

# Leatherback Research - Jupiter Island



Kelly Martin

Florida Leatherbacks Inc.

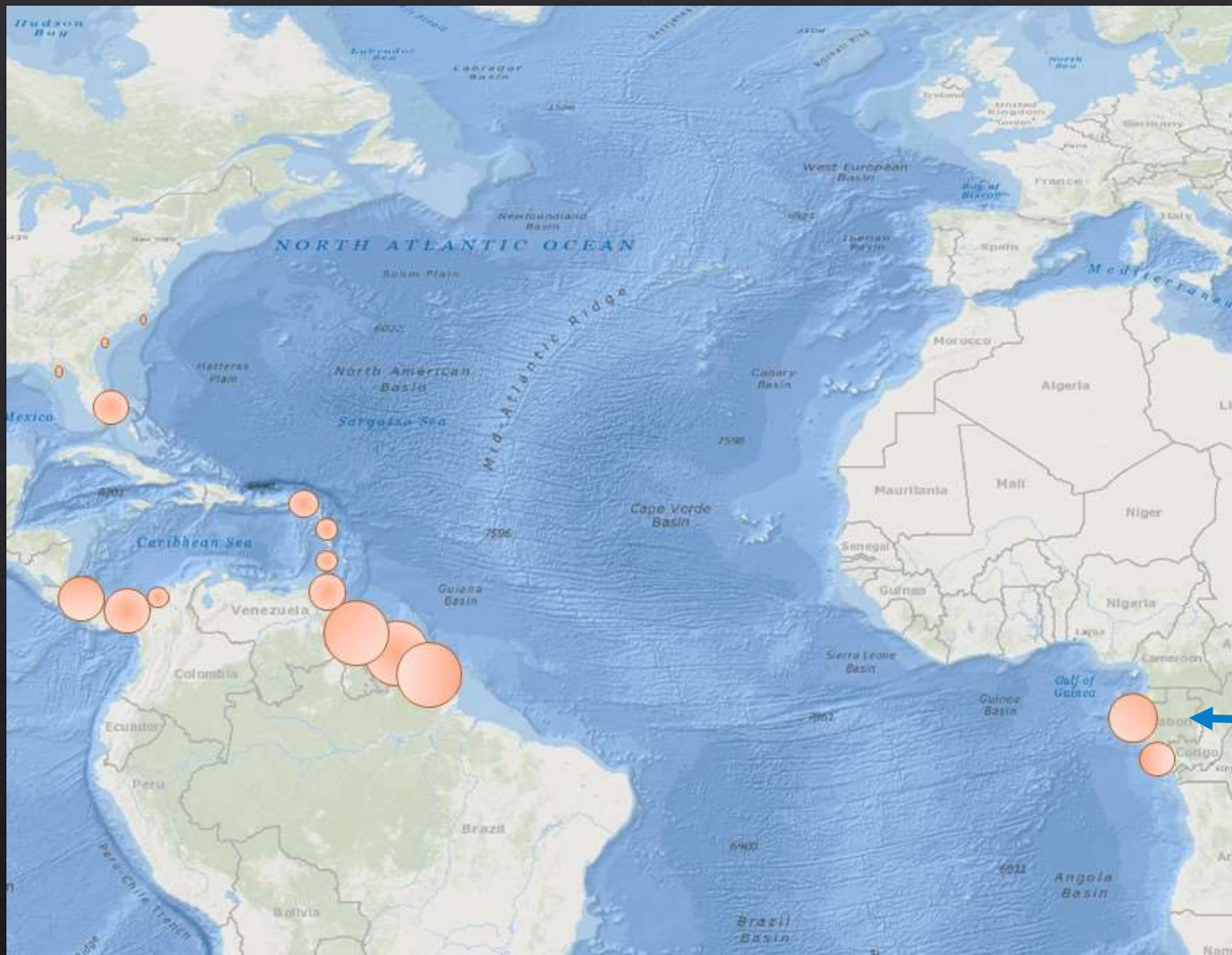
[www.floridaleatherbacks.com](http://www.floridaleatherbacks.com)





