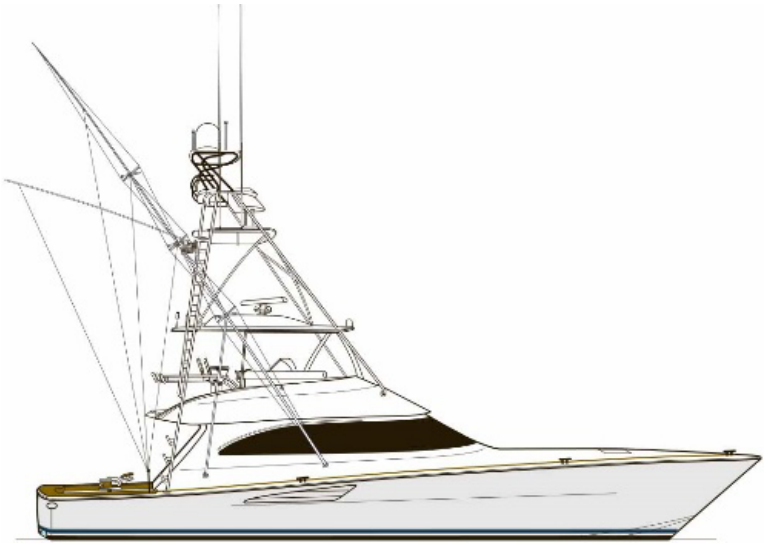
Steps towards monitoring impacts to highly migratory species (HMS) and the HMS recreational fishery in response to offshore wind activity



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Jeff Kneebone

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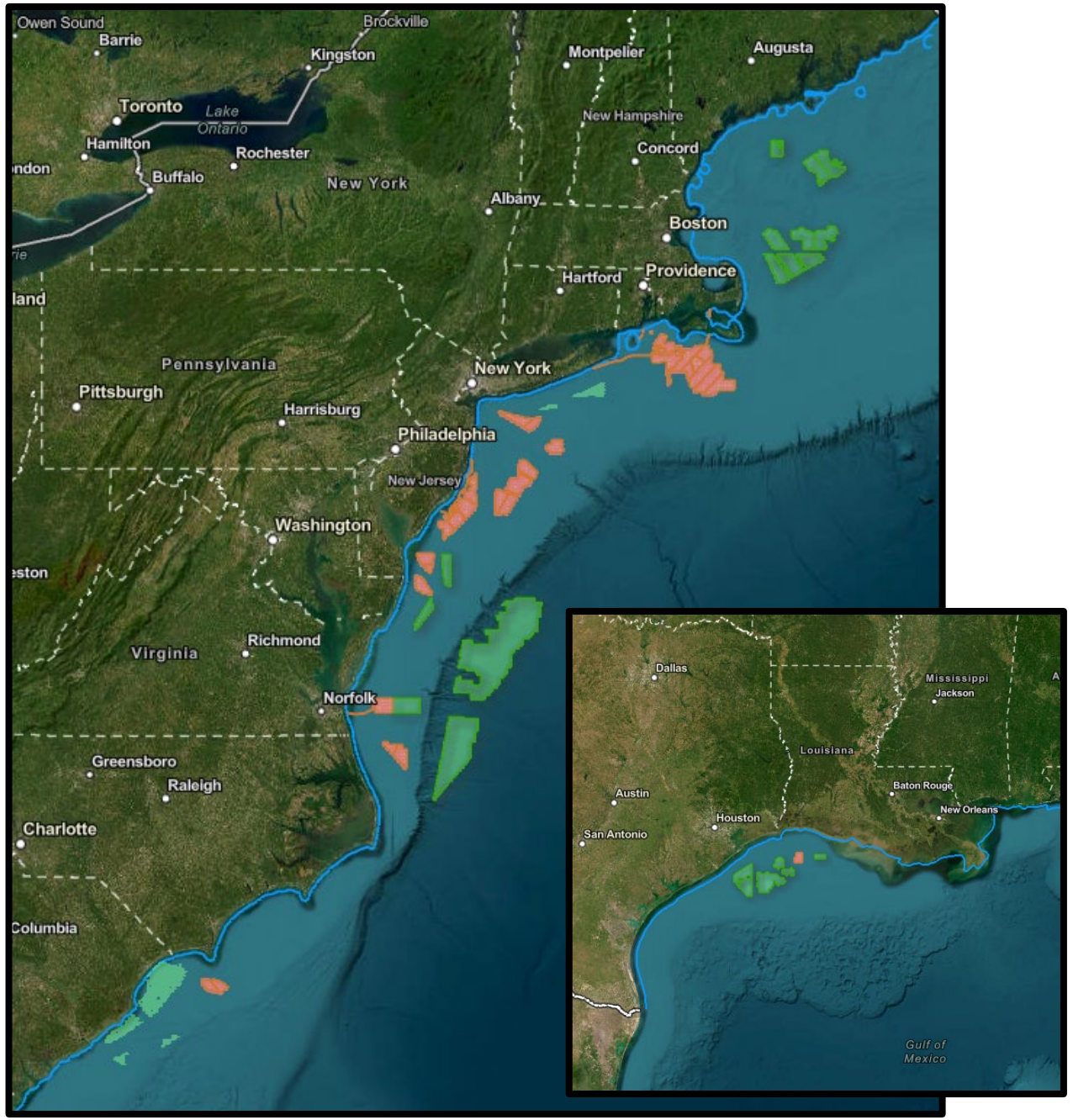
Anderson Cabot Center for Ocean Life
at the New England Aquarium

Offshore wind (OSW) footprint

- Overlaps with many HMS fisheries
- Recreational fishery (2022)*
  - 4,175 charter/headboat permits
  - 23,607 angling permits

- Overlaps with HMS EFH
  - Bluefin tuna
  - Yellowfin tuna
  - White marlin
  - Shortfin mako

- Questions about how OSW will impact:
  - HMS themselves
  - HMS fishery



*2022 HMS SAFE Report

https://www.boem.gov/renewable-energy/lease-and-grant-information

What data are needed for monitoring OSW impacts?

- Ideally, data from three periods:
  - Pre-construction (baseline)
  - Construction
  - Operations (functioning wind farm)

The Fishery

- Where is the fishing effort?
- What are the target species?
- What fishing tactics are used?

