

AES 2026: Symposium

Learning from unusual sawfish mortality events: causes, effects, and conservation applications



(Organizers: Gregg Poulakis, Tonya Wiley Jen Wyffels, Dean Grubbs)



Smalltooth Sawfish: 15 years of research to support recovery of a critically endangered species



R. Dean Grubbs, PhD
Ashley M. Dawdy, PhD

Florida State University Coastal and Marine Lab



IUCN: Critically Endangered



Largetooth Sawfish
(*Pristis pristis*)



Smalltooth Sawfish
(*Pristis pectinata*)



Green Sawfish
(*Pristis zijsron*)



Dwarf Sawfish
(*Pristis clavata*)



Narrow Sawfish
(*Anoxypristis cuspidata*)

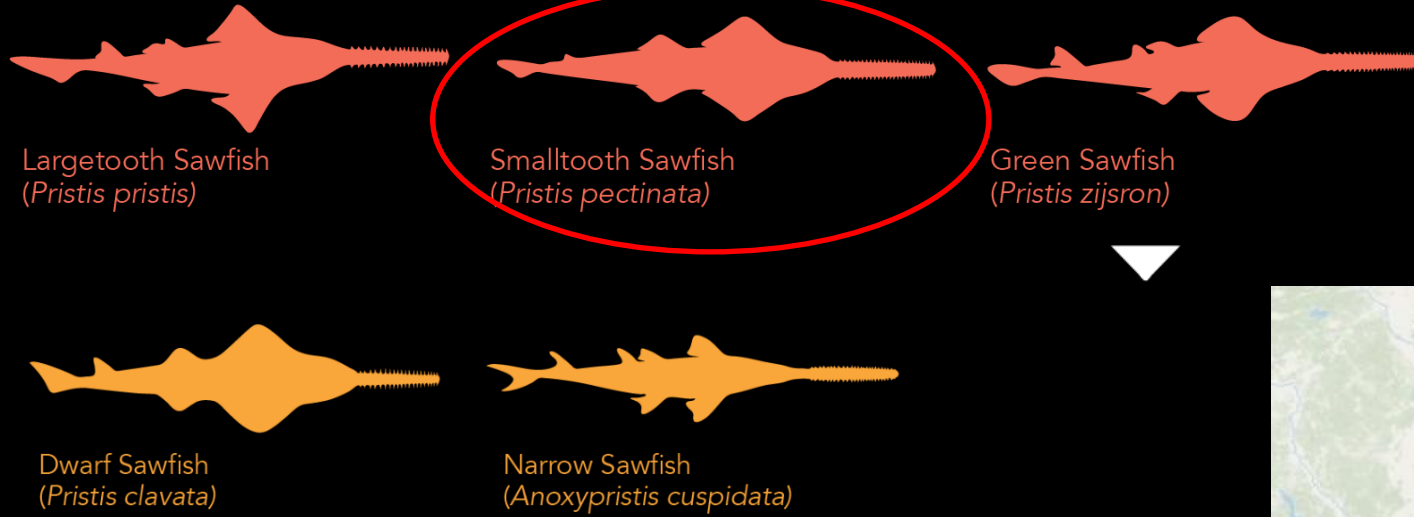
All Five Species are:

- Critically Endangered (IUCN)
- CITES Appendix I (bans international trade)



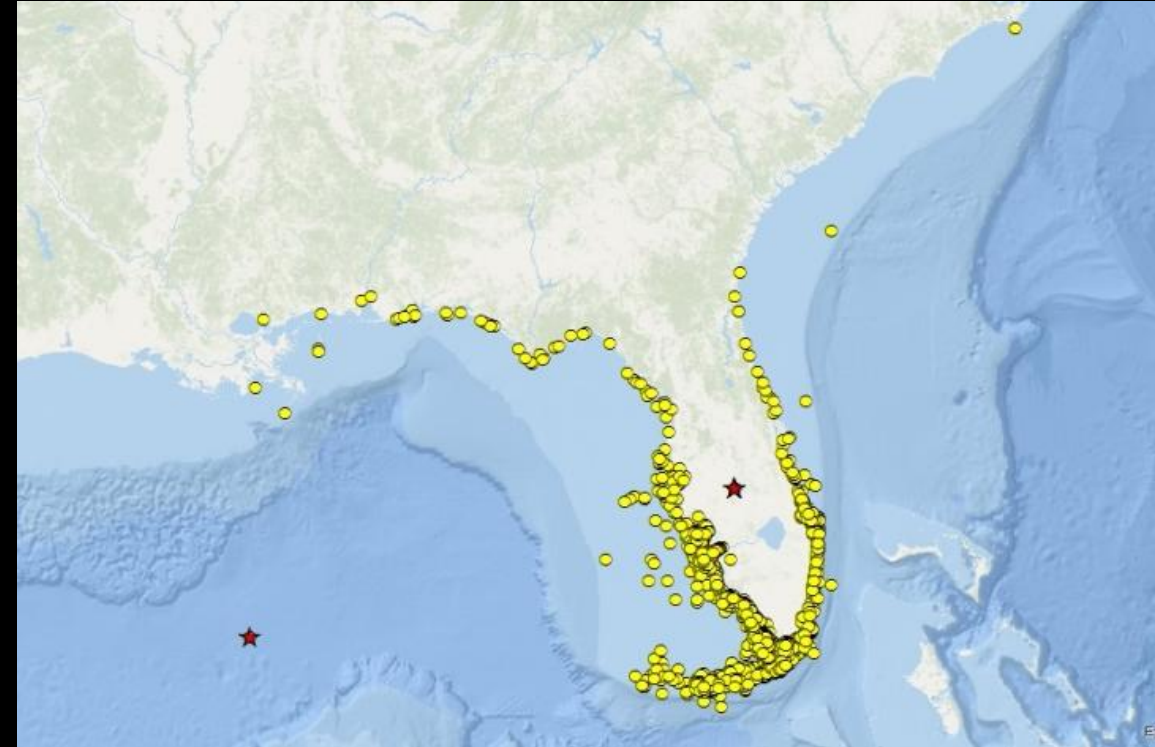
Smalltooth Sawfish distribution:
orange = current, dark gray = historical

IUCN: Critically Endangered



US Based Conservation Actions

- 1992: Sawfish protected in Florida
- 1995: Gill nets banned in Florida waters



used to cross-reference this action with the Unified Agenda.

List of Subjects in 49 CFR Part 665

Vehicle testing. Grant programs—transportation. Mass Transportation.

■ Accordingly, the interim rule amending 49 CFR part 665 which was published at 58 FR 58732, November 3, 1993, is adopted as a final without change.

Issued on: March 24, 2003.

Jennifer L. Dorn,

Administrator.

[FR Doc. 03-7549 Filed 3-31-03; 8:45 am]

BILLING CODE 4910-67-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 224

[Docket No. 009303059-3034-03; I.D. No. 021700B]

RIN No. 0648-XA49

**Endangered and Threatened Species;
Final Endangered Status for a Distinct
Population Segment of Smalltooth
Sawfish (*Pristis pectinata*) in the United
States**

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule; technical amendment

FOR FURTHER INFORMATION CONTACT: Shelley Norton, NMFS, at the address above, 727-570-5312, or David O'Brien, NMFS, 301-713-1401.

2001 (66 FR 19414). Comments received on the proposed rule are discussed below.

In addition to this final rule to list the

30 November 1999: Ocean Conservancy petitioned National Marine Fisheries Service to list the North American population of smalltooth sawfish as *Endangered* under the U.S. Endangered Species Act.

requesting that NMFS list the North American populations of smalltooth

during the 60-day public comment period, NMFS received a total of 12

01 April 2003: National Marine Fisheries Service listed the U.S. distinct population segment of smalltooth sawfish as an endangered species

natural or manmade factors affecting its continued existence. On March 10, 2000, NMFS published its determination that the petition presented substantial information indicating that listing may be warranted for smalltooth sawfish, but not for largetooth sawfish. Concurrently, NMFS announced the initiation of a smalltooth sawfish formal status review (65 FR 12959, March 10, 2000).

In order to conduct a comprehensive review of smalltooth sawfish, NMFS created a status review team to investigate the status of the species with regard to the listing criteria provided by

program for the species. One commenter also requested that listing of the largetooth sawfish be included in the comments rule is present.

Comment 1: that critical habitat is necessary for the species and urged NMFS to designate habitat.

Response: The ESA requires that, if a species is determined to be endangered or threatened, to the



Inferred population decline of 95% from 1900 to 2000

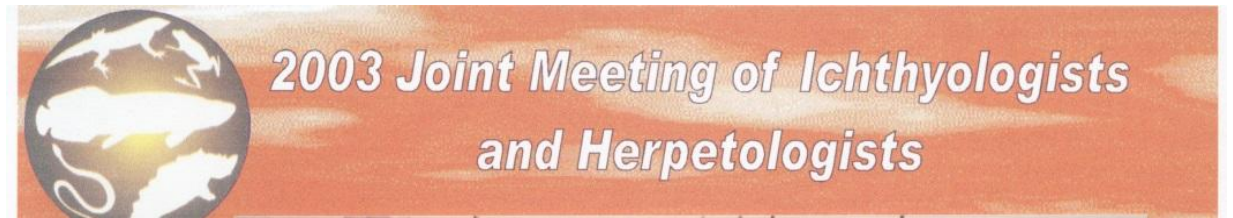


2003 Manaus, Brazil

AES Symposium

Sawfish: Threats, Biology, and Conservation in the 21st Century

(Colin Simpfendorfer, Salao Madeira)



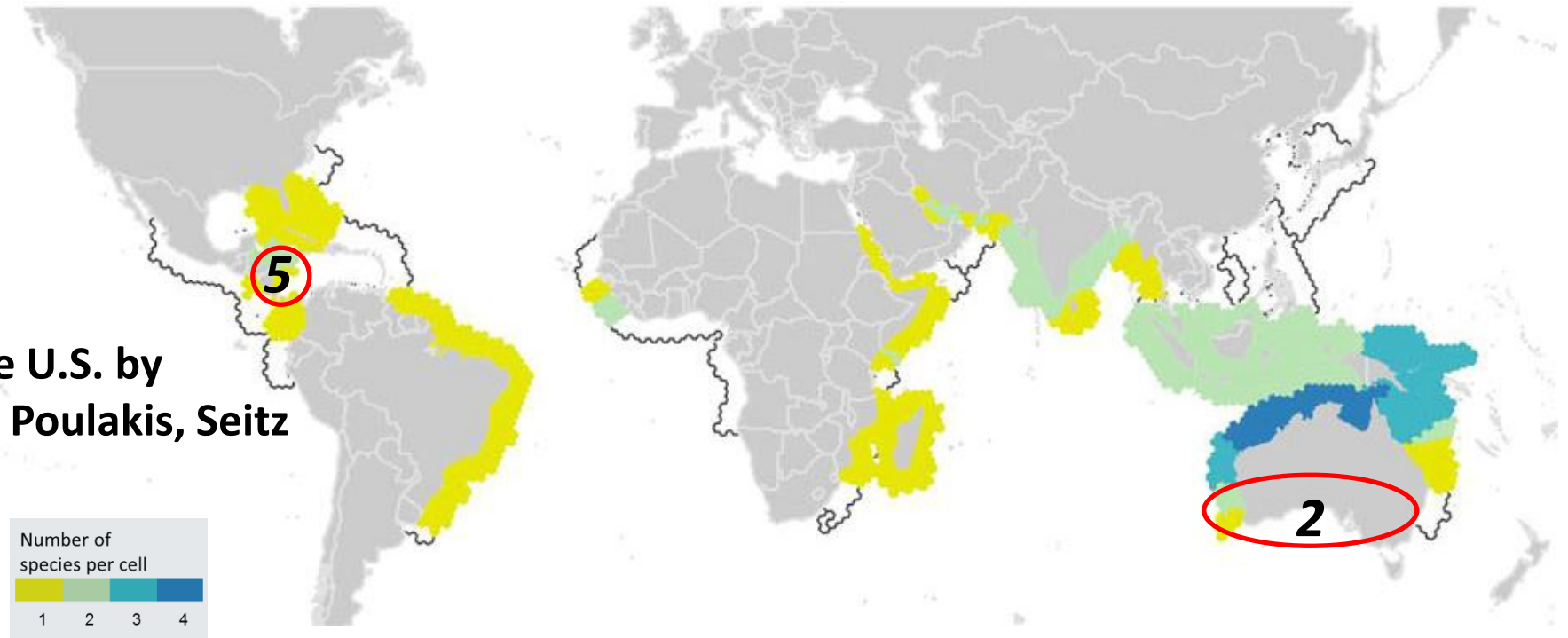
8 Presentations

Global (1)

