

GIANT MANTA RAY

Range and Distribution



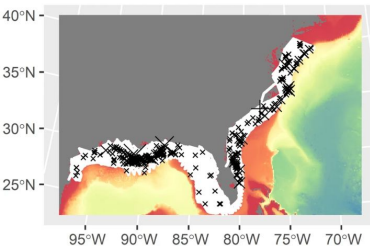
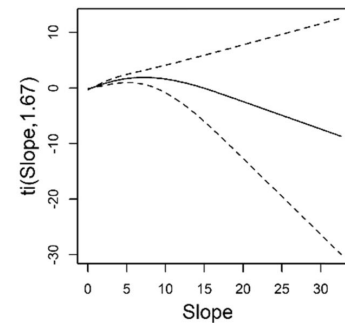
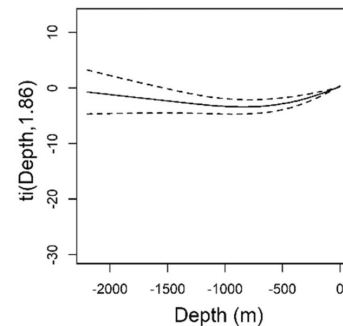
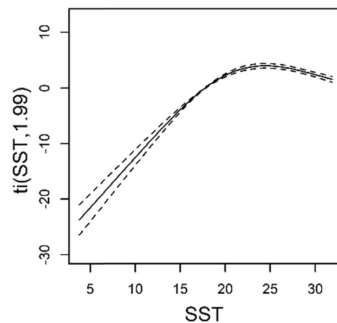
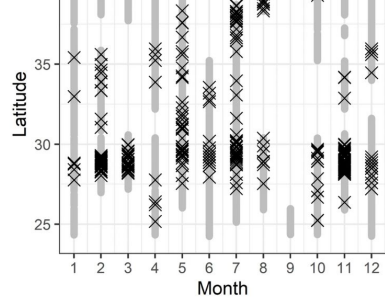
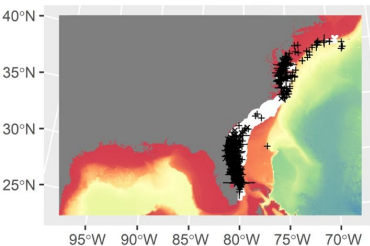
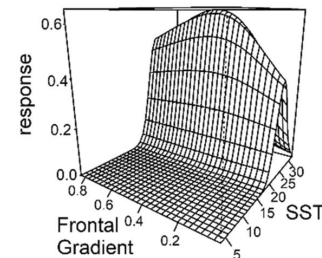
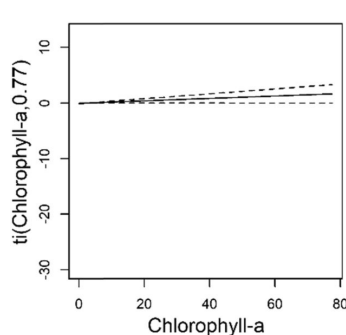
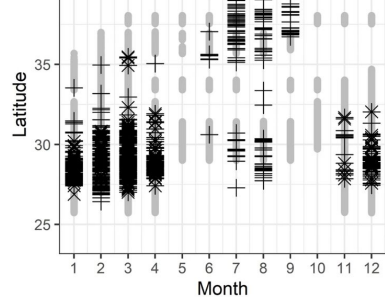
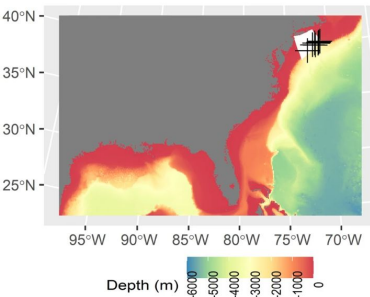
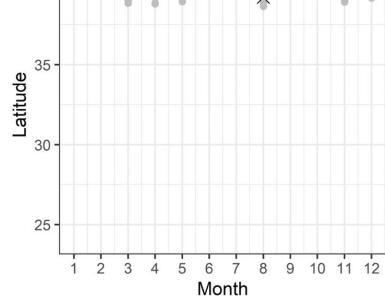
Nicholas A. Farmer, Ph.D.
Chief, Species Conservation Branch
NOAA Fisheries Southeast Regional Office

SAFMC Work Group
June 30, 2026

Global Range: Tropical, subtropical, and temperate waters, including offshore oceanic areas, coastal bays, and estuaries.

