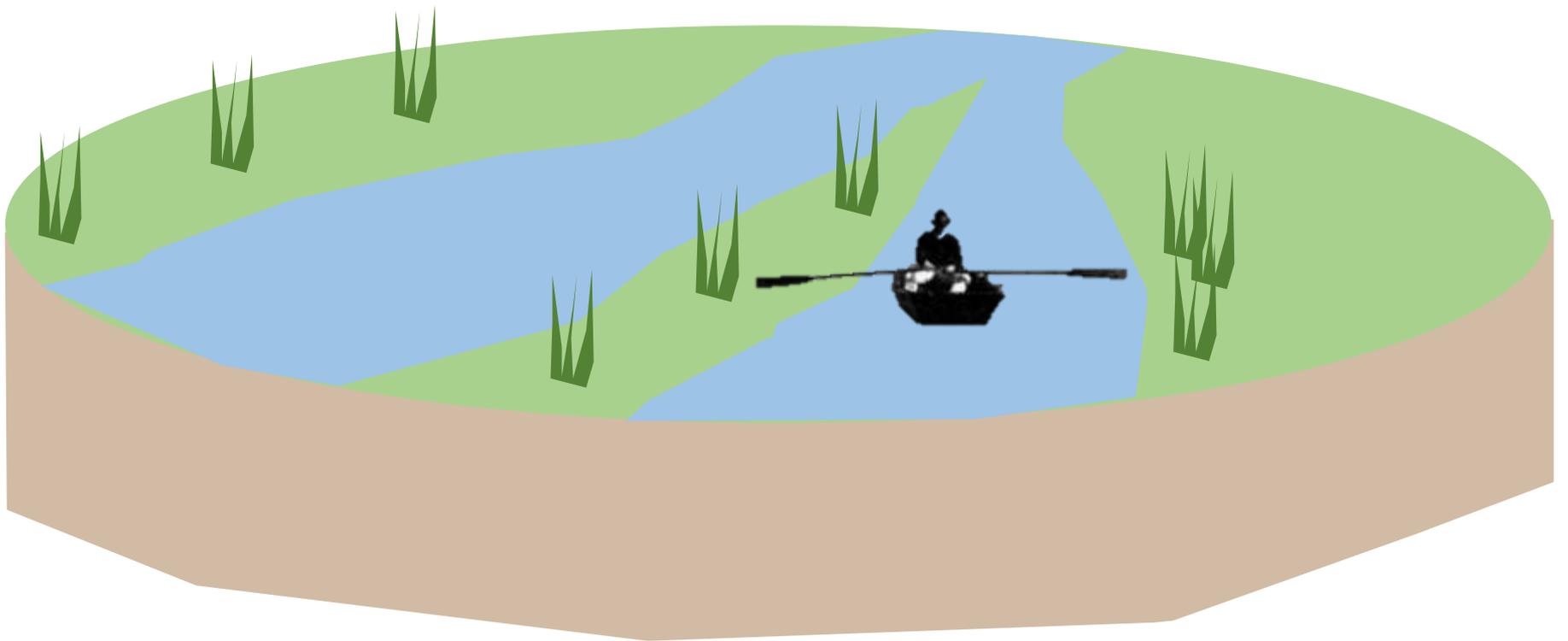
North



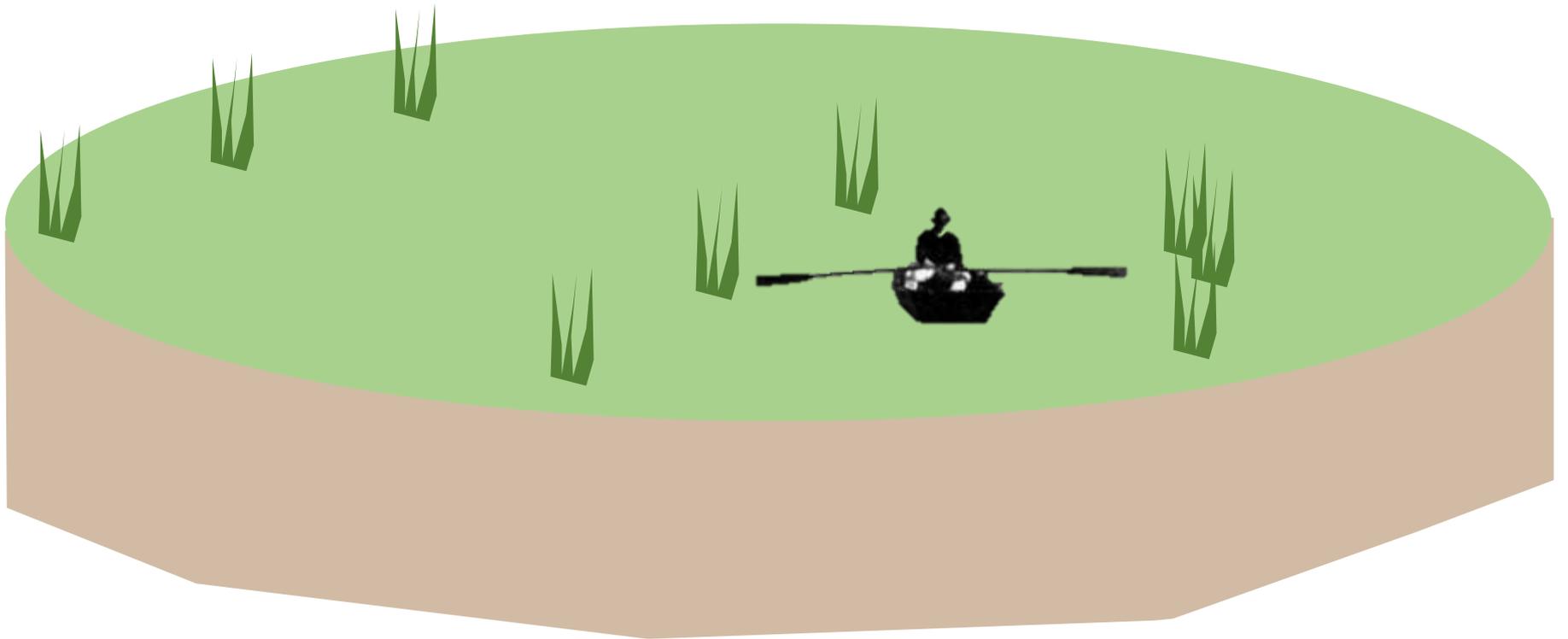
East

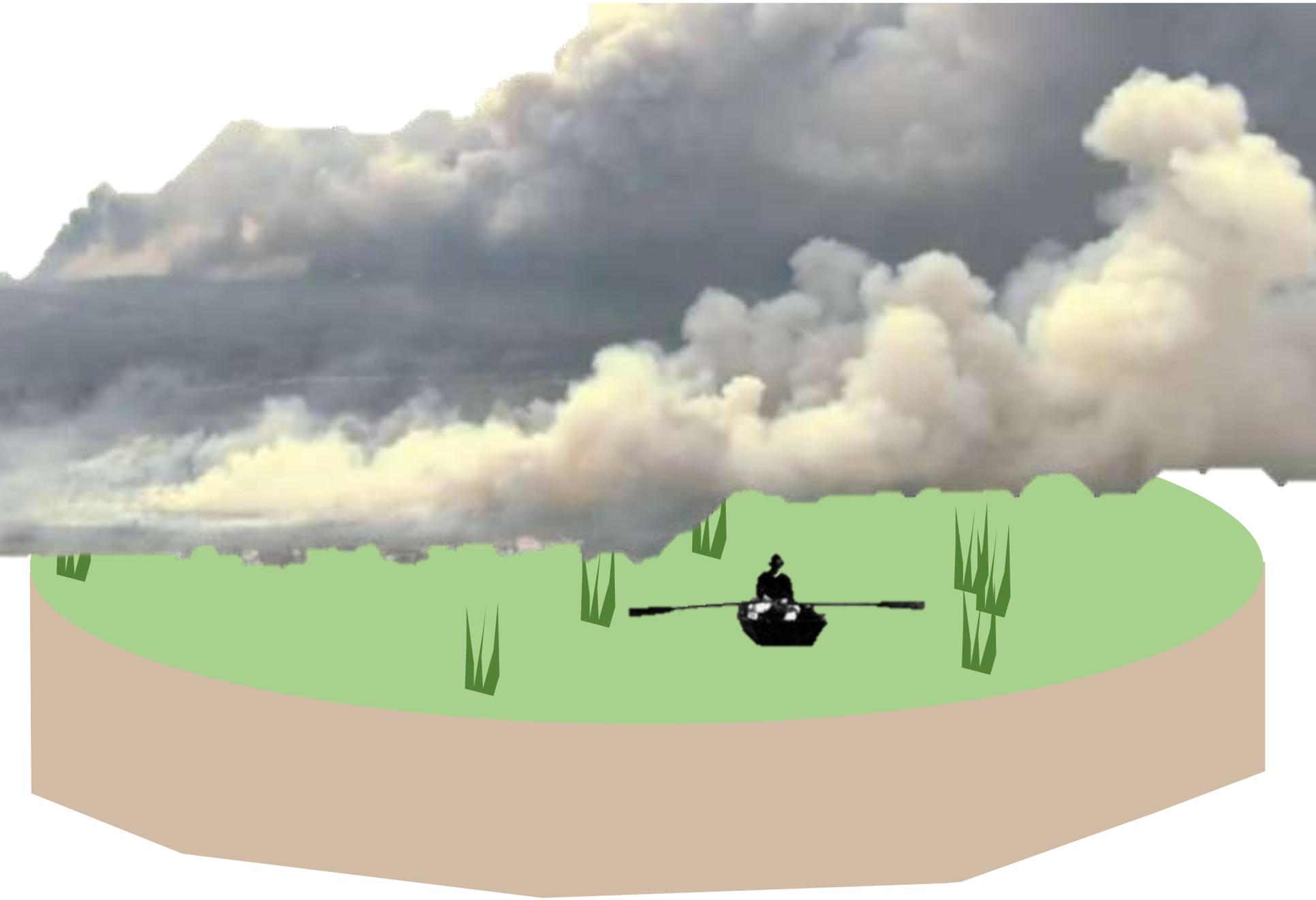
South

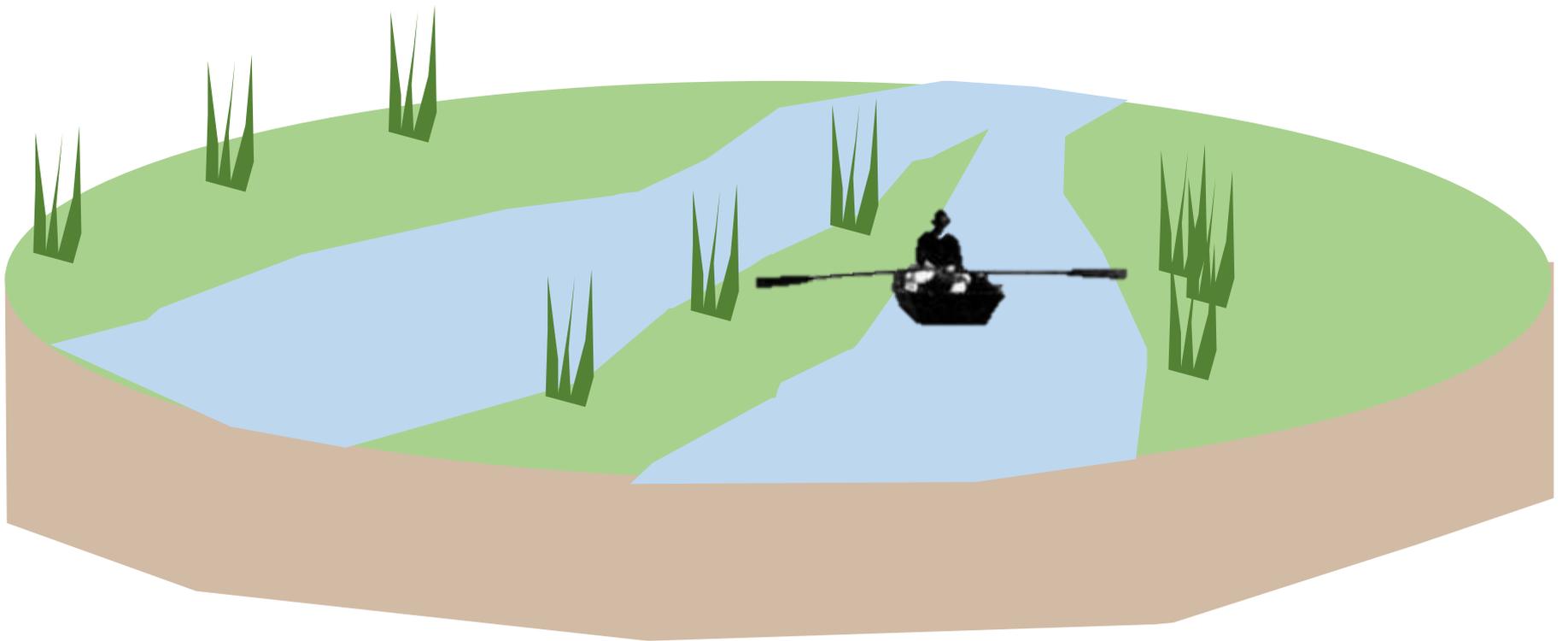
And not just EAA



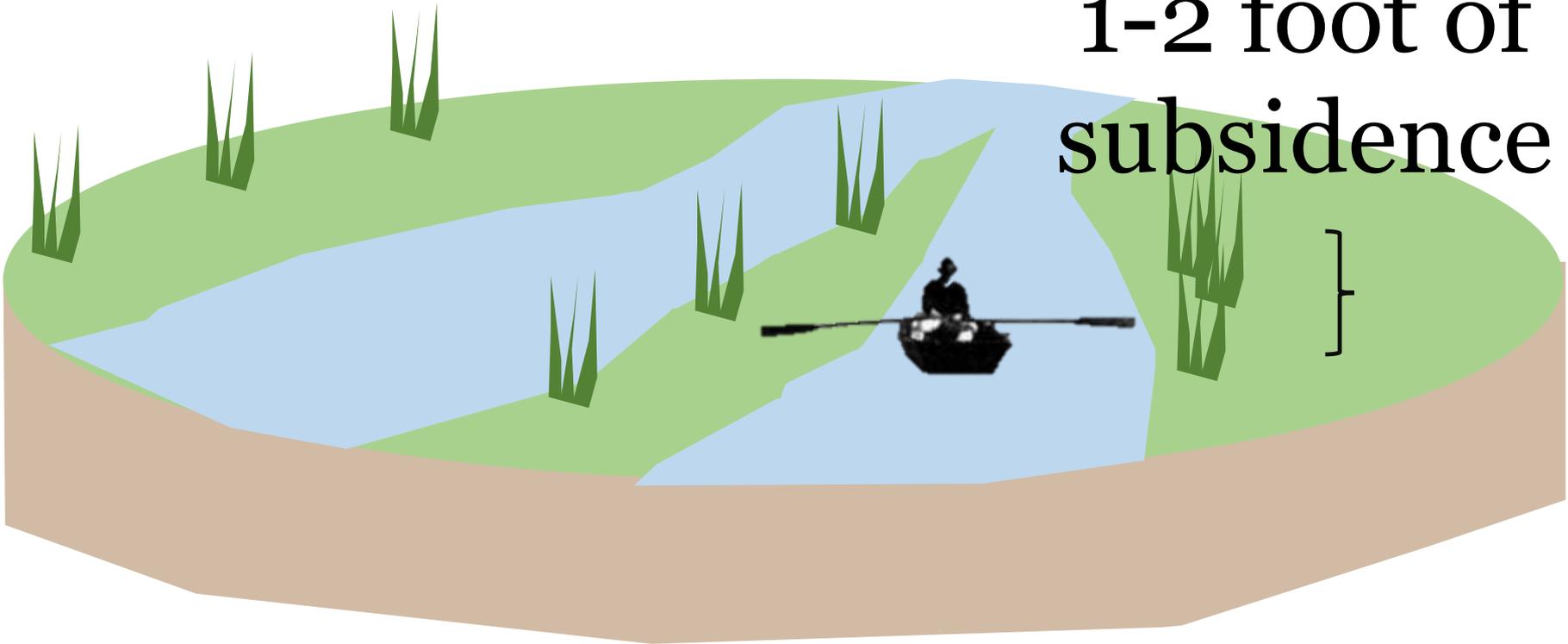
In the Everglades too





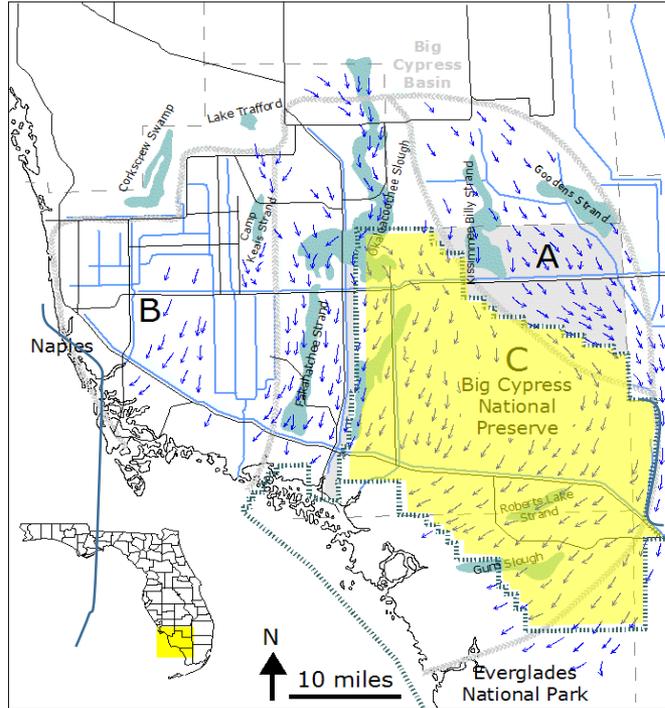


1-2 foot of
subsidence

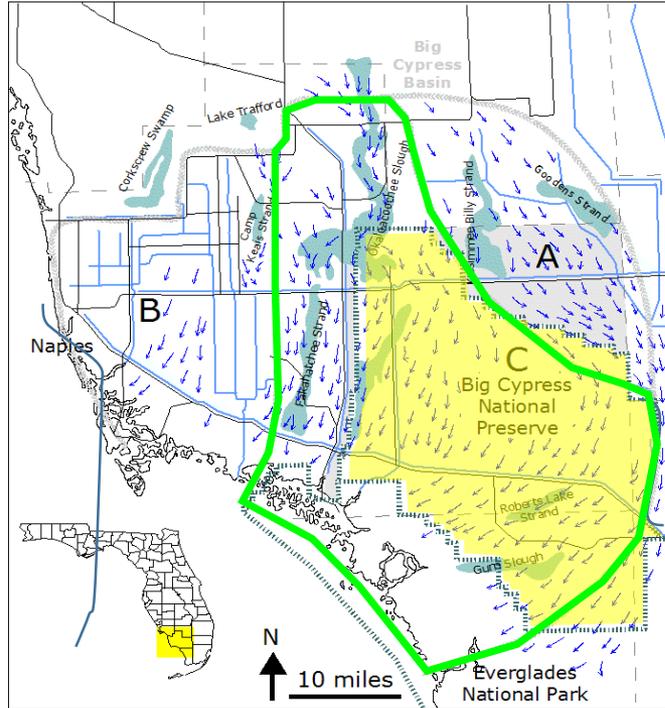


The Reality

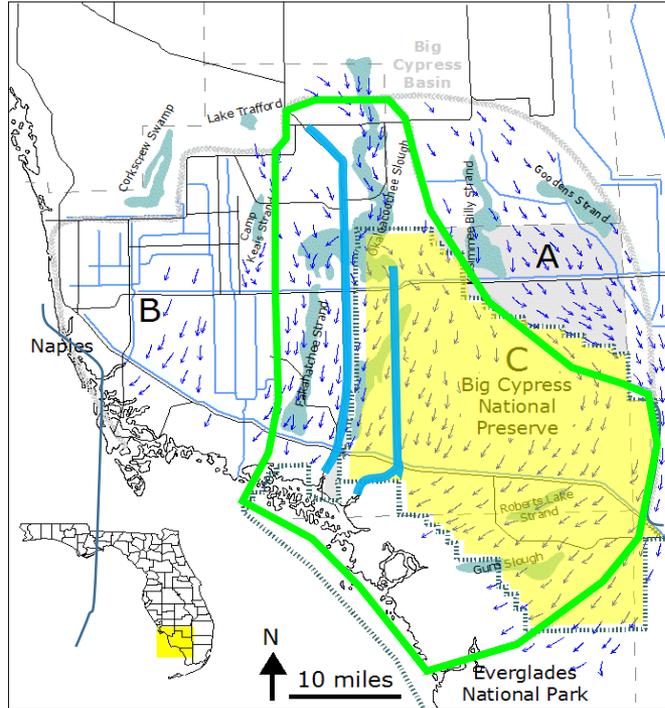
Klein Report, 1970



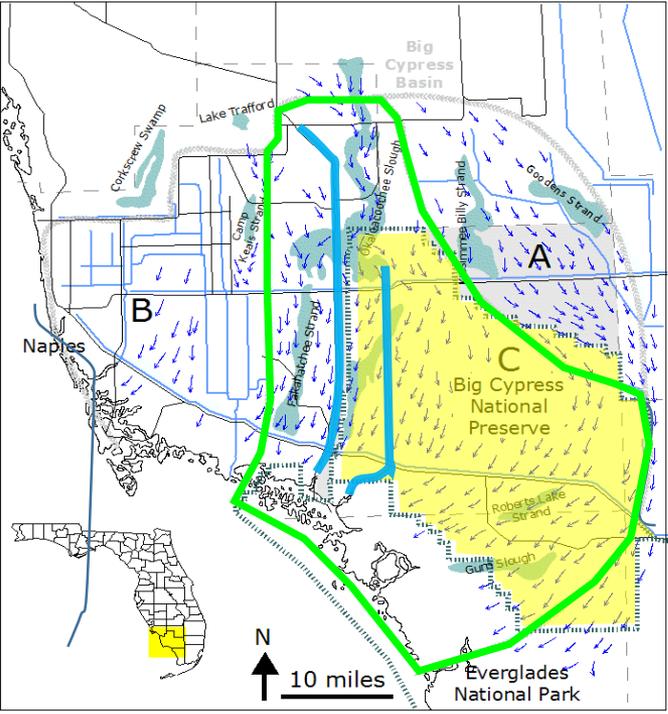
Klein Report, 1970

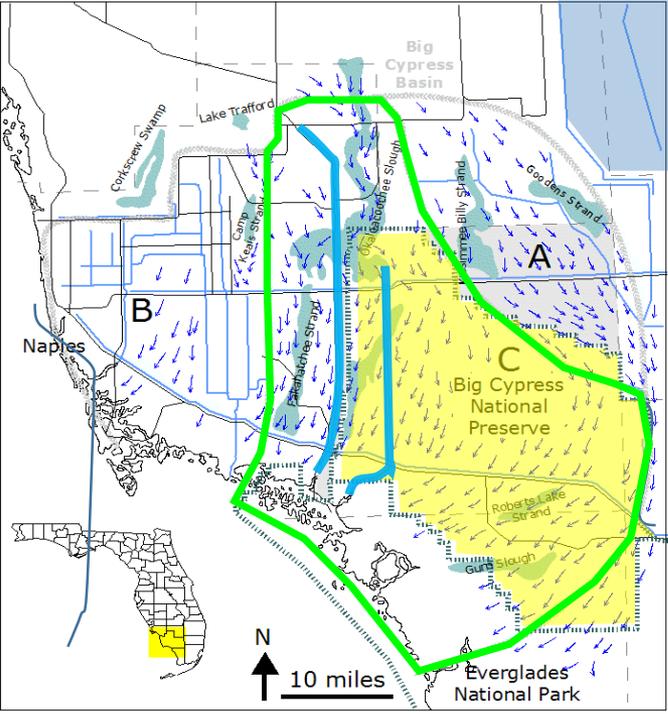
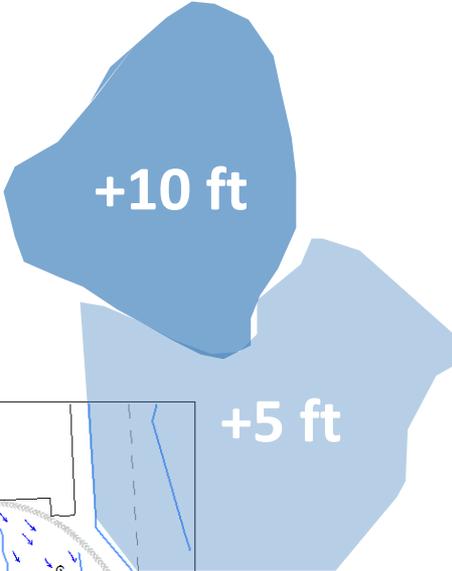