United States (5)

Australia (2)

1990-2003: Much work in the U.S. by
Simpfendorfer, Wiley, Yeiser, Poulakis, Seitz

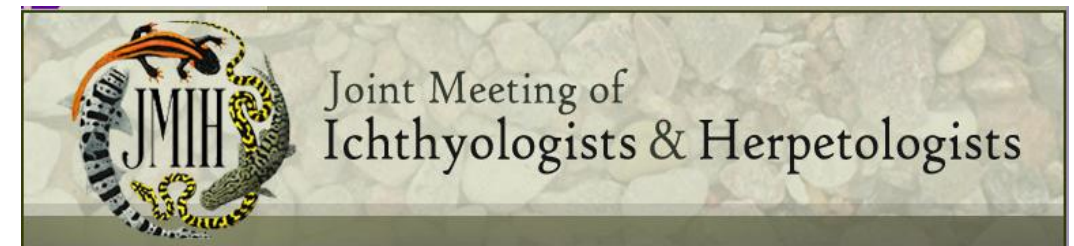


Diversity and distribution of extant sawfishes (Harrison and Dulvy, 2014).

2016 New Orleans, Louisiana

AES Symposium: Biology and Ecology of Sawfishes

(Gregg Poulakis, Dean Grubbs)

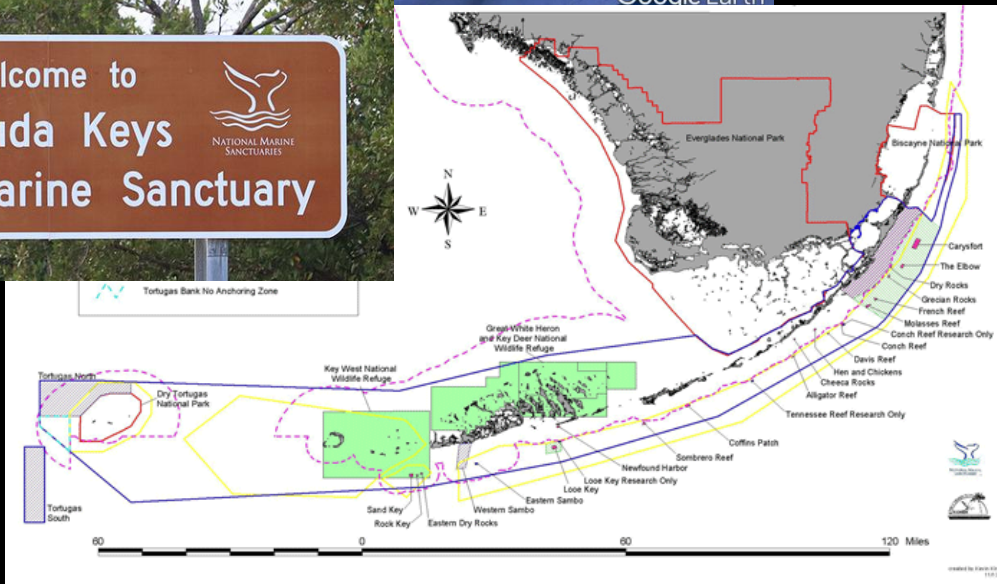


36 Presentations (14 countries) : *Global (4)*
United States (14) Senegal /Guinea Bissau/Sierra Leone (1)
Bahamas (1) Mozambique, Madagascar (1)
Mexico (1) Red Sea – Sudan (1)
Persian Gulf – United Arab Emirates (1)

Morphology/Physiology (3)
Bay of Bengal - Bangladesh (1)
Australia (7)
Papua New Guinea (2)
Arabian Sea – Pakistan (1)



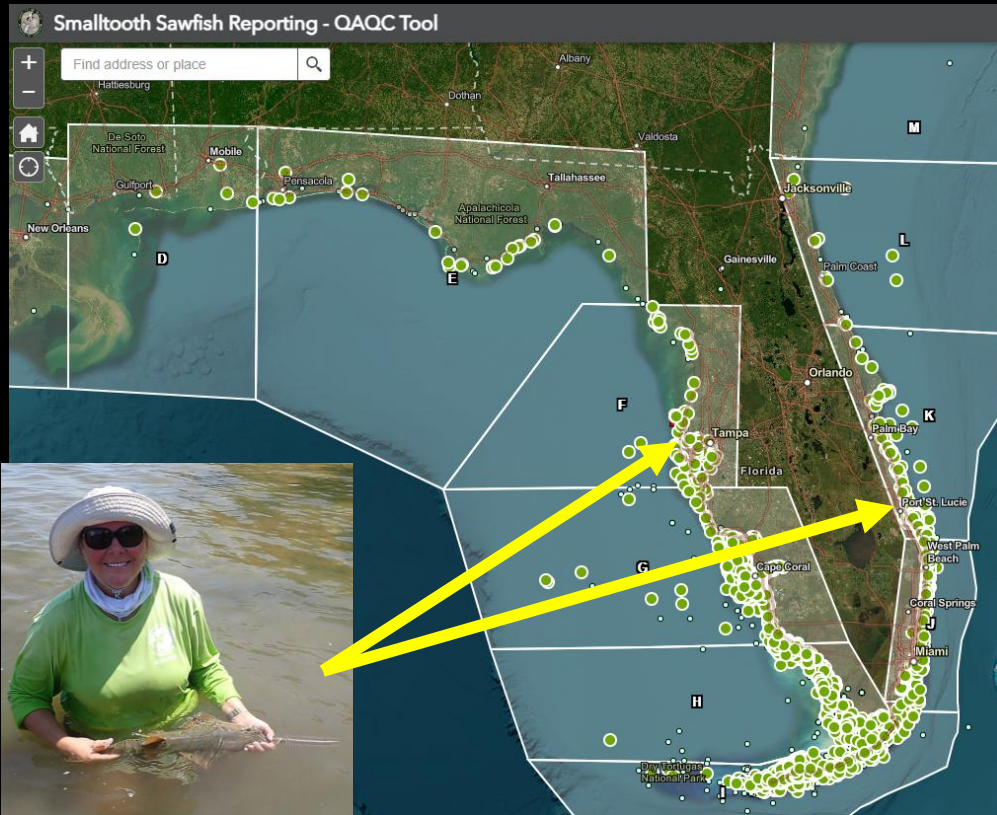
Harrison and Dulvy, 2014



2003-2023: 20 Years on the Endangered Species List

Signs of sawfish recovery?

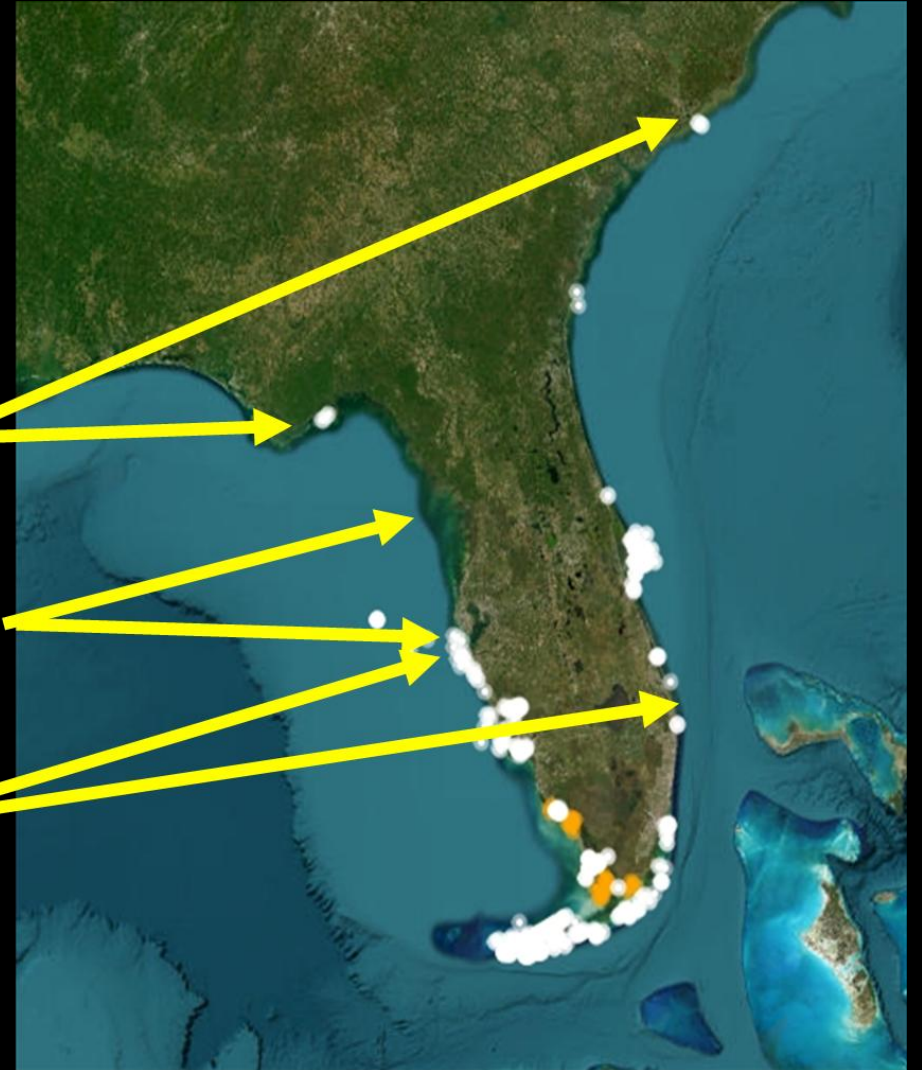
As of 2023, perhaps yes!



