Smalltooth Sawfish:
15 years of FSU research into adult movements and migration

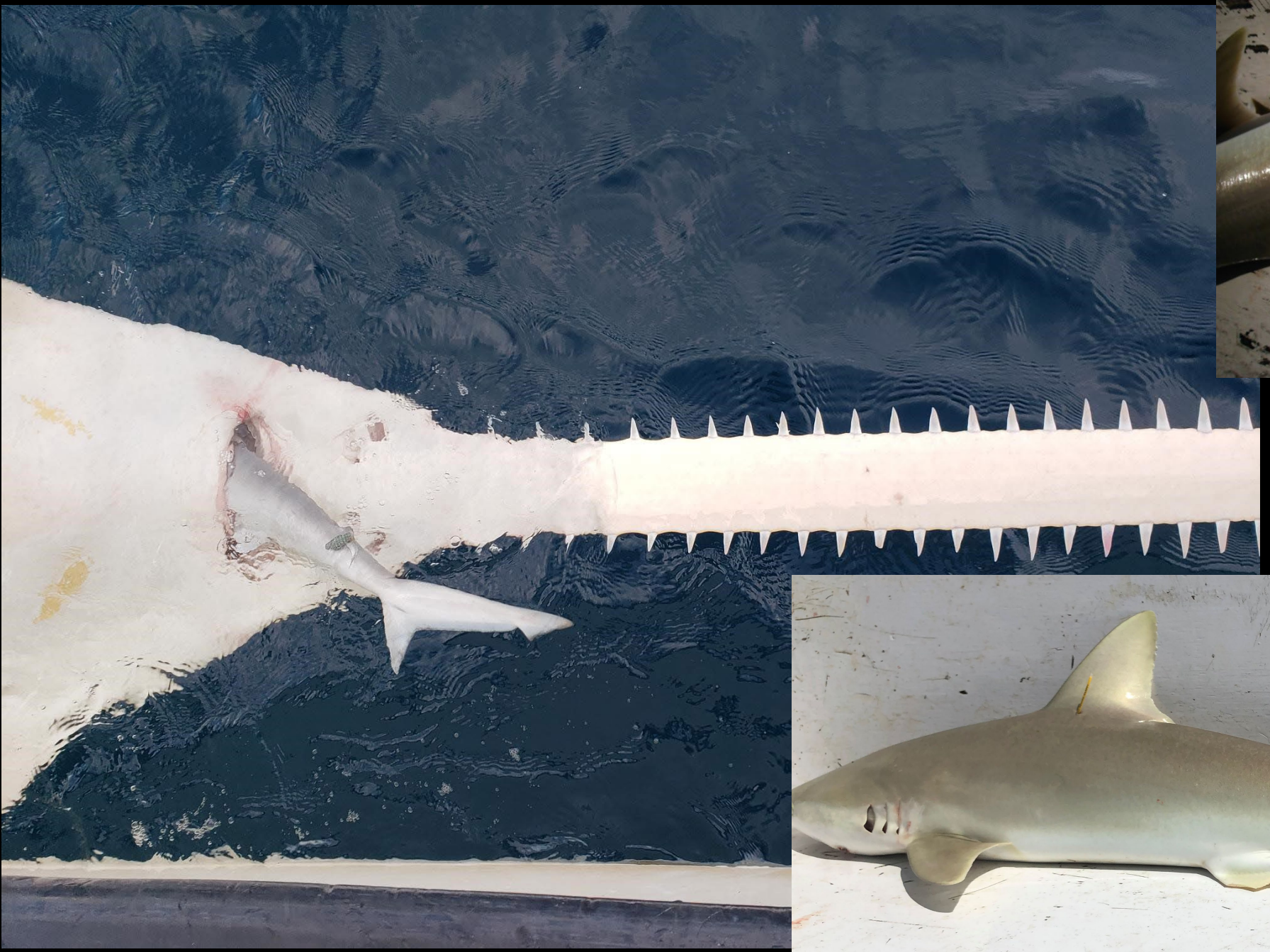
R. Dean Grubbs, PhD
Associate Director of Research
Florida State University Coastal and Marine Lab

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

R. Dean Grubbs (FSUCML)

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
-D. Portnoy, D. Swift – TAMUCC

Graduate Students:
-Ashley Dawdy - FSU
-Bianca Prohaska – FSU
-Jasmin Graham – FSU
-Lisa Hollensead - FSU
-Emma Jackson - FSU
-Jake Beretta - FSU
-Mikayla Beeson -FSU
-Blake Hamilton – FSU
-Brendan Talwar - FSU
-Johanna Imhoff – FSU
-Matt Kolmann – FSU
-Cheston Peterson – FSU
-Bryan Keller - FSU



NOAA
FISHERIES
SERVICE

LUNCH AND LEARN

NOVEMBER 13, 2013, 11:30-12:30

DOLPHIN CONFERENCE ROOM

Title: Overview of Smalltooth Sawfish Shrimp Trawl Bycatch, Observer Coverage, and PAT Data.

Presented by Dr. John Carlson

Research Fishery Biologist, NOAA Panama City Laboratory

Title: Movement Patterns and Reproductive Status of Smalltooth Sawfish and Habitats of Importance in Areas of Commercial and Recreational Fishery Interactions.

Presented by Dr. R. Dean Grubbs,

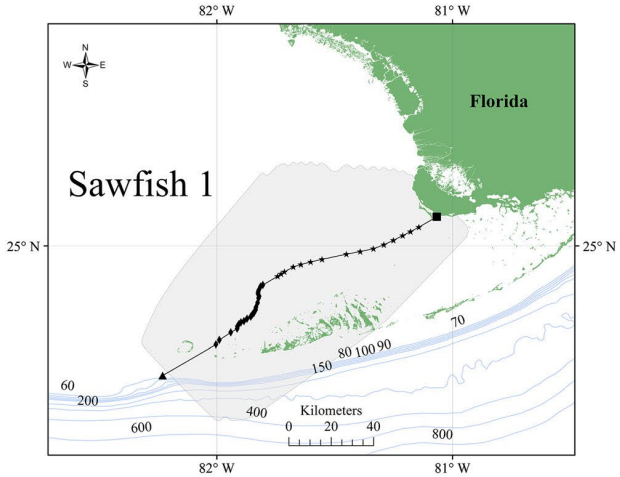
Florida State University, Coastal and Marine Laboratory

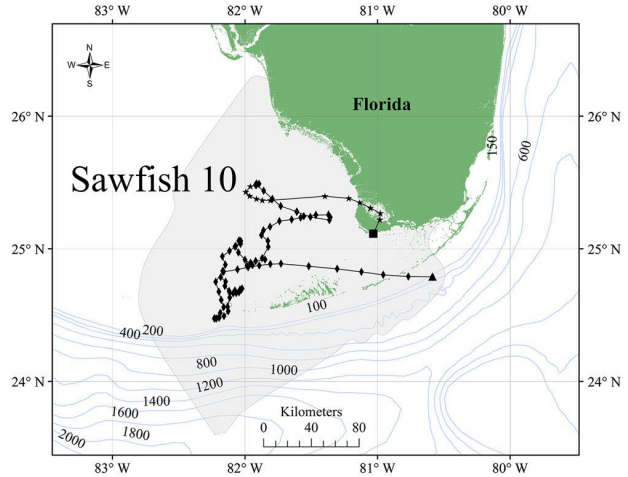
AQUATIC CONSERVATION: MARINE AND FRESHWATER ECOSYSTEMS

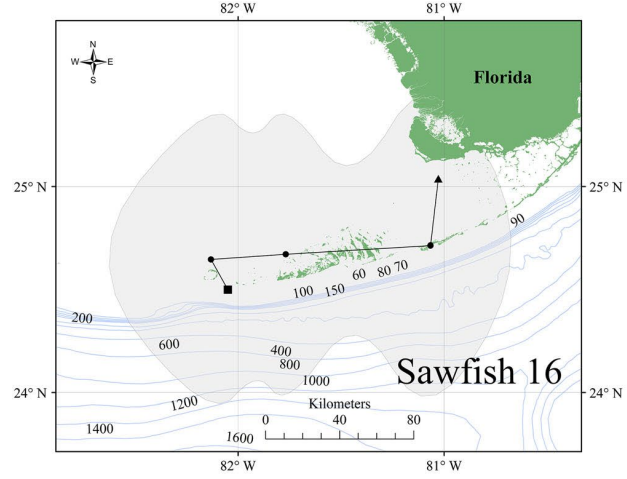
Aquatic Conserv: Mar. Freshw. Ecosyst. (2013)

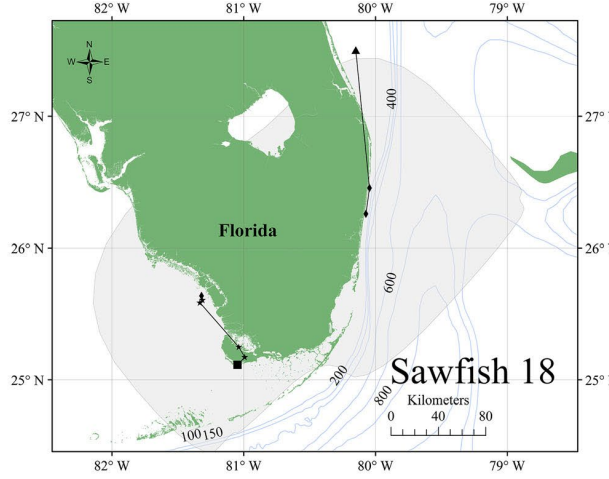
Movement patterns and habitat use of smalltooth sawfish, Pristis pectinata, *determined using pop-up satellite archival tags*

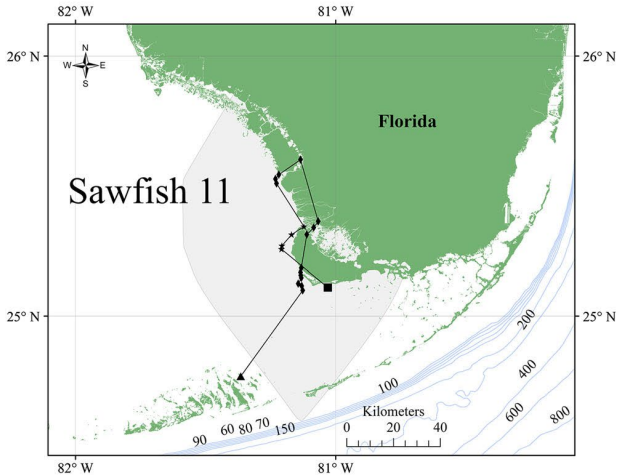
J. K. CARLSON[a,*], S. J. B. GULAK[a], C. A. SIMPFENDORFER[b], R. D. GRUBBS[c], J. G. ROMINE[d,e] and G.H. BURGESS[d]

