Flagler County
Board of County Commissioners
Workshop

Monday, September 17, 2018 at 3:00 p.m.

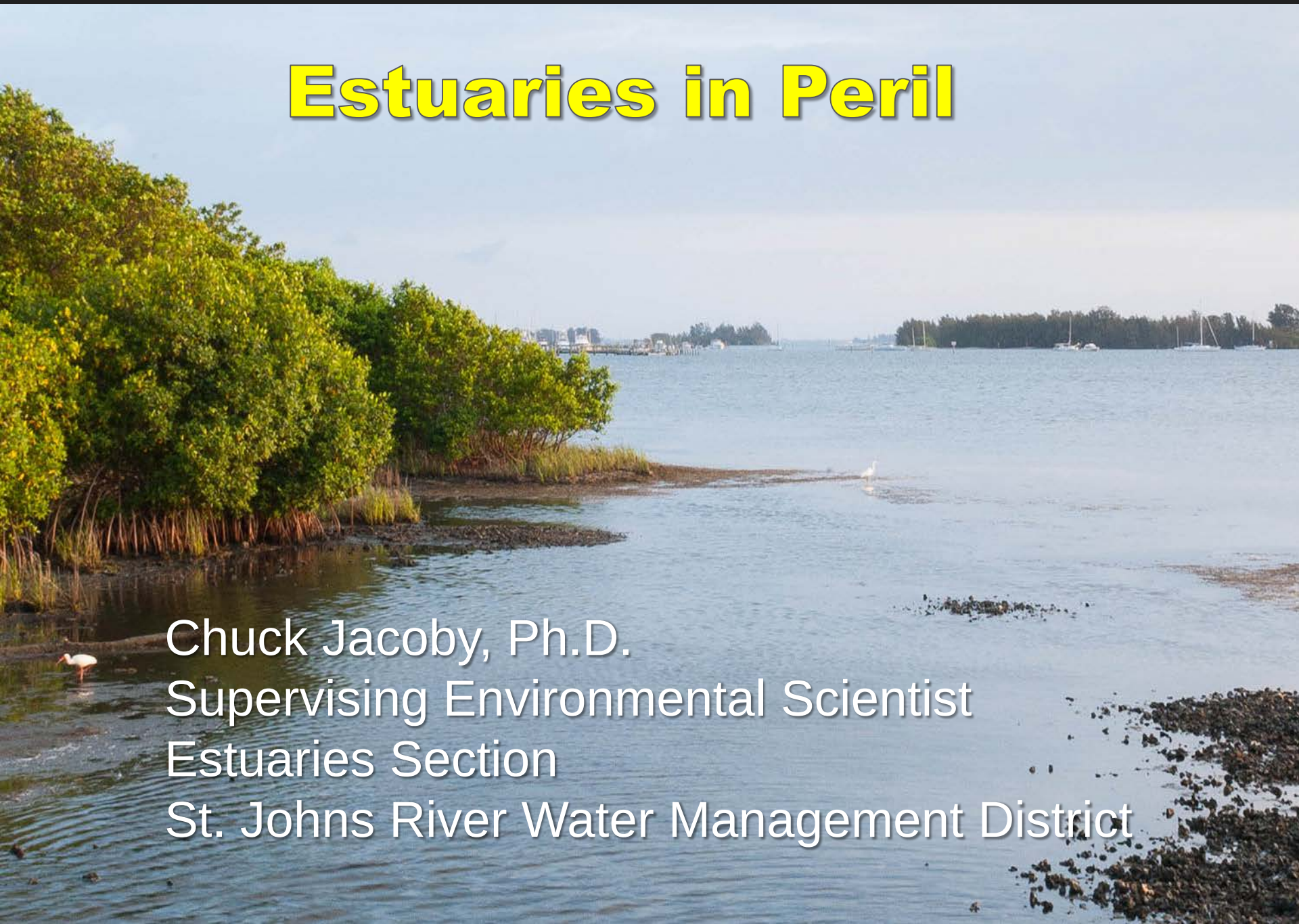
Emergency Operations Center, Building 3, 1769 E. Moody Blvd., Bunnell, FL 32110

Workshop Agenda

1. Call to Order
2. Pledge to the Flag and Moment of Silence
3. Welcome: Flagler County Board Chair
4. Educational Briefing on a Wetland Restoration Project in Southern Flagler County Presentation by St. Johns River Water Management District Staff, Florida Fish and Wildlife Conservation Commission Staff and Others
5. Public Comment
6. Adjournment

While this is a workshop only and no decisions are expected to be made by any of the governmental bodies, if a person decides to appeal any matter that may be discussed for a future proceeding, a record of the workshop may be needed and, for such purposes, the person may need to ensure that a verbatim record of the workshop is made.

Estuaries in Peril



Chuck Jacoby, Ph.D.
Supervising Environmental Scientist
Estuaries Section
St. Johns River Water Management District

Highly Valuable

System	Area (million acres)	Value ($ acre^{-1} year^{-1})	Global value (trillion $ year^{-1})
Open ocean	82,000	$102	$8.4
Estuaries	445	$9,244	$4.1
Marsh/mangroves	408	$4,044	$1.6
Coral reefs	153	$273	$0.4

Costanza 1997

Numerous Threats

- **Habitat loss and alteration**
- **Eutrophication (more organic matter)**
- **Sewage**
- **Overexploitation of fisheries**
- **Chemical contamination**
- **Freshwater diversion**
- **Introduced species**
- **Sea level rise**
- **Subsidence**
- **Debris**

Kennish 2002

Numerous Threats

- Habitat loss and alteration
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- Sea level rise
- Subsidence
- Debris

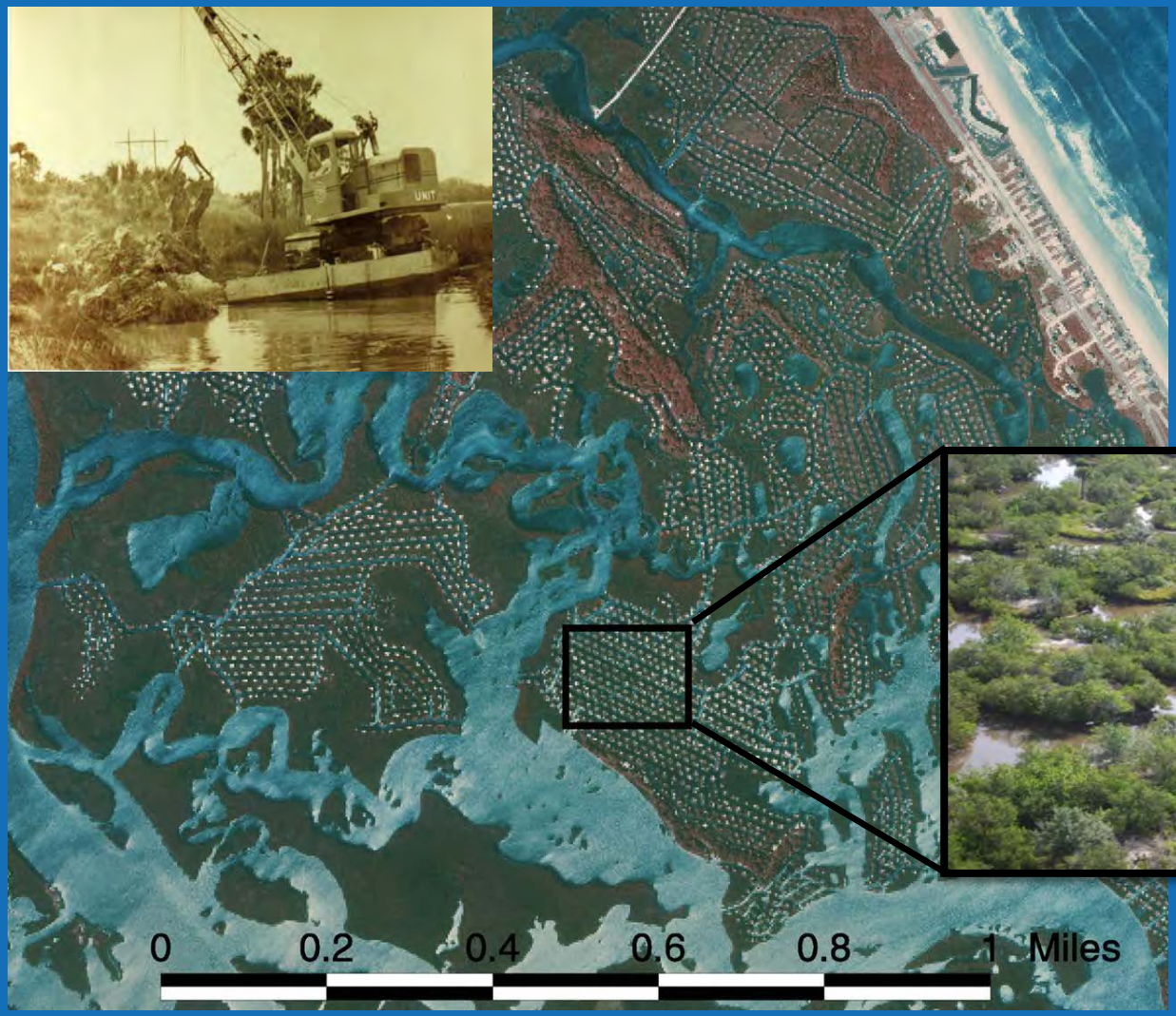
Kennish 2002

Loss of Saltmarsh

- **Major losses 1950s-1970s**
  (> 500,000 acres per year in the USA)
- **Global issue**

Himes-Cornel 2018

Loss of Saltmarsh



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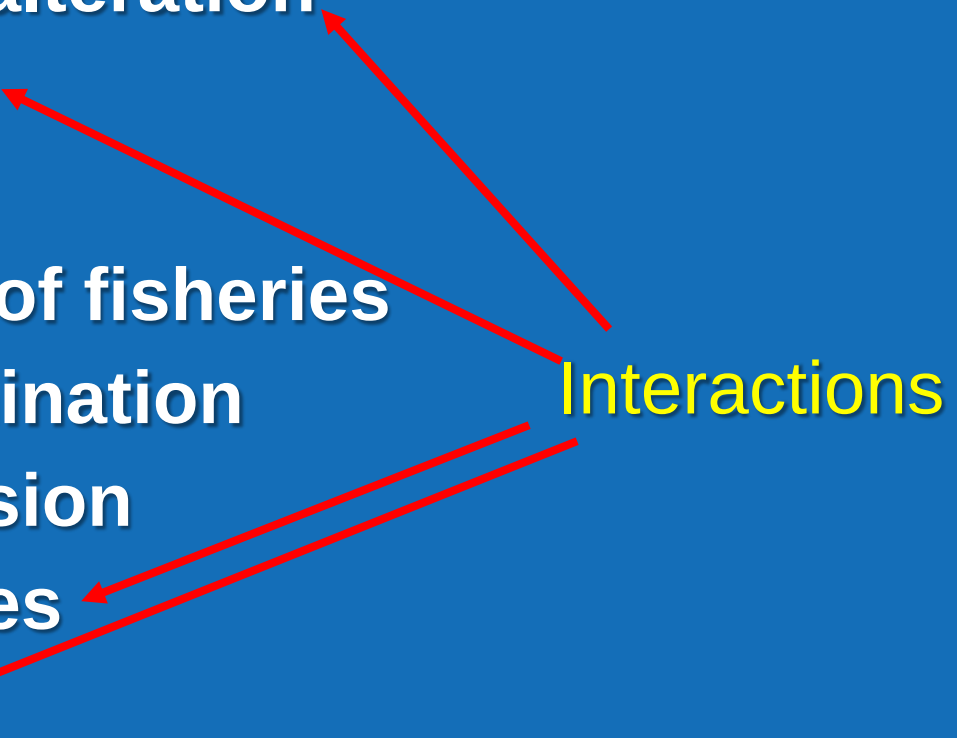
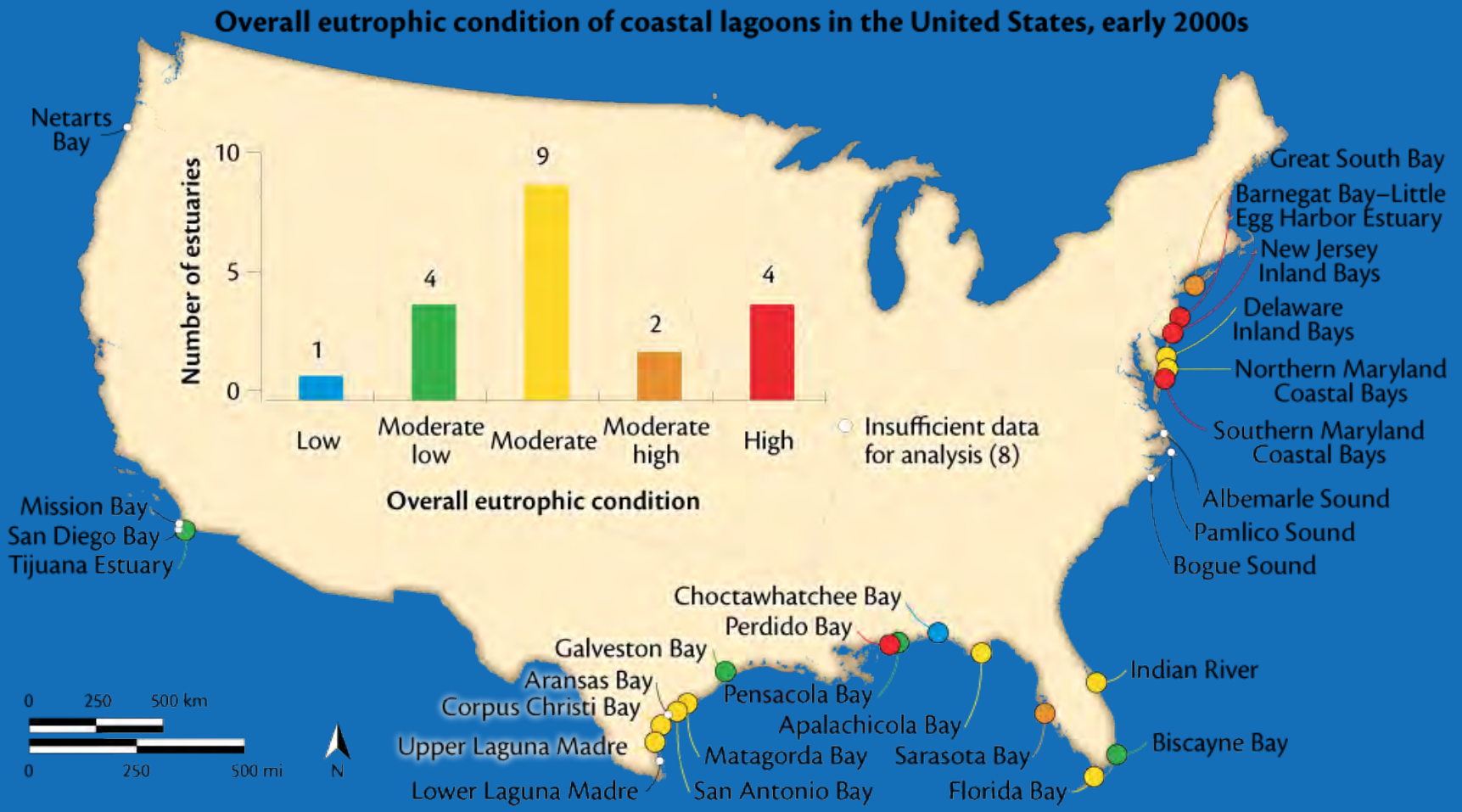


