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# FORENSIC MAPPING OF THE STUNNING TRANSFORMATION OF FLORIDA'S COASTAL WATERSHEDS

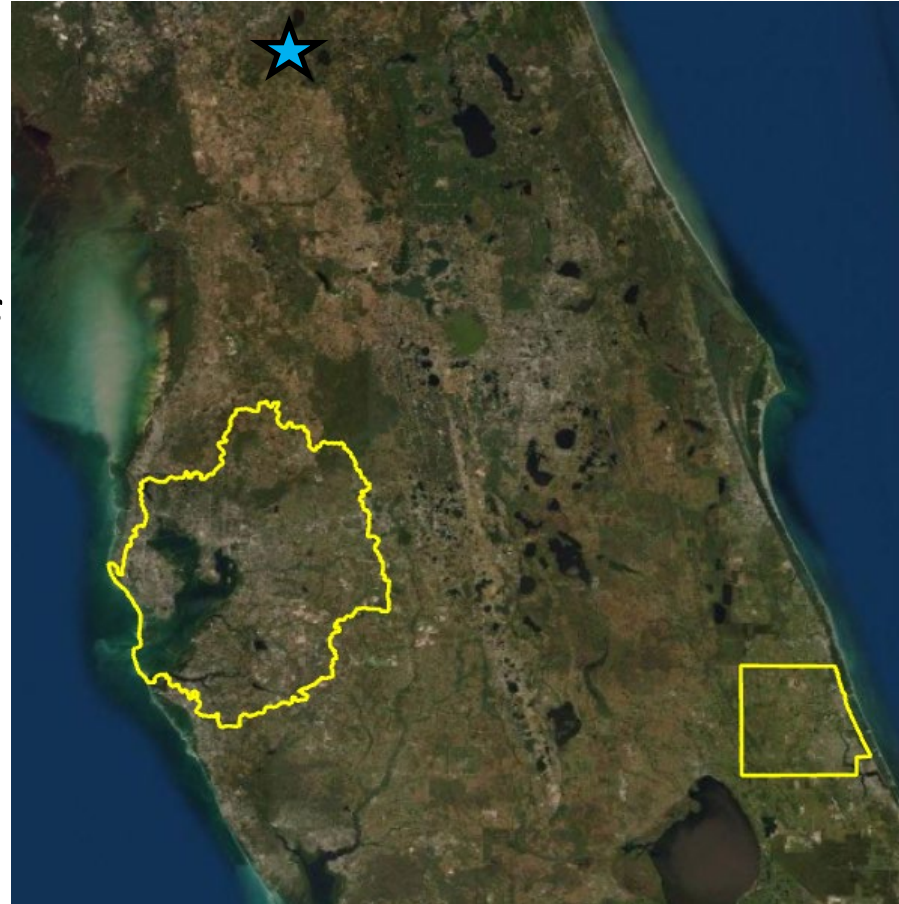
*- Kai Rains, M. Rains, S. Lawlor, K. Schmidt, and S. Landry*