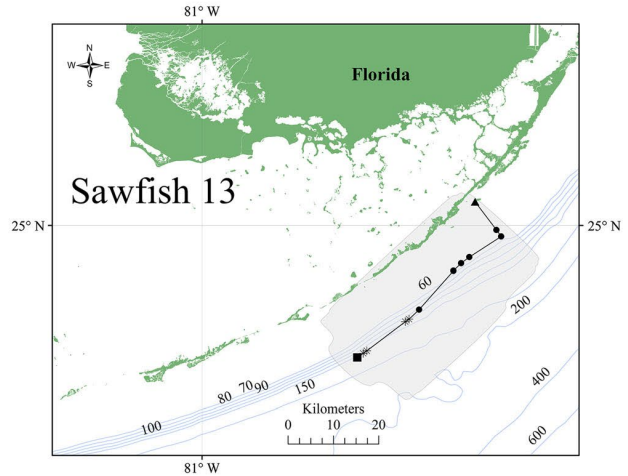


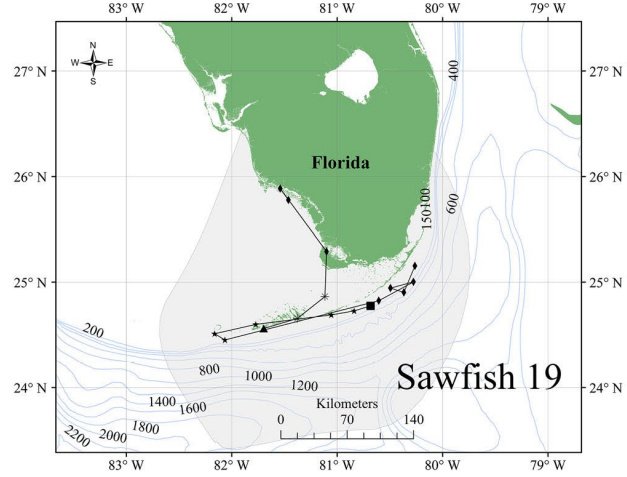


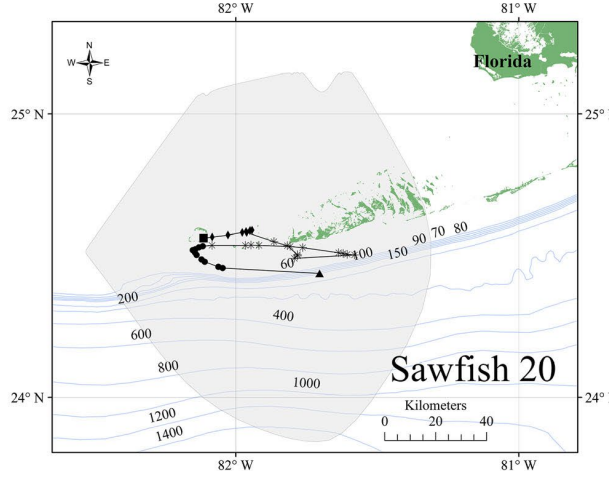












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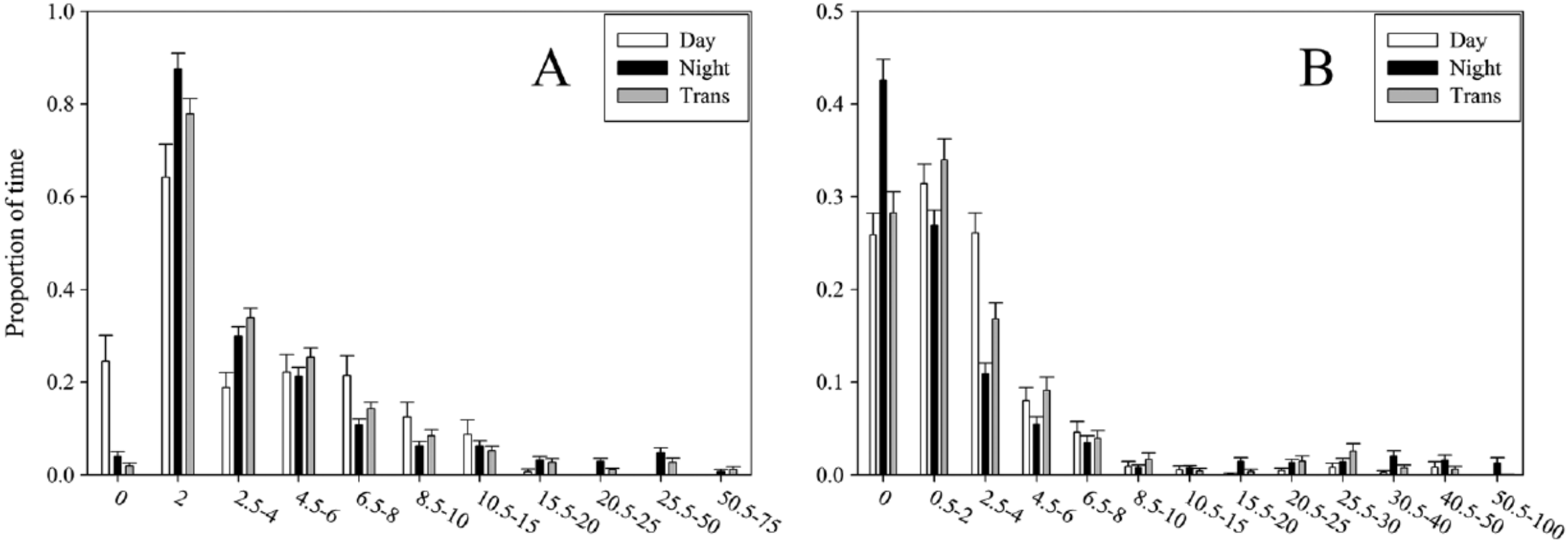
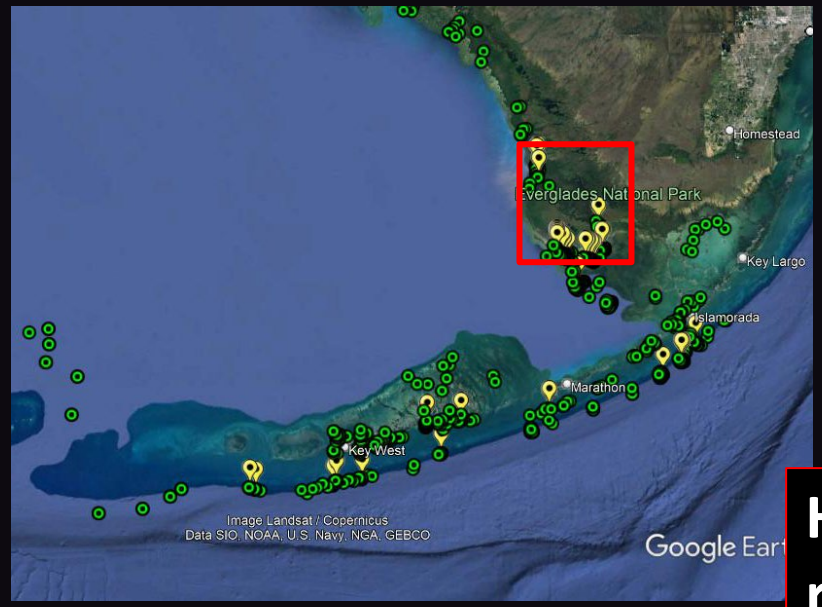
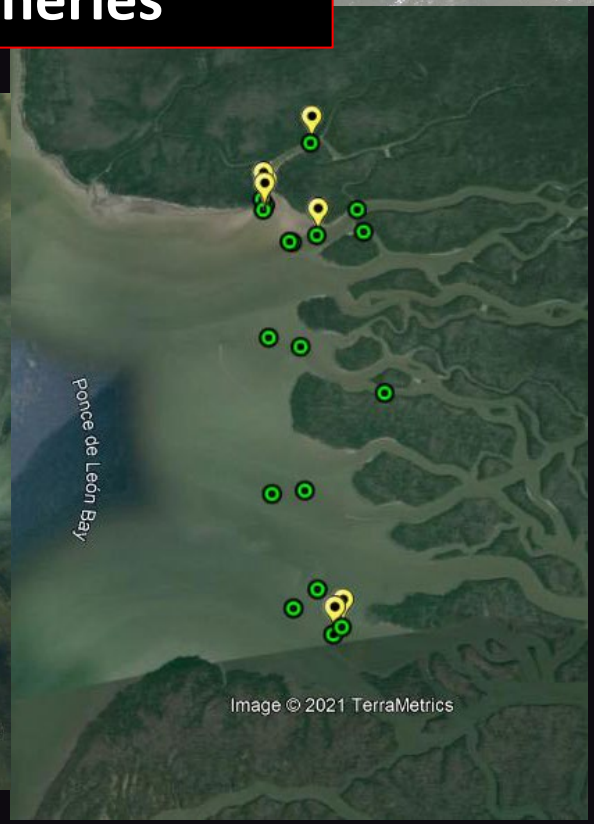


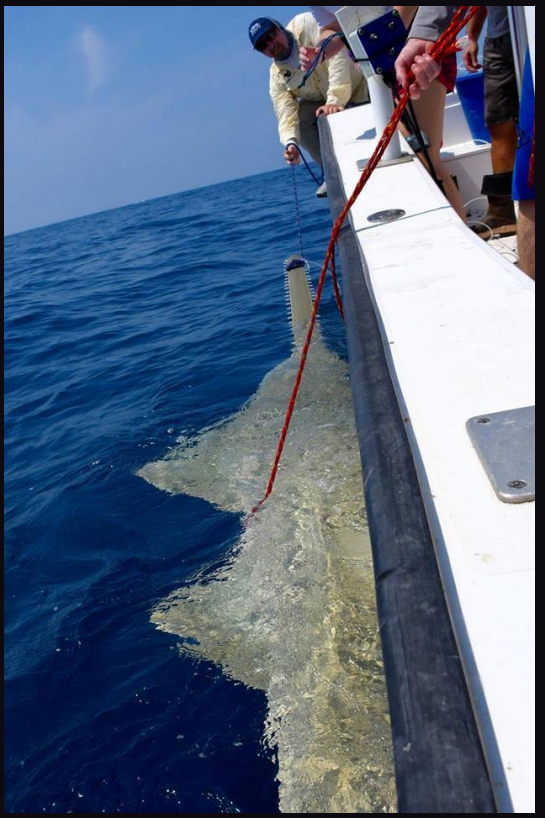
Mostly shallow coastal habitat use, but also use of deeper shelf edge habitats.

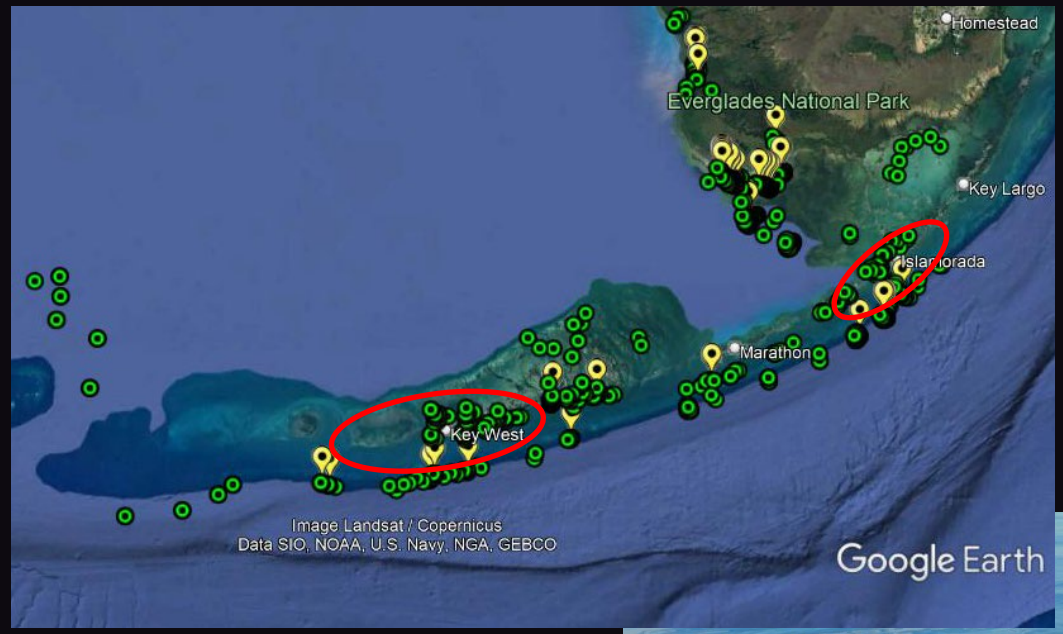


High encounter rates with recreational fisheries

Florida Bay/Ponce de Leon Bay (ENP)

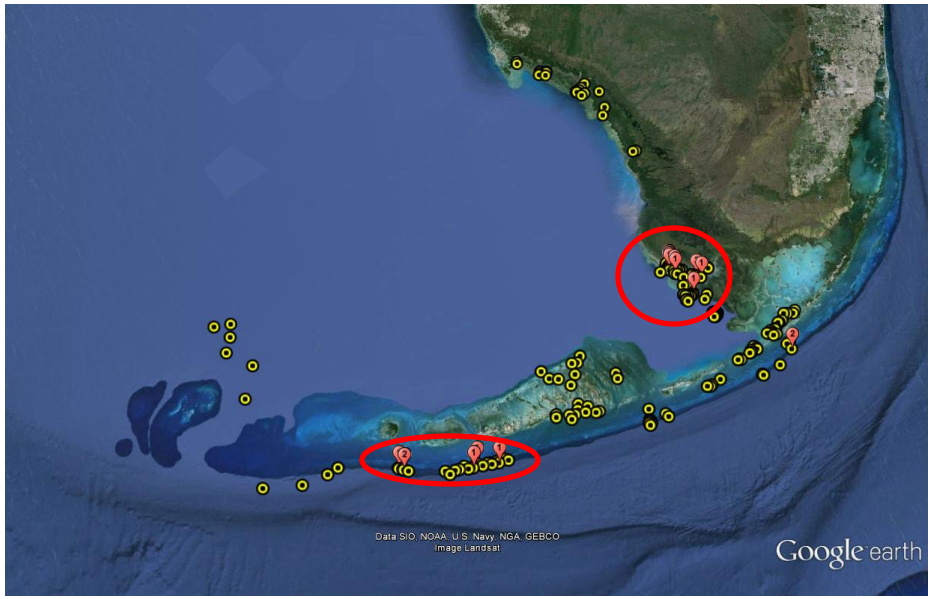


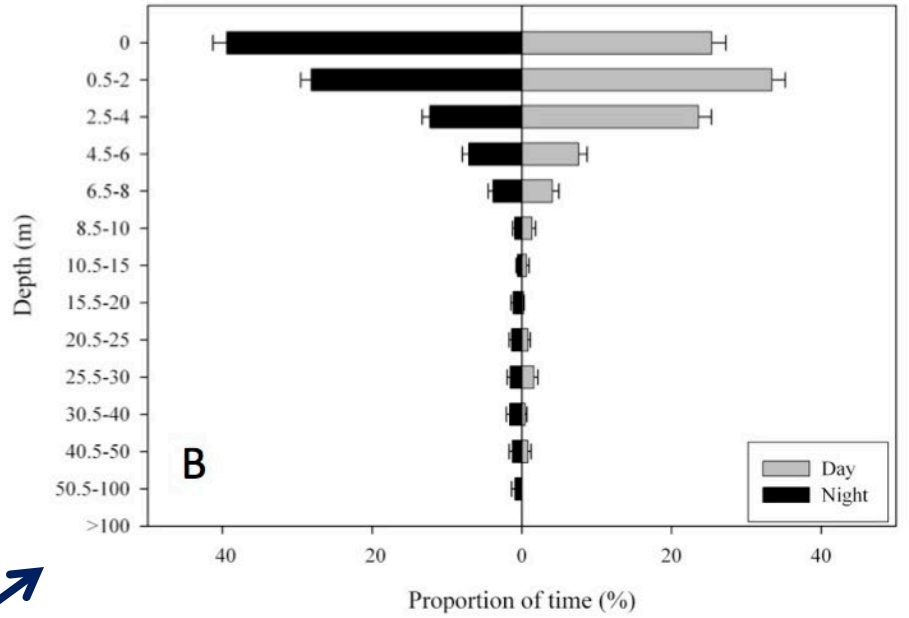




High encounter rates with commercial trawl and longline fisheries

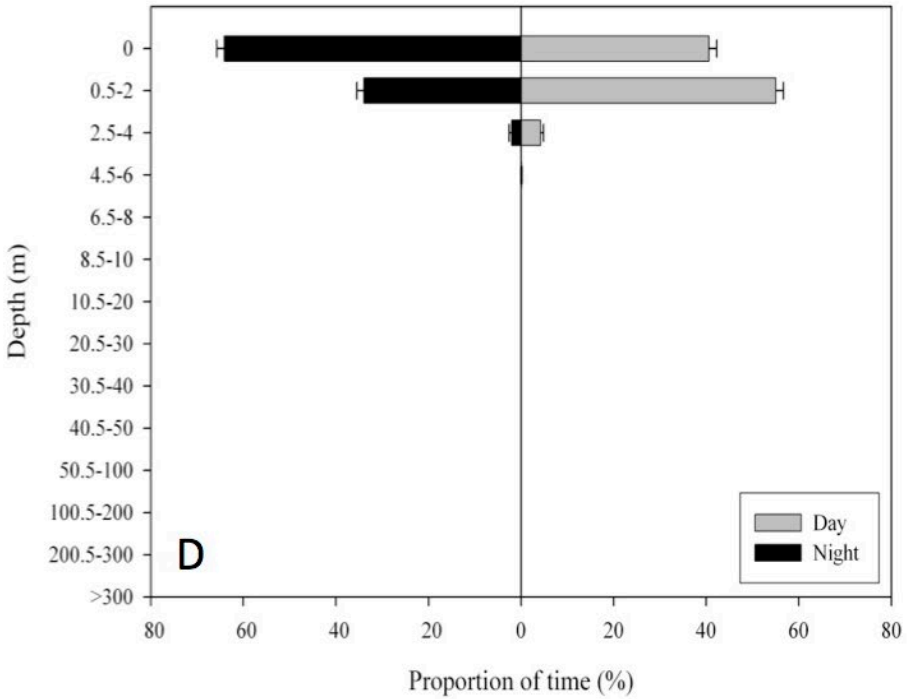
Florida Keys (FKNMS): Edge of continental shelf





Shelf Edge Pattern
(depth use to 40 fathoms)