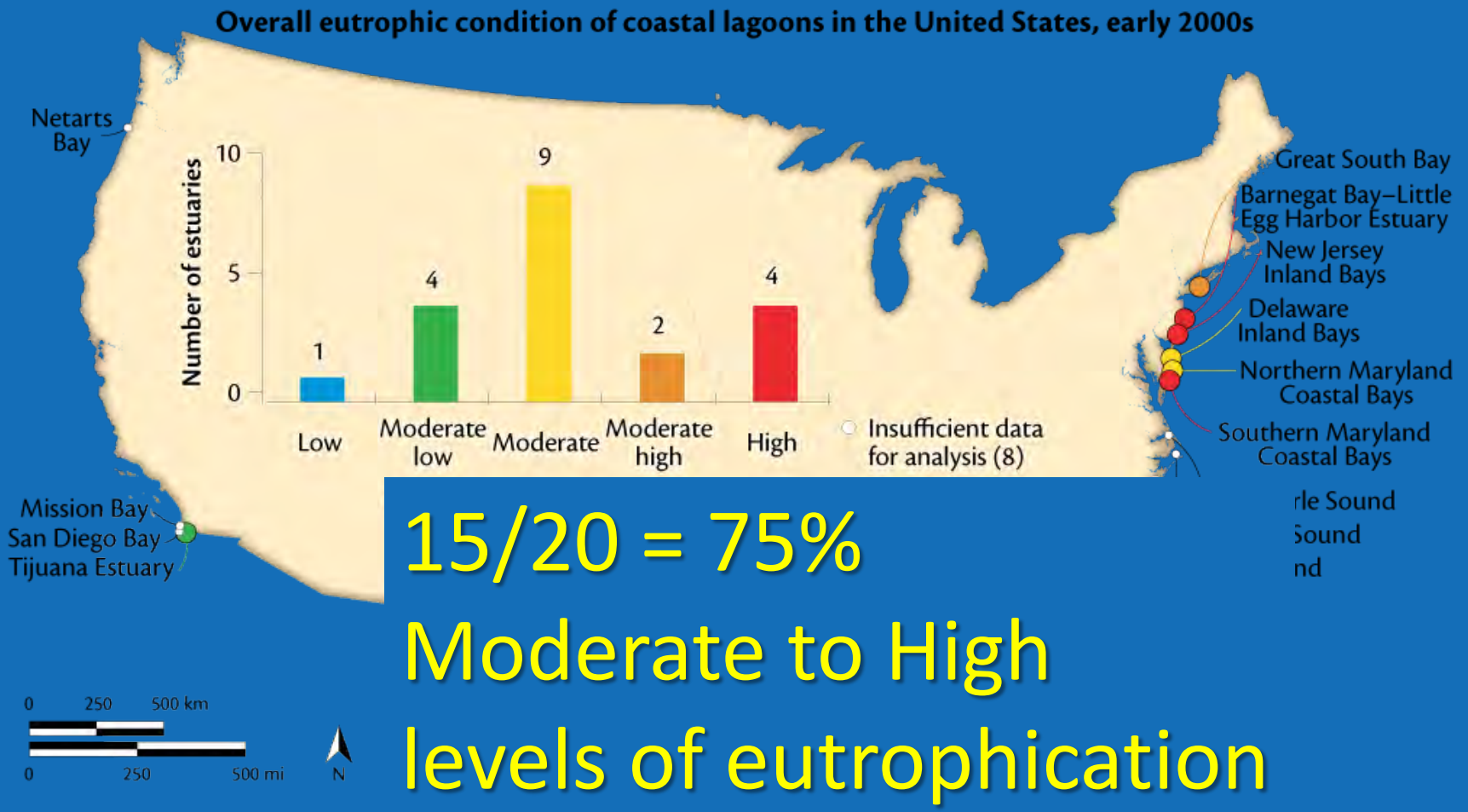
Kennish 2002

Eutrophication



Dennison et al. 2009

Eutrophication

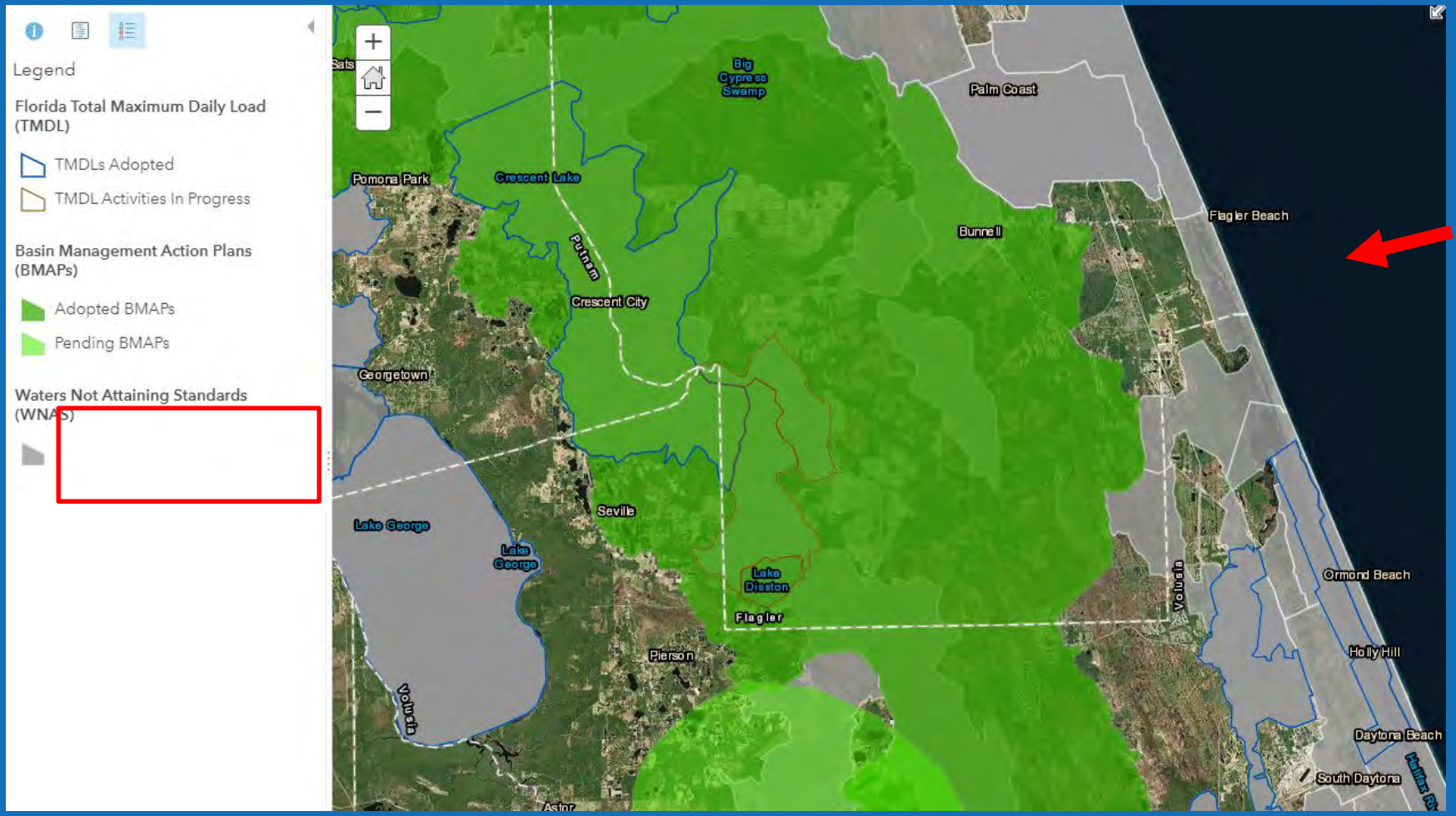


15/20 = 75%

Moderate to High levels of eutrophication

Dennison et al. 2009

Eutrophication



FDEP

Loss of Filtering

NOAA

Introduced species

J. Evans

Introduced Species

J. Evans

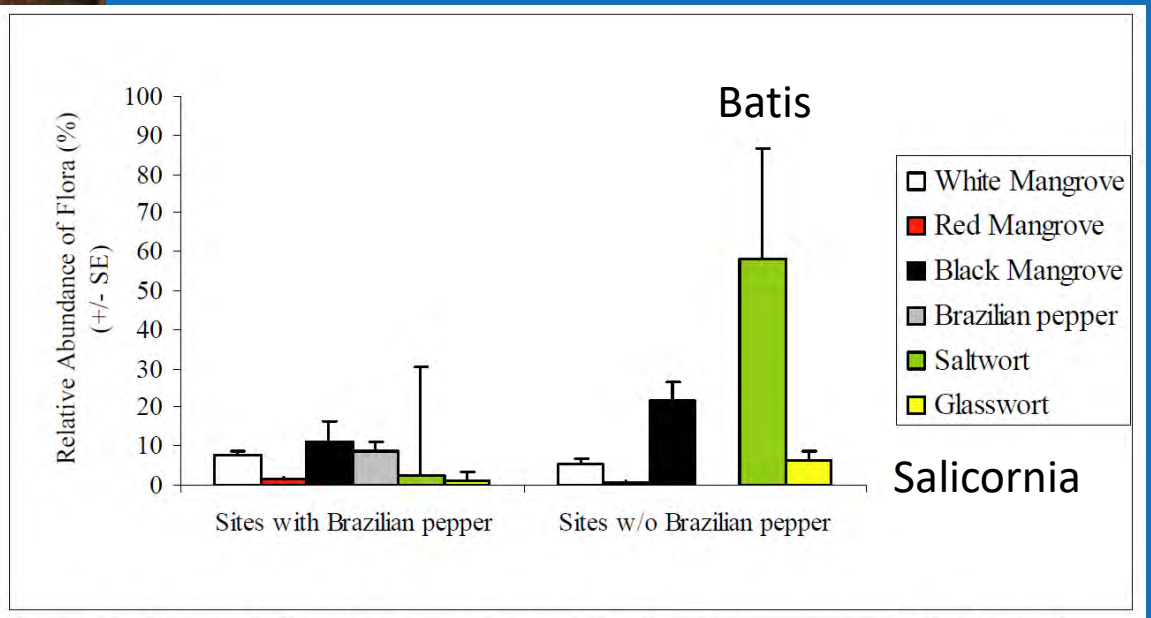
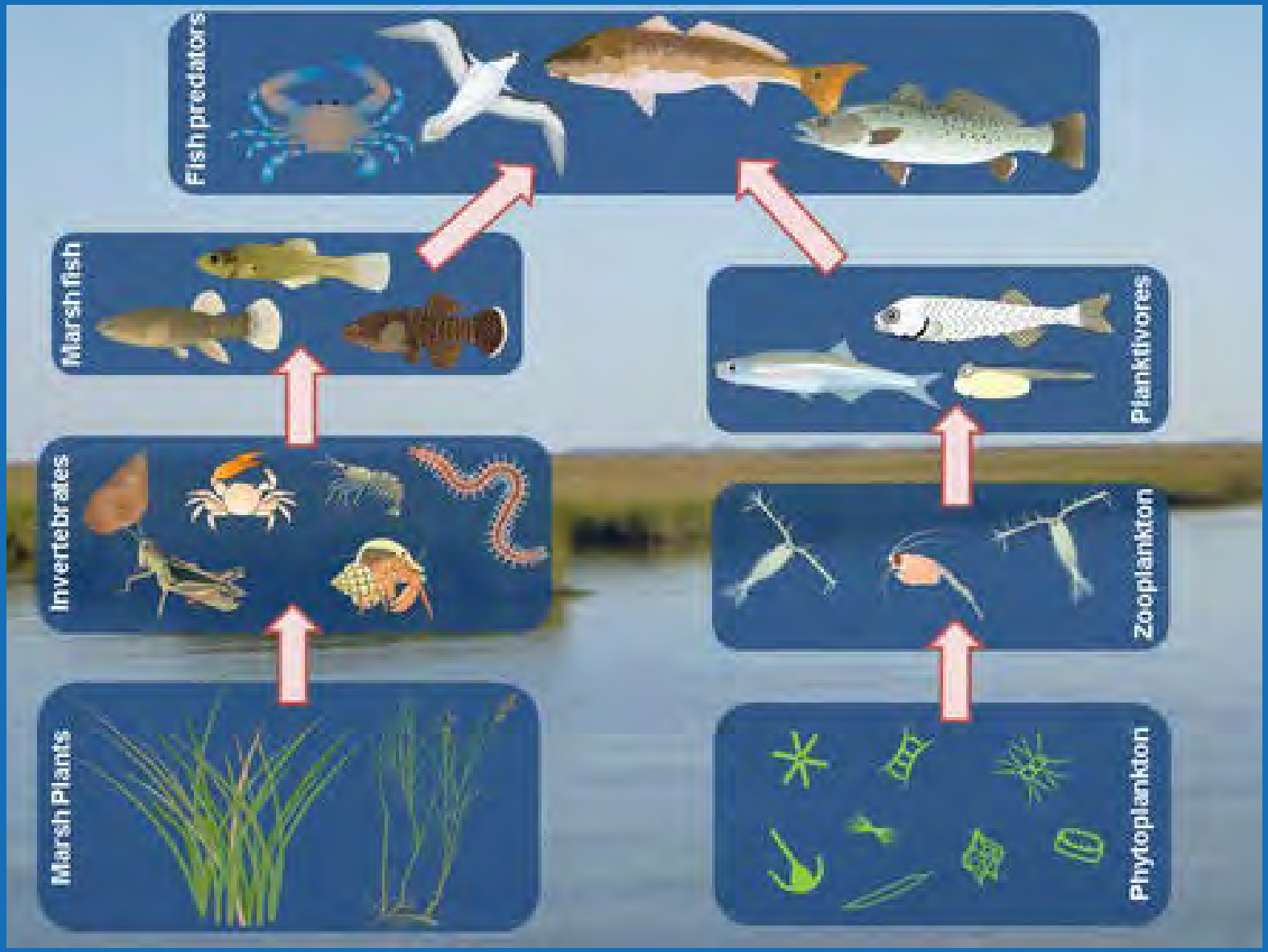


Figure 19. Mean relative abundance (%) (+ SE) of native mangroves and halophytic plants at sites with and without Brazilian pepper.

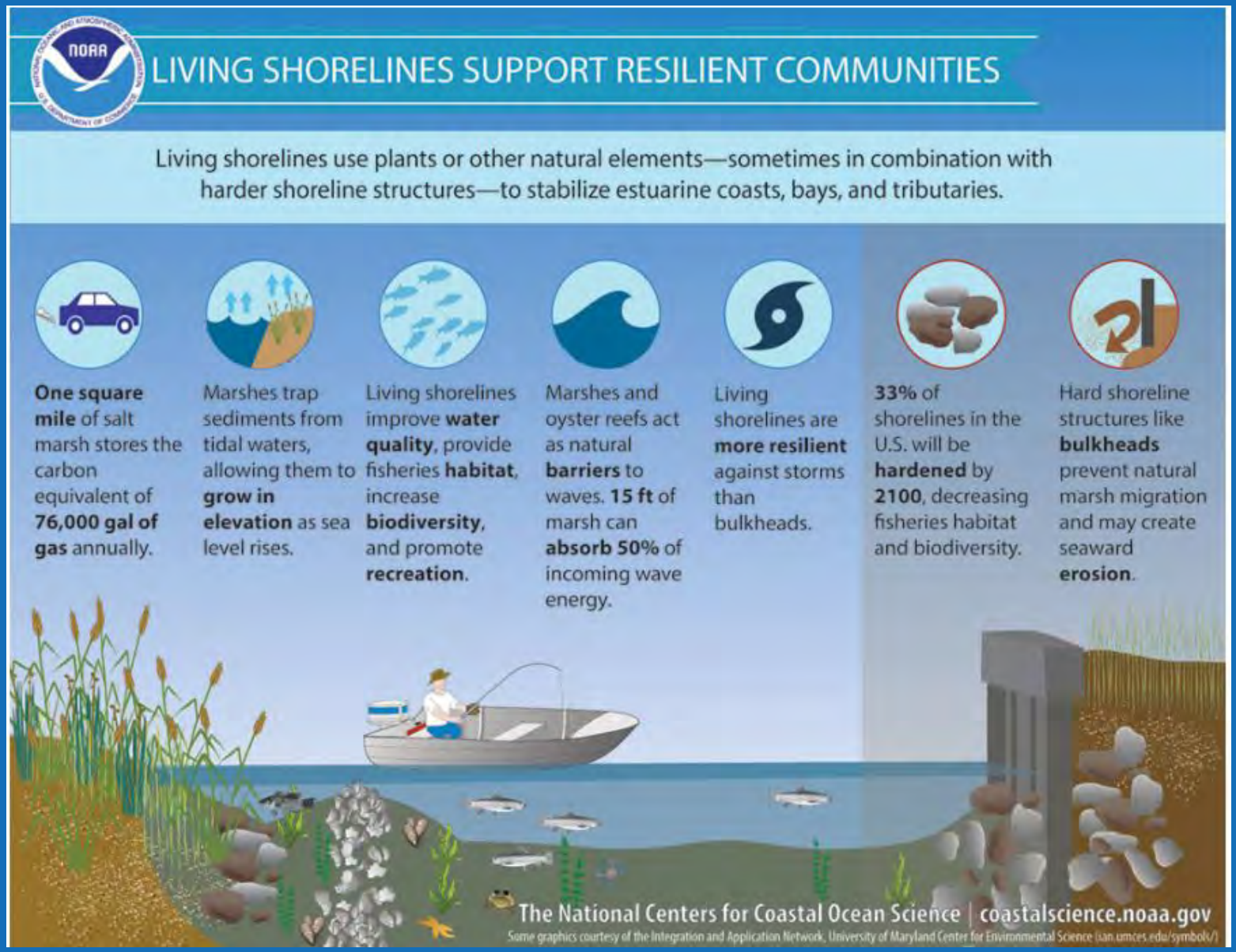
M. Donnelly MS Thesis

Less Resilient Trophic Webs



M. McCann

Sea Level Rise



NOAA

Sea Level Rise

NOAA

Numerous Threats

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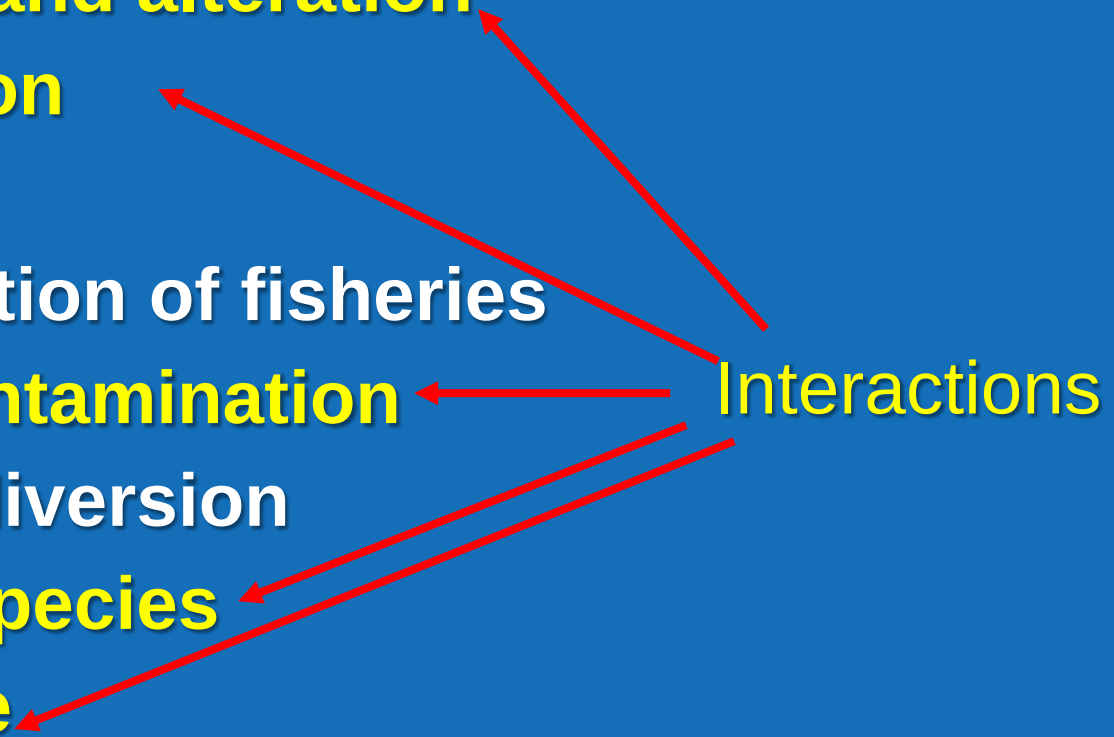