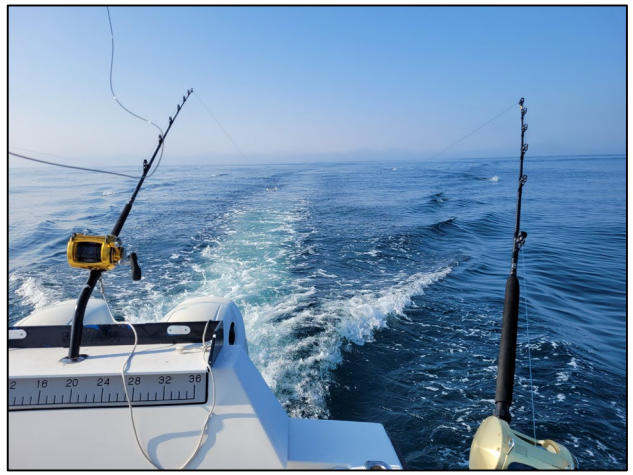
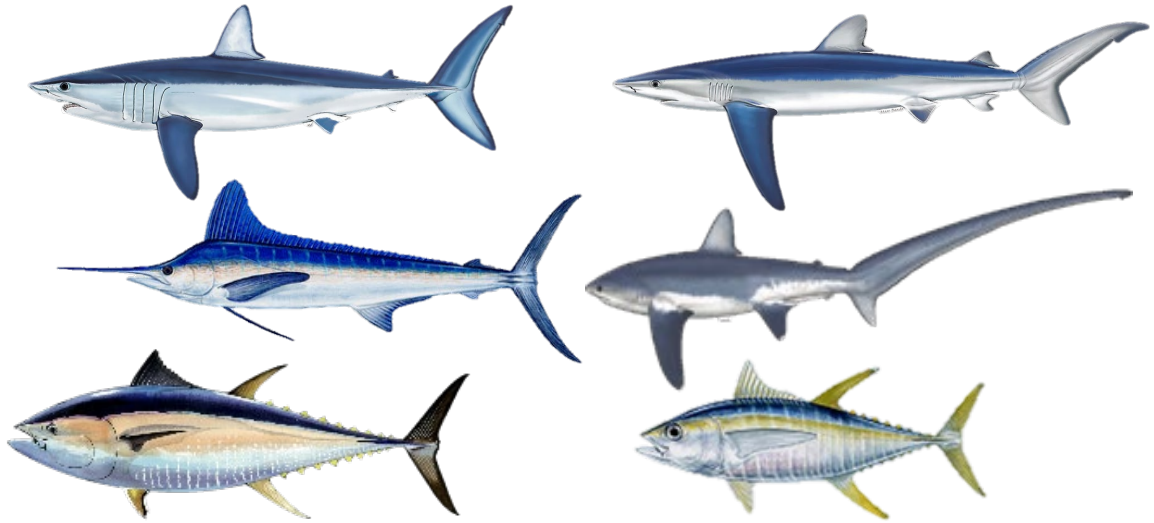


Photo credit: Edward Kim

The Fish

- Where are the fish in the OSW areas?
- What are their residence times?
- What are their movement patterns?



Steps towards monitoring: The Fishery

The goals

- Document the baseline spatial distribution of recreational fishing effort for HMS along the US east coast, in the Gulf of Mexico, and in the US Caribbean
- Document the most popular target species, fishing tactics, and fishing locations

The data

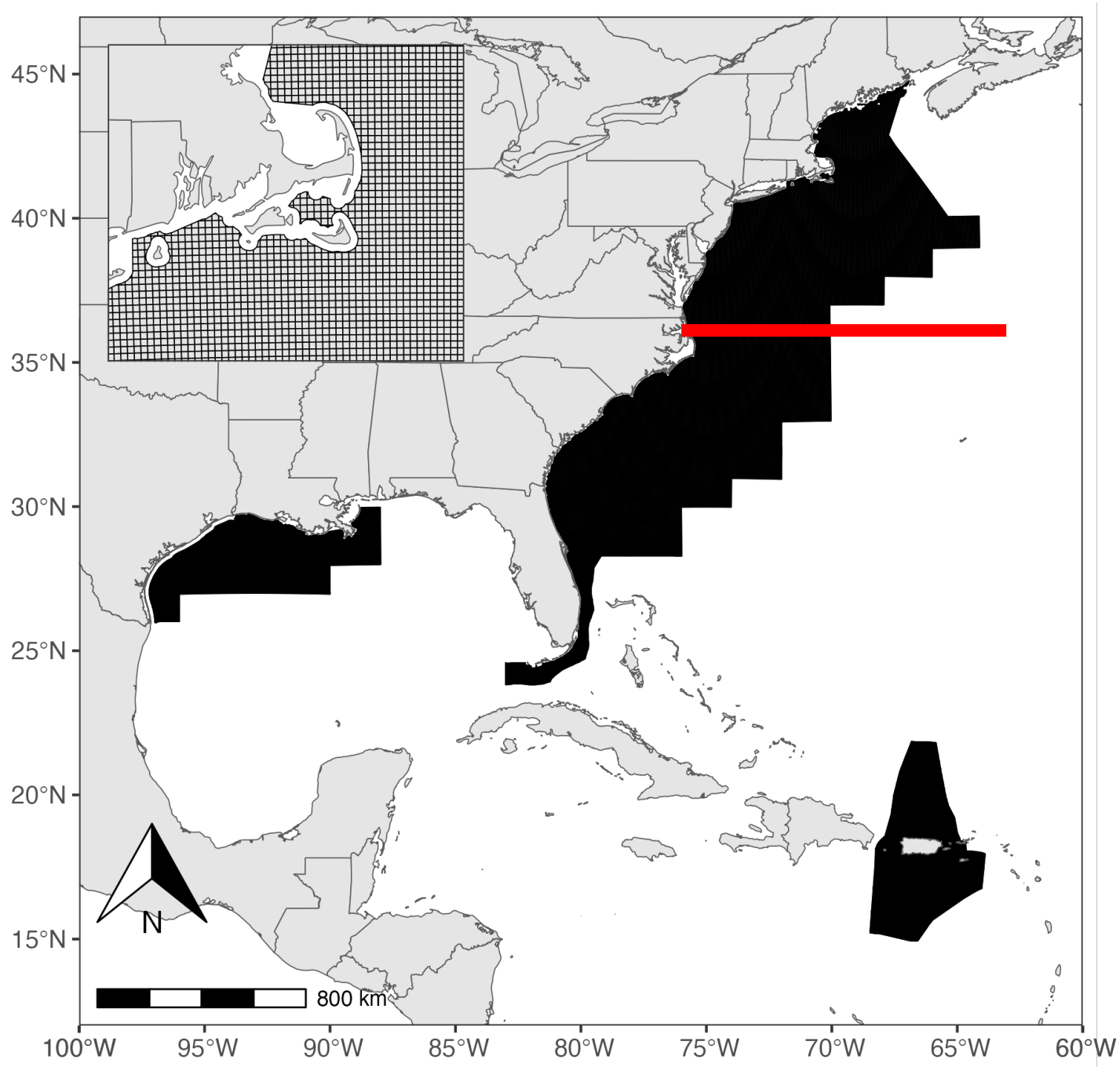
1) Large Pelagics Intercept Survey (LPIS): Virginia to Maine (2002 – Present)
2) Conventional tag, recapture, or release (CTR) events: US EEZ (1954 – Present)
3) Survey of recreational and charter fishermen: Done regionally and periodically

Collaborators:
Matthew Davis (Maine Department of Marine Resources)
Eric Orbesen, Read Hendon (SEFSC)
Cami McCandless (NEFSC, Cooperative Shark Tagging Program)
Peter Chaibongsai, Addie Spain (The Billfish Foundation)
Wessley Merten (Dolphinfish Research Program)