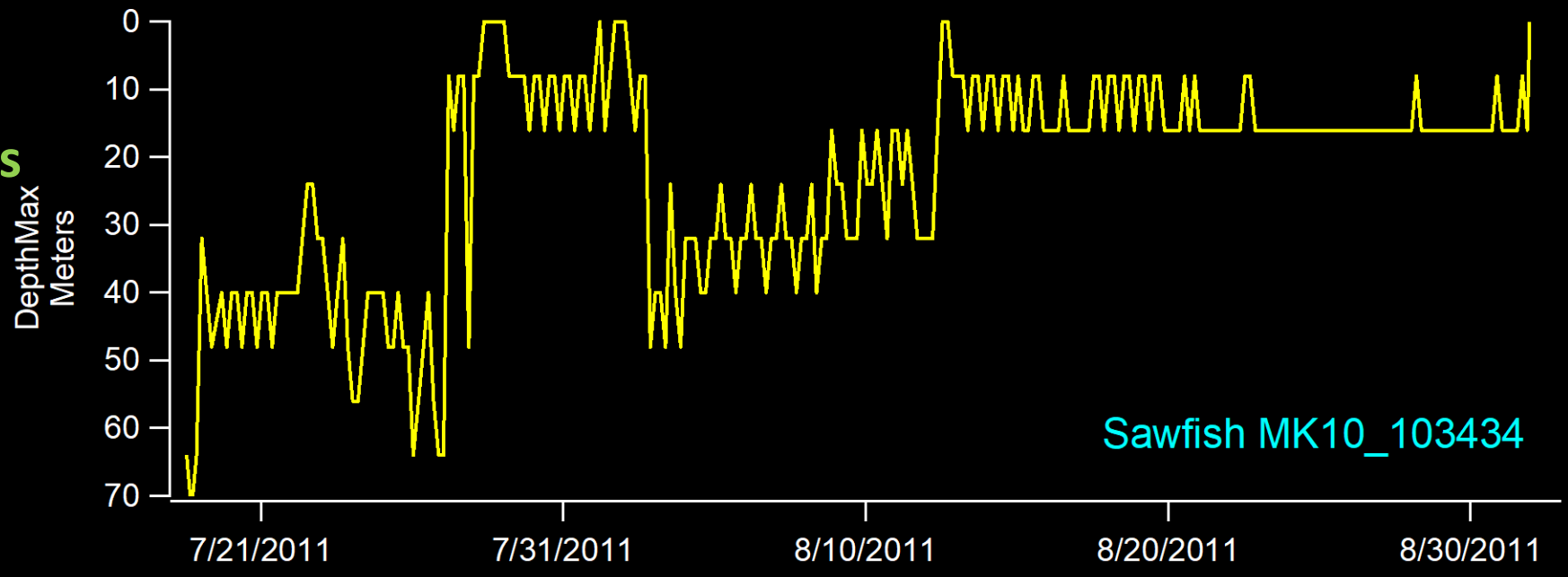
Florida Bay Pattern
(mostly <3 fathoms)



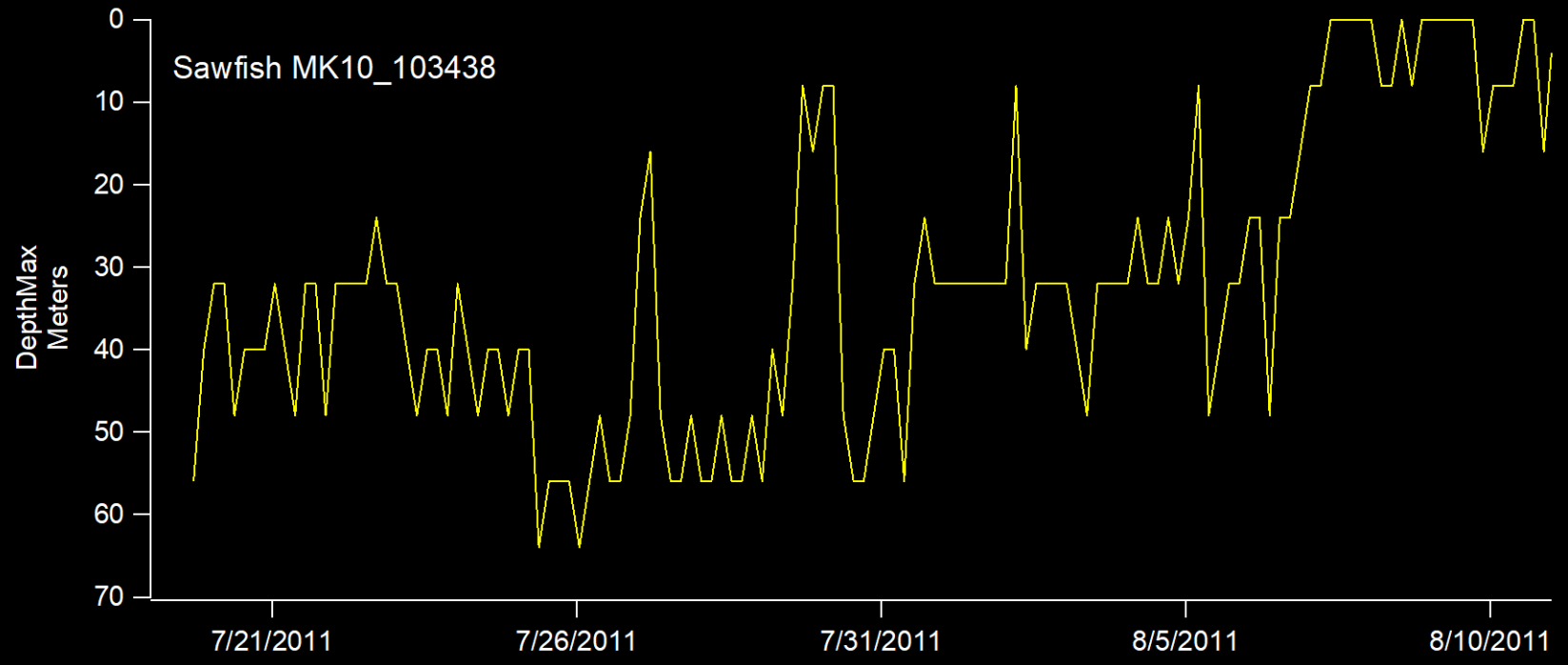
Carlson et al. (2013)
Aquatic Conservation

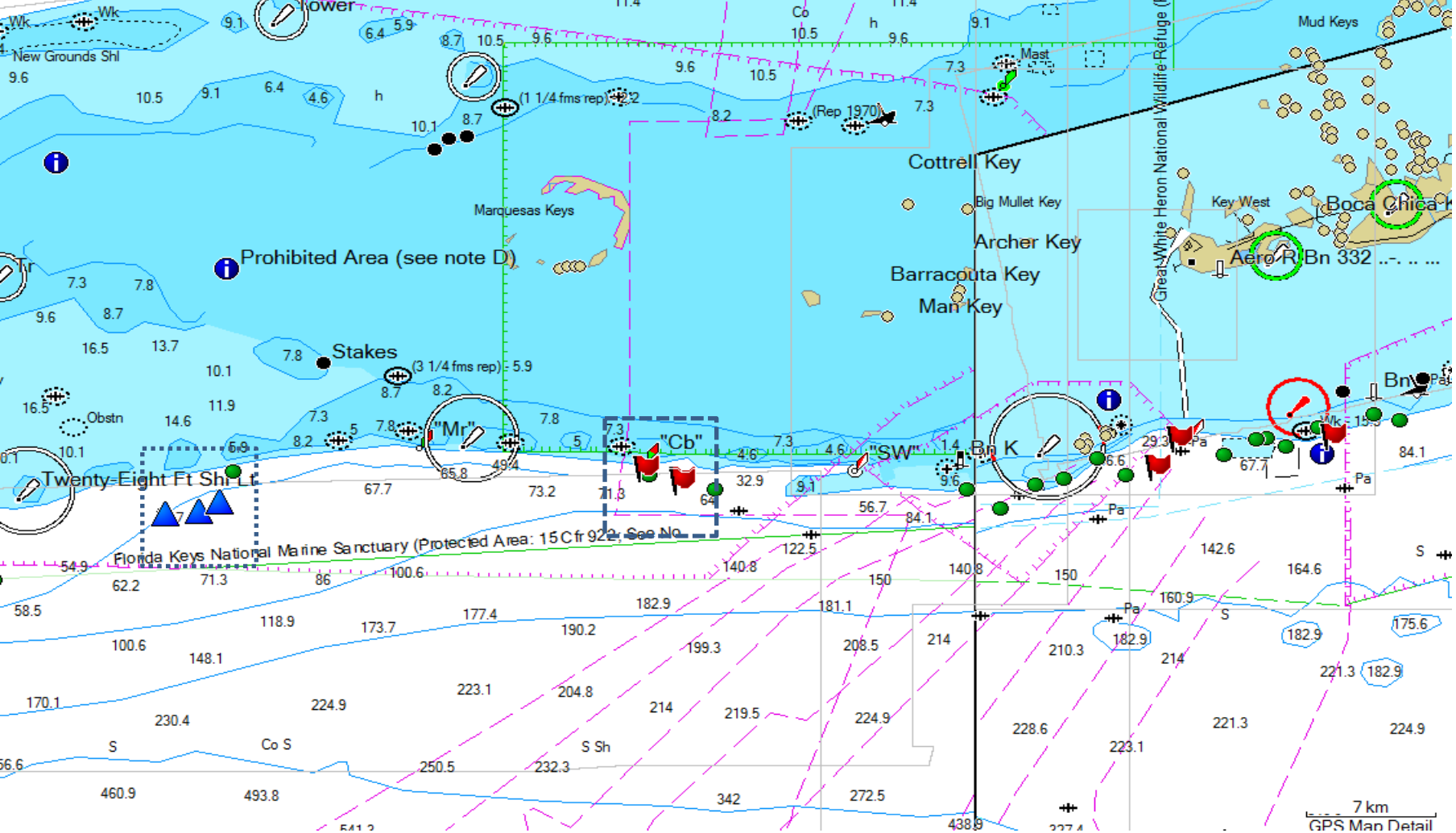
Depth tracks from PSATs of two sawfish showing use of shelf-edge habitats

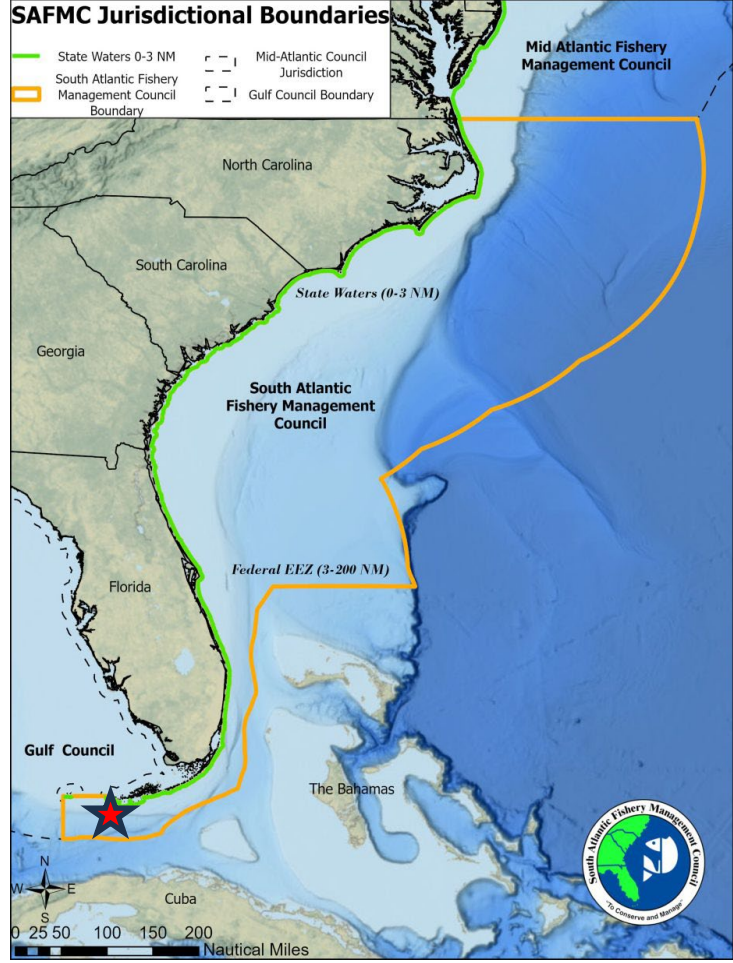
381 cm TL male (off Key West)



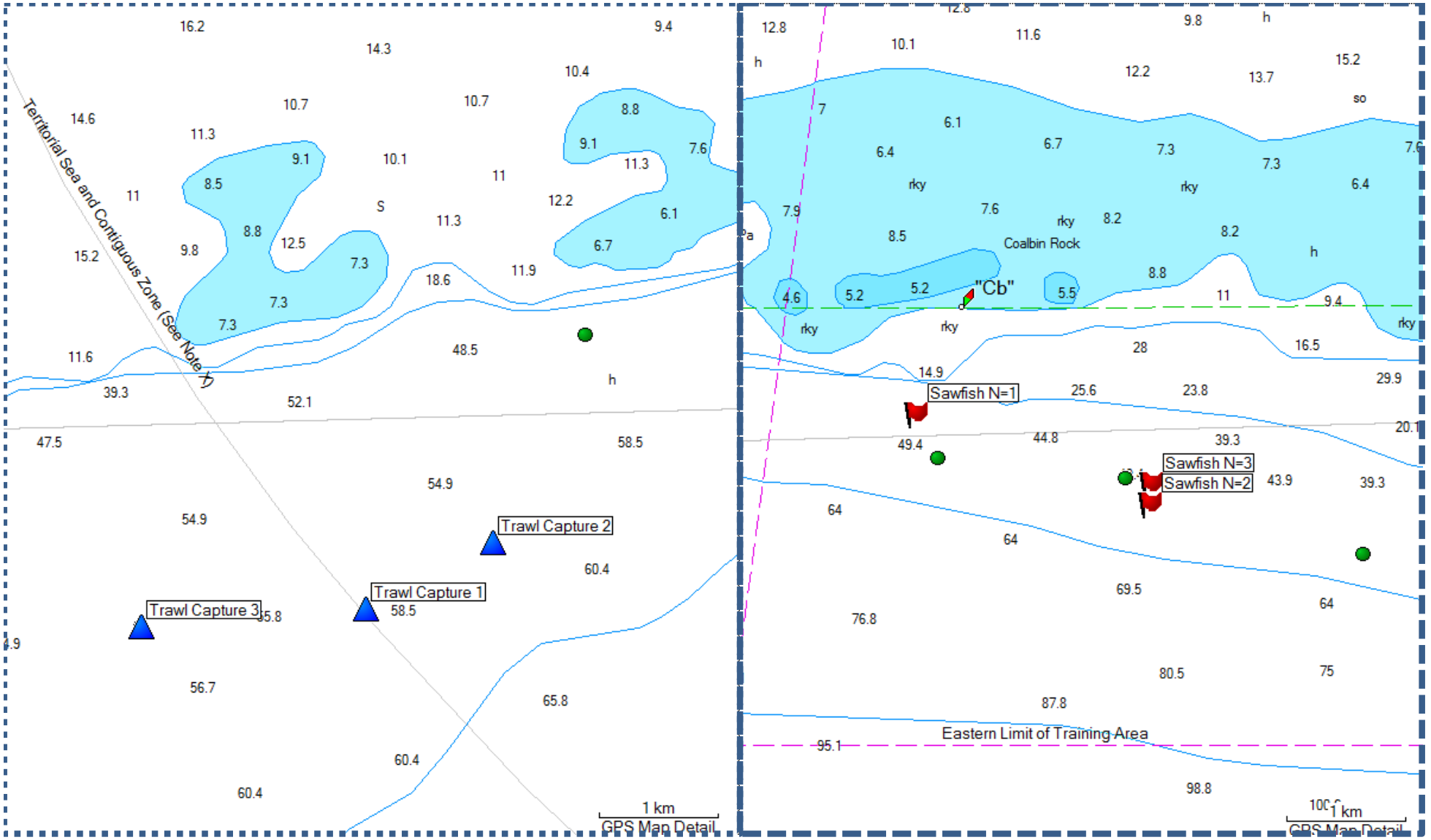
368 cm TL Female (off Marquesas)







Areas of high encounter rates with adult sawfish along the shelf edge from Key West to the Dry Tortugas.
Blue triangles = 3 adult sawfish caught in commercial shrimp trawls in March 2009 (Observer data from the NSED)
Red flags = 9 adult sawfish captured and tagged by FSU researchers over four days in July 2011.