Detected

Adult Tagged

Pupping



2026 New Orleans, Louisiana

AES Symposium: Learning from unusual sawfish mortality events: causes, effects, and conservation applications (Gregg Poulakis, Tonya Wiley Jen Wyffels, Dean Grubbs)



30 Presentations

*What happened?
Why it happened?
New biological info
Conservation implications?
What is next?*

Winter 2023-2024: Spinning fish disease leads to sawfish mass mortality
56 confirmed large sawfish mortalities; >250 stressed individuals
A smaller mortality event occurred in winter 2024-2025

Forbes
Rare Sawfish Deaths Baffle Scientists In Florida Keys
Melissa Cristina Marquez Contributor @
I write about the latest, existing research on sharks worldwide!
Mar 20, 2024, 09:23pm EDT

6 SOUTH FLORIDA
LOCAL WEATHER VIDEO ON YOUR SIDE INVESTIGATES RESPONDS NEWSLETTERS T... 91°
TRENDING Olympics Watch News 24/7 Hurricane Season Lessons from the Jungle Caught on Camera How to Stream Deals & Discounts for Summer...
FLORIDA KEYS
Fishkill mystery: Something is killing endangered sawfish in the Florida Keys
In the last six weeks, 20 sawfish have floated to shore in the Florida Keys.
By Ari Odzer • Published March 8, 2024 • Updated on

CNN World Africa Americas Asia Australia China Europe India Middle East More
World / Climate
Six rare sawfish deaths in 7 days have scientists baffled amid bizarre Florida fish behavior
By Jan Christensen, CNN
4 minute read • Updated 11:46
= SunSentinel
As sawfish deaths mounted, wildlife officers and researchers scrambled to respond, records show

Tampa Bay Times
NEWS / ENVIRONMENT
Hope, then heartbreak, as first 'spinning' sawfish dies in Tampa Bay
The Tampa Bay Times joined a recent research expedition in Tampa Bay as an eyewitness called in the first known report of a dying sawfish in the bay area.

NEWS NATION
MYSTERY FISH DEATHS
RESEARCHERS STUMPED BY SAWFISH DEATHS
CRITICALLY ENDANGERED SPECIES
A SISTER IN LAW TO THE REV. MARTIN LUTHER KING, JR., DIES IN TAMPA BAY

'Heartbreaking': Tourists watch endangered sawfish die on crowded beach as death toll rises to 32

Death toll of endangered sawfish rises as concern over reason grows
2K 1

MOST POPULAR
1 Here's the scoop: Finalists are in for South Florida's best ice cream - and now it's time to vote!
2 Taking Ozempic or other weight-loss meds? Watch your diet to avoid 'exchanging one problem for another'
3 Dave Hyde: Called out for 'folding' by veteran newsmen, Dolphins need for team toughness sits atop to-do list



Thank You Symposium Sponsors!



save our seas
foundation



All activities performed under
authorization and guidance of
NOAA Fisheries Emergency
Section 7 Consultation
#SERO-2024-00402

and

ESA Section 10 permits
to Gregg Poulakis,
Tonya Wiley, John Carlson, and
Colin Simpendorfer

Smalltooth Sawfish: 15 years of research to support recovery of a critically endangered species



R. Dean Grubbs, PhD
Ashley M. Dawdy, PhD

Florida State University Coastal and Marine Lab



Movement Patterns, Habitat Use, and Reproduction of Adult Smalltooth Sawfish in Florida

Collaborators:

- J. Carlson, A. Brame – NOAA
- J. Gelsleichter - UNF
- G. Poulakis group – FWC
- T. Wiley, A. Kroetz – HCC
- G. Burgess, L. French– FMNH
- K. Feldheim – Field Museum
- Sonja Fordham – SAI
- Jen Wyffels – Ripley's
- Chris Malinowski
- D. Portnoy, D. Swift – TAMUCC



Graduate Students:

- Ashley Dawdy - FSU
- Jasmin Graham – FSU
- Bianca Prohaska – FSU
- Lisa Hollensead - FSU
- Emma Jackson - FSU
- Jake Beretta - FSU
- Mikayla Beeson -FSU
- Annais Muschett-Bonilla
- Blake Hamilton – FSU
- Brendan Talwar - FSU
- Johanna McNutt – FSU
- Matt Kolmann – FSU
- Cheston Peterson – FSU
- Bryan Keller - FSU

Fishery-independent longlines:

50 hooks per set

Baited with ladyfish

1-hour soak time

Gangions: 2.5m long, 800 lb (3.2 mm)
monofilament (last 25 cm doubled),
16/0 circle hooks

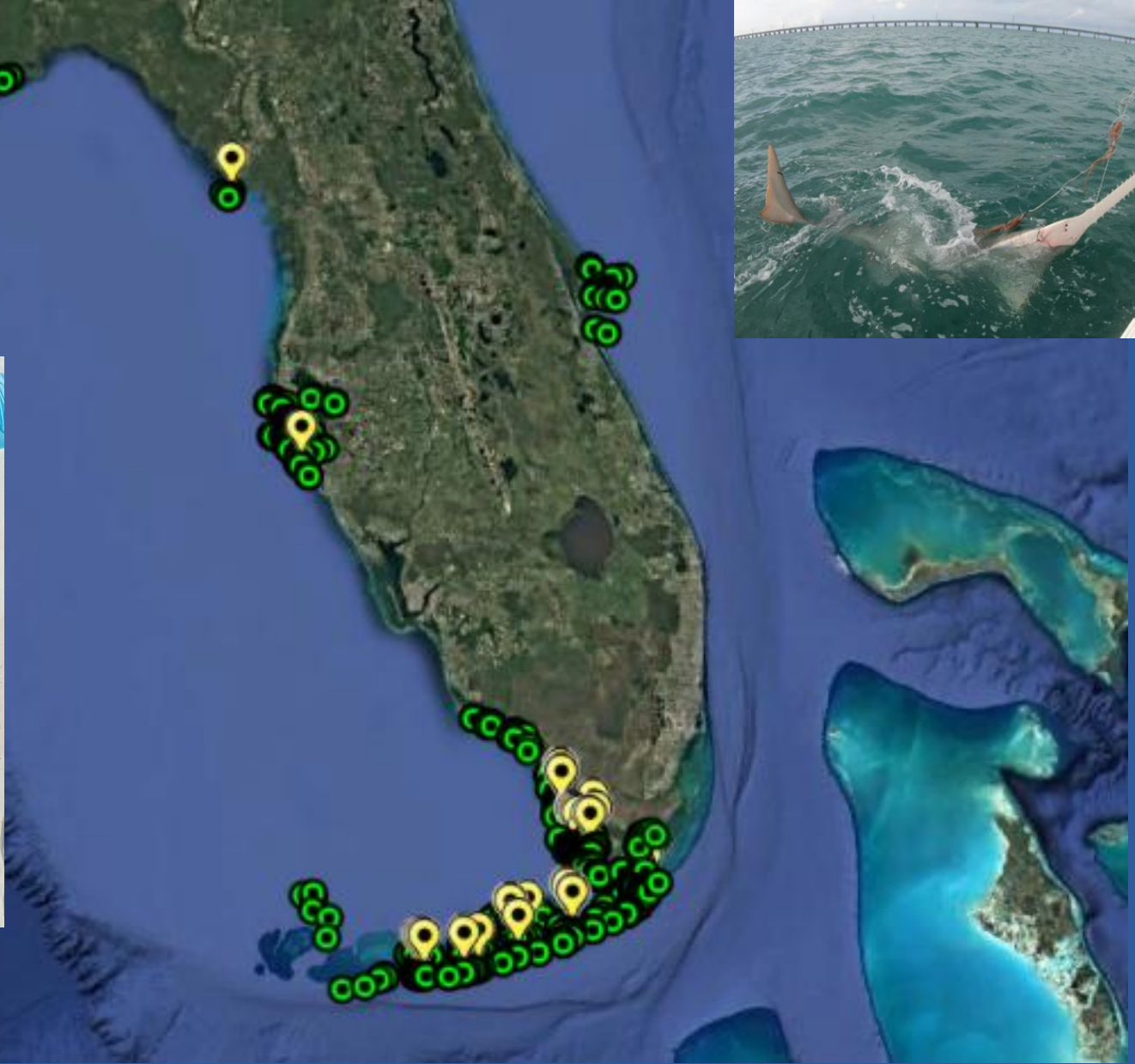


FSU Adult Sawfish Survey

1,329 sets (2011-2026)

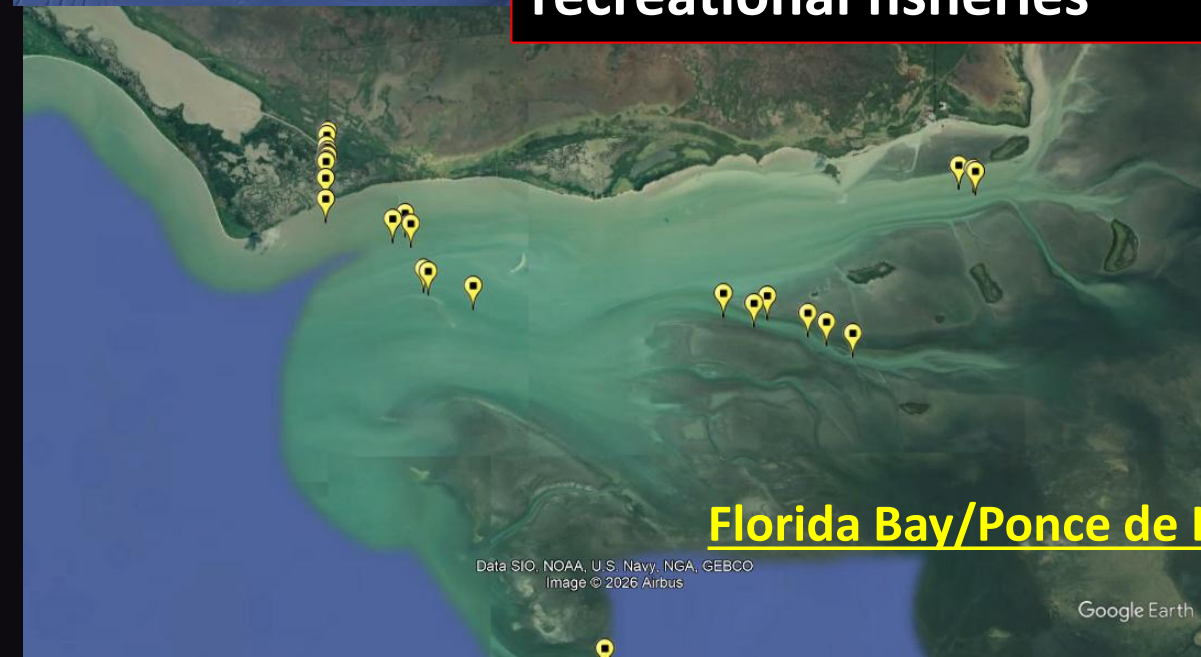
161 large sawfish caught

5,321 total sharks and rays





High encounter rates with recreational fisheries



Florida Bay/Ponce de Leon Bay (ENP)