Klein Report, 1970



+10 ft

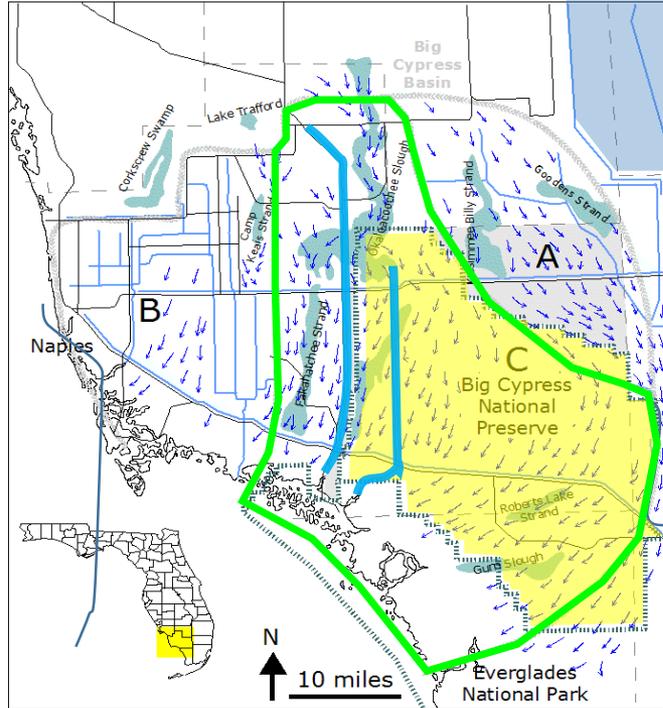


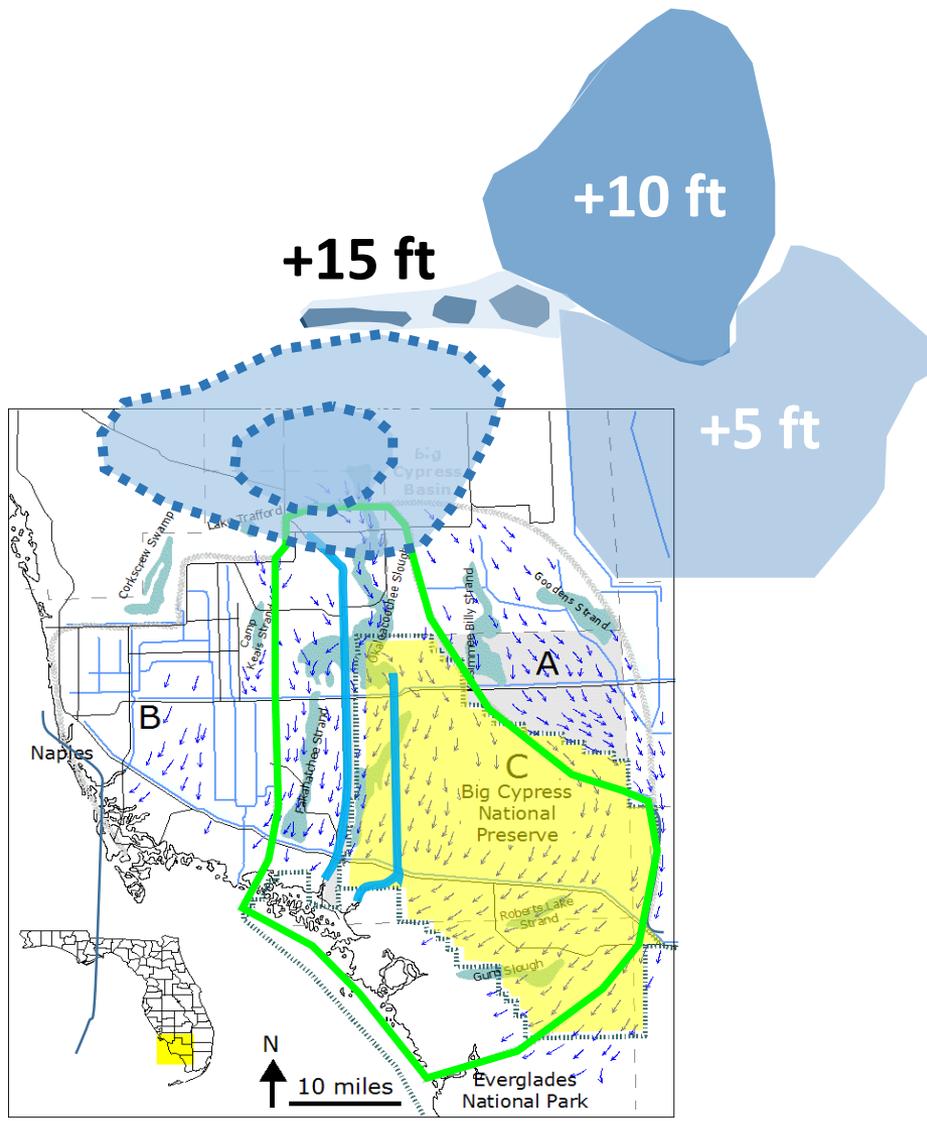


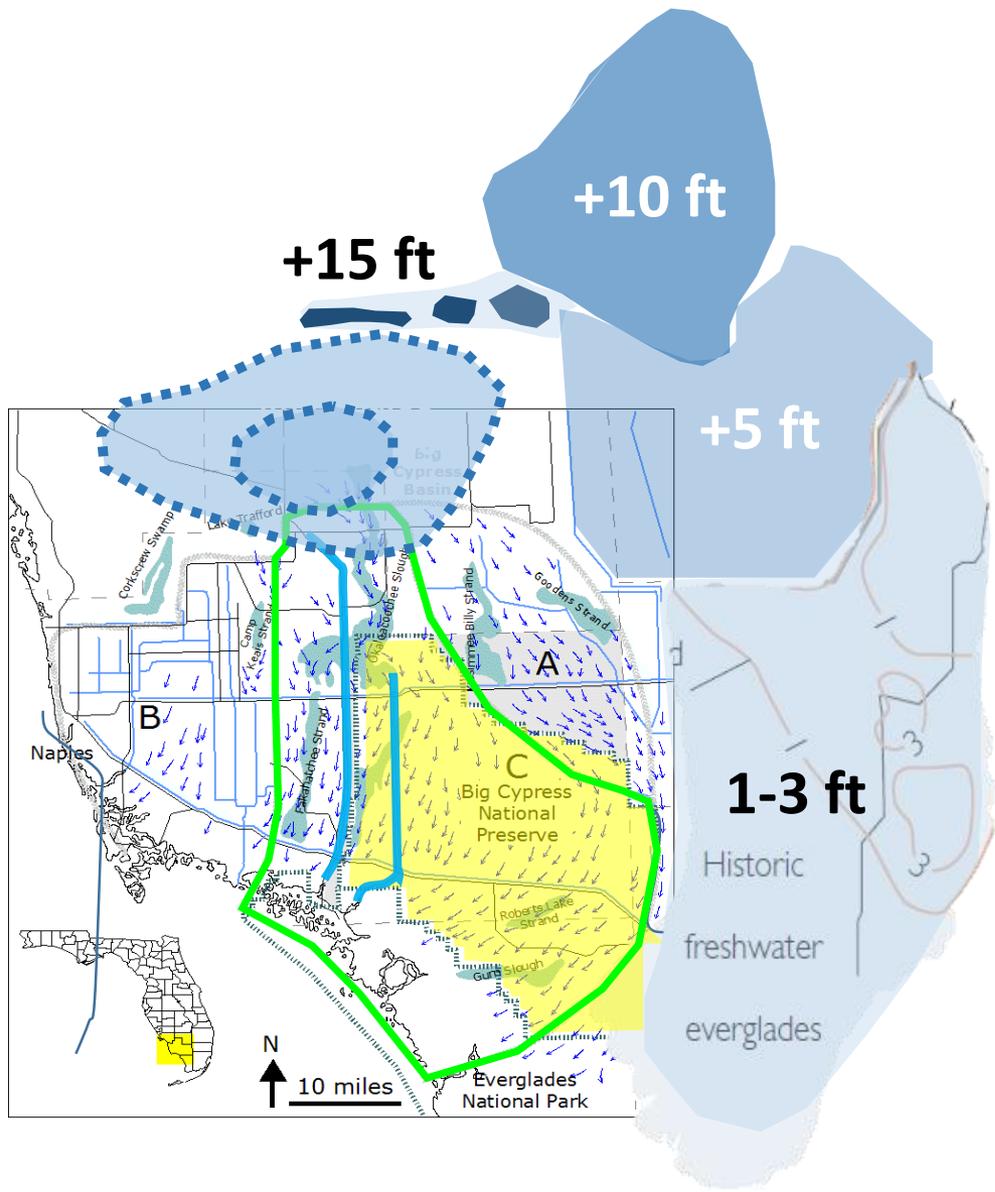
+15 ft

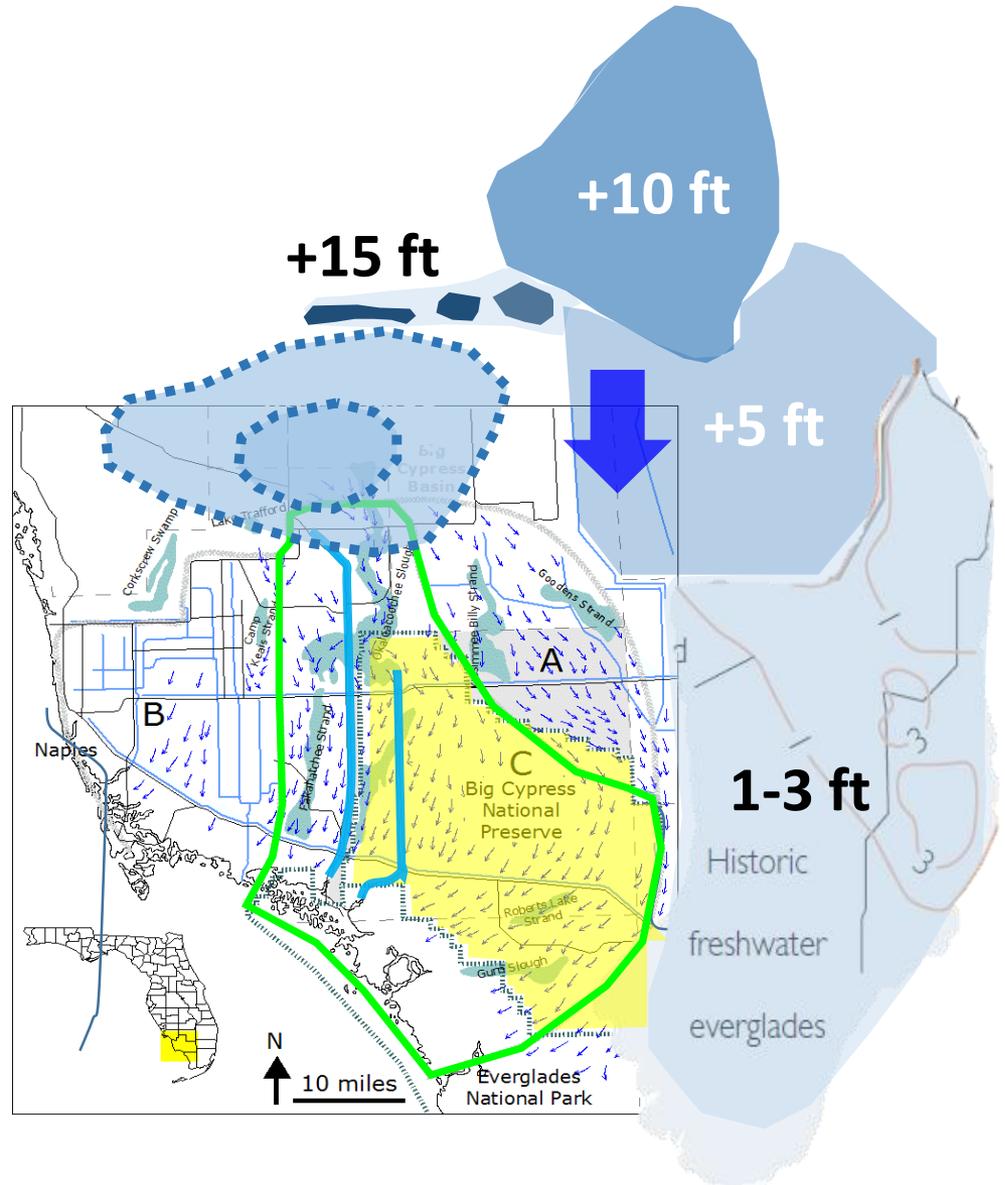
+10 ft

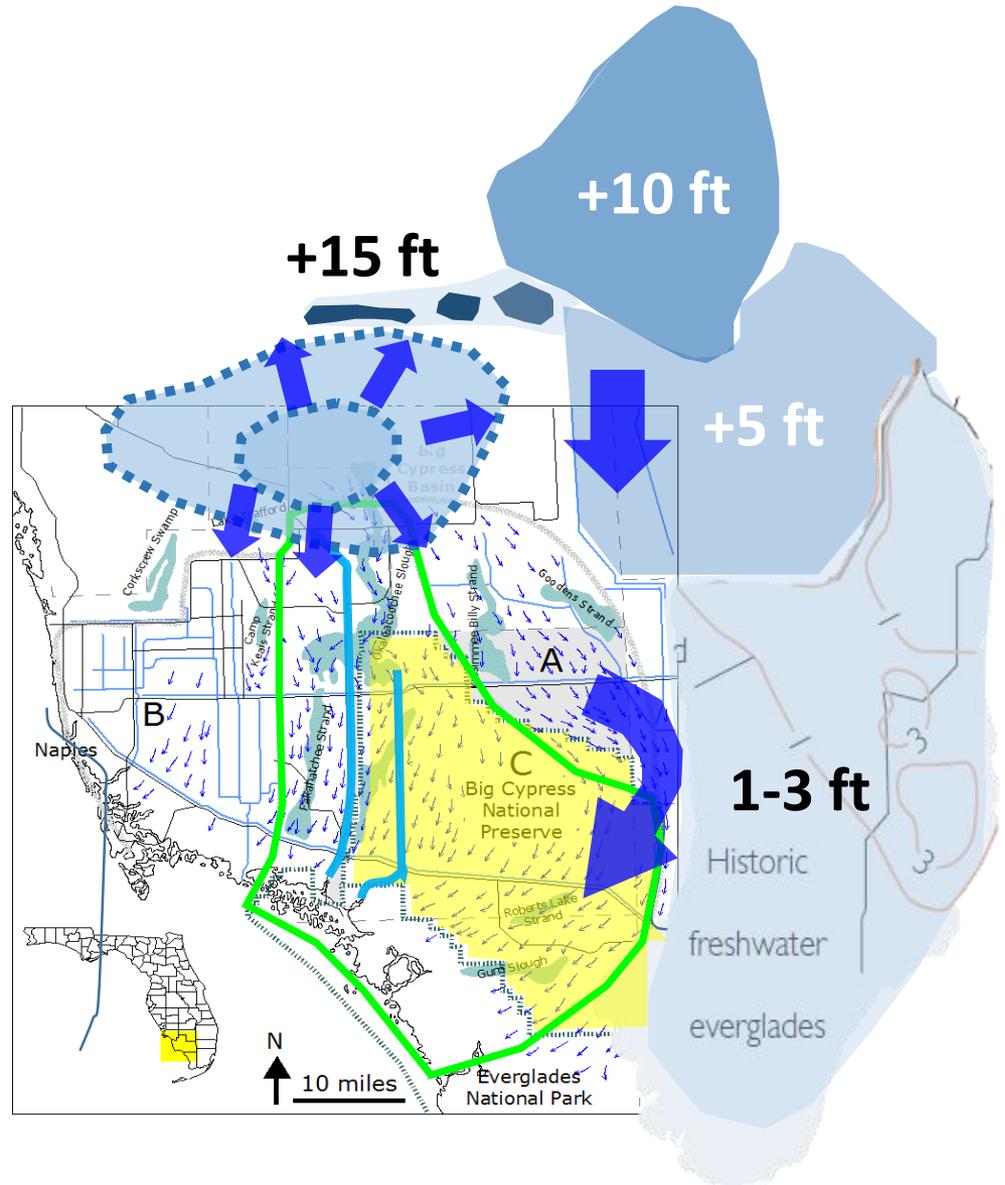
+5 ft

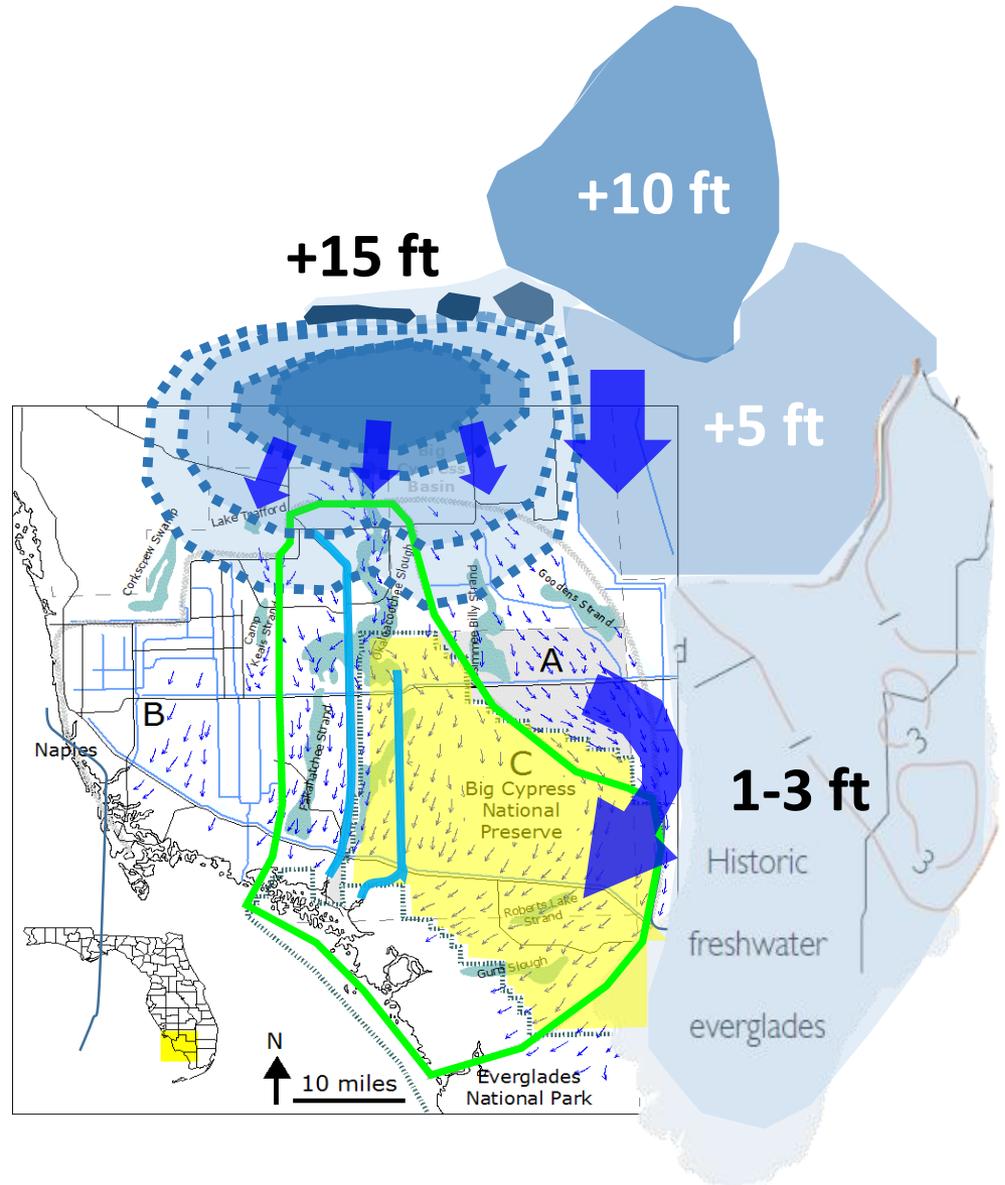


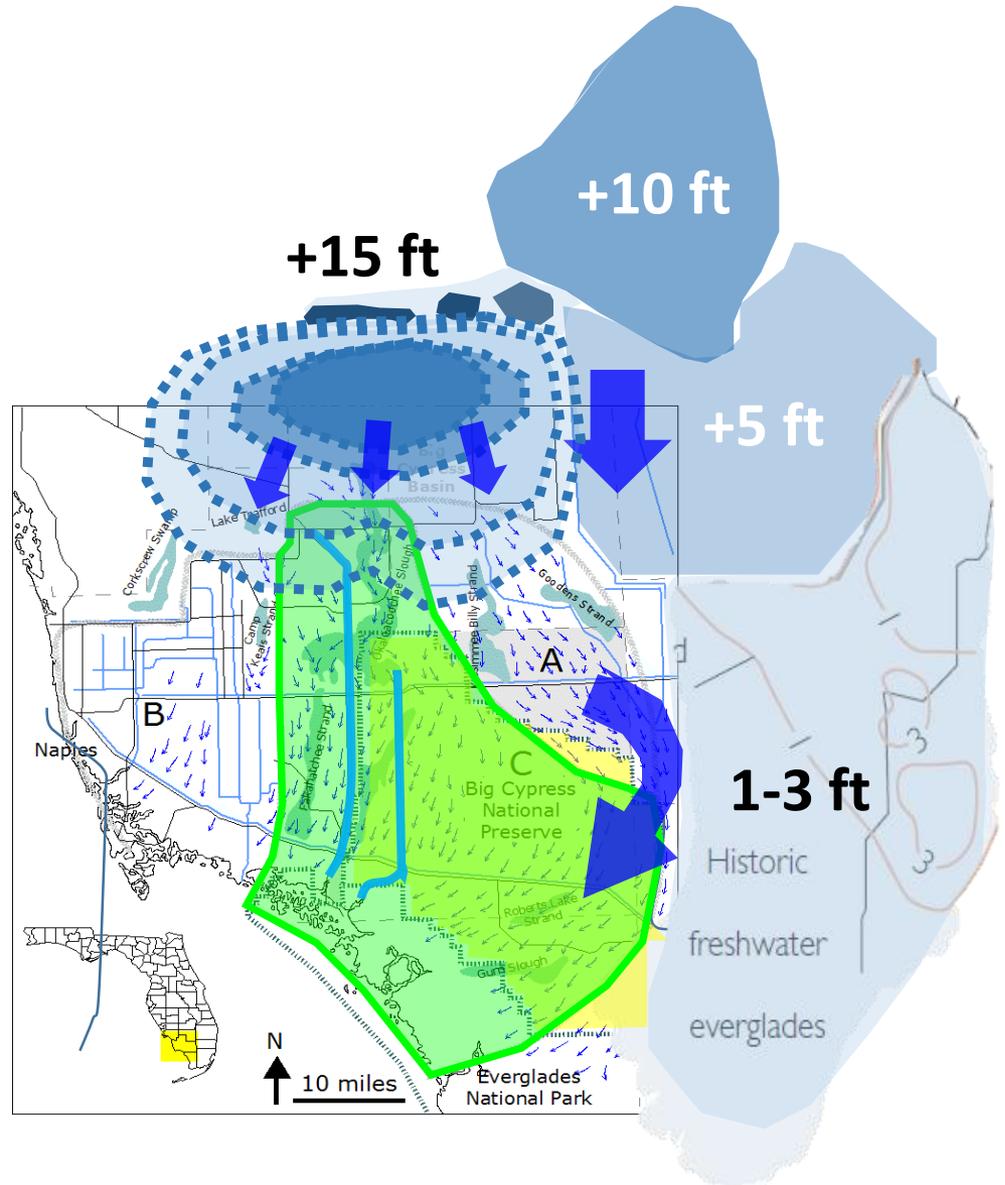


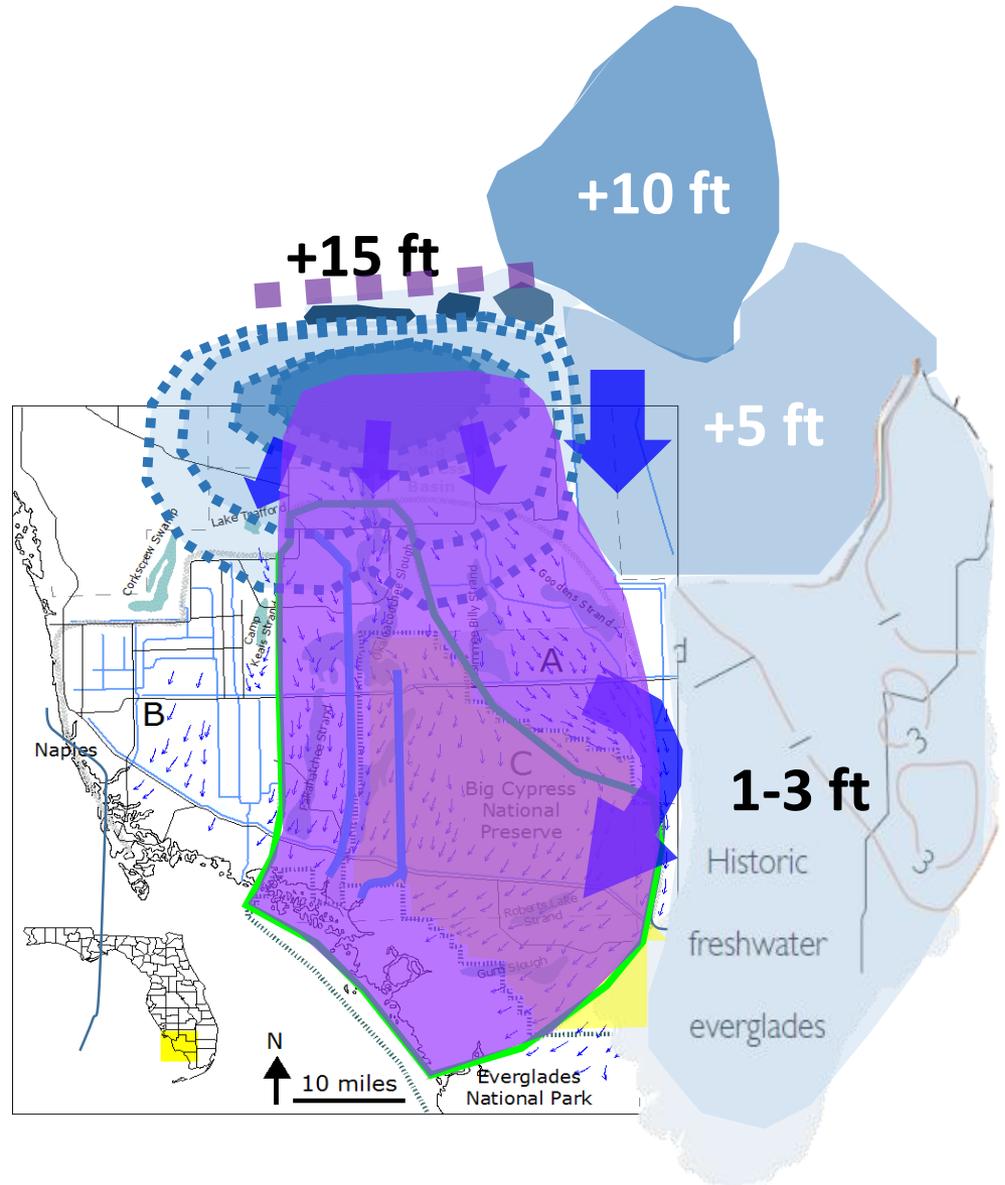


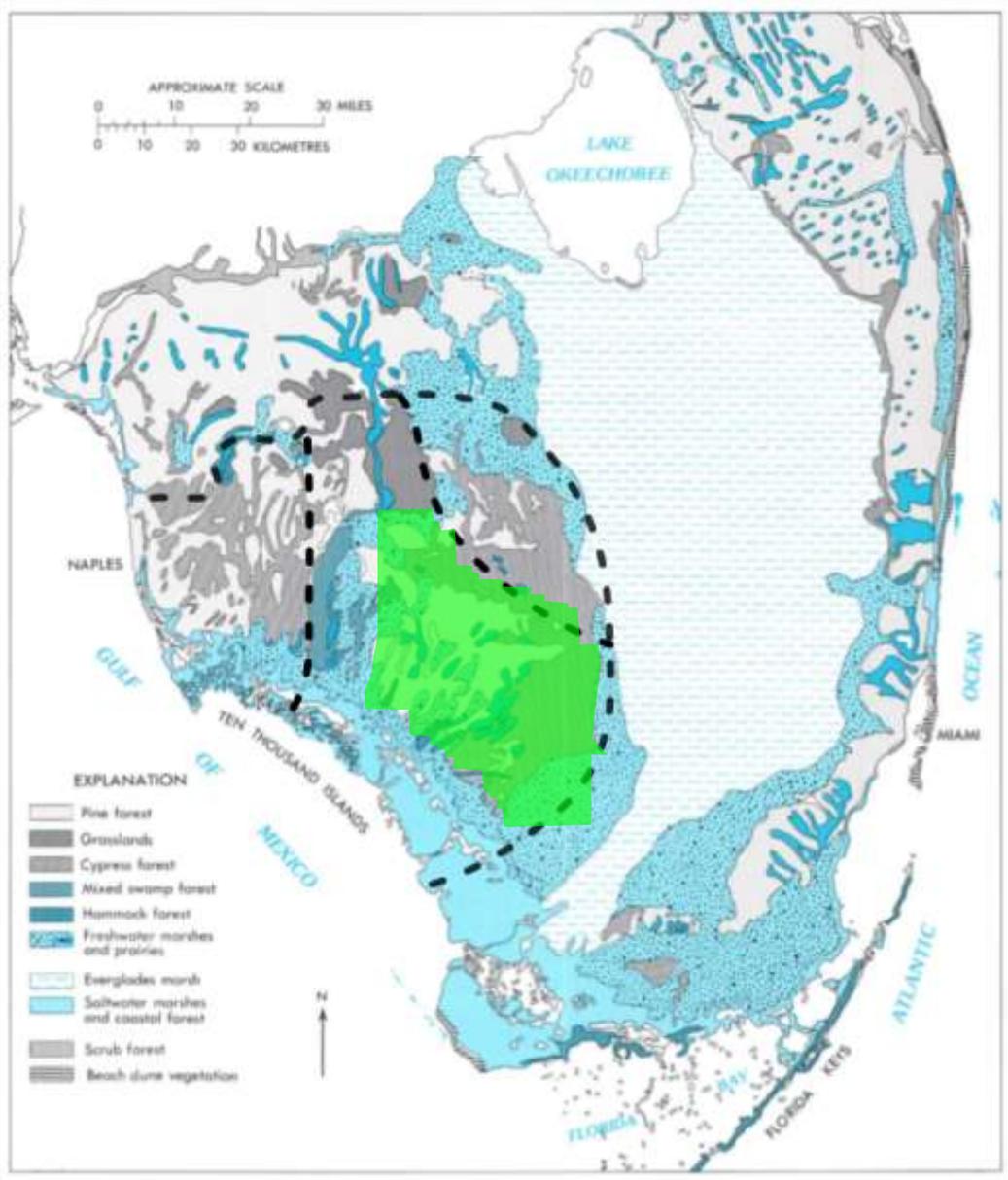