Tampa Bay Watershed  
5,909 km<sup>2</sup>

Area and Distribution of  
Wetlands and Artificial  
Water Features

1950s-2000s



St Lucie County (Mainland)  
1,494 km<sup>2</sup>

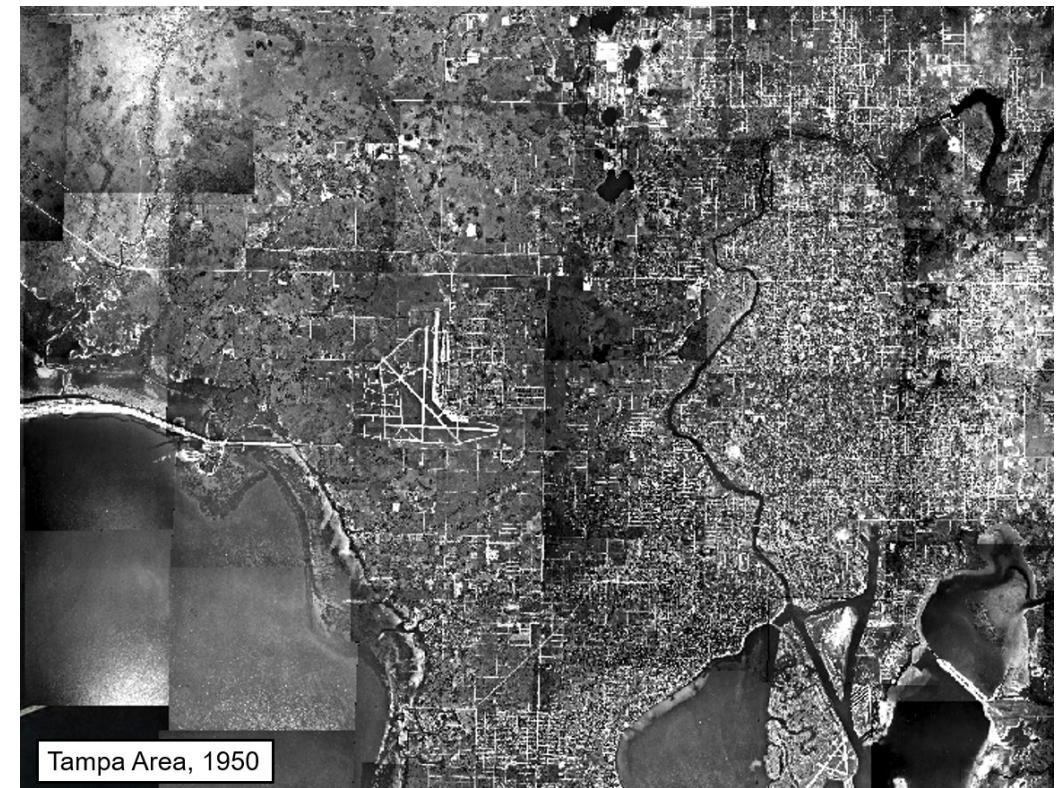
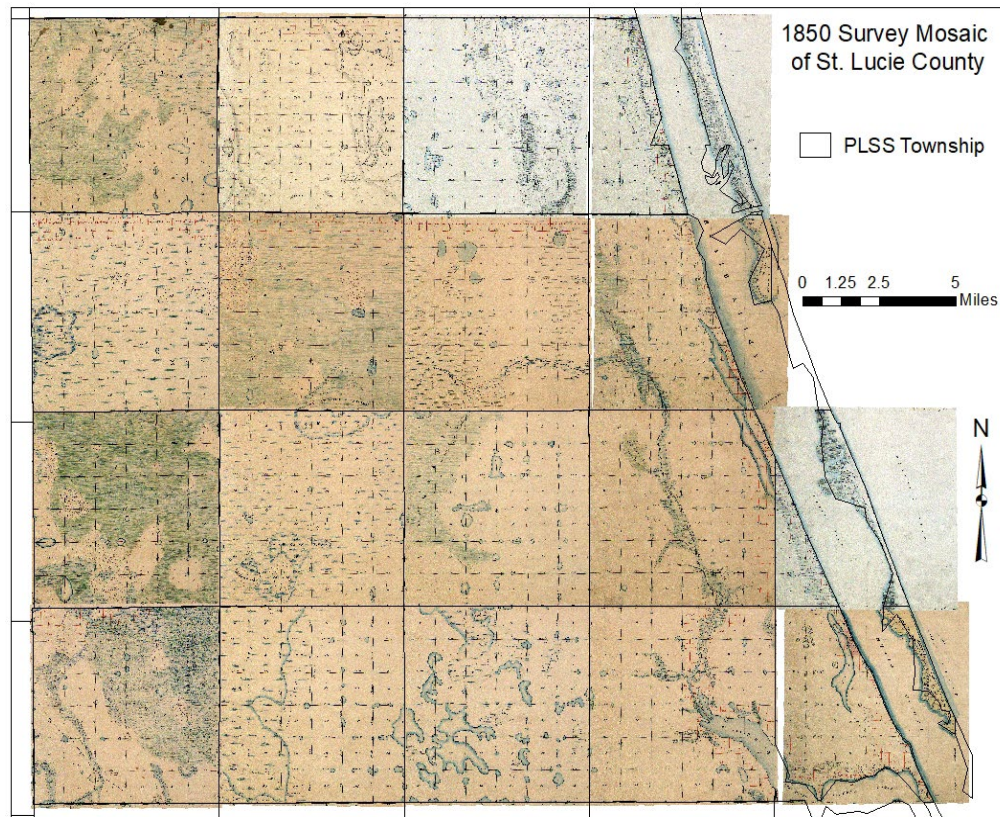
Area and Distribution of  
Wetlands and Channels,  
Landscape Hydrological  
Connectivity