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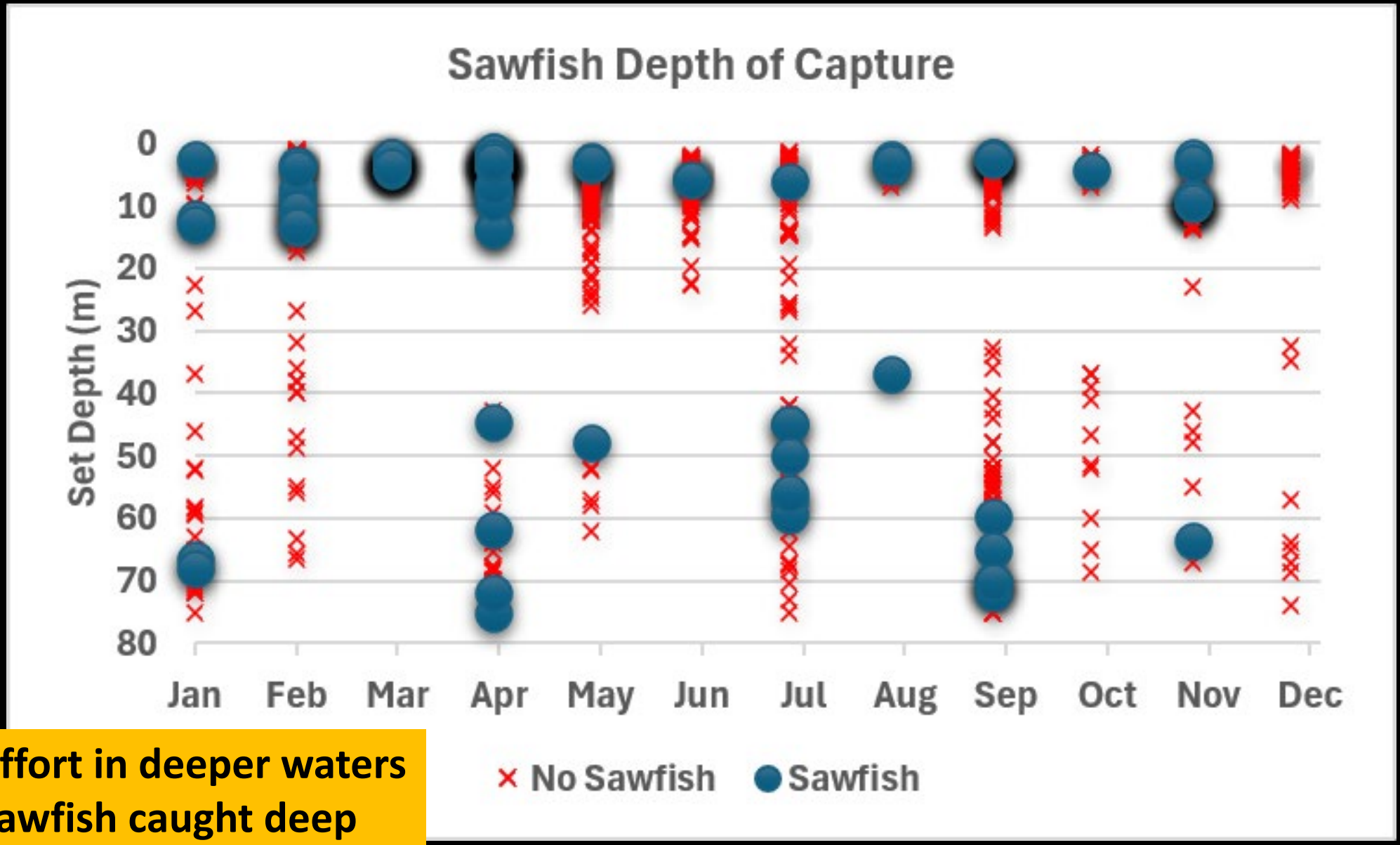
FLORIDA
1,291 sets (2011-2026)
161 large sawfish caught
5,193 total sharks and rays

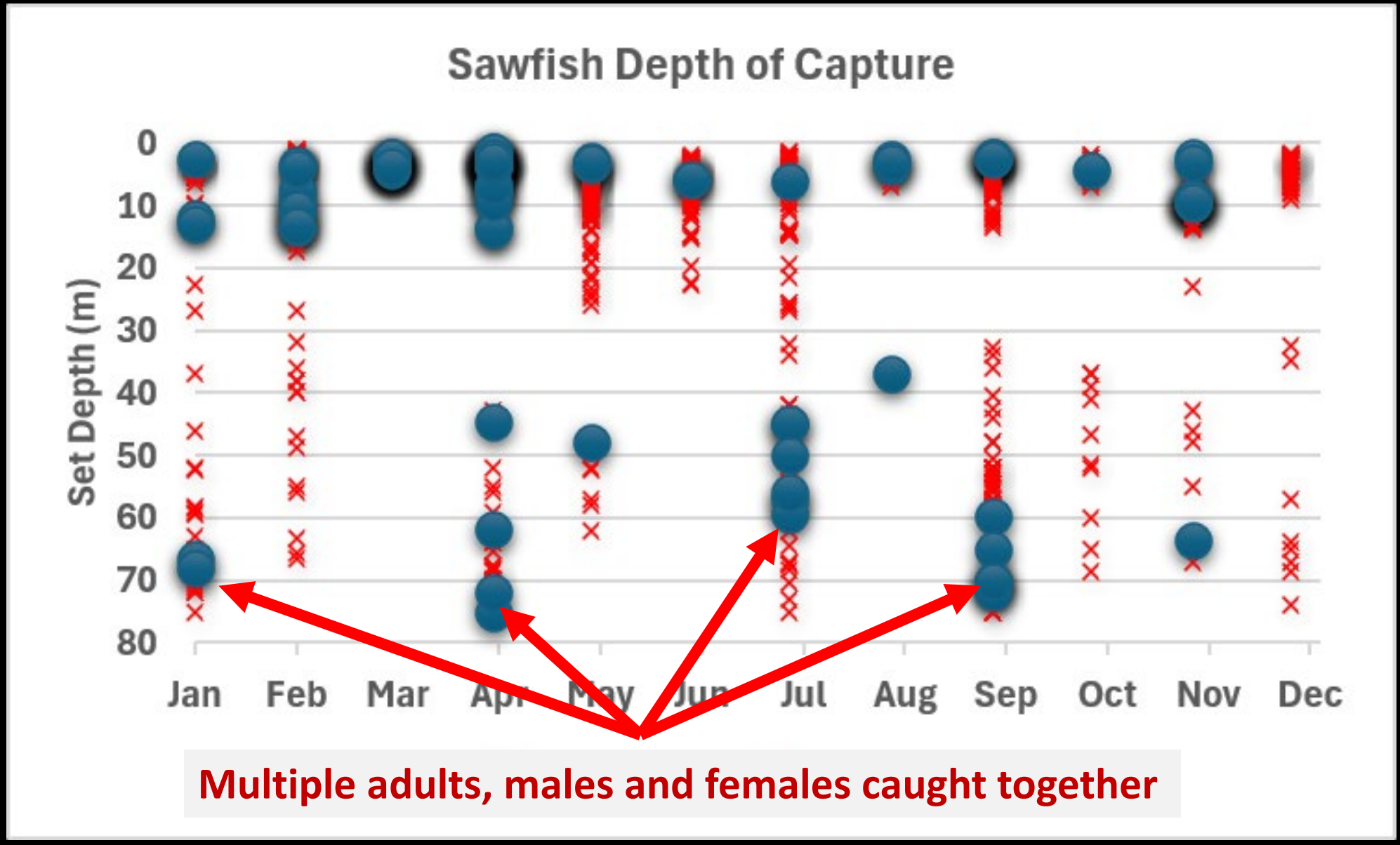
Fishery-independent longlines:

50 hooks per set
Baited with ladyfish
1-hour soak time
Gangions:
2.5m (8ft) long, 800 lb (3.2 mm) monofilament (last 25 cm doubled), 16/0 circle hooks

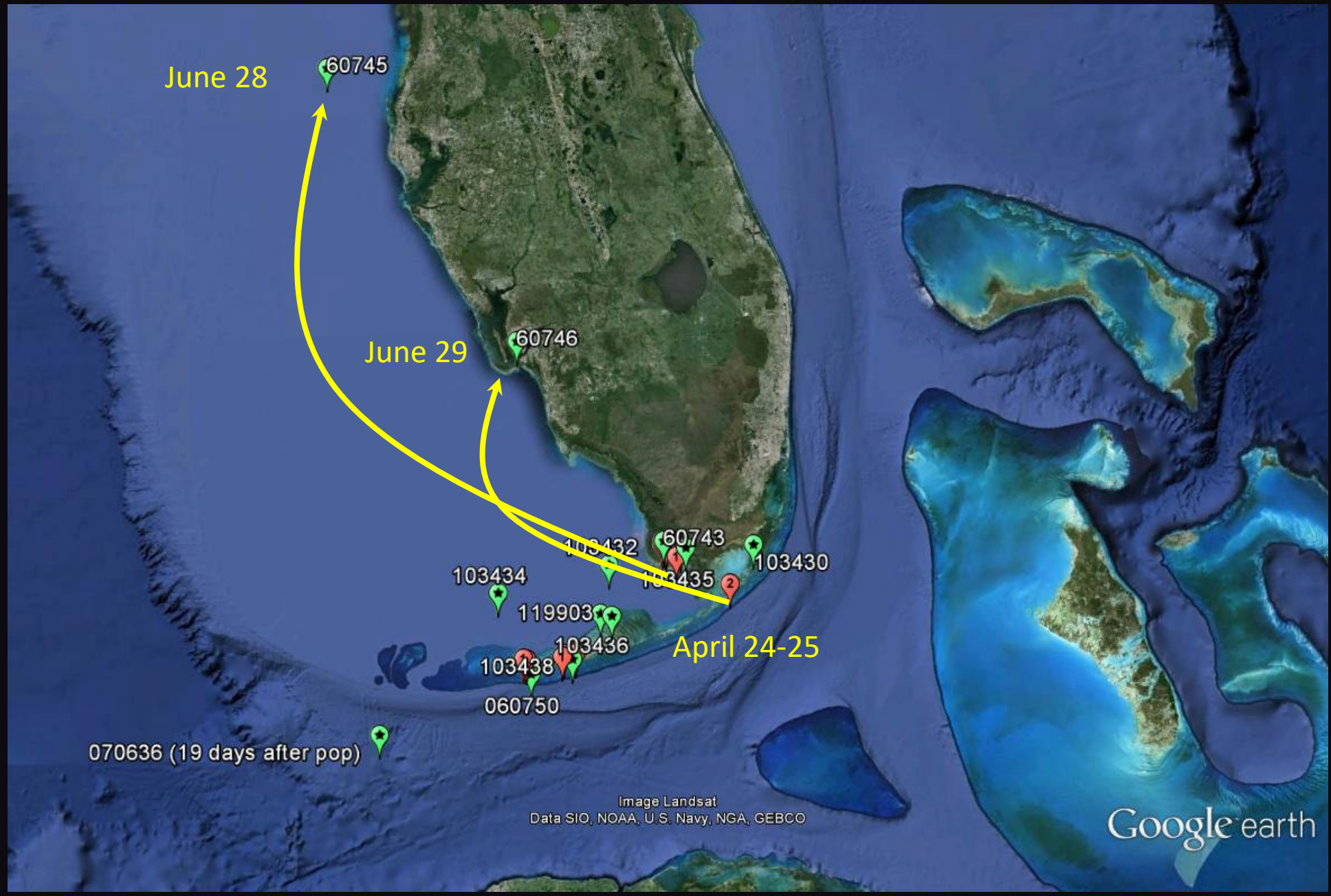


16% of effort in deeper waters
20% of sawfish caught deep

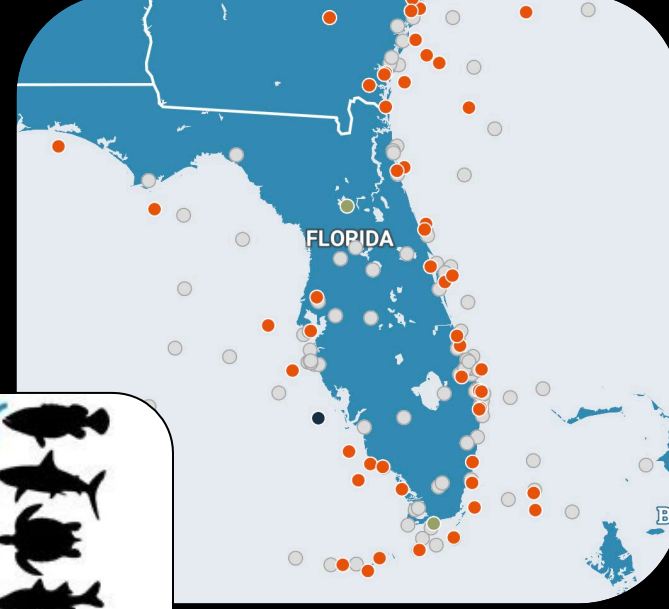
FSU fishery-independent longline survey set depths by month. 2011-2026



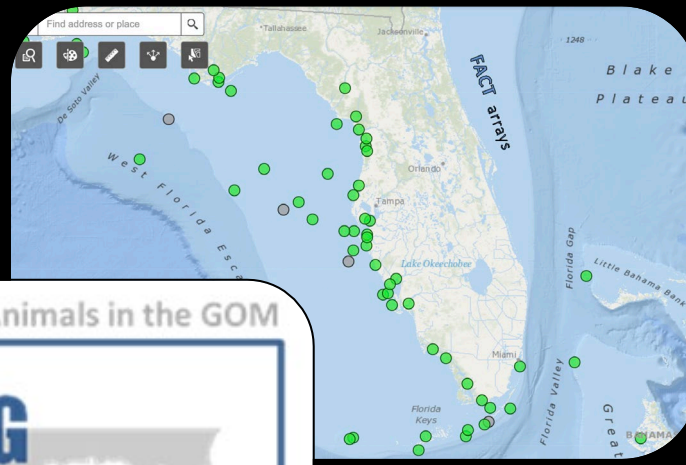
FSU fishery-independent longline survey set depths by month. 2011-2026


June 28
60745
June 29
60746
60743
103430
103434
119903
103436
103438
060750
April 24-25
070636 (19 days after pop)
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google earth

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



FACT Fish Move.