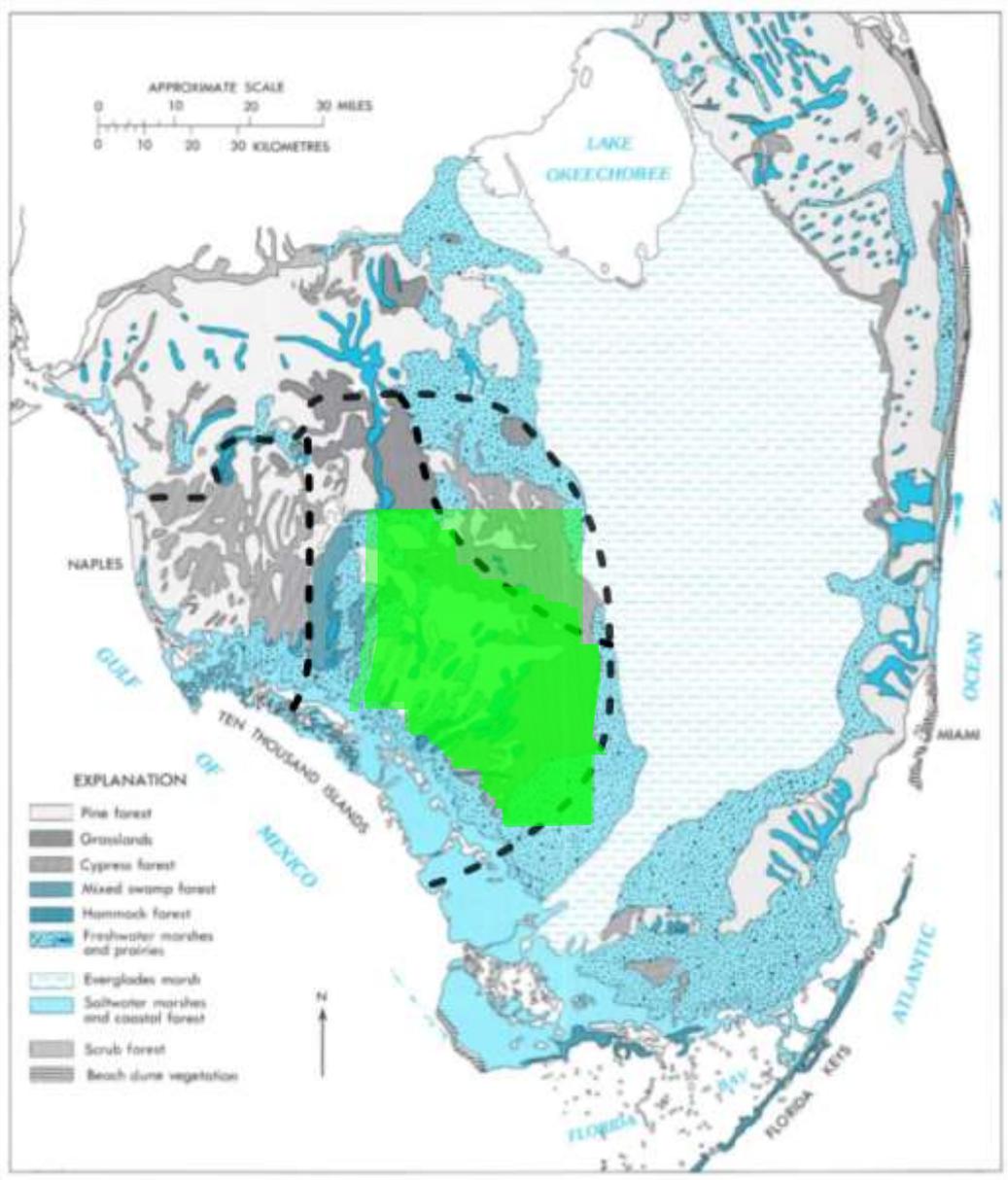


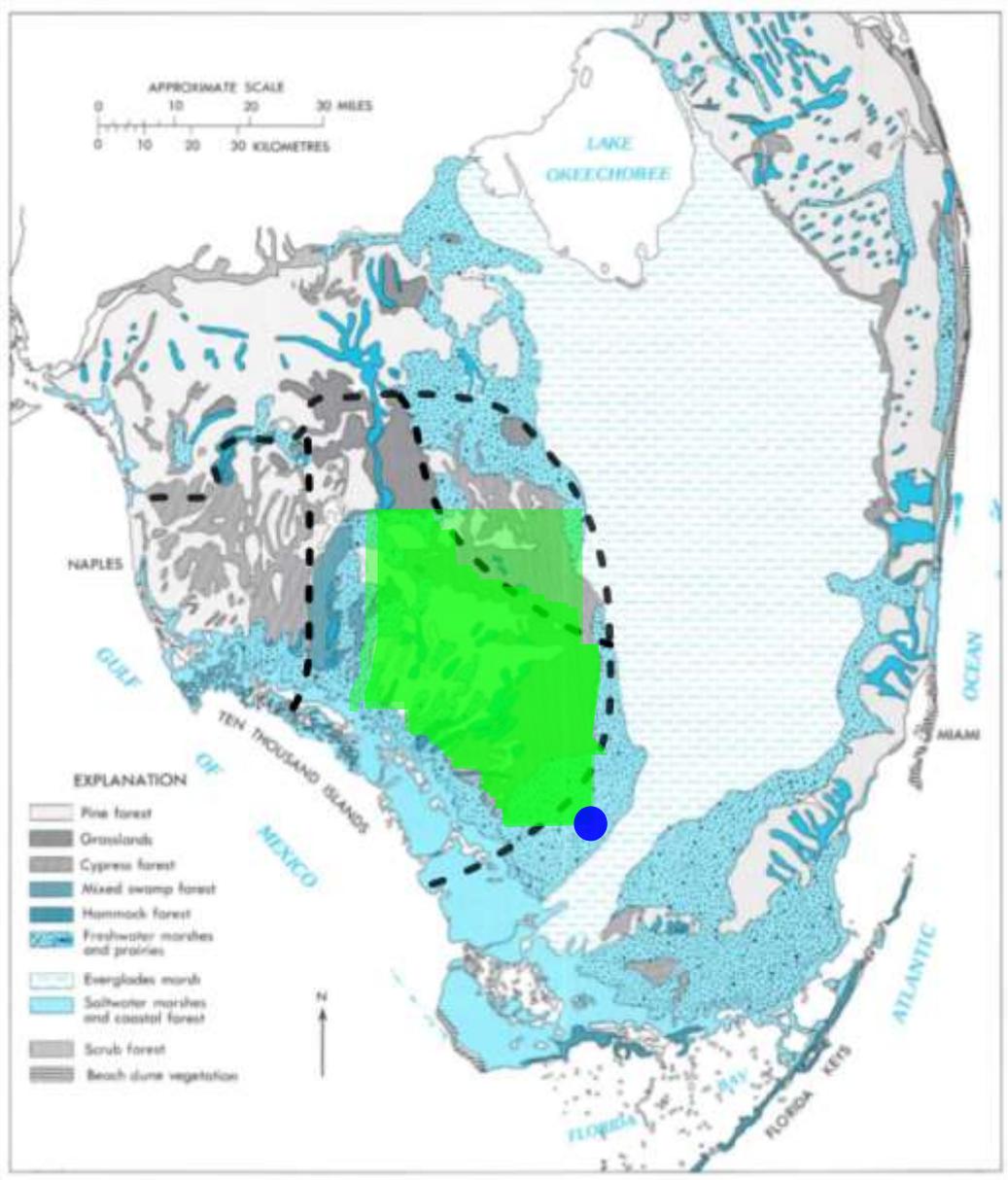


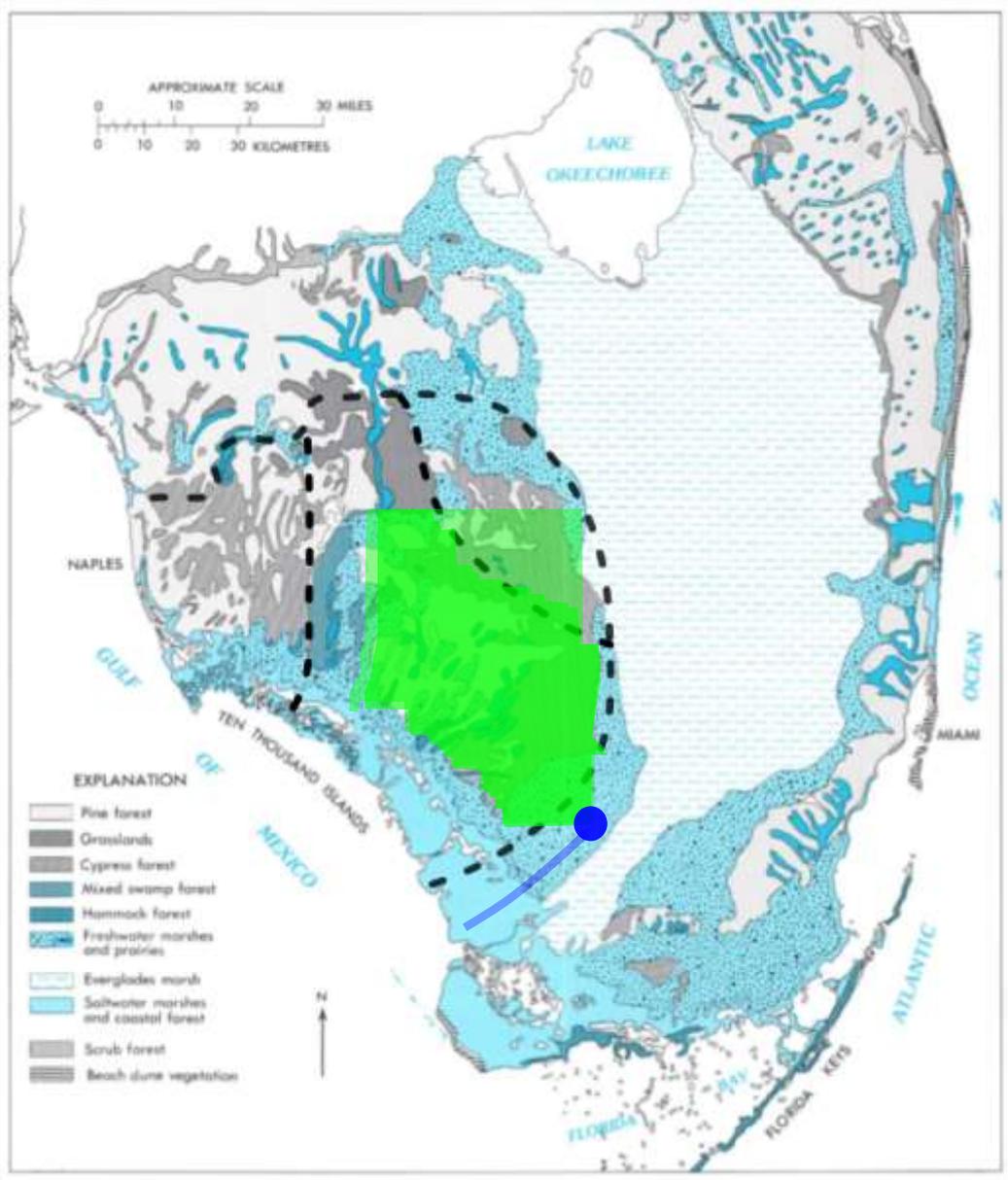


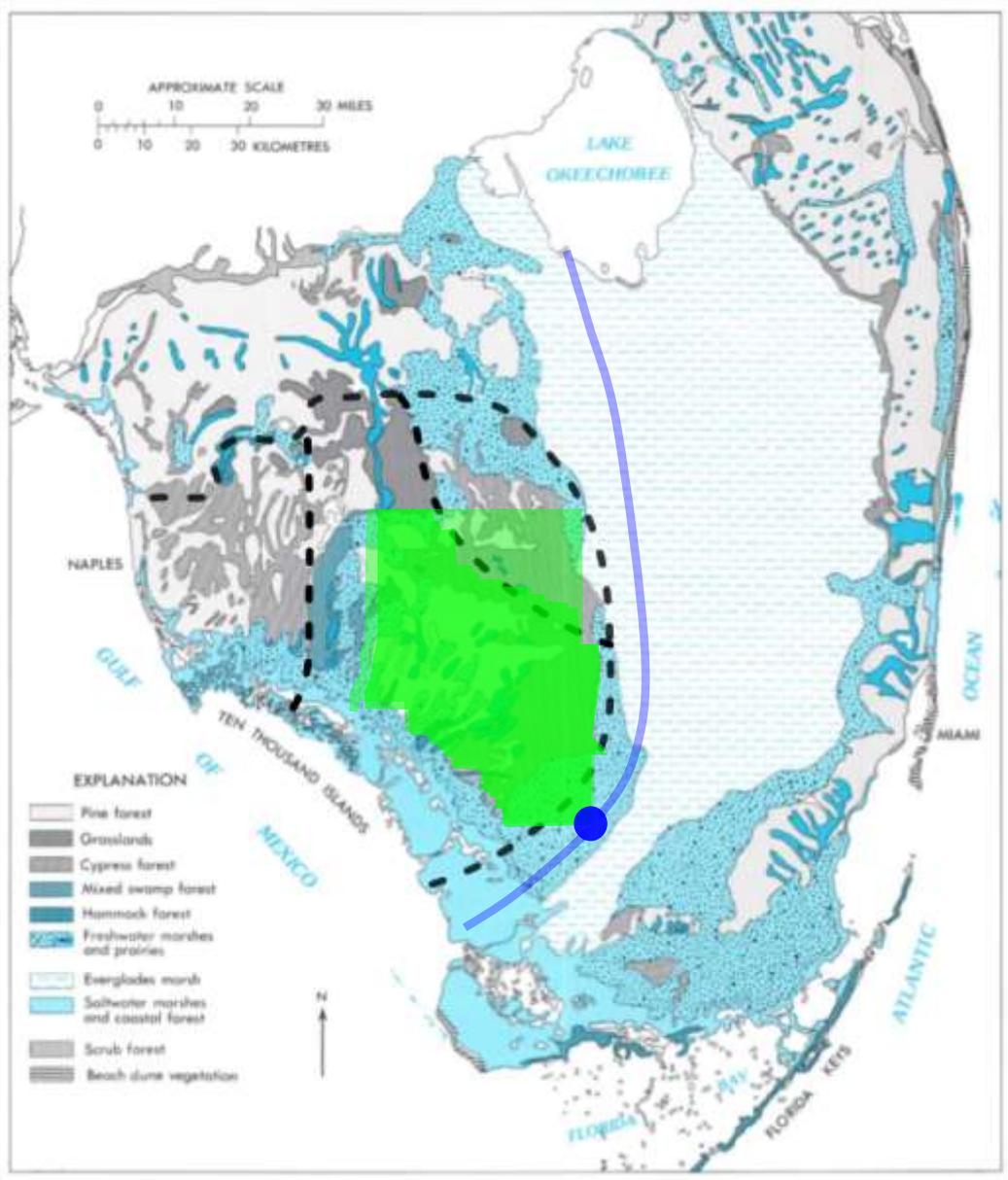


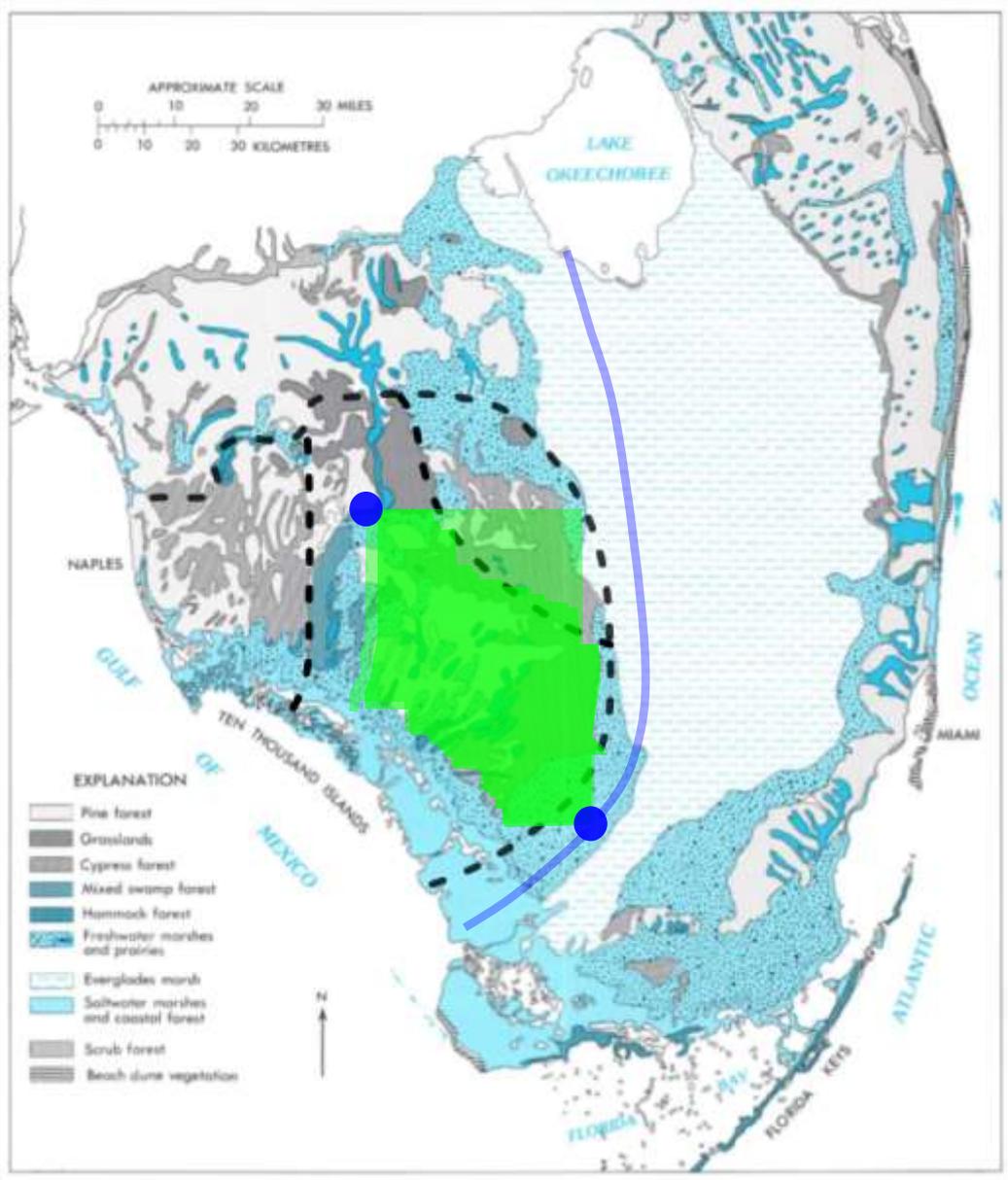


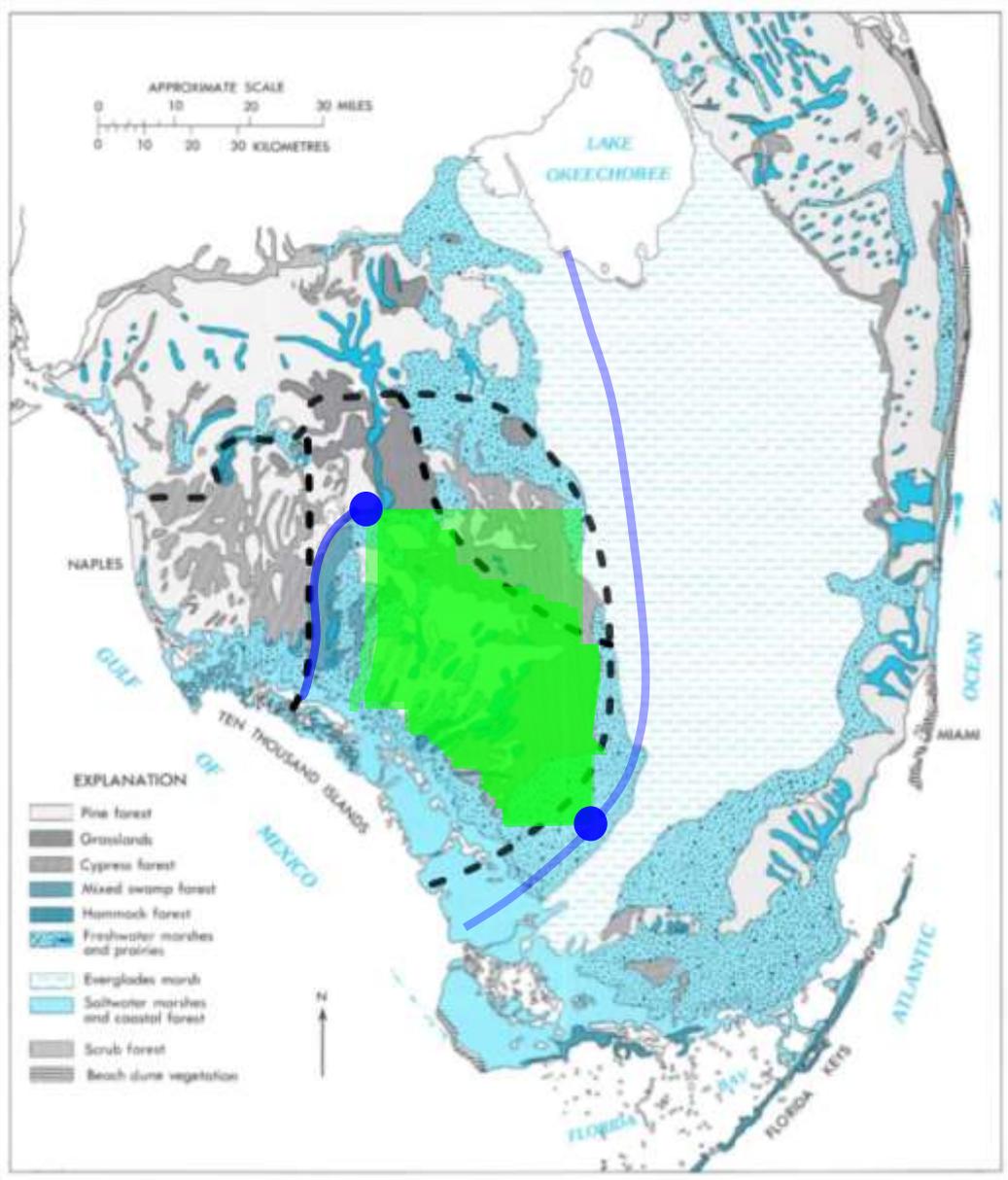


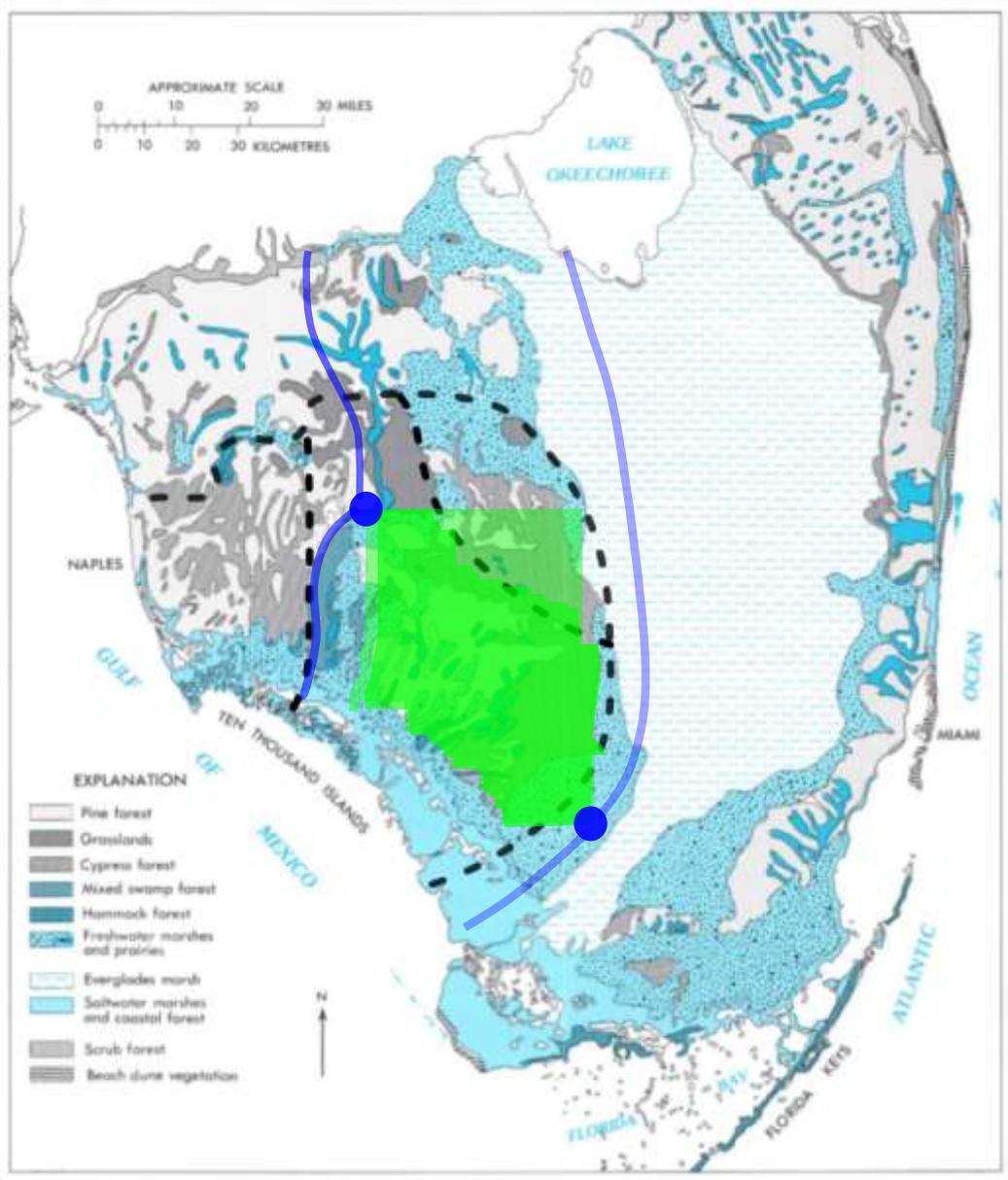


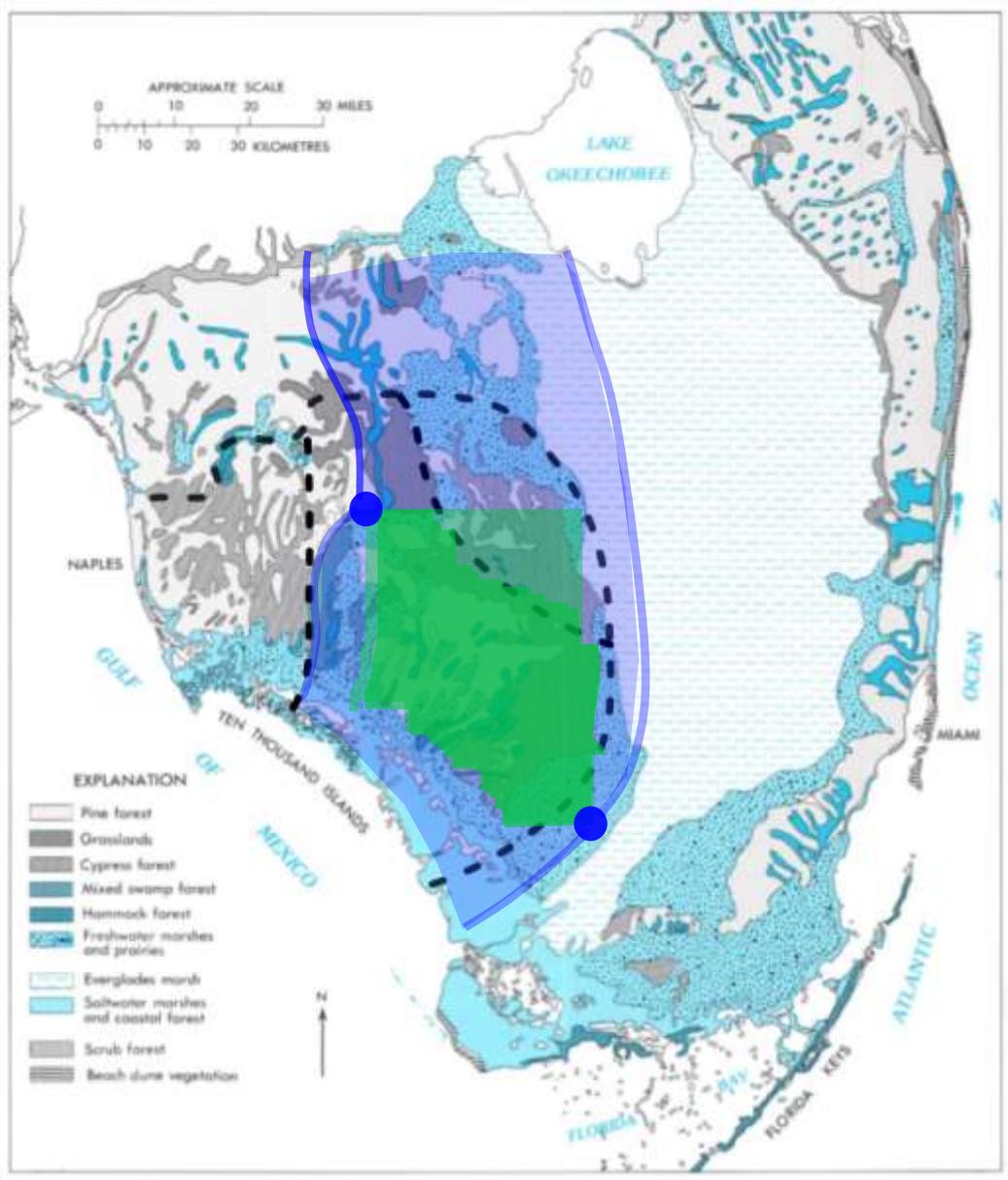












Explanation



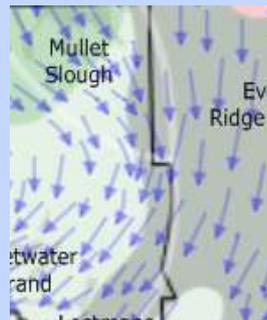
A Role of Lake Flirt