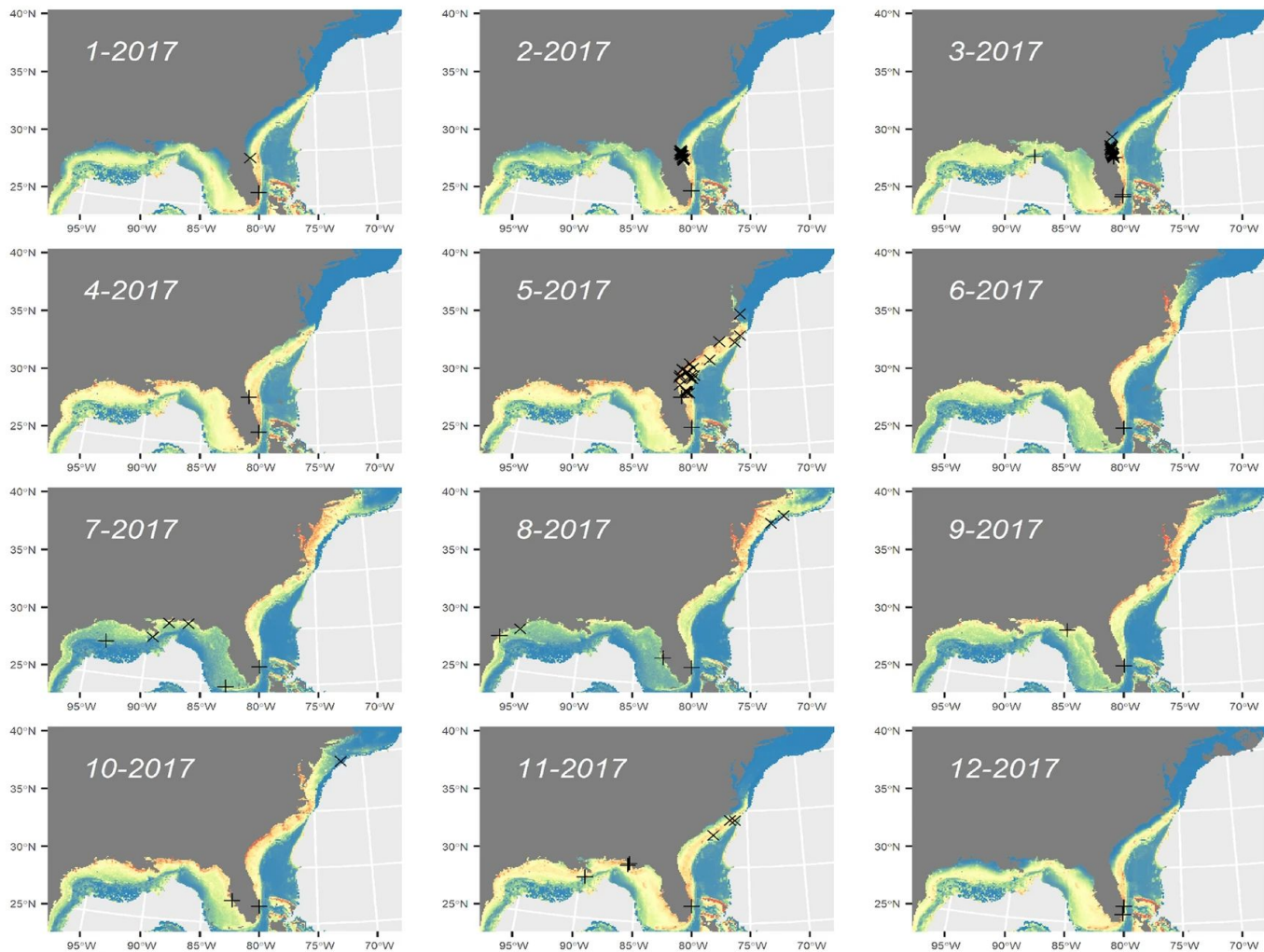


Thermal Tolerance: As low as 19°C; preferences vary by region: they frequent 19–22°C waters off the U.S. East Coast, compared to 25–30°C in areas like the Yucatan Peninsula and Indonesia.

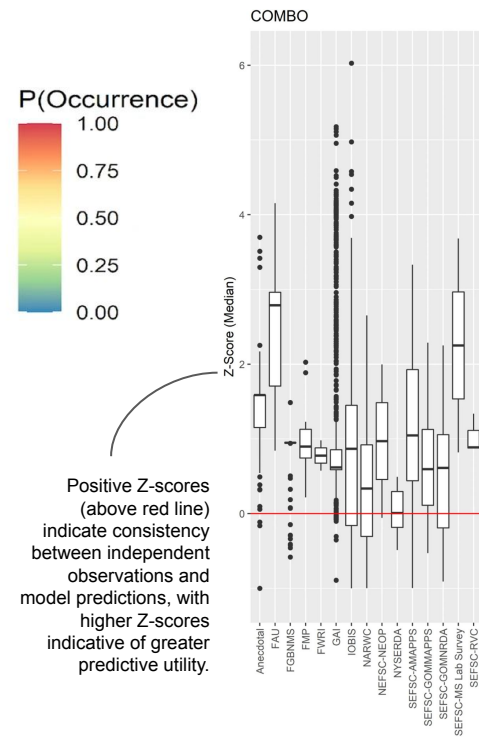
A**B****C****D****E****F**

Higher probabilities of observation with:

- **SST** between 20 and 30 °C (17.5%),
- increasing **Chl-a** concentrations (8.5%) ,
- moderate **Front-Z** (< 1%),
- nearshore and shelf-edge **depths** (1.8%),
- moderate bathymetric **slopes** (< 1%)



Predicted probability of occurrence for manta rays for combined surveys (SEFSC, NARWC, and NYSERDA) model for monthly average environmental conditions in 2017 with overlay of internal (X) and external (+) validation points.

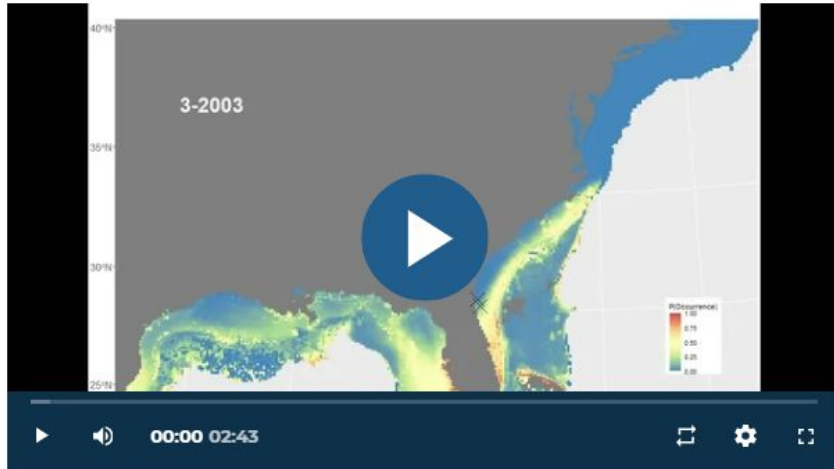


Link to video of model predictions vs. observations

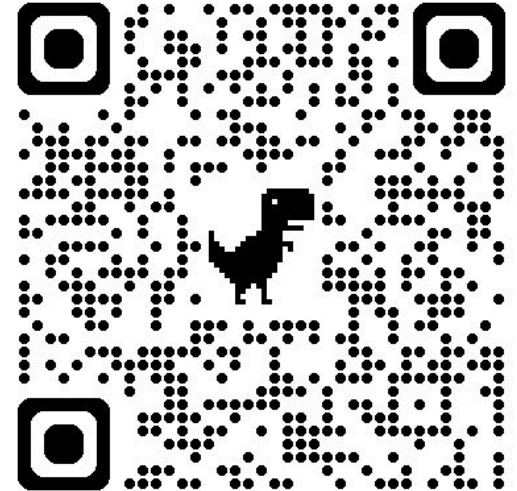
<https://www.nature.com/articles/s41598-022-10482-8#Sec17>

Supplementary Information

[Supplementary Information 1. \(download DOCX ↓\)](#)