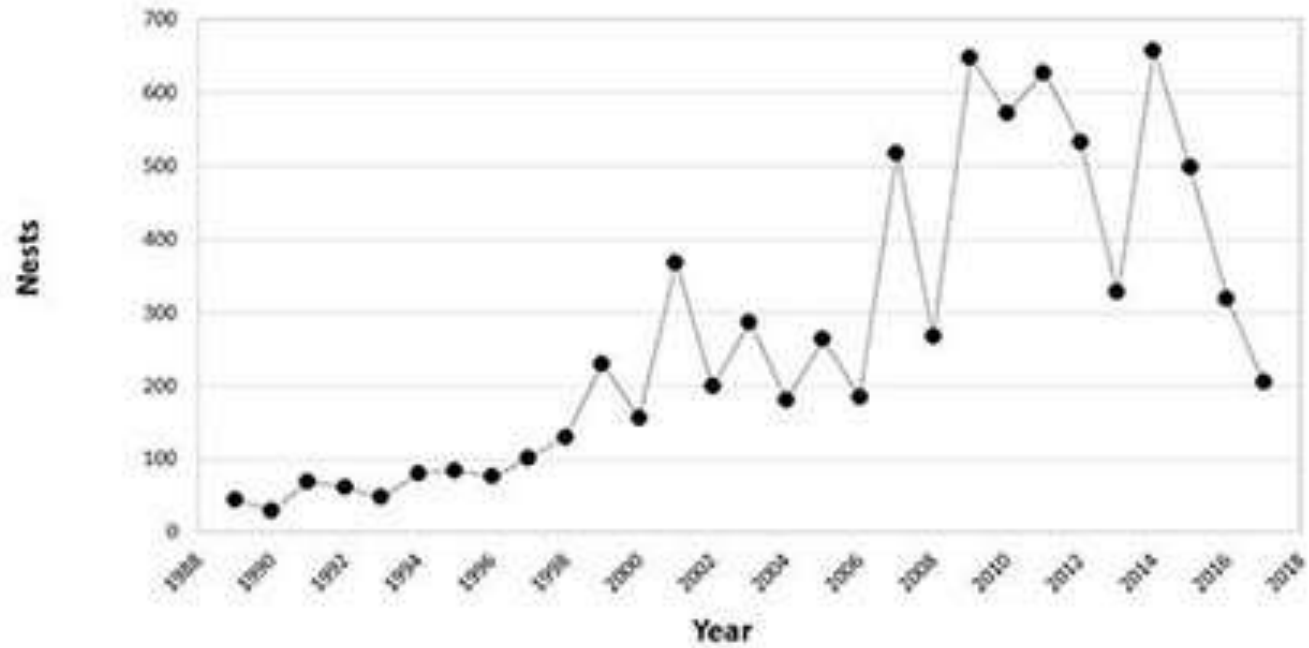
- ◇ The largest turtle on Earth
  - ◇ 7 ft.
  - ◇ 2,000 lbs
- ◇ Widest distribution of any reptile
  - ◇ Temperate to tropical
  - ◇ Indian, Atlantic, and Pacific Oceans
- ◇ Maximum dive depth of over 4,000 feet
- ◇ They are able to live in colder temperatures than any other sea turtle
- ◇ They feed exclusively on jellyfish and other soft-bodied marine animals





World's largest population recently discovered in Gabon. 15,000-40,000 females.

In Florida, nest numbers have increased exponentially in recent decades.





## What we knew:

- ◇ They are here
- ◇ Nest numbers are increasing

?