1850s-1950s-2000s



## Methods: GIS-based

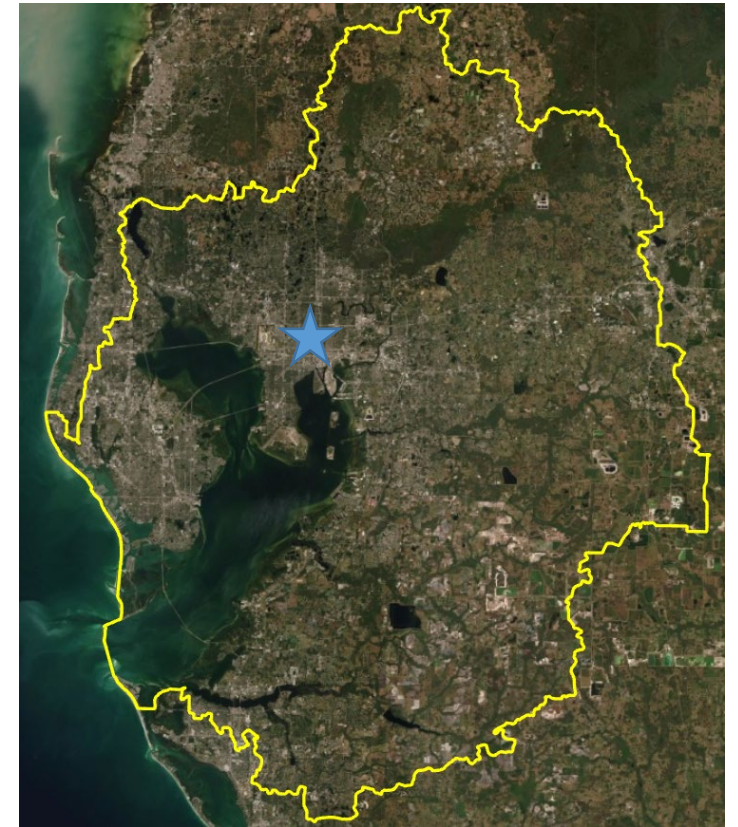
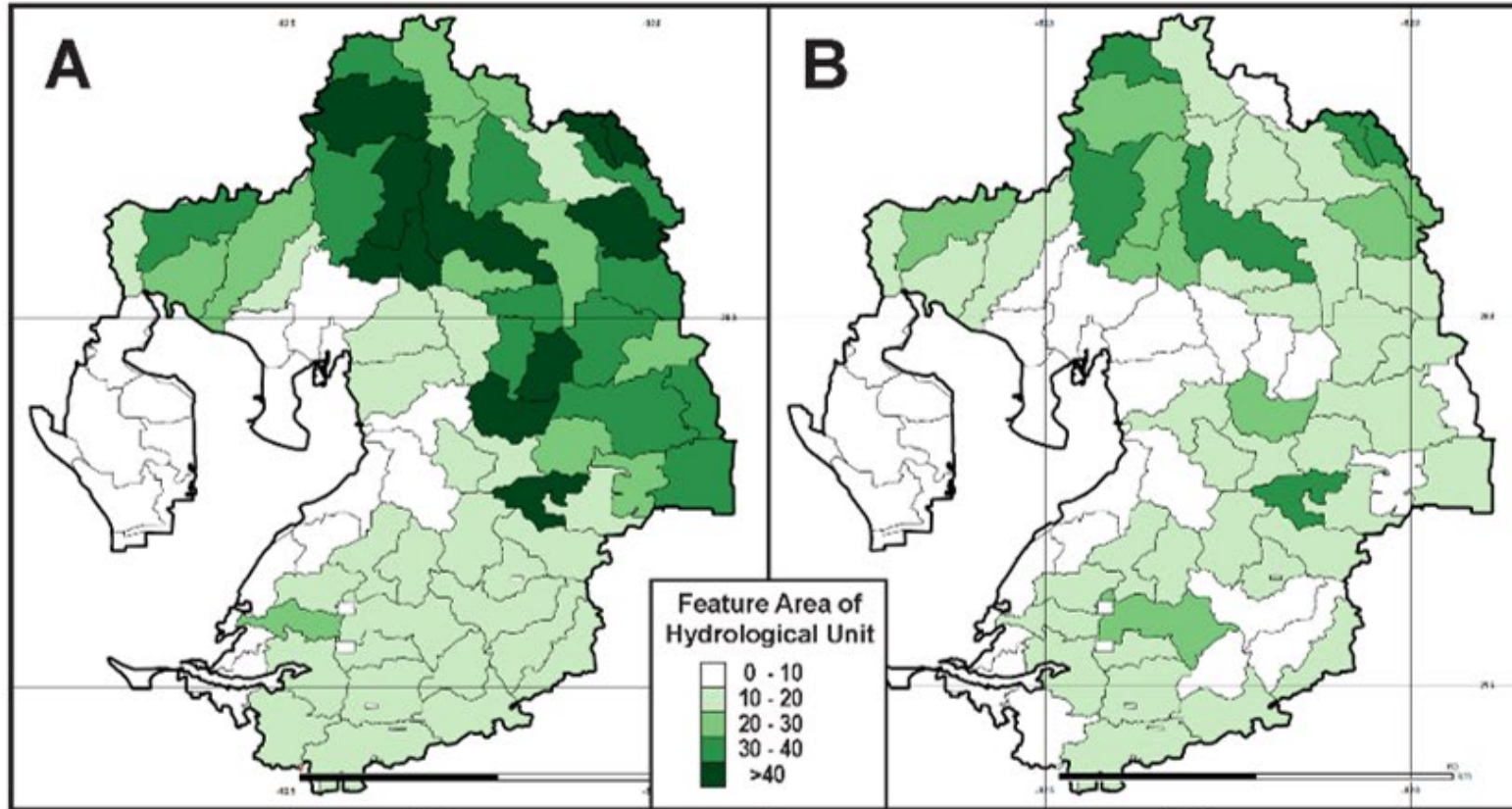
- Current: Water Management District LULC Maps (FLUCCS)
- Historical: Aerial imagery, Soil and Topography maps, Partial Mapping, Sketches and other documentation

