UNIVERSITY OF MARYLAND CENTER FOR ENVIRONMENTAL SCIENCE
CHESAPEAKE BIOLOGICAL LABORATORY

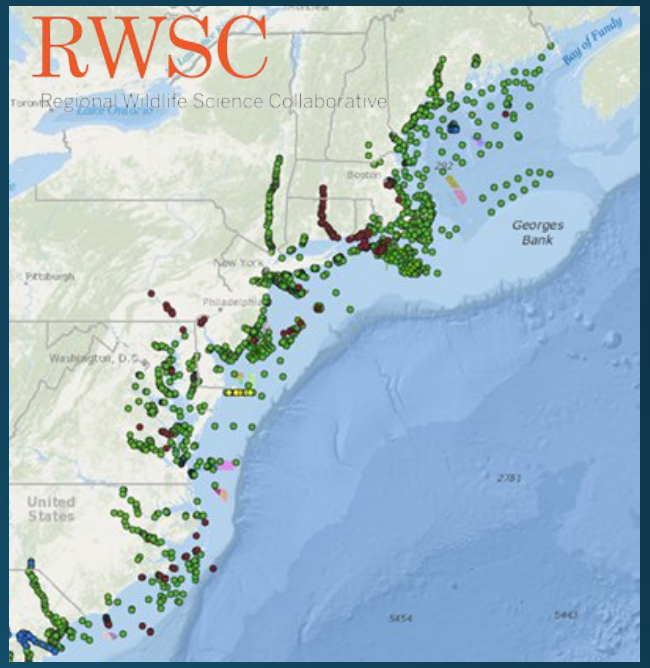
TailWinds Tailwinds.umces.edu

Dave Secor, Mike O'Brien

Regional telemetry at a crossroads:

Leveraging data sharing and telemetry networks for improved stewardship of migratory marine fauna

- What is this crossroads?
- Why is regional telemetry important?
- Improving engagement in the data request.
- Is data sharing now the norm?



https://rwsc.org/map/

ROSA Responsible Offshore Science Alliance

US Wind Fueling our future, naturally.

MBON Marine Biodiversity Observation Network

2026 State of the Science
Offshore Energy, Wildlife, and Fisheries Conference
June 8-11

June 9, 2026

Advancement of Telemetry Data Supply Cycles

That was then: 2005

ASMFC Atlantic Sturgeon Technical Committee (D. Secor, Chair)

"Got to start somewhere:" Sharing an Excel spreadsheet



Dewayne Fox
Founder and Coordinator

John Manderson
Founder

Tom Savoy
Founder

Atlantic Cooperative Telemetry Network

This is now: 2020 onwards (adj for COVID)

- Expansion of regional data nodes
- Networked regional nodes: Ocean Tracking Network



OCEAN TRACKING NETWORK

Still a bottom up endeavor: Mike O'Brien (and others) paving the way for regional telemetry data sharing

- Database (15) rescue, curating and posting; since 2020 >0.5 M detections sent to >150 investigators on 60 different species
- Manages SAXATILIS data server: 2004-2026, 2.5 M records
- Six open-source software programs on regional node and OTN platforms
- Data Governance Committee, ROSA
- Steering Comm., Mid-Atlantic Acoustic Telemetry Obs. System

Packages

matos

An R API package for the Mid-Atlantic Acoustic Telemetry Observing Syste

- https://matos.obrien.page

otndo

A package to understand OTN data

- https://otndo.obrien.page

rvdat

Lightweight, low-level access to Innovasea's Fathom VDAT executable

- https://rvdat.obrien.page/

glatos (contributor)

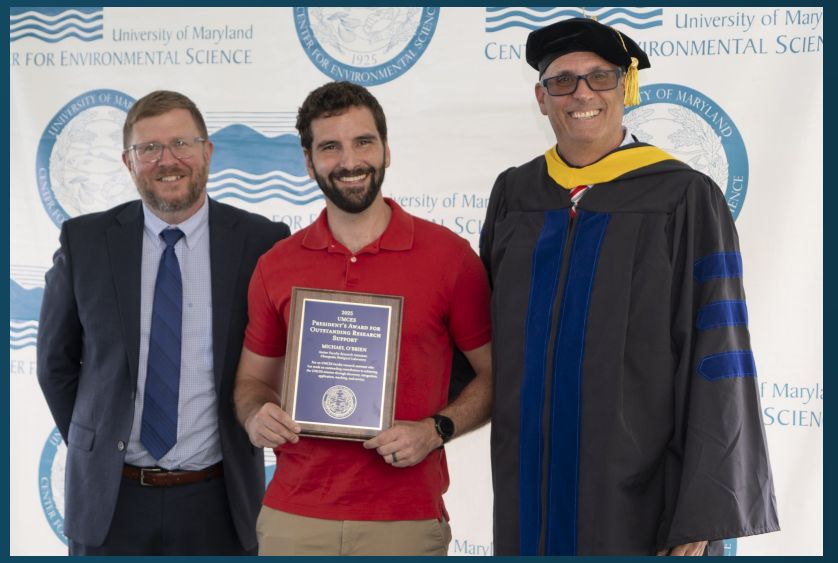
A package for the Great Lakes Acoustic Telemetry Observation System

- https://github.com/ocean-tracking-network/glatos

TelemetryR (Archived)