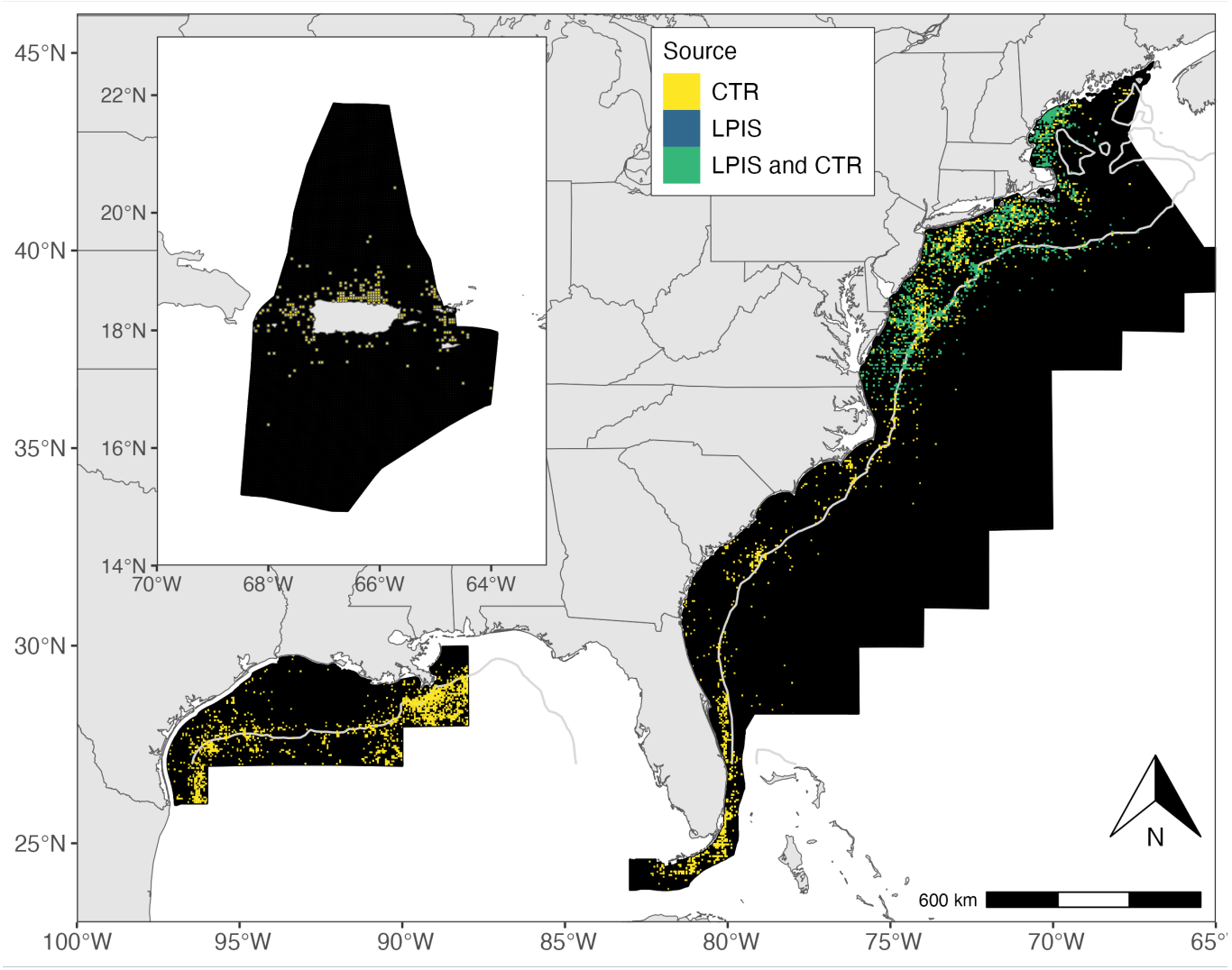
Tag, recapture, and release (CTR) data providers:

Aggregating LPIS and CTR data

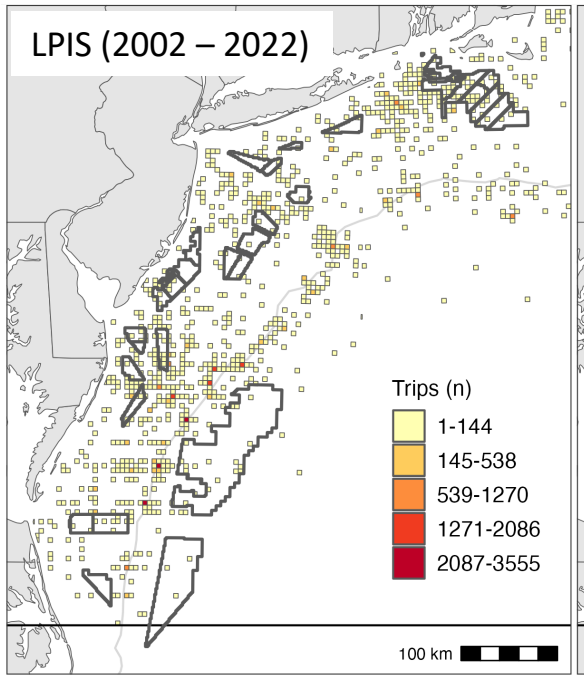
- LPIS (2002 – 2022)
  - 43,035 trips
  - 280,310 catch records
  - 33 species, 7 HMS groups
- CTR records (1954 – 2022)
  - 254,588 events
  - 46 species, 6 HMS groups
- CTR records (2002 – 2022)
  - 22,310 events
  - 35 species, 6 HMS groups
- BOEM Outer Continental Shelf (OCS) blocks
  - 67,514 individual blocks
    - Atlantic (48,448 blocks)
    - Gulf of Mexico (9,207 blocks)
    - US Caribbean (9,859 blocks)