High pre-drainage elevation of Lake Okeechobee and **Ft Thomson falls** backs water in Lake Flirt floodplain up against the northern toe of the Immokalee Rise



B Ground-water inflows from Immokalee Rise

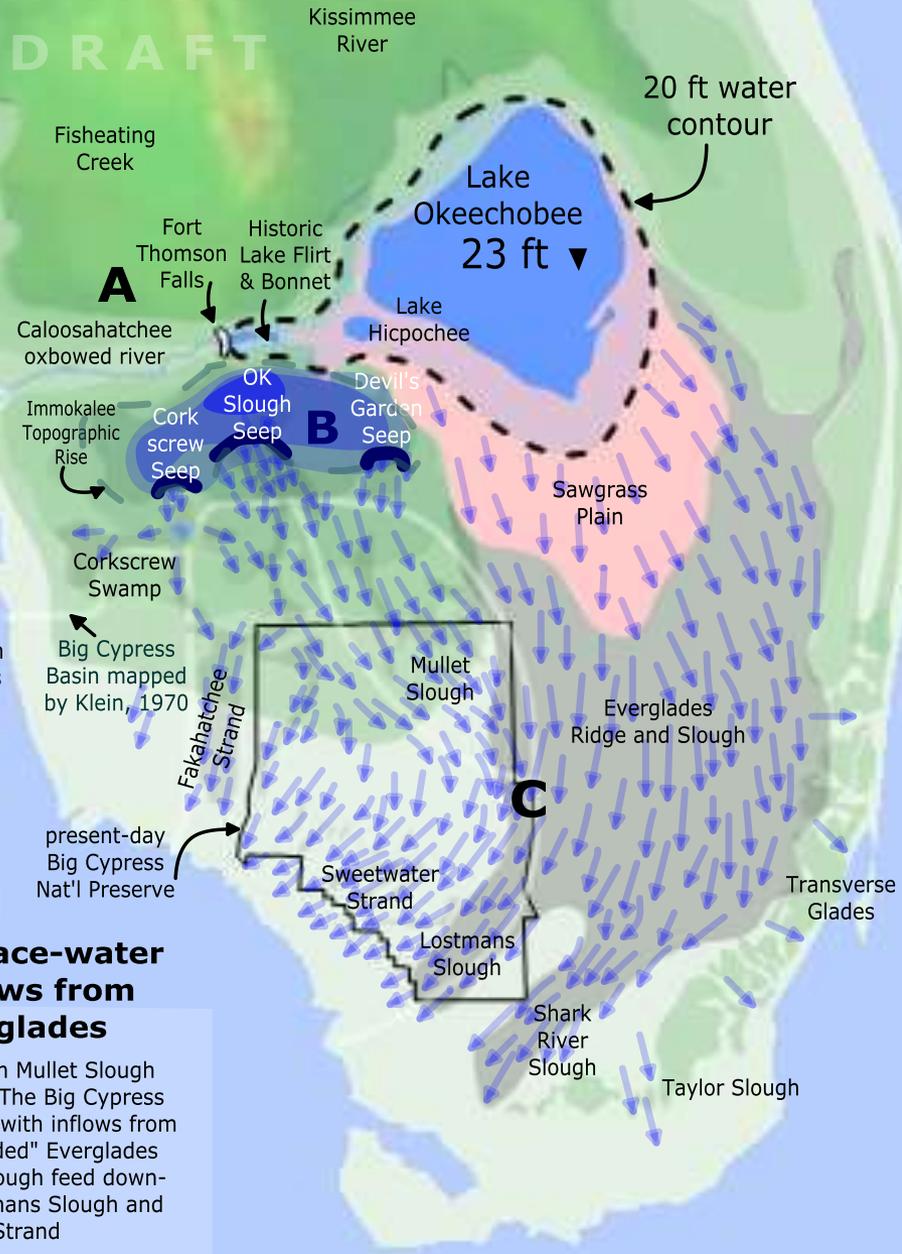
Higher boundary conditions to the north (i.e. Lake Flirt) and east (i.e. Sawgrass Plain) resulted in a higher ground-water mound under the Immokalee Rise, which in turn flowed south into the Big Cypress Swamp through OK Slough and other seeps