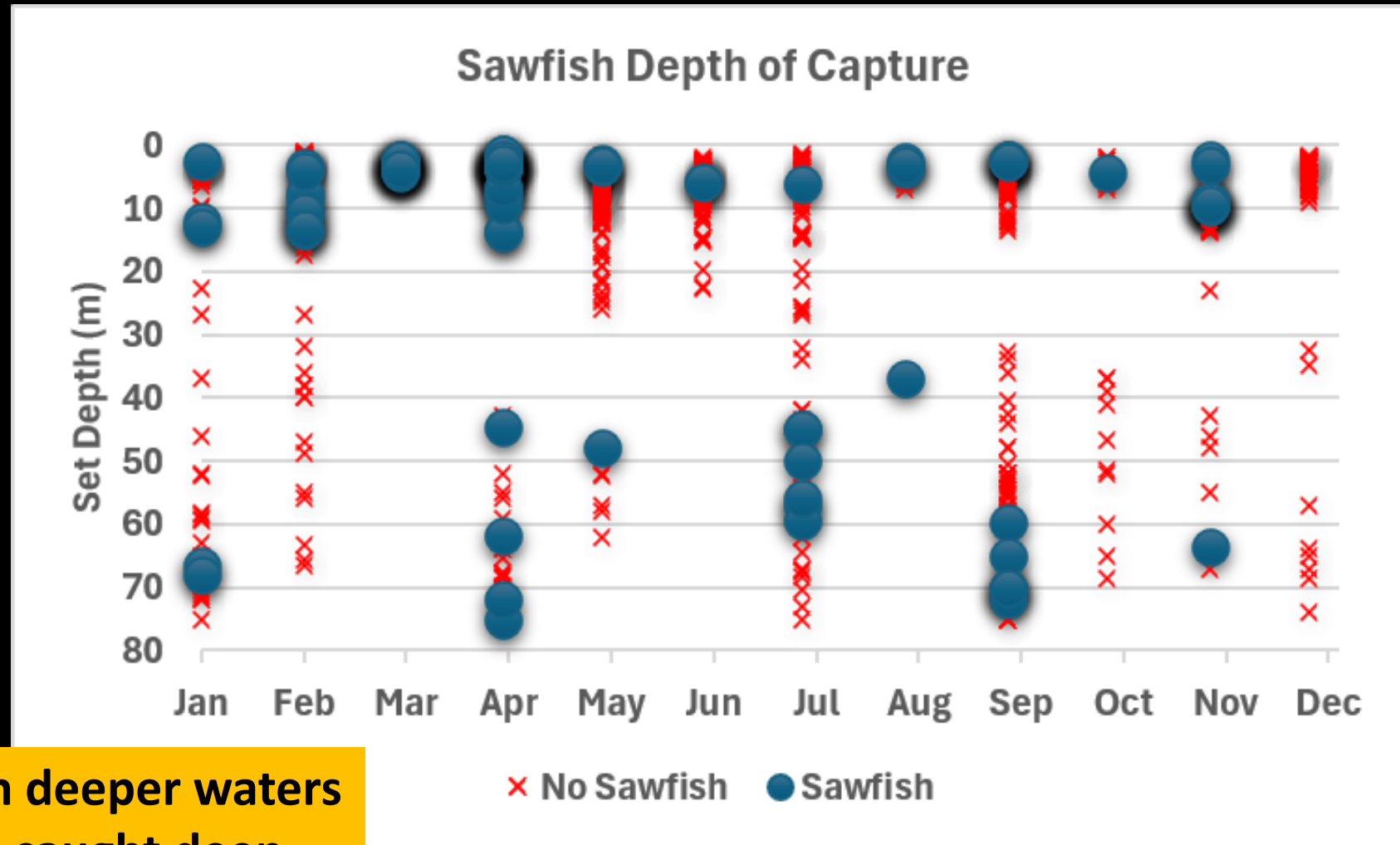




High encounter rates with commercial trawl and longline fisheries

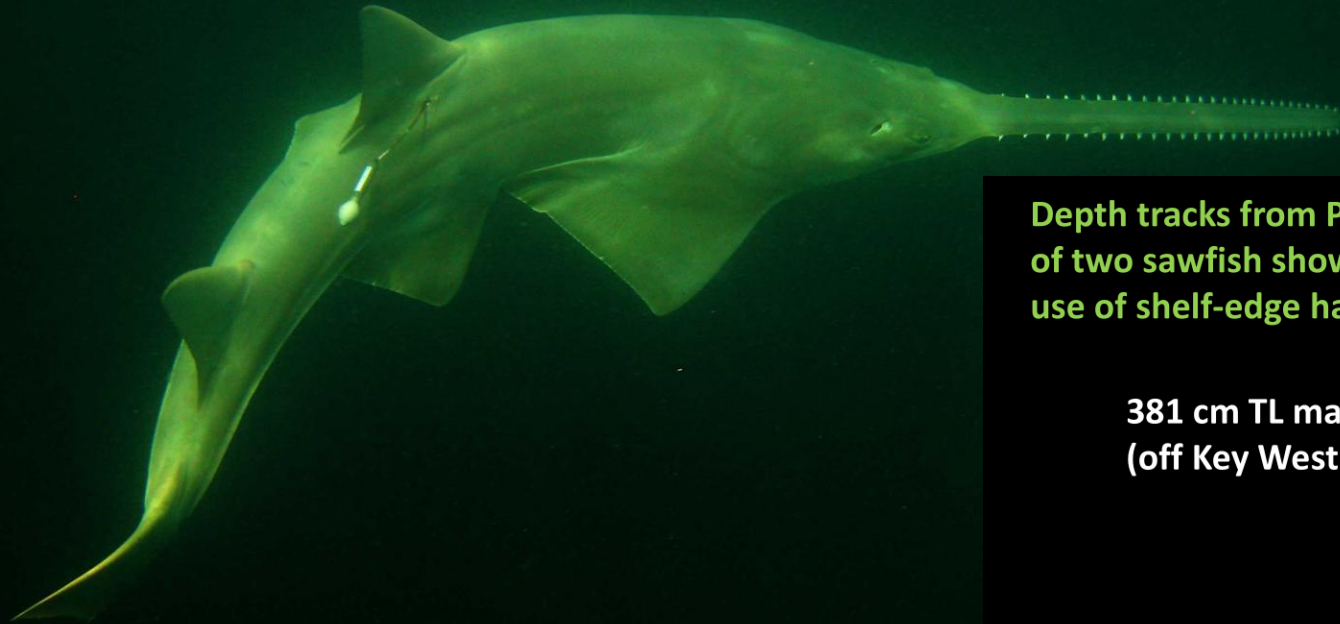


FSU fishery-independent longline survey set depths by month



16% of effort in deeper waters
20% of sawfish caught deep

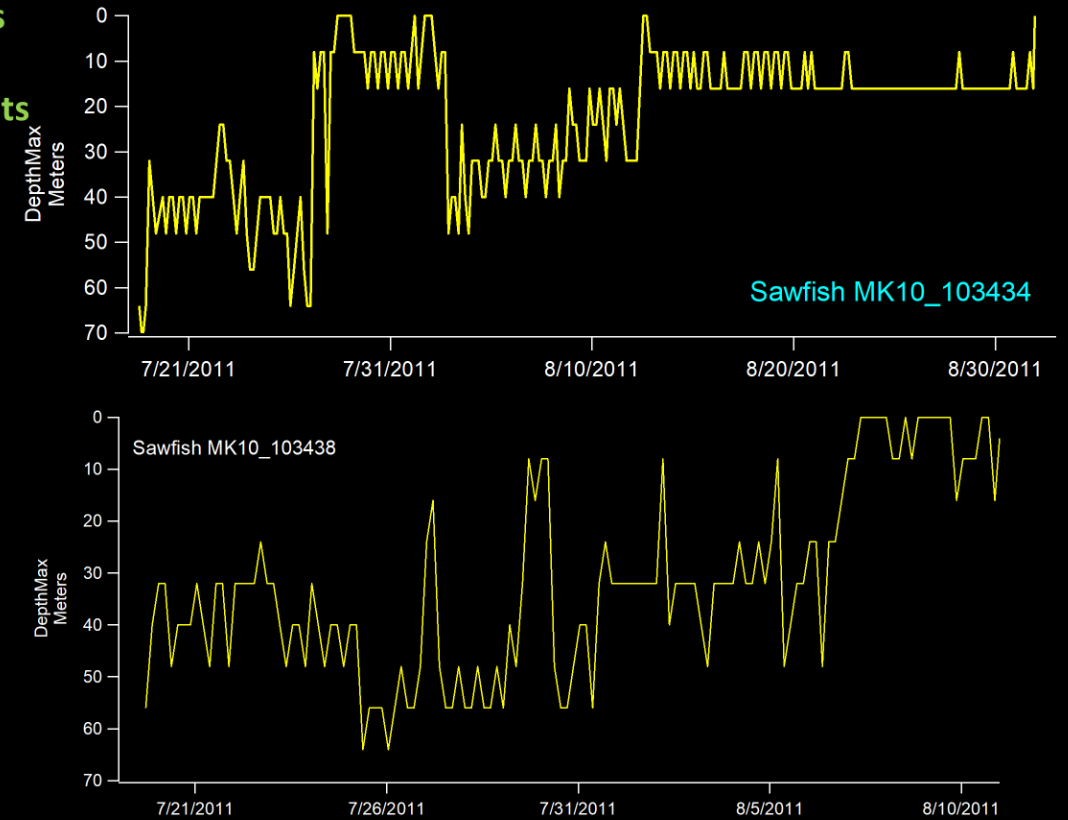
Popoff Archival Transmitting (PSAT) Satellite Tags



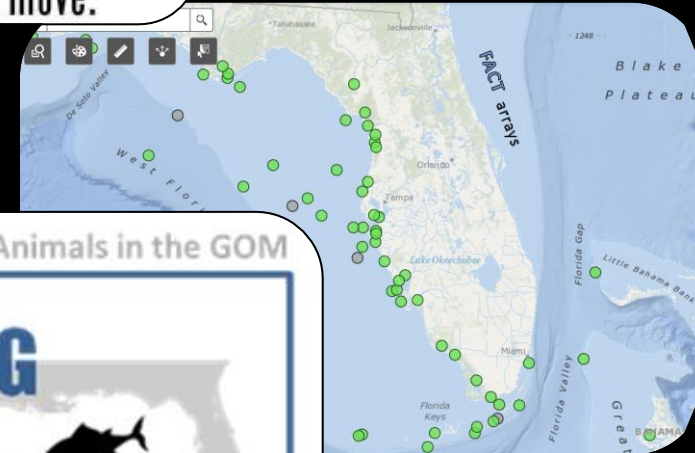
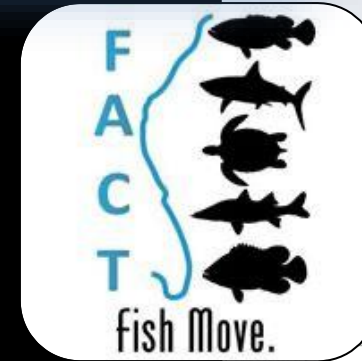
Depth tracks from PSATs
of two sawfish showing
use of shelf-edge habitats