Kennish 2002

Thank You

Biology and Ecology

Jeff Beal

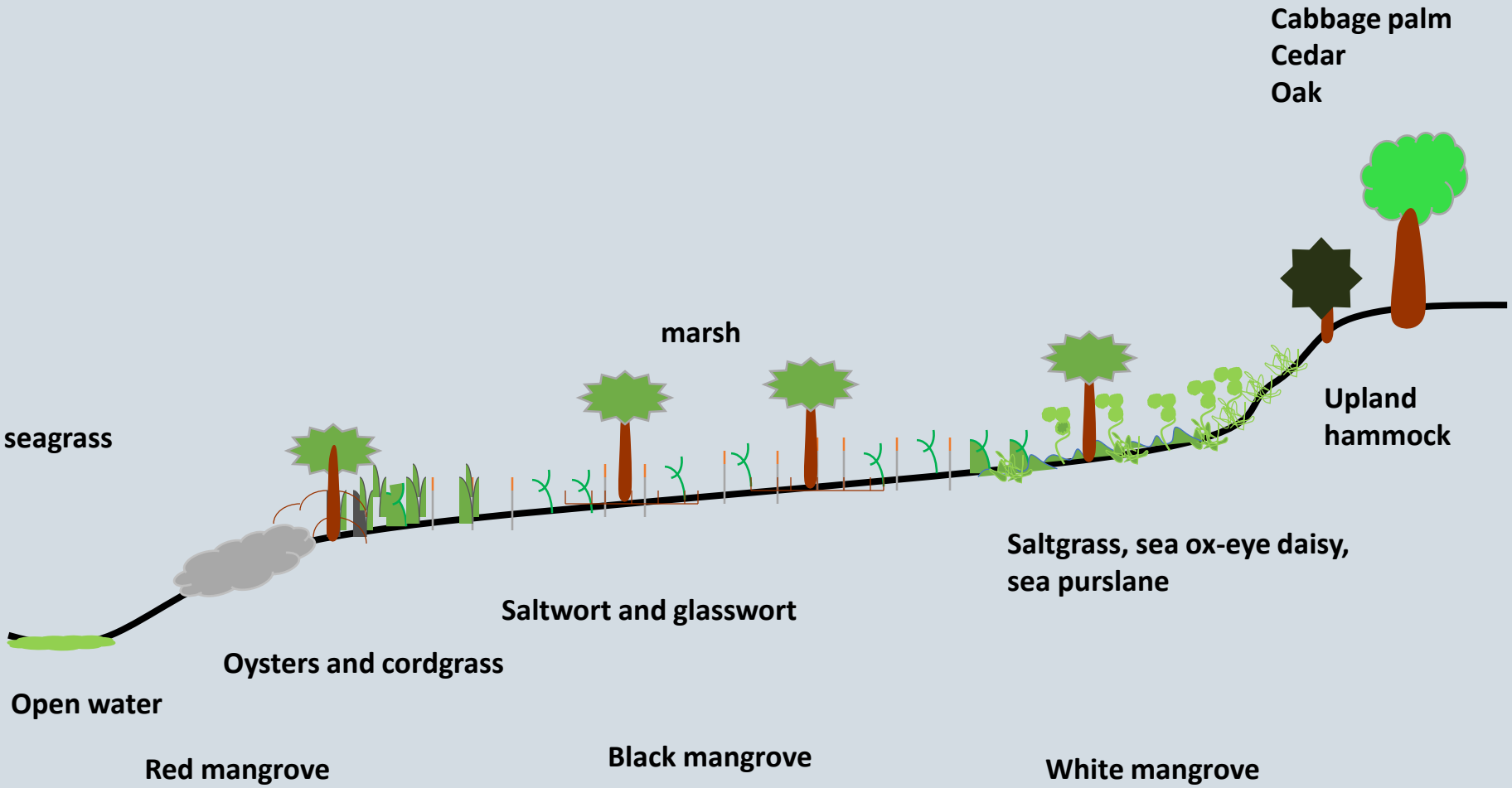
Marine/Estuarine Subsection

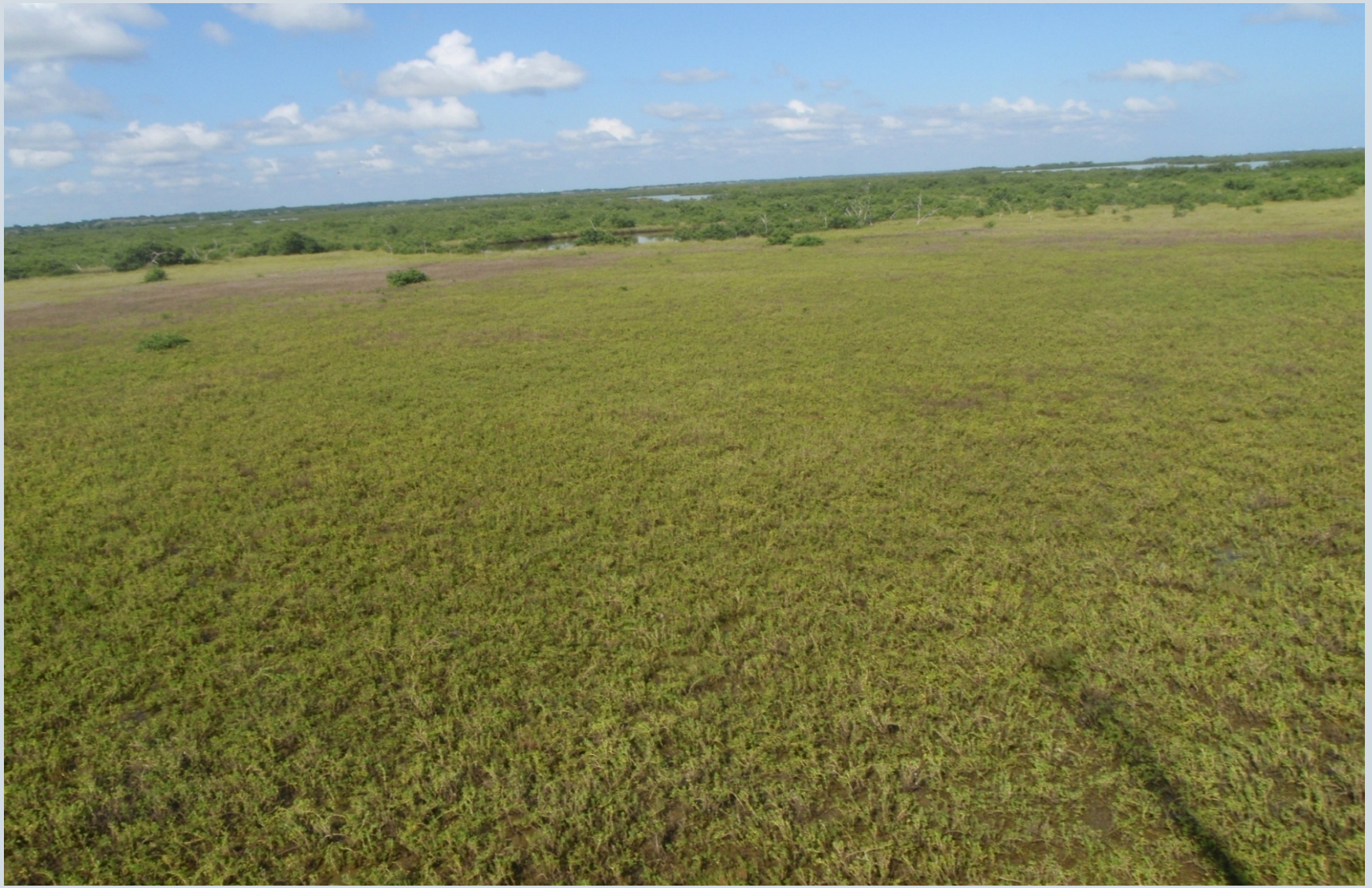
Florida Fish and Wildlife Conservation Commission

Dragline Ditch Restoration: Biology and Ecology

Jeff Beal
FWC Marine/Estuarine Subsection

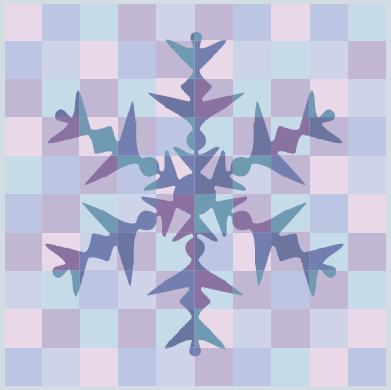
Natural Intertidal Wetland

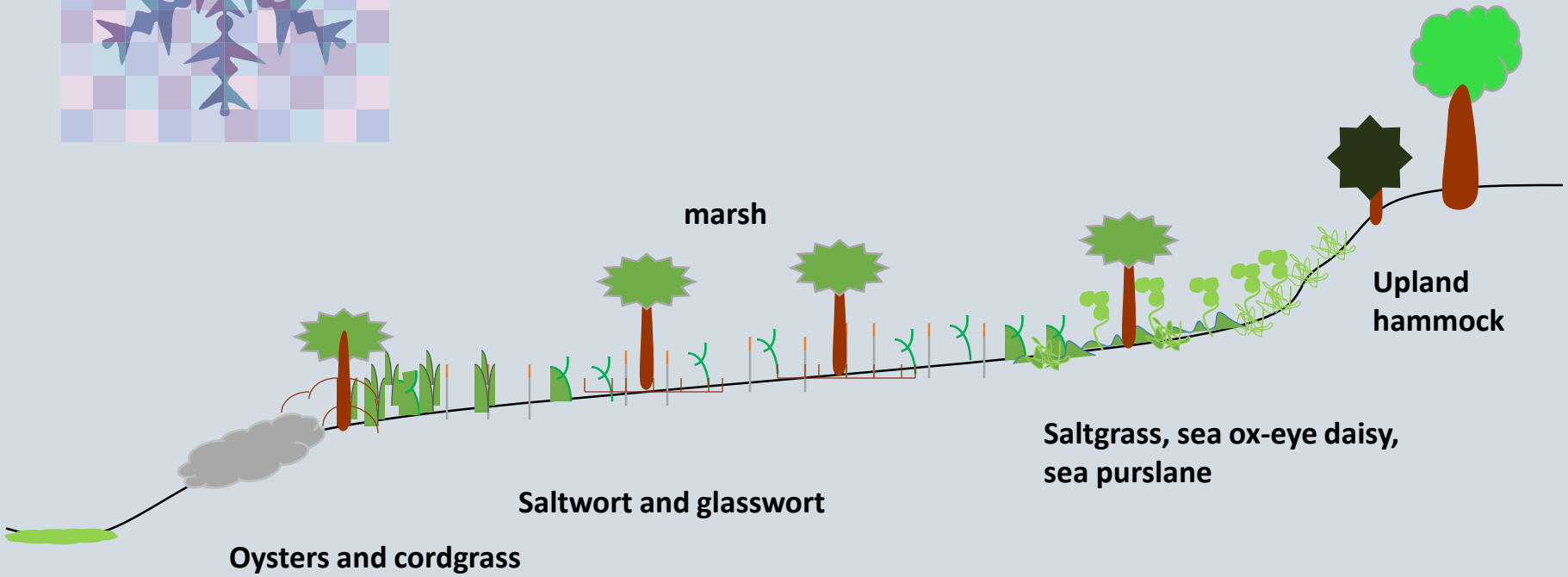




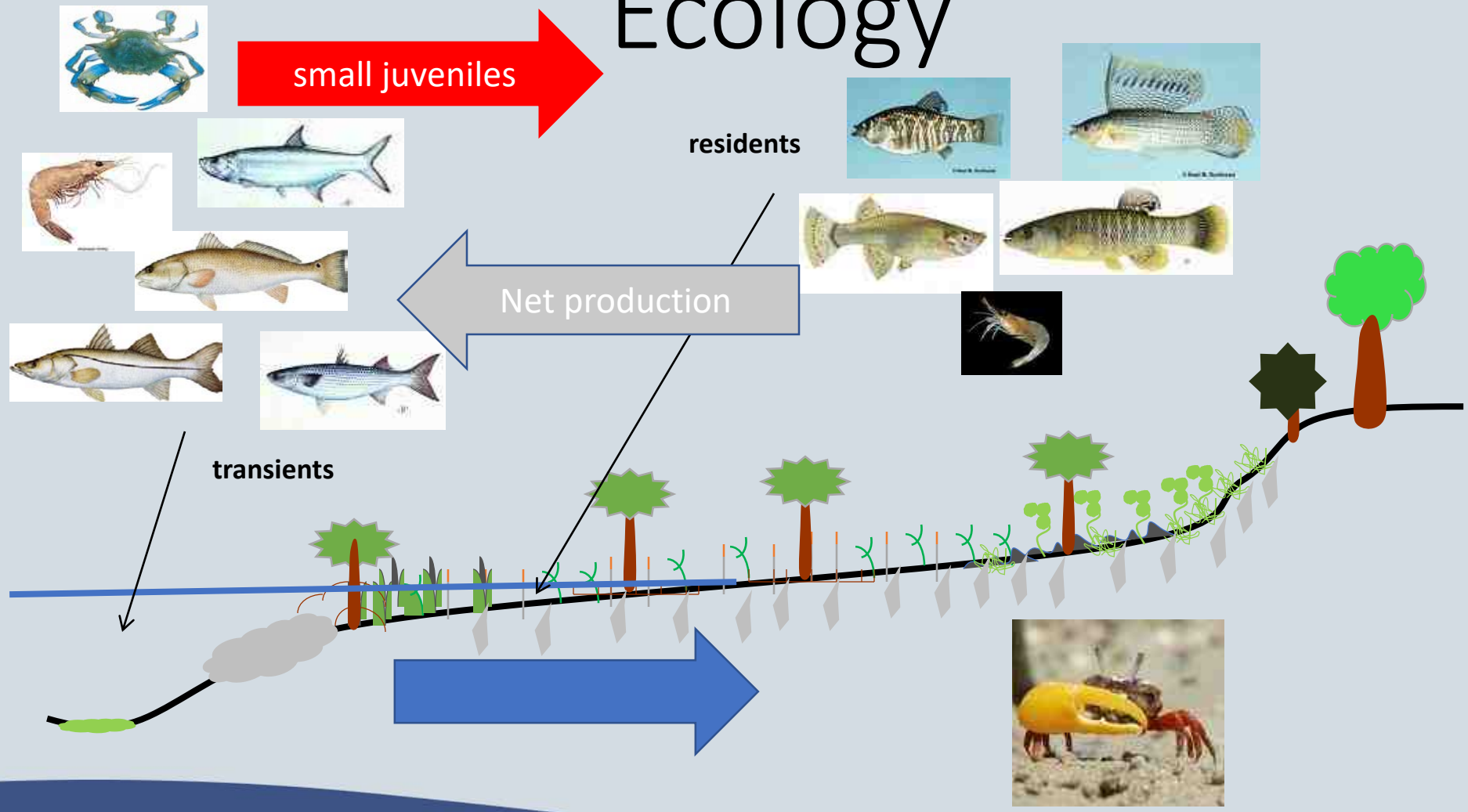
Pristine wetland

Multi-decadal Mangrove Freezing

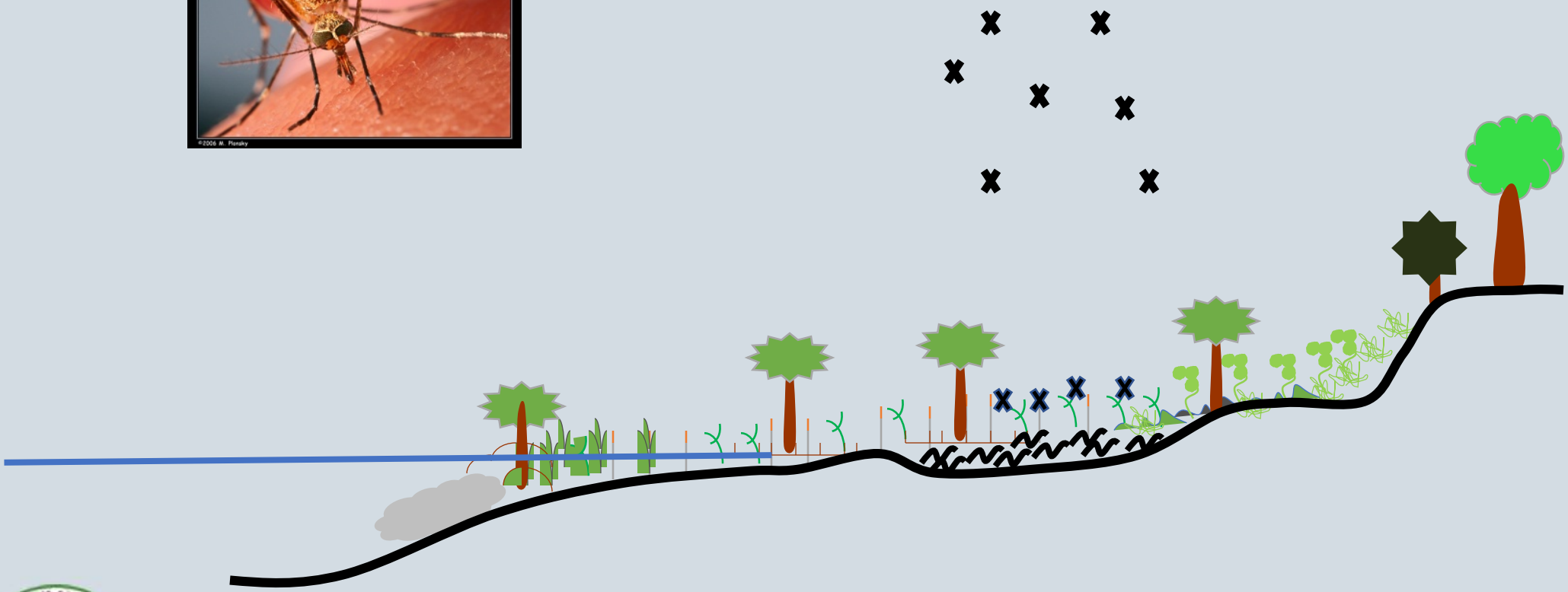




Natural Intertidal Wetland Ecology

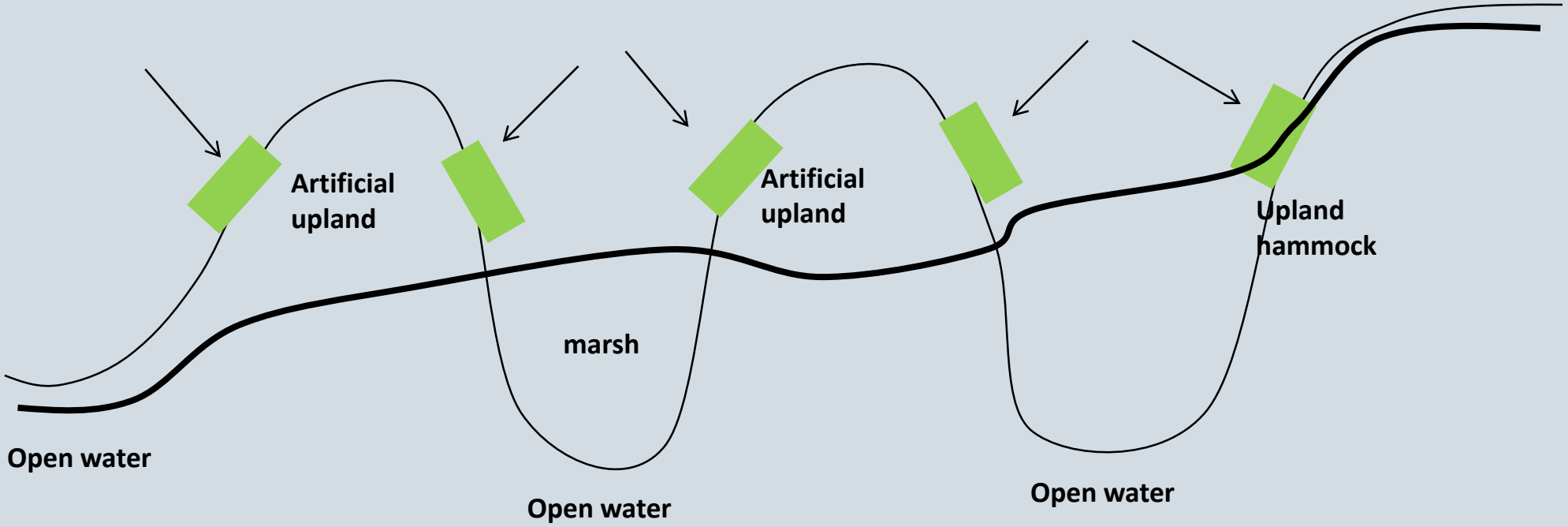


Mosquito Production



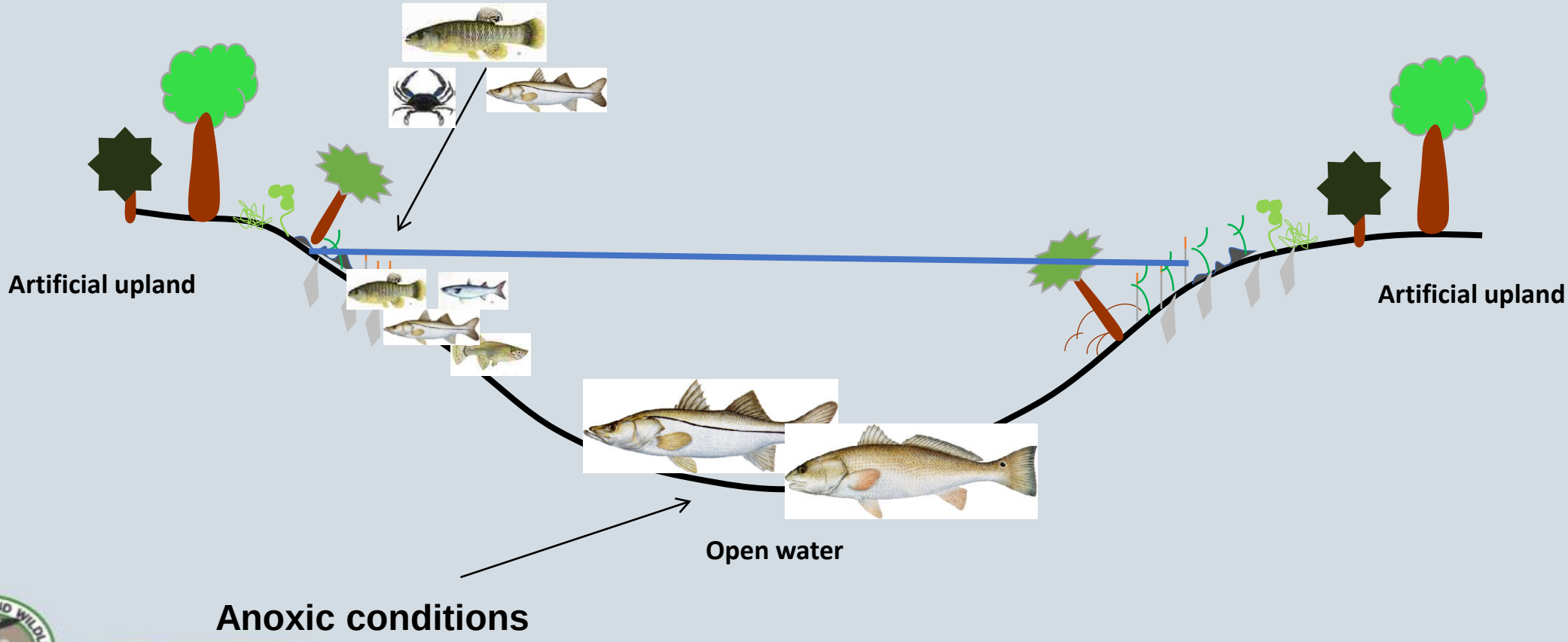
Dragline Ditching

Intertidal Wetlands?