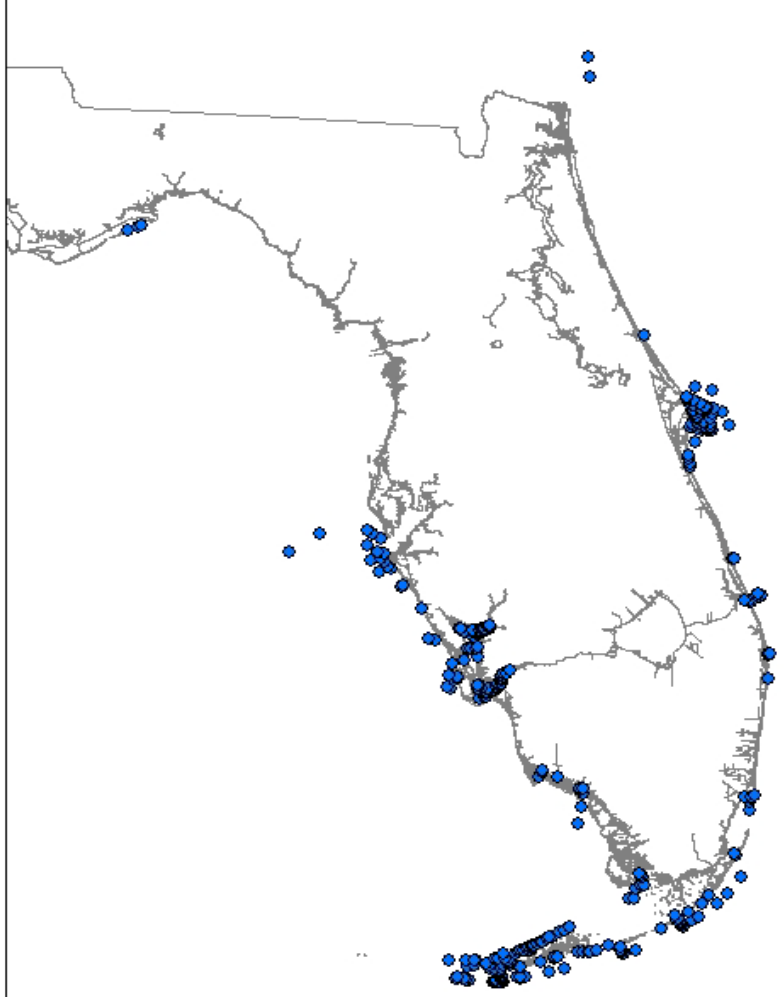
Integrated Tracking of Aquatic Animals in the GOM

iTAG

V16-20864
1-Apr-17
PP-17-134
Queen of Nassau Wreck
Male, 383 cm TL

Tallahassee
Jacksonville
Orlando
Tampa
Florida
Sanibel Island
Miami
Dry Tortugas
Nassau
The Bahamas
Straits of Florida

23 April 2017
23 April 2018
19 April 2019
Nov 2017 – March 2018
1 April 2017
29 May 2017
Nov 2017
Oct 2018-Feb 2019



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

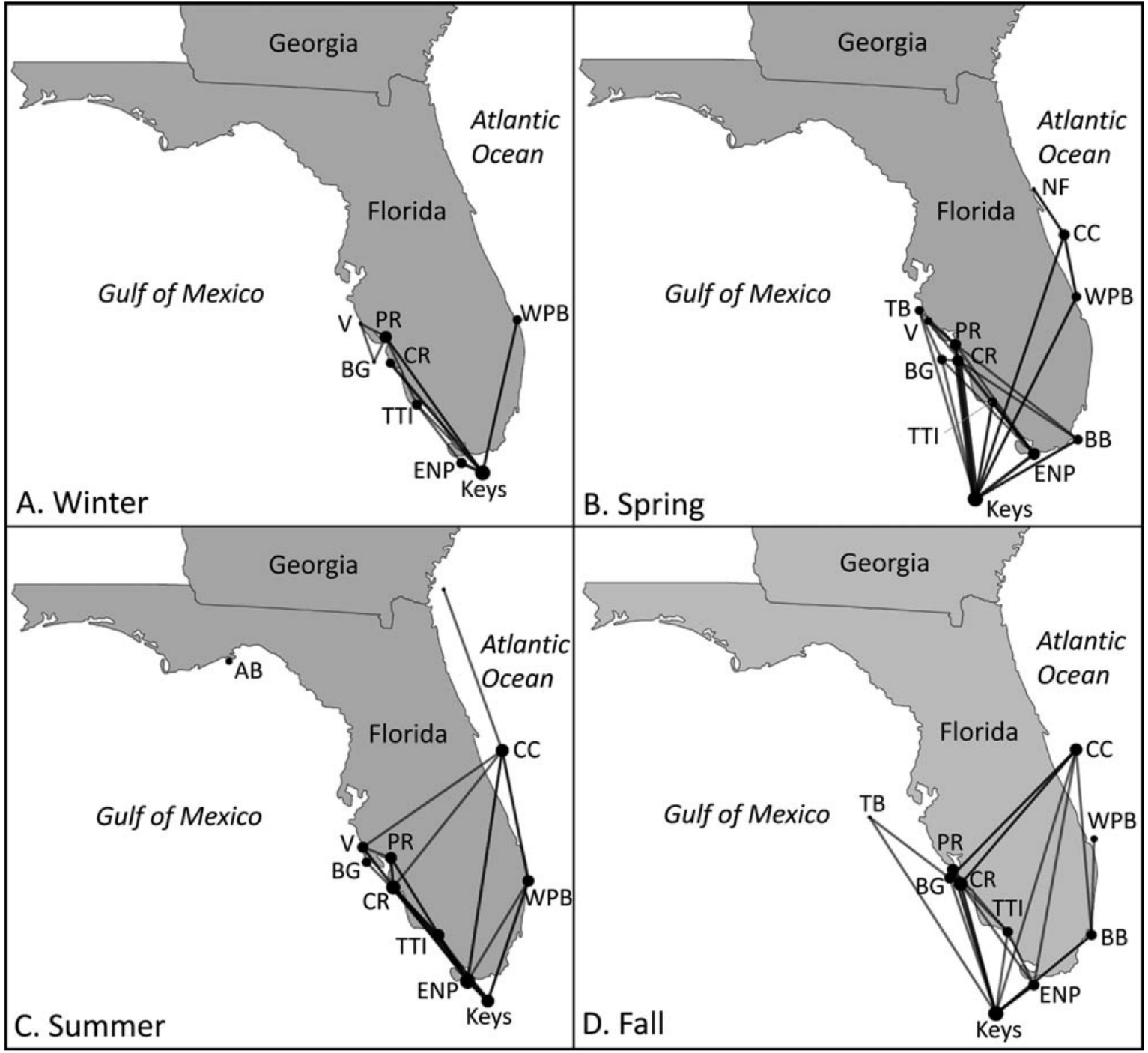
Vol. 44: 45–59, 2021
https://doi.org/10.3354/esr01088

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. Kroetz[2], Gregg R. Poulakis[3], Rachel M. Scharer[3], John K. Carlson[4], Susan Lowerre-Barbieri[5,6], Danielle Morley[7], Eric A. Reyier[8], R. Dean Grubbs[1]



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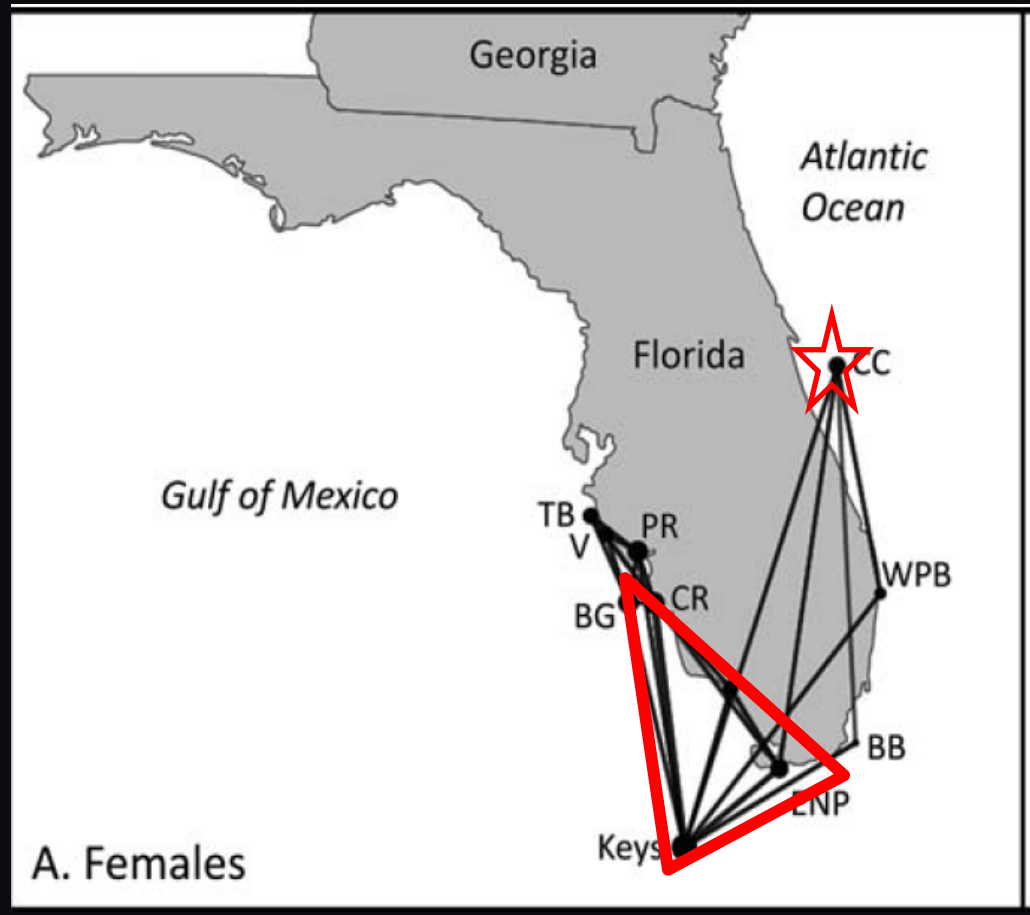

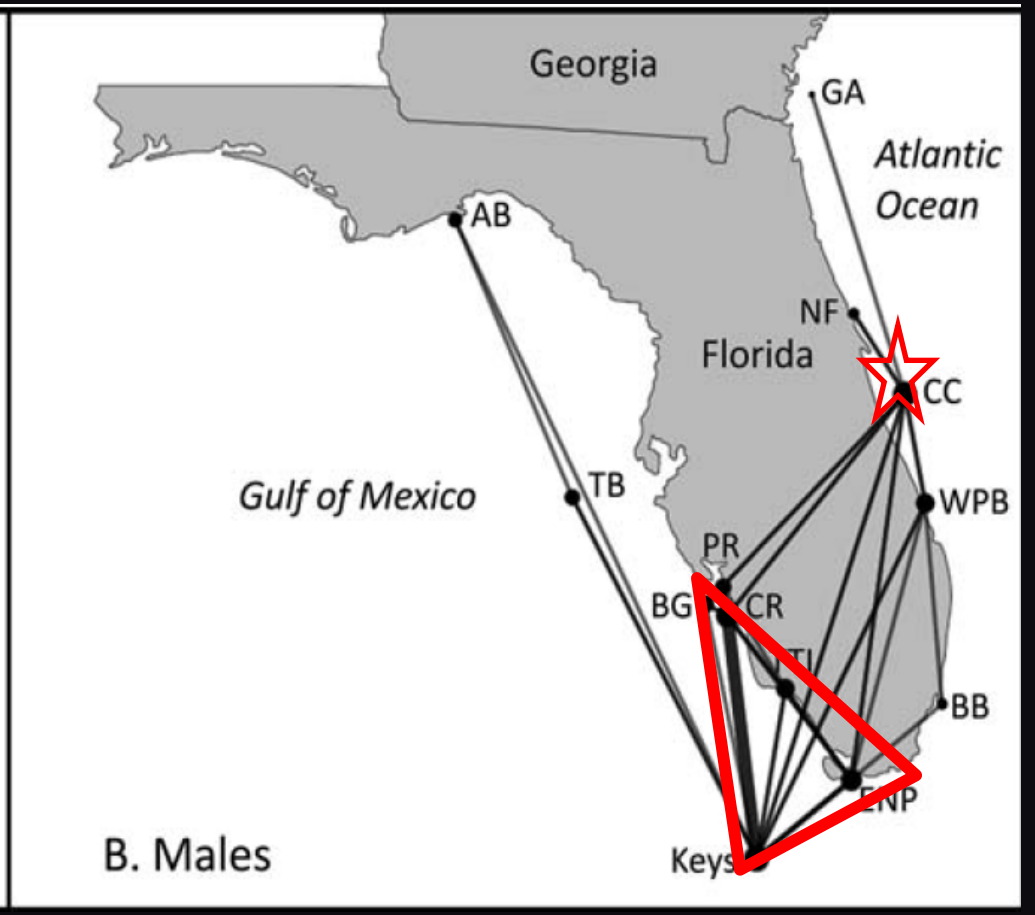

Regions containing possible Critical Habitat for adult sawfish

Possible migratory contingents

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

ENDANGERED SPECIES RESEARCH
Endang Species Res

Published January 28

OPEN ACCESS

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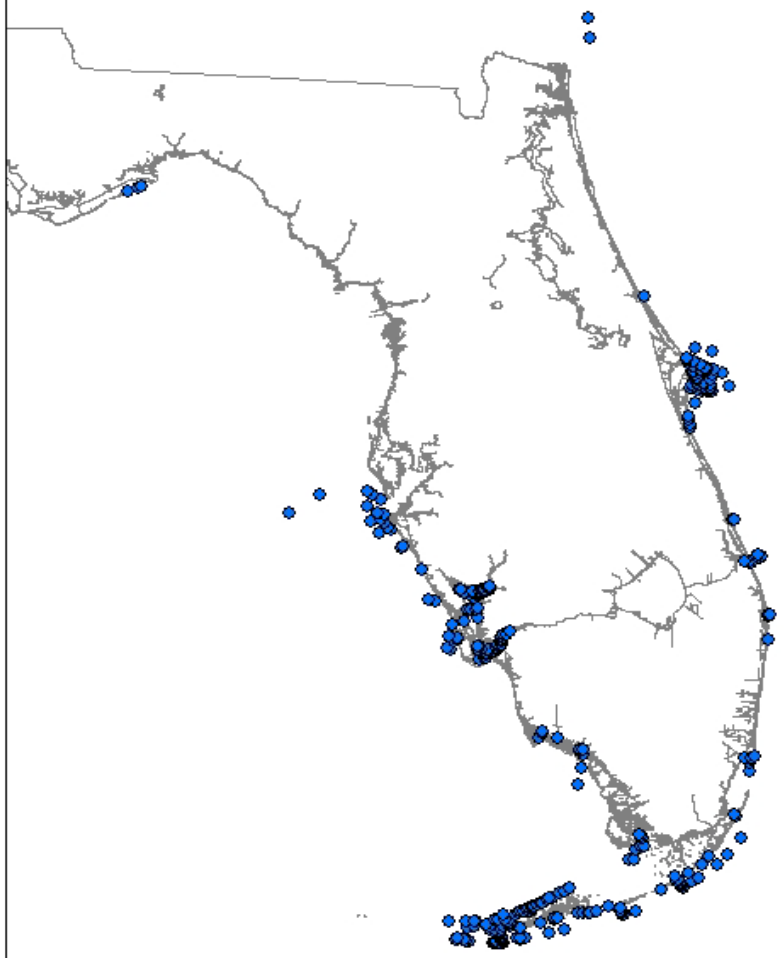
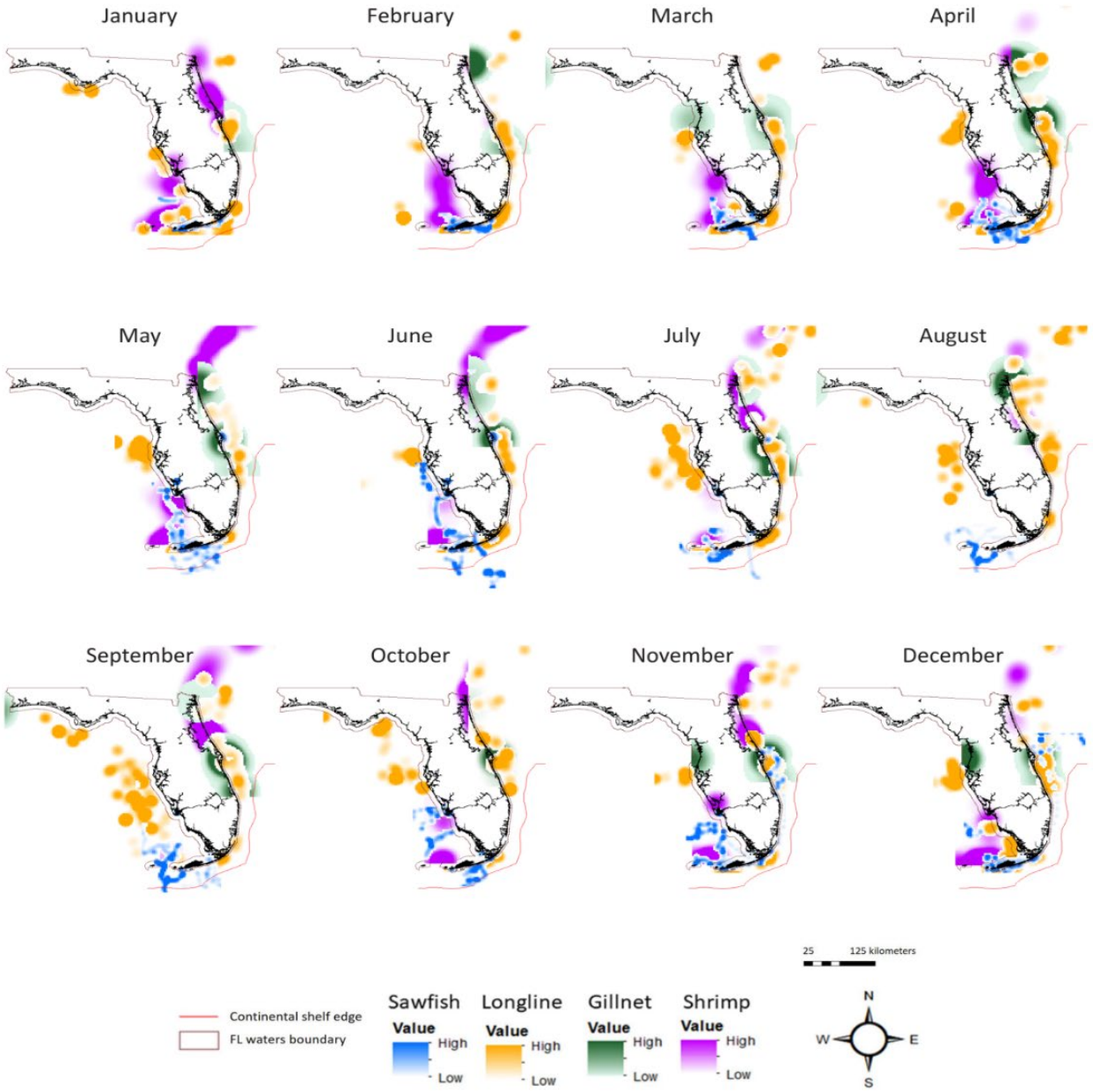