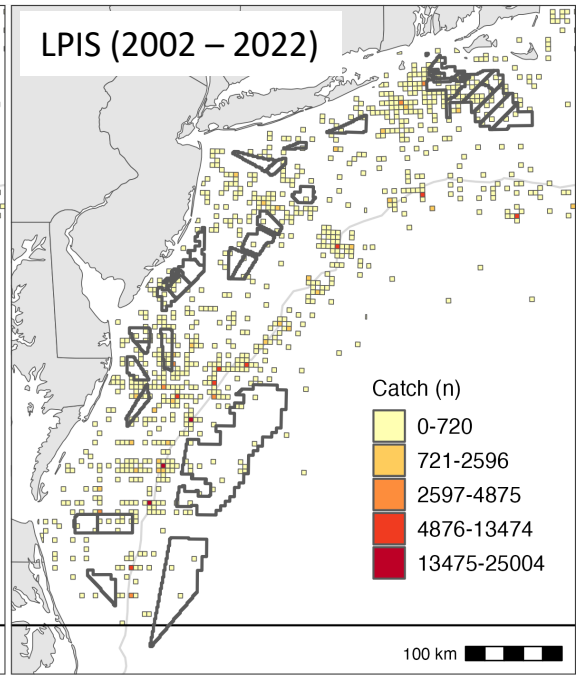


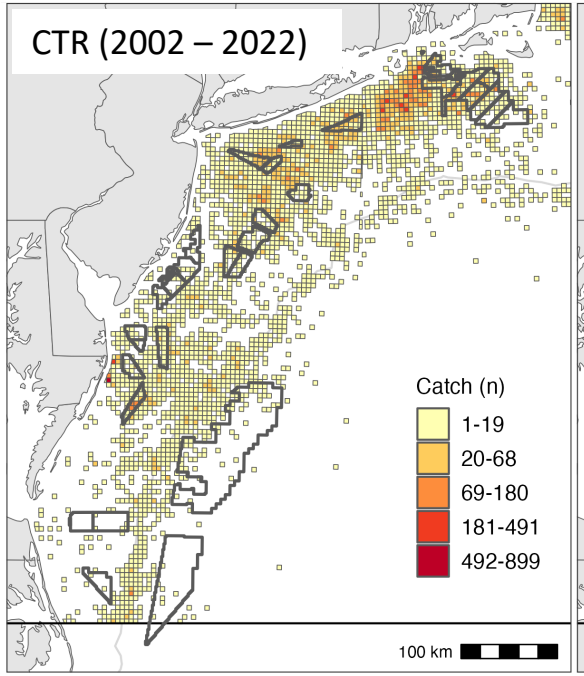
Effort based on the LPIS and CTR

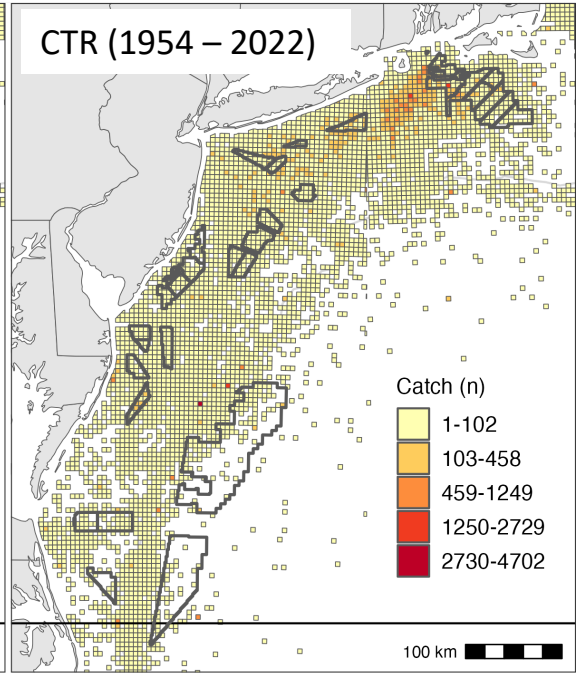


Kneebone et al. (in review)