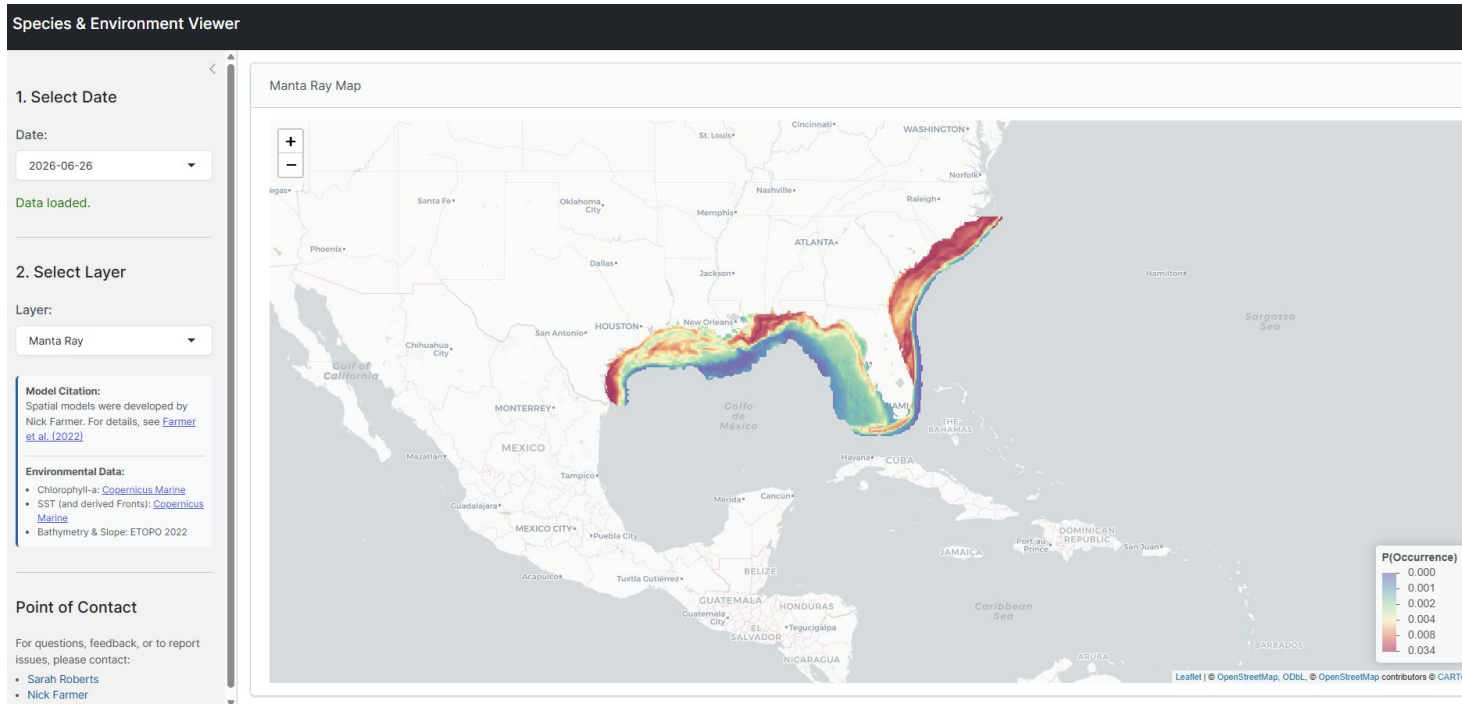
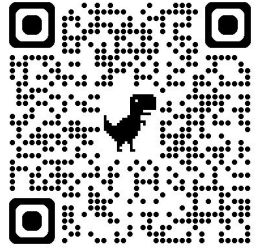


Supplementary Video 1.



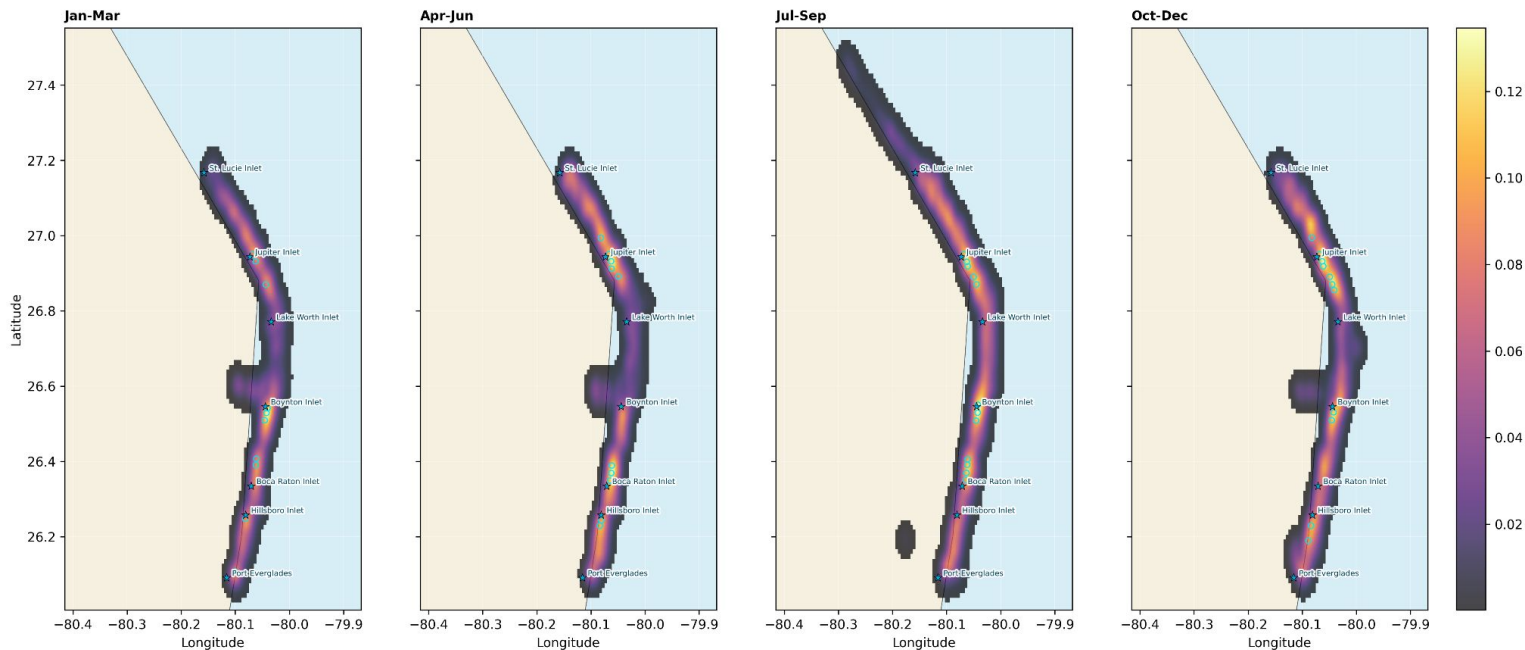
Real-time Predictions of Manta Ray Distribution

<https://connect.fisheries.noaa.gov/SEProtectedSpecies/>



Seasonal Patterns in the SEFL Nursery

Survey Adjusted Seasonal Hotspot Consensus (quarterly)



Covariates:

- Latitude, longitude
- Month/day-of-year (sin/cos)
- Transect (East/West)
- Nearest inlet (distance)
- Satellite ocean color
- Chlorophyll (chlor_a)
- Diffuse attenuation (Kd_490)
- Apparent visibility (AVW)
- Tide height
- Tidal stage
- Tidal intensity
- Lunar phase
- Lunar illumination
- Air temp
- Prior-day precipitation
- Northward current
- Beaufort wind
- Sea state
- Turbidity
- Visibility
- Glare (observer 1 & 2)
- Wind speed
- Wind direction
- Cloud cover

Preliminary Results from: Teasdale T, Pate J, Farmer N

Manta Ray Tracking Project - Technology

MiniPAT Satellite Tag

Features:

Archival; infers positions from depth, temperature, and light records.