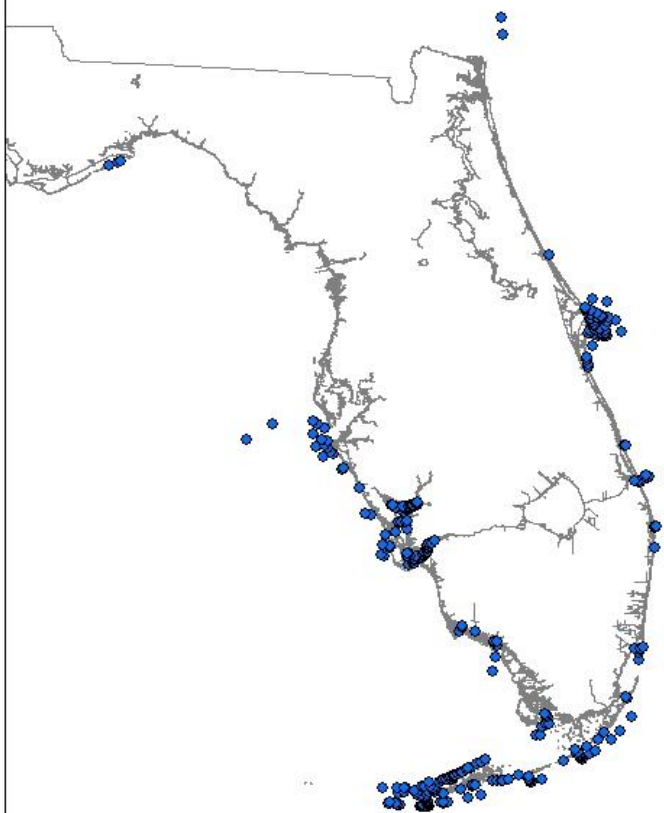
381 cm TL male
(off Key West)

368 cm TL Female
(off Marquesas)



Shift from satellite telemetry (high failure rates, low spatial resolution) to acoustic telemetry for adult sawfish beginning in 2016.

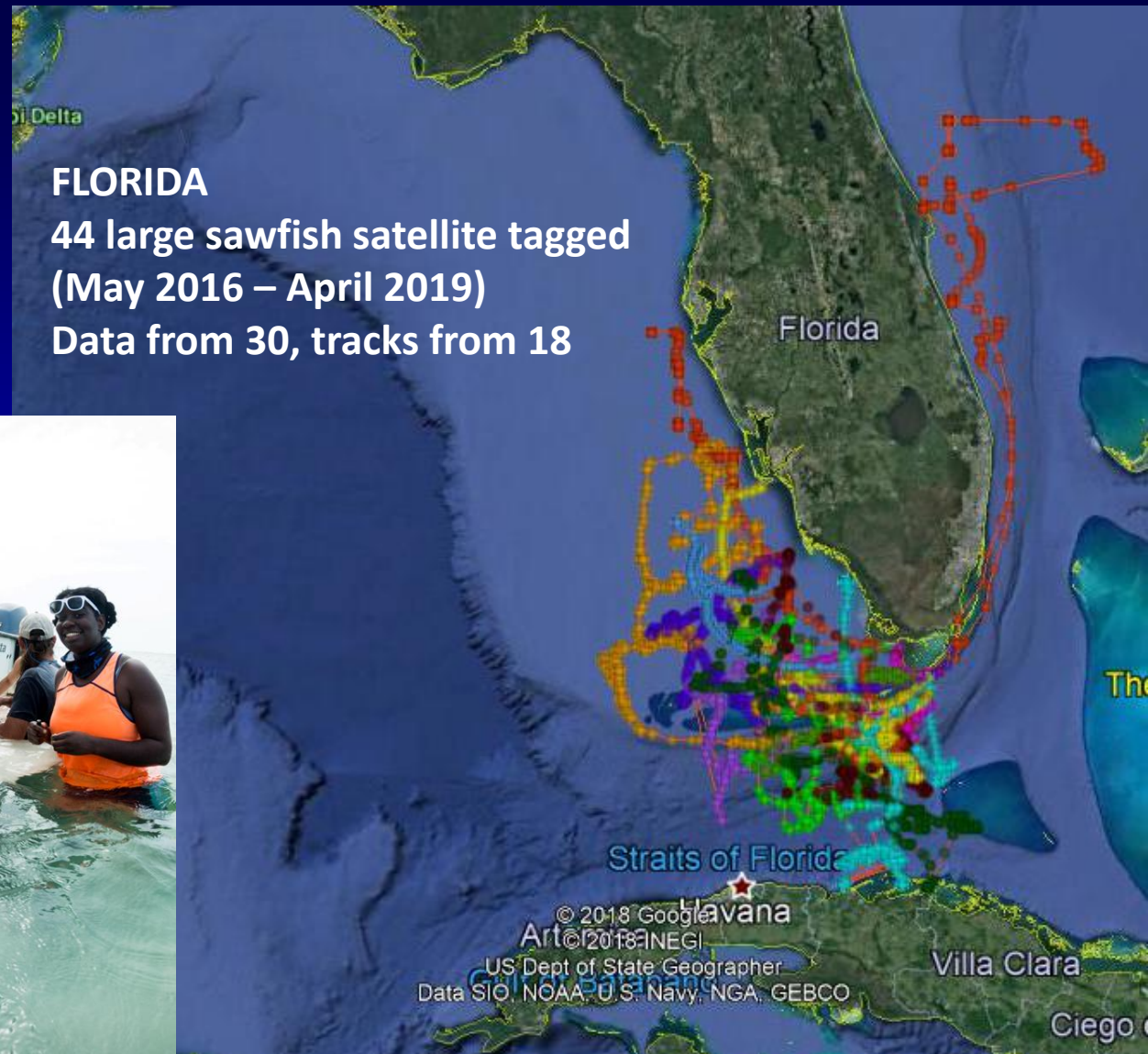




FLORIDA
43 large sawfish implanted with V16 acoustic tags
(May 2016 – April 2019)



FLORIDA
44 large sawfish satellite tagged
(May 2016 – April 2019)
Data from 30, tracks from 18

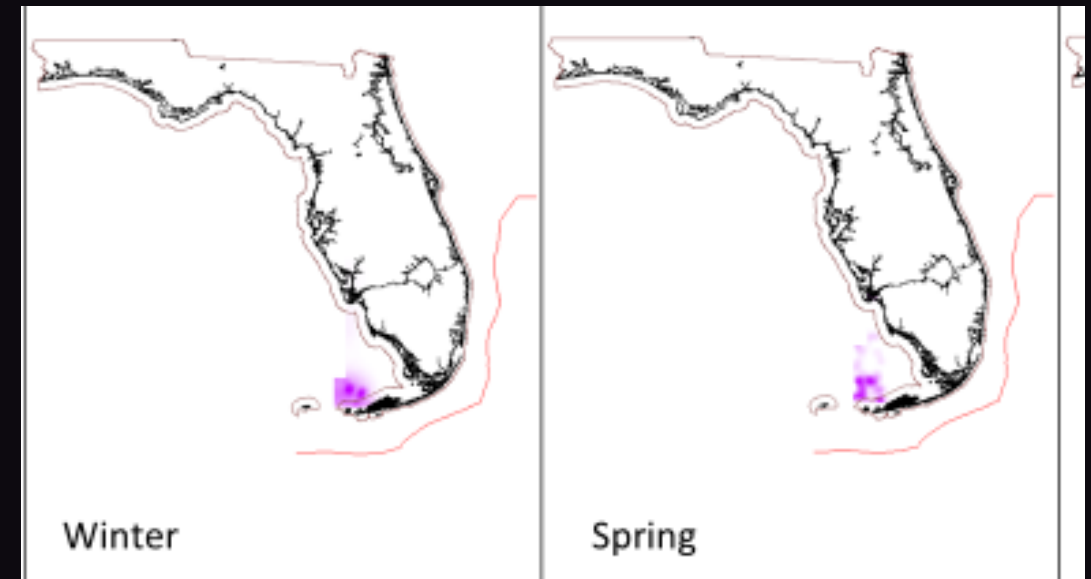
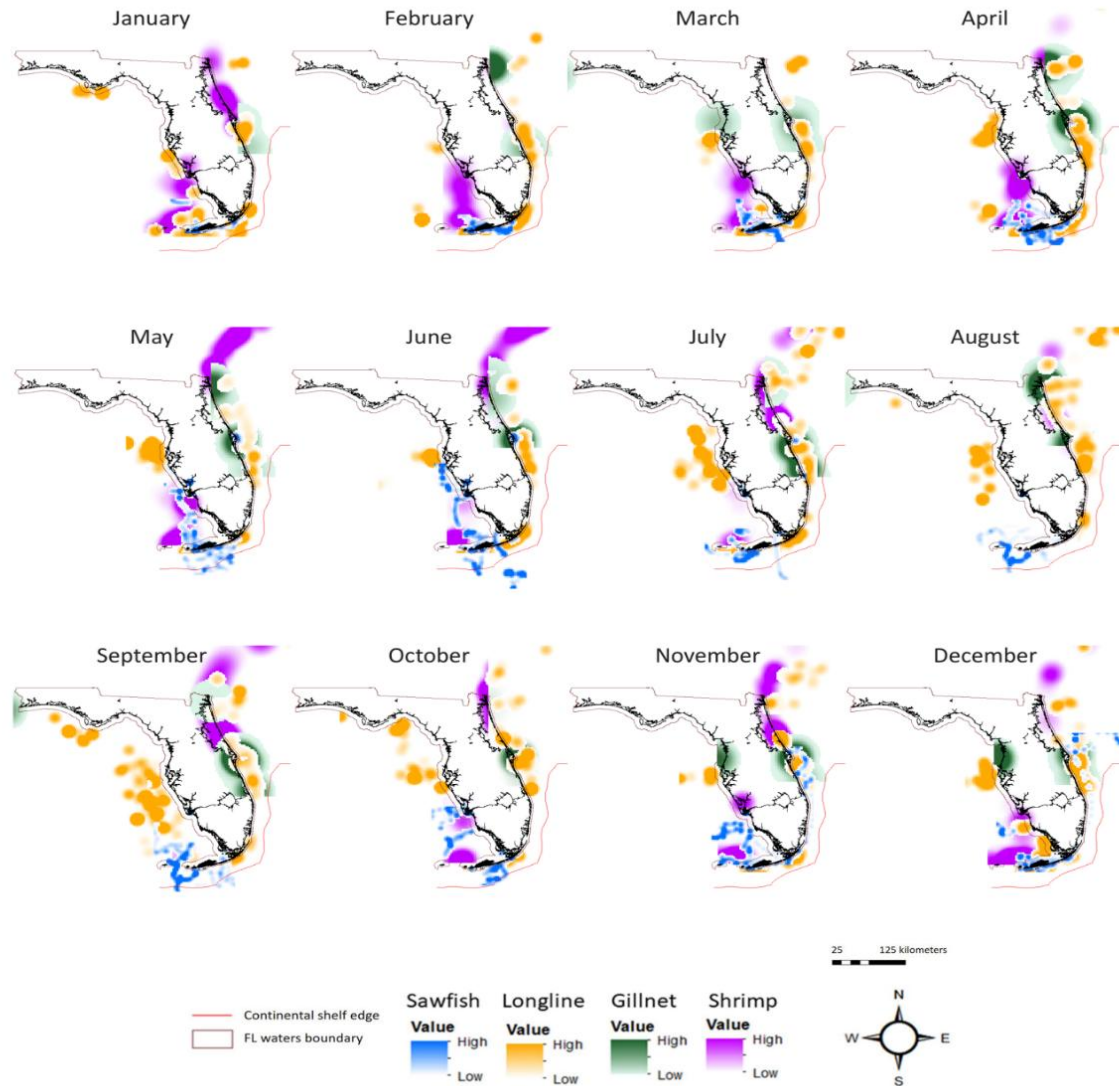