An R API package for the Atlantic Cooperative Telemetry (ACT) Network

- https://github.com/mhpob/TelemetryR



Mike receiving the 2025 UMCES President's Award for Research Support

394. UMCES: University of Maryland Center for Environmental Science
    1. CBBBMB (ACT): UMCES Chesapeake Backbone, Mid-Bay *Type=Deployment, Records=NA, LastModified=NA*
    2. HRSB04 (ACT): UMCES Resident Hudson Striped Bass Migration *Type=Data, Records=NA, LastModified=NA*
    3. HRSB09 (ACT): UMCES Lower Hudson Striped Bass Contingents *Type=Data, Records=NA, LastModified=NA*
    4. HUDRSB (ACT): UMCES-NYSDEC Hudson Striped Bass Spawning *Type=Data, Records=NA, LastModified=NA*
    5. MDBSB (ACT): UMCES Black Sea Bass & Offshore ... *Type=Data, Records=NA, LastModified=NA*
    6. MDWEA (ACT): UMCES BOEM Offshore Wind Energy *Type=Data, Records=NA, LastModified=NA*
    7. MDWEAMAM (ACT): UMCES BOEM Marine Mammal Monitoring *Type=Deployment, Records=NA, LastModified=NA*
    8. PASBT (ACT): UMCES Potomac River Striped Bass Migration *Type=Data, Records=NA, LastModified=NA*
    9. PAXSB08 (ACT): UMCES Striped Bass Thermal Squeeze *Type=Data, Records=NA, LastModified=NA*
    10. POPISL (ACT): UMCES Poplar Island Array *Type=Deployment, Records=NA, LastModified=NA*
    11. TAILWINDS (ACT): UMCES TailWinds *Type=Deployment, Records=NA, LastModified=NA*

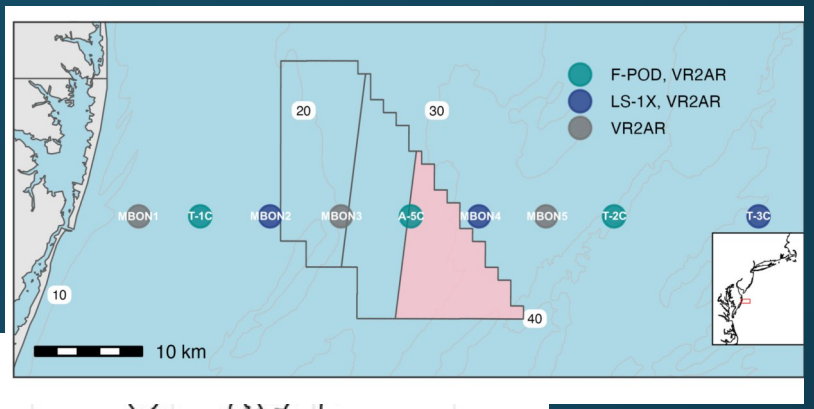
OCEAN TRACKING NETWORK

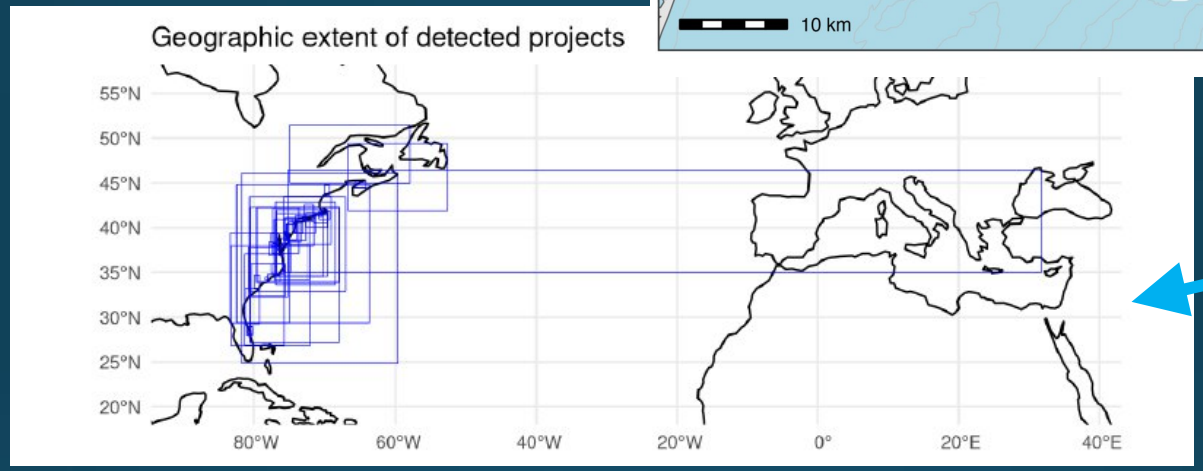
Secor Lab Data Sharing

23 direct email requests 2024-2025

APEM, Ltd
Atlantic States Marine Fisheries Commission
Atlantic White Shark Conservancy
George Mason University
Jacksonville University
Maine Department of Marine Resources
Massuchsetts Div Marine Fisheries
Monmouth University
NOAA Chesapeake Bay Office
NOAA Chesapeake Bay Office
NYSDEC
OCEARCH
RI Div Marine Fisheries
Rutgers University
Rutgers University
Smithsonian Environmental Research Center
Stony Brook University
Stony Brook University
U.S. Fish and Wildlife Service
University New Hampshire
USGS
VIMS
VIMS