Pros:

Broad coverage, 6-month retention*, no recovery needed.

Cons:

Expensive, low-resolution, transmission issues.



SPOT Satellite Tag

Features:

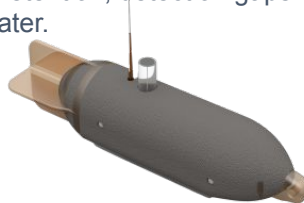
Active transmission, GPS positioning.

Pros:

High-resolution positioning, no recovery needed.

Cons:

No environmental data, moderate cost, shorter retention, detection gaps when underwater.



Acoustic Tag

Features:

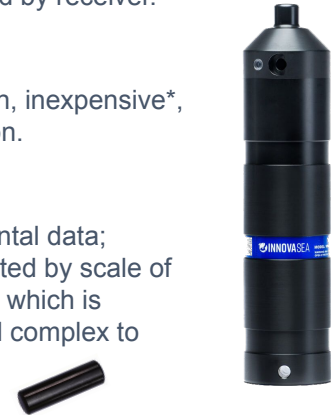
Active transmission, coded signal recorded by receiver.

Pros:

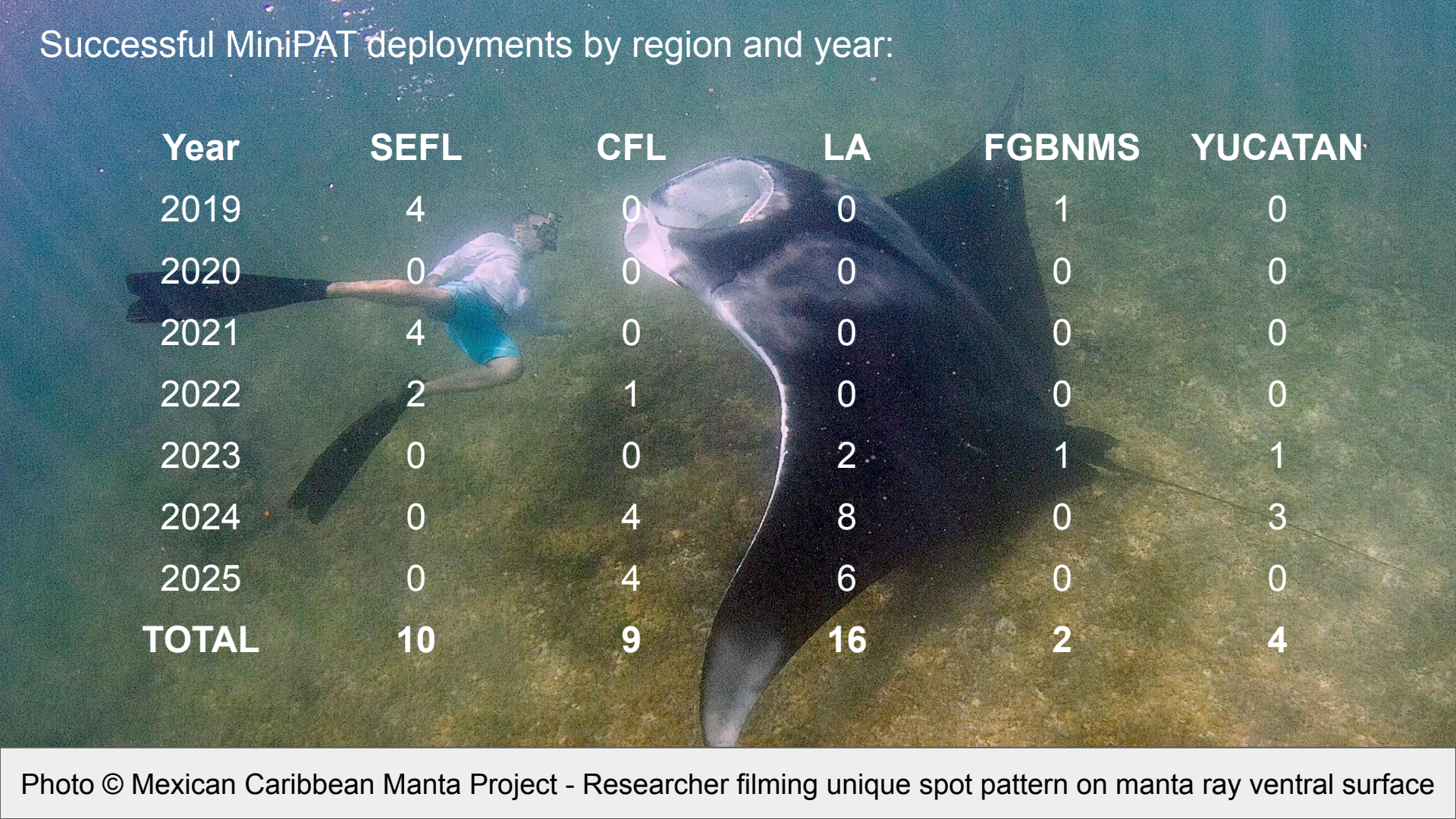
High-resolution, inexpensive*, longer retention.

Cons:

No environmental data; detections limited by scale of receiver array, which is expensive and complex to maintain.