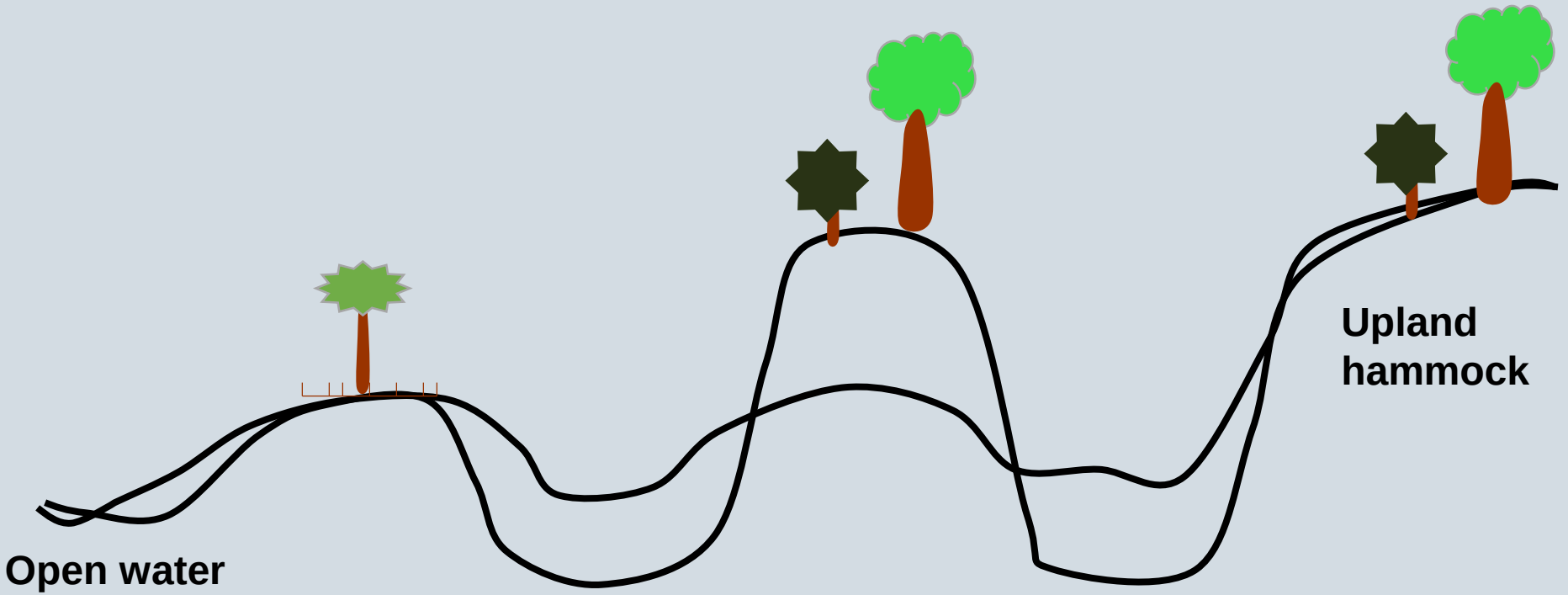


Flagler Dragline Site C1
Write a description for your map.
Legend
Feature 1
Google Earth
200 ft
N

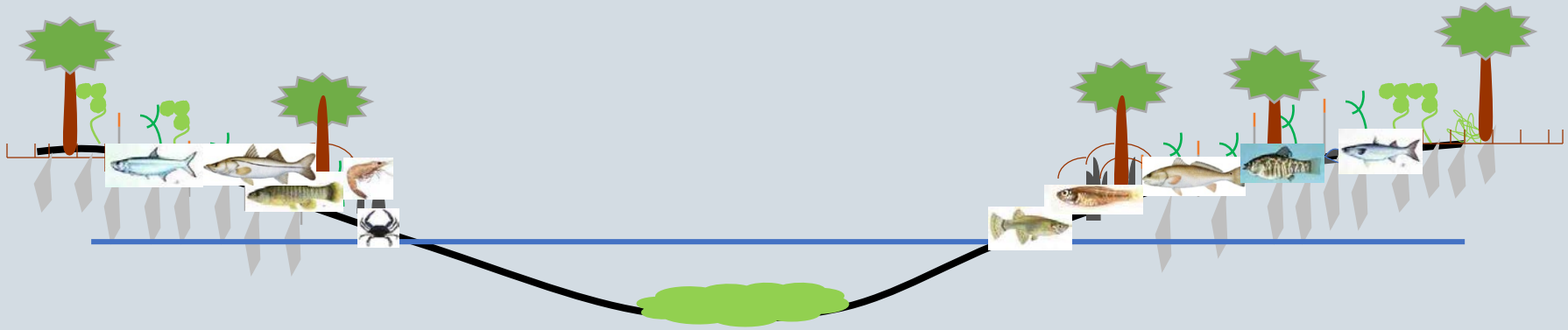
Dragline Ditch Ecology



Dragline Ditched Wetland Restoration

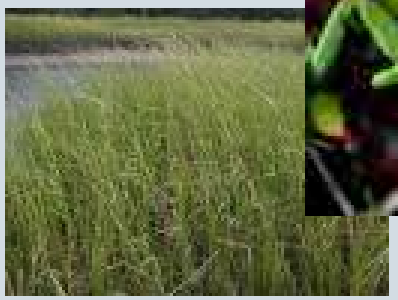


Restored Wetland Ecology

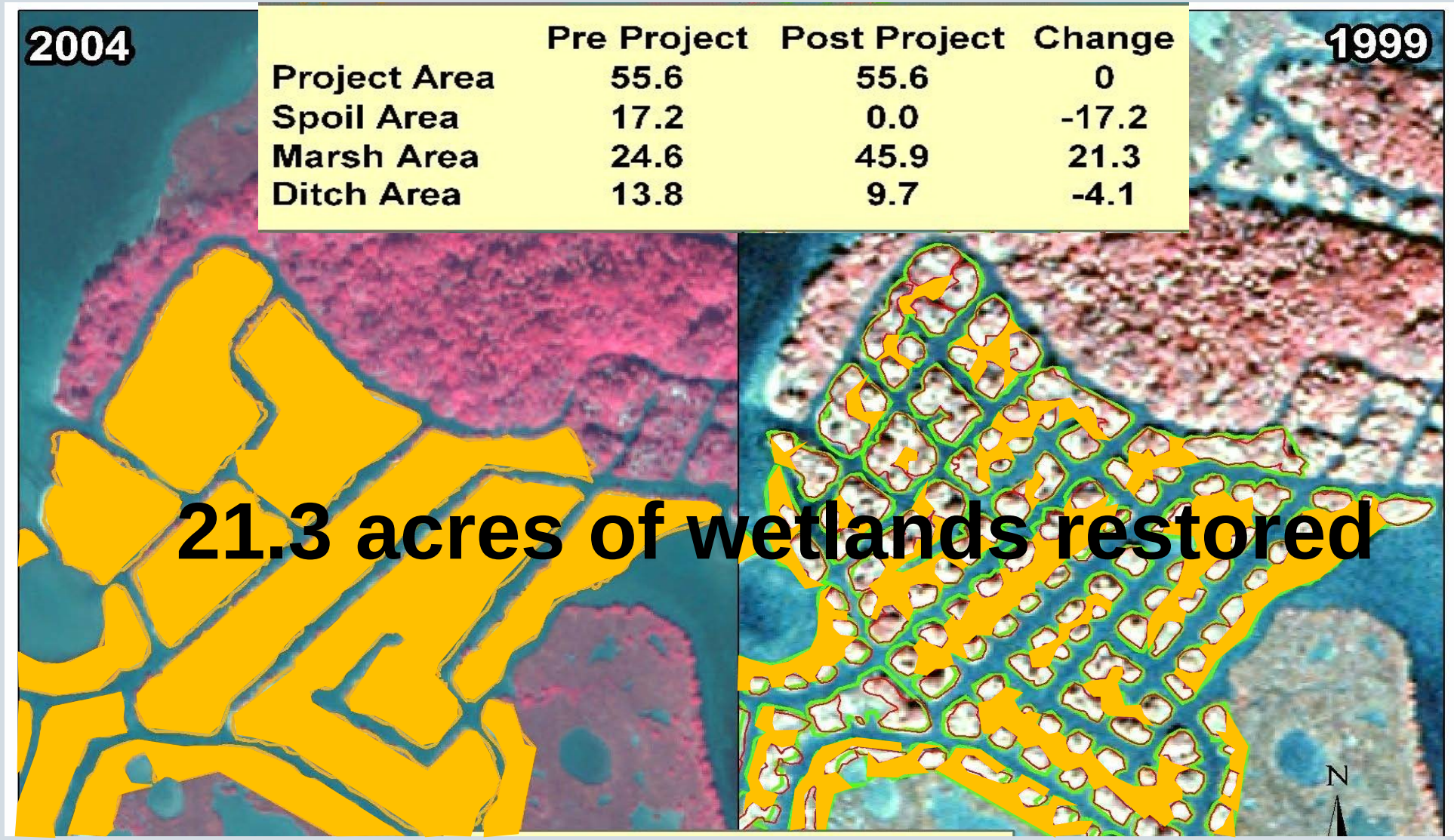


Provides 50lbs of fish biomass per acre annually to adjacent waters Stevens et al. 2007

Indicators of Success: Plants



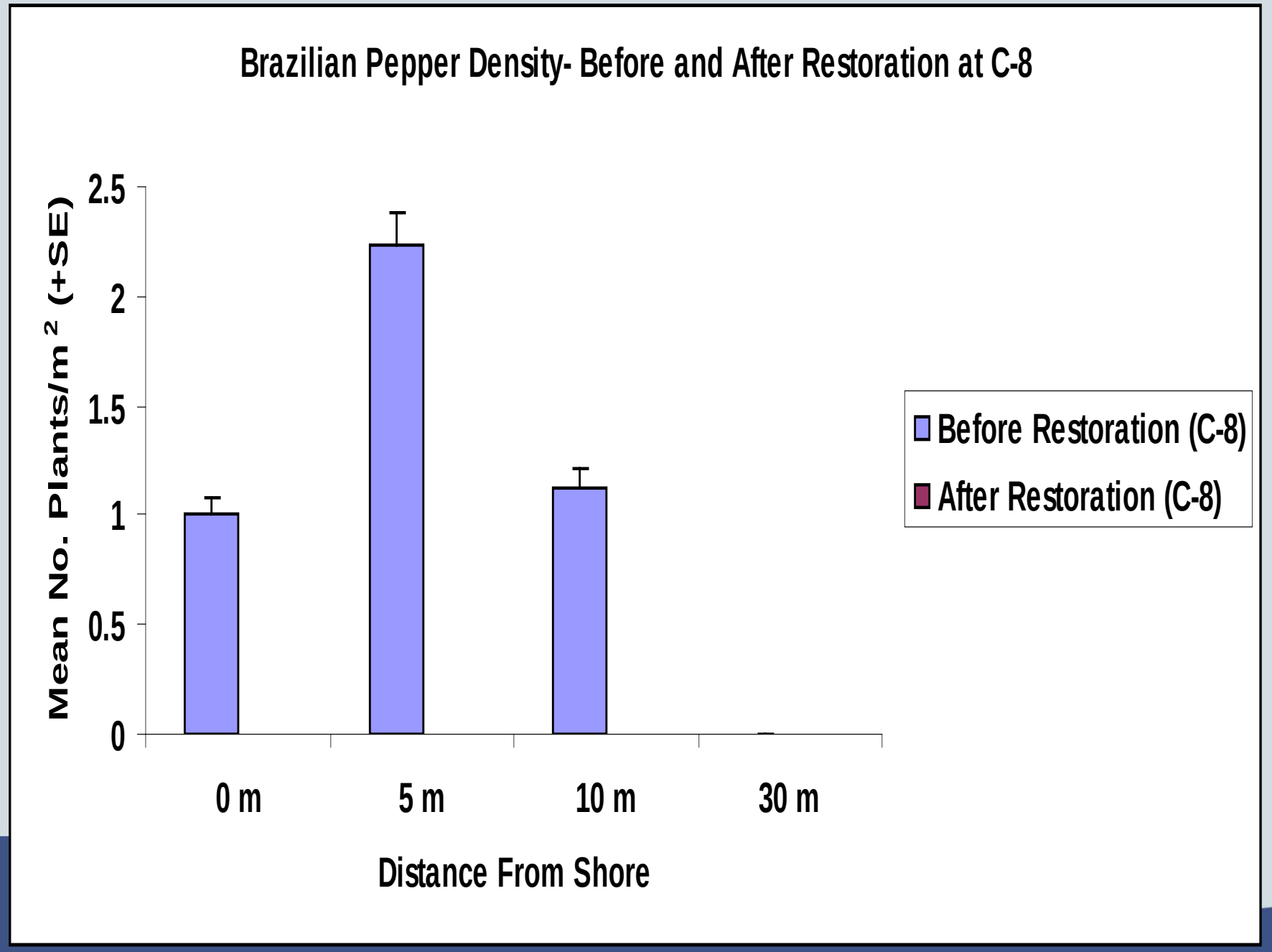
	Pre Project	Post Project	Change
Project Area	55.6	55.6	0
Spoil Area	17.2	0.0	-17.2
Marsh Area	24.6	45.9	21.3
Ditch Area	13.8	9.7	-4.1



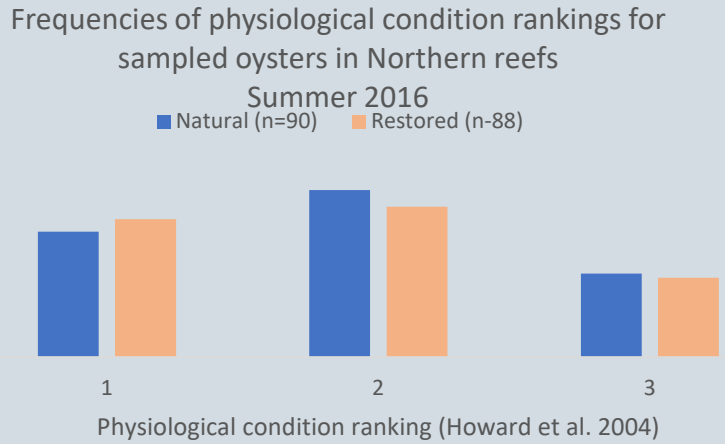
45.9 acres of wetlands

24.6 acres of wetlands

Impounded Saltmarsh Restoration


Brazilian Pepper Density- Before and After Restoration at C-8
Mean No. Plants/m 2 (+SE)
2.5
2
1.5
1
0.5
0
0 m
5 m
10 m
30 m
Distance From Shore
Before Restoration (C-8)
After Restoration (C-8)

Indicators of Success: Animals



(Howard et al. 2004)

- **Live oysters per unit area**
- **Oyster abundance by size class**

(Oyster Restoration Monitoring and Assessment Handbook 2014)