TailWinds/MBON array 2024-2028





Mike's data report code

otndo

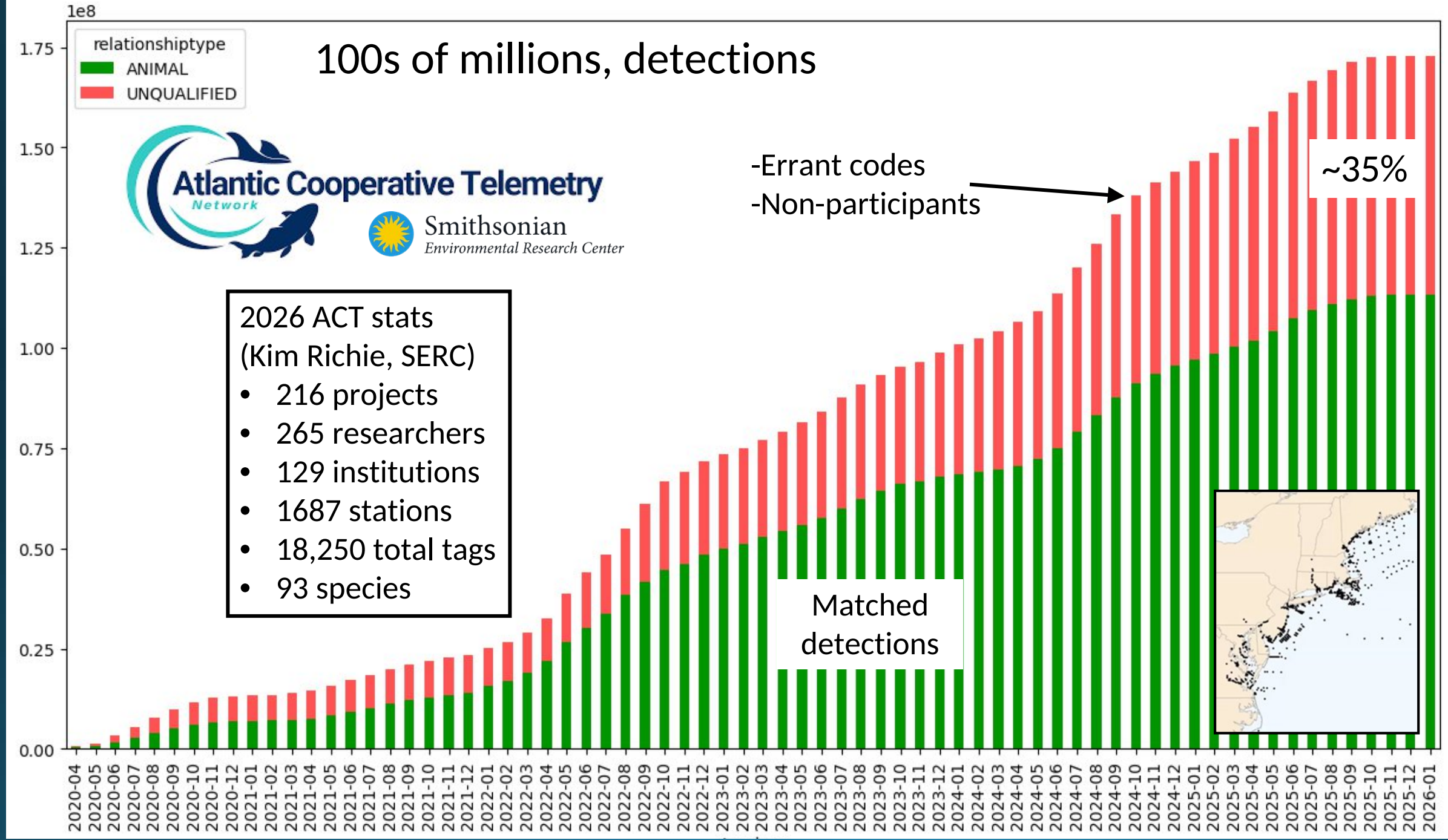
A package to understand OTN data

- https://otndo.obrien.page

For 2024-2025 matched detections (687 tags) sent to 67 investigators.

Species: Atlantic sturgeon; great white, sand tiger, sandbar, spinner, dusky, angel, thresher, Atlantic sharpnose, and blacktip sharks; green and leatherback sea turtles; striped bass; bluefin tuna; swordfish; false albacore; cobia; manta and cownose rays; alewife and blueback herring

100s of millions, detections



Atlantic Cooperative Telemetry Network

Smithsonian Environmental Research Center

-Errant codes
-Non-participants

~35%

2026 ACT stats
(Kim Richie, SERC)

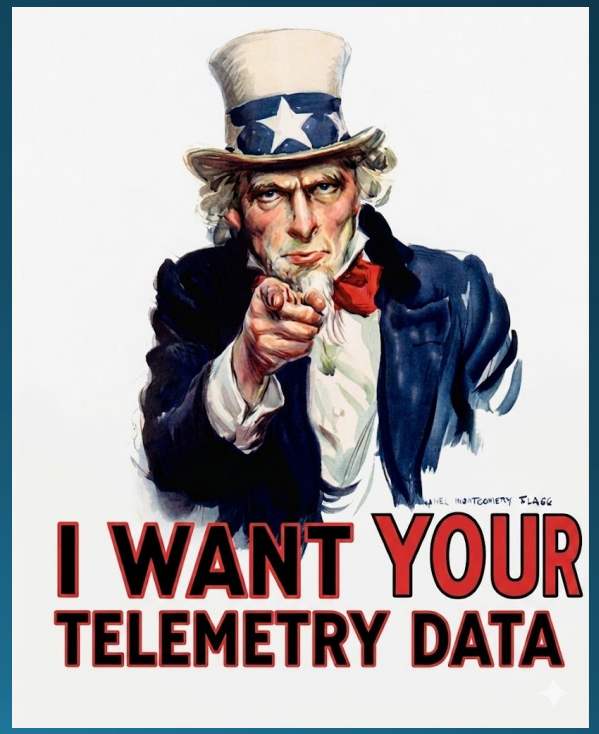
- 216 projects
- 265 researchers
- 129 institutions
- 1687 stations
- 18,250 total tags
- 93 species