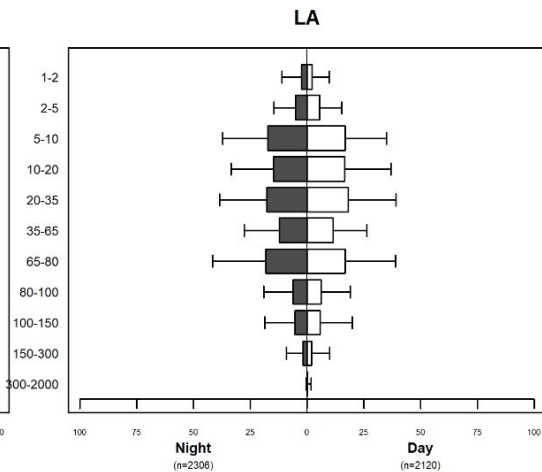
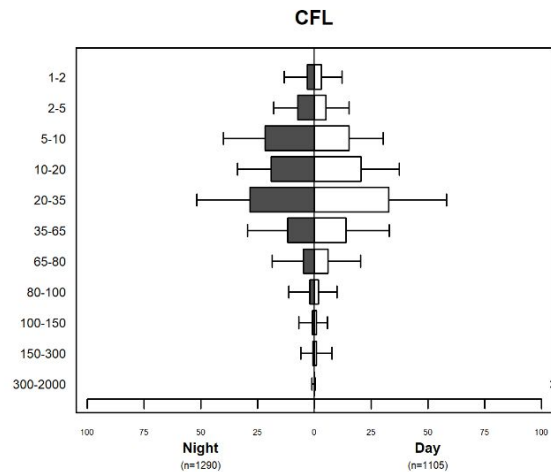
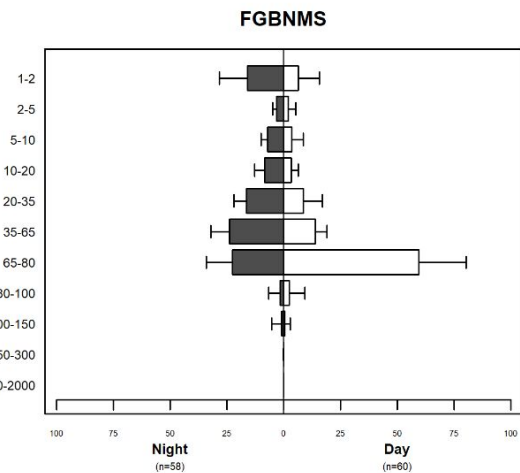
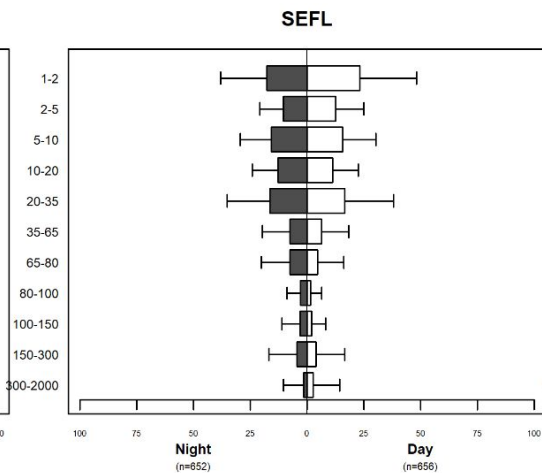
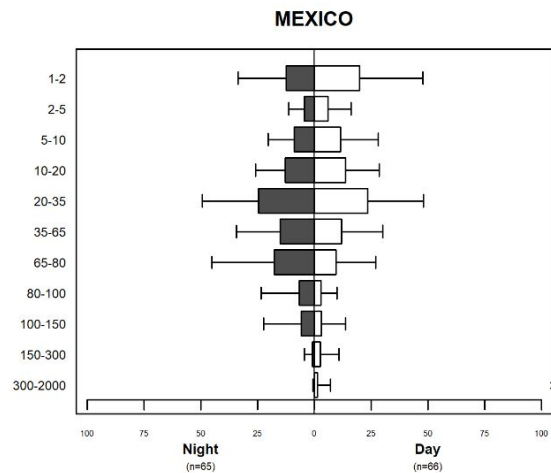


Successful MiniPAT deployments by region and year:

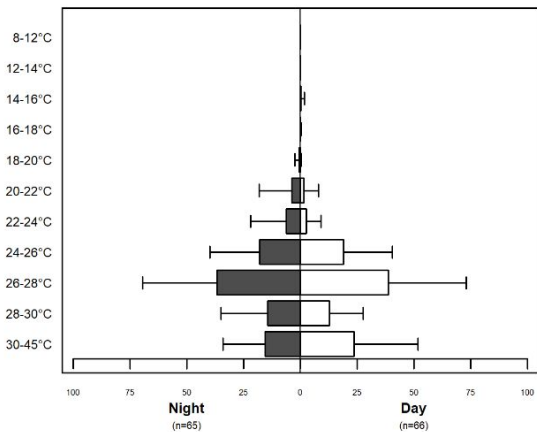
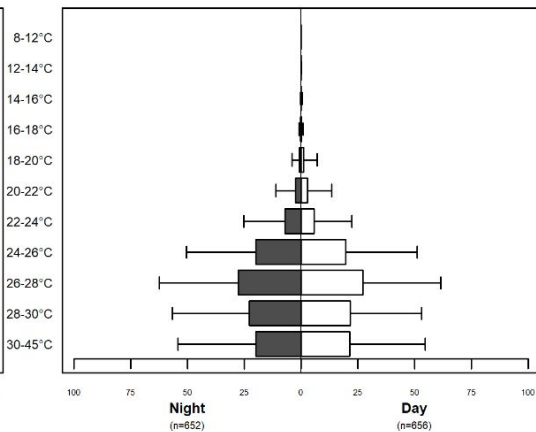
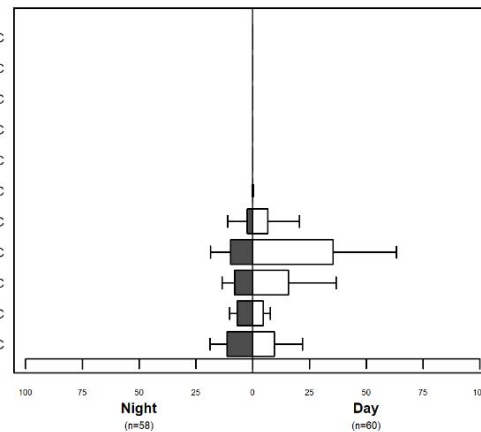
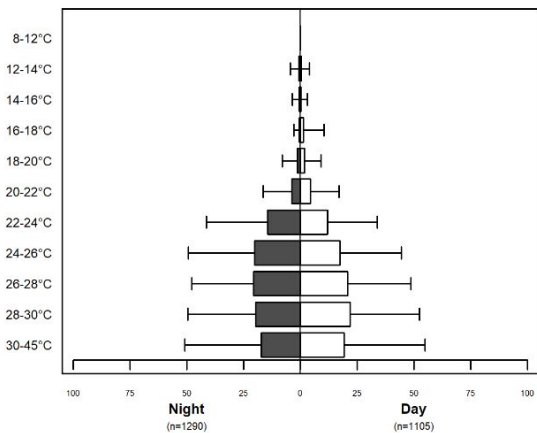
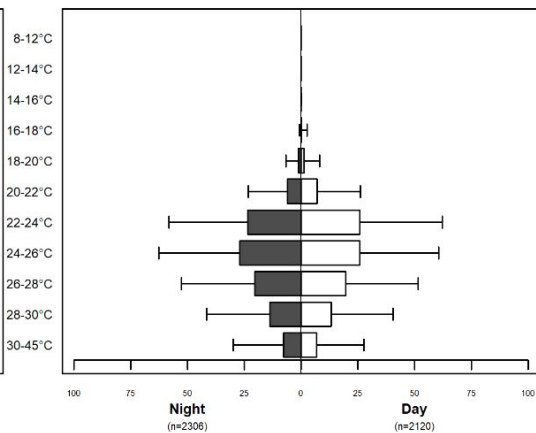


A background image showing a diver in a white shirt and blue shorts filming a large manta ray underwater. The manta ray is dark with a white ventral surface and a distinctive white spot pattern. The scene is set in clear, blue water with a sandy bottom.