## What we wanted to know:

- ◇ How many are there?
- ◇ How often do they return to nest?
- ◇ Where did they come from?
- ◇ What is the survival rate?
- ◇ How many nests does each turtle lay?
- ◇ How long do they live?
- ◇ Where do they go from here?
- ◇ What is the genetic structure?
- ◇ What is their site fidelity?
- ◇ Does each female follow the same pattern?
- ◇ What are the major threats?
- ◇ How long do they take to mature?
- ◇ Where do hatchlings go?
- ◇ ...



# How Do We Answer These Questions?



Photo: Matthew Godfrey

Through long-term, hands-on research!





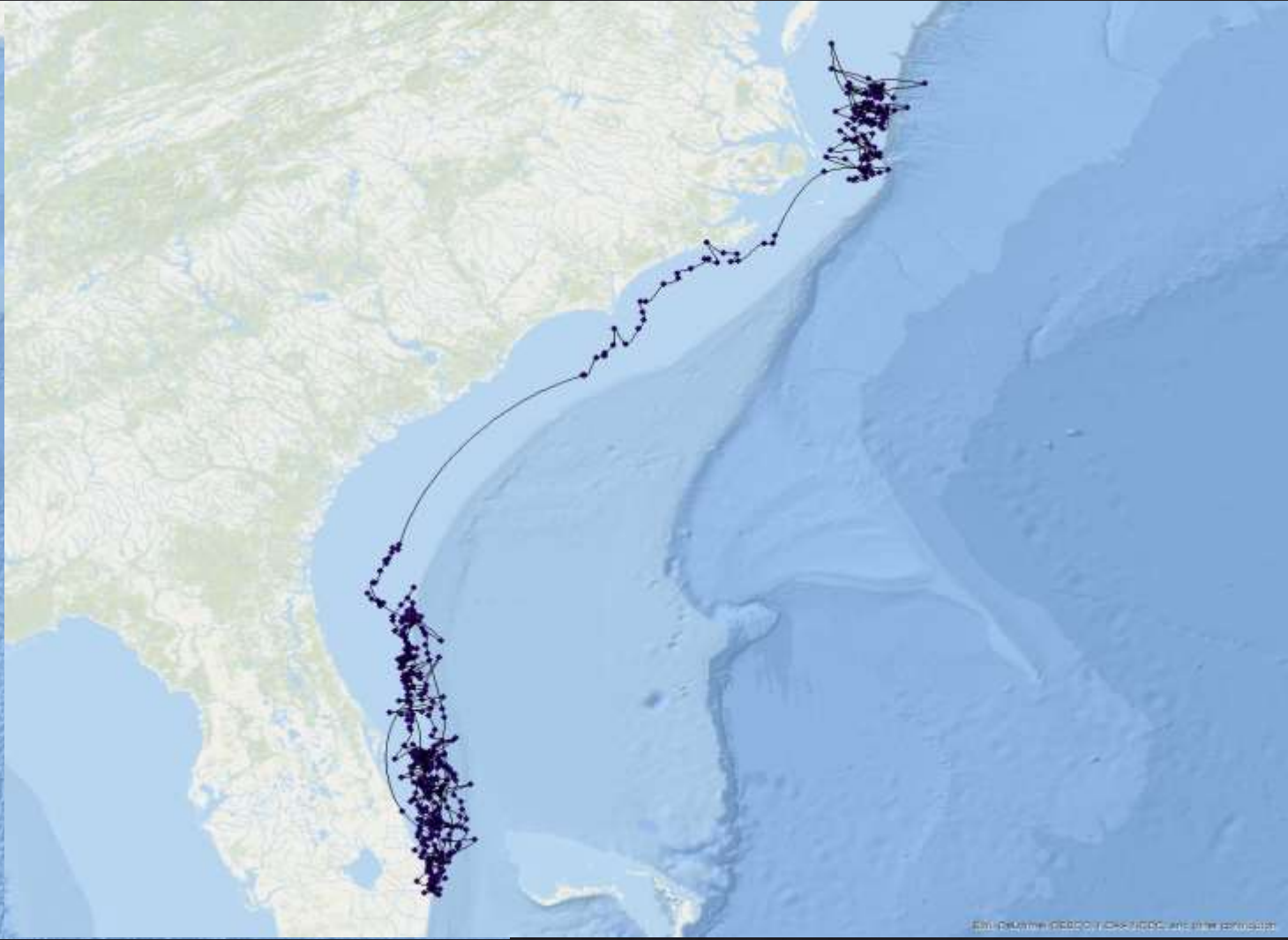
- ◇ Flipper Tag
- ◇ PIT tag
- ◇ Measure
- ◇ Biopsy
- ◇ Injuries