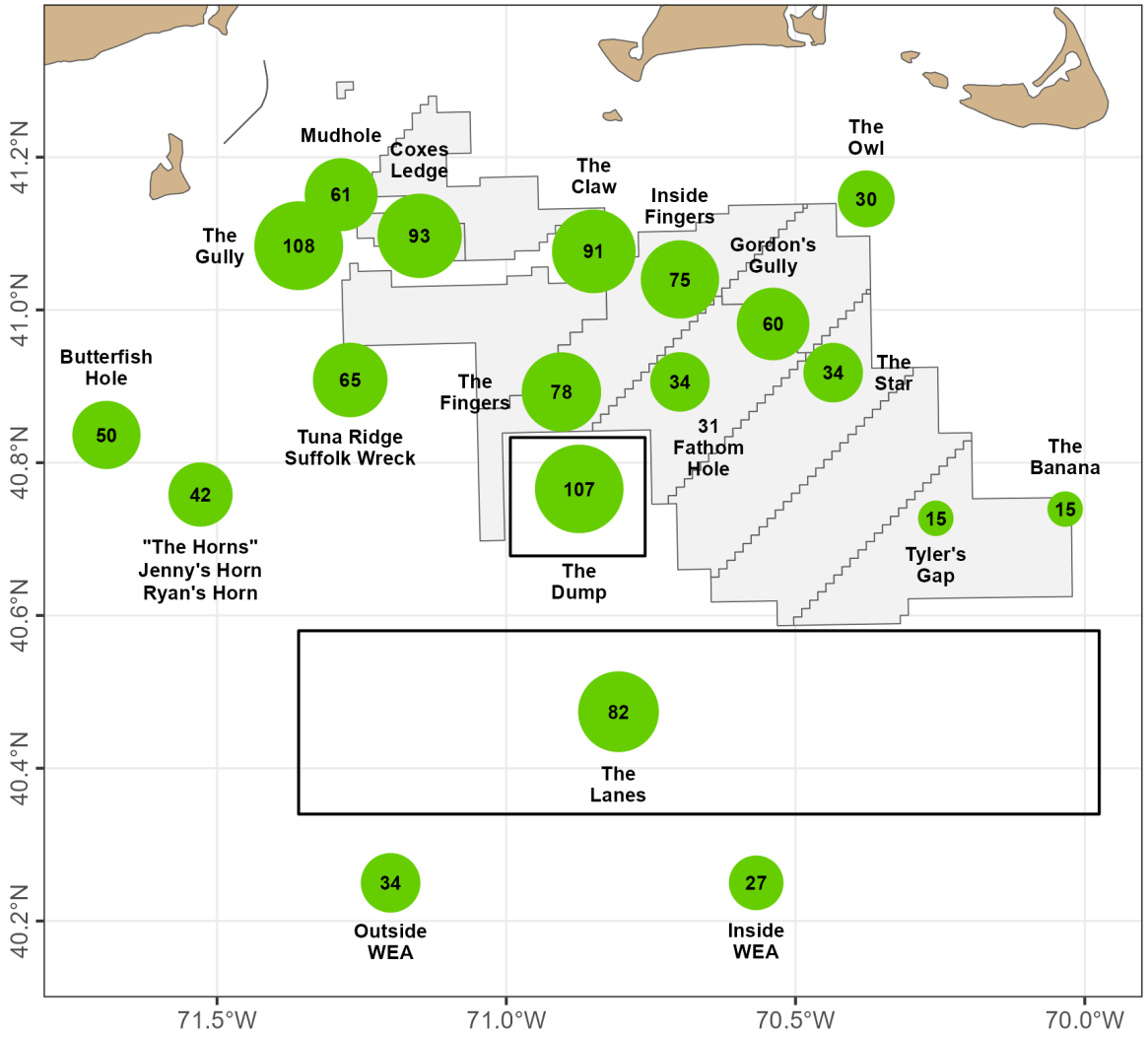




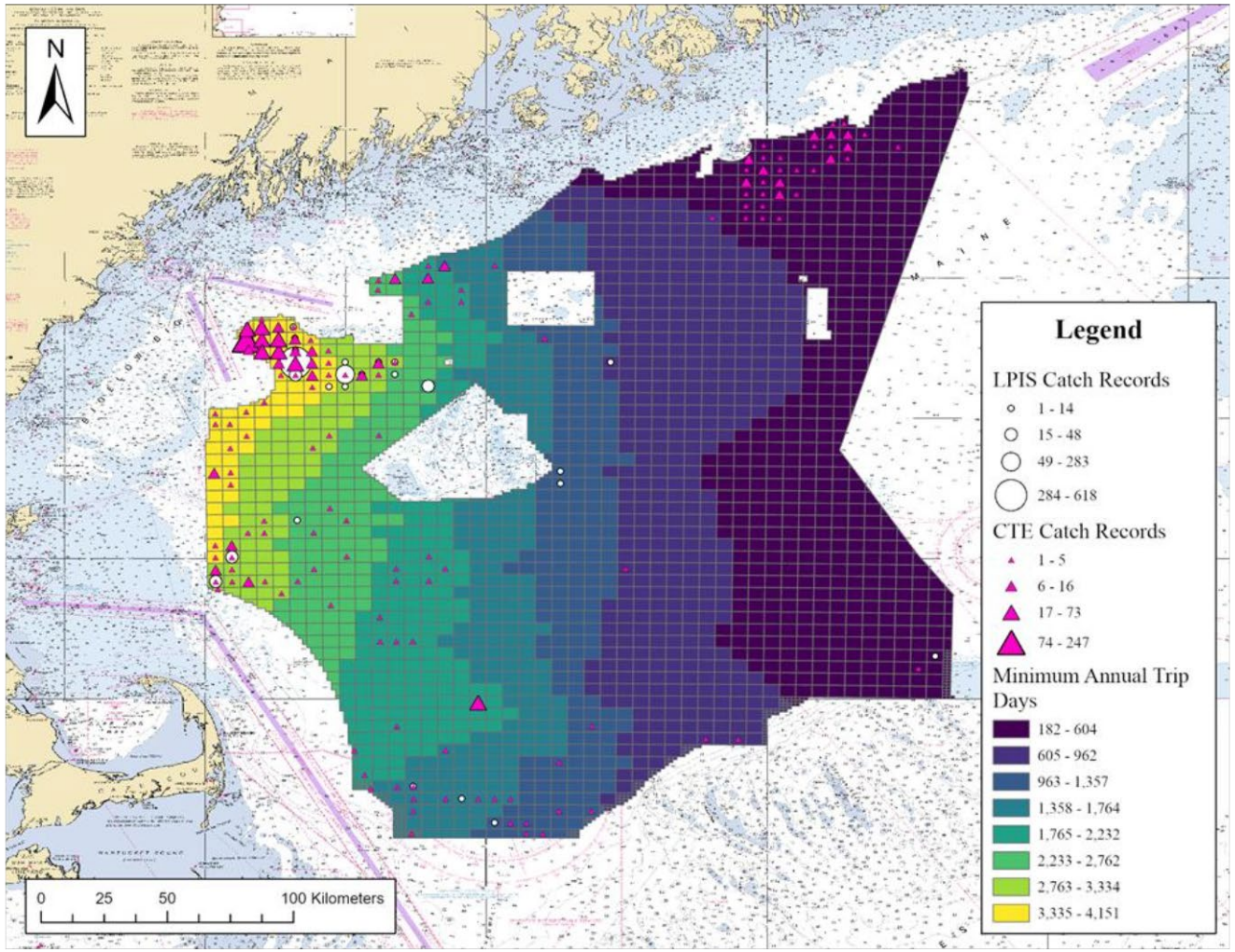




Surveys of anglers in southern New England and the Gulf of Maine



Circles represent how many of the 183 responding private anglers (angling category) fished in that area during 2021



Spatial overlay of LPIS catch and CTR tagging events onto the area reported to be fished based on the online survey

Steps towards monitoring: The Fish

The goals

- Document the baseline presence and movements of HMS in the wind energy areas
- Monitor changes to these metrics during and after construction

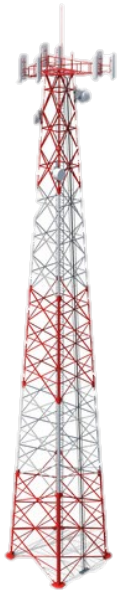
The technique

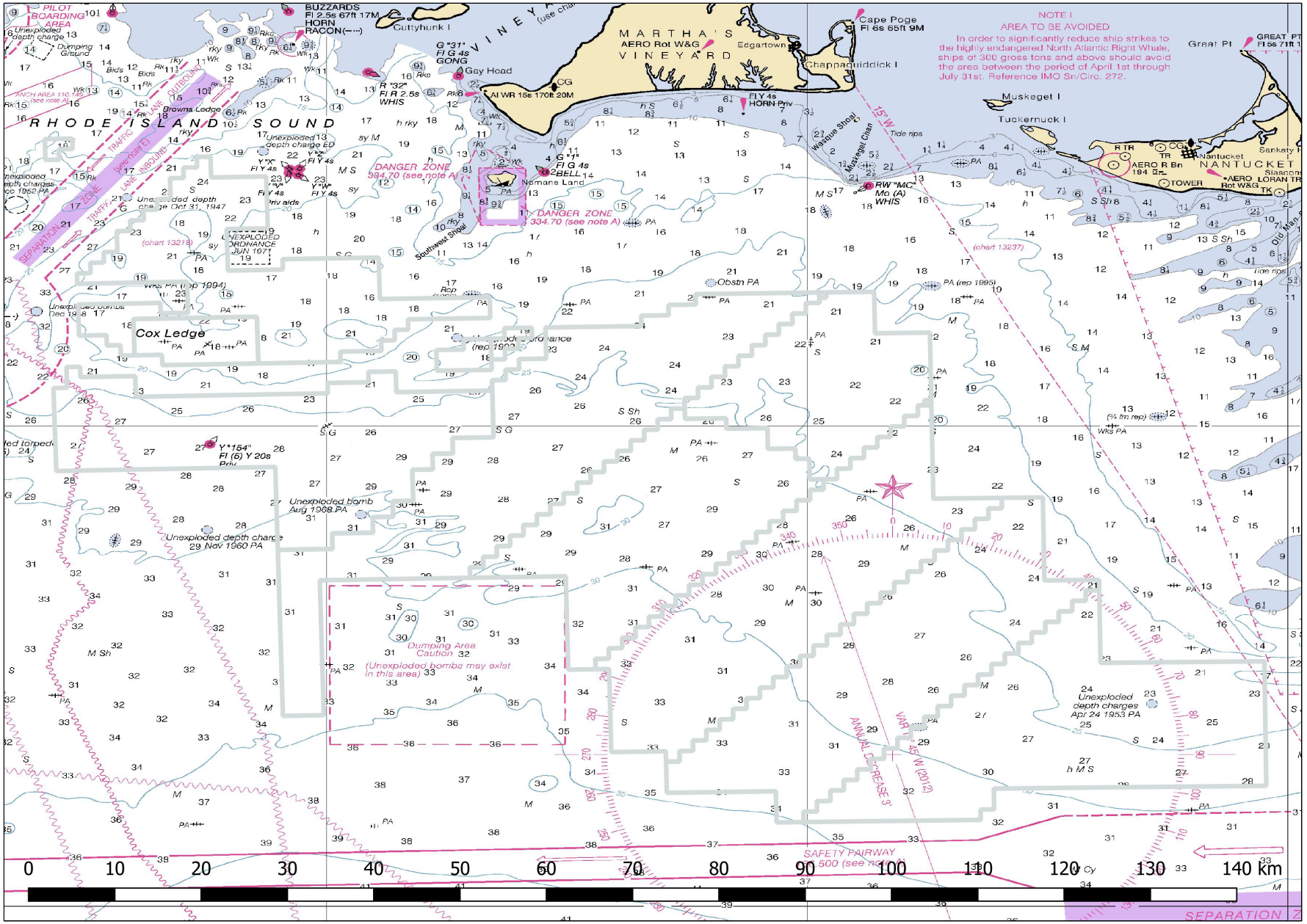
1) Passive acoustic telemetry

Collaborators:
Brian Gervelis (INSPIRE Environmental)
Keith Dunton (Monmouth University)
Walt Golet (University of Maine)
Matthew Davis (Maine Department of Natural Resources)

The developers:

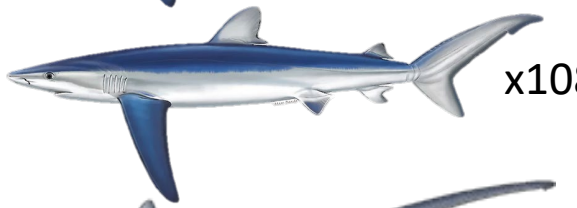
How are we monitoring the fish?