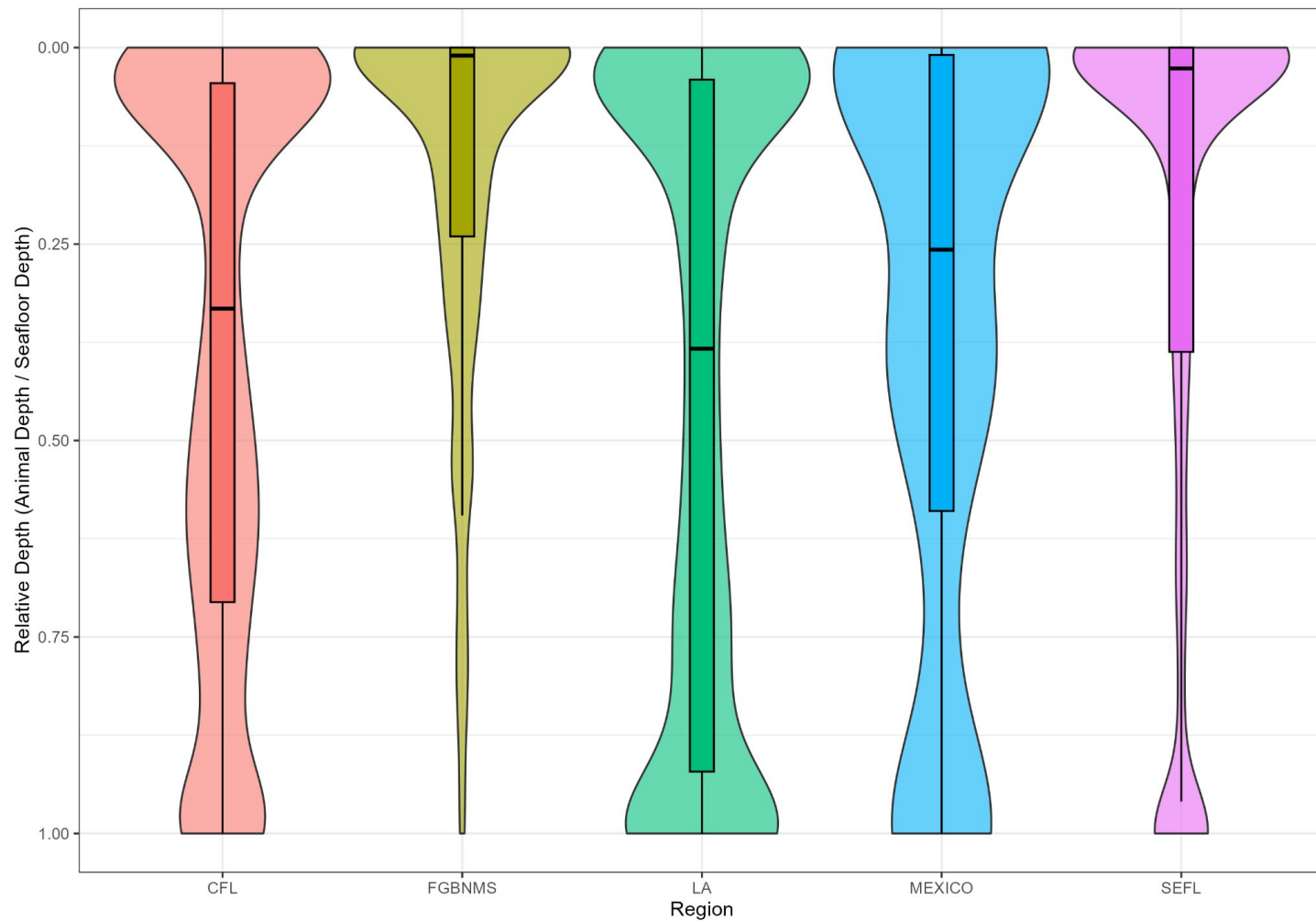
Year	SEFL	CFL	LA	FGBNMS	YUCATAN
2019	4	0	0	1	0
2020	0	0	0	0	0
2021	4	0	0	0	0
2022	2	1	0	0	0
2023	0	0	2	1	1
2024	0	4	8	0	3
2025	0	4	6	0	0
TOTAL	10	9	16	2	4



Depth Use
by Region
(preliminary results)

MEXICO**SEFL****FGBNMS****CFL****LA**

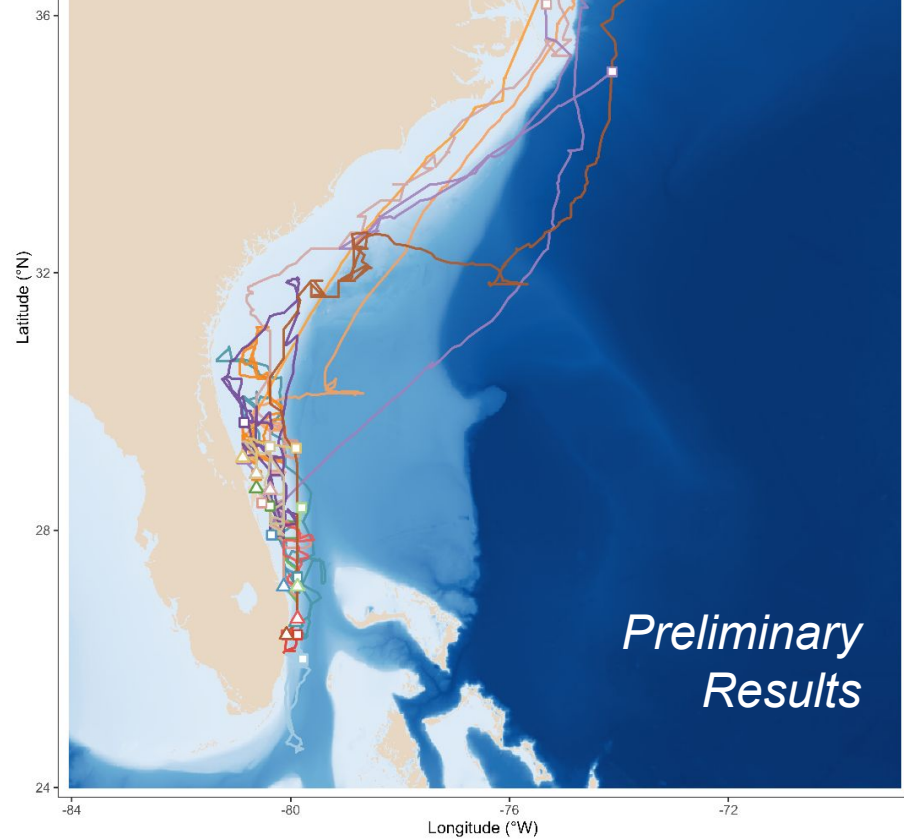
Temperature Use
by Region
(preliminary results)