Matched detections

The crossroads

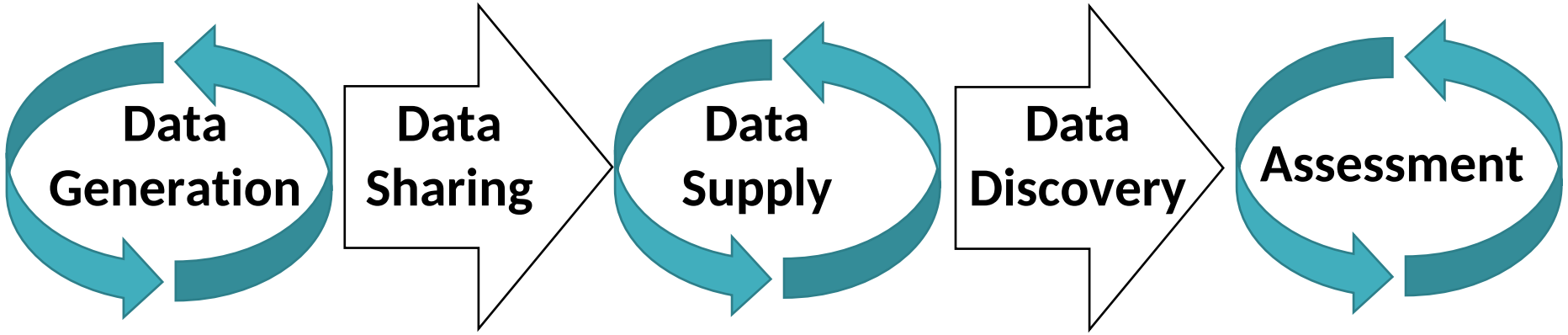
1. Realization of regionally (globally) coordinated, interoperable telemetry data. Telemetry nodes now canvas North America.
2. Distribution tools (help from automation, networks, industry) are widely available, easing data sharing.
3. Most, <u>but not all</u> telemetry scientists participating





Why is regional telemetry important?

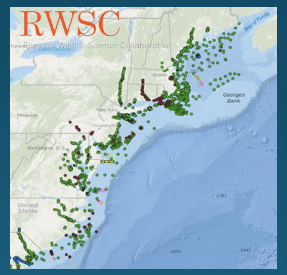
Linked adaptive (recursive, self-correcting, evolving) cycles leading from data generation to **impact assessment**.

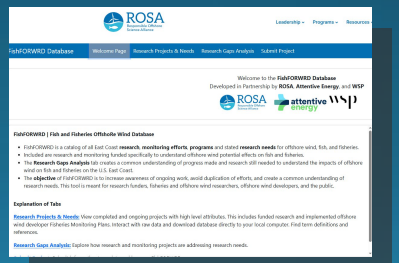




Atlantic Cooperative Telemetry Network

OCEAN TRACKING NETWORK





ASMFC Atlantic Sturgeon Stock Assessment

Migration “Flyway” Assessment

https://www.rosascience.org/fishforwrd/

ASMFC Atlantic sturgeon is unique in US in that it relies on a regional telemetry data to assess stock status.

- Mark-recapture estimate of detection probability/survival. (Z is complement of survival).
- Relies on many tagged sturgeon, receivers, and tag life spans (>10 years)

Table 10. Probability that *Z* is greater than the $Z_{50\%EPR}$ reference point from the 2024 update and the 2017 benchmark.

Population	2024 Update	2017 Benchmark
Coast	1.8%	6.5%
Gulf of Maine	55.5%	73.5%
NY Bight	20.2%	31.2%
Chesapeake Bay	14.1%	30.0%
Carolina	18.2%	75.4%
South Atlantic	26.5%	40.2%

Data sharing among state and academic scientist GA to ME

Table 8. Number of acoustically tagged Atlantic sturgeon by DPS and size group.

	Total	< 1300 mm	> 1300 mm
Gulf of Maine	224	55	169
NY Bight	534	144	390
Chesapeake Bay	464	74	390
Carolina	489	208	281
South Atlantic	364	133	231







Data workshops (data discovery) begin this August for 2028 Benchmark Assessment.

- Depends on continued tagging and sharing
- May integrate genetics this round
- No reason other species would not work (e.g., striped bass)