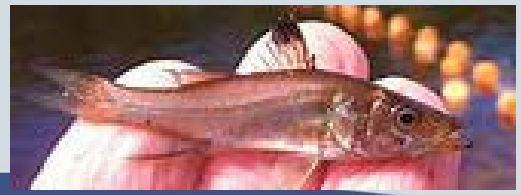
Indicators of Success: Animals

- Eat mosquito larvae
- Favorite prey of small snook

- Eat mosquito larvae
- 109F; 167ppt salinity; 1.6mg/L DO

- Eat mosquito larvae

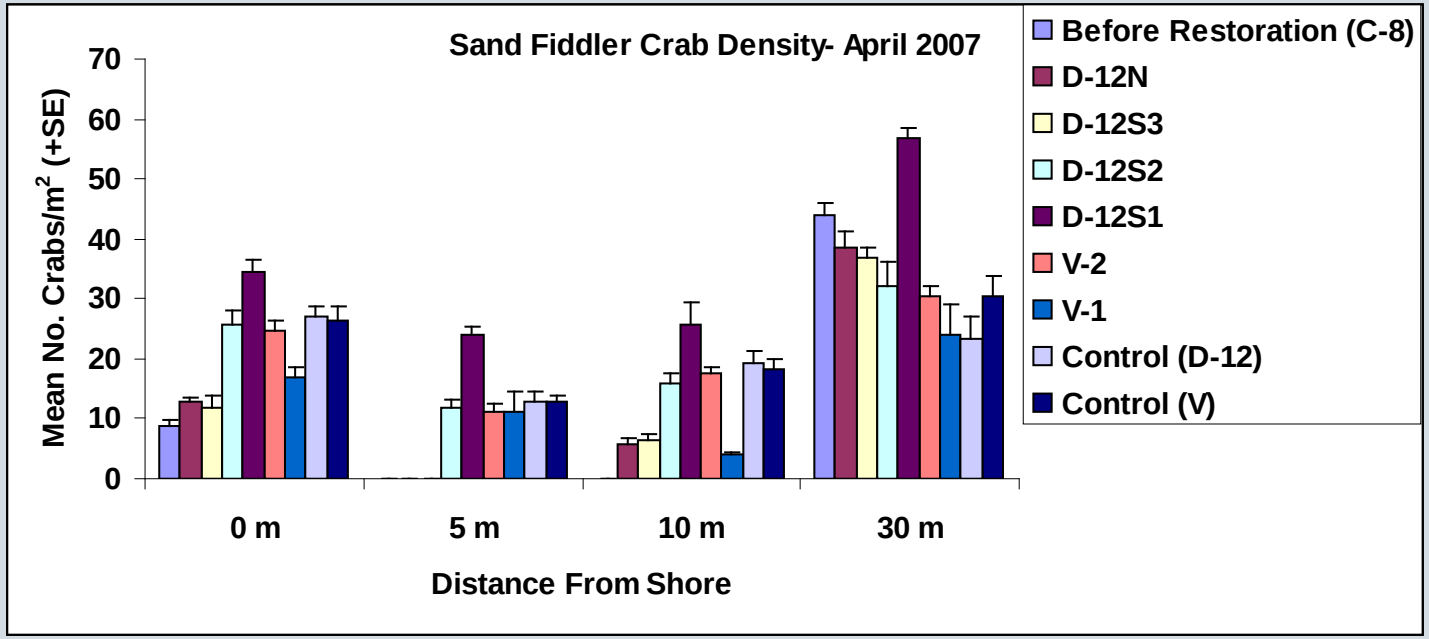
- Eat plant detritus

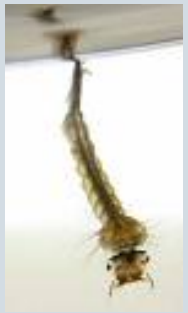


- 0mg/L DO
- cannabalistic

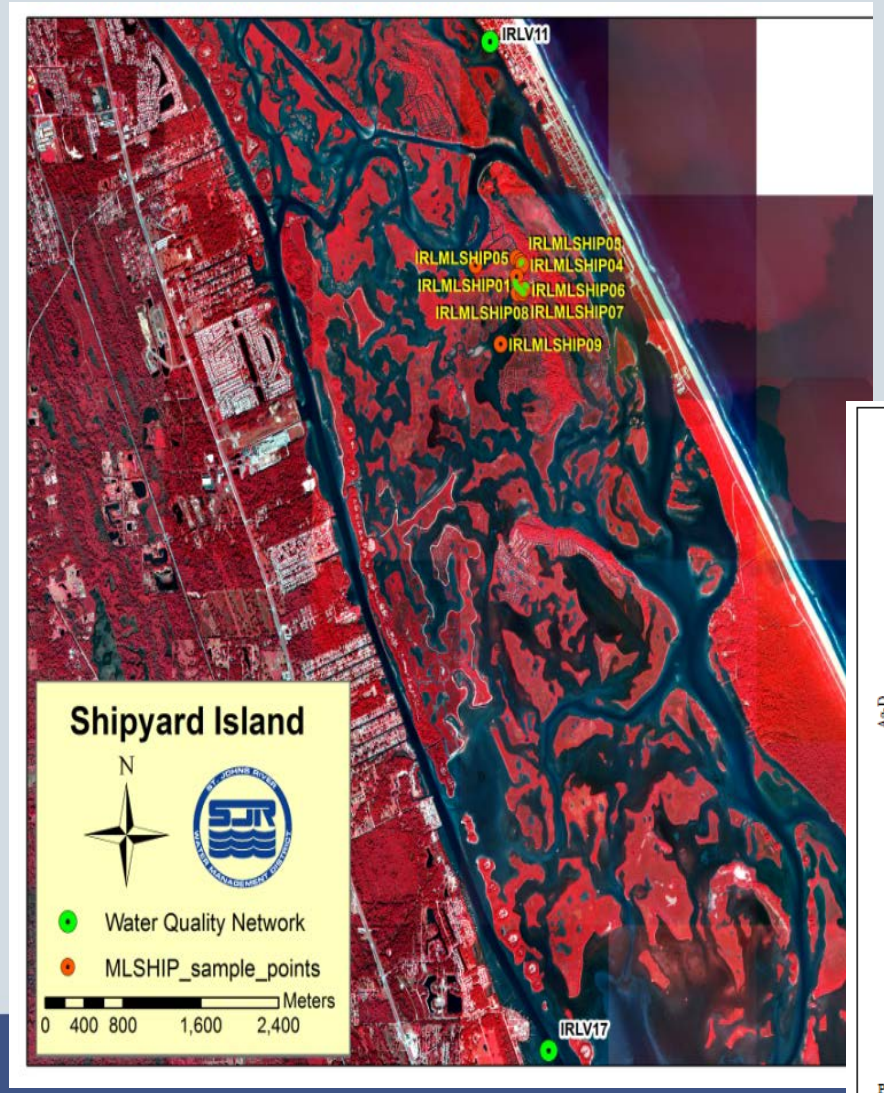
*Fall High Tides

Indicators of Success: other restoration projects

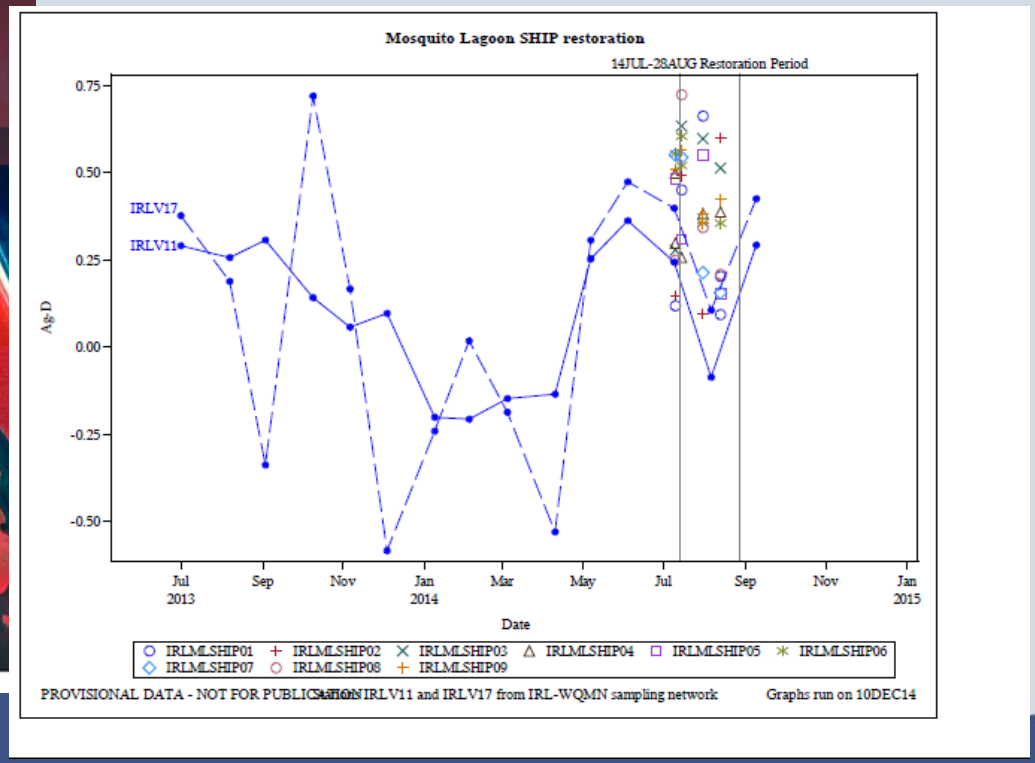

Sand Fiddler Crab Density- April 2007
Mean No. Crabs/m2 (+SE)
70
60
50
40
30
20
10
0
0 m
5 m
10 m
30 m
Distance From Shore
Before Restoration (C-8)
D-12N
D-12S3
D-12S2
D-12S1
V-2
V-1
Control (D-12)
Control (V)



Indicators of Success: Water



- **Salinity**
- **Dissolved Oxygen (DO)**
- **Turbidity**
- **Temperature**
- **Nutrients: N, P (various forms)**



Project Goals

Maximize the footprint of intertidal saltmarsh

= maximize plant primary production and habitat

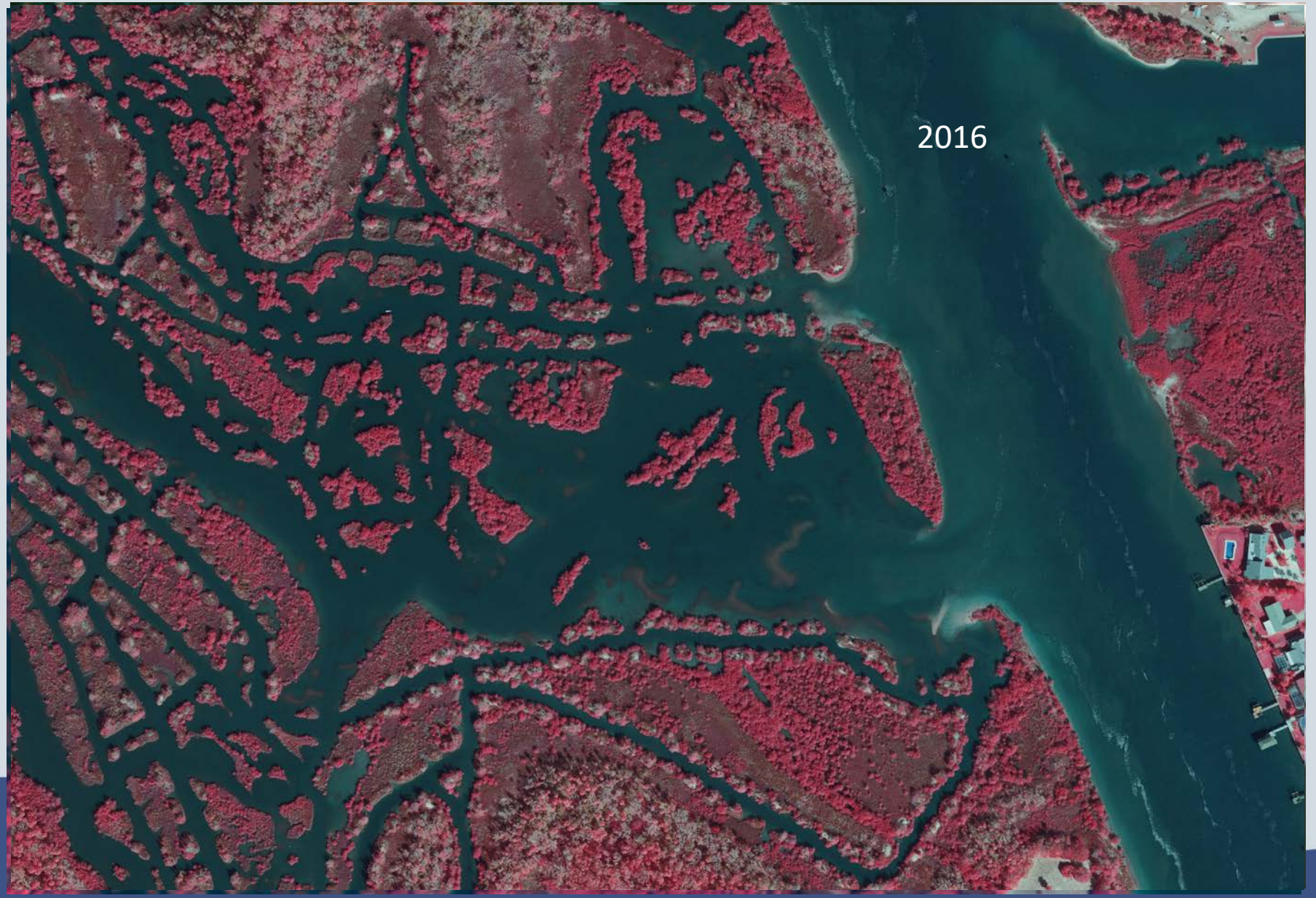
= maximize fish, shrimp, and crab production

= provide mosquito control

= maximize the fishing experience

4 years post-restoration

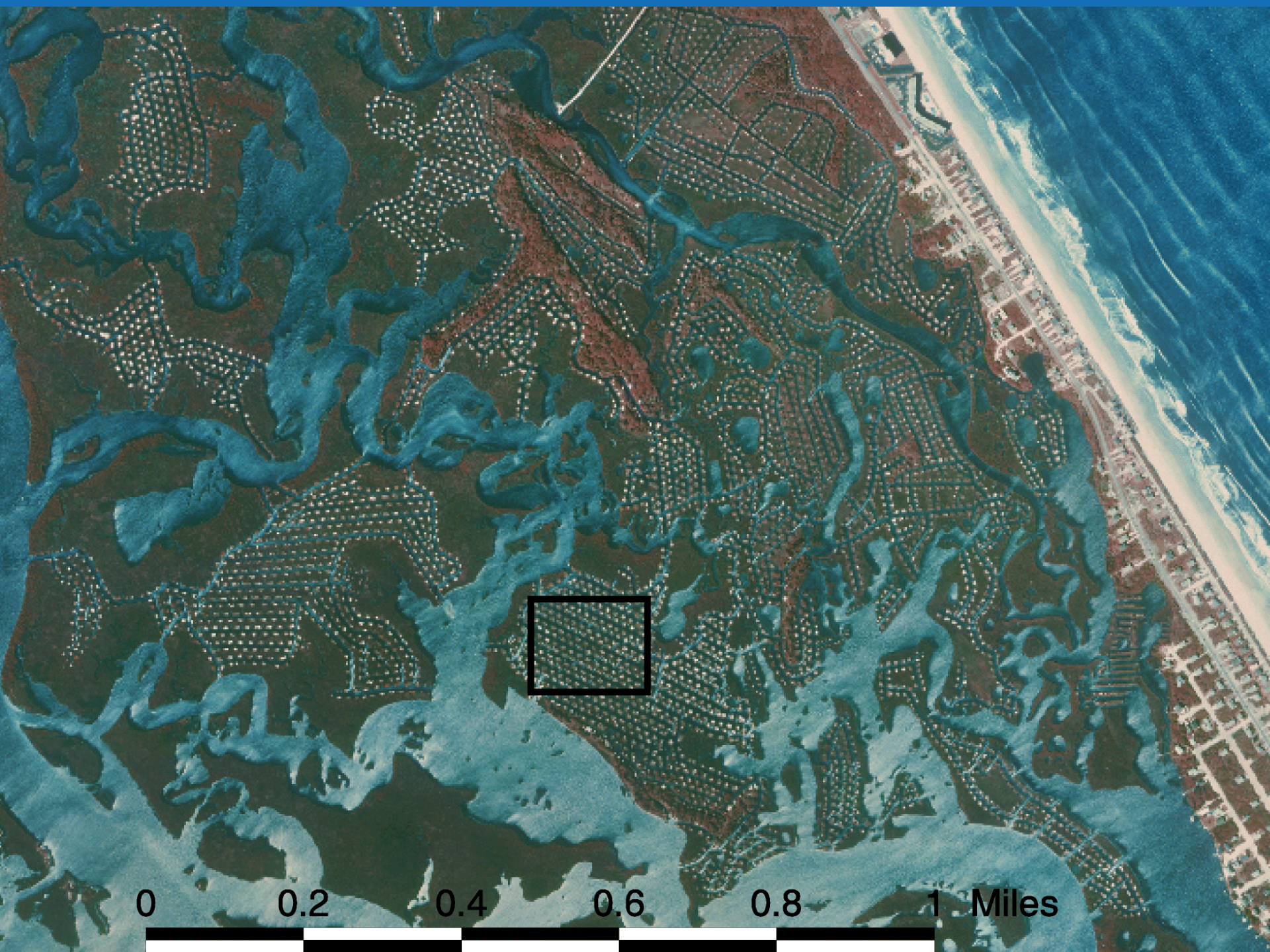
The Cost of Doing Nothing



Method and Site Description

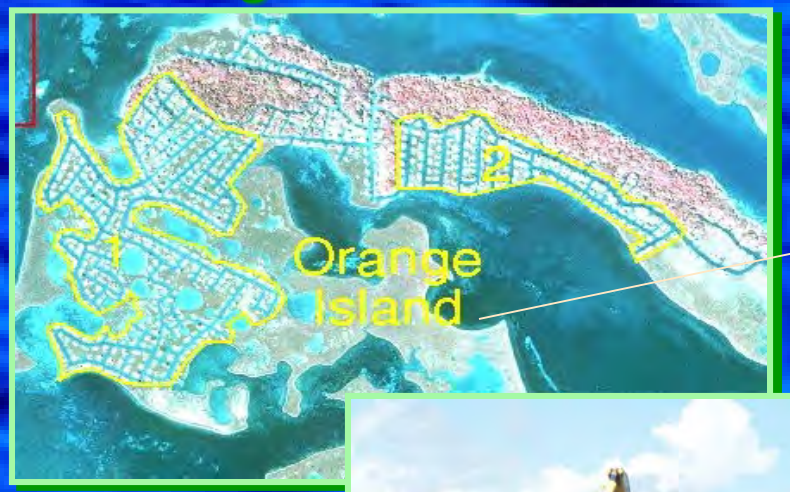
Ron Brockmeyer
Environmental Scientist V
St. Johns River Water Management District