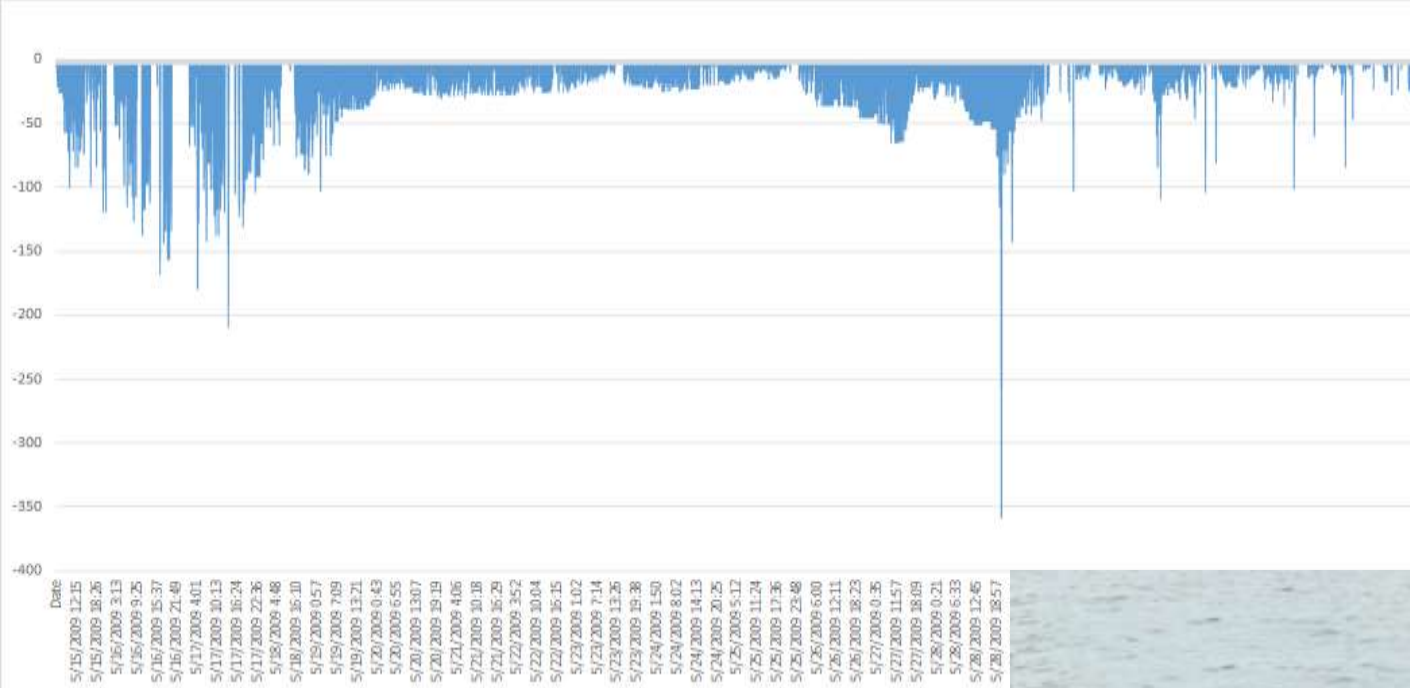


What additional techniques can we use to help answer questions?