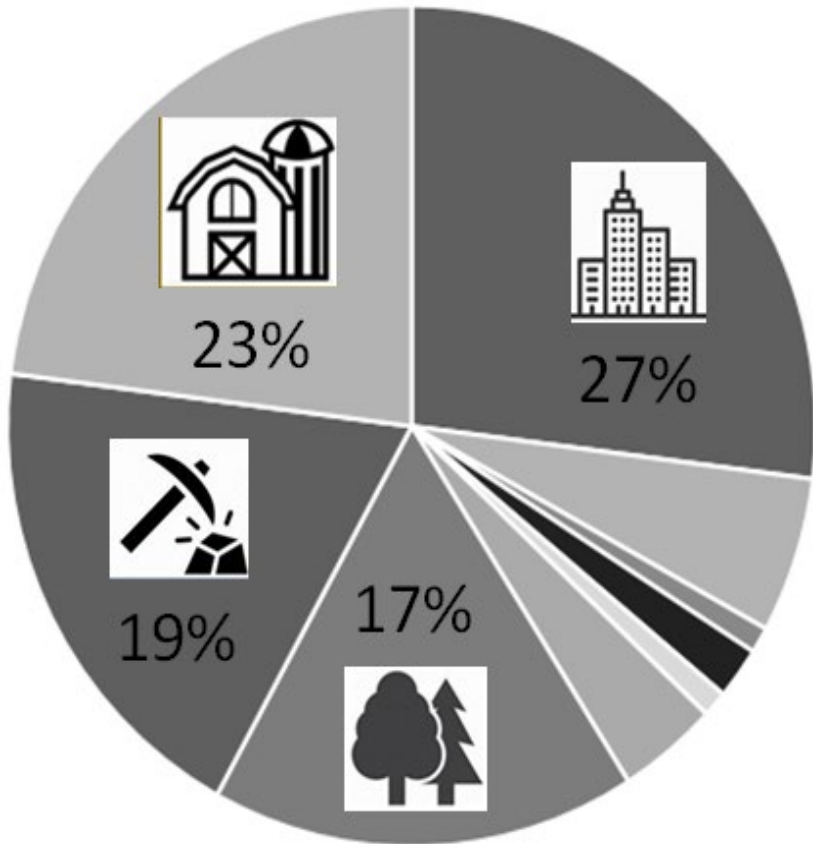




1950s –Wetland Area

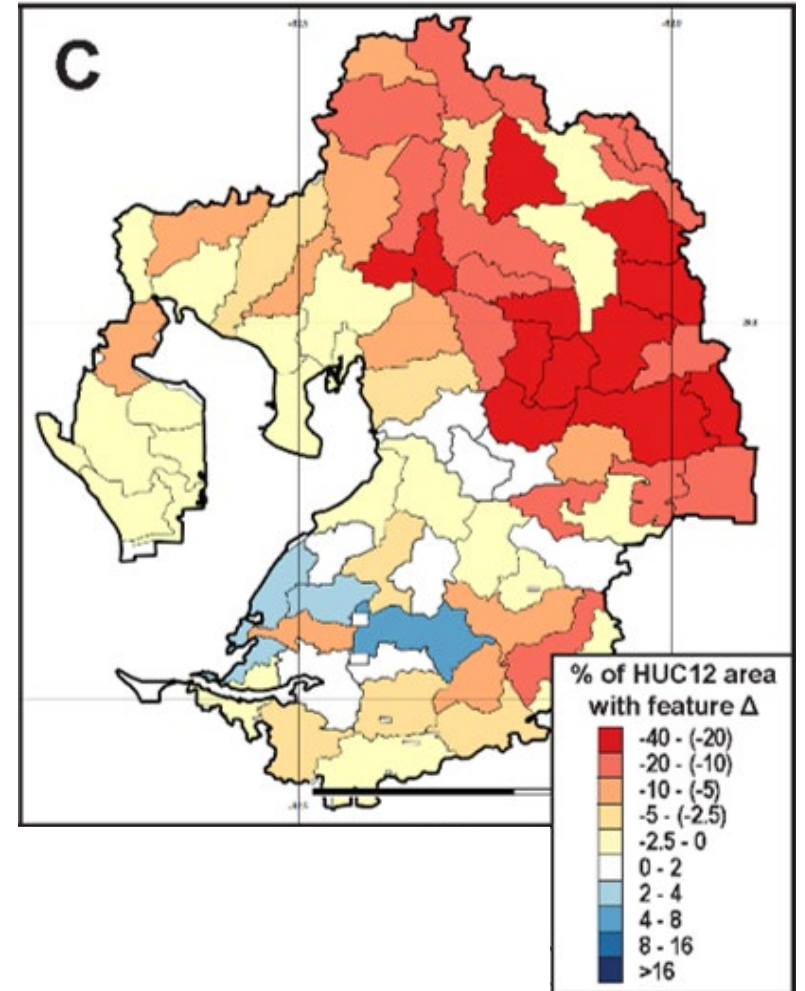
2000s –Wetland Area





Current Land Use of Wetland Area  
Lost Since the 1950s

## Wetland Area Change



# Tampa Bay: Wetland area lost, Artificial Water Feature area gained

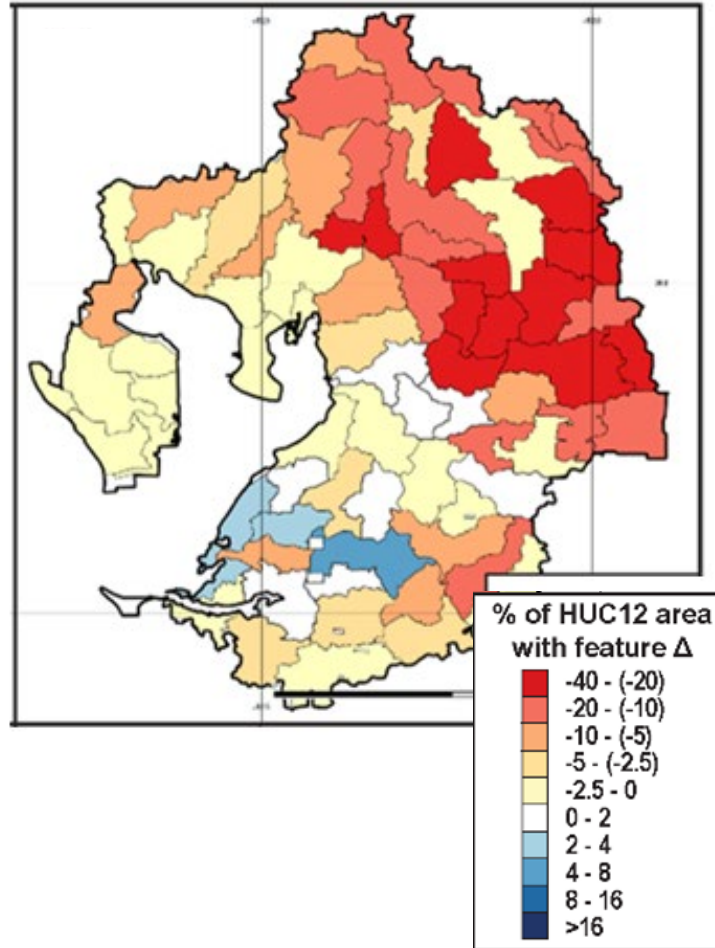


	n		Area (Km <sup>2</sup> )				Perimeter (km)			
	1950s	2007	1950s	2007	Difference	Change (%)	1950s	2007	Difference	Change (%)
<b>Wetlands</b>	33,758	25,861	1271	855	-416	-33	27,194	20,939	-6255	-23
<b>Artificial Water Features</b>	235	14,110	11	143	132	1300	203	5932	5729	2922
<b>Wetlands and Artificial Water Features</b>	34,215	42,696	1282	998	-284	-22	27,398	26,871	-527	-1.9