UNIT


0
0.2
0.4
0.6
0.8
1 Miles

Coastal Wetlands
Solutions

Fill ditches & grade draglined marshes



Began 1999, 620 acres rehabilitated

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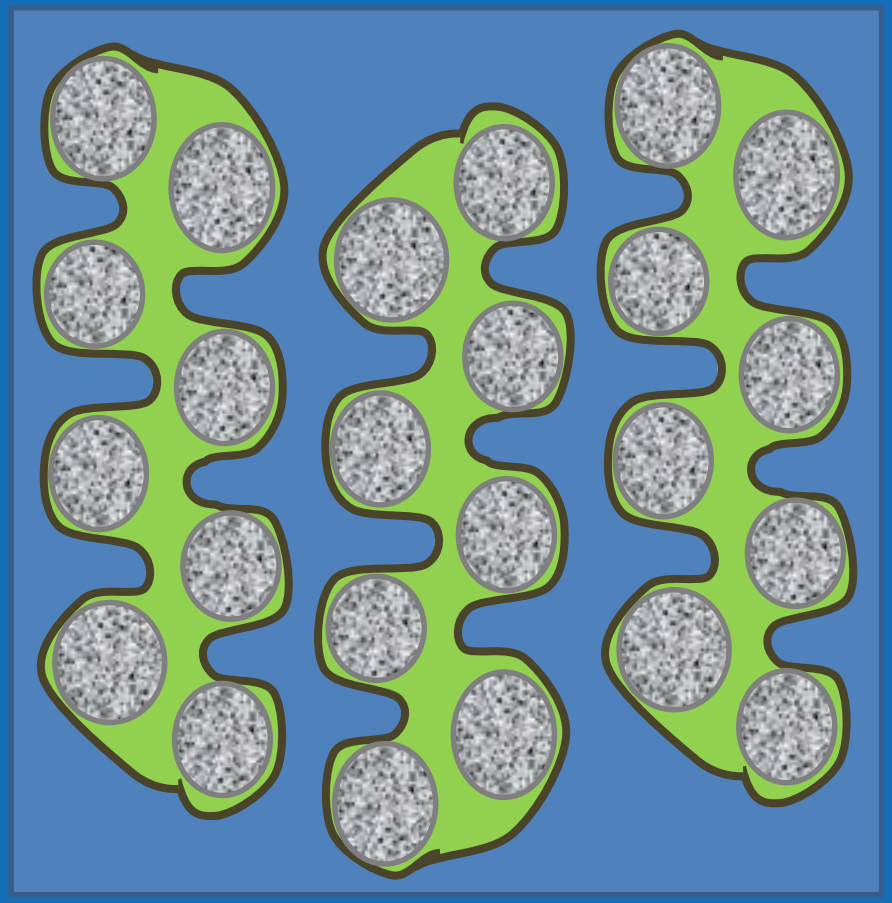
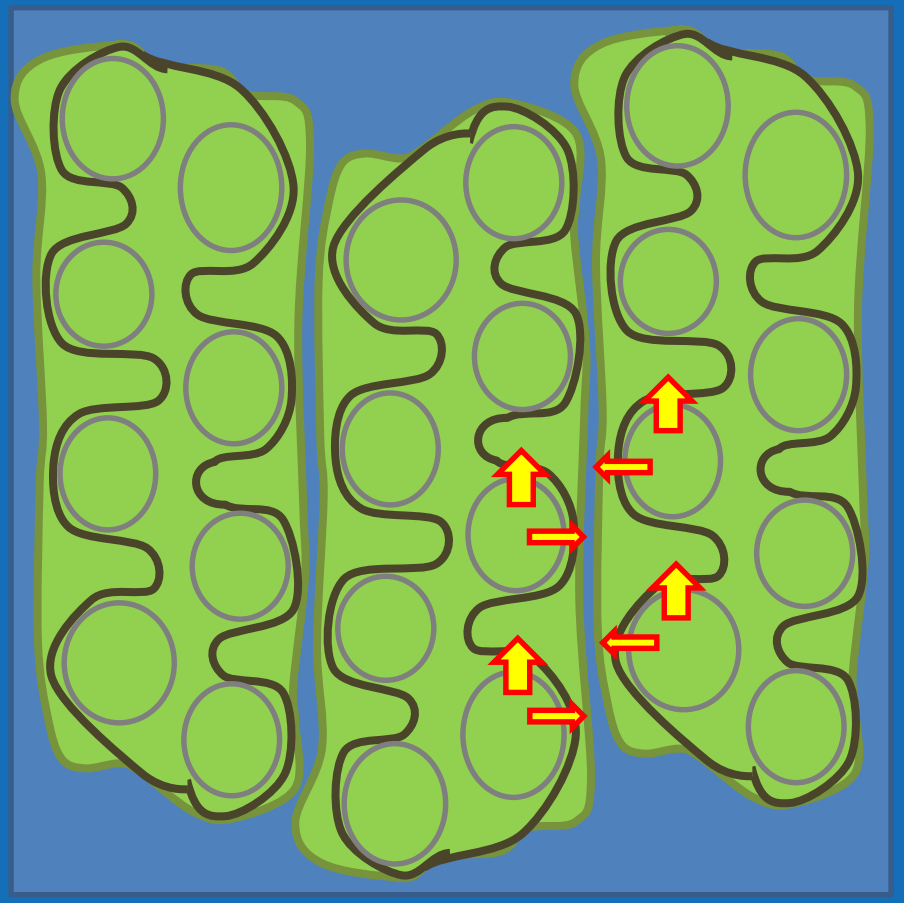
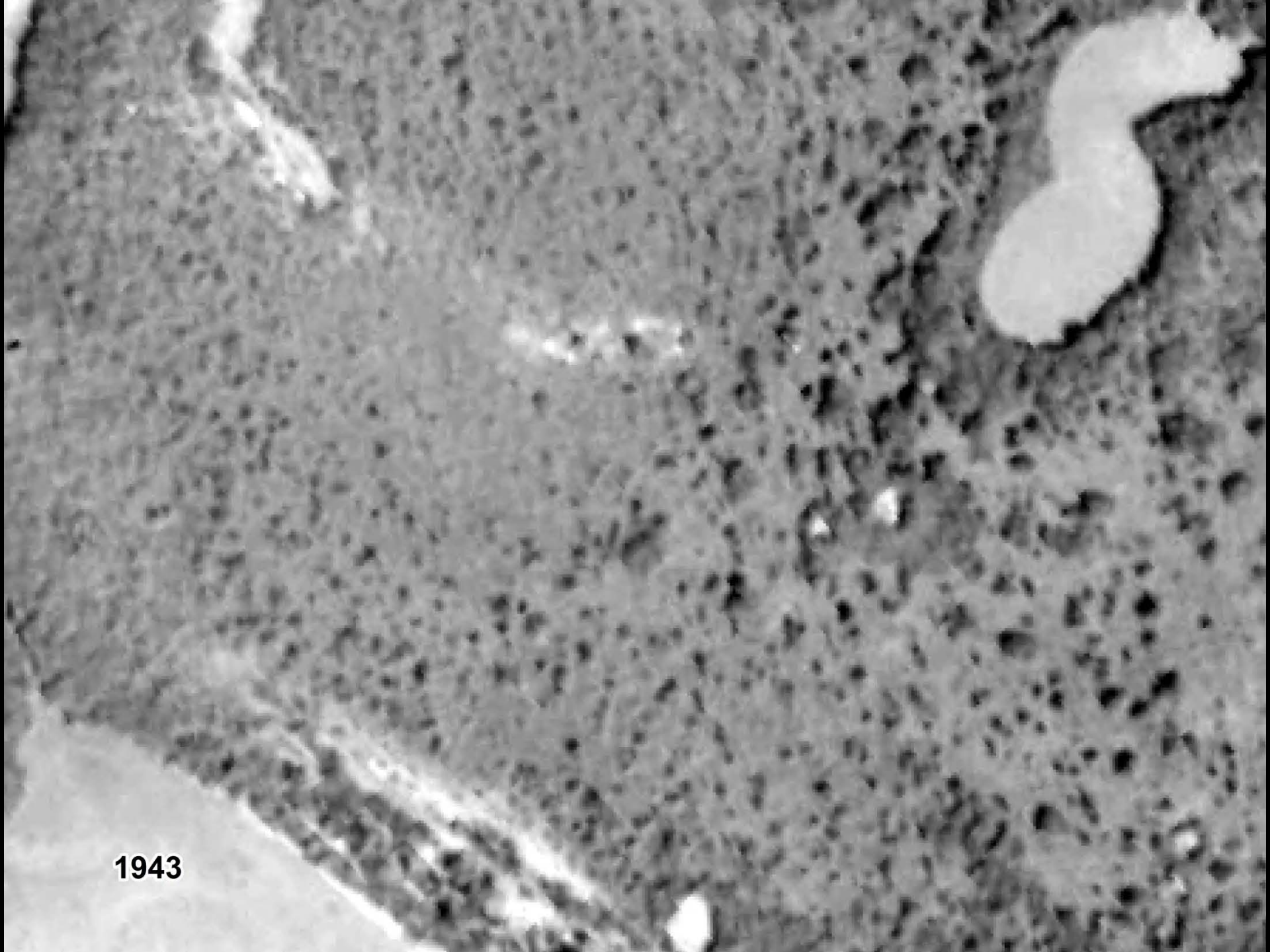
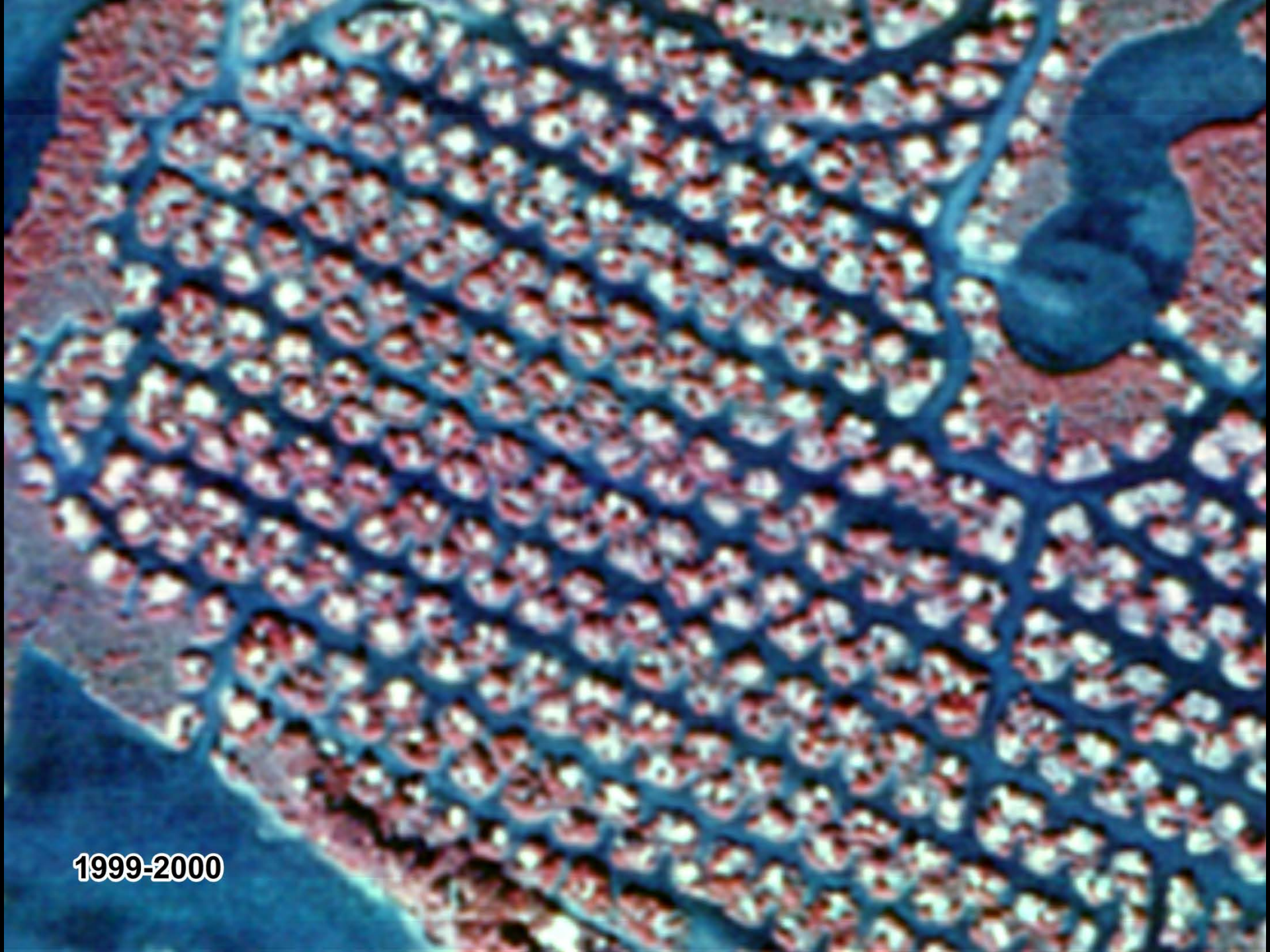





1943


1999-2000

CAT

2013

June 2015

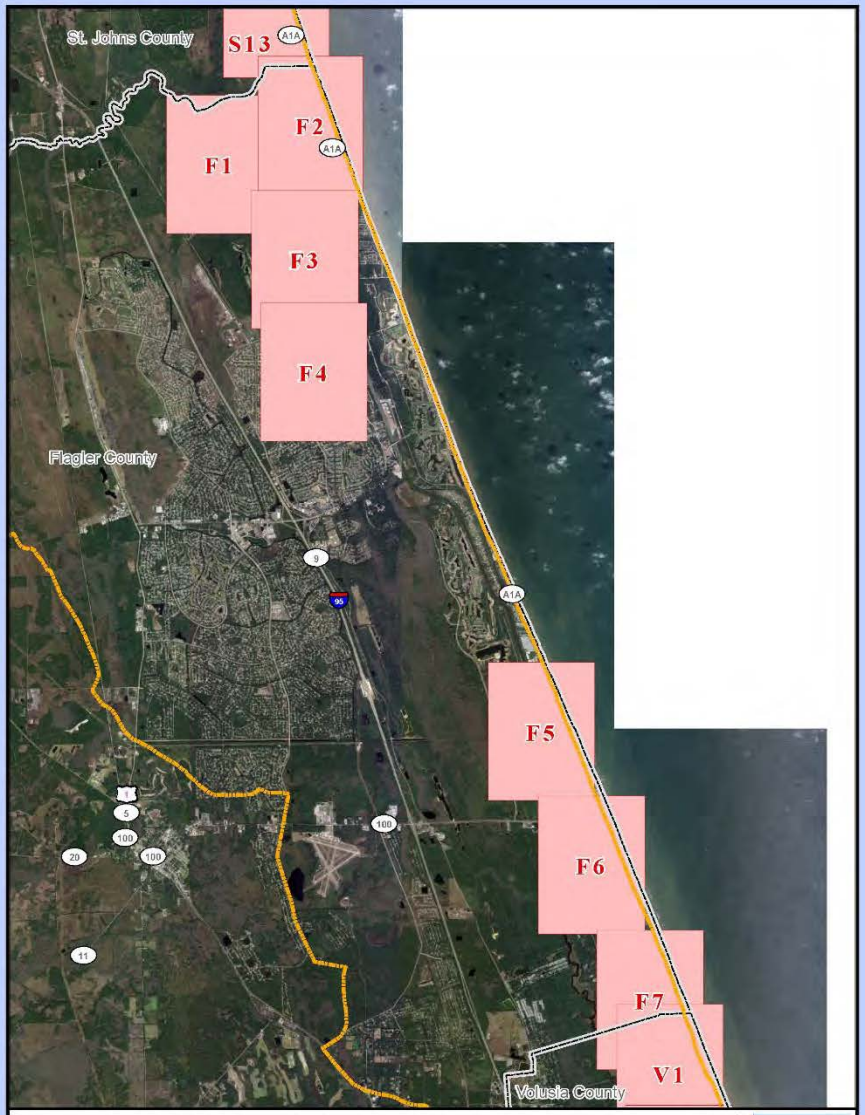
2015/08/11

2015/08/11

2015/08/11

Site Selection

- Large concentration of dragline-impacted wetland - degrading
- Public conservation lands
- Land manager approval
- Grant agency approval
- Strong local knowledge/partners
- Permit considerations – cultural resources, adjacent habitat, access, water quality



Map Layout
Disturbed & Filled Marsh Areas
Flagler County, FL
Northern Coastal Basin

Map Layout Grid
Northern Coastal Basin
County Boundary

N
W E
S

1.5 0 1.5 3 Miles

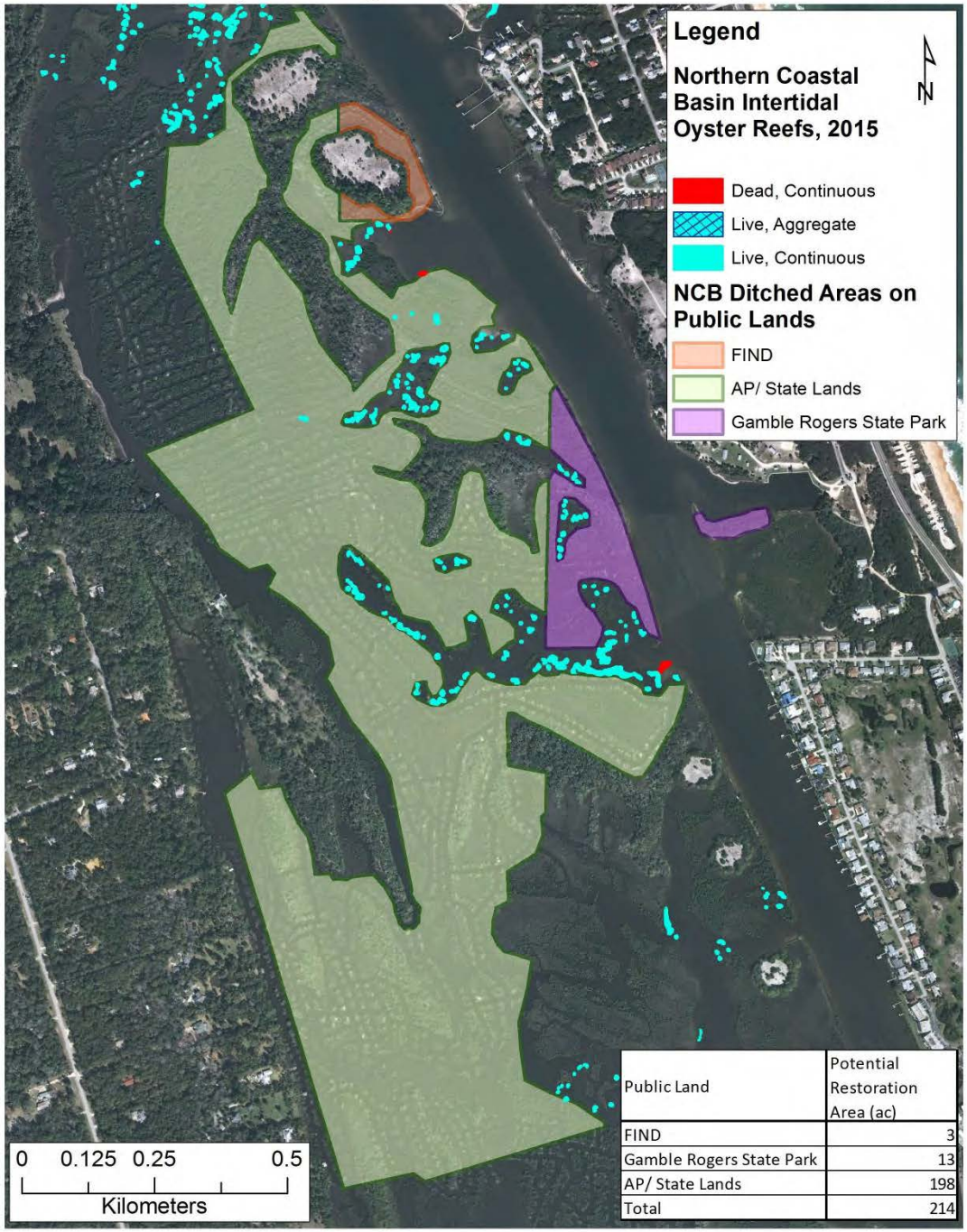
Disturbed Marsh Areas
Flagler County, FL
Northern Coastal Basin
Map F7

N
W E
S

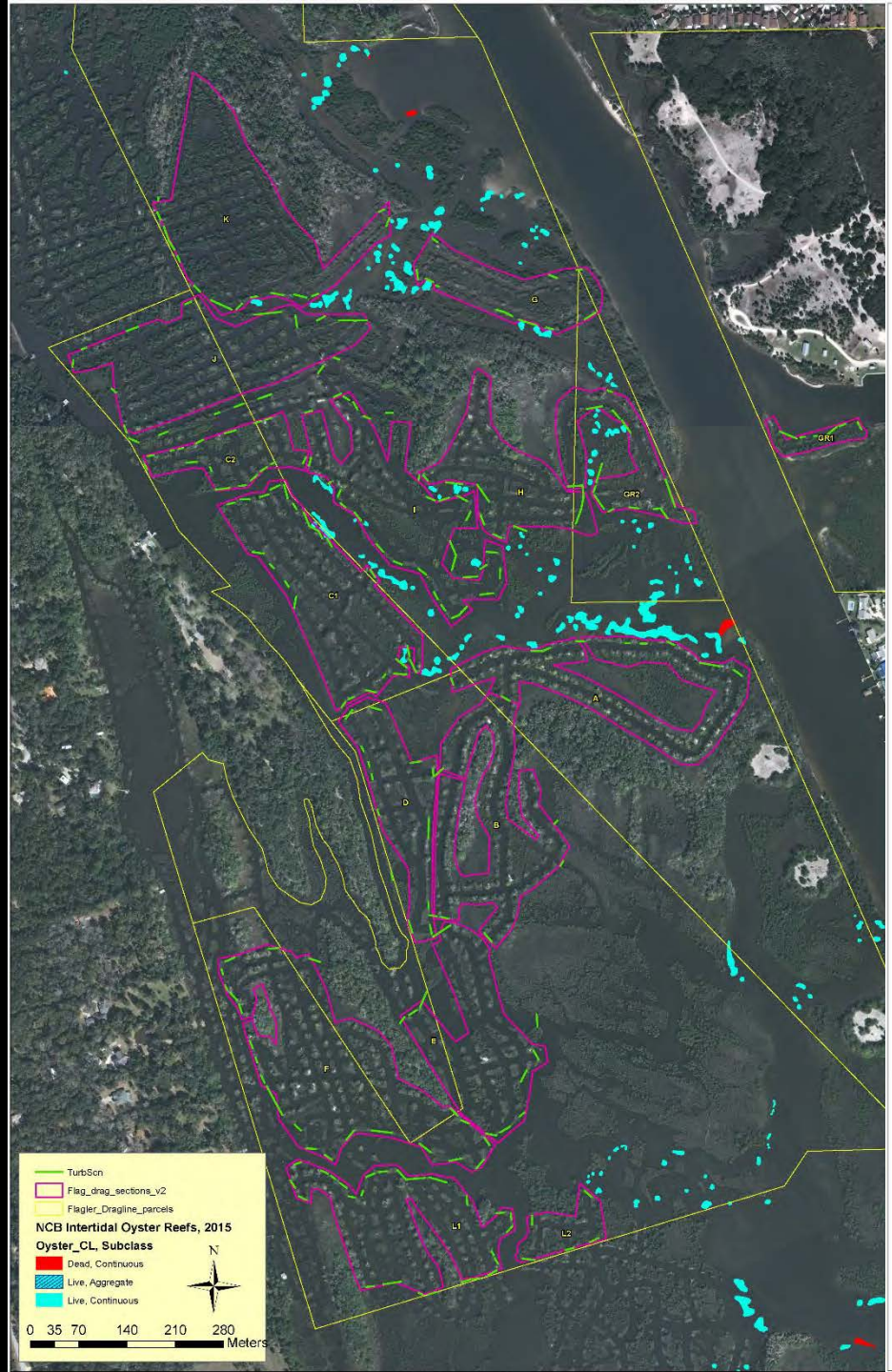
Disturbed Marsh (2007)	Spoil Site (2007)
Ownership Type	Ownership Type
Private	Private
Public	Public