Tag deployments through 2024 (n=354)


x67


x108

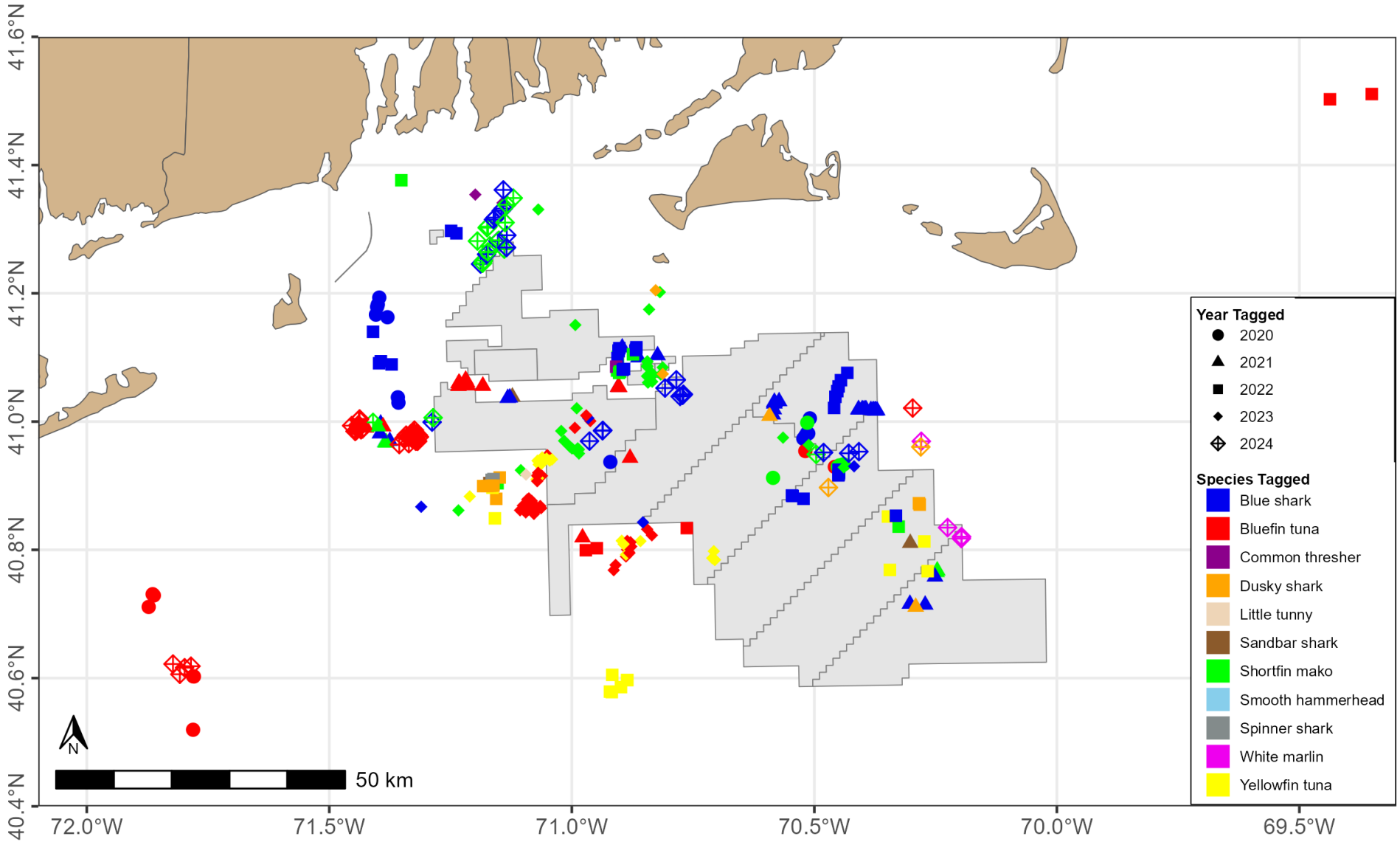

x3


x14

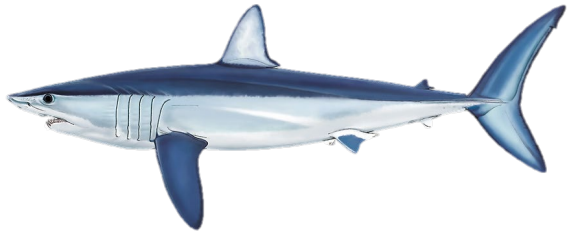

x120


x31

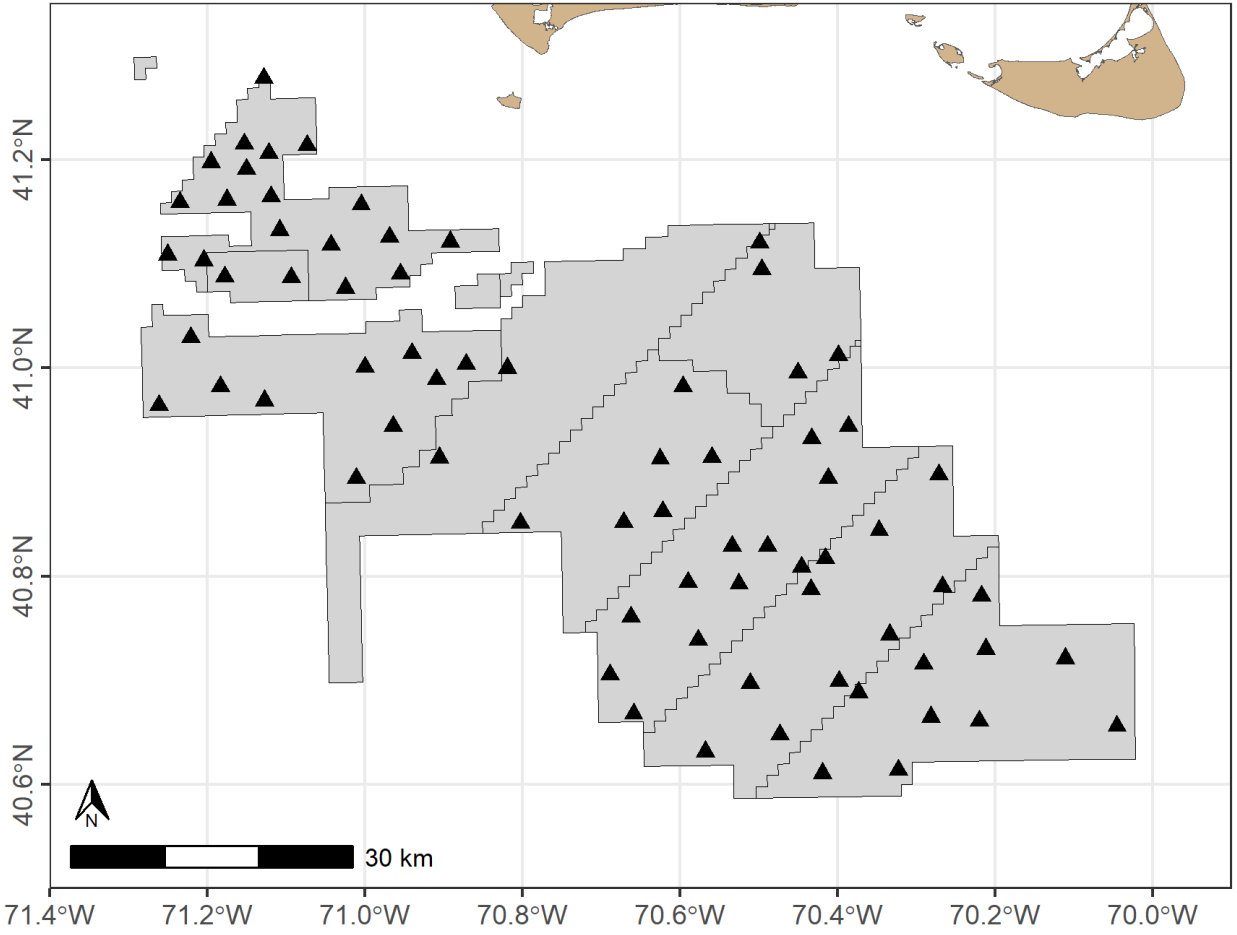

x4



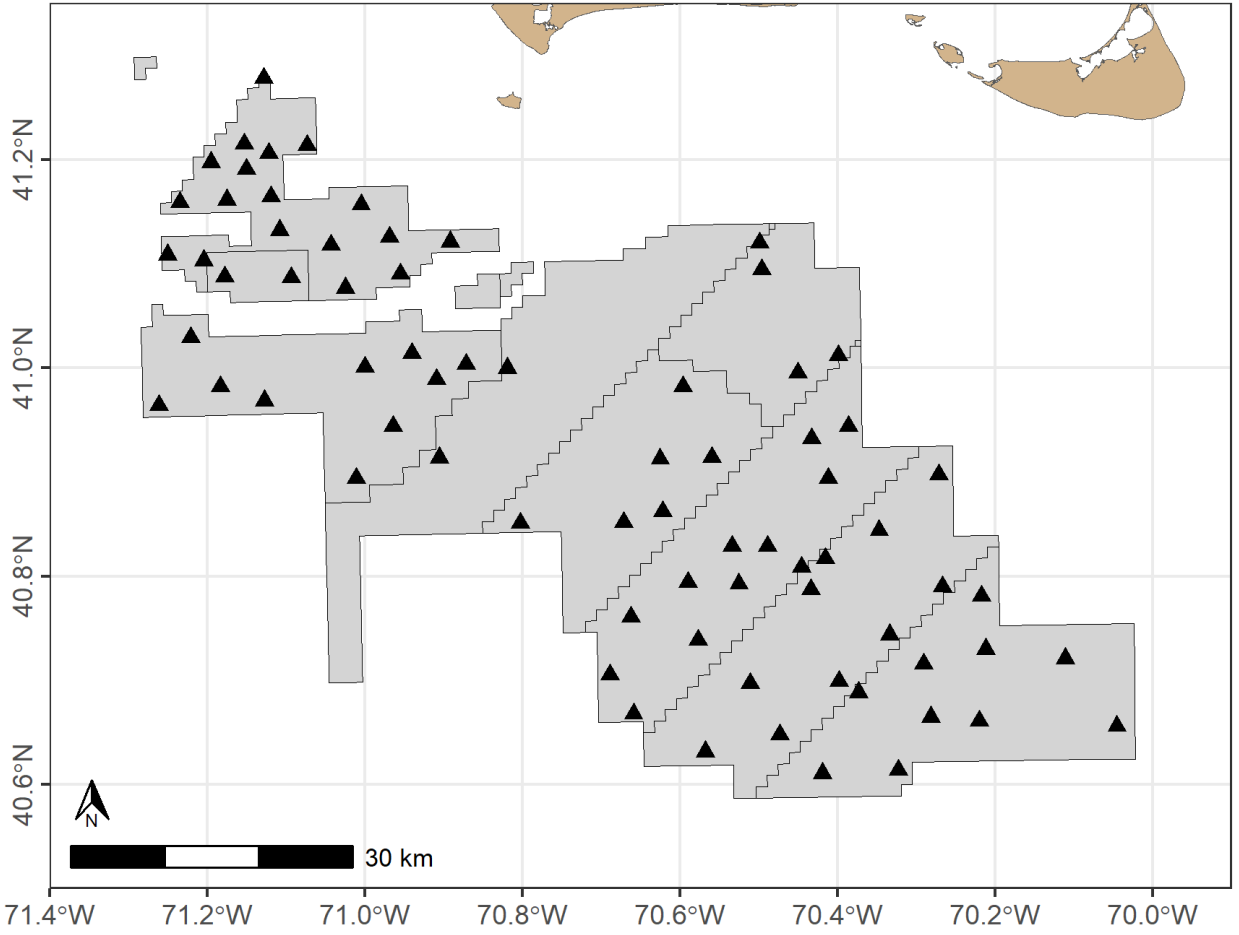
Why regional monitoring is essential