# Short-term and Long-term tracking data





## Dive Behavior





# Genetic Results



- Family trees
- Population Origin

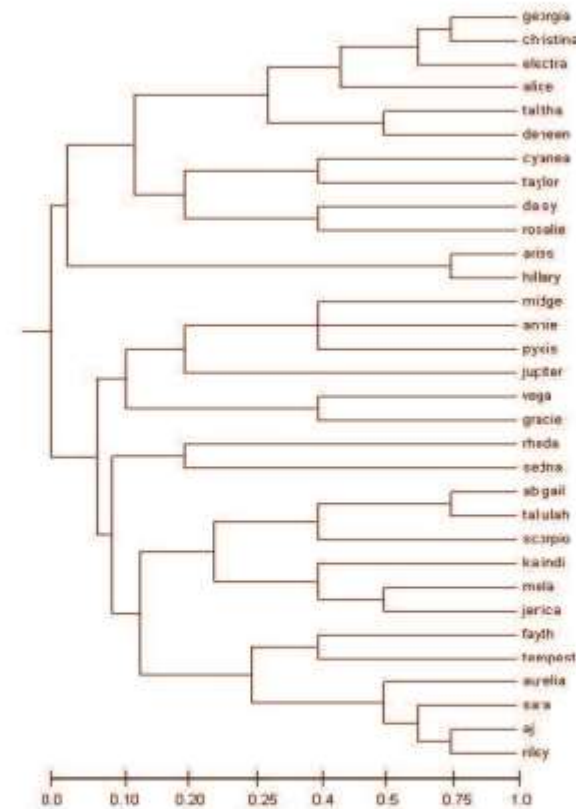


Figure 4.4: Leatherback family tree. A portion of the family tree generated using MEGA for the leatherback population in Florida, based on coefficients of relatedness (scale).  $r \geq 0.5$  indicates an immediate family grouping (full siblings, half siblings (maternal) or mother-daughter pairs). Full tree available upon request.

From 11 years of tagging data on 19 km of Palm Beach County:

- 466 individuals
- Annual survival rate of 88.9%
- Average of 100 females per year
- Remigration interval of 2.7 years
- 2-4 clutches per year



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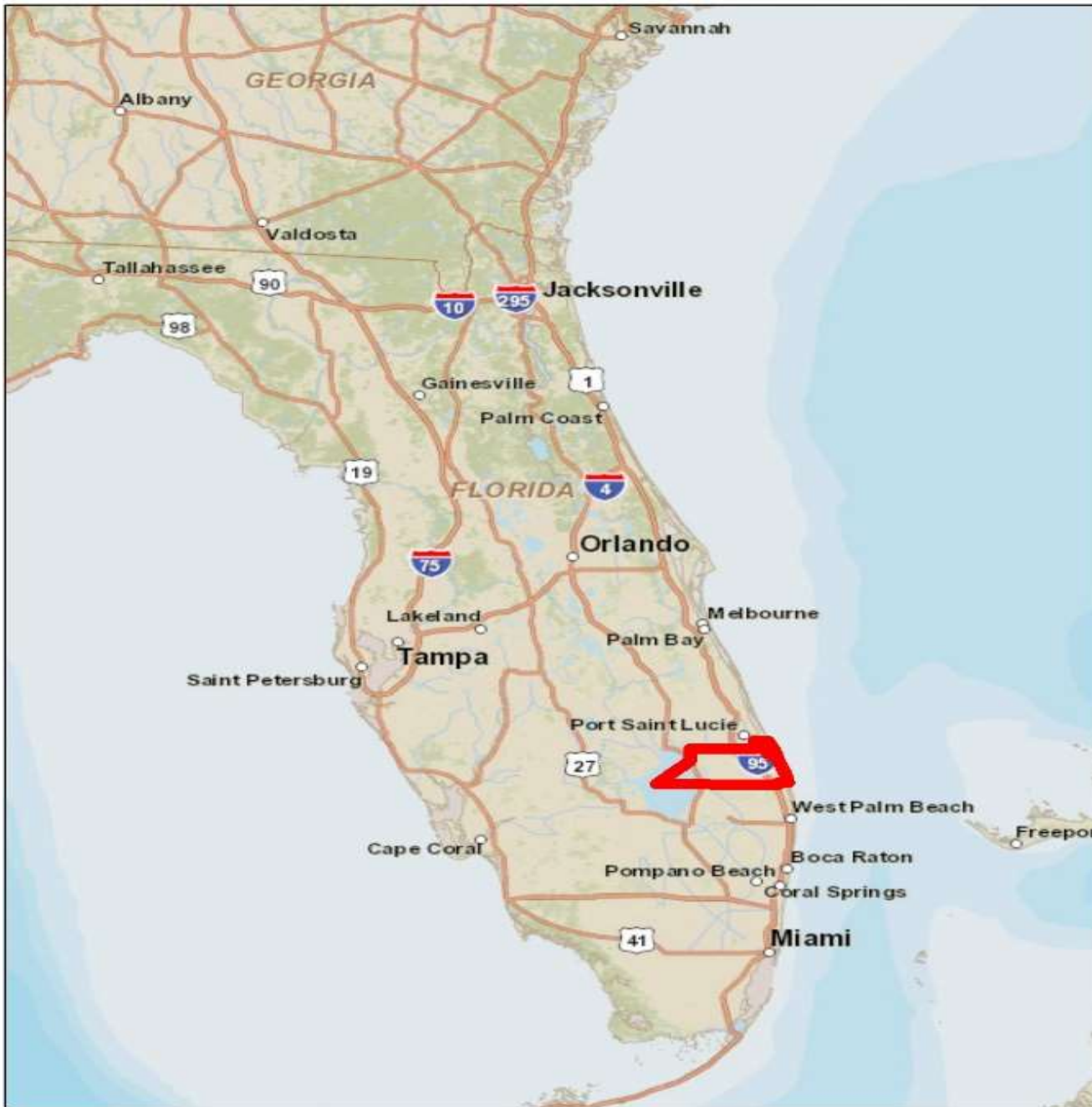
**Increased nesting, good survival and variable site fidelity for leatherback turtles in Florida, USA**  CrossMark

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How do we address these data gaps and inaccuracies?