C Surface-water inflows from Everglades

Outflows from Mullet Slough **stay within** The Big Cypress which, along with inflows from the "unsubsidized" Everglades Ridge and Slough feed downstream Lostmans Slough and Sweetwater Strand

DRAFT



Pre-drainage Swamp Overview



Pre-drainage swamp was **much bigger** than today's truncated watershed



Pre-drainage Swamp Overview



Pre-drainage swamp was **much bigger** than today's truncated watershed



Pre-drainage swamp was **groundwater** fed by Immokalee Rise



Pre-drainage Swamp Overview



Pre-drainage swamp was **much bigger** than today's truncated watershed



Pre-drainage swamp was **groundwater** fed by Immokalee Rise, not just rain



Pre-drainage swamp water **Everglades fed**, today it is drained into the Everglades



Pre-drainage Swamp Overview



Pre-drainage swamp was **much bigger** than today's truncated watershed



Pre-drainage swamp was **groundwater** fed by Immokalee Rise, not just rain

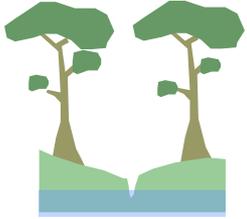


Pre-drainage swamp water **Everglades fed**, today it is drained into the Everglades



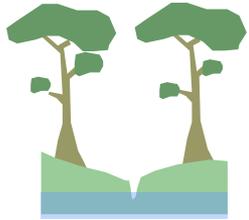
Pre-drainage **flow budget** was profoundly larger than today

Post-drainage Swamp Overview

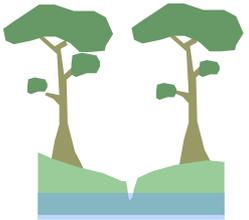


Dredging of and draining into the **Caloosahatchee** was first and biggest impact

Post-drainage Swamp Overview

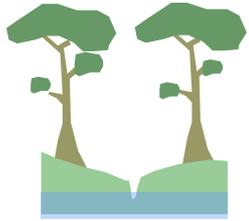


Dredging of and draining into the **Caloosahatchee** was first and biggest impact

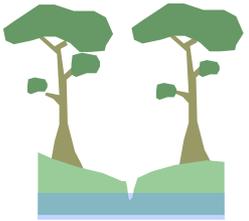


Pre-drainage swamp was ground-water fed, today it is **ground-water drained**

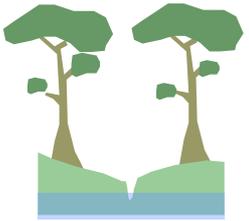
Post-drainage Swamp Overview



Dredging of and draining into the **Caloosahatchee** was first and biggest impact

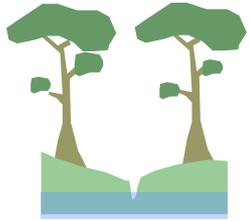


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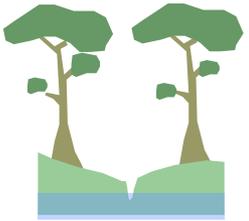


OK Slough sadly does not flow into Fakahatchee Strand

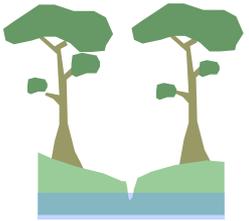
Post-drainage Swamp Overview



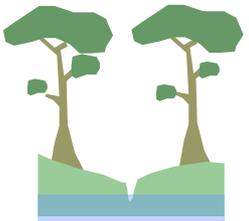
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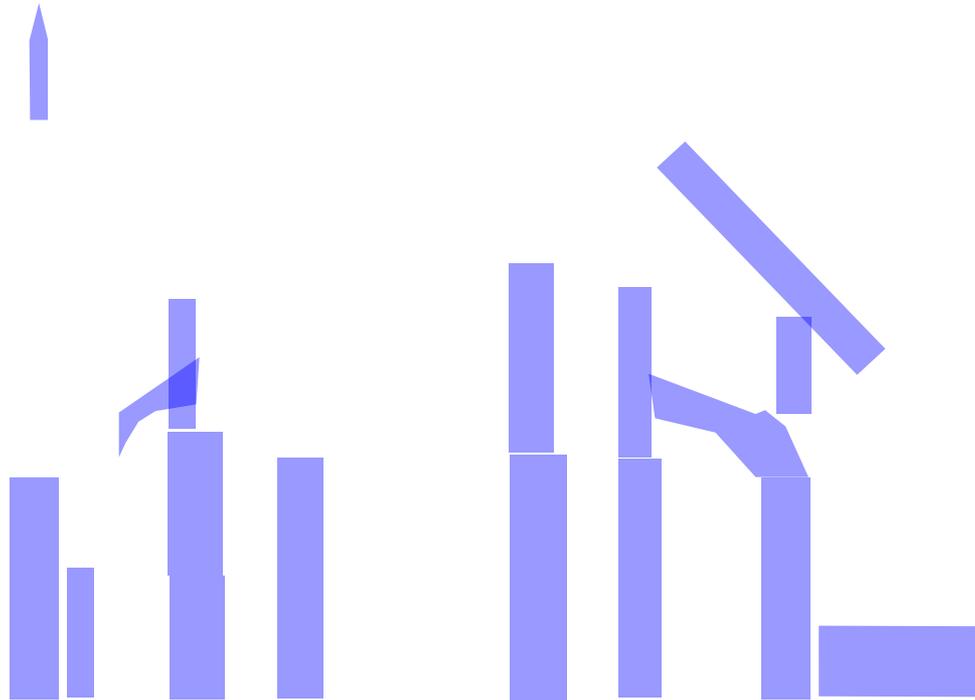


OK Slough sadly does not flow into Fakahatchee Strand

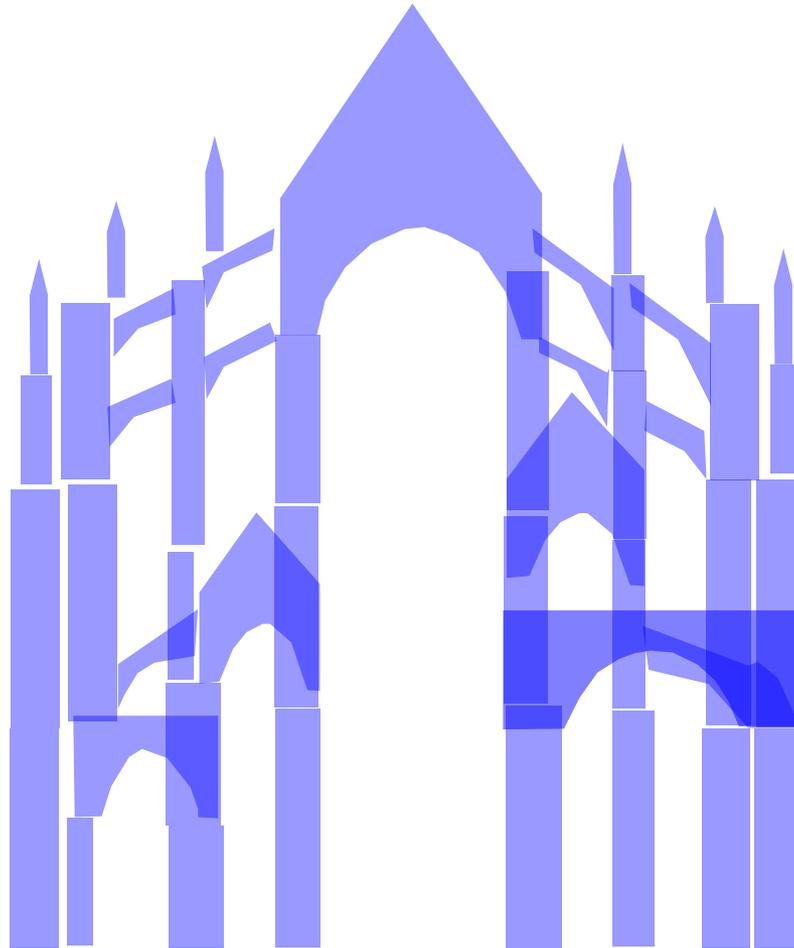


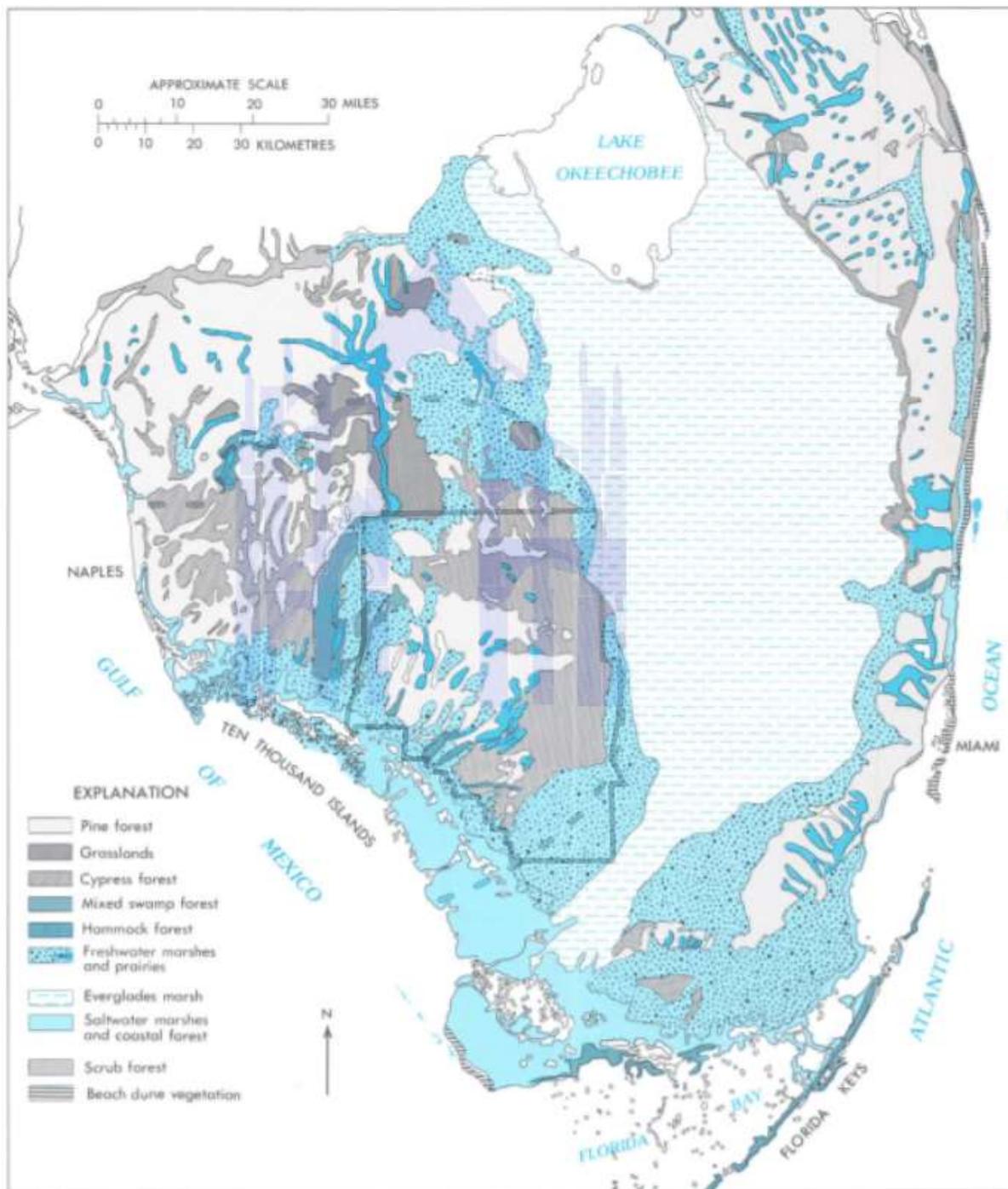
The swamp is managed as a fireshed, not as a watershed as envisioned by founders

What do we mean by “**derelict ruins?**”

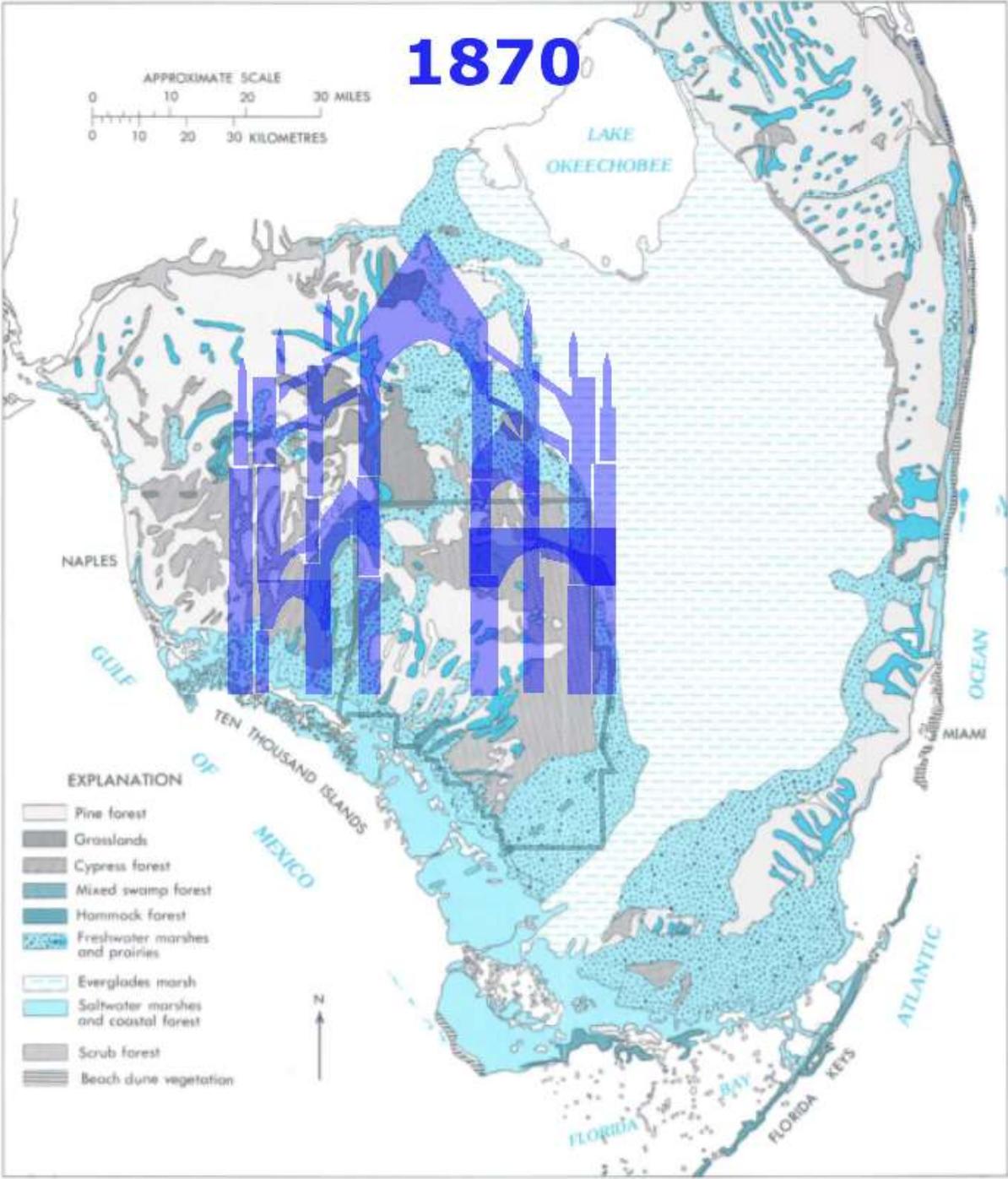
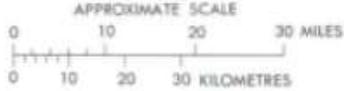