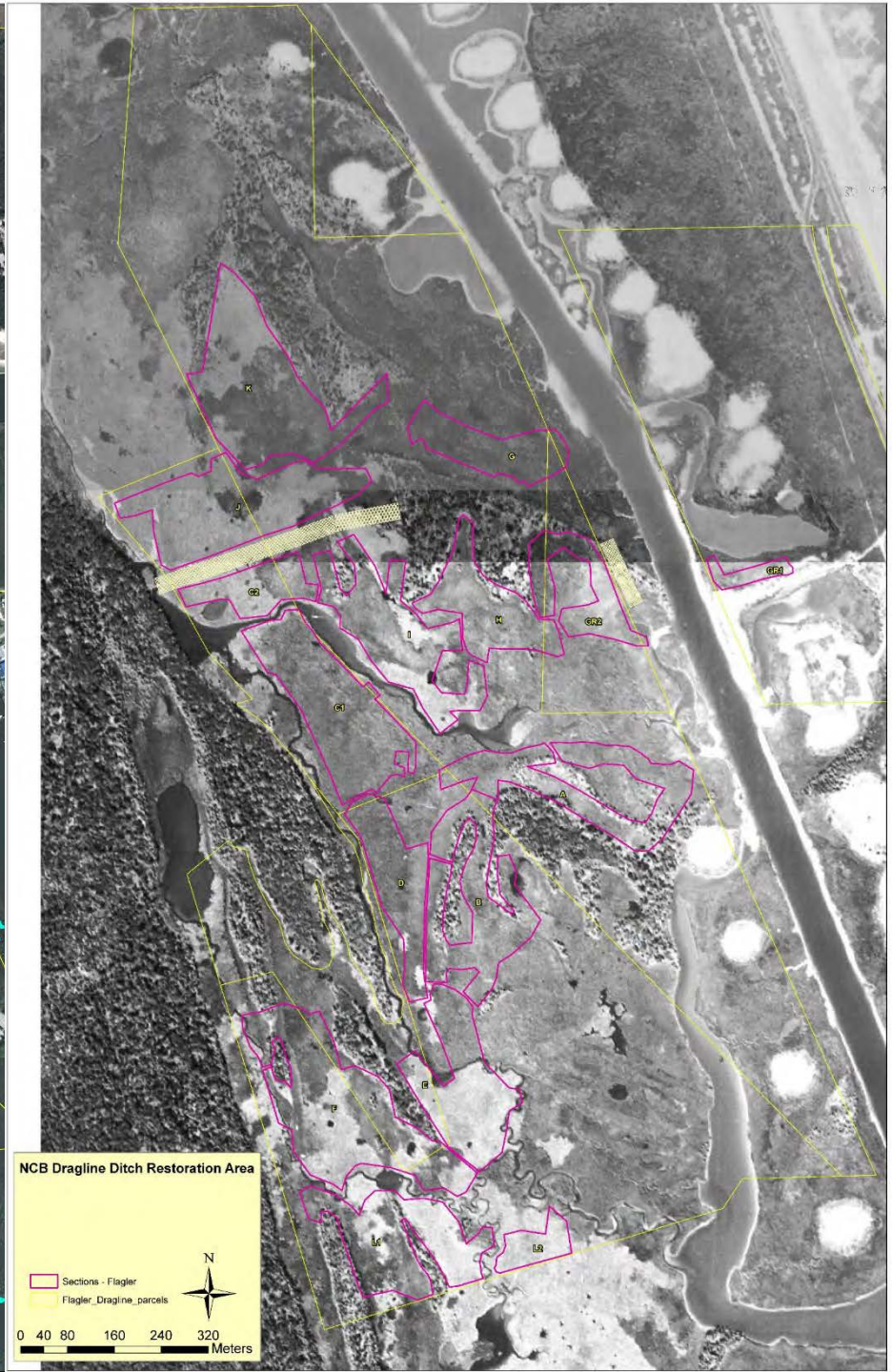
750 0 750 1,500 Feet

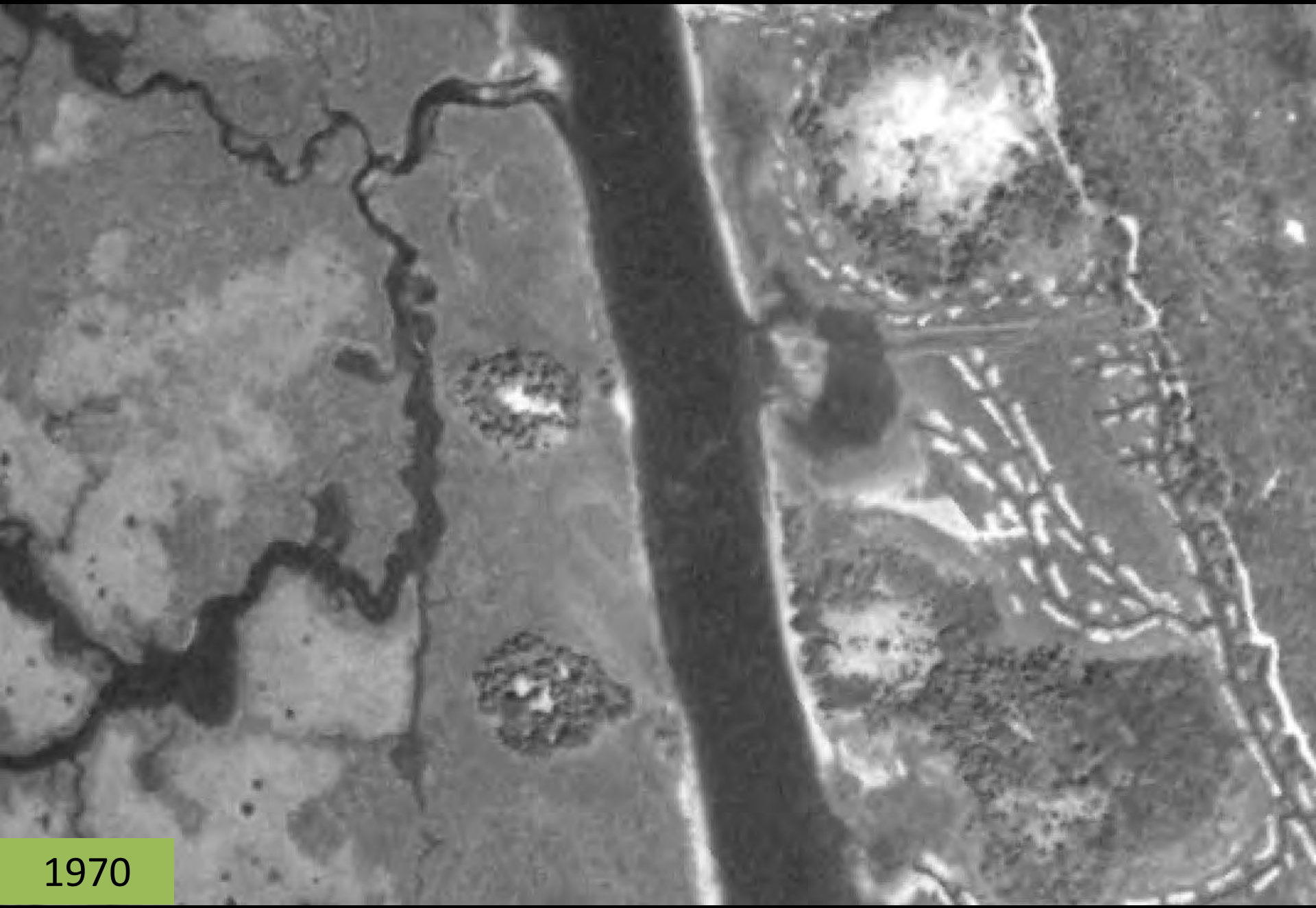
Areas Impacted by Dragline Ditches - Flagler County



Public Land	Potential Restoration Area (ac)
FIND	3
Gamble Rogers State Park	13
AP/ State Lands	198
Total	214


TurbScn
Flag_drag_sections_v2
Flagler_Dragline_parcels
NCB Intertidal Oyster Reefs, 2015
Oyster_CL, Subclass
Dead, Continuous
Live, Aggregate
Live, Continuous
N
0 35 70 140 210 280
Meters

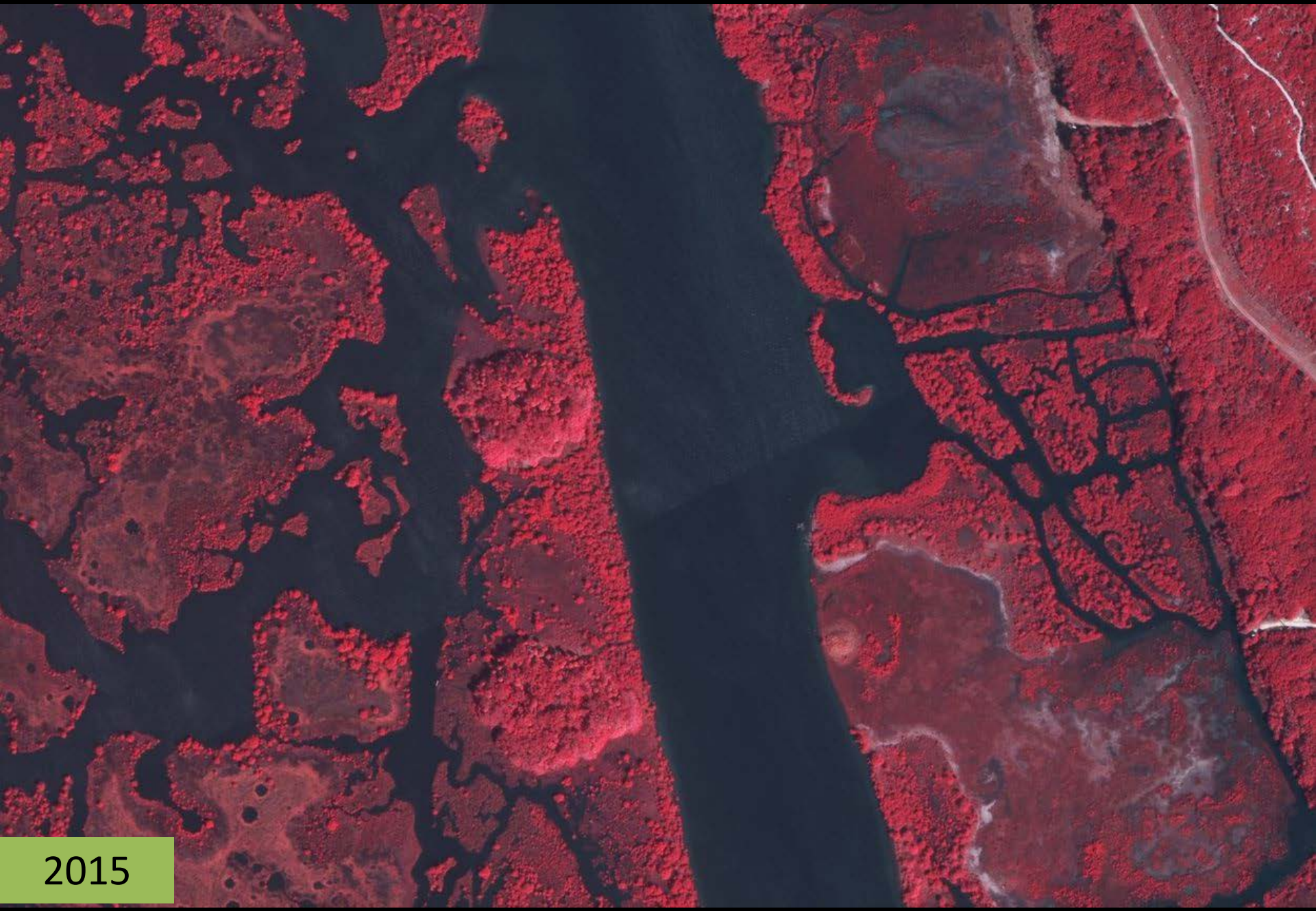

NCB Dragline Ditch Restoration Area
Sections - Flagler
Flagler_Dragline_parcels
N
0 40 80 160 240 320
Meters