In 2013, Palm Beach County had 253 leatherback nests.

Martin County had 352, 39% of the statewide total but just 2.7% of the coastline.

The two counties combined had a total of 68% of the statewide nests.



# Jupiter Island – 2014

## *The Inaugural Year*

- ◆ Increase sample size
- ◆ Address site fidelity
- ◆ Better calculate clutch frequency and therefore survival rates
- ◆ Catch “north” turtles



A night scene on a beach. In the foreground, a red cooler sits on the sand, illuminated from within, casting a warm glow. To its right, a motorcycle is parked on the sand. The background shows the ocean under a dark blue night sky.

# Jupiter Island – 2014

## *The Inaugural Year*

- May 2 – June 25
- 15 km
- South Jupiter Island
- Hobe Sound / St. Lucie  
Inlet St. Park

# 173 Encounters

## 101 Individuals

© Florida Leatherbacks Inc.





51 untagged, 50 tagged (49.5% recapture rate)

Down from a 65% recapture rate in PBC

Indicative of poor site fidelity in previous study areas



49 tagged in Palm Beach County and 1 in Brevard

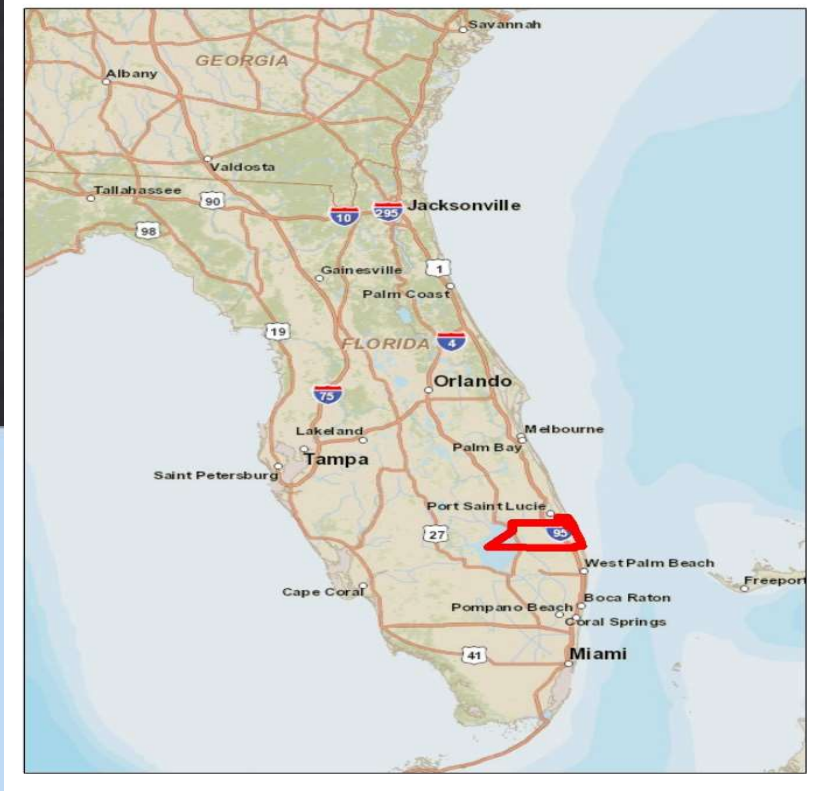
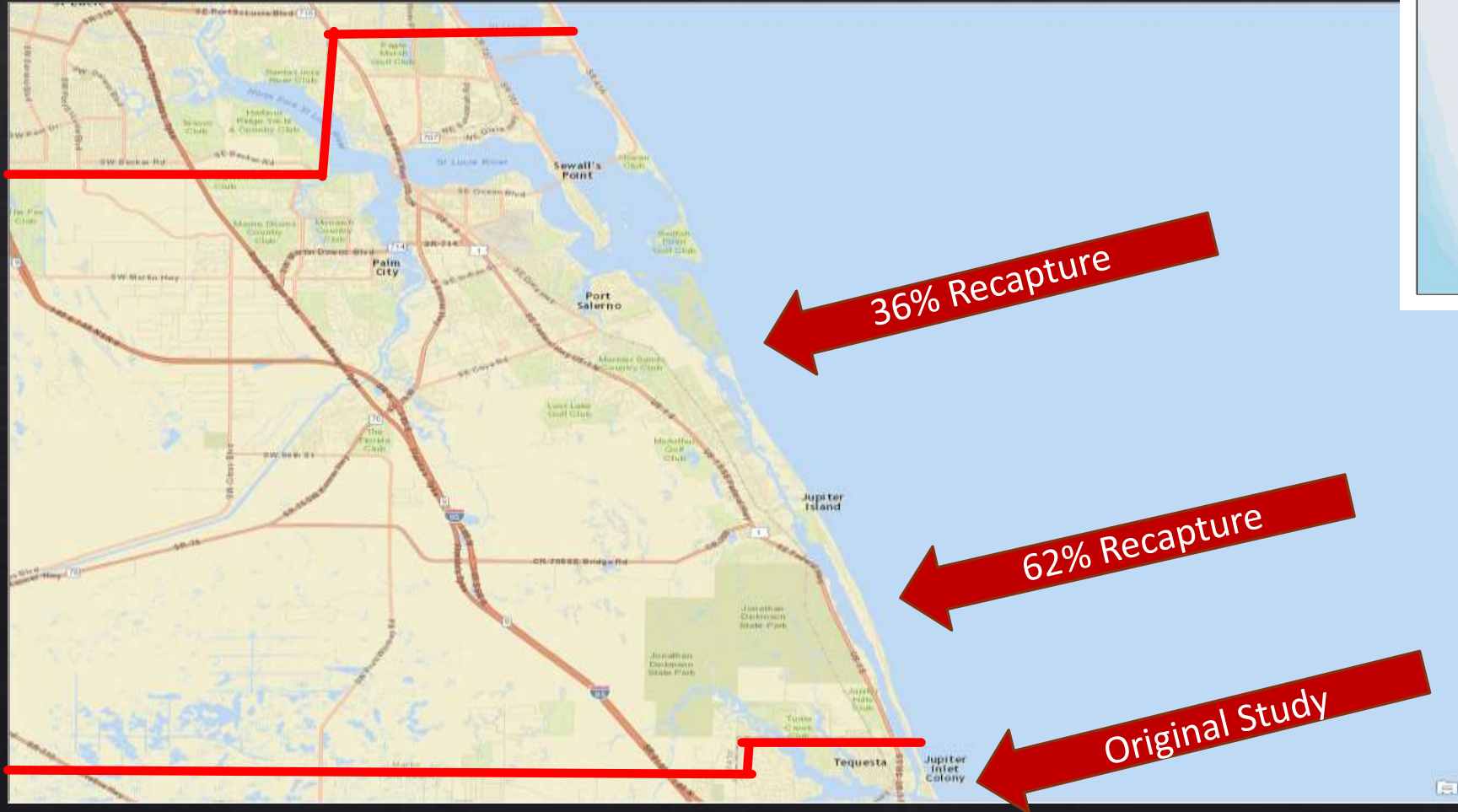
Five turtles had been observed in both counties previously