Think of pre-drainage
swamp as a hydrologic
cathedral



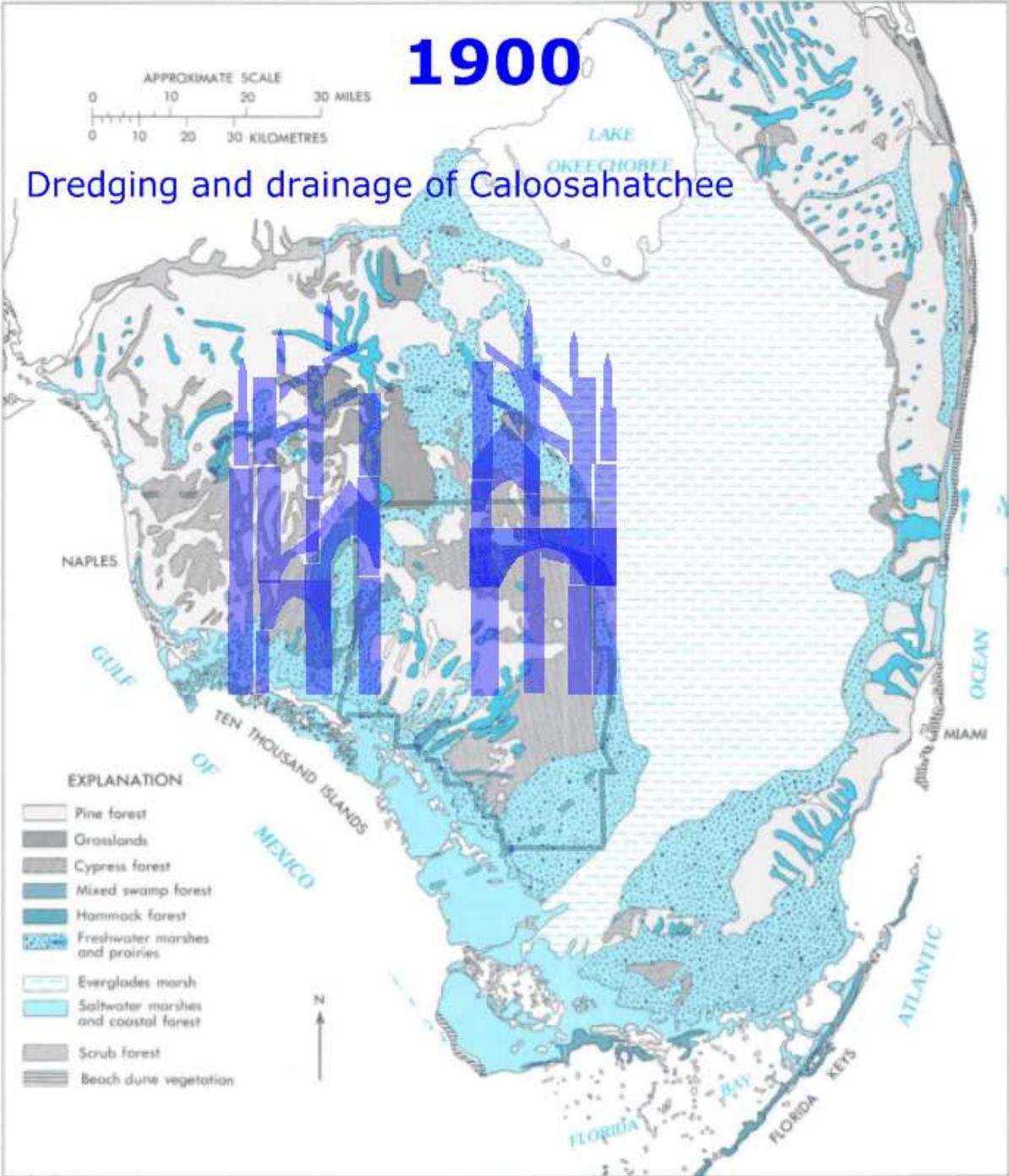


1870



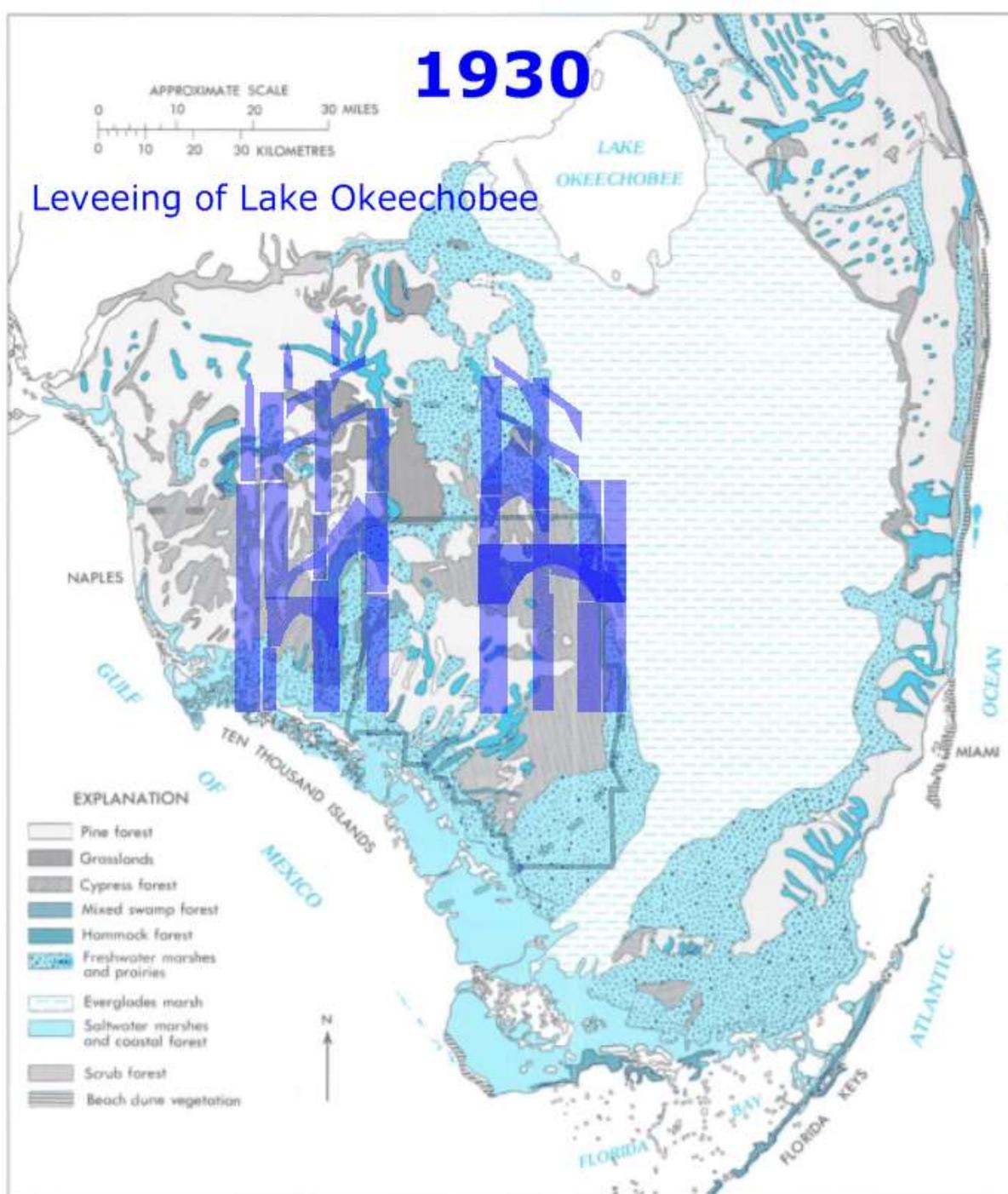
1900

Dredging and drainage of Caloosahatchee

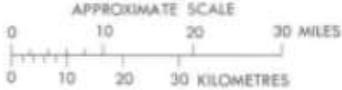


1930

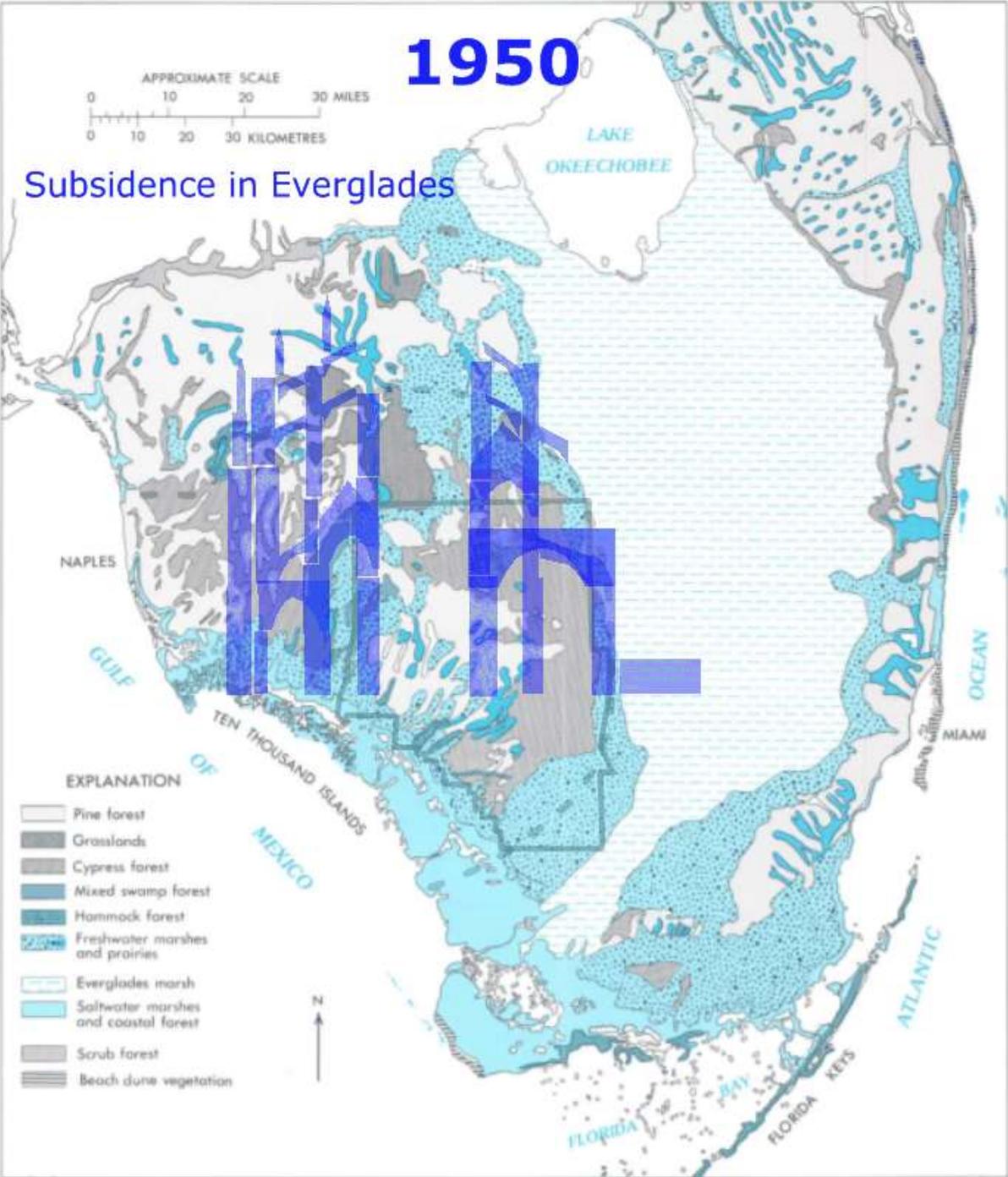
Leveeing of Lake Okeechobee



1950

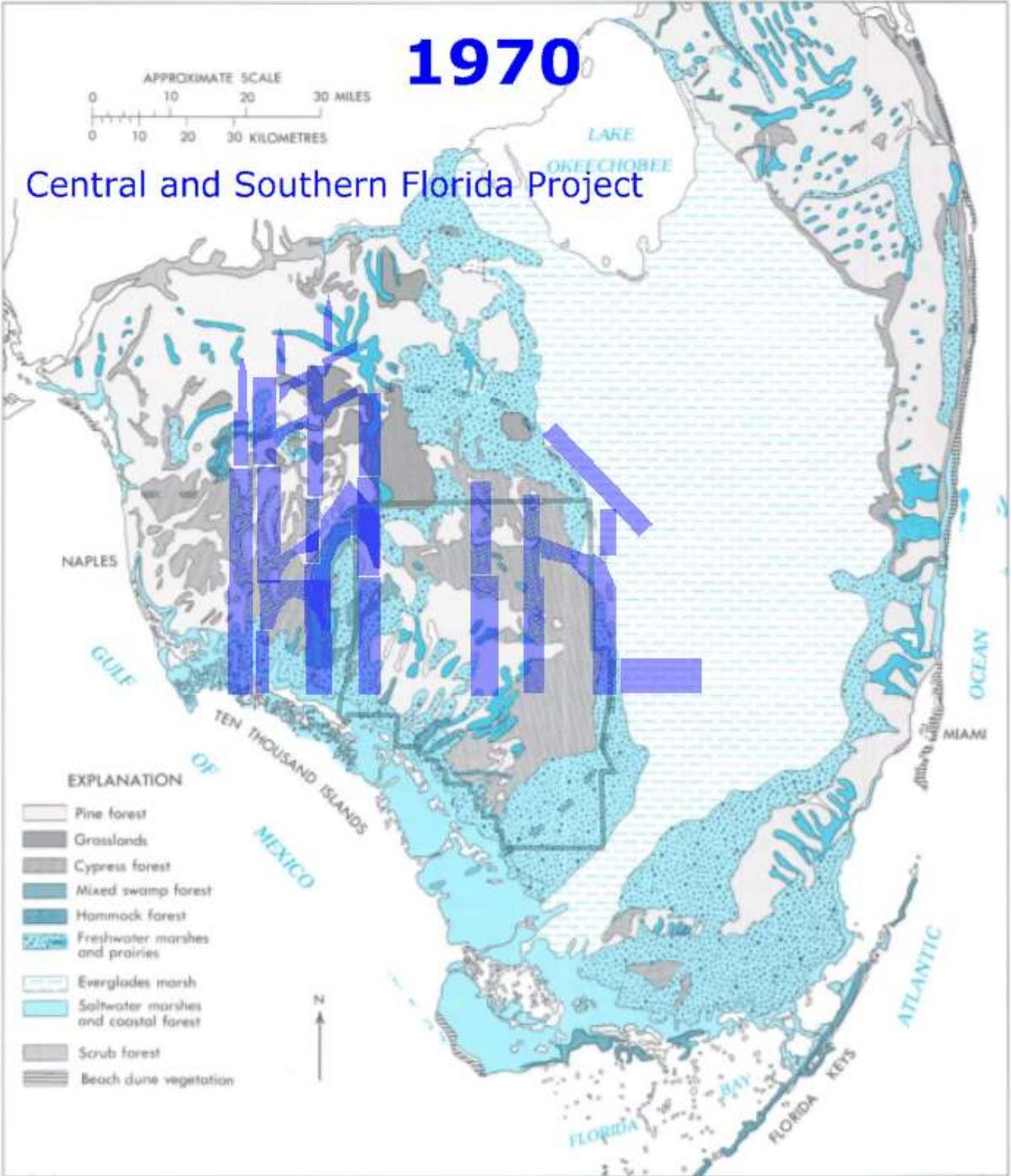
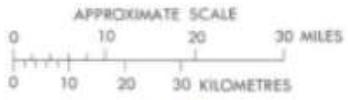


Subsidence in Everglades



1970

Central and Southern Florida Project



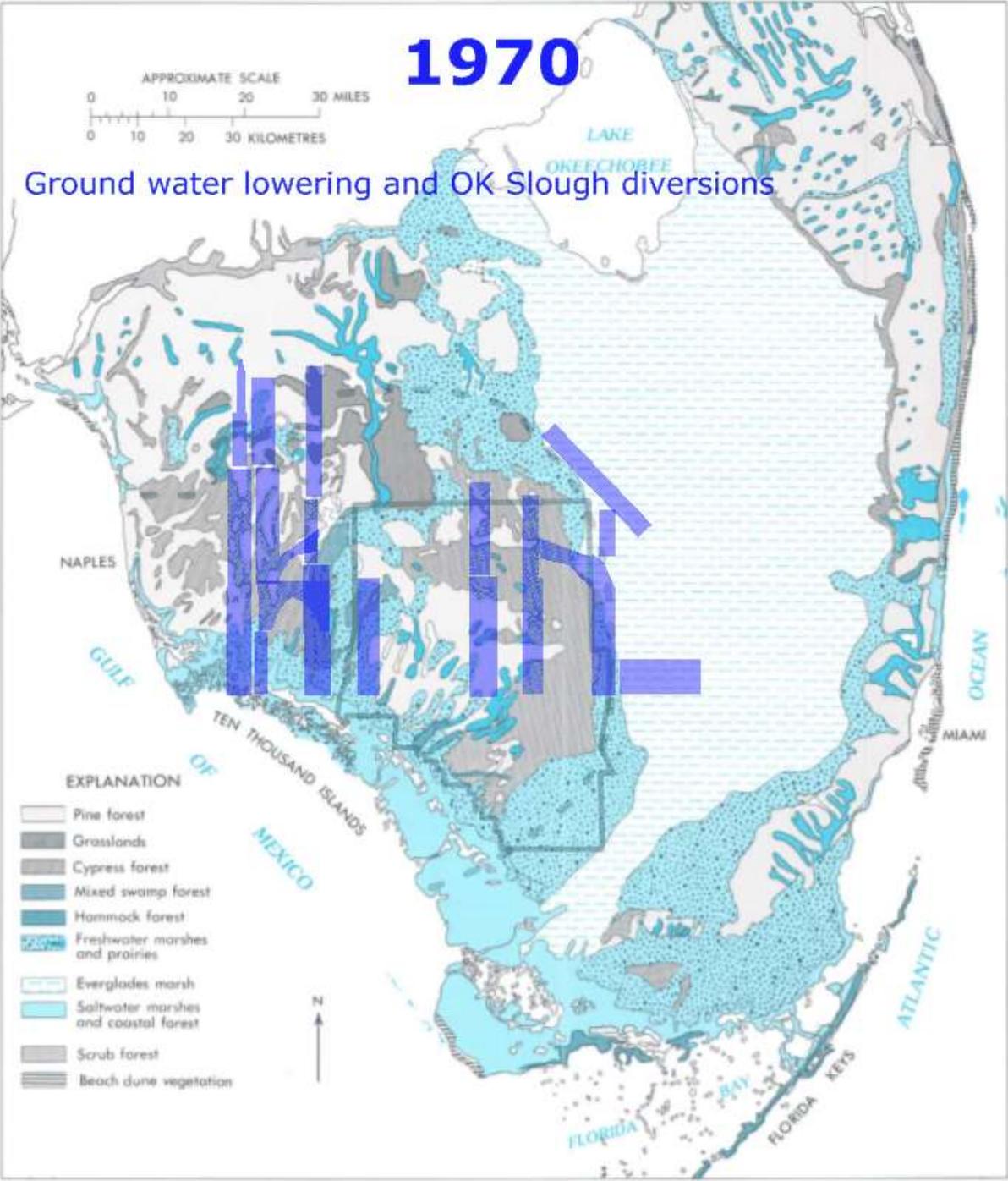
EXPLANATION

- Pine forest
- Grasslands
- Cypress forest
- Mixed swamp forest
- Hammock forest
- Freshwater marshes and prairies
- Everglades marsh
- Saltwater marshes and coastal forest
- Scrub forest
- Beach dune vegetation

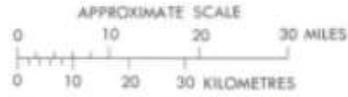
1970



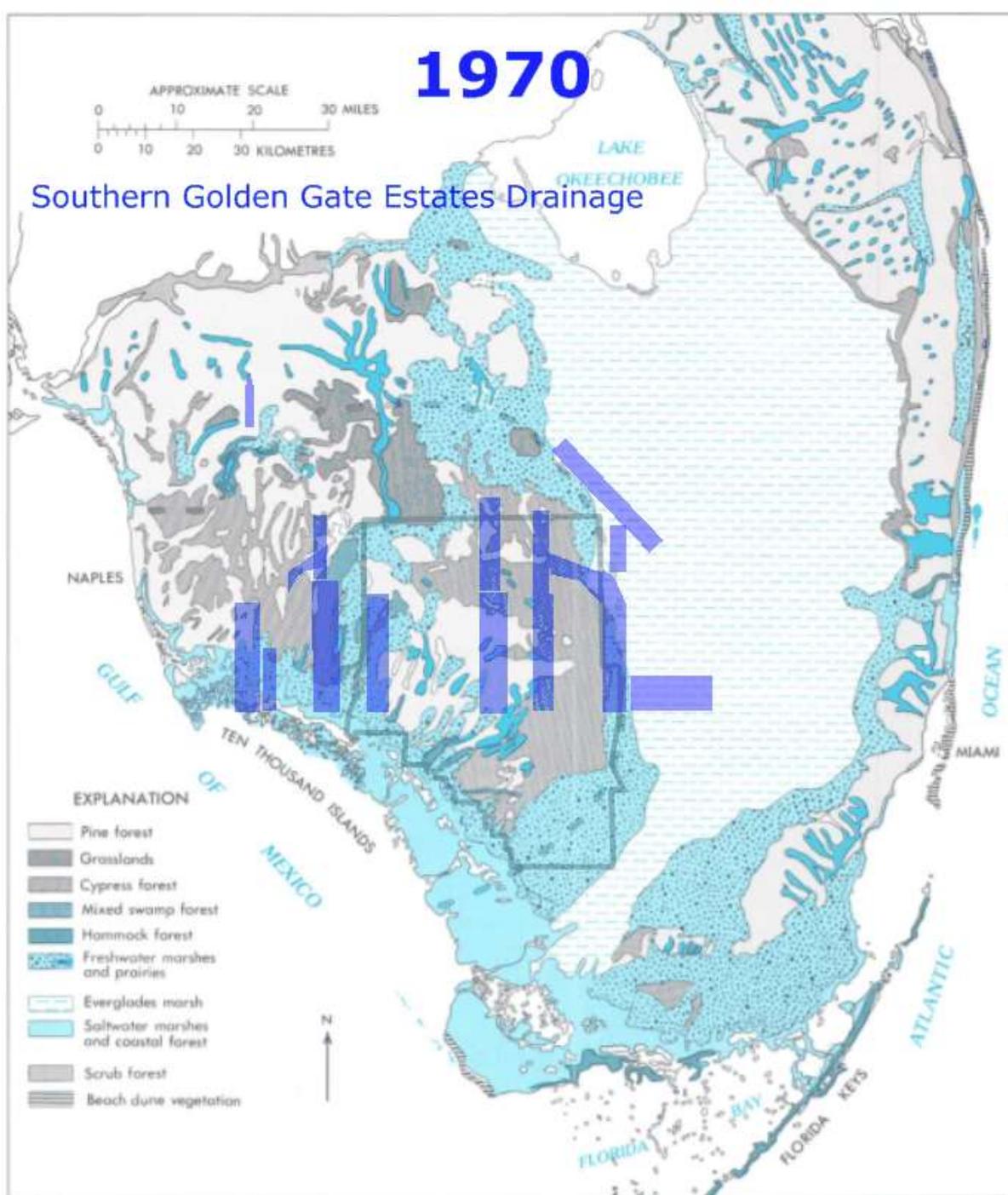
Ground water lowering and OK Slough diversions



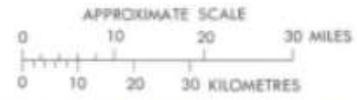
1970



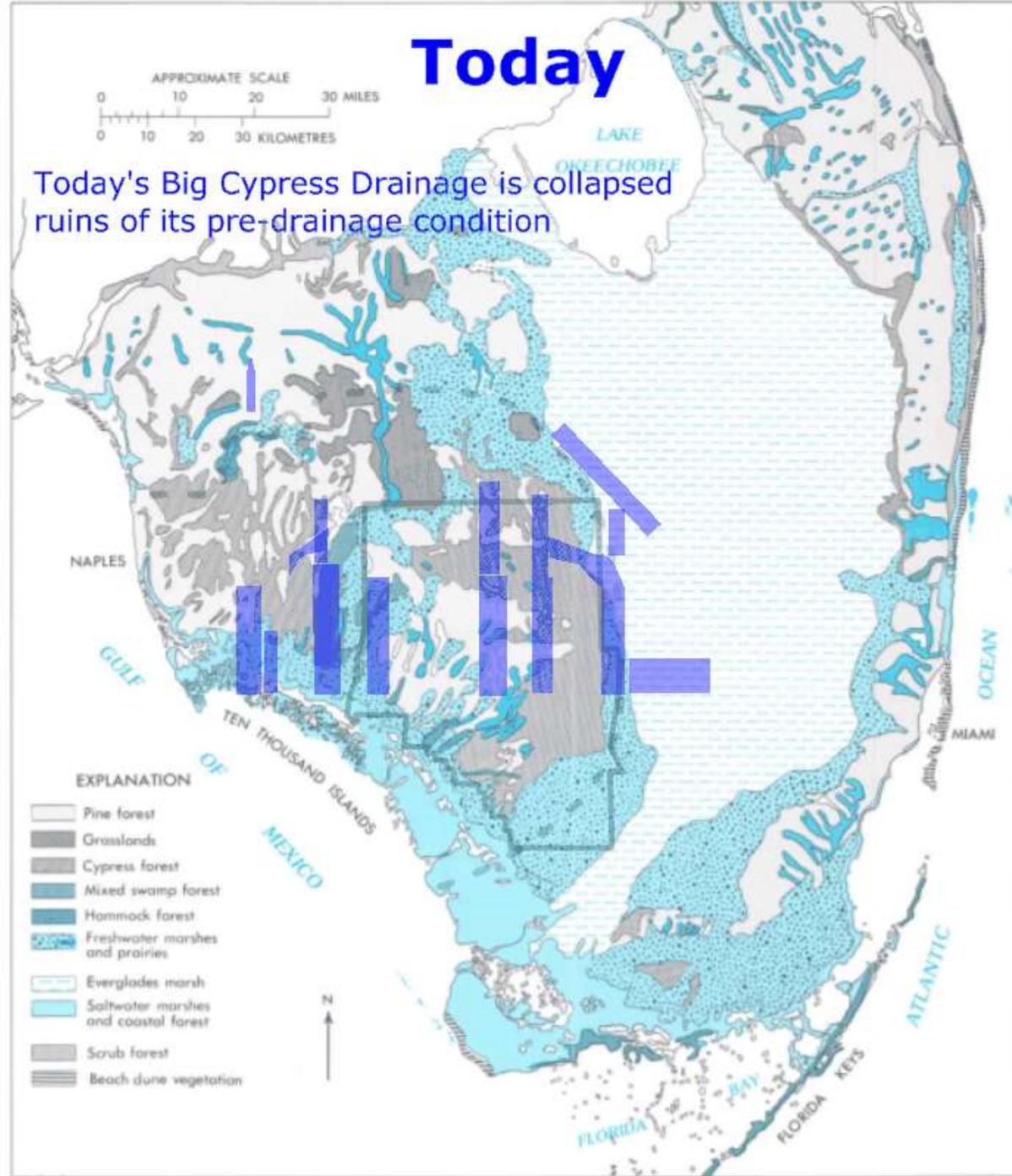
Southern Golden Gate Estates Drainage



Today



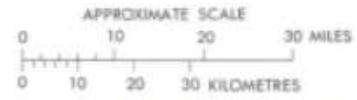
Today's Big Cypress Drainage is collapsed ruins of its pre-drainage condition