FLORIDA
43 large sawfish implanted with V16 acoustic tags
(May 2016 – April 2019)

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



Received: 1 April 2021 | Revised: 22 November 2021 | Accepted: 8 December 2021

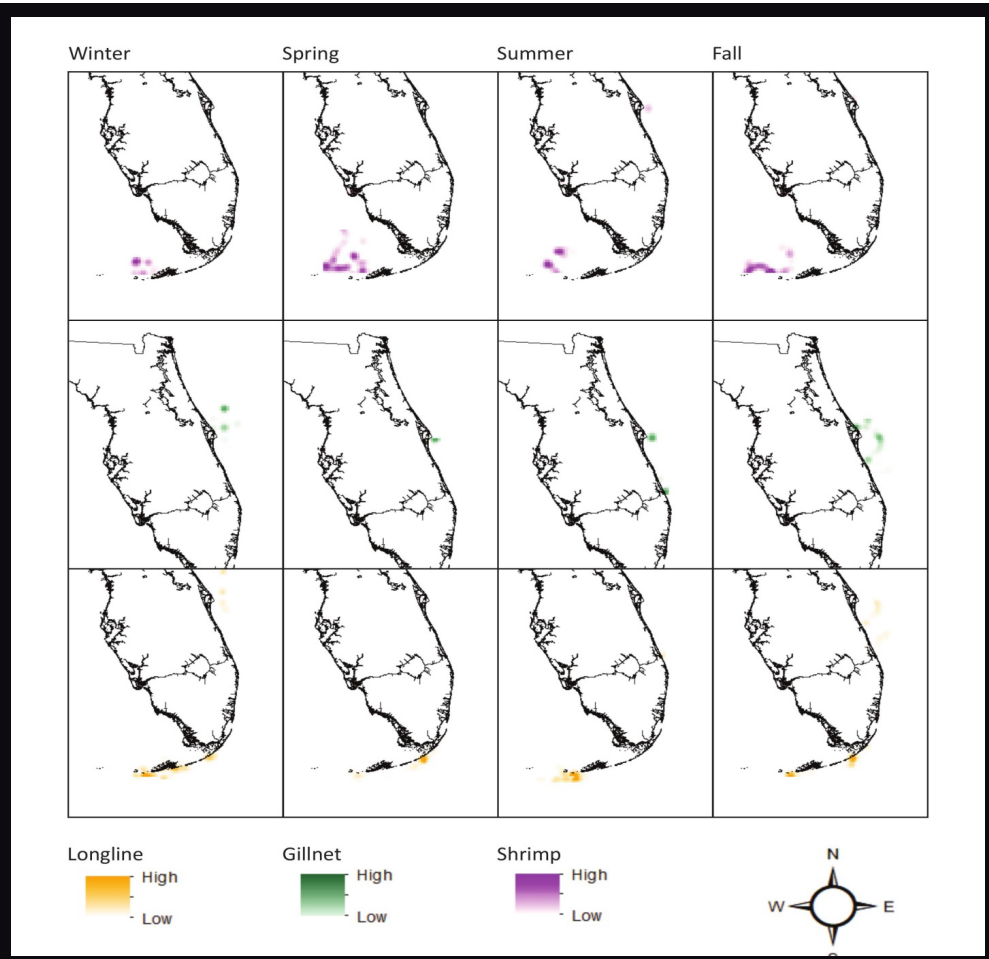
DOI: 10.1002/aqc.3777

RESEARCH ARTICLE

WILEY

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

Jasmin Graham[1] | Andrea M. Kroetz[2,3] | Gregg R. Poulakis[4] | Rachel M. Scharer[4] | John K. Carlson[3] | Susan K. Lowerre-Barbieri[5,6] | Danielle Morley[7] | Eric A. Reyier[8] | R. Dean Grubbs[1]



Stress Physiology

Vol. 36: 121–135, 2018
https://doi.org/10.3354/esr00892

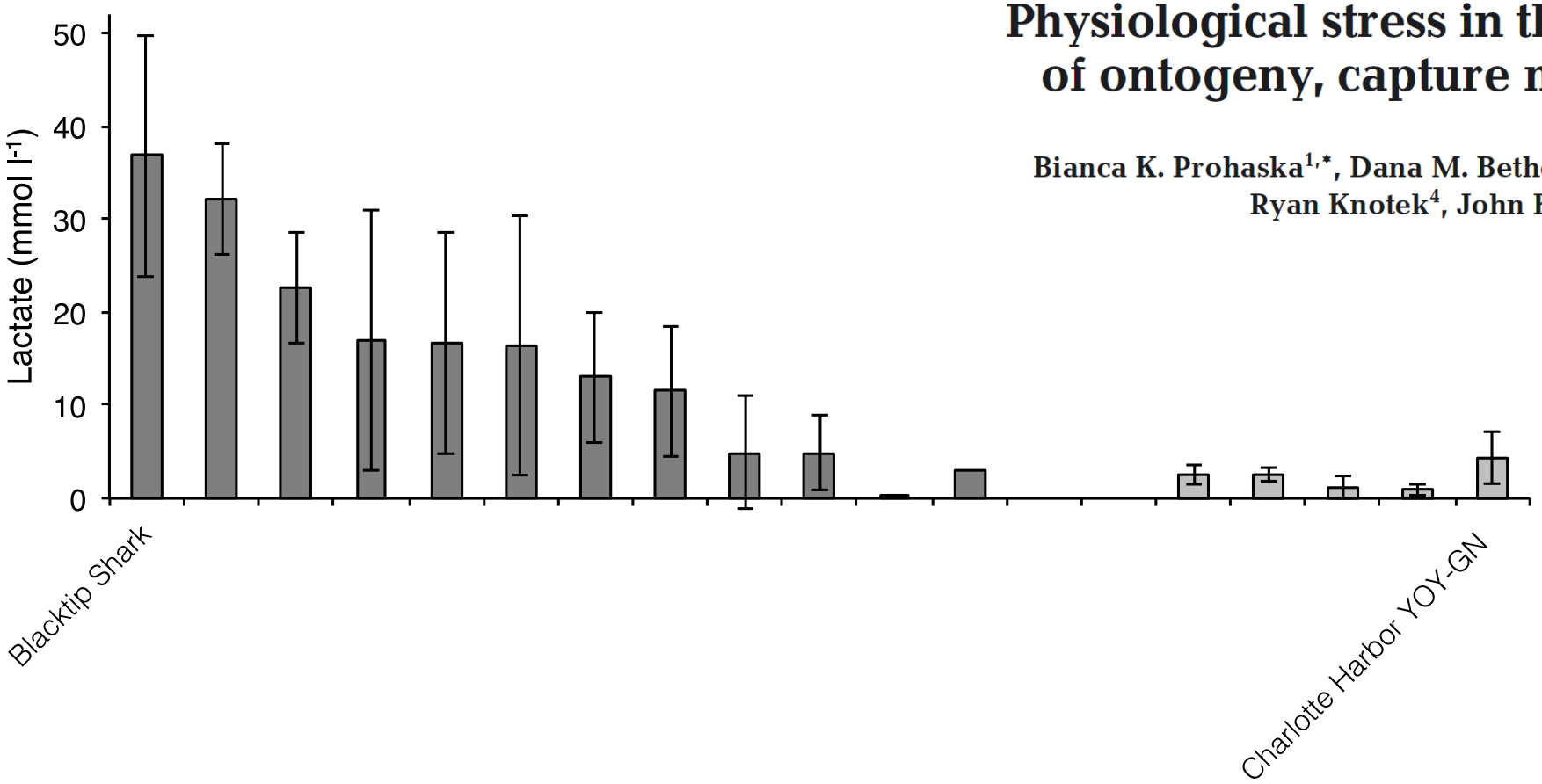
ENDANGERED SPECIES RESEARCH
Endang Species Res

Published June 29

Contribution to the Theme Section 'Biology and ecology of sawfishes'

Physiological stress in the smalltooth sawfish: effects of ontogeny, capture method, and habitat quality

Bianca K. Prohaska[1,*], Dana M. Bethea[2], Gregg R. Poulakis[3], Rachel M. Scharer[3], Ryan Knotek[4], John K. Carlson[5], R. Dean Grubbs[1]



Lactate and HCO_3 are very low (=unstressed) in longline and rod and reel
No data for trawl capture (lack of observers to collect samples)

29 June 2017
17 July 2017

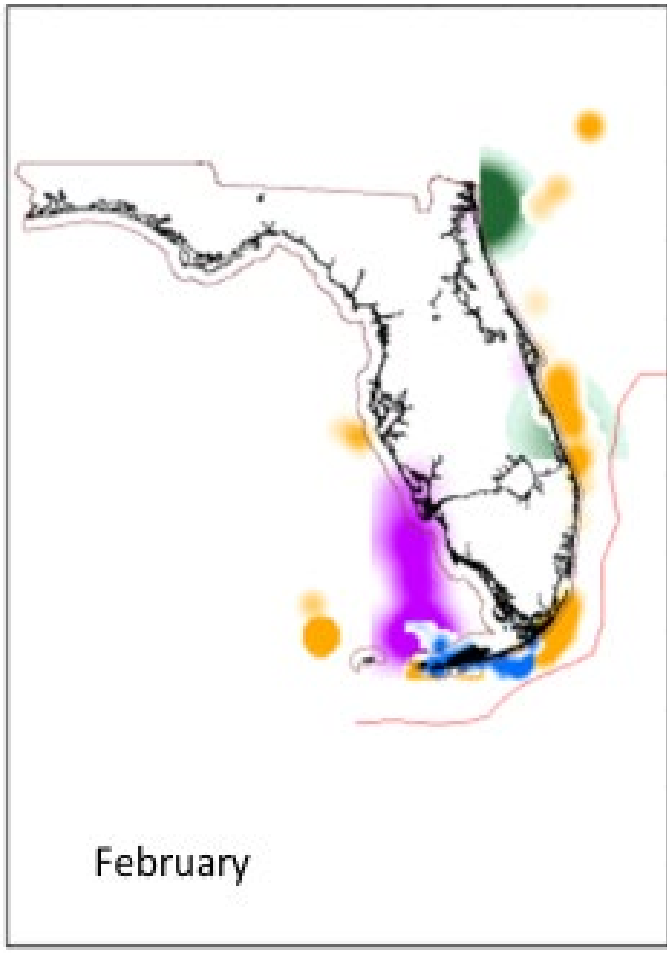
08 May – 08 June 2017

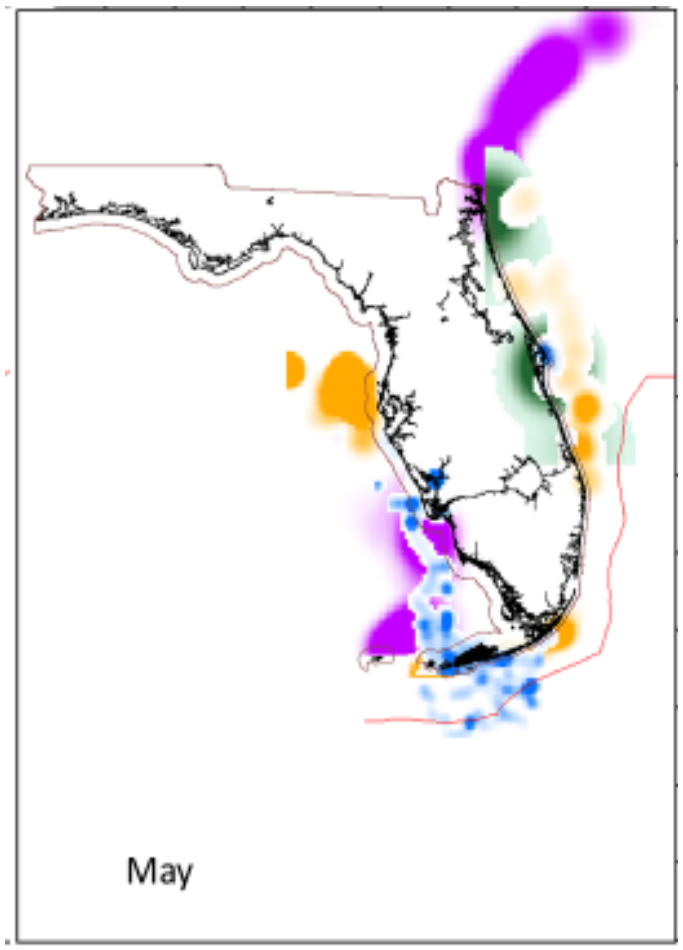
14 April 2017

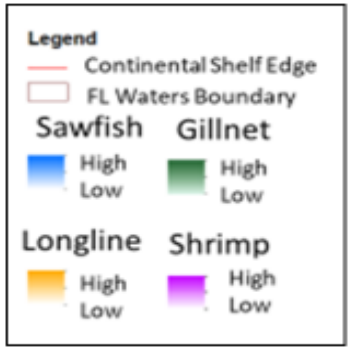
Tallahassee
Jacksonville
Orlando
Tampa
Florida
Sanibel Island
Miami
Nassau
The Bahamas
Straits of Florida