RESEARCH ARTICLE

Commercial fishery bycatch risk for large juvenile and adult smalltooth sawfish (*Pristis pectinata*) in Florida waters

Jasmin Graham¹  | Andrea M. Kroetz^{2,3}  | Gregg R. Poulakis⁴  |
Rachel M. Scharer⁴ | John K. Carlson³ | Susan K. Lowerre-Barbieri^{5,6} |
Danielle Morley⁷  | Eric A. Reyier⁸ | R. Dean Grubbs¹

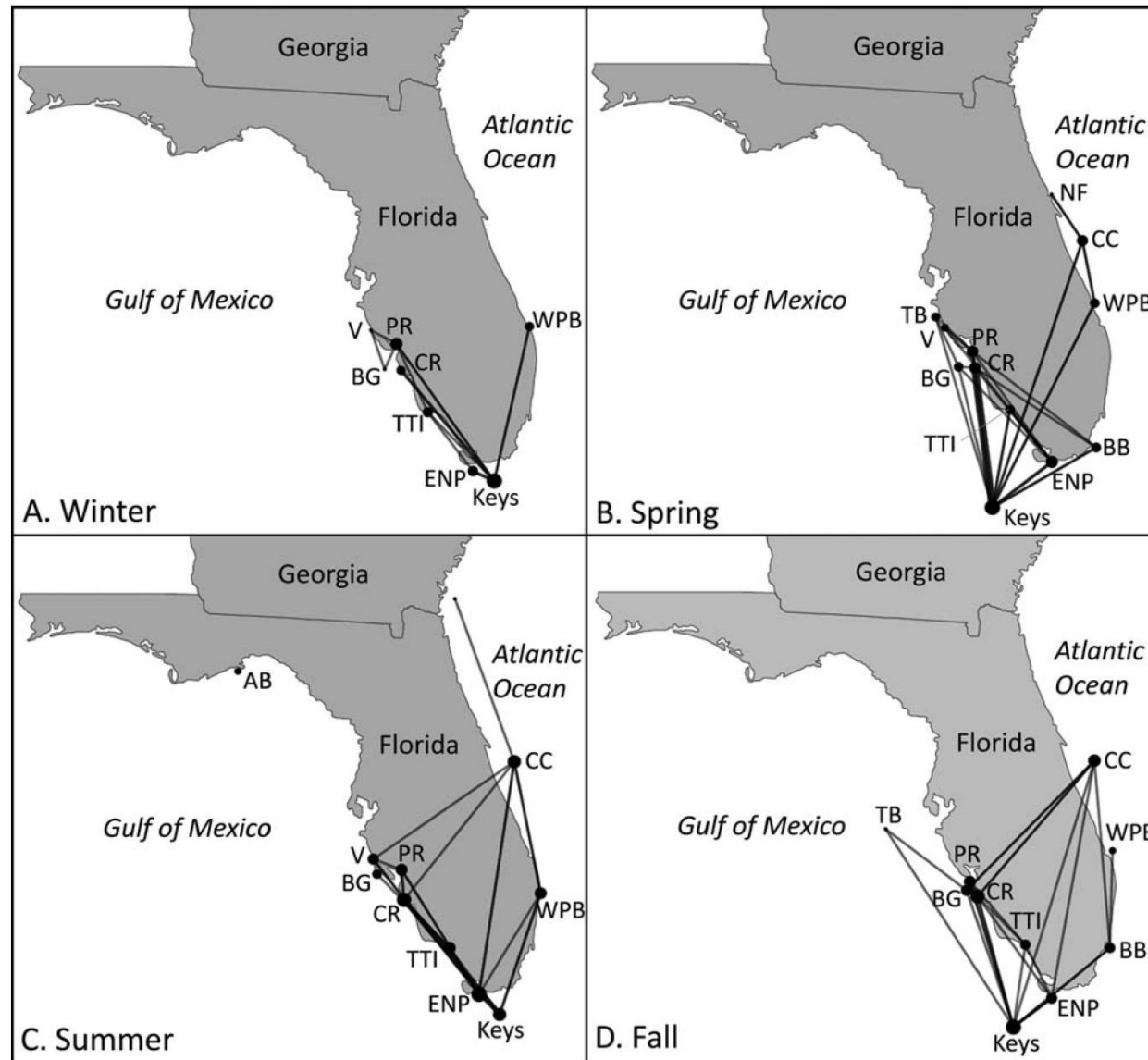
Sawfish overlap with shrimp trawl effort



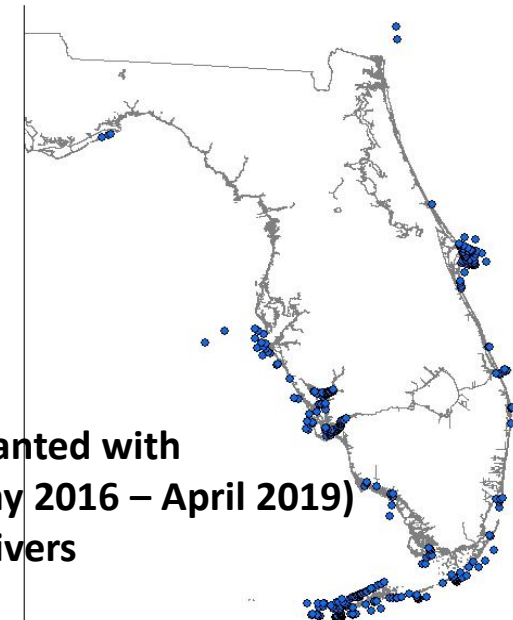


Large-scale space use of large juvenile and adult smalltooth sawfish *Pristis pectinata*: implications for management

Jasmin Graham^{1,*}, Andrea M. Kroetz², Gregg R. Poulakis³, Rachel M. Scharer³, John K. Carlson⁴, Susan Lowerre-Barbieri^{5,6}, Danielle Morley⁷, Eric A. Reyier⁸, R. Dean Grubbs¹



43 large sawfish implanted with
V16 acoustic tags (May 2016 – April 2019)
Detected on 461 receivers



Regions containing possible Critical Habitat for adult sawfish

Possible migratory contingents

Vol. 44: 45–59, 2021
<https://doi.org/10.3354/esr01088>

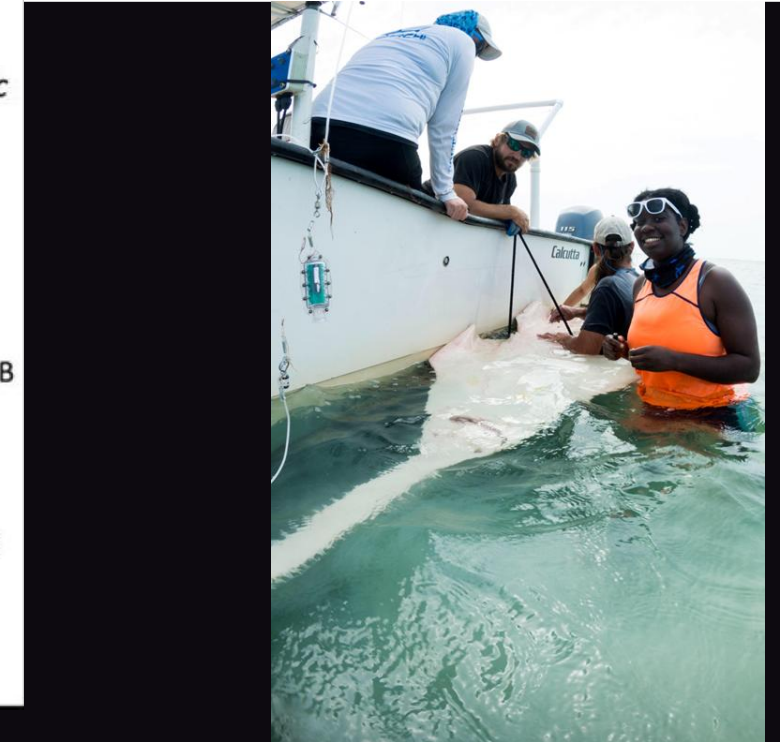
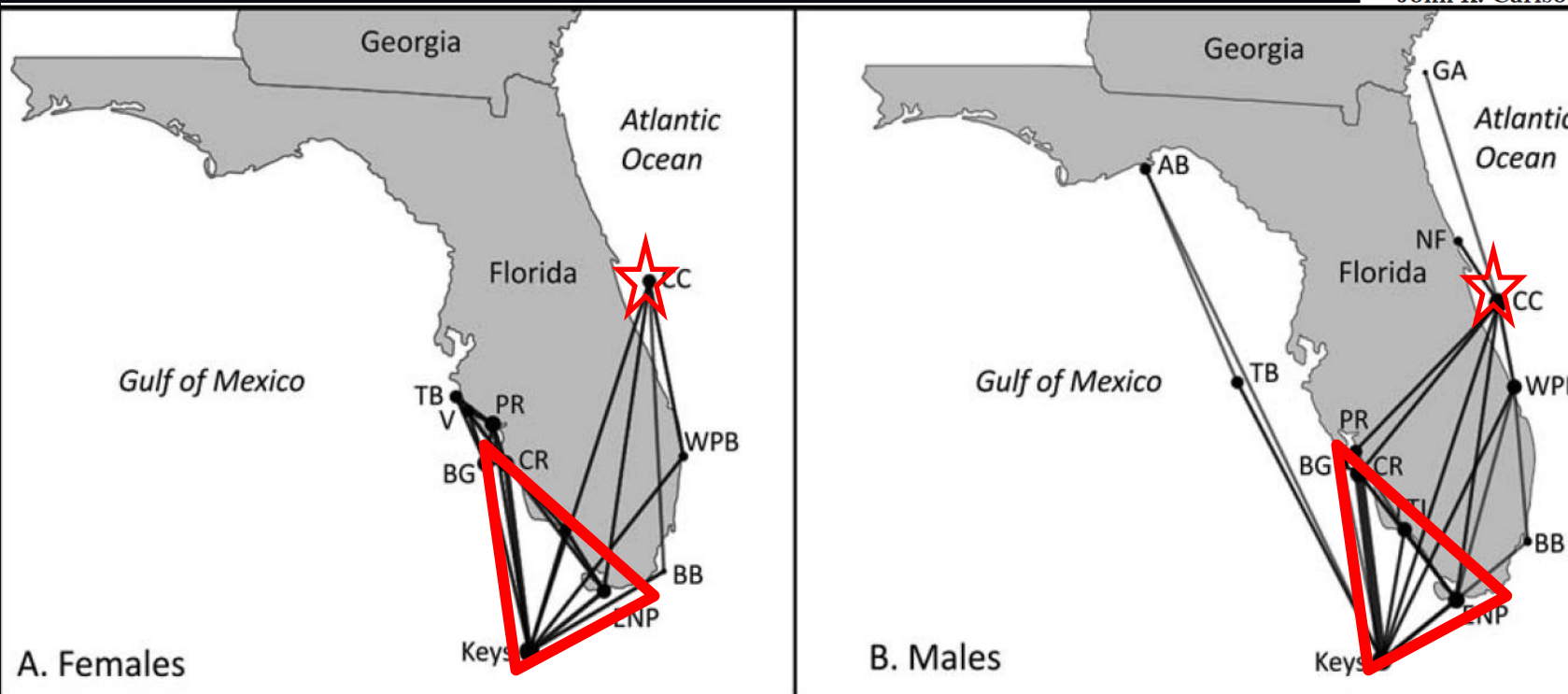
ENDANGERED SPECIES RESEARCH
Endang Species Res