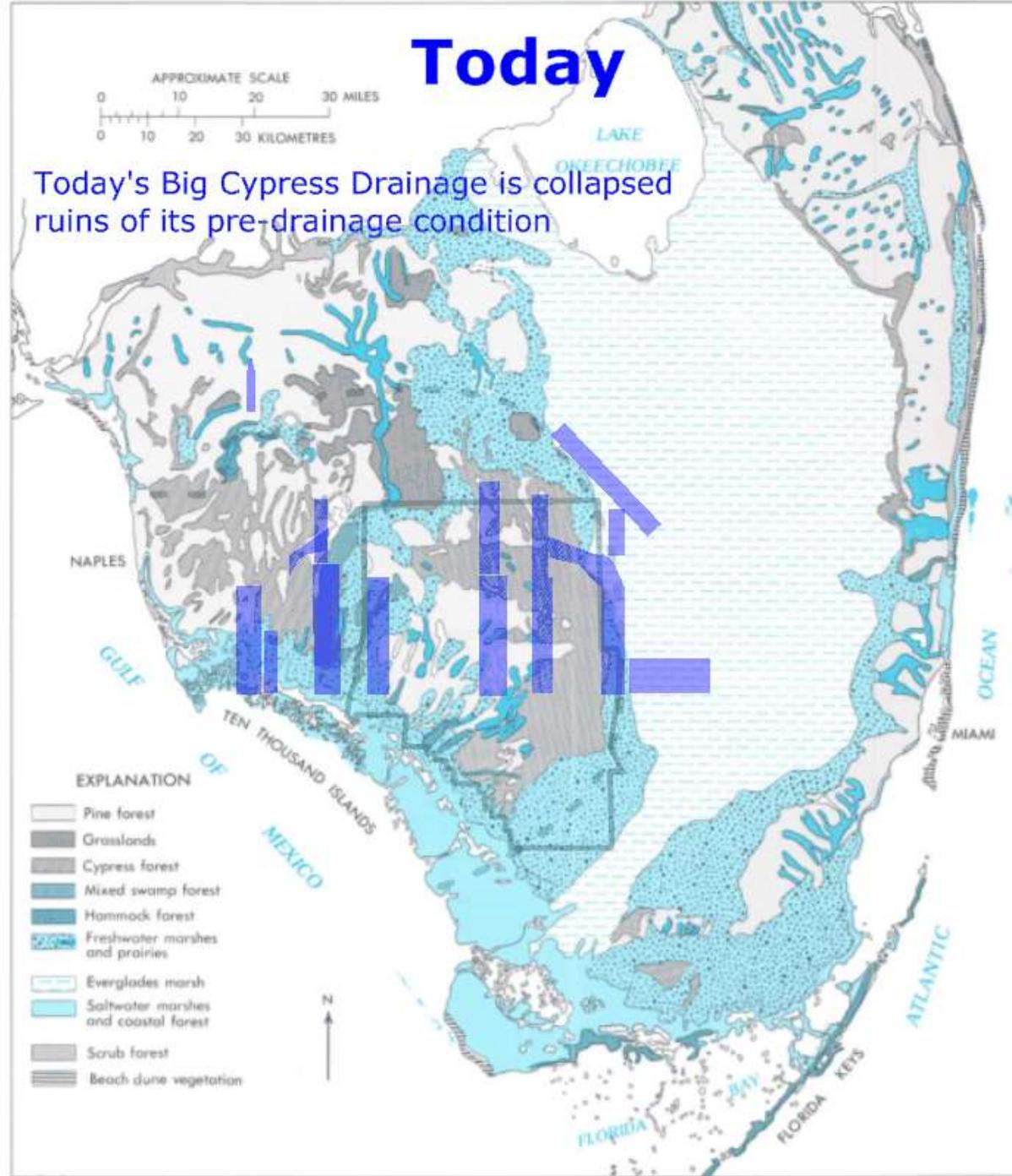
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Today



Today's Big Cypress Drainage is collapsed
ruins of its pre-drainage condition

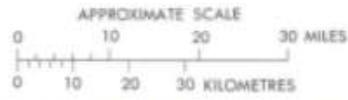


EXPLANATION

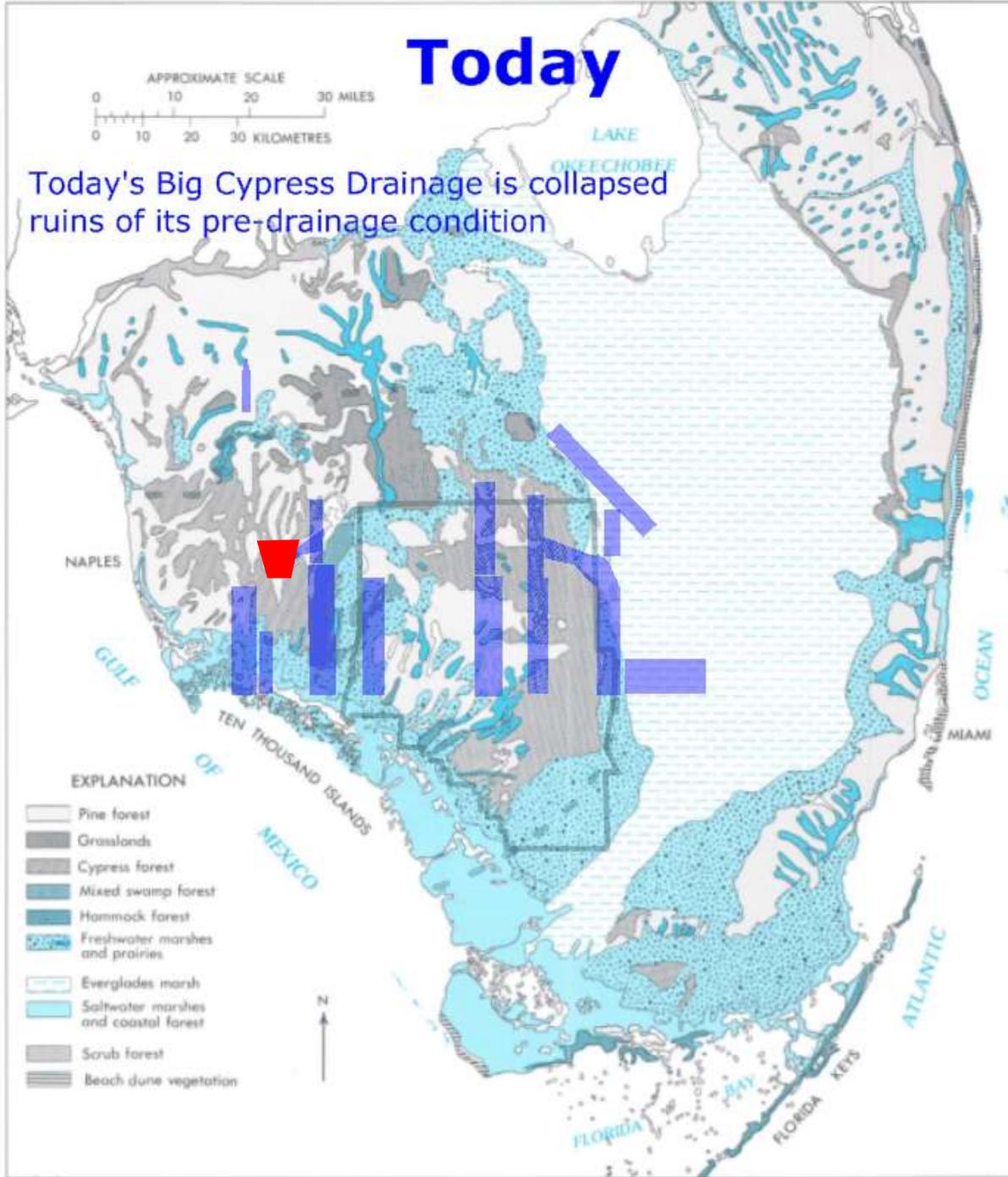
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Today



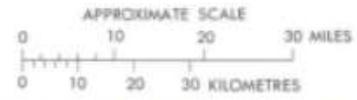
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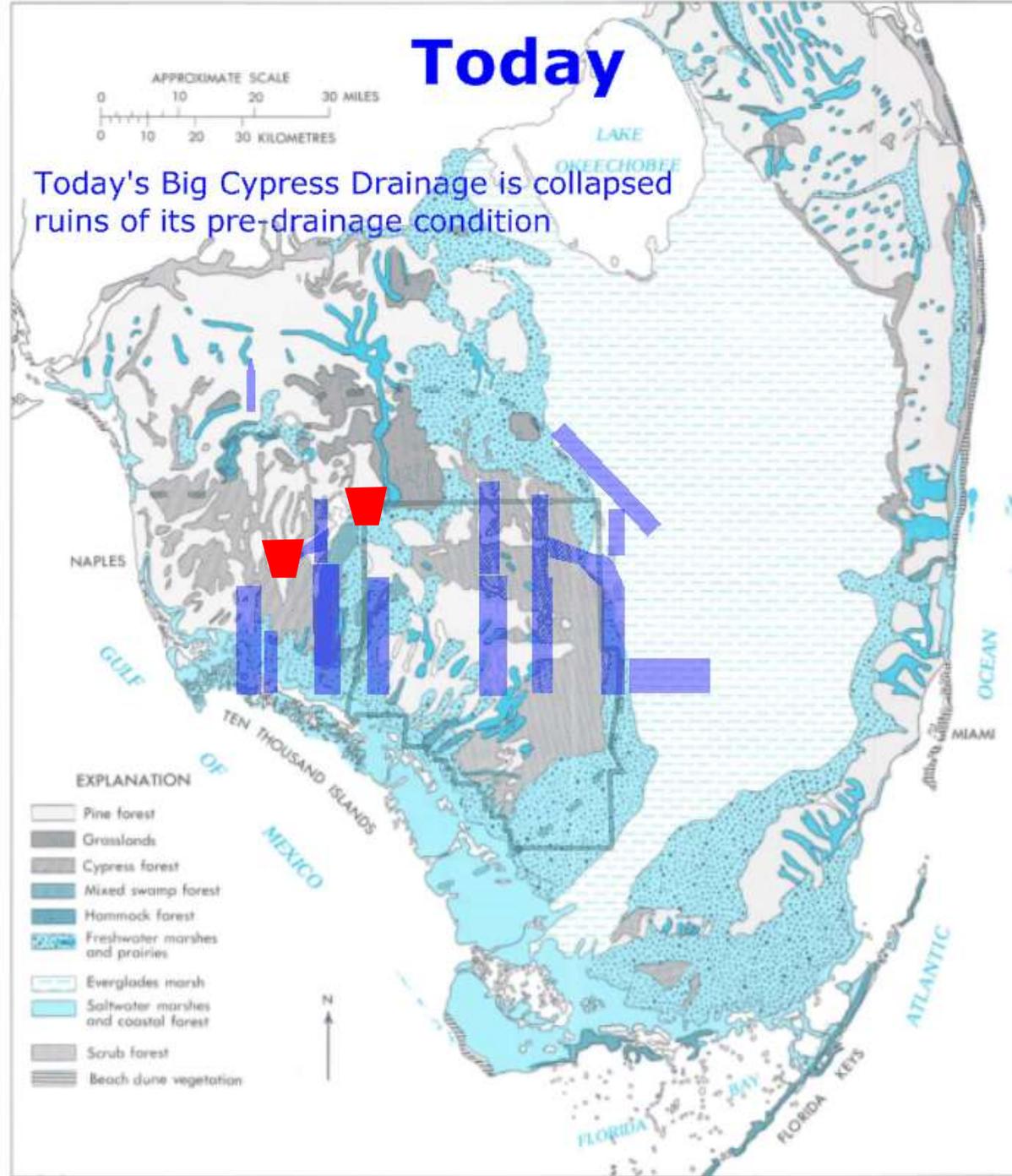
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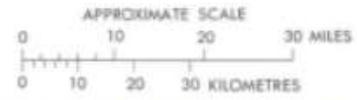
Today



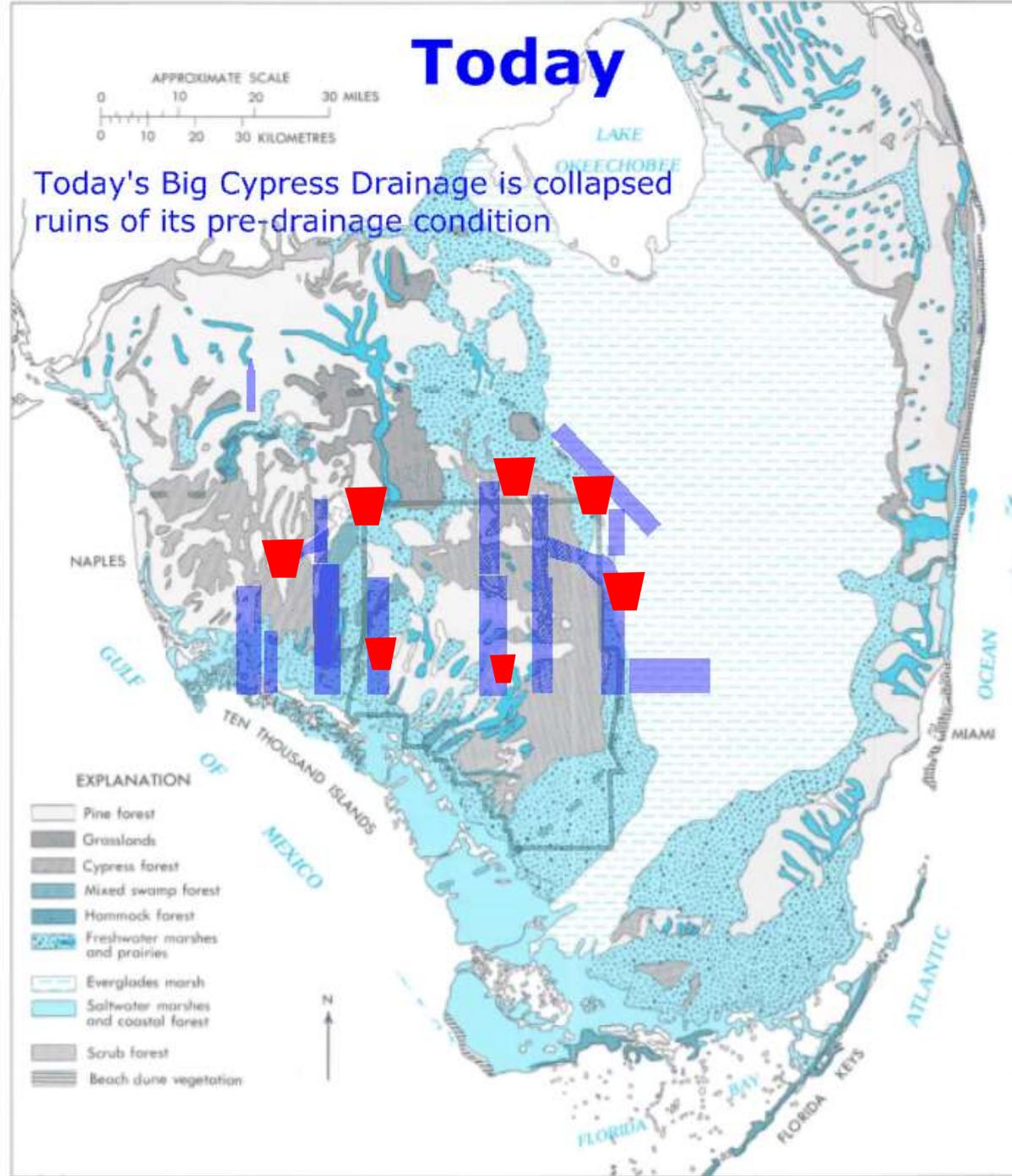
Today's Big Cypress Drainage is collapsed ruins of its pre-drainage condition