Shortfin Mako 2023-05-31



Bluefin Tuna 2023-05-31



Tis the season for HMS

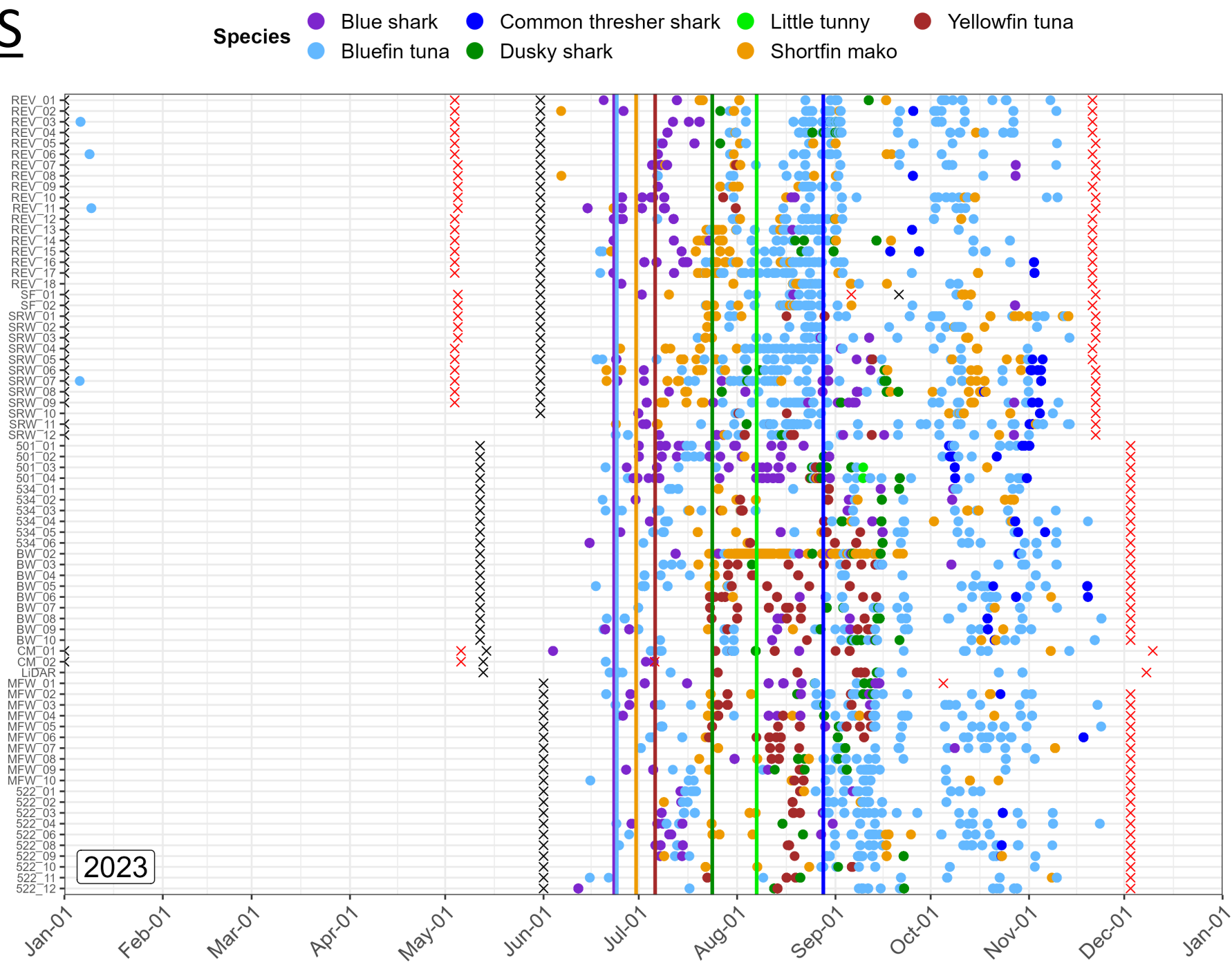
	Tagged	Detected	% detected
Blue shark	86	73	85%
Shortfin mako	50	40	80%
Dusky shark	12	11	92%
Bluefin tuna	70	54	77%
Yellowfin tuna	31	17	55%
All species	258	202	78%