Jupiter Island recapture rate: 62%

Hobe Sound recapture rate: 36%





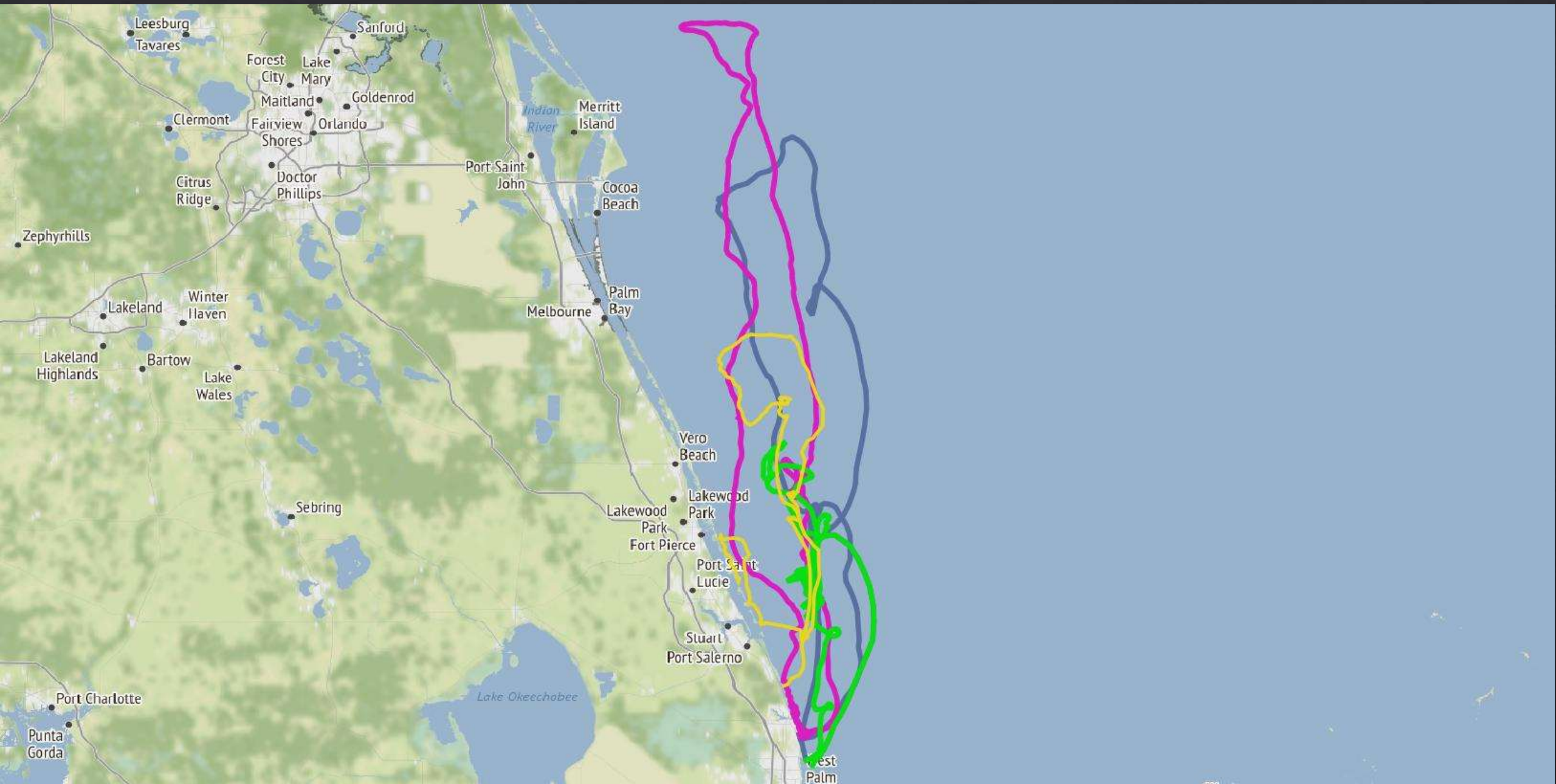


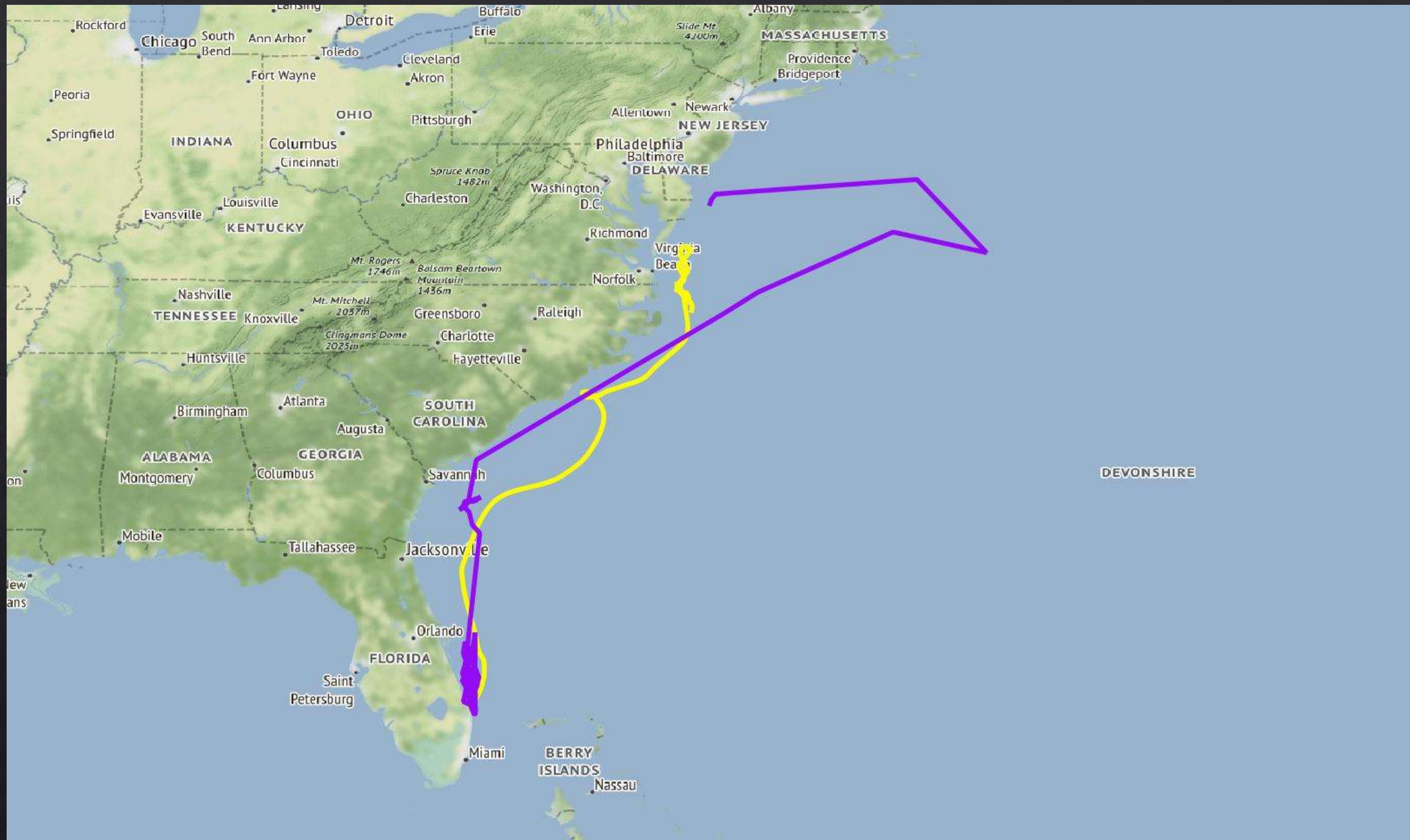
# What Next?