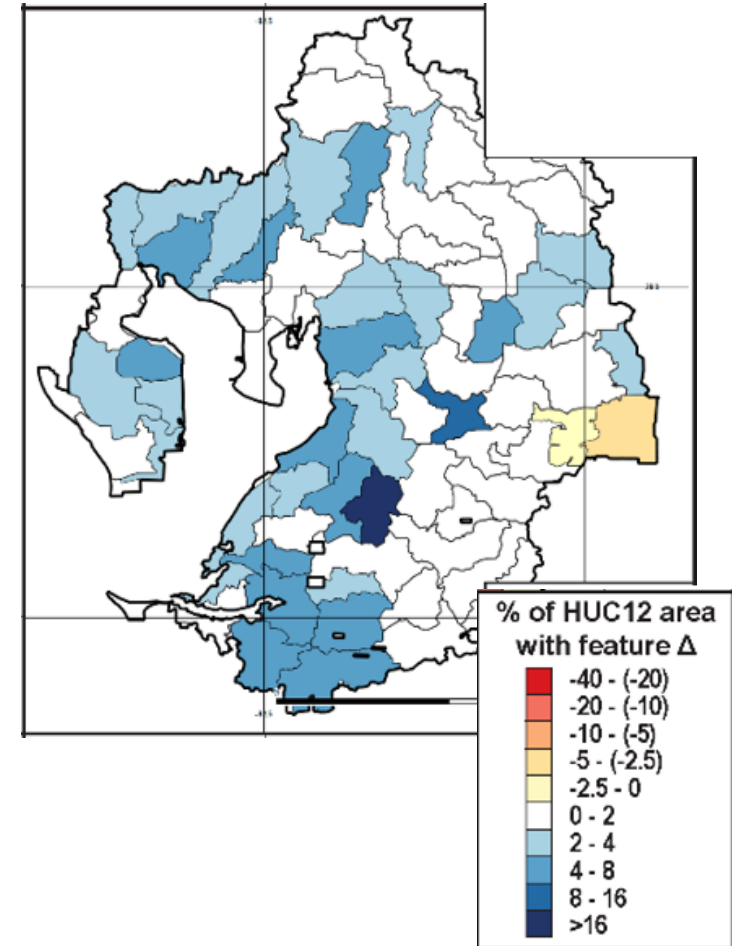


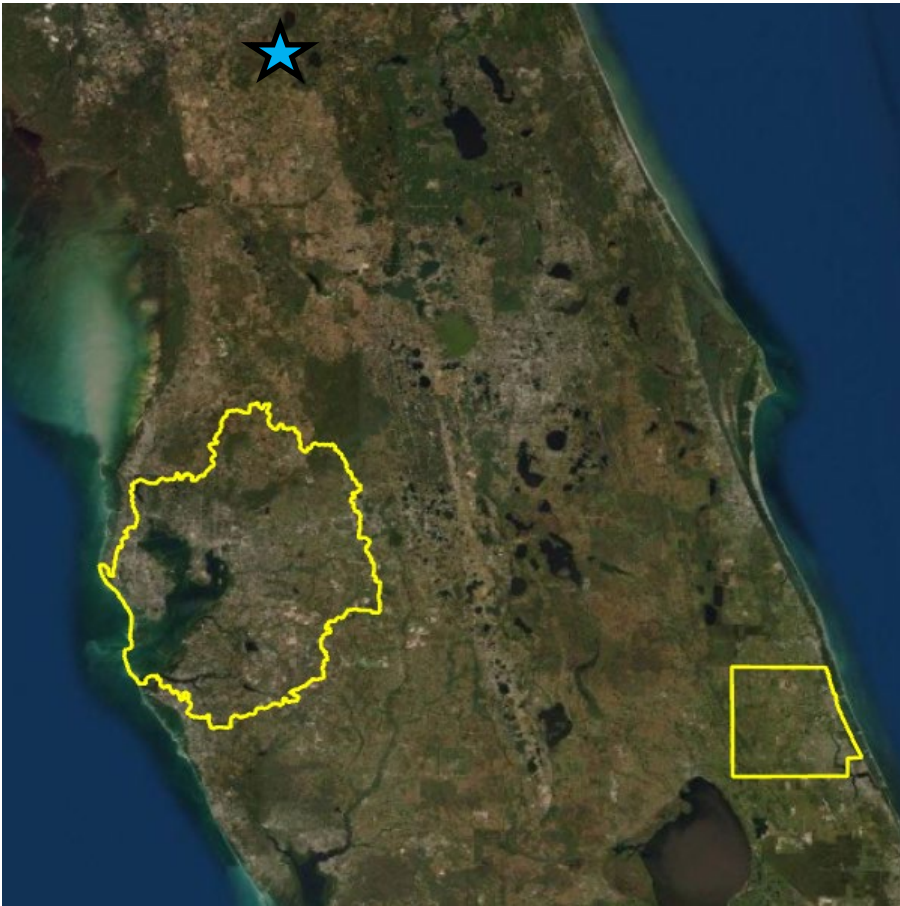
# Where did Change Occur?