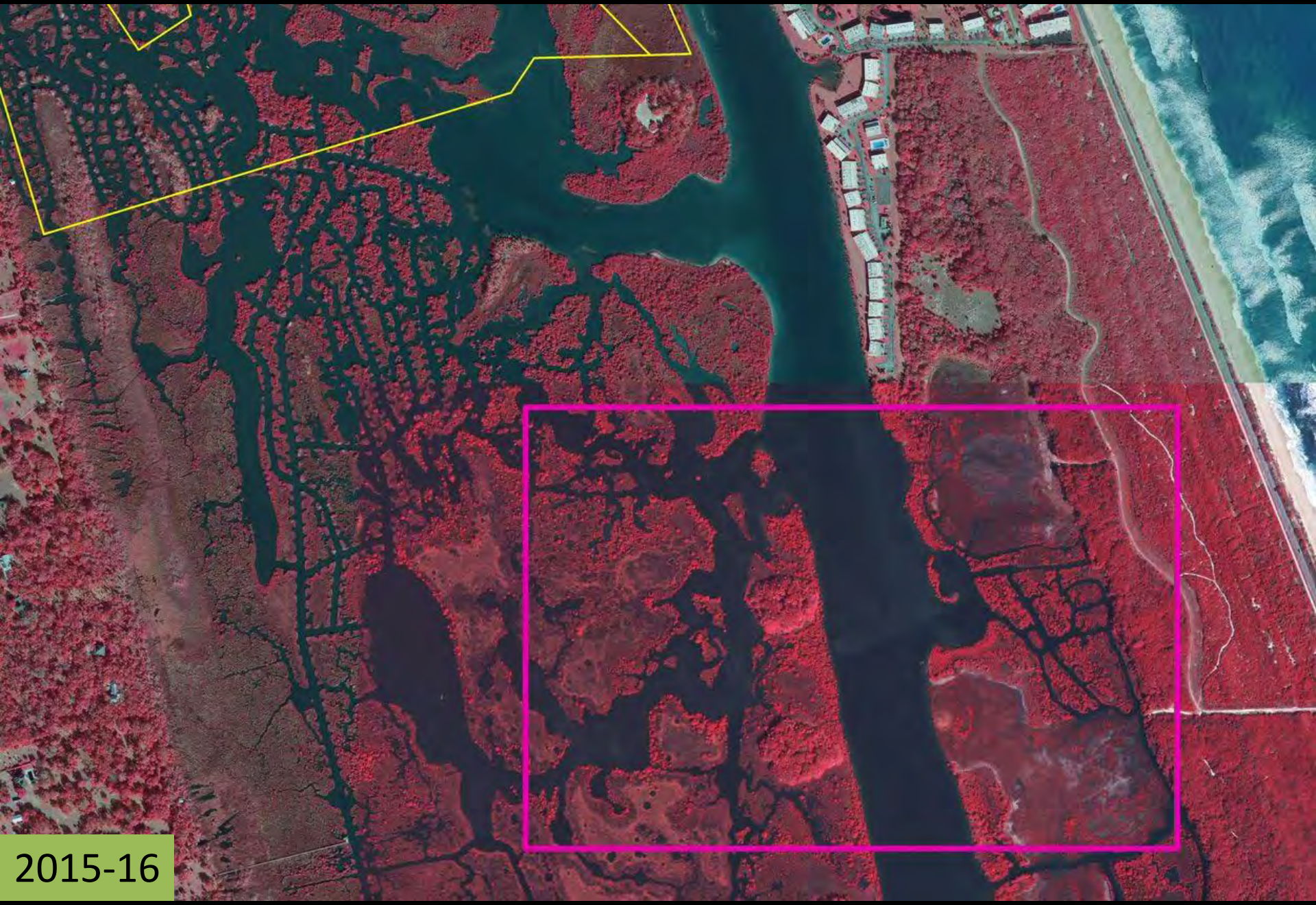


1970

2009

2012


2015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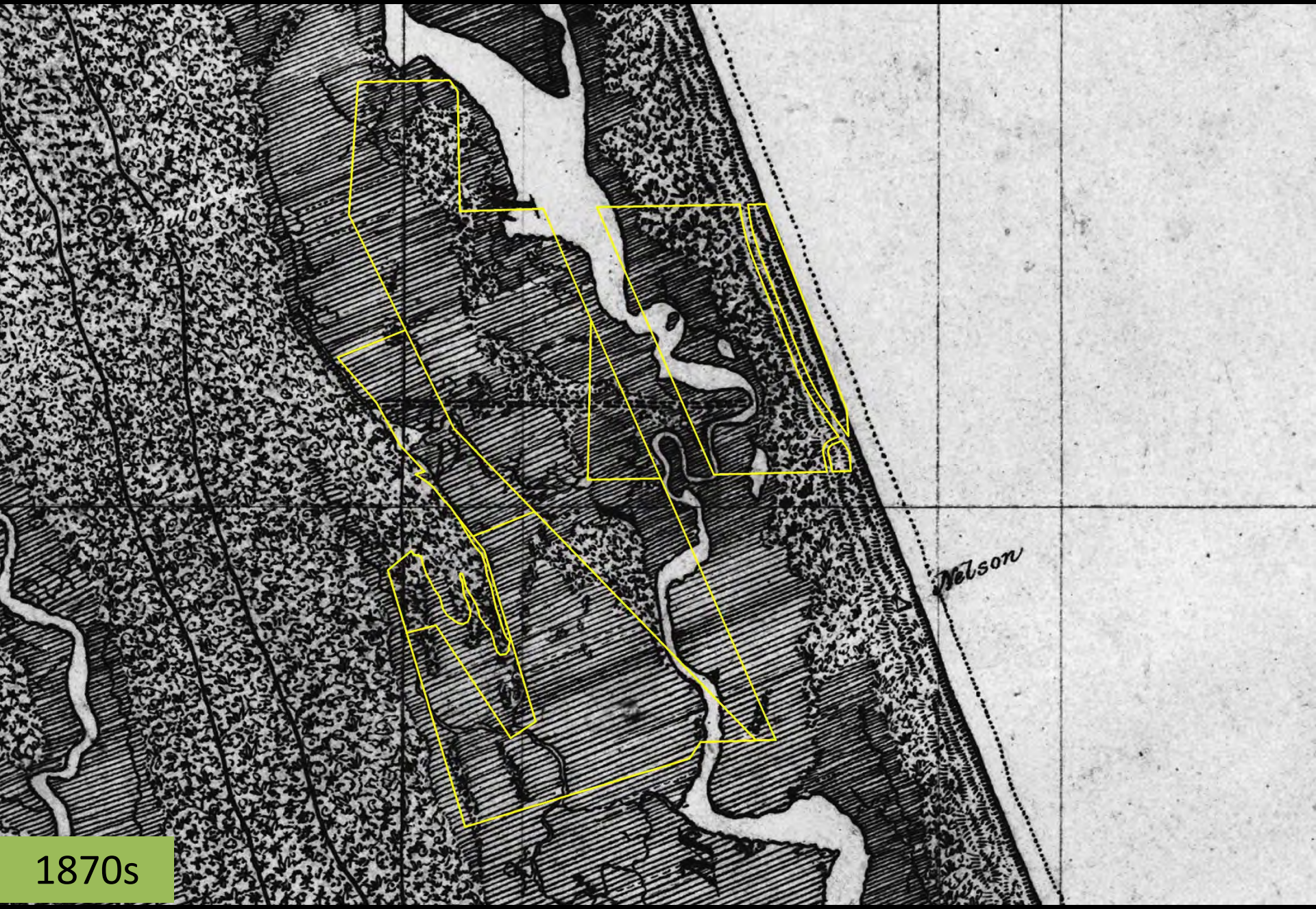
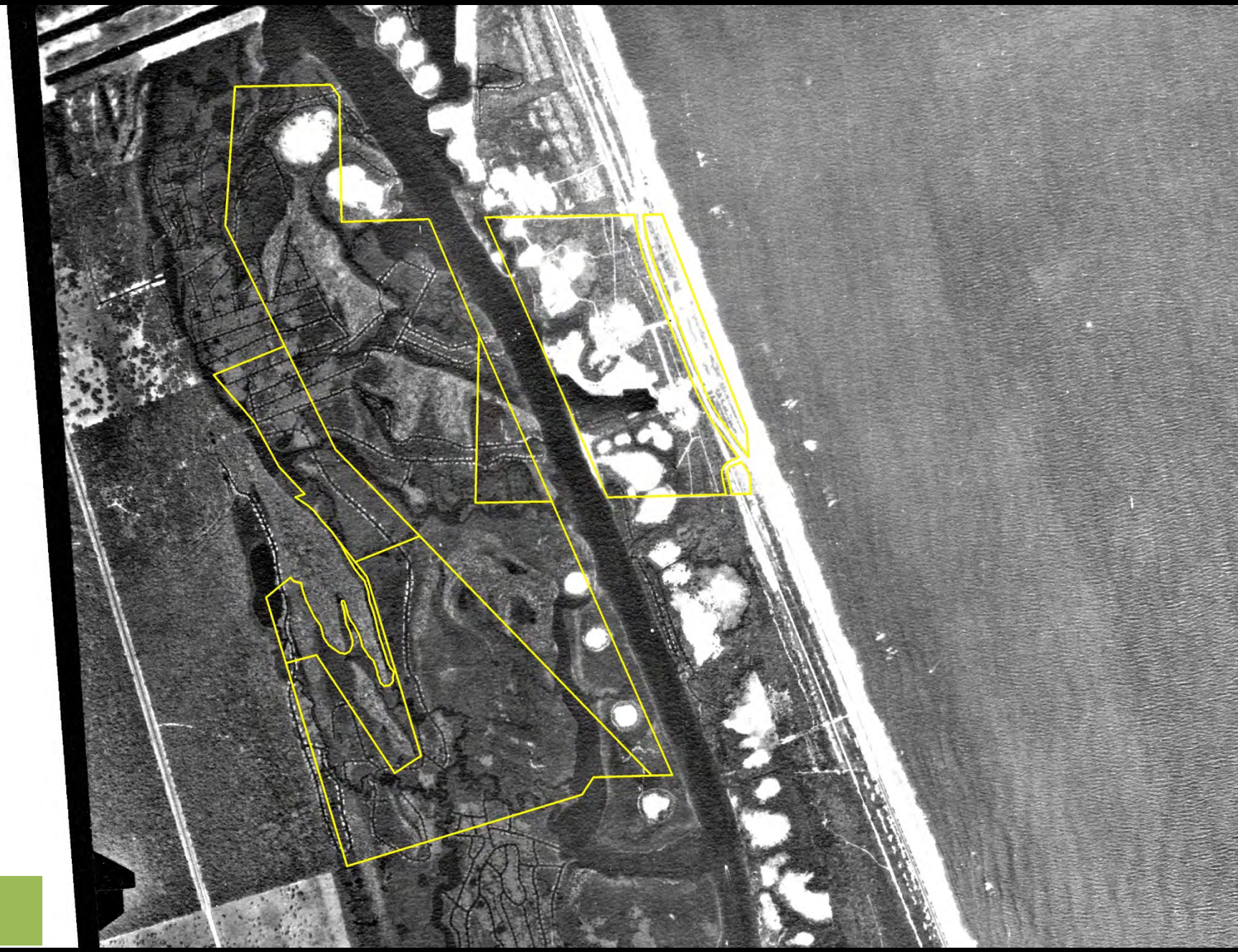


1870s

1943

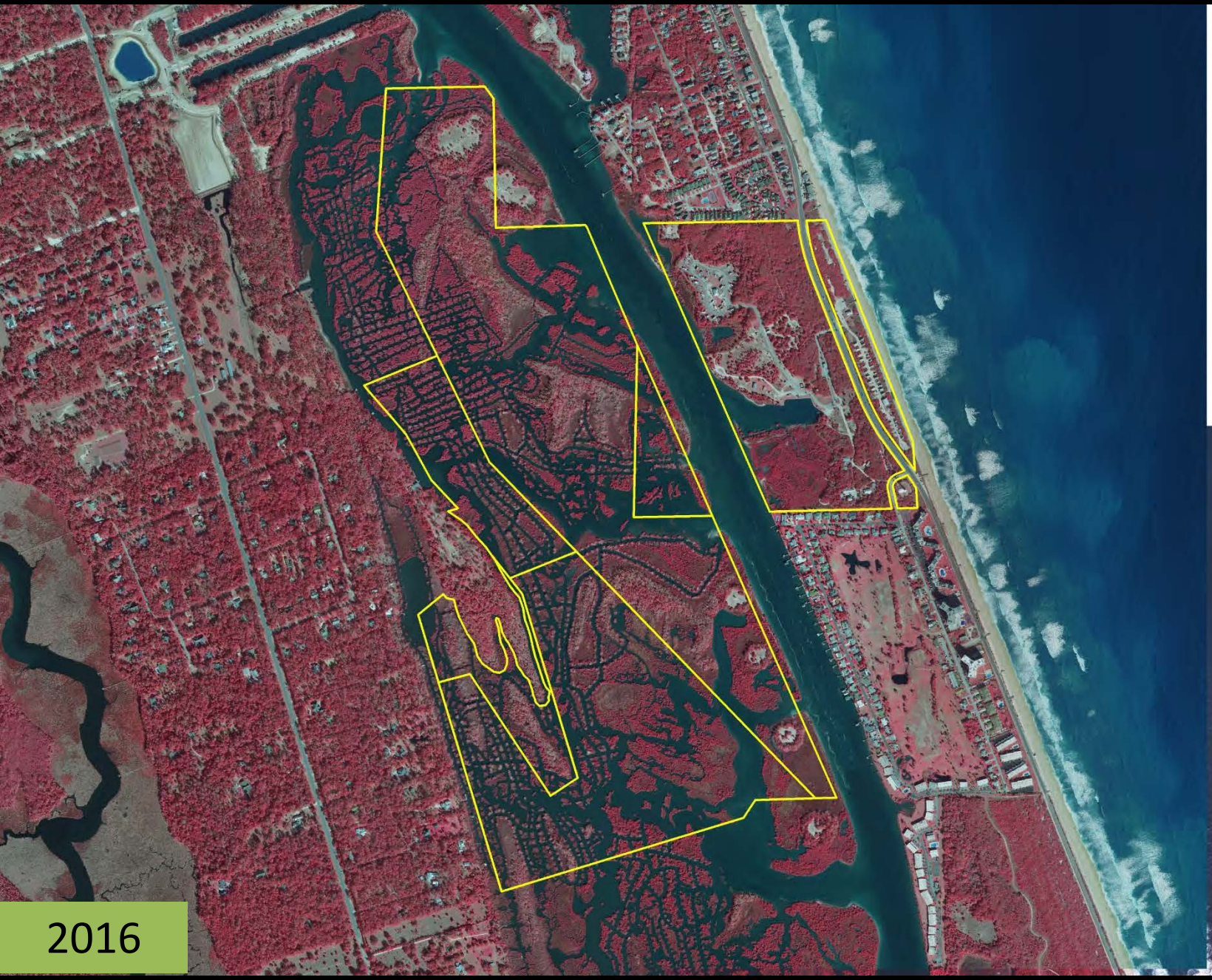


1965

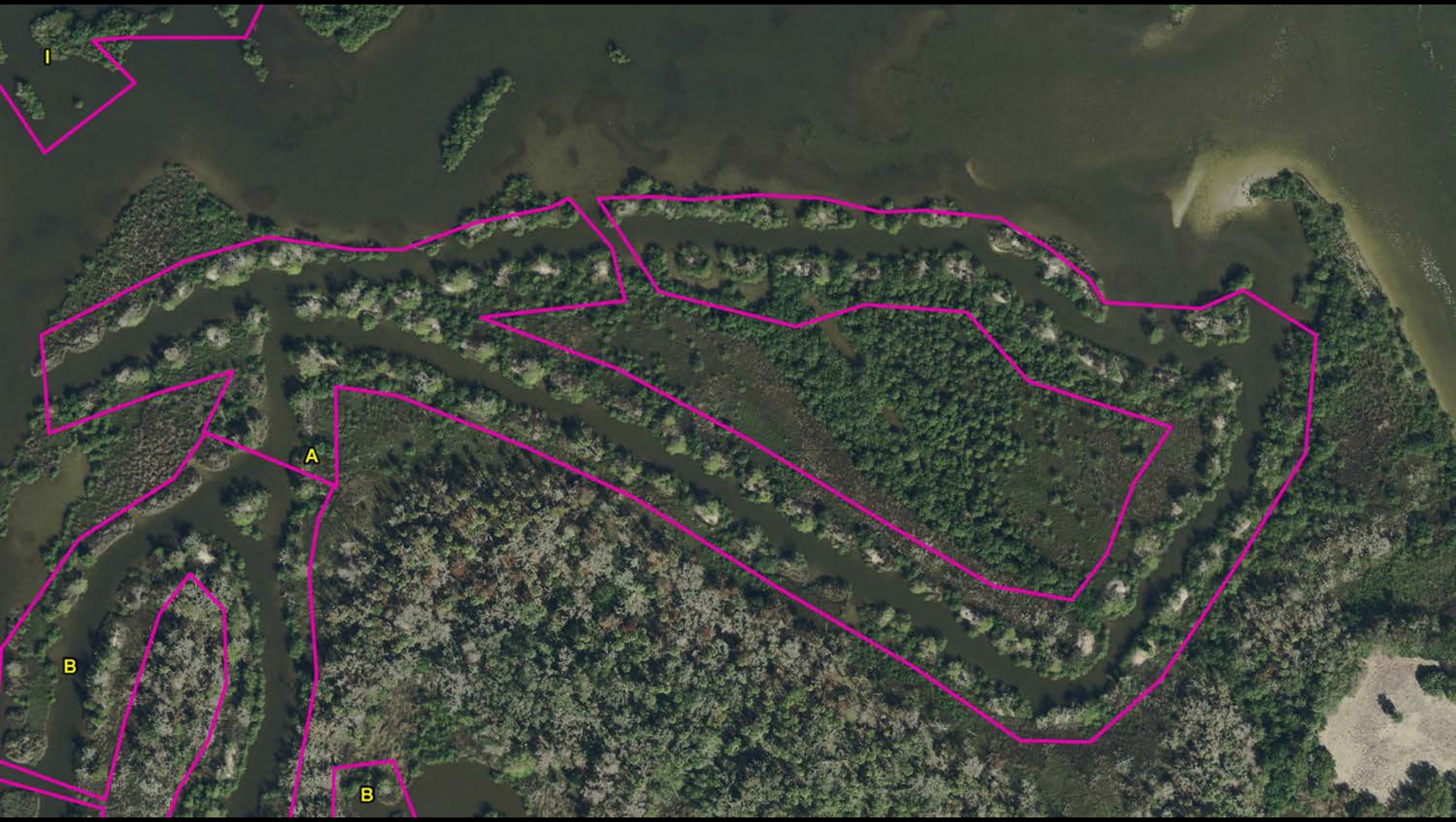
1970

1980

1999



2016


I
A
B
B

Ecological Oversight

Chris Schlageter

Ecologist

Old Florida Conservation

Floridan Resource Conservation and Development Council

Partnership Funding

Gian Basili
Fish and Wildlife Biologist
Coastal Program
U.S. Fish and Wildlife Service

Partners & Funding

Funding	Funding source	Amount
FWC revenue	USFWS grant	$316,000
	FWC sources	$100,000
FDEP Parks	FDEP sources	$25,000
District match	District sources	$100,000
TOTAL		$541,000

National Coastal Wetlands Conservation Grants Program

- **Funded by excise taxes on fishing equipment & boat fuel**
- **In 2018, $19 million awarded to 22 projects in 13 states**
- **Competitive application process**
- **Evaluated based on many criteria including benefits to:**
  - **T & E species**
  - **Coastal dependent or migratory birds**
  - **Fish**

National Coastal Wetlands Grant

- Goal: Long-term conservation (>20 years) of coastal wetland ecosystems
- Projects:
  - Acquisition of wetlands from willing sellers
  - Wetland restoration or enhancement
- Applicants: Agencies designated by the Governor of a coastal state *(i.e.*, state DEP or fish & wildlife agency)

Requirements

- 25% required match for states like Florida
- Match can include conserved lands and in-kind contributions
- Match can be provided by the state or a partner
- Funds must be obligated within 2 years
- Maximum $1 million grants
- 90% of the grant must support conservation activities

Stay Informed
Jim Troiano
Intergovernmental Coordinator
Governmental Affairs Program
St. Johns River Water Management District

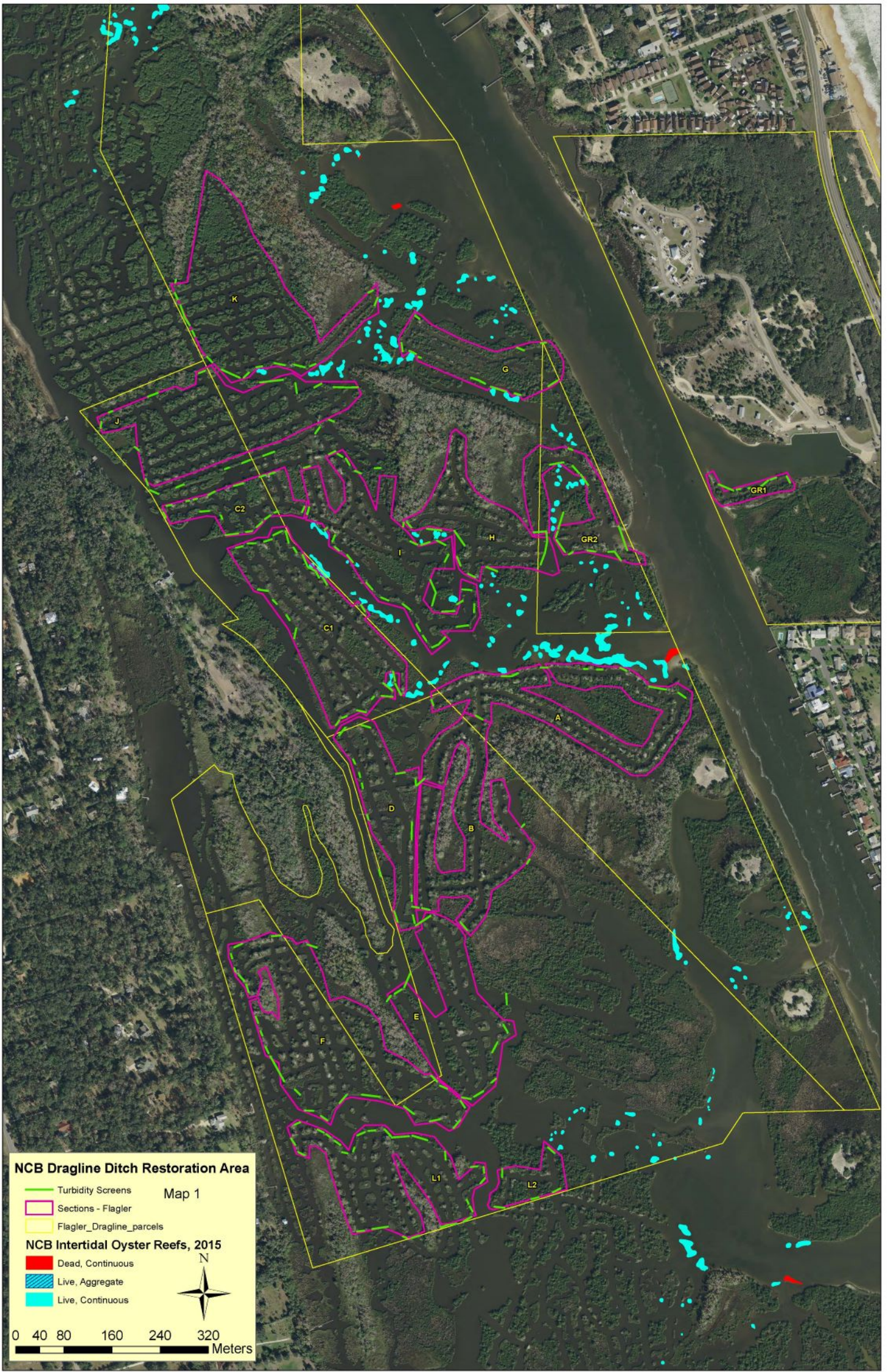
Stay Informed on the Project

- Webpage: www.sjrwmd.com/facts/flagler-wetland-restoration-project/
- FlaglerRestoration@sjrwmd.com

Upcoming Community Workshops

- **Thursday, October 4, from 5:30 p.m. to 7:30 p.m. at the Flagler Beach City Hall.**

- **Wednesday, November 7, from 5:30 p.m. to 7:30 p.m. at the Flagler Beach City Hall.**


K
G
J
C2
H
GR2
I
GR1
C1
A
D
B
E
F
L1
L2
NCB Dragline Ditch Restoration Area
Map 1
Turbidity Screens
Sections - Flagler
Flagler_Dragline_parcels
NCB Intertidal Oyster Reefs, 2015
Dead, Continuous
Live, Aggregate
Live, Continuous
N
0 40 80 160 240 320
Meters