Relative depth
use by region
(benthic vs.
pelagic)

[preliminary
results]

Manta Ray Movements off Florida



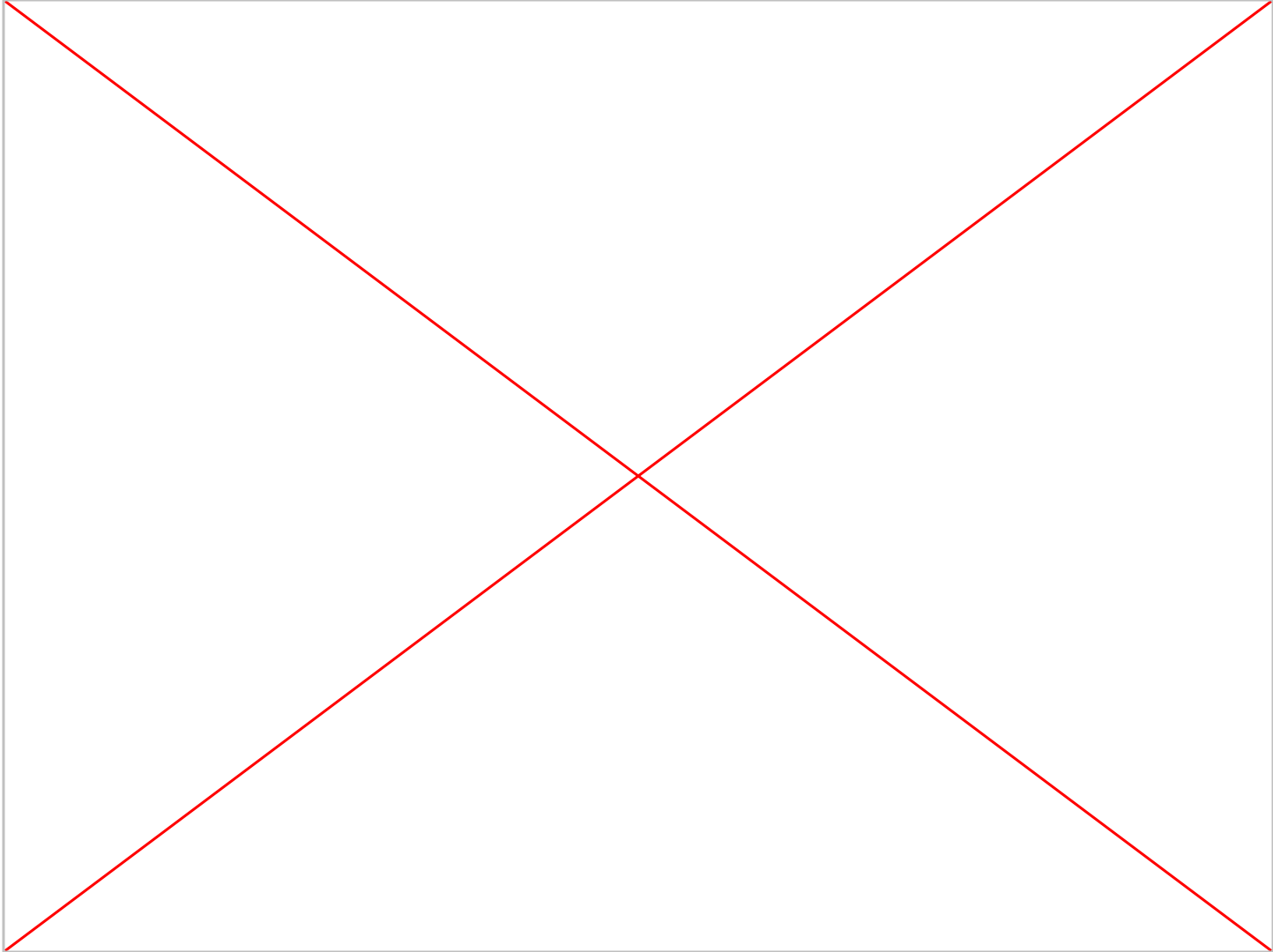
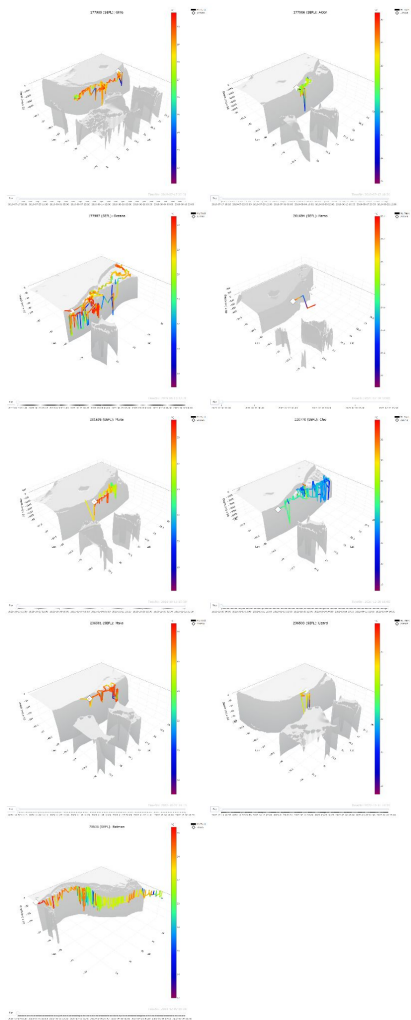
Status

- End
- △ Start

Manta Individual

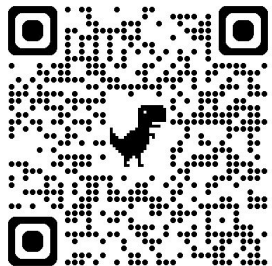
- 177985: Gillie (55 days)
- 177986: Aidon (36 days)
- 177987: Oceane (115 days)
- 201694: Nemo (1 days)
- 201695: Maite (57 days)
- 206188: Joker (158 days)
- 220770: Cleo (140 days)
- 236501: Mako (43 days)
- 236503: Lizard (136 days)
- 244827: Junior (180 days)
- 245401: Mary McLeod (181 days)
- 245403: Bethune (180 days)
- 245527: Artemis (173 days)
- 281574: Saxon (180 days)
- 281575: Castle (140 days)
- 281576: Schooner (67 days)
- 281577: Coronado (10 days)
- 70635: Batman (180 days)





Questions?