V16-20857
14-Apr-17
PP-17-198
near Sugarloaf Key
Male, 407 cm STL

Google Earth







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FLORIDA

161 large sawfish caught

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

>200 incl. FWC and NOAA tagged

FLORIDA STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

INVESTIGATING THE BEHAVIORAL ECOLOGY OF IMPERILED BATOIDS

IN THE UNITED STATES GULF OF MEXICO AND FLORIDA KEYS

By

ASHLEY MACKENZIE DAWDY

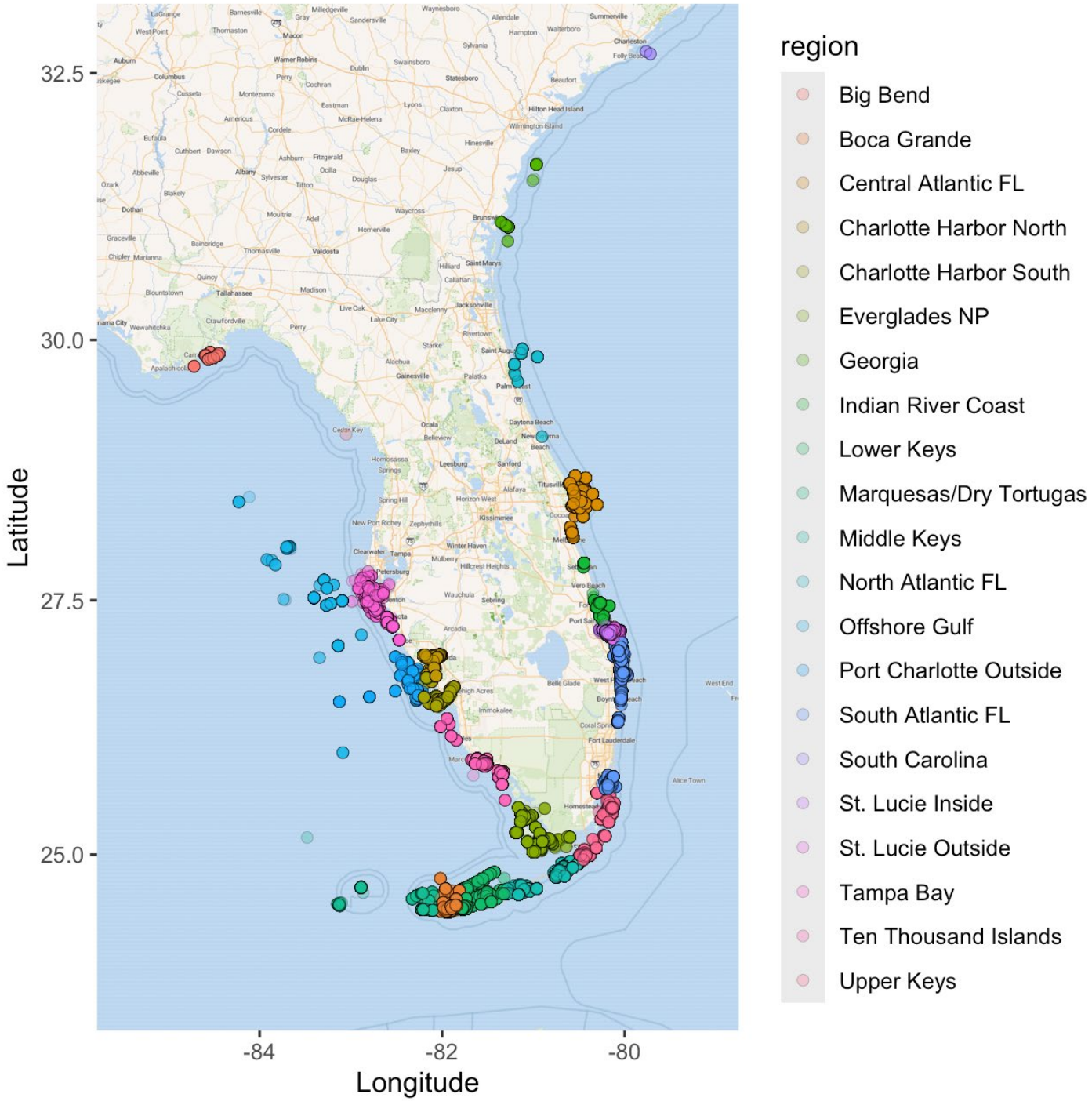
A Dissertation submitted to the
Department of Biological Science
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

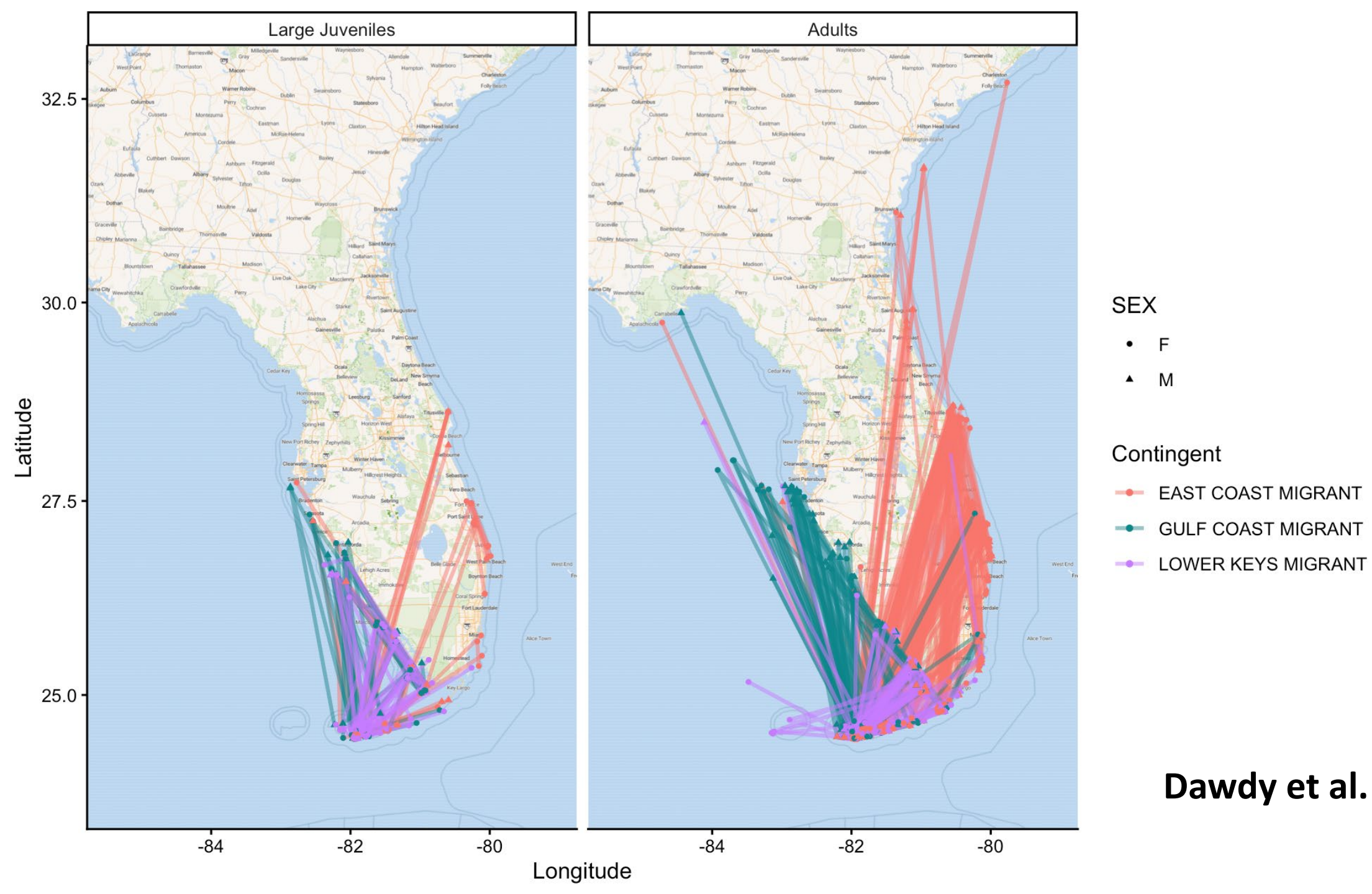
2026

CHAPTER 2

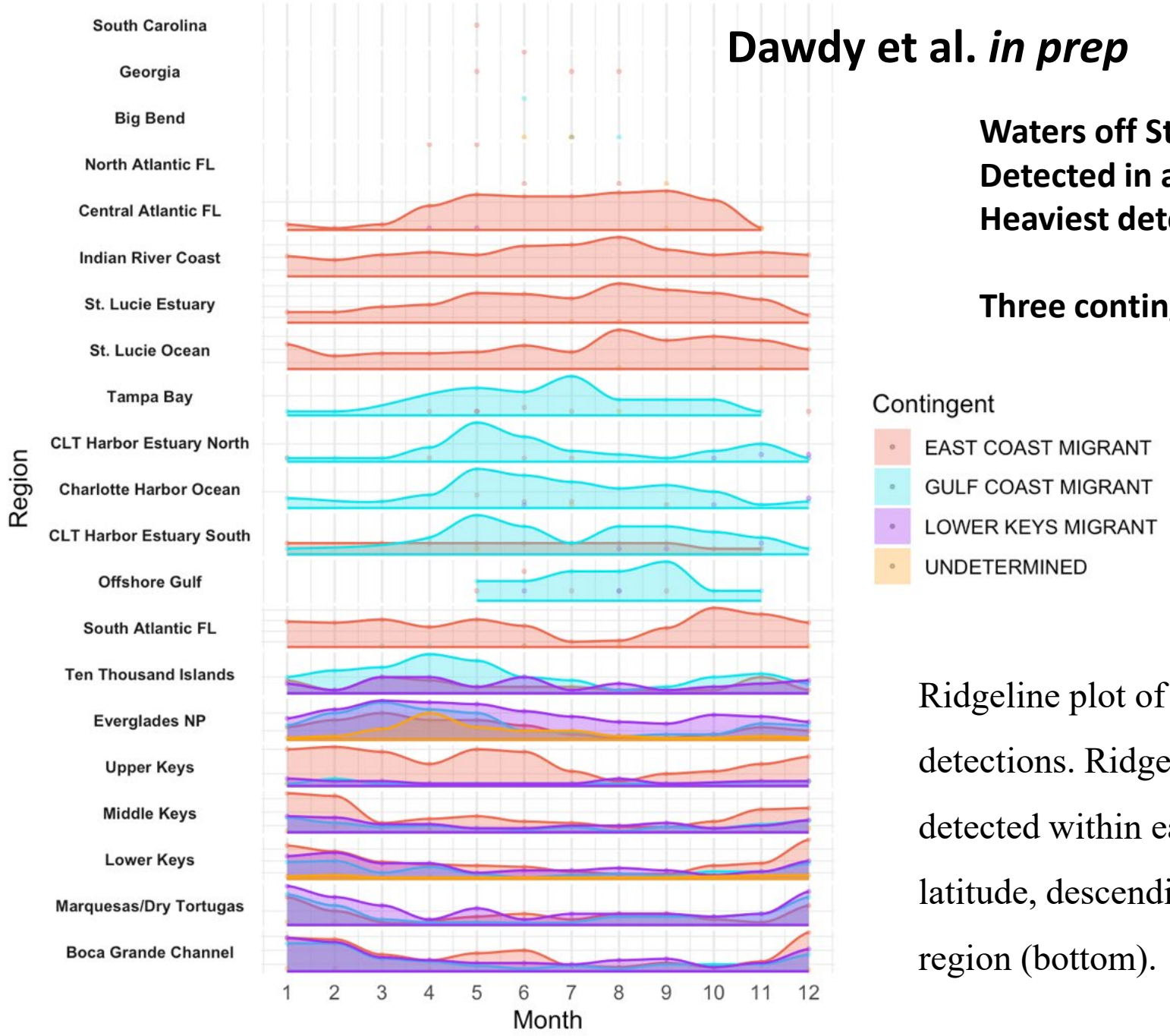
MIGRATORY BEHAVIOR OF THE CRITICALLY ENDANGERED SMALLTOOTH SAWFISH (PRISTIS PECTINATA) IN THE SOUTHEAST UNITED STATES

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





Dawdy et al. *in prep*

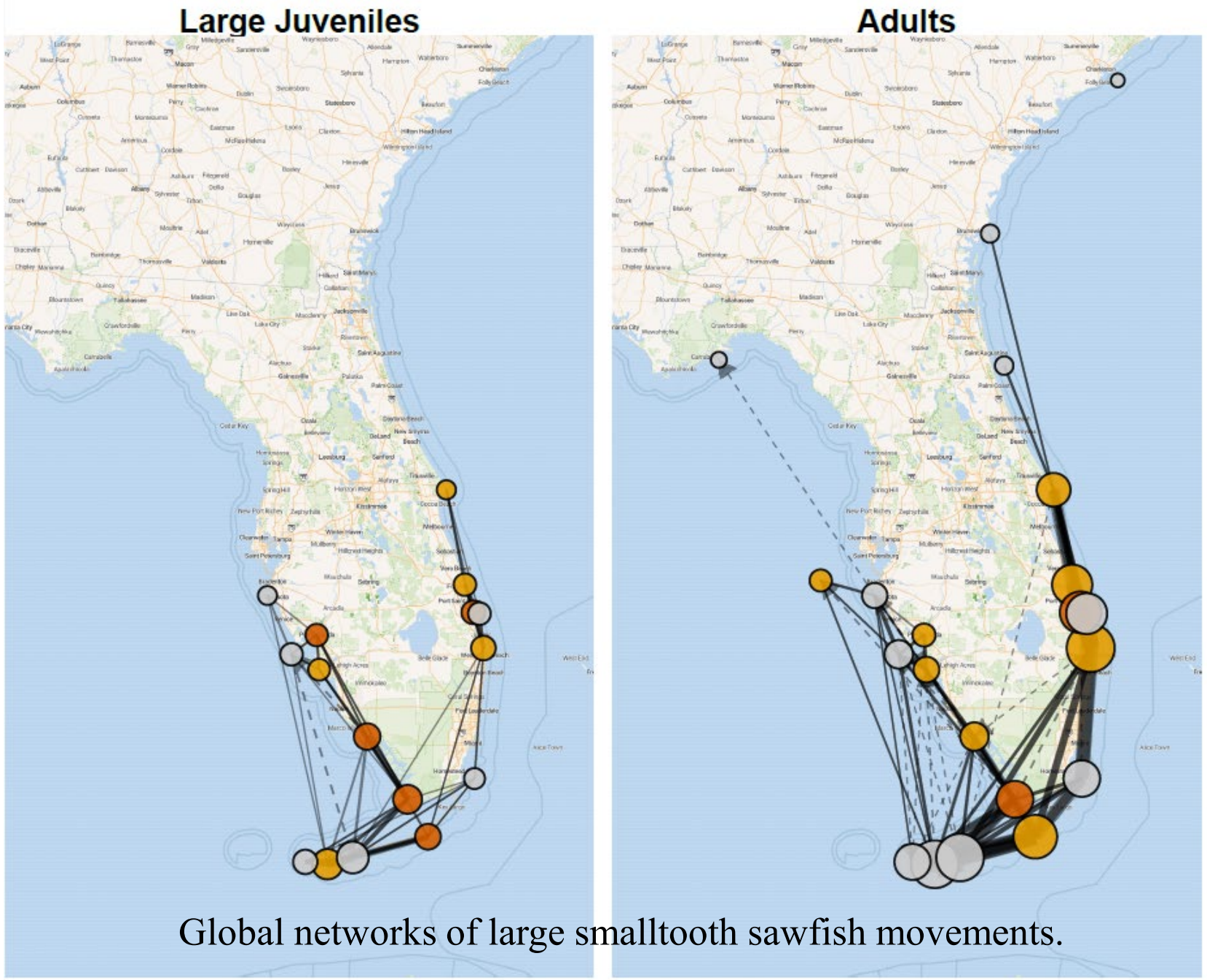


Dawdy et al. *in prep*

Waters off St. Lucie to Cape Canaveral
Detected in all months
Heaviest detections April-October

Three contingents mix in the Keys

Ridgeline plot of all large juvenile and adult Smalltooth Sawfi detections. Ridge height indicates number of unique sawfish detected within each region per month. Regions are ordered by latitude, descending from northernmost (top) to southernmost region (bottom).