Atlantic States Marine Fisheries Commission

NEWS RELEASE

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

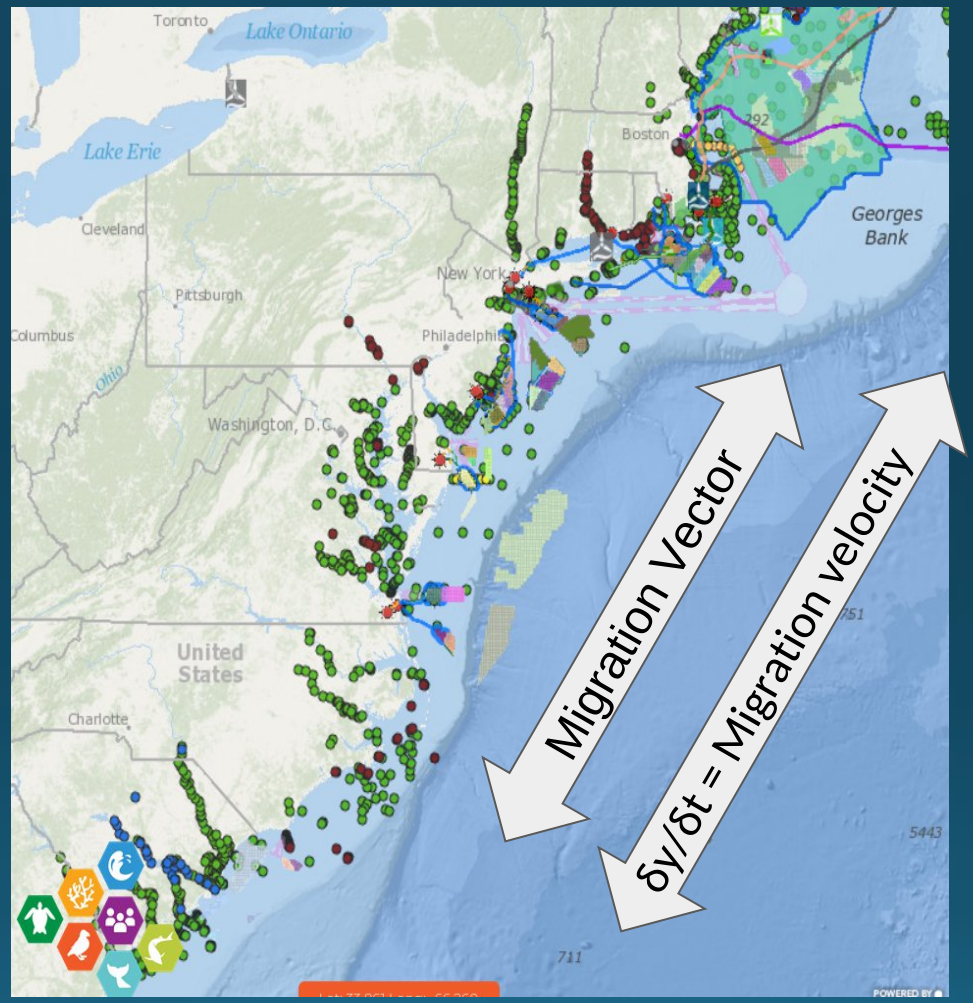
FOR IMMEDIATE RELEASE
April 23, 2026

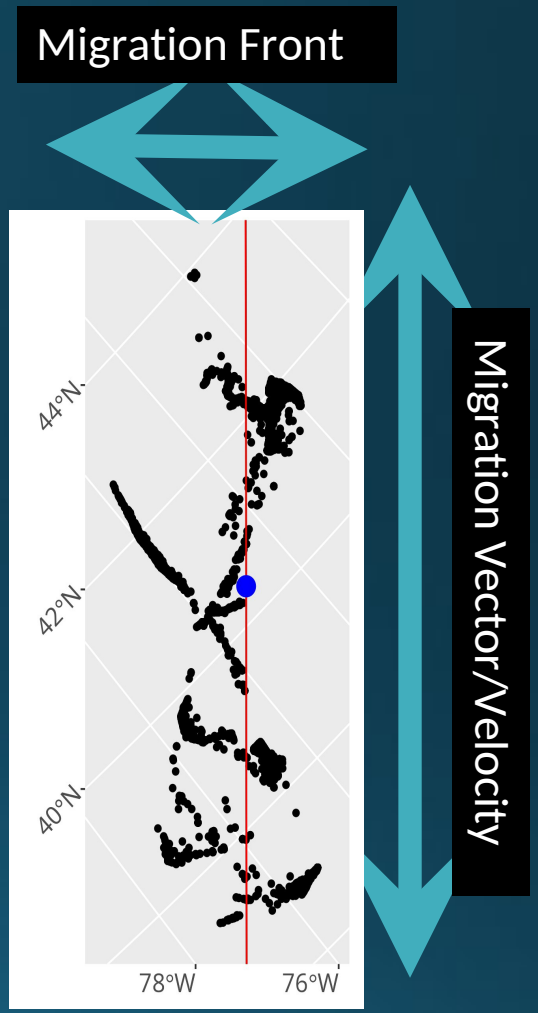
PRESS CONTACT: Tina Berger
703.842.0749

ASMFC Begins Preparations for Atlantic Sturgeon Benchmark Stock Assessment

Migration “Flyway” Assessment







Secor, DH, MHP O’Brien, H. Bailey. 2025. The flyway construct and assessment of offshore wind farm impacts on migratory marine fauna. *ICES Journal of Marine Science* 82(3).

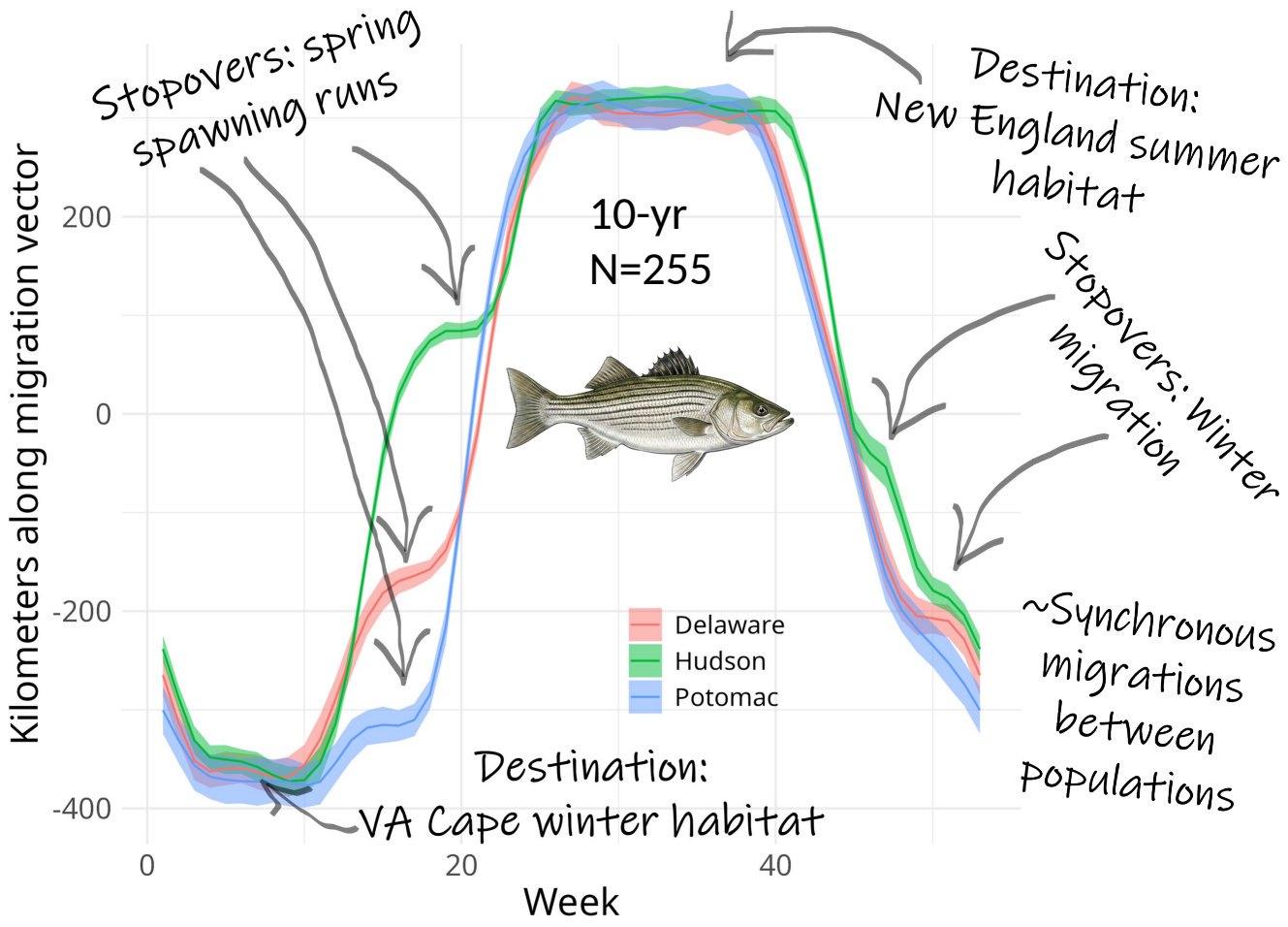
(See also in ROSA/RWSC Poster Session)