Published January 28



Large-scale space use of large juvenile and adult smalltooth sawfish *Pristis pectinata*: implications for management

Jasmin Graham^{1,*}, Andrea M. Kroetz², Gregg R. Poulakis³, Rachel M. Scharer³, John K. Carlson⁴, Susan Lowerre-Barbieri^{5,6}, Danielle Morley⁷, Eric A. Reyier⁸, R. Dean Grubbs¹



Winter 2023-2024: 56 confirmed large sawfish mortalities 228 distressed individuals

Scientists rush to find cause of sawfish deaths off Florida Keys | Morning in America

MYSTERY FISH DEATHS

NEWS
NATION

RESEARCHERS STUMPED BY SAWFISH DEATHS
CRITICALLY ENDANGERED SPECIES

4:50 AM PT

S. A SISTER-IN-LAW TO THE REV. MARTIN LUTHER KING, JR., DIES

MAIN

MORNING



Tampa Bay Times

HURRICANE

NEWS

SPORTS

OPINION

LIFE & CULTURE

FOOD

Obituaries

Classifieds

NEWS / ENVIRONMENT

Hope, then heartbreak, as first 'spinning' sawfish dies in Tampa Bay

The Tampa Bay Times joined a recent research expedition in Tampa Bay as an eyewitness called in the first known report of a dying sawfish in the bay area.



Dean Grubbs, the associate director of research at Florida State University's Coastal and Marine Laboratory, wrangles in a shark caught on June 19 in Tampa Bay. Grubbs and team are the first researchers to catch an adult sawfish in the bay. The animal's blood could help solve a mysterious die-off in the Florida Keys. [MAX CHESNES | Times]



89°F Mostly sunny

Winter 2023-2024: tag and collect samples from sawfish in affected area



Sawfish sample type(s)	Destination	Purpose
Preserved whole blood (EM , RNA later, and formalin fixes)	Jen Wyffels (Ripleys Aquarium)	Blood ultrastructure
Blood smears, whole blood (lithium heparin), preserved whole blood (formalin fix)	University of Miami	Elasmobranch blood panel (complete blood chemistry and plasma chemistry analysis)
Whole blood (EDTA), plasma	Michigan State University	Toxic elements, trace nutrients
Fecal swabs (banked)	Jen Wyffels (Ripleys Aquarium)	GI genetic sequencing
Fin clip	Kevin Feldheim (Field Museum)	Genetic sequencing
Plasma, red blood cells	Jim Gelslechter (University of North Florida)	Reproductive hormone analysis
Plasma (banked)	Chris Malinowski (Ocean First Institute)	
White muscle biopsy	FSU	Stable isotopes

Feb/Apr 2024:
Tagged 15 “healthy” adults
Nov 24 - Apr 25:
Tagged 24 more adults



Huge amount of work after returning to the dock led by doctoral students Ashley Dawdy, Emma Jackson, and Jake Beretta



<https://www.changingseas.tv/>
Episodes 1703

Public Awareness 3 documentaries

Discovery Channel
Shark Week 2026



Why are some sawfish affected and others aren't?

P0101743 Recapture: March 2026

P010743 Tagged: February 2024

P011076 Recapture: April 2024

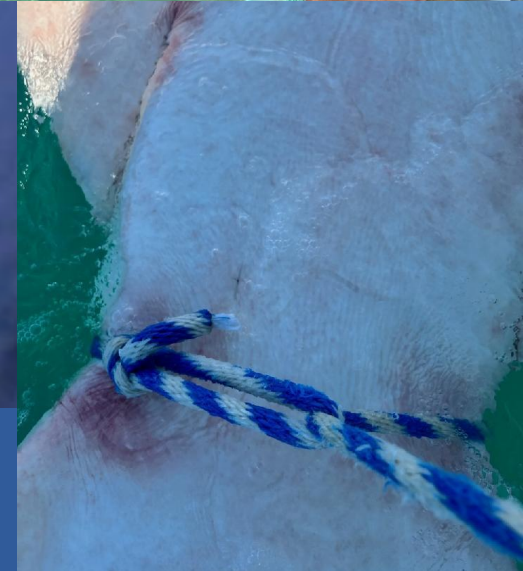
P011076 Tagged: February 2024

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus



Tagged in Ten Thousand Islands
in 2008, 125 cm, 6 months old

Recaptured in 2025 in FL Keys
383 cm and mature, 8 years old





Why are some sawfish affected and others aren't?

Text from Andrea Kroetz

Wednesday, Apr 24, 2024 • 15:40

Lukas and I just recovered the Coot Bay male you tagged in 2017. Dead, external tag there but can't read it. 😞

Coot Bay Male: Tagged April 2017

Coot Bay Male: Mortality April 2024

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus



2025 Mortality event: 9 confirmed large sawfish mortalities



Cedar Key Female: Tagged June 2023

Cedar Key Female: Died February 2025

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

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WUSF Morning Edition

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Environment

Endangered sawfish are turning up dead again in South Florida waters

WLRN Public Media | By Jenny Staletoich
Published March 4, 2025 at 10:17 AM EST

f x in e

Windows Search Chrome Edge Word Excel PowerPoint

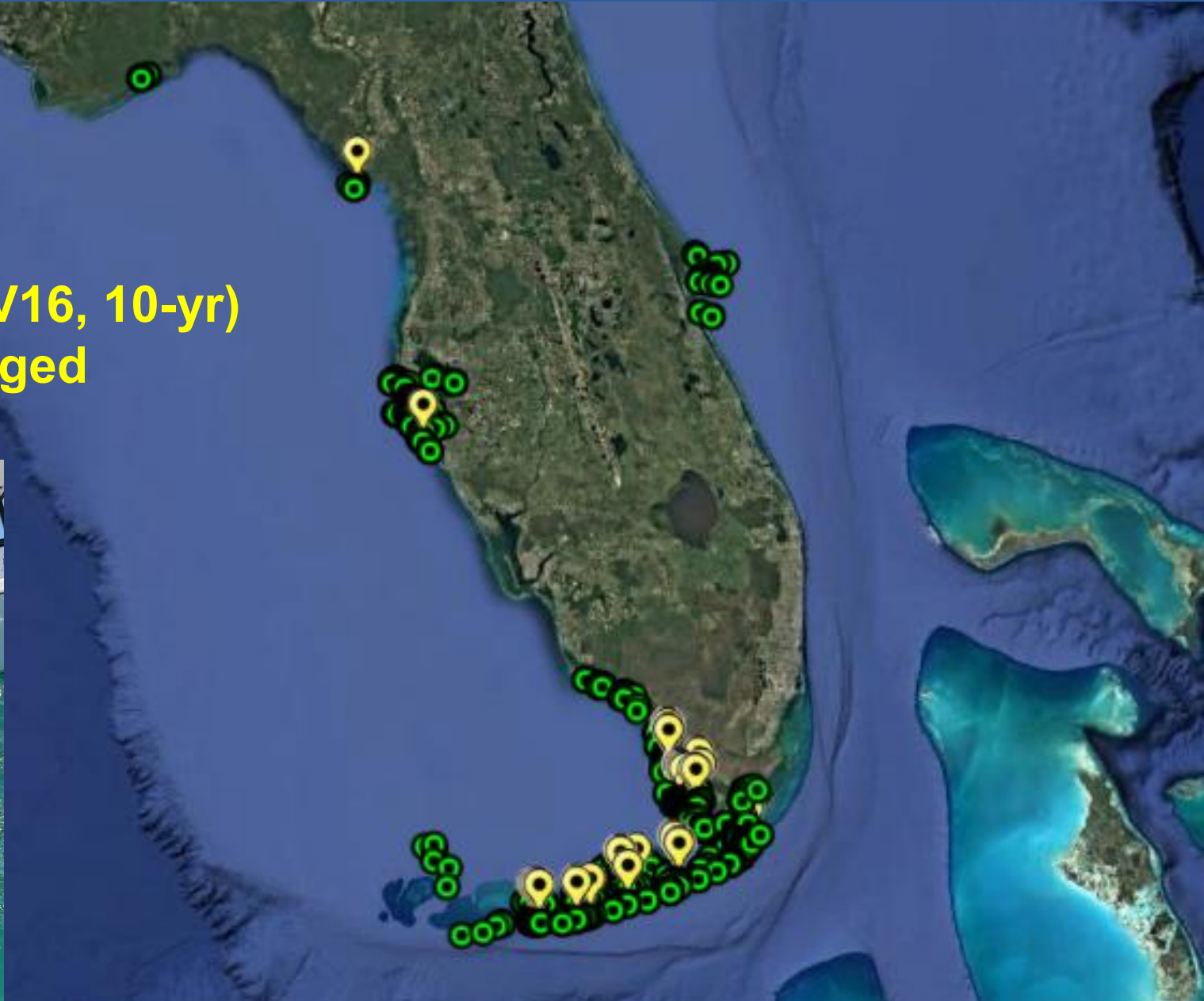
Google Earth

FLORIDA

161 large sawfish caught

114 acoustic tagged by FSU (V16, 10-yr)