Residence times

1 to 2,992 minutes (~50 hrs)
Average: 40 – 80 minutes
Blue shark & yellowfin longest

Interesting tidbits

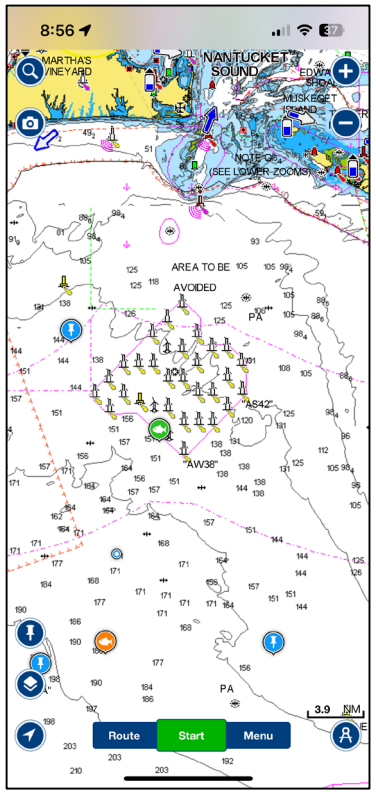
Blue shark detected 4yrs straight
6 bluefin detected 3yrs straight
3 makos detected 3yrs straight
4 yellowfin tagged in 2022 returned



Next steps in the monitoring plan

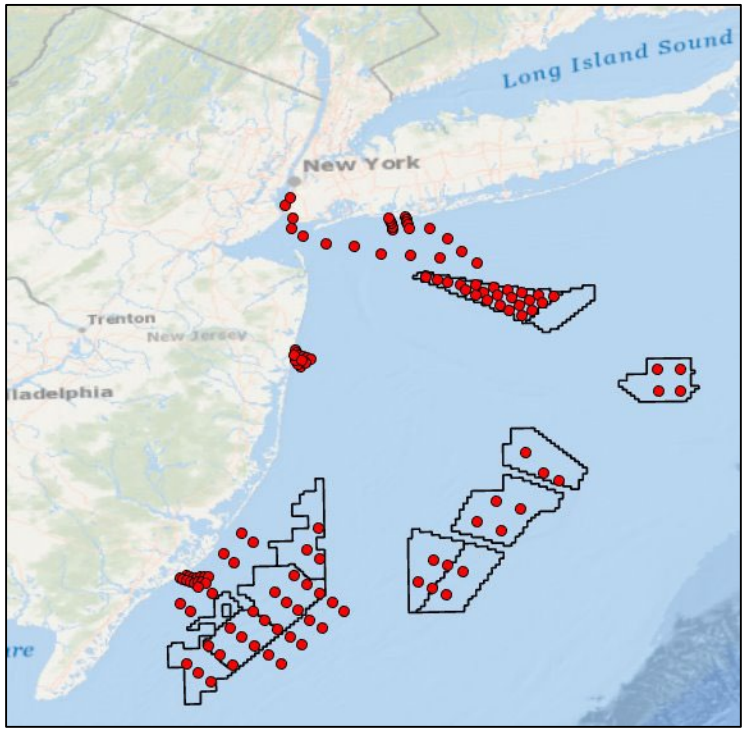
The Fishery

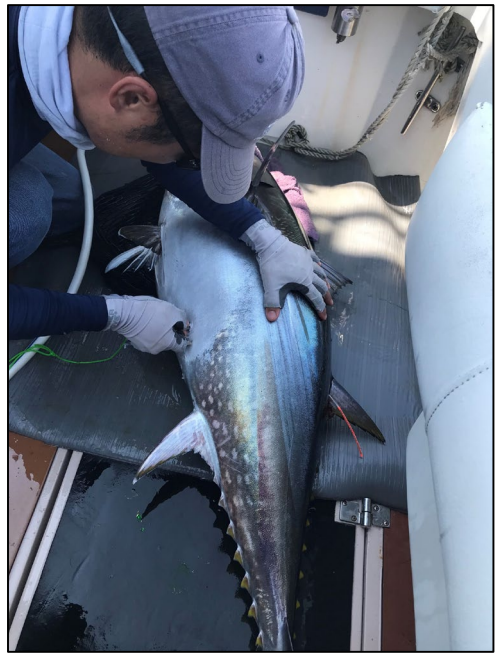
- Continue to build data time series
- Publish methodology
- More regional angler surveys?
- New methods to monitor fishing effort?



The Fish

- Continue to monitor during construction and operations
- Expand geographic scope by working with other projects in the Gulf of Maine and mid-Atlantic
- Analyze data!





Many thanks to many and online references

Captains

- Rob Taylor (Reel EZ)
- Tyler Macallister (Bottom Line)
- Mike Littlefield (ArchAngel)
- Willy Hatch (Machaca)
- Diego Bernal (Toro)
- Greg Mataronas (Cailyn & Maren)
- Mark and Sean Leach (Sea Holly III, Jessica Beth)
- Mohawk Bolin (Rock n' Roll)

Staff

- Ed Kim, Ryan Lowndes, Ryan Knotek (NEAQ)
- Connor Capizzano (INSPIRE Environmental)

Published and available reports

The Fishery - southern New England: Kneebone and Capizzano (2020)

The Fishery - Gulf of Maine: Davis and Kneebone (2023)

The Fish (pilot telemetry project): Gervelis and Kneebone (2022)

Synthesis of the Science: Review of factors that may impact HMS

NOAA Technical Memorandum (Section 1.4.4, Page 83)

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