ROSA Responsible Offshore Science Alliance

Dave Secor, Michael O’Brien, Matthew Breece, Aaron Carlisle, Dewayne Fox, Bradley Wetherbee

Migration “Flyway” Assessment: Population synchrony is a stand-in for BACI phase regional OWF impacts. Will OWF produce new stopovers and changed velocities?

(See also in ROSA/RWSC Poster Session)



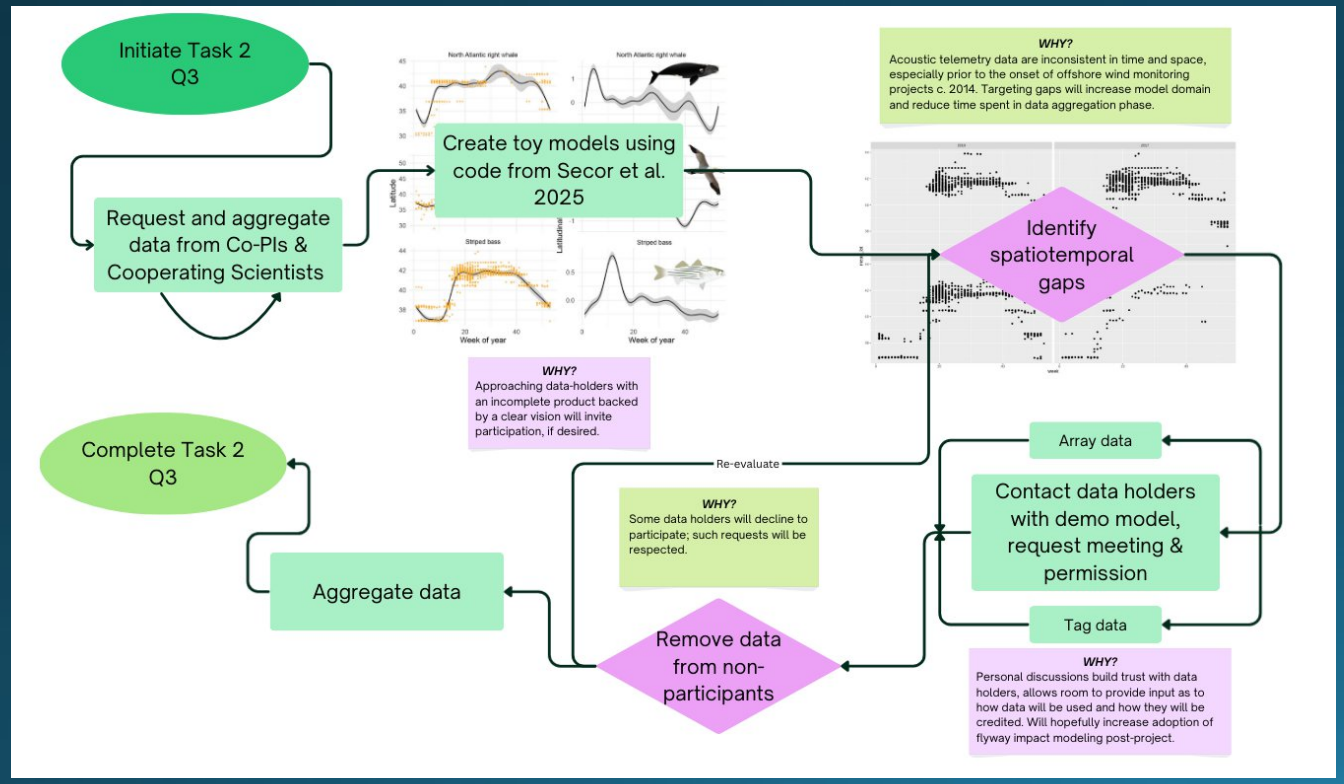
1. Obtain 10-yr telemetry databases for striped bass, Atlantic sturgeon, and sand tiger shark.
2. Model regional flyways and test for effects of oceanographic and climate variables.
3. Develop flyway metrics thru feature analysis that are estimable, unbiased and meaningful.

Flyway Assessment of Offshore Wind Farm Impacts on Migratory Fishes

ROSA Responsible Offshore Science Alliance

Improving engagement in the regional data request.

How NOT to do it: *Please give us all your data. We're doing habitat models for many species across the entire US Atlantic. We're not sure how it will go but you can be a co-author…*



Project data supply cycle (M. O'Brien)

Challenges in the regional ask:

- Why is the requestee's data important?
- How do we engage the requestee early and throughout the project?