>200 incl. FWC and NOAA tagged



Dawdy et al. *in prep*

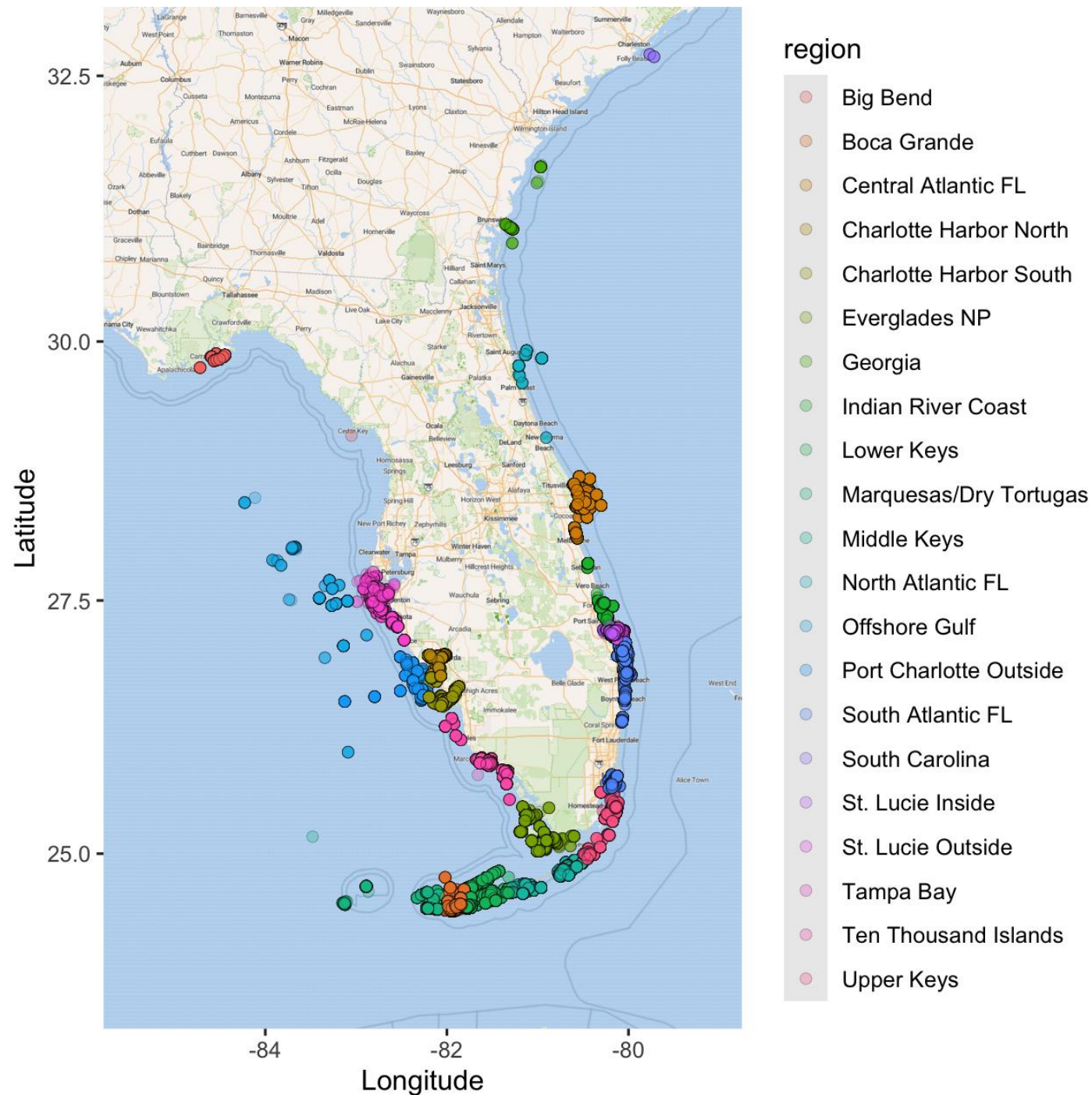
2016-2025

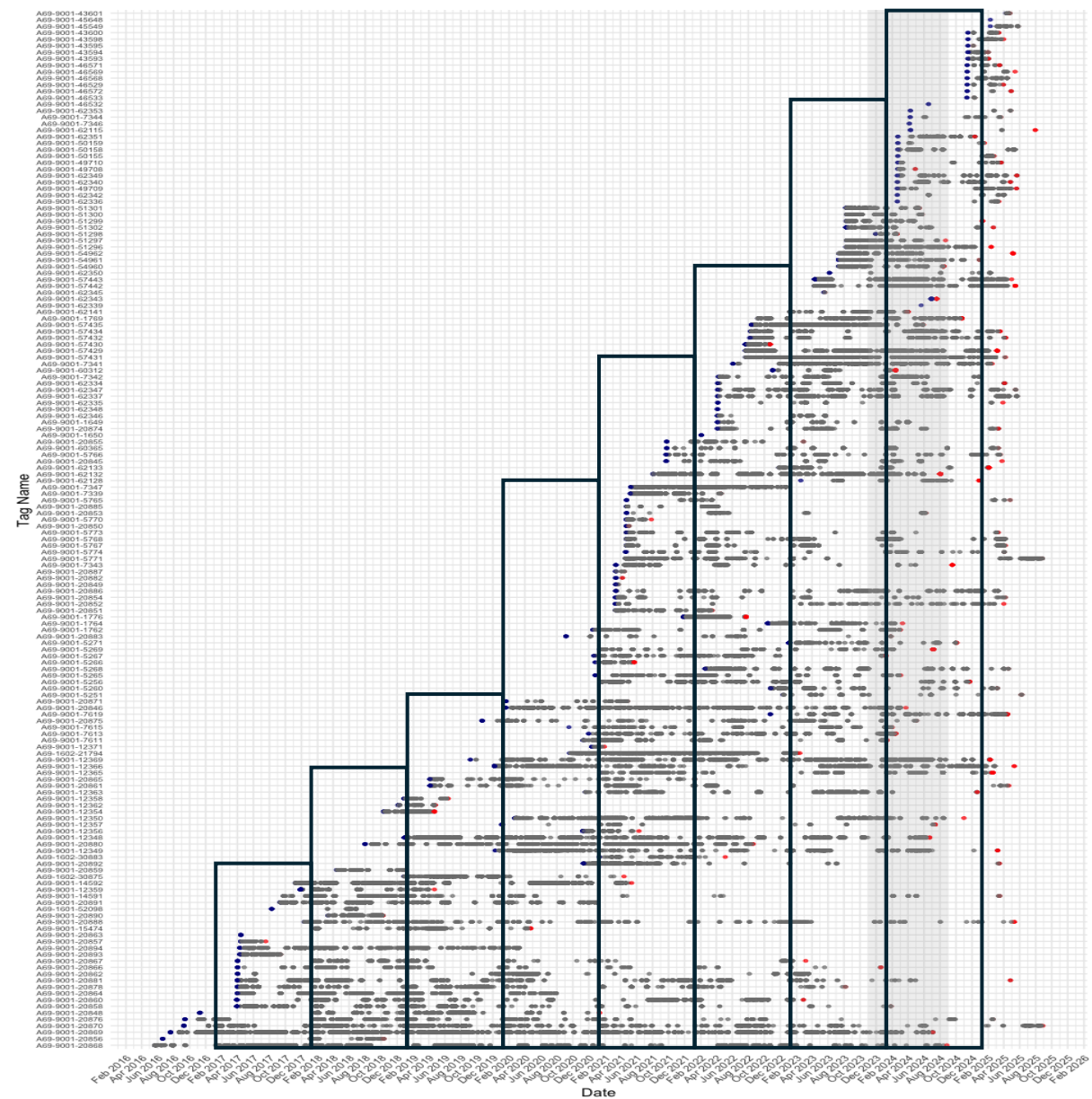
183 large sawfish with V16 acoustic tags

(tagged by FSU, FWC, NOAA)

Detected in 1,867 receivers

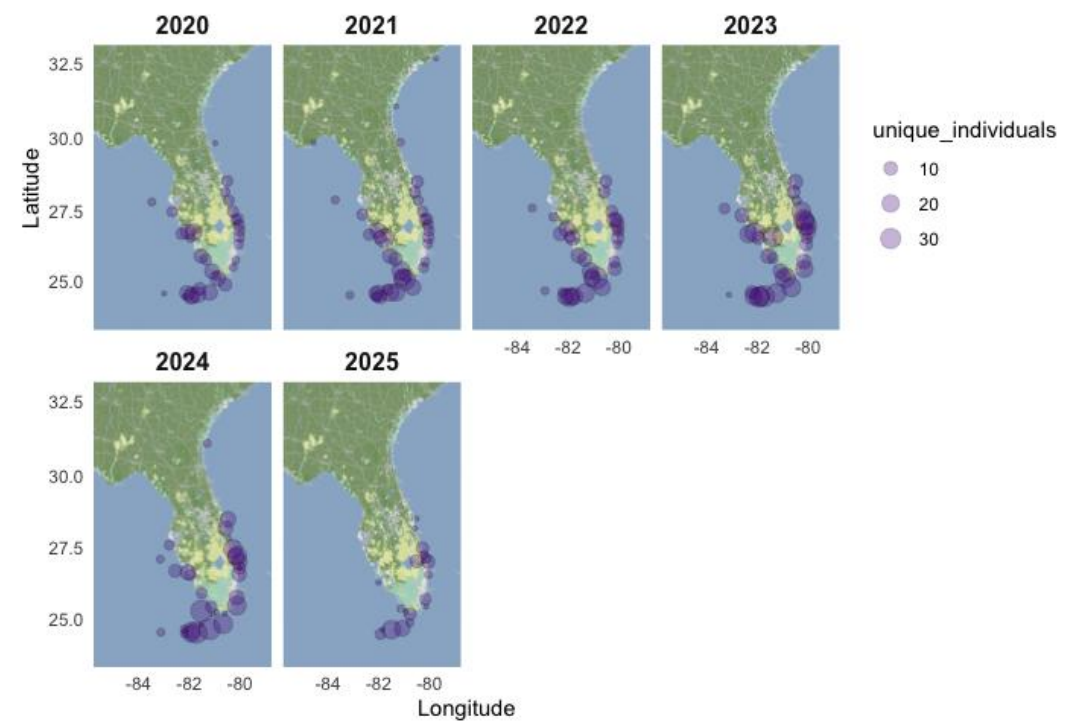
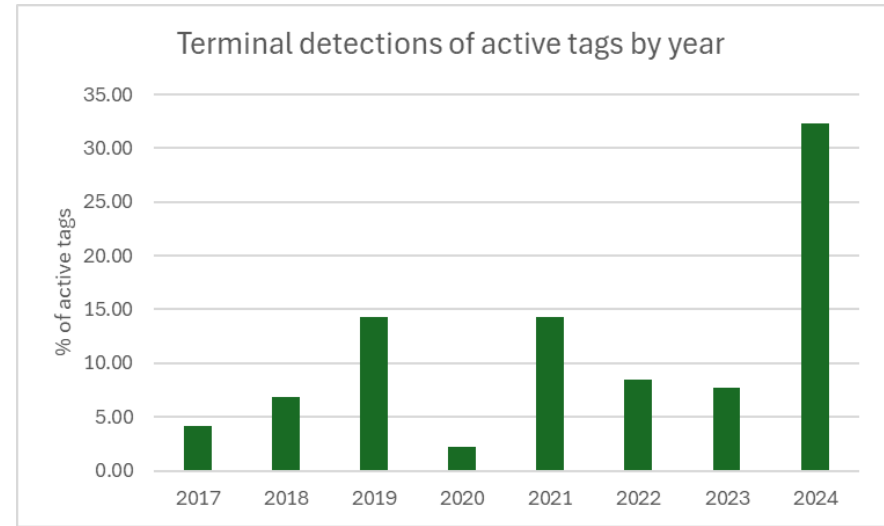
Nearly 400,000 detections





Detection Type

- Last
- Other
- Release



Thanks for listening!