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Huge thanks to:

Jessica Pate (MMF)
Calusa Horn (SERO)
Christian Jones (SEFSC)
Bryant Turffs (MMF)
Karen Fuentes (MCMP)
Guy Stevens (MT)
Josh Stewart (MT)
Andrea Marshall (MMF)

Tom Teasdale
Brett Falterman
Mike Dance (LSU)
Marissa Nuttall (FGBNMS)
Olivia Eisenbach (FGBNMS)
John Carlson (SEFSC)
Ramon Bonfil (ECOSUR)
Jennifer Lee (SERO)...and many more!



Source	Years	N	Latitude (°N)	Area
FAU	2014–2019	99	25–27	Miami Beach to Jupiter Inlet, Florida, USA
FGBNMS	1990–2017	144	27–29	Offshore Texas, USA
FMP	2016–2020	142	26–28	Hollywood to Port Salerno, Florida, USA
FSU	2019	1	29–30	Florida Panhandle, USA
FWRI	2018–2020	122	27–30	Florida, USA
GAI	2010–2017	1536	28–30	St. Augustine Inlet to Cape Canaveral, Florida, USA
IOBIS	1925–2016	1361	36°S–44°N	Global
NARWC	1979–2017	1240	26–40	Florida to Maine, USA
NEFSC-NEOP	1993–2014	8	35–40	North Carolina to Maine, USA
NYSERDA	2016–2017	6	39–41	New York: Long Island to South Wilmington/Block Canyon
Opportunistic	1999–2020	239	17–34	Global
Publication	1993–1994	3	27–29	Indian River Lagoon, Florida, USA
SEFSC-AMAPPS	2010–2019	367	27–40	Florida to New Jersey, USA
SEFSC-GOMMAPPS	2017–2018	109	25–31	Gulf of Mexico (U.S. waters)
SEFSC-GOMNRDA	2011–2012	119	25–31	Gulf of Mexico (U.S. waters)
SEFSC-MS Lab	1982–2015	5	28–30	Gulf of Mexico (U.S. waters)
SEFSC-RVC	2000–2013	6	24–27	Dry Tortugas and Florida Keys, USA



MANTA AND DEVIL RAYS

Identification Guide

Report Sightings: manta.ray@noaa.gov



GIANT / OCEANIC MANTA RAY (*Mobula birostris*) – Listed under the Endangered Species Act

Size (disc width): average (13–16.5 ft), max (26 ft), birth (~6 ft)

Coloration: black with white shoulder patches that form a “T-shape” but white and black morphs do occur.



SPINETAIL DEVIL RAY (*Mobula mobular*)

Size (disc width): average (6–9 ft), max (17 ft), birth (~5 ft)

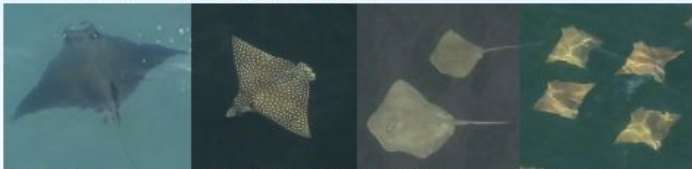
Coloration: dark grey with black “crescent shape” stripe that extends shoulder to shoulder.



SICKLEFIN / CHILEAN DEVIL RAY (*Mobula tarapacana*)

Size (disc width): average (6.5–9 ft), max (11 ft), birth (~4 ft)

Coloration: golden brown to an olive green. No distinct markings.



DEVIL RAY (*Mobula hypostoma*)

Size: 3–4 ft

SPOTTED EAGLE RAY (*Aetobatus narinari*)

Size: 5–10 ft

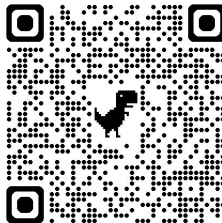
SOUTHERN STINGRAY (*Hypanus americanus*)

Size: 4–5 ft

COWNOSE RAY (*Rhinoptera bonasus*)

Size: 3 ft

Photo Credits: Todd Pusser; Harry Webb, Georgia Aquarium; Florida Fish and Wildlife Conservation Commission; Kim Bassos-Hull, Mote Marine Laboratory; APEM and Normandeau Associates images prepared for New York State Energy Research and Development Authority | Scientific Names consistent with AFS Names of Fishes 06/24



Southeast Shrimp Fisheries Giant Manta Ray Release Guidance

This guidance describe the procedures for releasing a manta ray from a shrimp trawl. Under these procedures, the trawl is retrieved in a normal manner. **The manta ray is not brought onboard the vessel.** The objective is to bring portions of the net tail and body out of the water in order to maneuver the captured ray towards and out the mouth of the net.

Step 1: The haulback of all nets should proceed as usual. Bring doors to the block.

Step 2: Position the vessel so that the manta/trawl is on the windward/upwind side of the boat. Reduce speed or take the engine out of gear if possible. This will reduce drag on the animal, allowing it to move towards the mouth of the net in subsequent steps.

Step 3: Retrieve the bag and dump the catch as usual.

Step 4: Using a whip/lifting line positioned forward of the TED, raise sections of trawl netting out of the water as high as possible, causing the animal to slide toward the trawl mouth.

- It may require several lifts/whips, moving forward in the trawl body with each lift, to move the animal toward the trawl mouth.
- If the animal stops moving, try lowering the trawl doors to the water. This will increase the angle of the whip line lifting point relative to the trawl mouth and help move the animal toward the trawl mouth.

Step 5: If the animal does not move after repetitive lifts are attempted, it may be necessary to cut portions of the trawl net webbing that appear to be under tension near or around the animal. Bring those areas of the trawl as close to the vessel as possible and make necessary cuts to relieve tension. Take care to avoid cutting the animal.

Step 6: Once released from the trawl, monitor the animal's direction of movement. Take care to maneuver the vessel away from the animal while it is recovering.

Step 7: Report the incident to manta.ray@noaa.gov or call Calusa Horn, NMFS Southeast Giant Manta Ray Recovery Coordinator at 727-824-5312



Photo: Josh Stewart



Photo: NOAA