Request

We are writing to ***request permission to use your Atlantic sturgeon detection and receiver data*** *and offer participation in a regional flyway modeling study funded by the Responsible Offshore Science Alliance (ROSA); see below for details. We have identified that your data fills a spatiotemporal gap in the data aggregated thus far, and* ***we invite you to provide input to the project in its beginning stages and collaborate on future products****.*

May we ask that you respond to this email with one of the following or a different response of your choice?

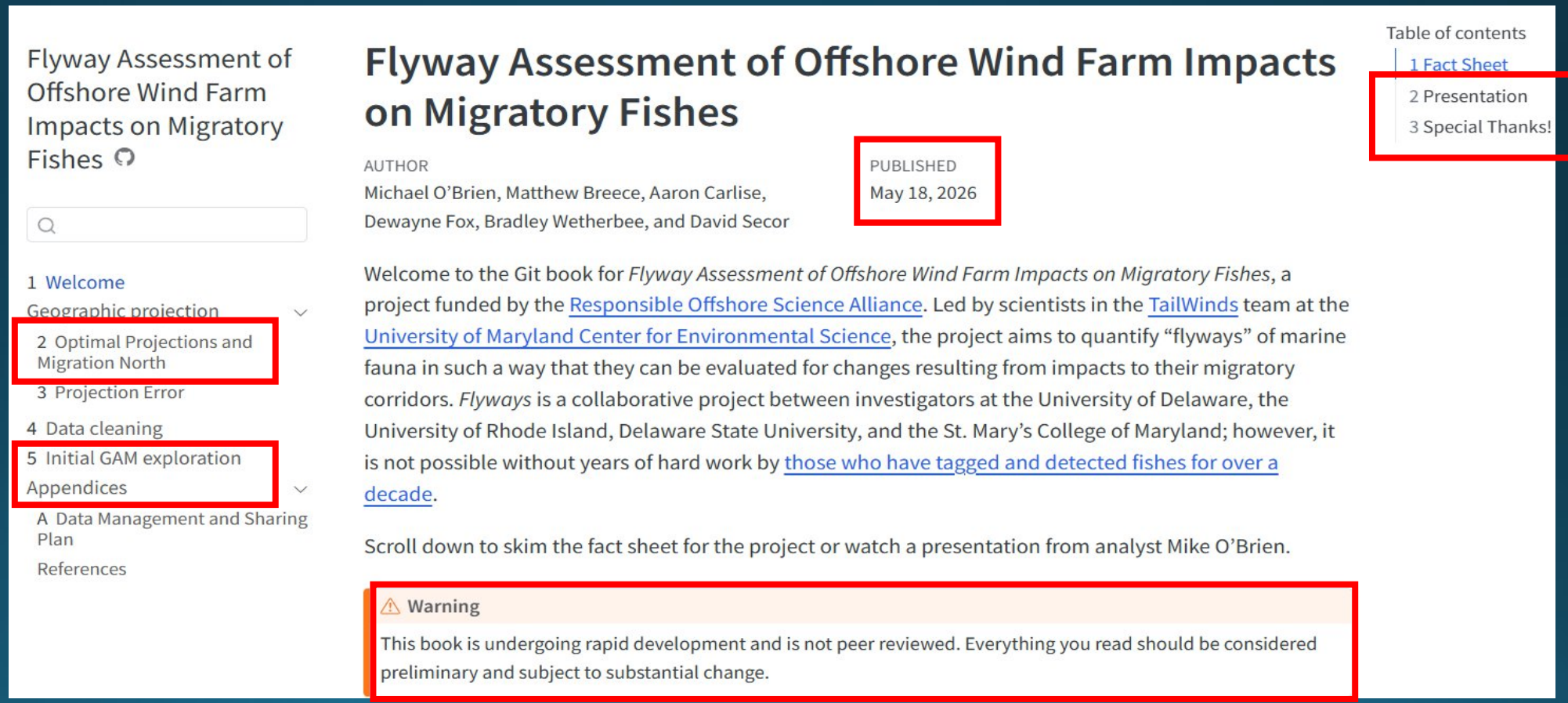
- *I would like to participate, let's discuss (over Zoom/Google Meet/Microsoft Teams, etc.)*
- *Please use the data, but I would not like to participate*
- *Please do not use my data and I would not like to participate*