2015-2017

- ◇ Expanded to 25 miles of coverage (county line to county line)
- ◇ 522 Encounters
- ◇ 225 Individuals
  - ◇ 90 new (40%)
- ◇ 4 short-term transmitters
- ◇ 2 long-term transmitters with NOAA











## 2018 so far...

- ◇ 284 encounters!
- ◇ 97 Individuals
  - ◇ 27 new (28%)
- ◇ Tracking Isla!

## Martin County over Five Years

- ◇ 979 encounters!
- ◇ 434 Individuals
- ◇ 168 of these were previously untagged
- ◇ Big steps in answering our questions!

# Interesting Finds

Dual Citizens!

Costa Rica



PIT - 084597520



# Interesting Finds

Dual Citizens!

Canada





# Interesting Finds



Venus





# Interesting Finds

For the first time ever  
we documented ten  
nests from a single turtle  
in one season.

# Interesting Finds

Clover





# Interesting Finds



Largest Female – 5'8" shell length

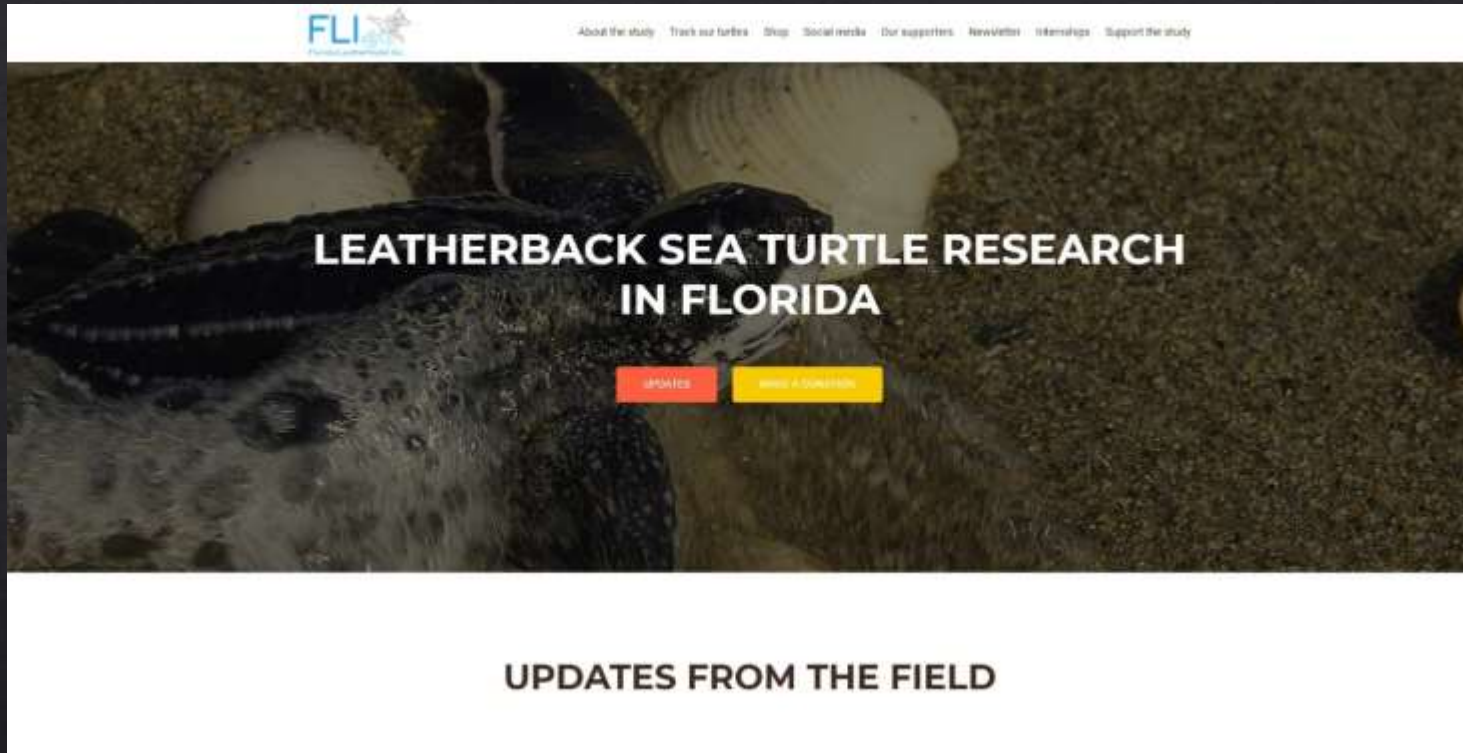
Smallest Female – 4'3" shell length

Most Encounters – 28 (Spica)

Longest Gap in Encounters – 14 years

Oldest Tag Encountered – 16 years

# Follow our work -



# [www.floridaleatherbacks.com](http://www.floridaleatherbacks.com)



A large sea turtle, likely a leatherback, is resting on a sandy beach. The turtle is positioned in the center-right of the frame, facing away from the viewer towards the ocean. Its dark, textured carapace is prominent, and its long, pointed flippers are visible. The sand in the foreground is marked with numerous tracks and indentations, suggesting the turtle's movement. In the background, gentle waves with white foam are breaking onto the shore under a clear sky.

# Thank You!

Without the support of the Town of Jupiter Island, this work would not be possible and we would not have made such big strides in answering our research questions about these endangered turtles!