Global networks of large smalltooth sawfish movements.

Dawdy et al. *in prep*

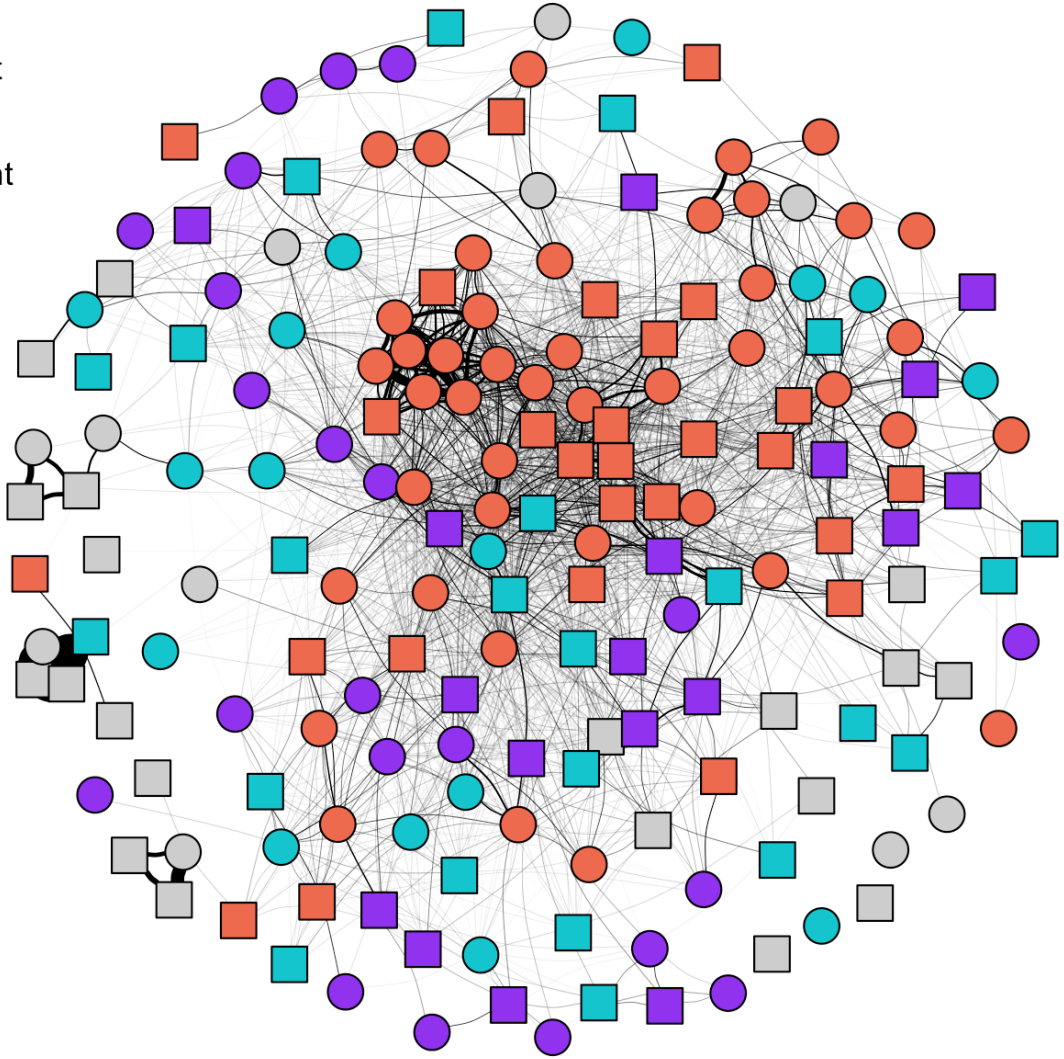
Contingent

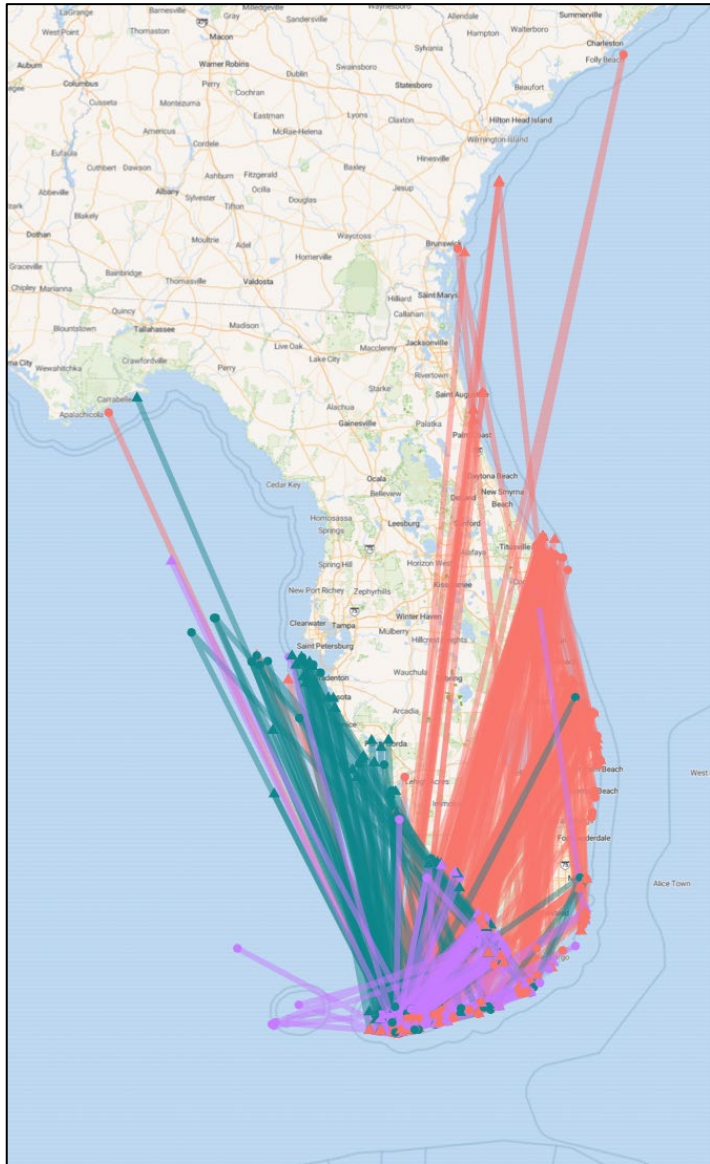
- East Coast Migrant
- Gulf Coast Migrant
- Lower Keys Migrant
- Undetermined

Sex

- Female
- Male

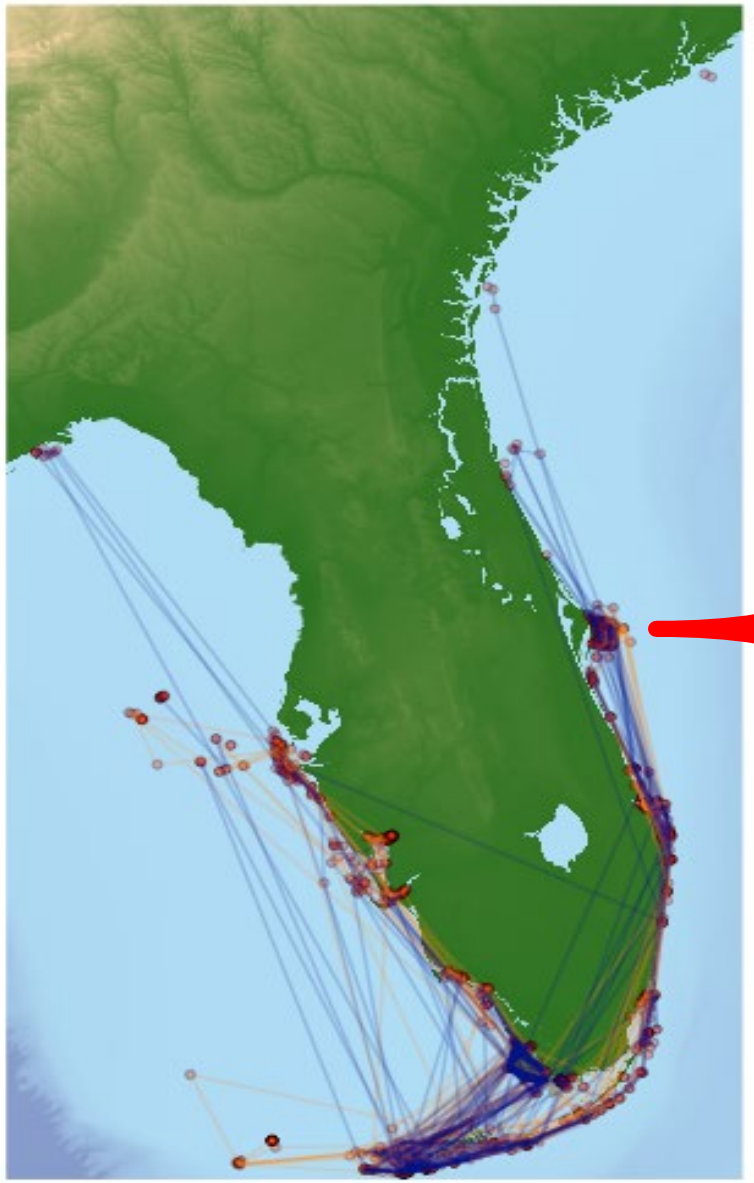
Dawdy et al. *in prep*



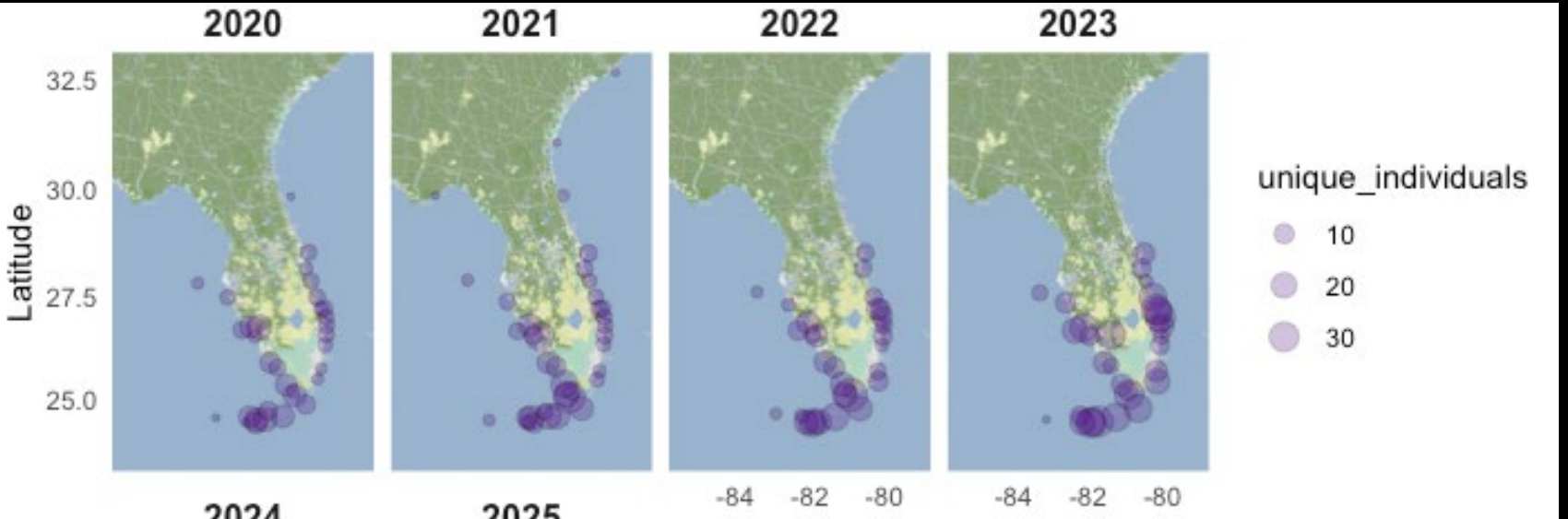


Social network of tagged large smalltooth sawfish (n = 180) based on observed associations using acoustic telemetry. Nodes represent individual fish and edges represent co-occurrence strength. Edge width is proportional to the strength of association between individuals

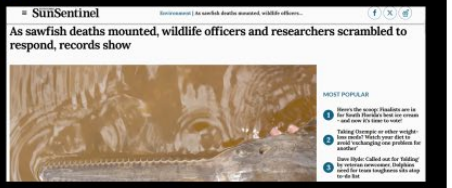
MATURE

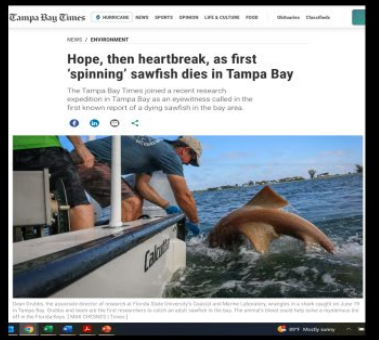


station	latitude	longitude	n_detections	Tagged Sawfish
CC15	28.60068	-80.58413	996	17
CC14	28.57129	-80.56733	886	16
MR2B	28.15475	-80.57651	174	15
MR1B	28.16898	-80.57968	132	14
CC12	28.50905	-80.54908	318	13
CC3	28.43518	-80.56013	272	13
MR1A	28.2093	-80.59384	128	13
MR4B	28.12517	-80.56893	105	13
MR5B	28.10778	-80.56408	87	12
CC19	28.54103	-80.55106	378	11
BOEM5	28.43711	-80.42952	1298	10
MR3A	28.162	-80.582	229	10
CC11	28.47951	-80.5335	179	10
MR2A	28.18464	-80.58927	72	10



56 confirmed large sawfish mortalities
7 were tagged in previous years (12.5%)
>250 stressed individuals





Smalltooth Sawfish:
15 years of FSU research into adult movements and migration

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