https://tailwinds.umces.edu/ROSA-flyways/

Engagement

Living project workbook



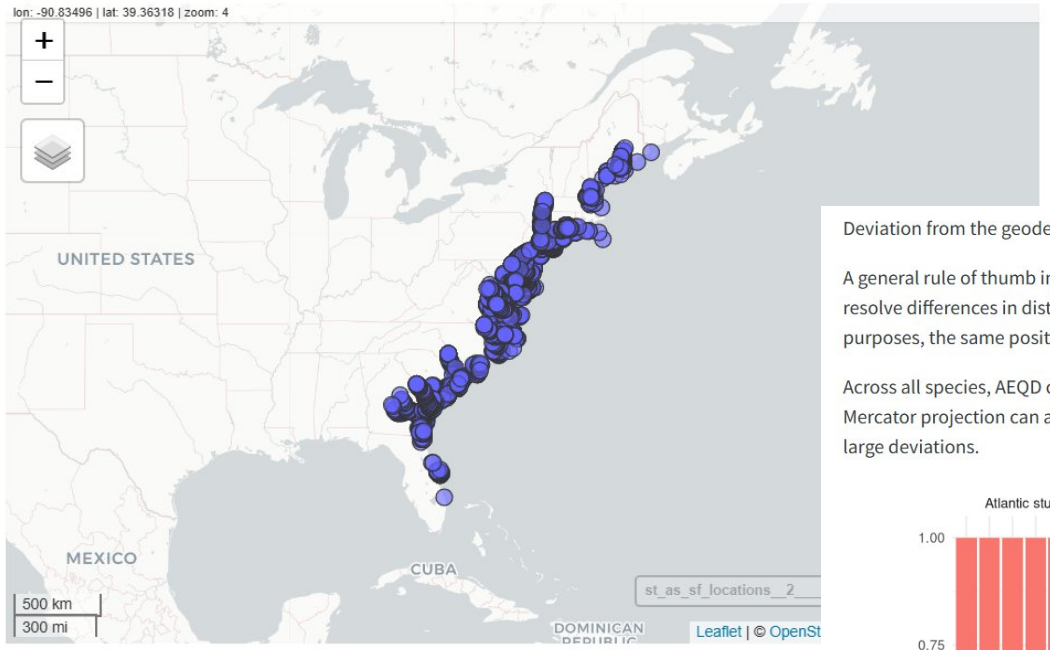


Project resources and updates for sponsors & collaborators

Leaflet maps of detection data

3.1.2 Atlantic sturgeon

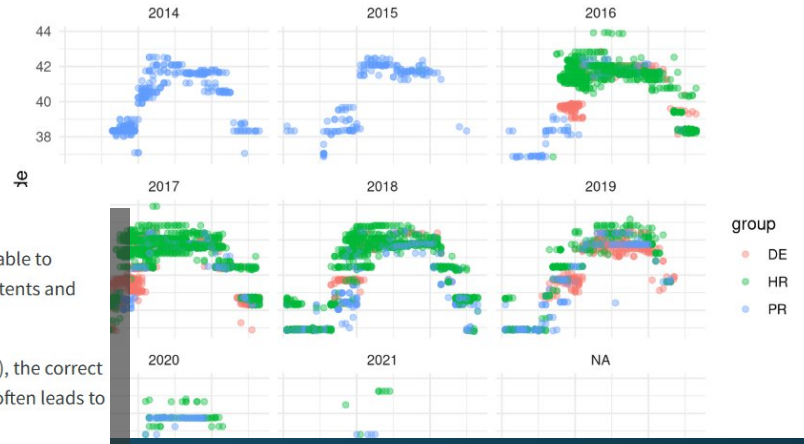
Atlantic sturgeon have the largest range, with detections from northern Maine to southern Florida.



5.1 Striped bass *Morone saxatilis*

We first visualize the distribution of the median per-individual latitudes through time:

```
ggplot(sb) +
  geom_point(aes(x = wk, y = med_lat, color = group), alpha = 0.4) +
  facet_wrap(~year) +
  labs(x = "Week of year", y = "Weekly median latitude") +
  theme(axis.title = element_text(size = 12))
```

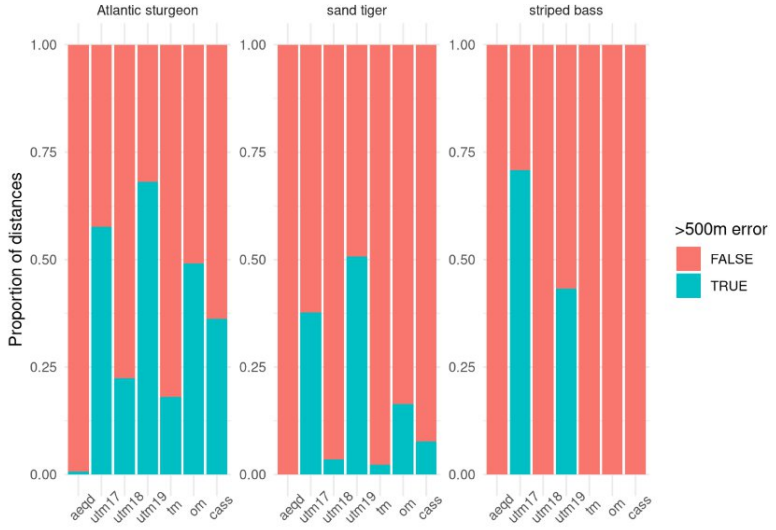


Code for GAM models

Deviation from the geodesic distance

A general rule of thumb in acoustic telemetry is a 500 meter range of detection. As we are unable to resolve differences in distance less than 500 meters, errors less than 500 meters are, for all intents and purposes, the same position.

Across all species, AEQD caused the fewest detectable errors. At regional scales (striped bass), the correct Mercator projection can also be sufficient, but at coastal scales (Atlantic sturgeon) Mercator often leads to large deviations.

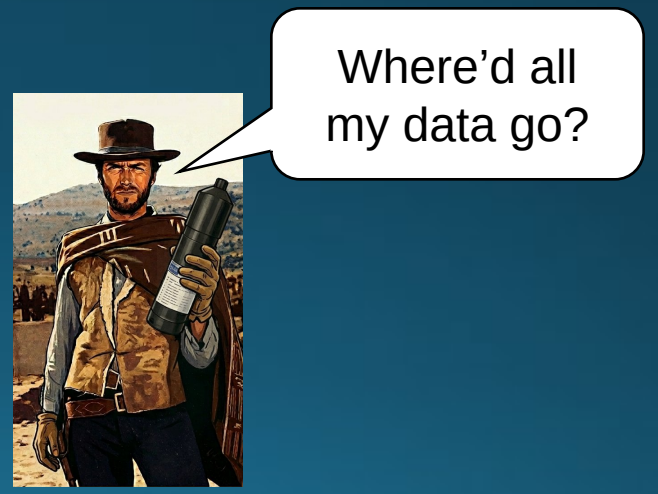


Tests among geospatial projection types

Dave Secor, Mike O'Brien

Discussion: Data sharing should be the norm within the telemetry community.

- Generation of telemetry data has become mostly routine. Intellectual property should center on the designed intent for the data. Data outside that intent should be shared.
- Automation, networks mean that the data supply chain is easily accessed, open for business.
- Regional requests should engage data providers.
- Papers and reports come and go, telemetry data is the gift that keeps on giving.
- Data shouldn't die on the prairie with the retirement of a project or an individual.



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