## Wetland Area



## Artificial Water Feature Area





## St Lucie County Mainland

Area and Distribution of Wetlands and  
Channels, Landscape Hydrological  
Connectivity

1850s-1950s-2000s

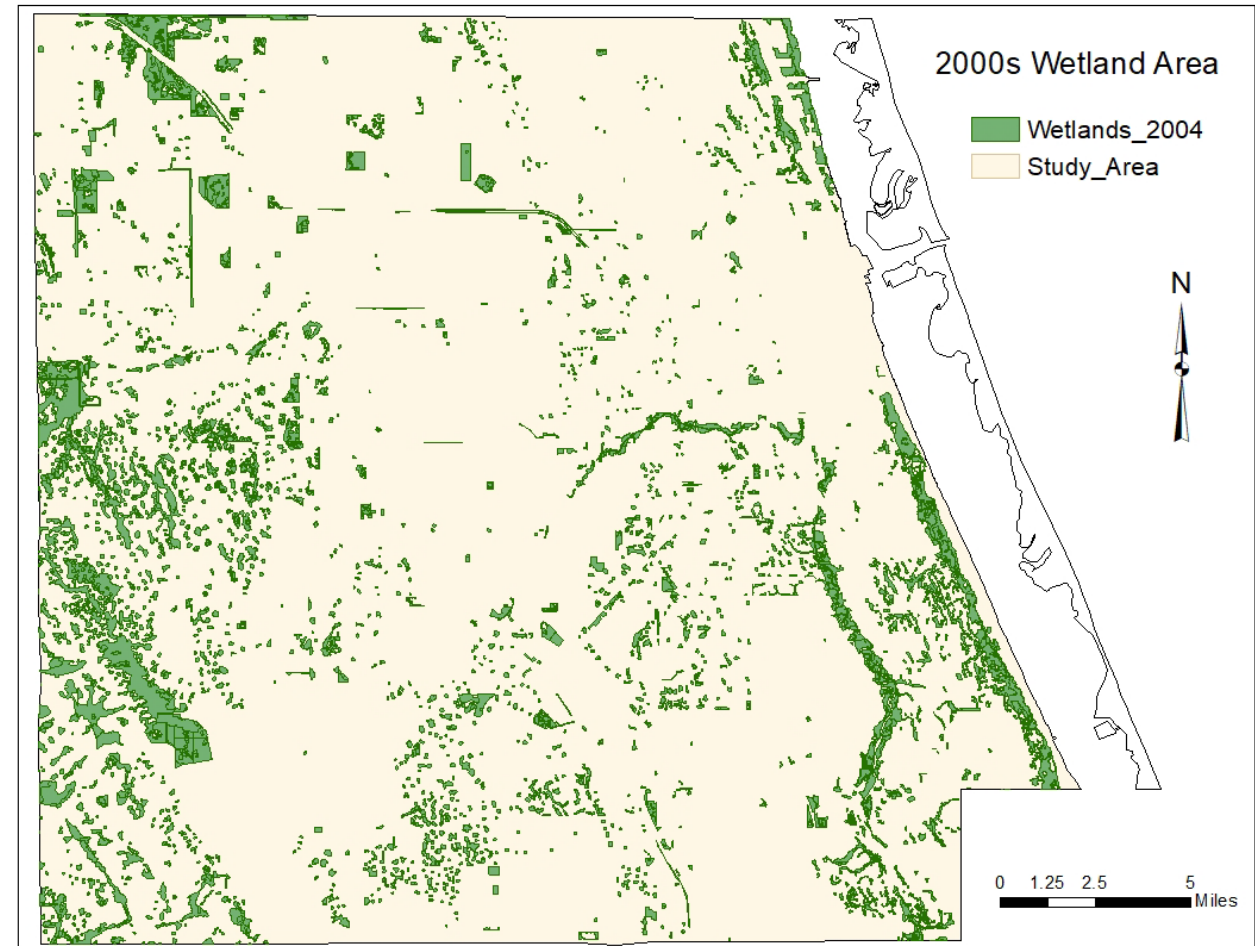


# 1850s - 2000s: $\geq 86\%$ change in wetland area

Period	Wetland Area (km <sup>2</sup> )	% of Mainland County Area
1850s <sup>1</sup>	$\geq 954$	$\geq 65\%$
1950s <sup>2</sup>	653	45%
2000s	129	9%


<sup>1</sup>1850s wetland area is a conservative estimate

<sup>2</sup>1950s sample wetland area extrapolated to full county



# Wetland Change

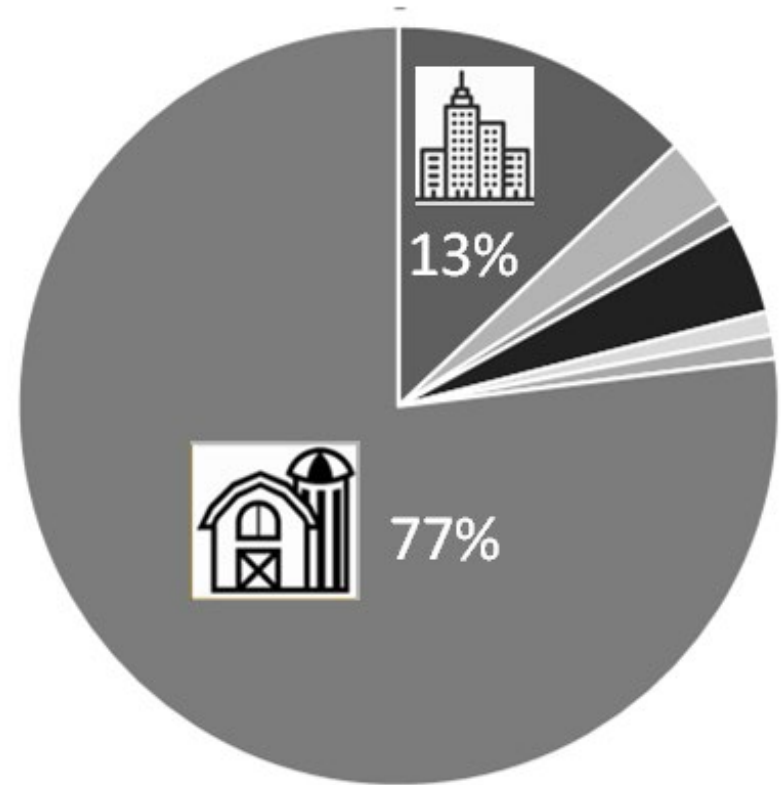
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# Current Land Use of Wetland Area Lost 1850s – 2000s





# Quantify Changes to Landscape Hydrological Connectivity

How much channel length has been gained?