Today

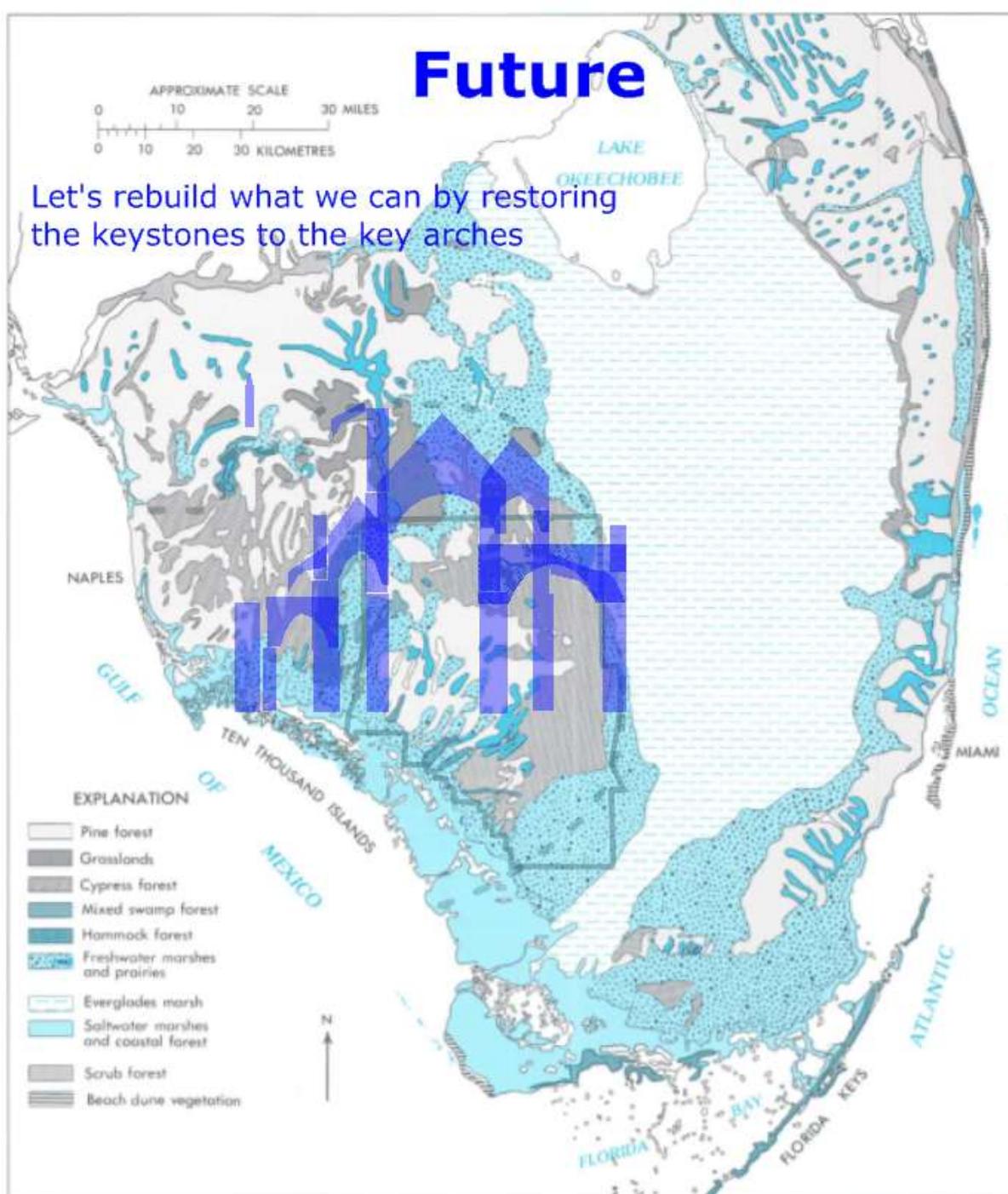


Today's Big Cypress Drainage is collapsed ruins of its pre-drainage condition



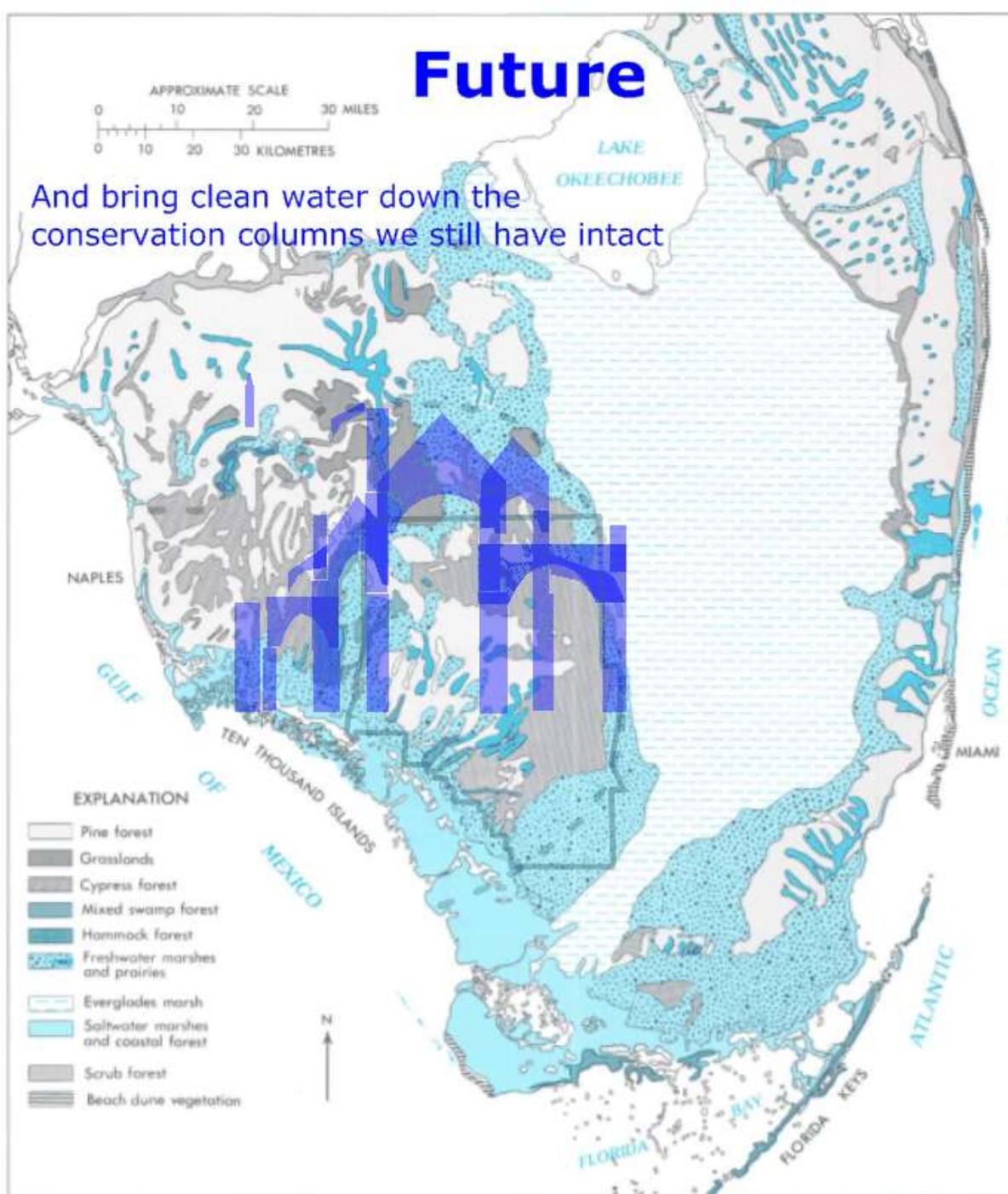
Future

Let's rebuild what we can by restoring the keystones to the key arches

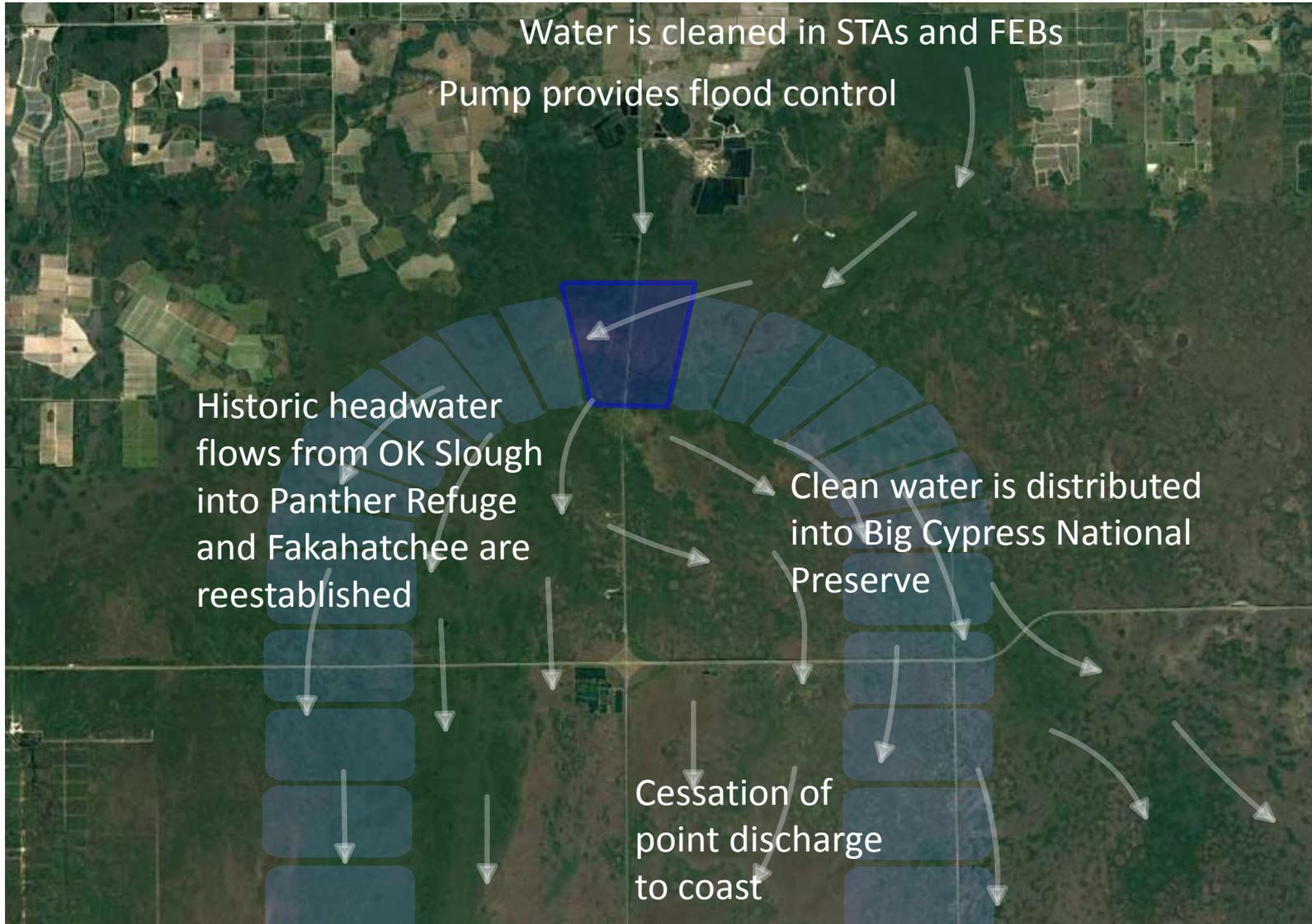


Future

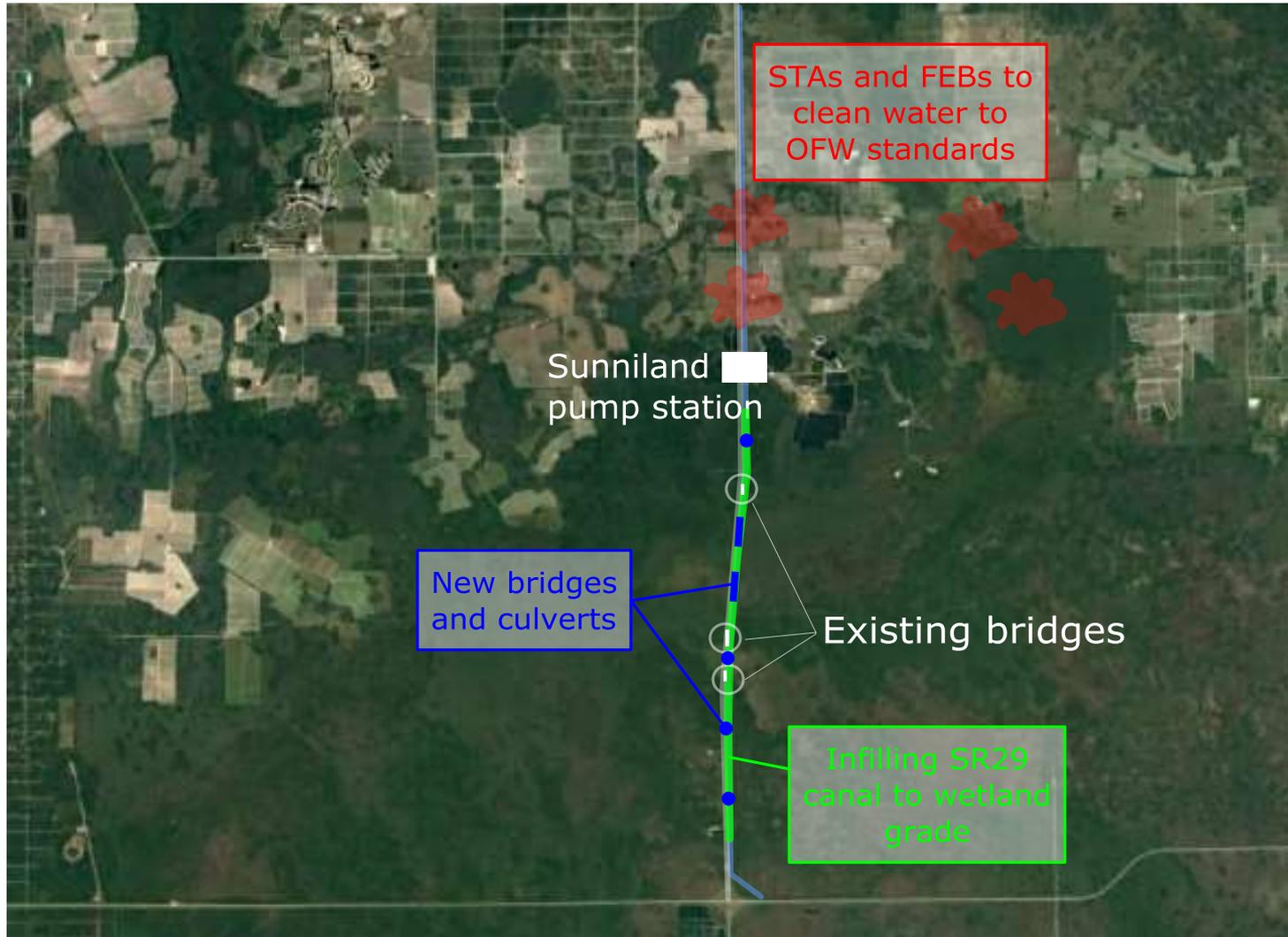
And bring clean water down the conservation columns we still have intact



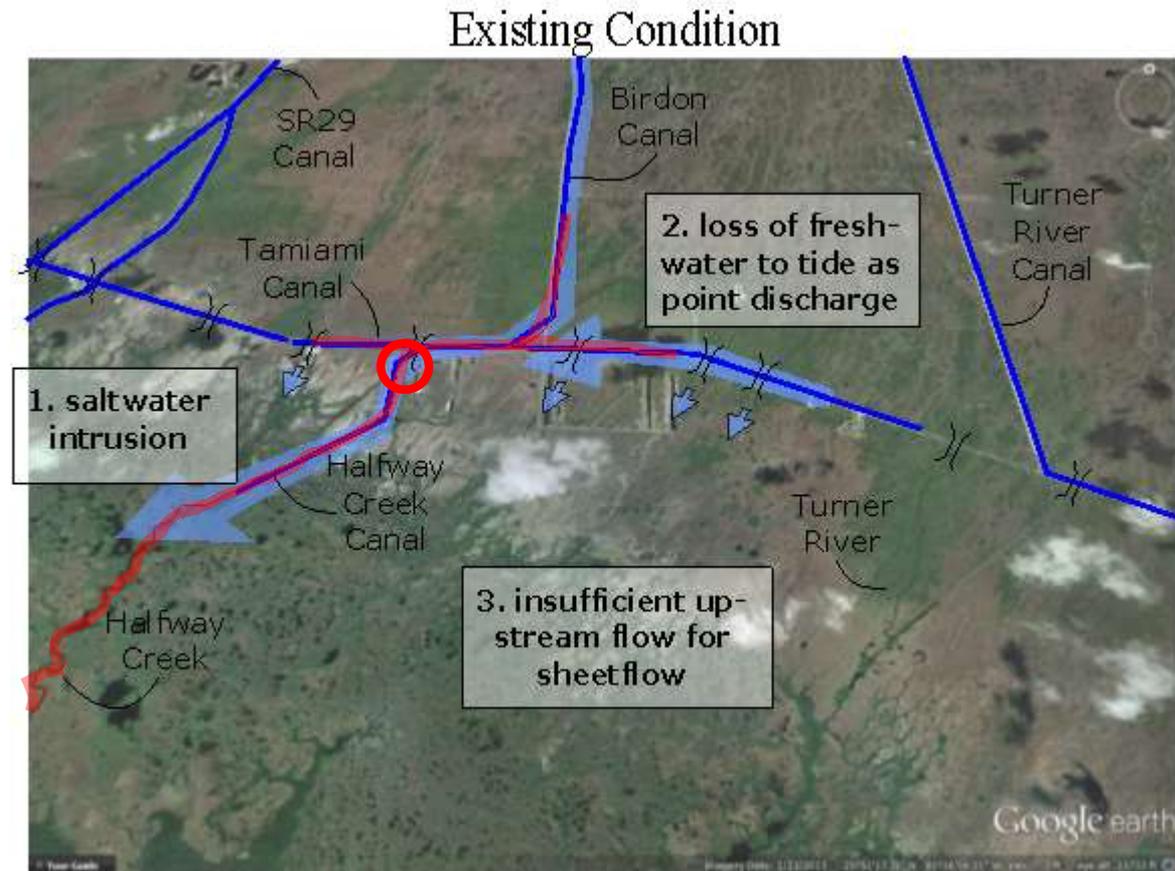
With Keystone in Place



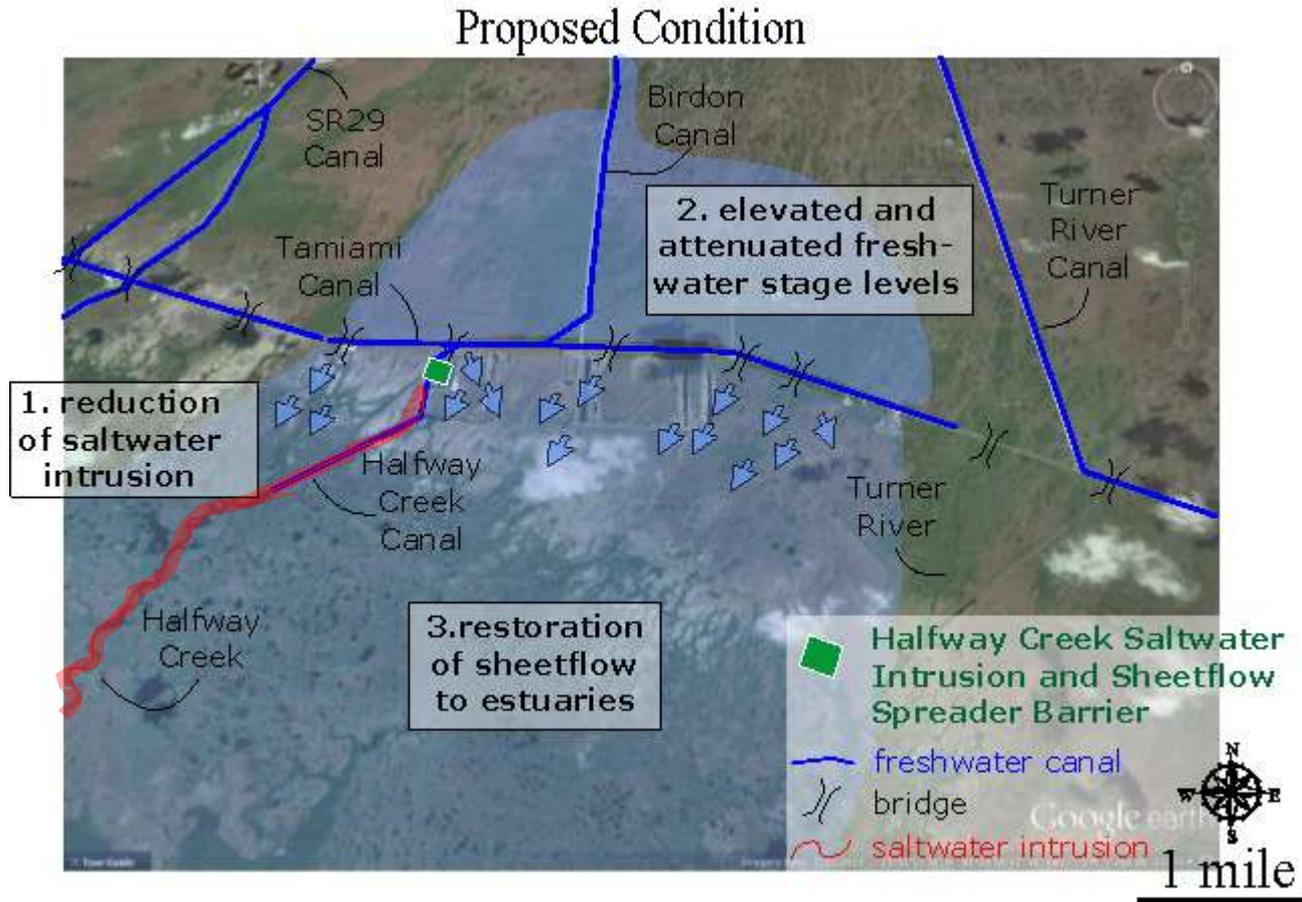
Closer look



Halfway Creek - Status Quo



With Keystone in Place



Recommendations

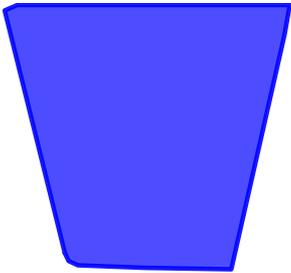


(1) Rain-driven self-contained swamp mentality has imperiled Everglades Restoration

Recommendations



(1) Rain-driven self-contained swamp mentality has imperiled Everglades Restoration



(2) We can rebuild the Big Cypress Swamp ruins by strategic restoration at critical keystone spots

Status Quo isn't free

Status Quo isn't free

Cost



to fight wildfires
in **millions**

of dollars

100

80

60

40

20

0

2005

2010

2015

2020

Complex (est)

Deep

Jarhead

Huckabee

Orange Blossom

Mud Lake Complex

Parliament/Cowbell

Major
wildfires
by name



Cumulative cost
2005-present



Status Quo isn't free

Cost



to fight wildfires
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100

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2005

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Complex (est)

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Orange Blossom

Mud Lake Complex

Parliament/Cowbell

Major
wildfires
by name



\$70,000,000



**Cumulative cost
2005-present**



\$70M

=



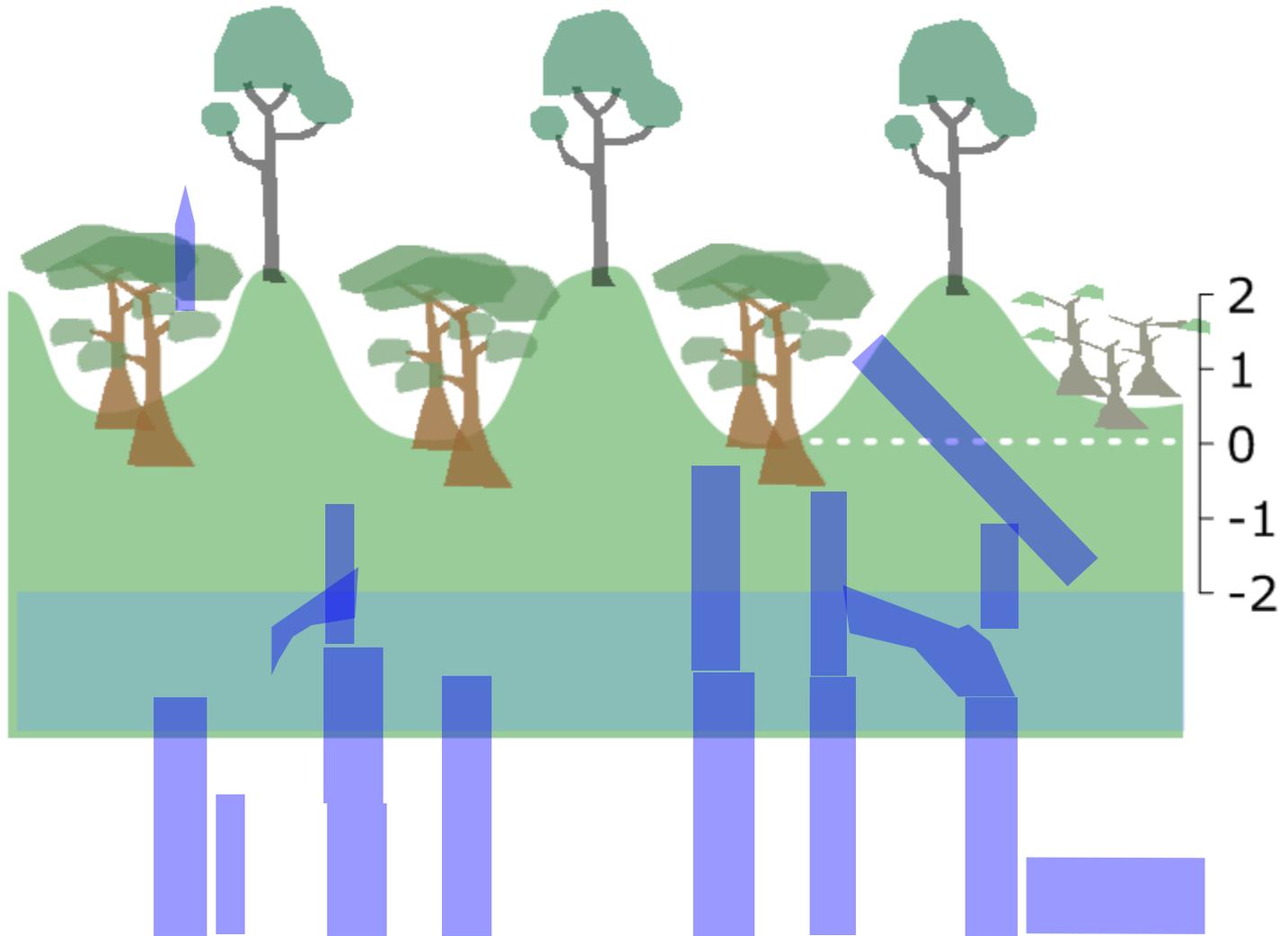
\$0



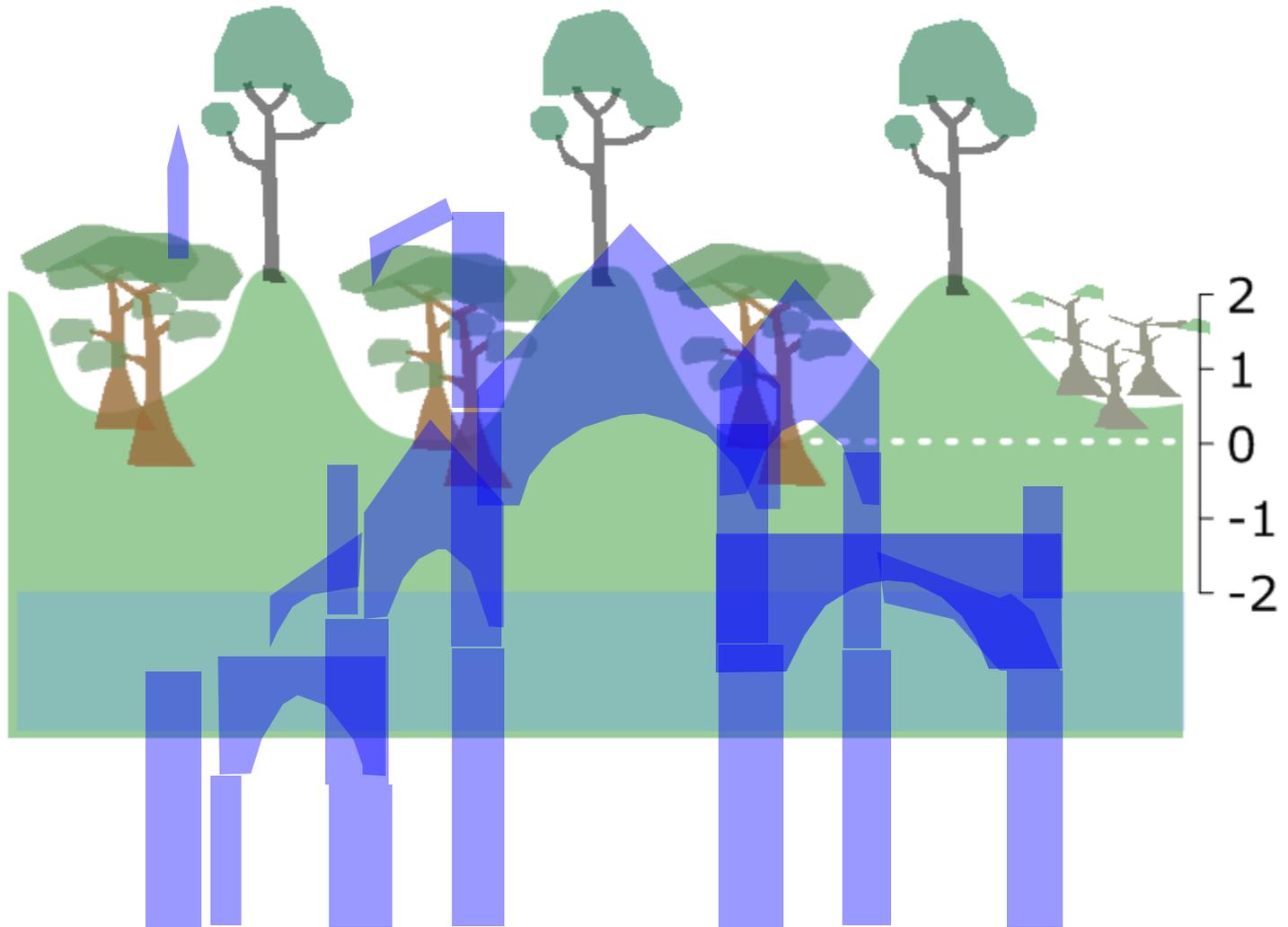
\$70M = **\$0**

for increasing swamp's
long-term **natural resilience**
to fight **drought**

Drought **vulnerable**



Drought **vulnerable**



Questions