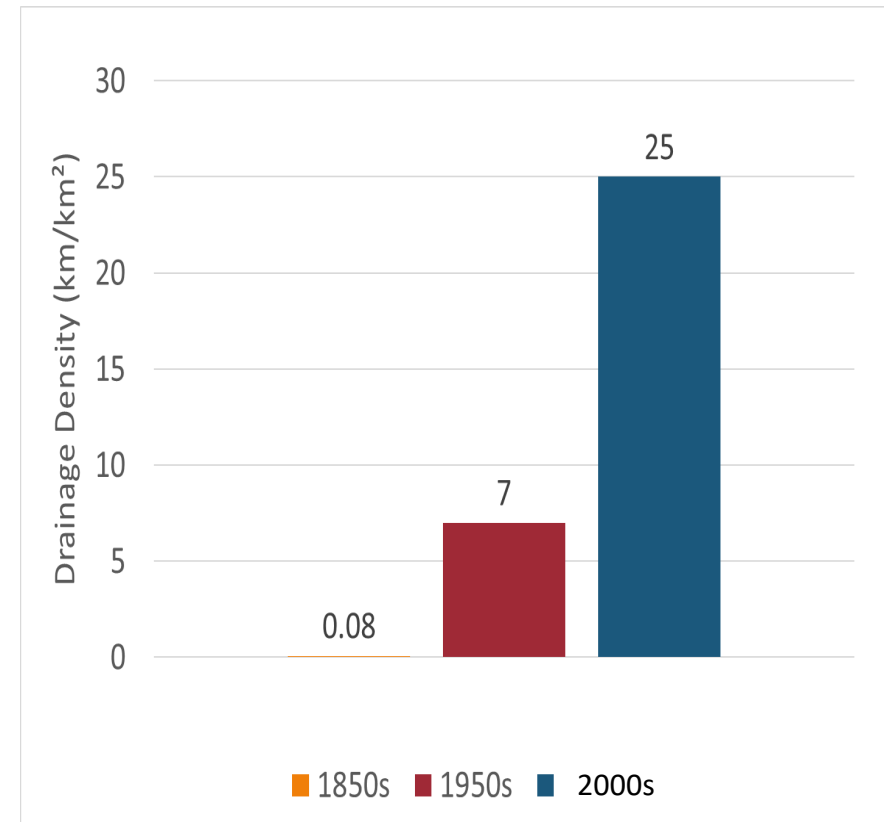
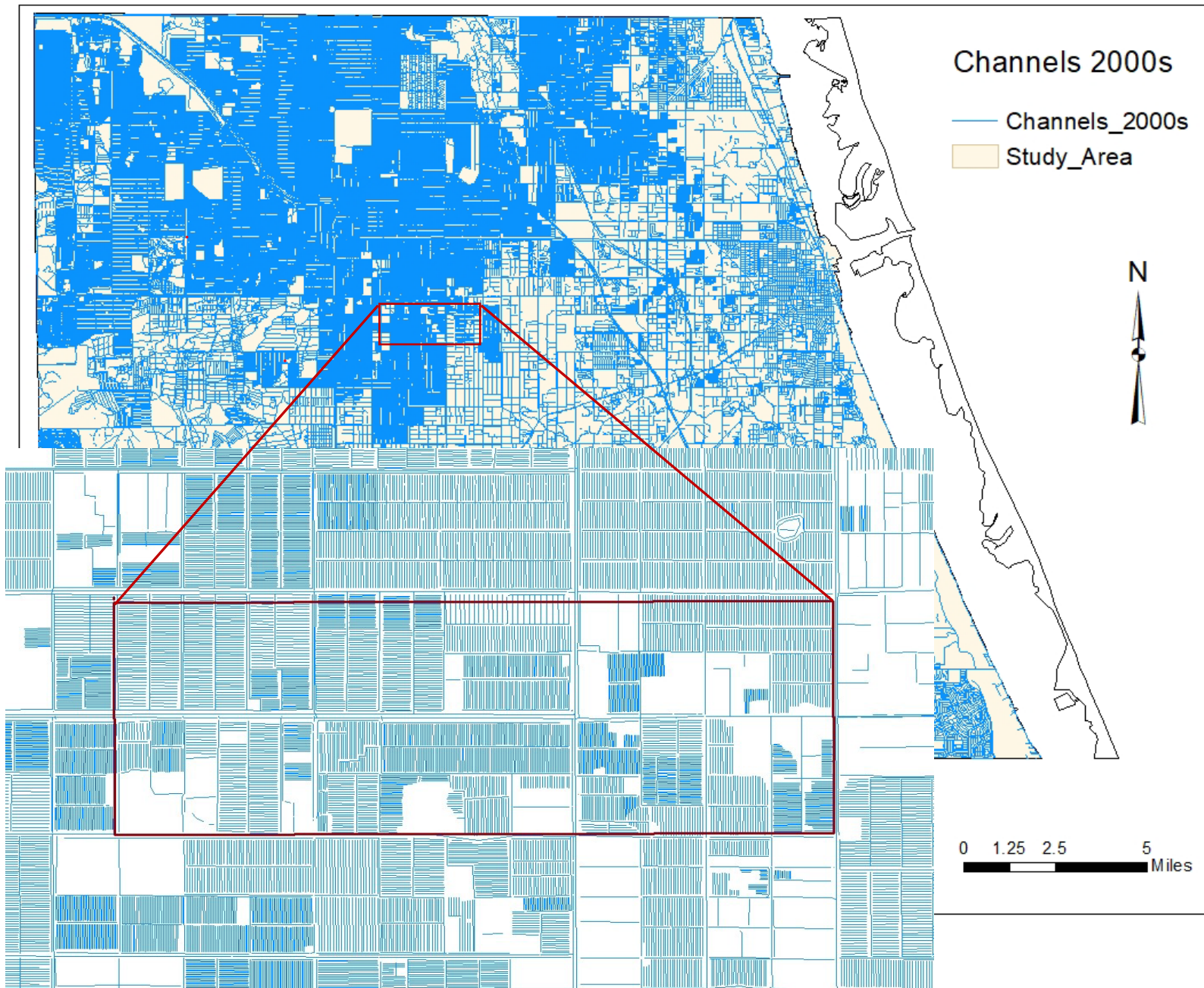
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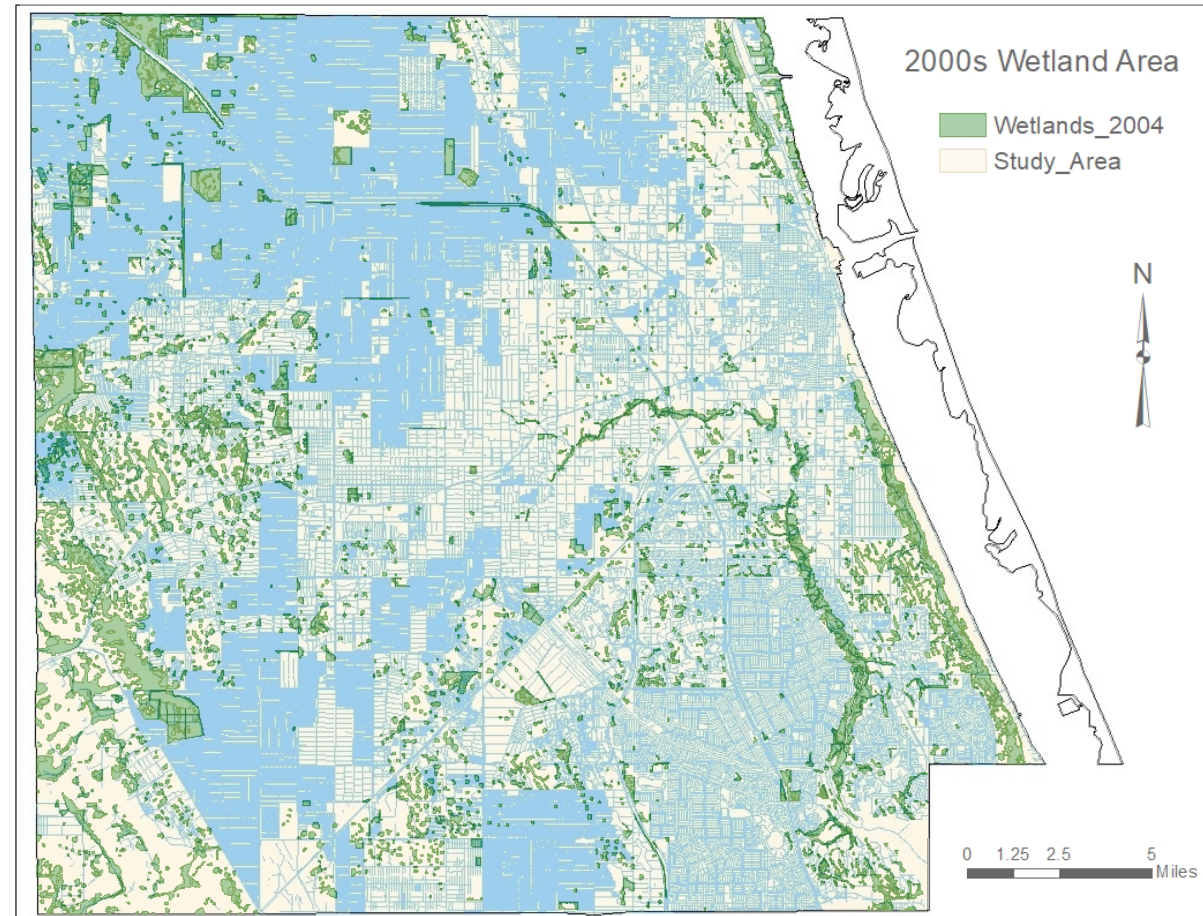






Drainage density has increased by >300% between 1850s-2000s!!

# Landscape Hydrological Connectivity has increased



2% of county was within 100 m of a channel

85% of county is within 100 m of a channel



# Applications: Effective and Purposeful Land Use Planning

- Wetland preservation, restoration, compensatory mitigation
- Restoration of drainage for enhanced management of downstream water quality

EPA Wetland Program Development Grant:

*WETLANDS AND WATER QUALITY: A MULTIMETRIC TOOL FOR RESTORATION PRIORITIZATION IN THE INDIAN RIVER LAGOON WATERSHED*



Graduate Students: Stephanie Lawlor, Kurt Schmidt, Claire Flannagan  
Undergraduate Students: Many tenacious, hard-working individuals

Funding:

