Atlantic States Marine Fisheries COMMISSION

Multispecies Data

Katie Drew, ASMFC

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NOTE: Additional slides on non-stationarity and species distribution to come.

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Outline

- ERP Species
  - Life history
  - Assessment & stock status
  - Changes from 2019 ERP Benchmark

- NWACS-FULL Species
  - Changes from 2019 ERP Benchmark

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Striped Bass

- *Morone saxatilis*
- Anadromous species: spawn in rivers during the spring
- Spend first 5+ years in estuaries
  - 3 main stocks:
    - Chesapeake Bay,
    - Delaware Bay,
    - Hudson River
  - Managed and assessed as a single stock

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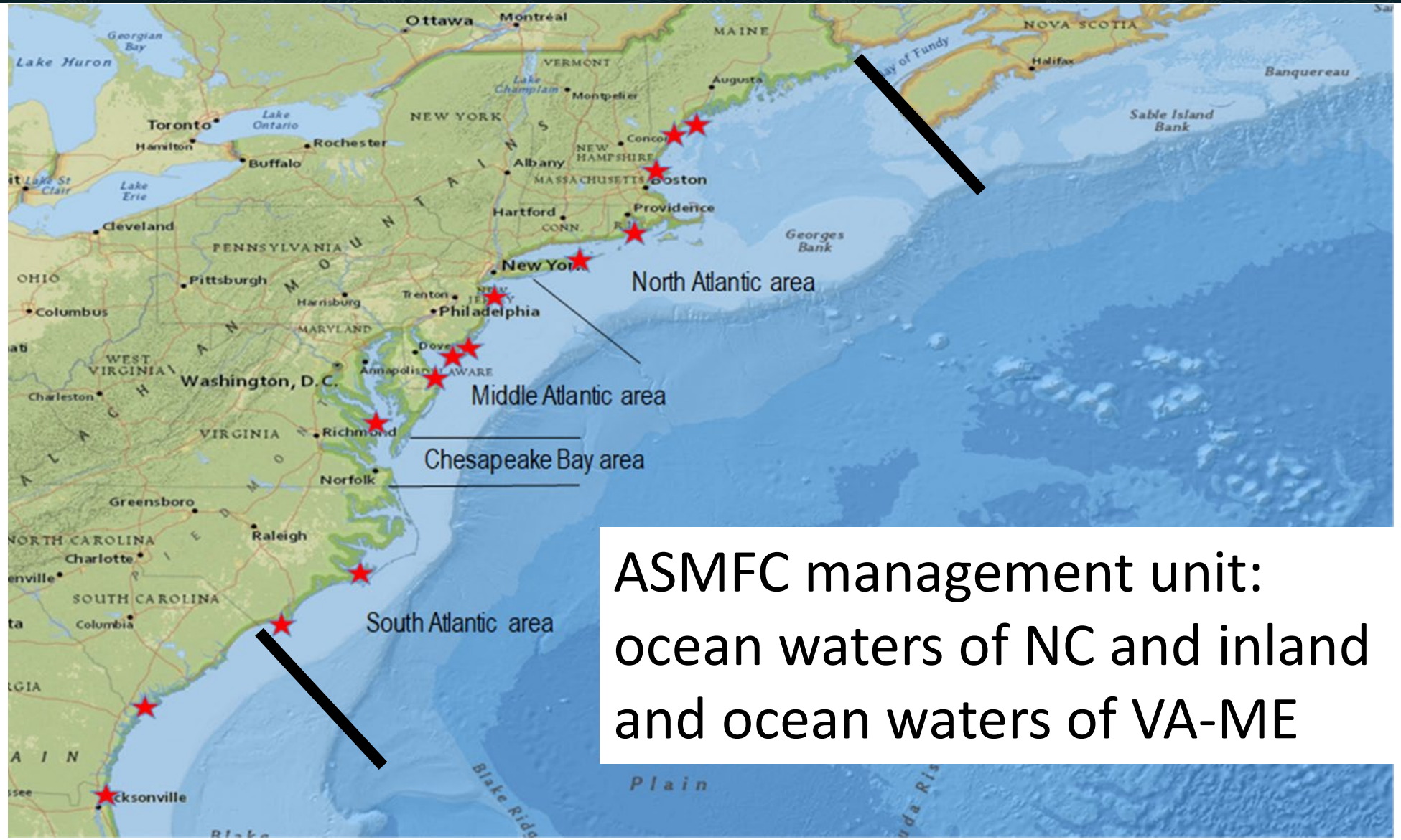
Striped Bass



ASMFC management unit: ocean waters of NC and inland and ocean waters of VA-ME

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Striped Bass

- Assessed with a statistical catch-at-age model
- 1982-2023
- TC recommended indices:
  - Composite Chesapeake Bay YOY
  - CT LISTS
  - MRIP CPUE
  - Alternate: MD Spawning Stock Survey

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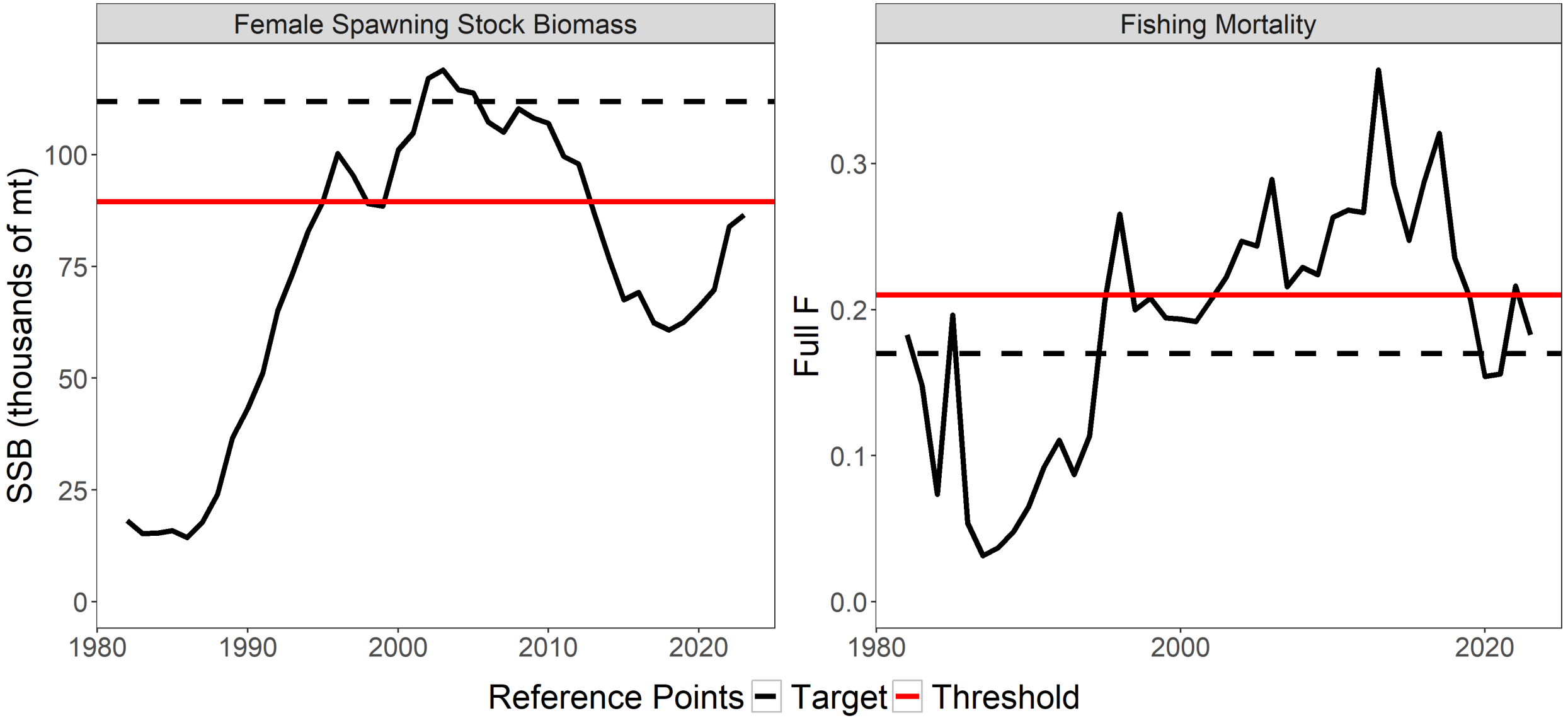
Striped Bass



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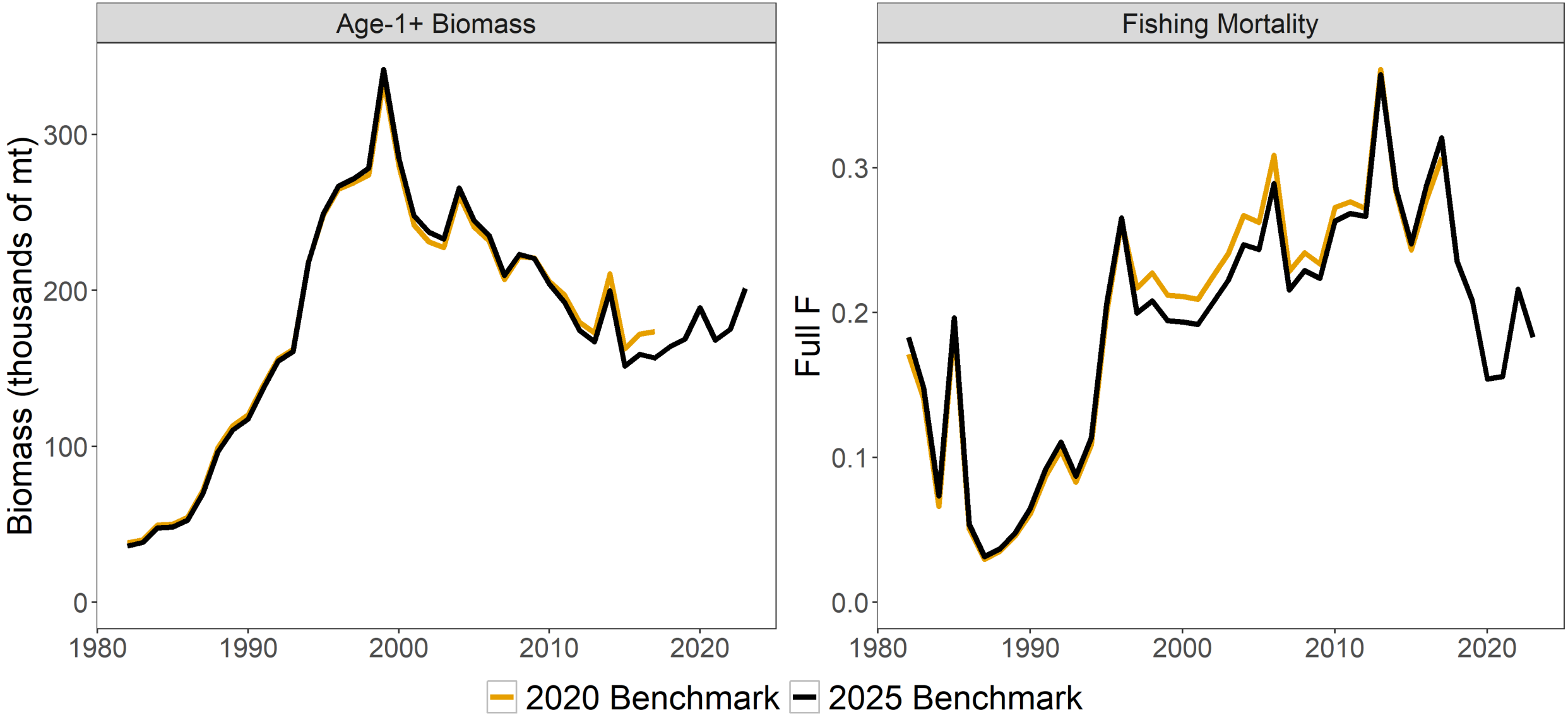
Striped Bass



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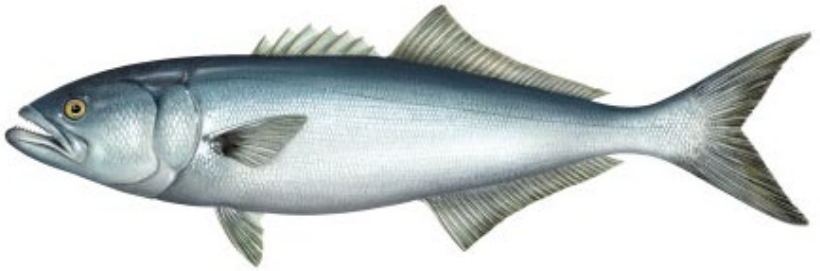
Bluefish

- *Pomatomus saltatrix*
- Coastal pelagic species found worldwide
- NMFS management unit: Florida – Maine
- Spawn offshore, juveniles settle in estuaries
- Migrate north to Maine in summer and south to Florida in winter
- Fast-growing, early maturing species



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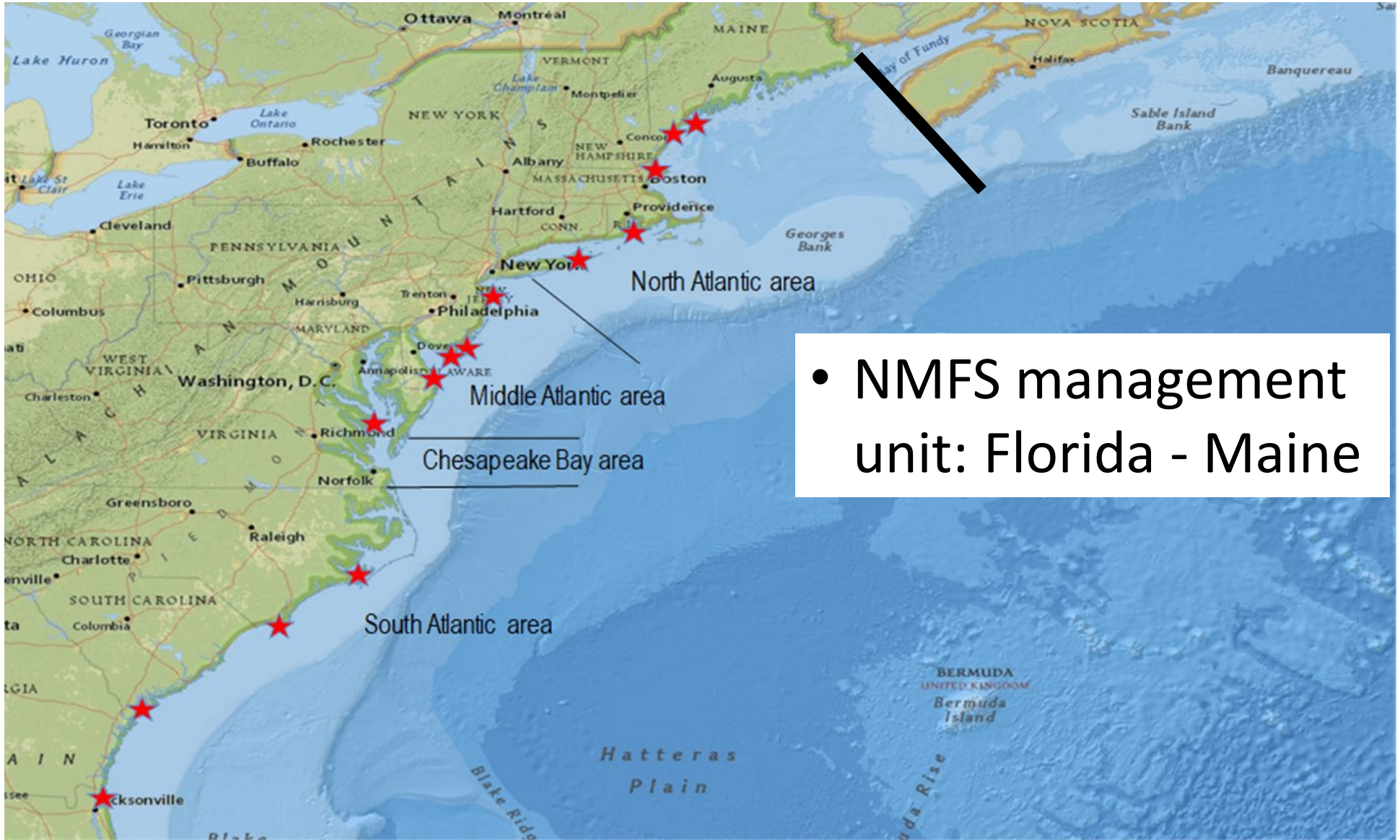
Bluefish



- NMFS management unit: Florida - Maine

Bluefish

- Research Track in 2022, changed from ASAP (statistical catch-at-age model) to WHAM (state-space catch-at-age model)
  - 1985-2022
  - Projection data used for 2023
- TC recommended indices:
  - Coastwide composite YOY
  - NC Pamlico Sound Independent Gillnet Survey
  - MRIP CPUE
  - Alternate: NEFSC Albatross Trawl Survey

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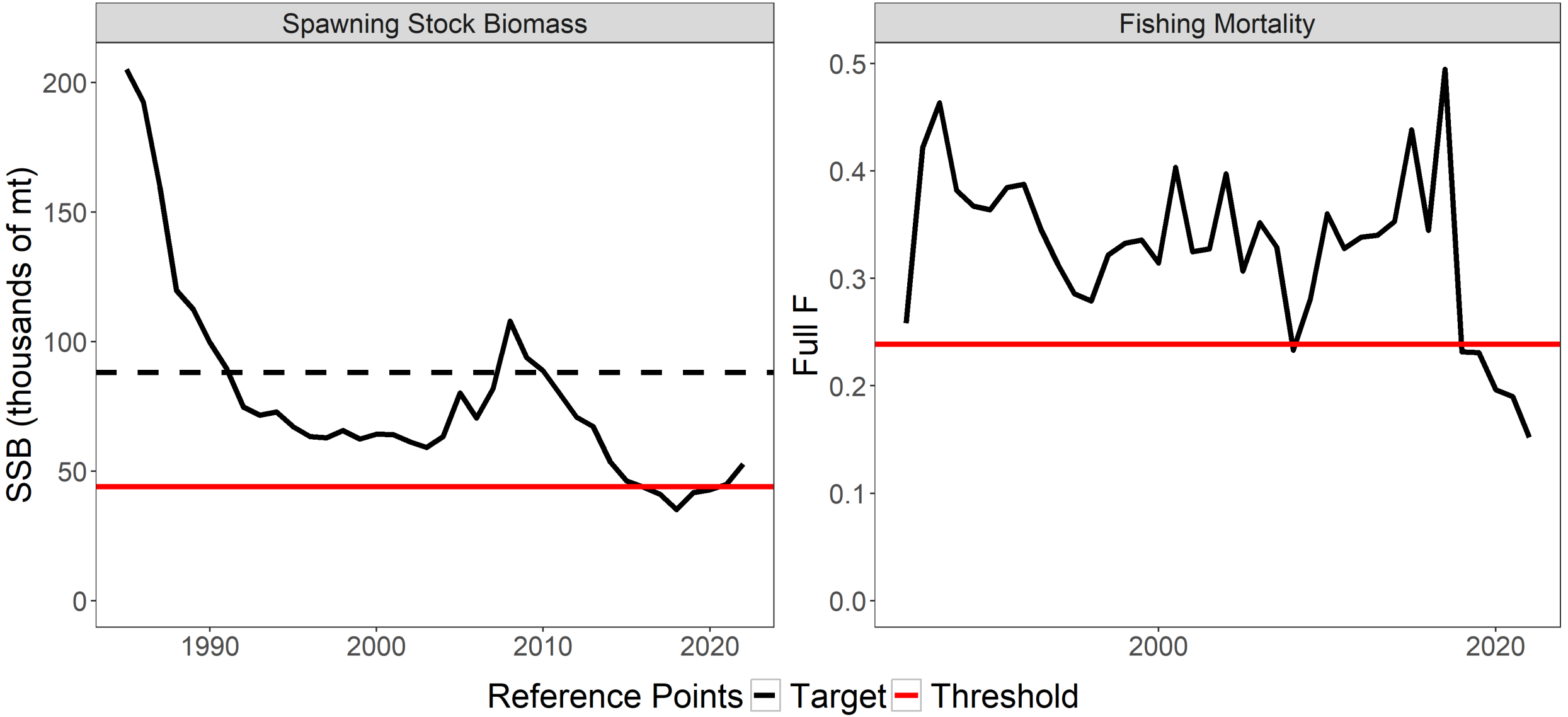
Bluefish



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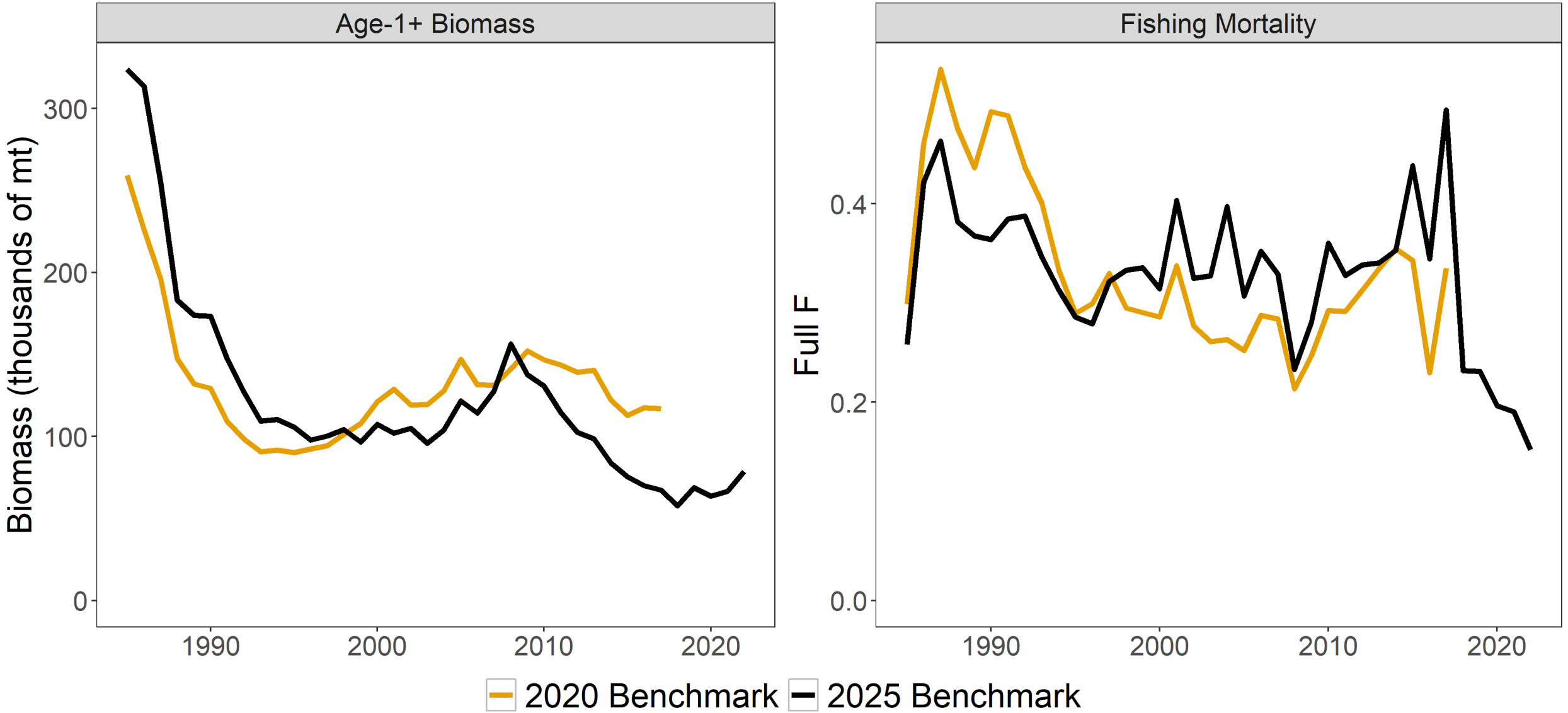
Bluefish



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Spiny Dogfish

- *Squalus acanthia*
- Unit stock from Labrador to Florida; most abundant from Nova Scotia to North Carolina
- Migrate north in spring and summer into the Gulf of Maine, migrate south to the mid-Atlantic in fall and winter
- Long lived species (max age 40 years); bear live young

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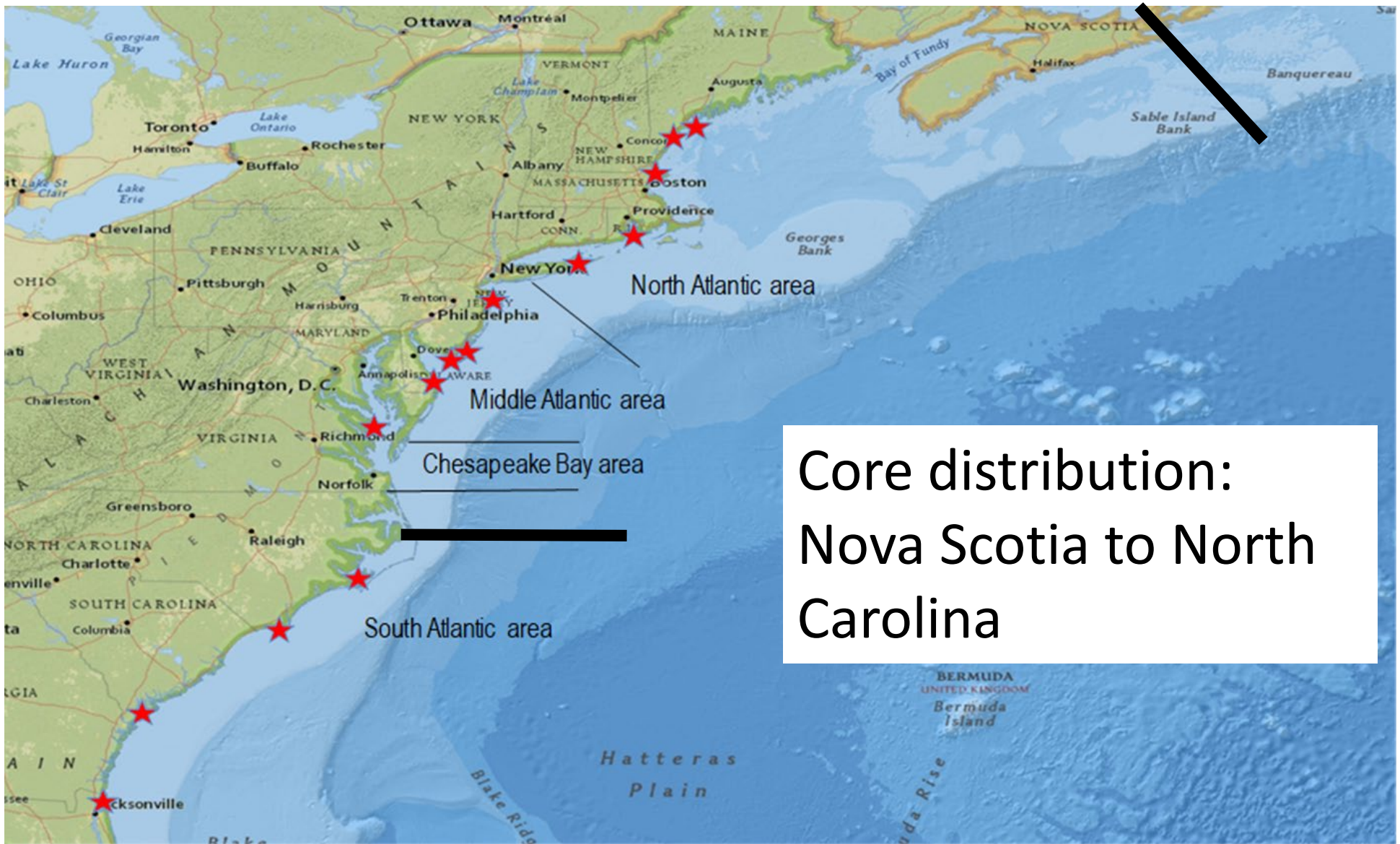
Spiny Dogfish



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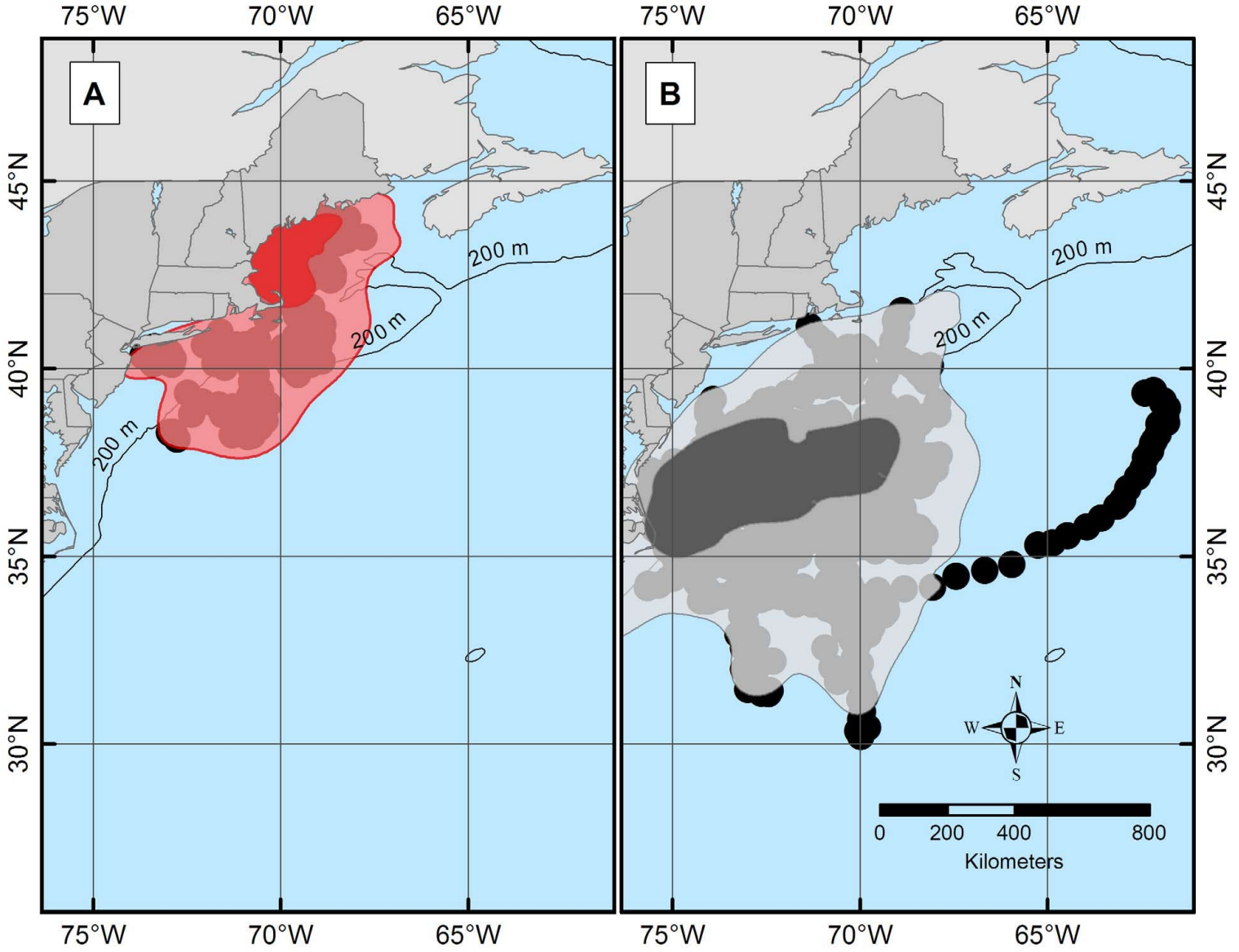
Spiny Dogfish

- Carlson et al. (2014) found that fish tagged off of NC moved much farther offshore, well outside the model domain

- Concluded that a large proportion of the population is not sampled on an annual basis in the NEFSC bottom trawl



Spiny Dogfish

- Research Track 2022, changed from swept-area biomass and exploitation rate from trawl survey to a Stock Synthesis length-structured model
  - 1920-2022
  - Projection data used for 2023

- One index: NEFSC Spring Bottom Trawl Survey

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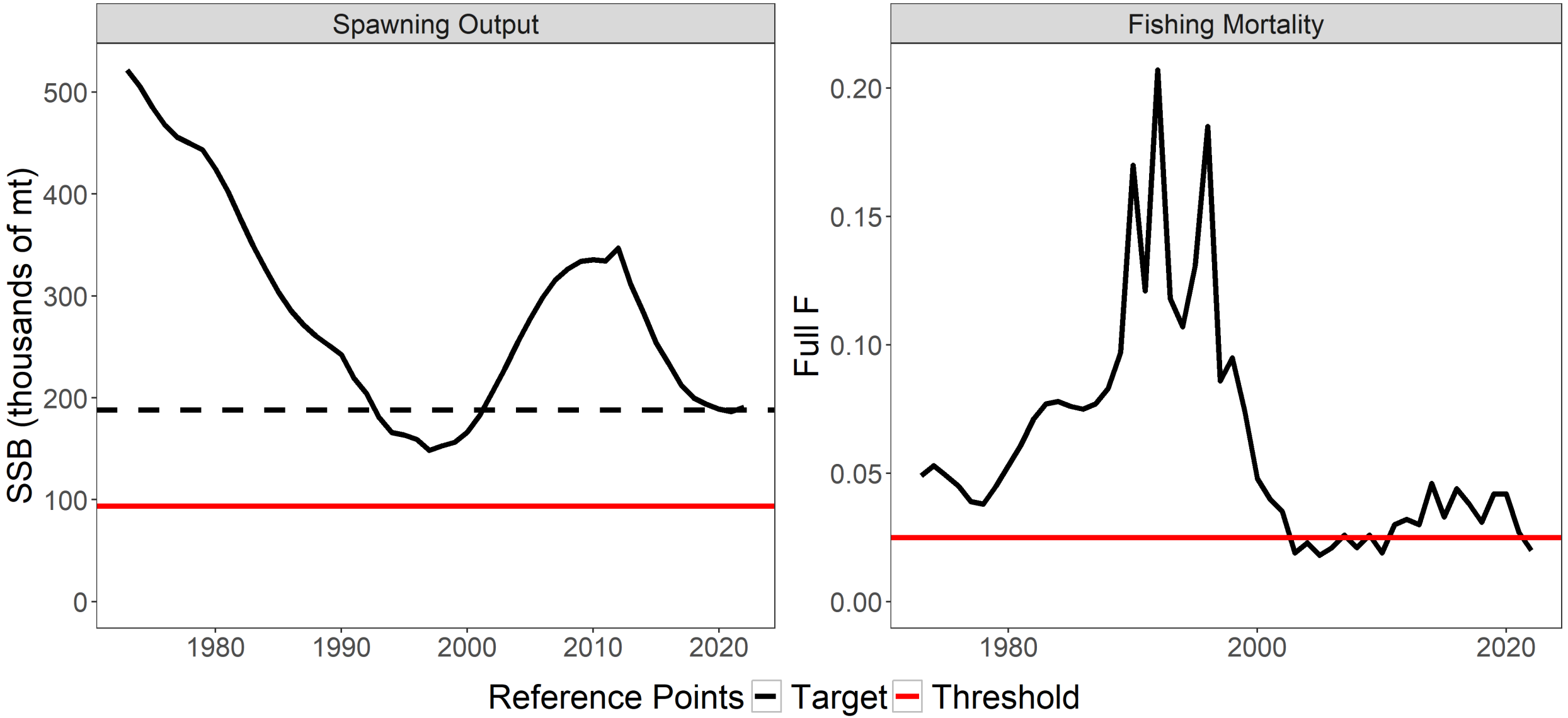
Spiny Dogfish



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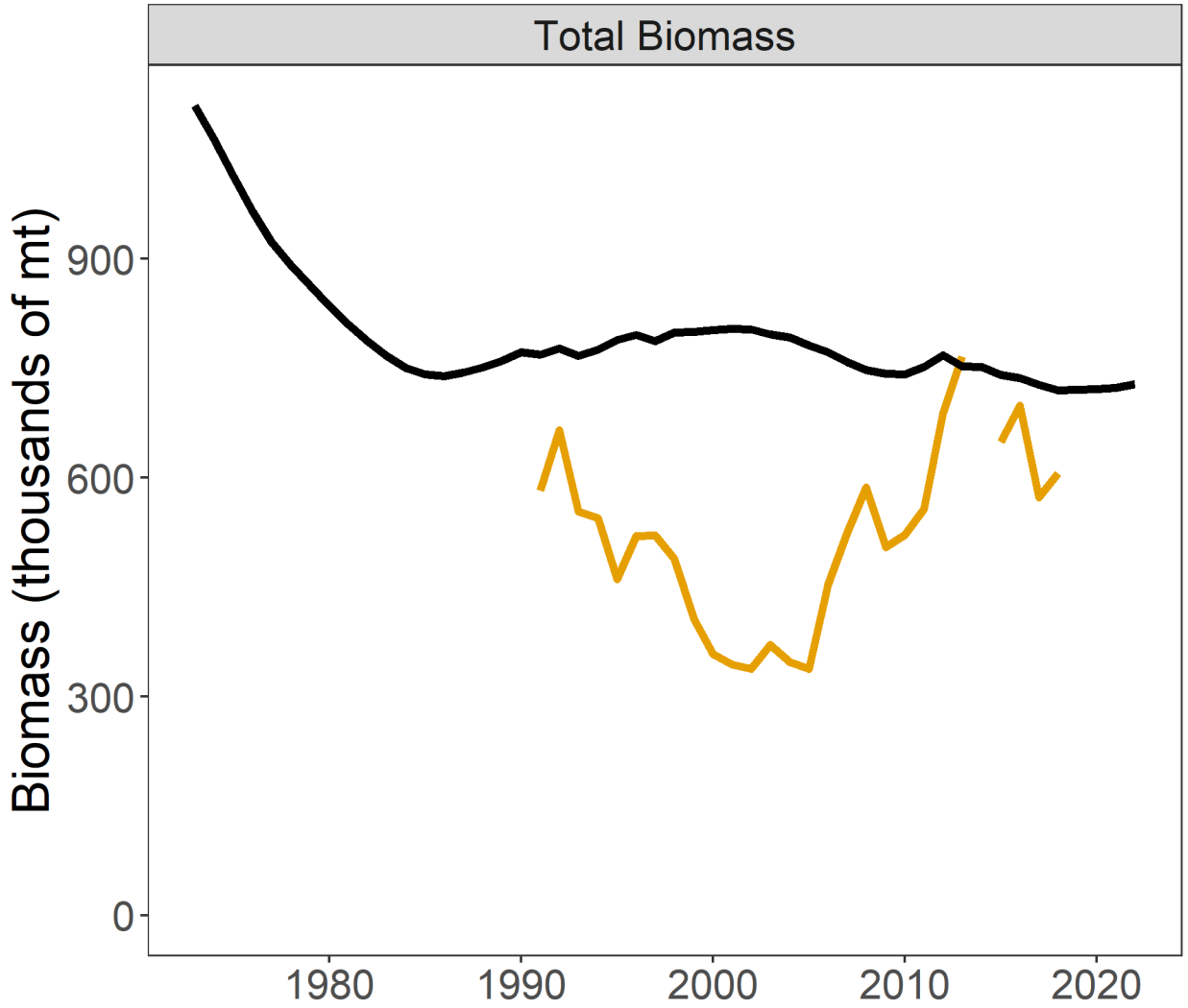
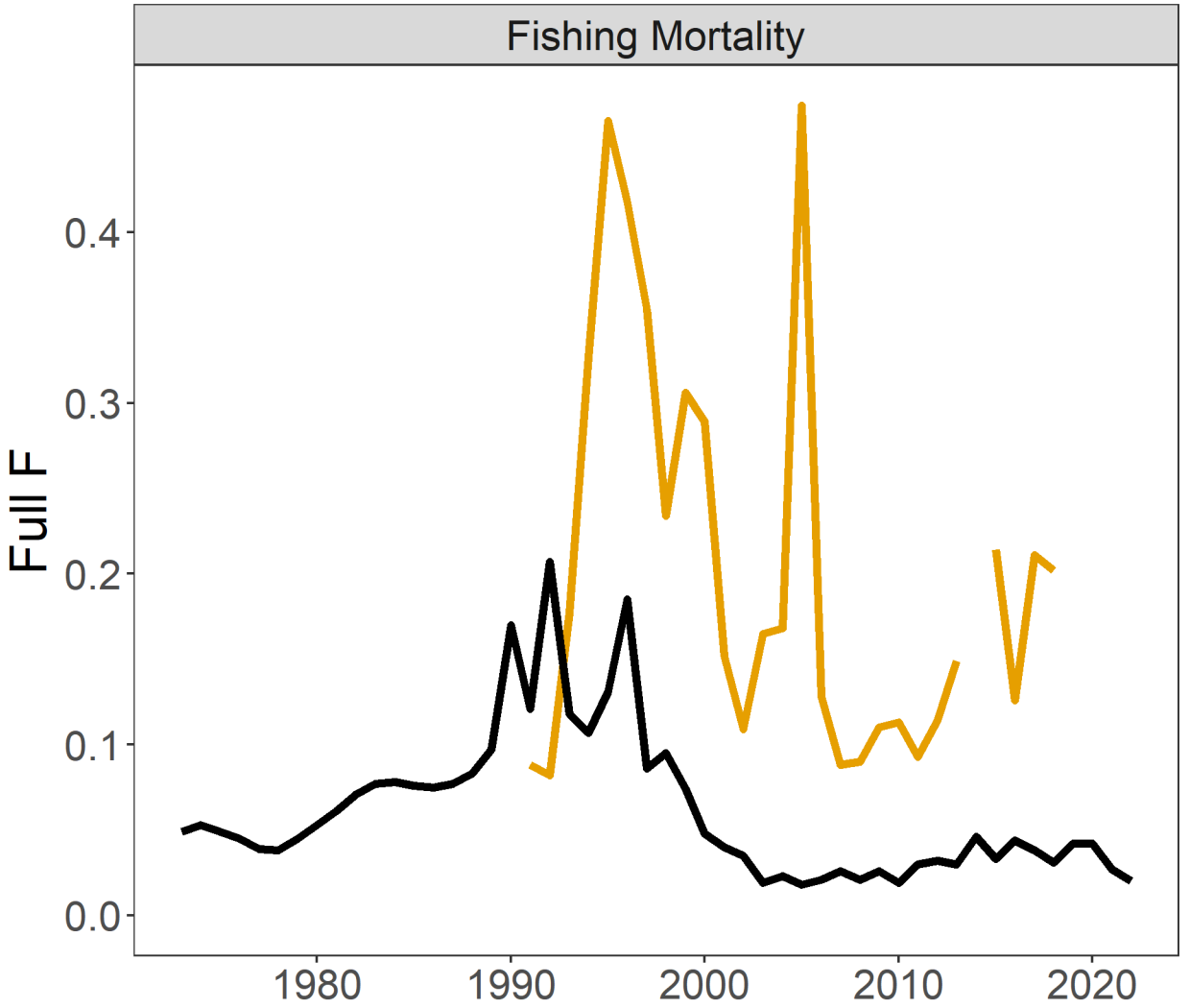
Spiny Dogfish





2020 Benchmark 2025 Benchmark

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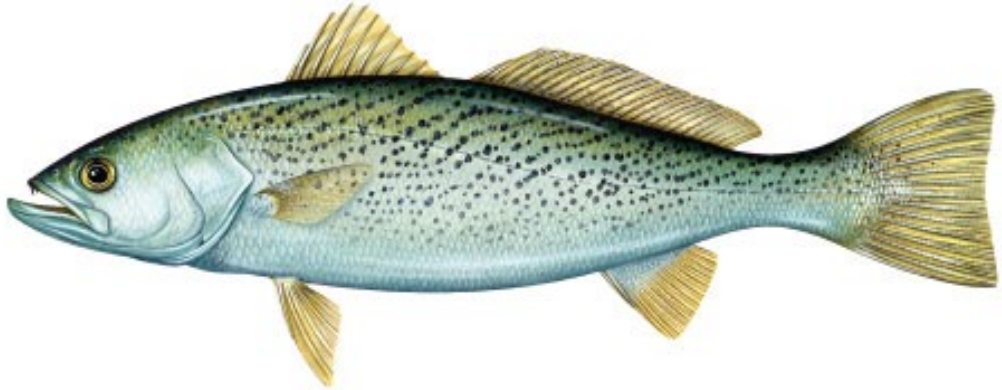
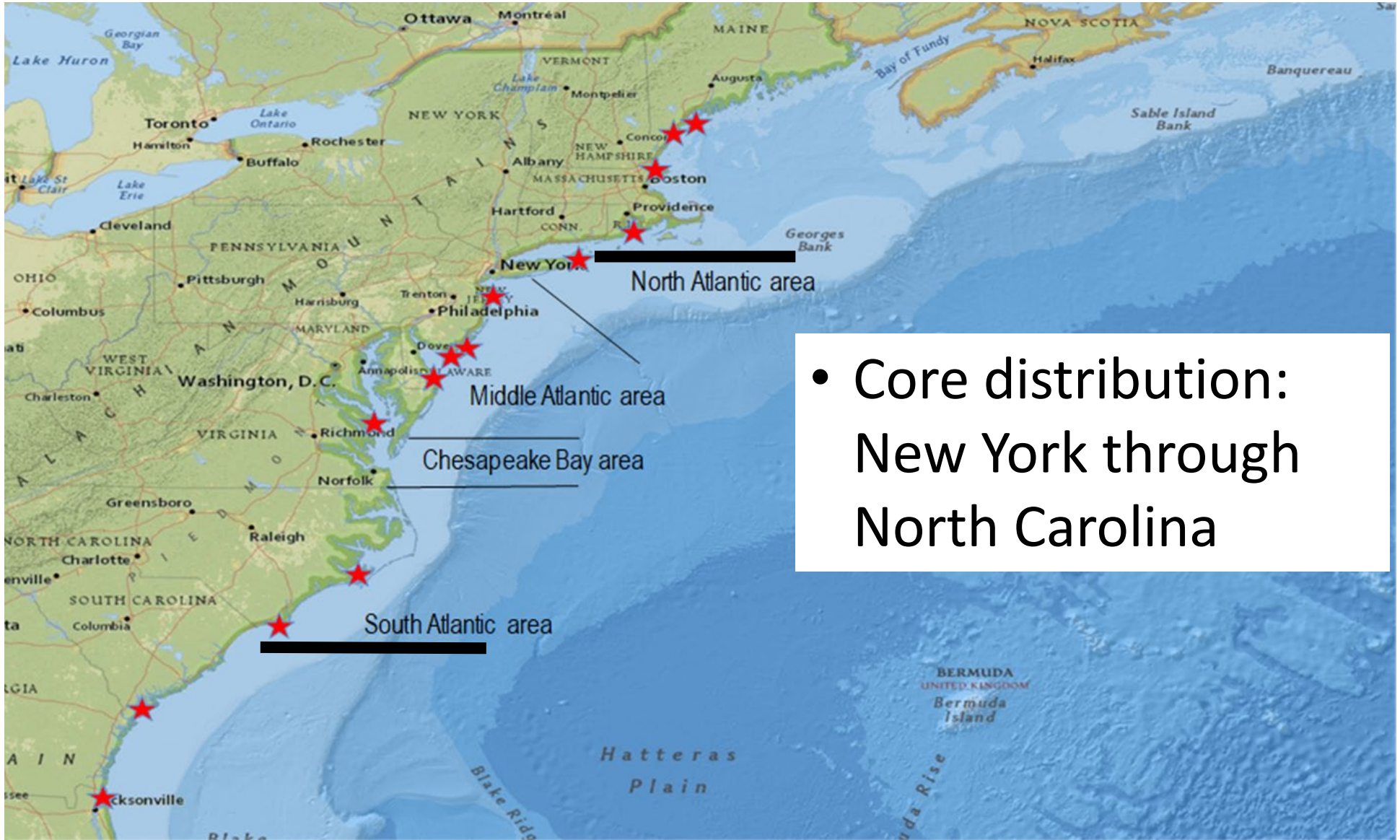
Weakfish

- *Cynoscion regalis*
- ASMFC management unit: Florida through Massachusetts, but the core of the distribution is North Carolina through New York
- Move inshore and south in winter, offshore and north in summer



Atlantic States Marine Fisheries COMMISSION

Weakfish



- Core distribution: New York through North Carolina

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Weakfish

- Assessed with a Bayesian statistical catch-at-age model that estimates time-varying M and spatial heterogeneity in the indices
- 2025 Update
  - 1982-2023 (preliminary results)

- TC recommended indices:
  - Composite YOY
  - DE Bay 30’ Trawl
  - MRIP CPUE
  - Alternate: NJ Ocean trawl (offshore), NC PSIGNS (inshore)

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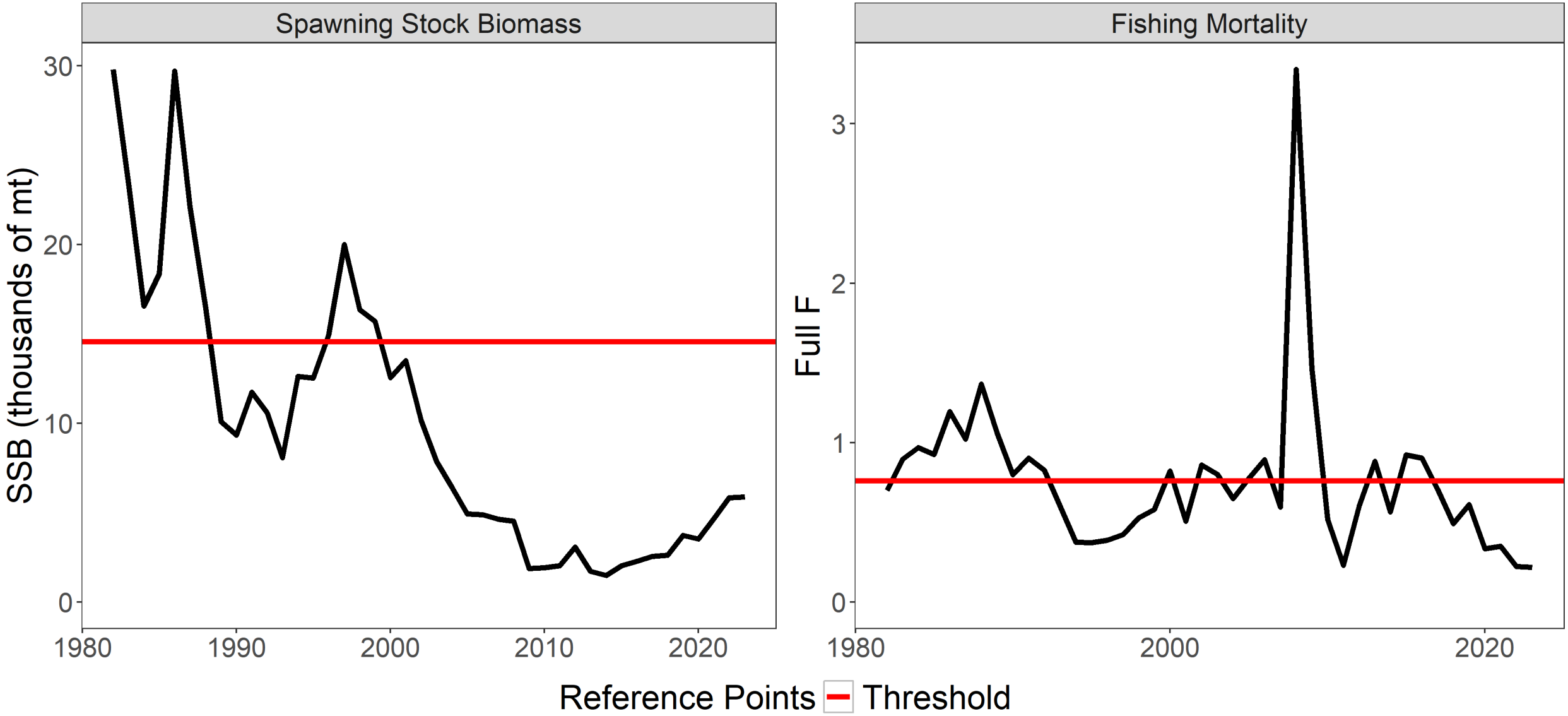
Weakfish



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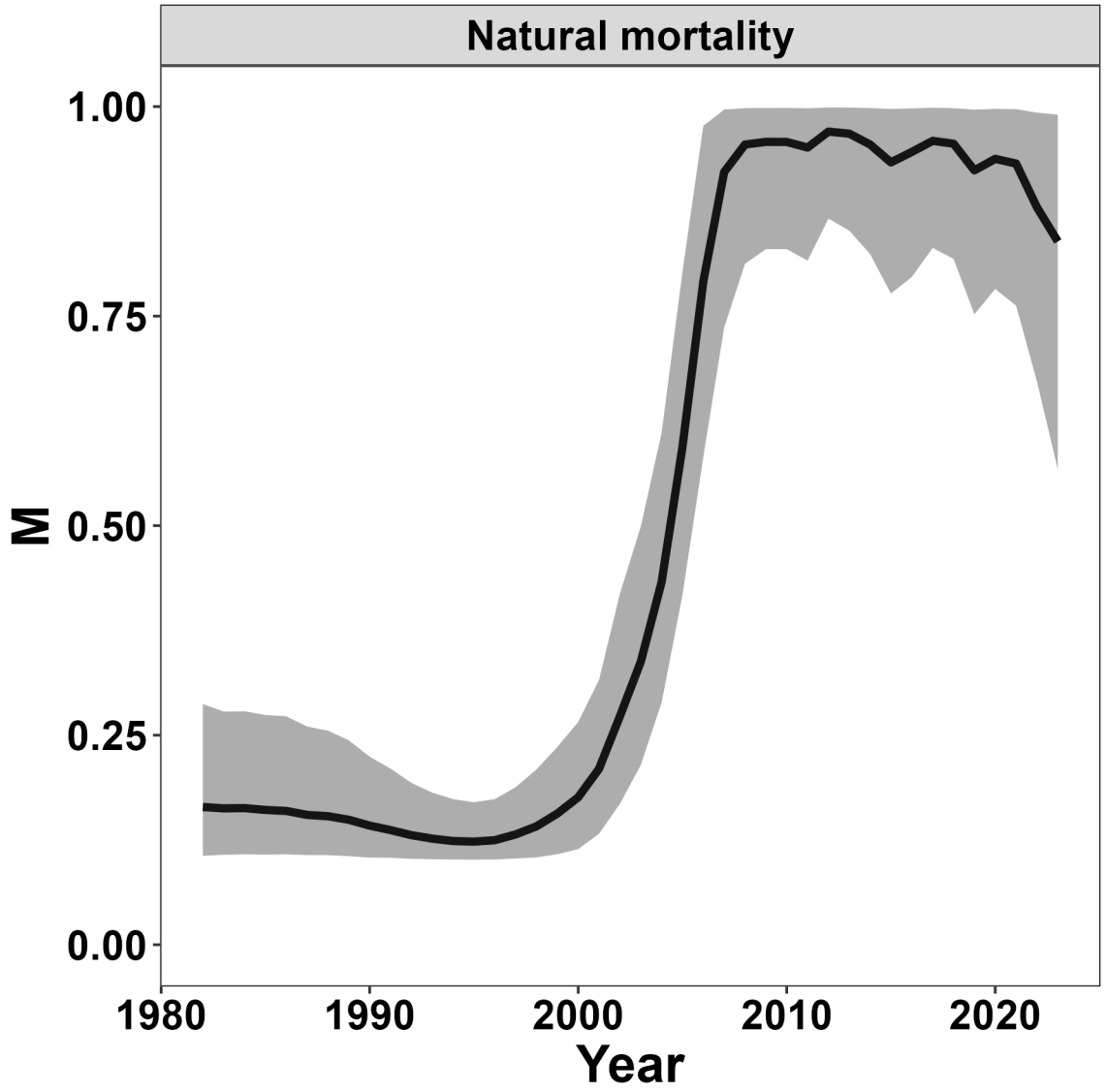
Weakfish

- ERP WG noted difficulty in balancing weakfish in the EwE models at the start of the time-series

- Krause et al. (2020) used an integrated tagging model to estimate M for weakfish tagging in NC in 2013-2017

  →Estimated M=2.33 yr^{-1} for age 2-3 weakfish



Weakfish

- ERP WG scaled the time-series of M estimated by the Bayesian assessment model so that the M in 2013-2017 was equal to the Krause et al. (2020) tag-based estimate of M

- Used a Lorenzen curve to develop a time- and age-varying M, scaled so that the time-varying M was the M of age-2.5

- Input the rescaled time- and age-varying M into an ASAP model to estimate total biomass and F for use in EwE models

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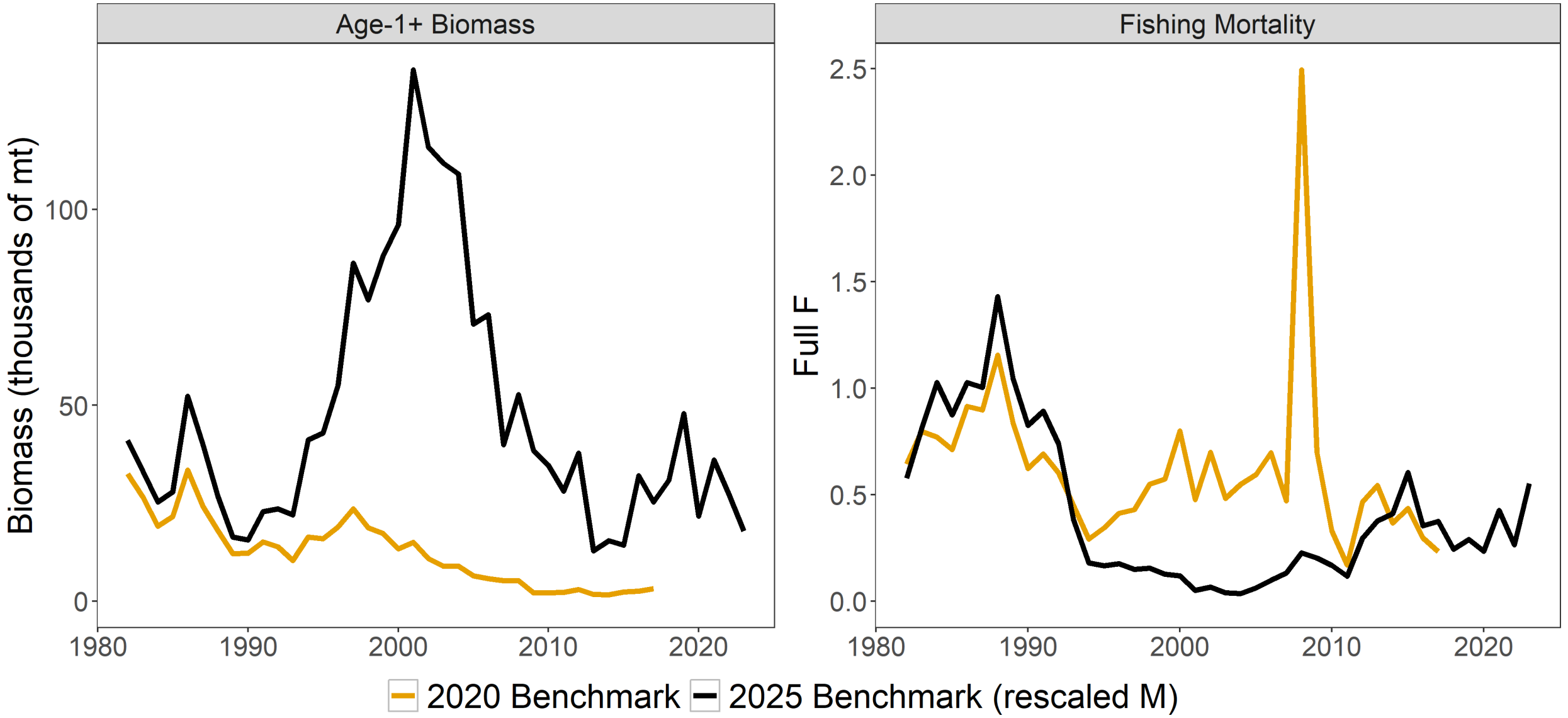
Weakfish



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Atlantic Herring

- *Clupea harengus*
- Range from Labrador through North Carolina
- Two spawning components: one on Georges Bank and one in coast Gulf of Maine waters
- Summer in Gulf of Maine, overwinter in Block Island Sound-Virginia Cape
- Schooling planktivore
- Important forage species

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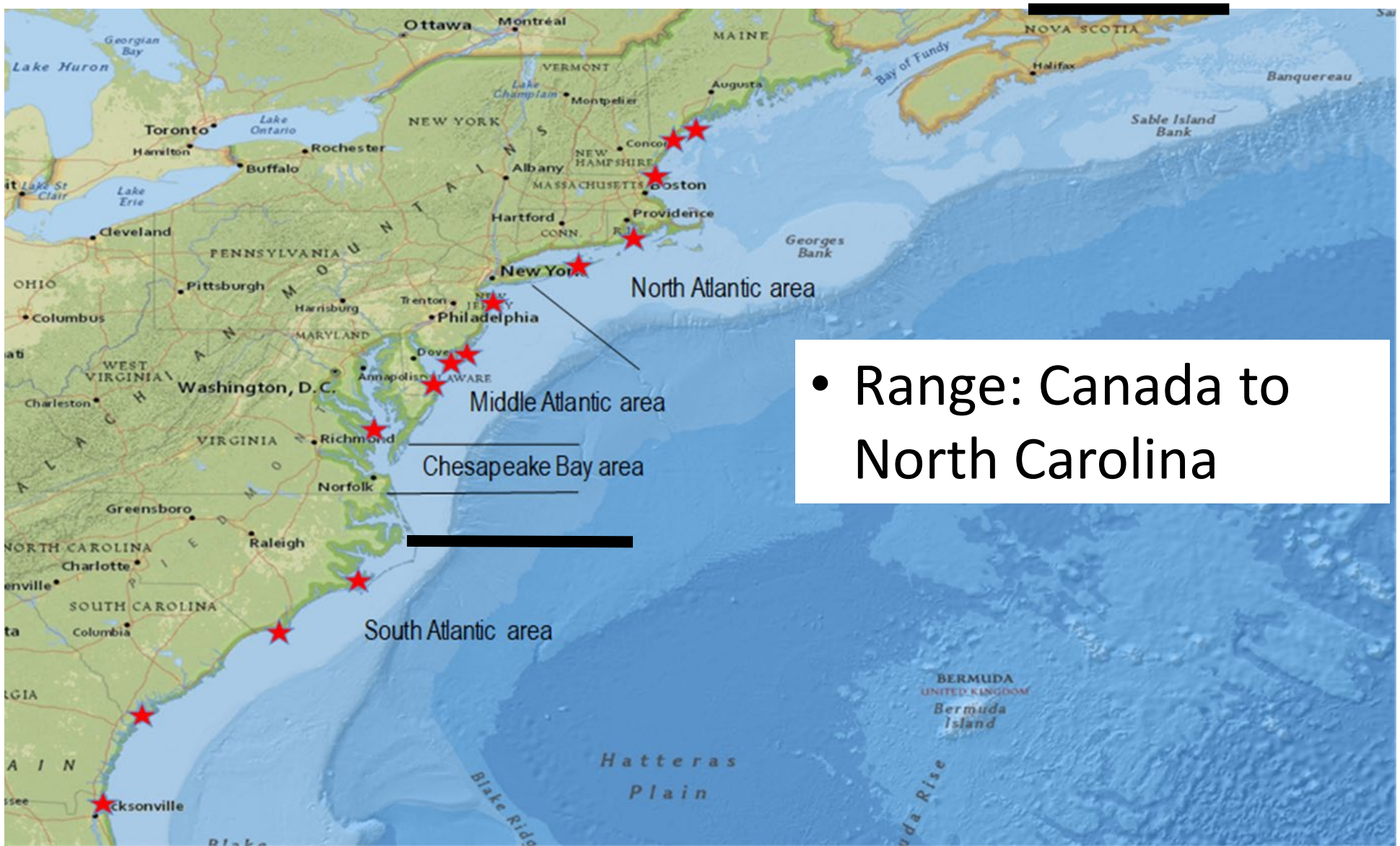
Atlantic Herring



- Range: Canada to North Carolina

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Atlantic Herring

- 2024 Management Track Assessment using ASAP
  - 1965-2023
- 2025 Research Track using WHAM
  - Not completed in time to be included in this assessment

- TC recommended indices:
  - NEFSC Fall Albatross
  - NEFSC Fall Bigelow
  - Alternate: ASMFC Summer Shrimp Survey
  - No YOY (fall spawners)

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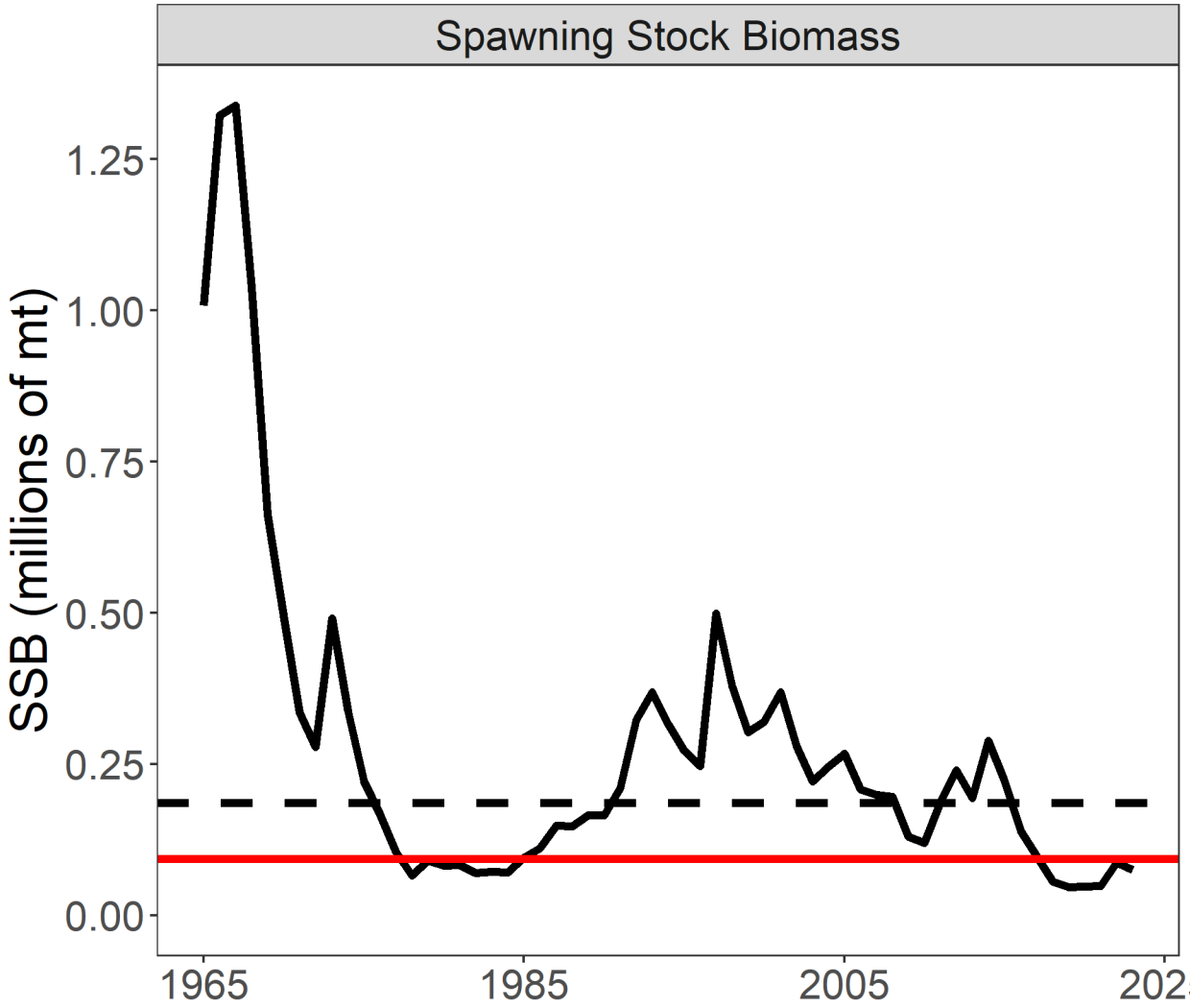
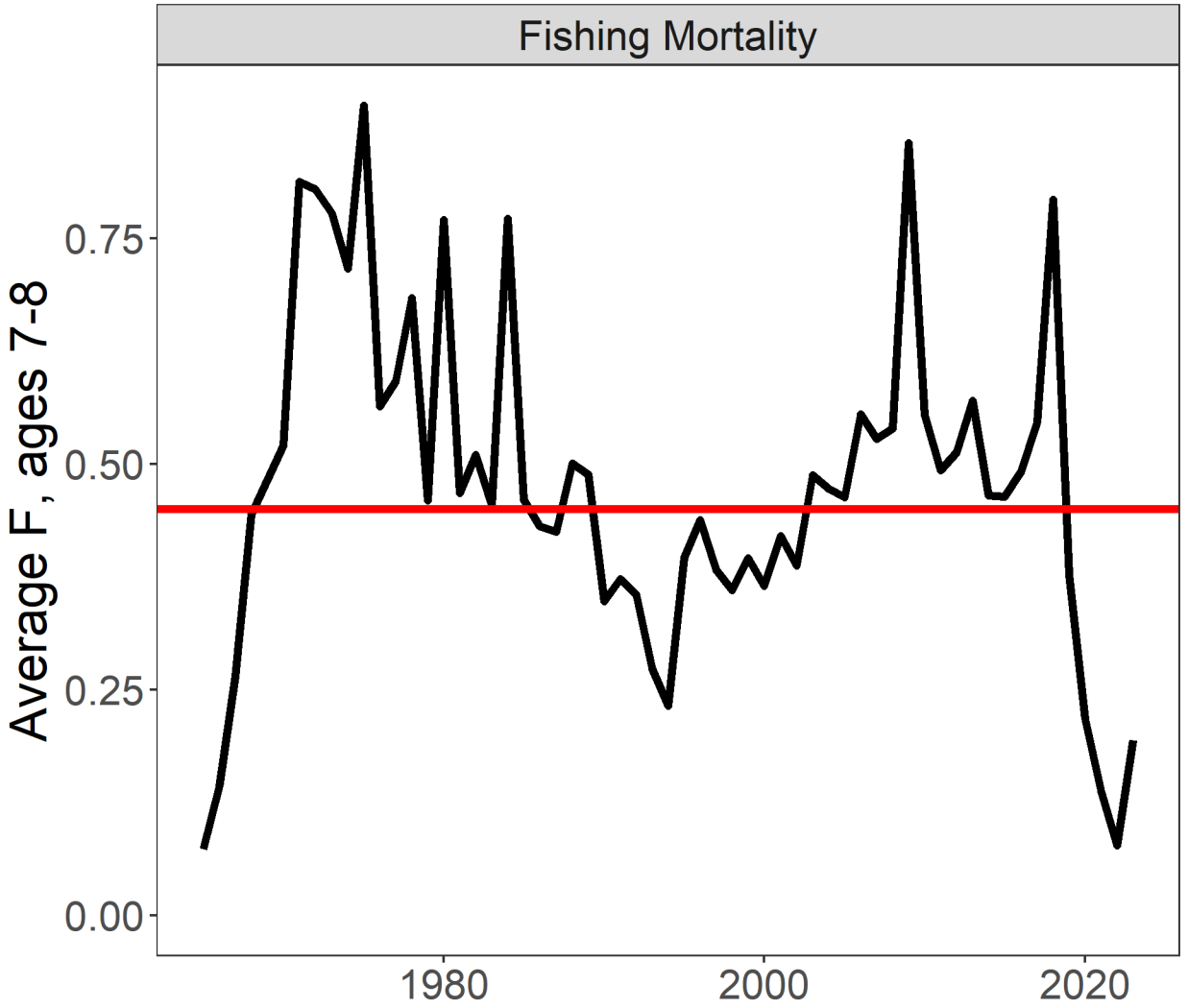
Atlantic Herring





Reference Points — Target — Threshold

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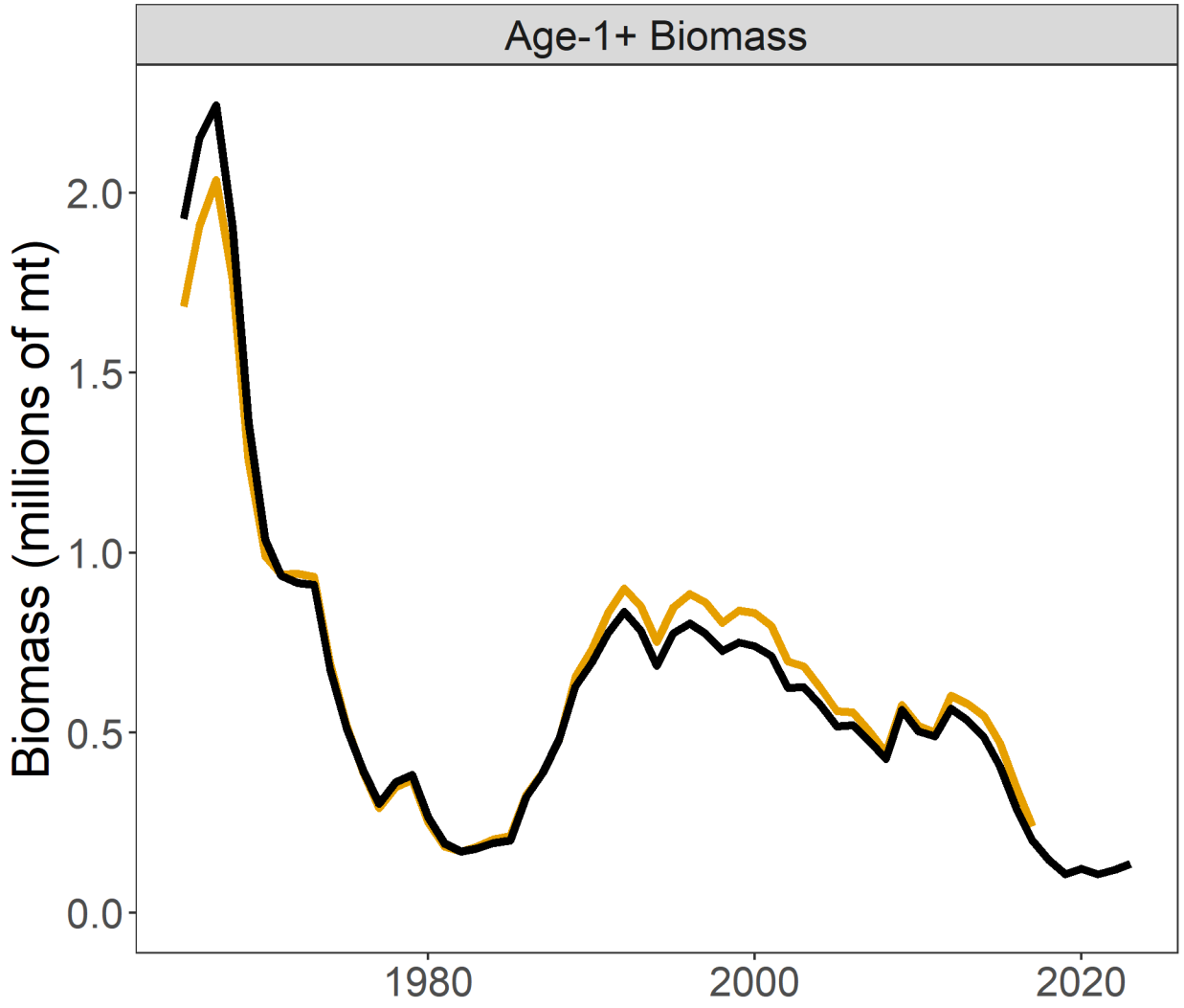
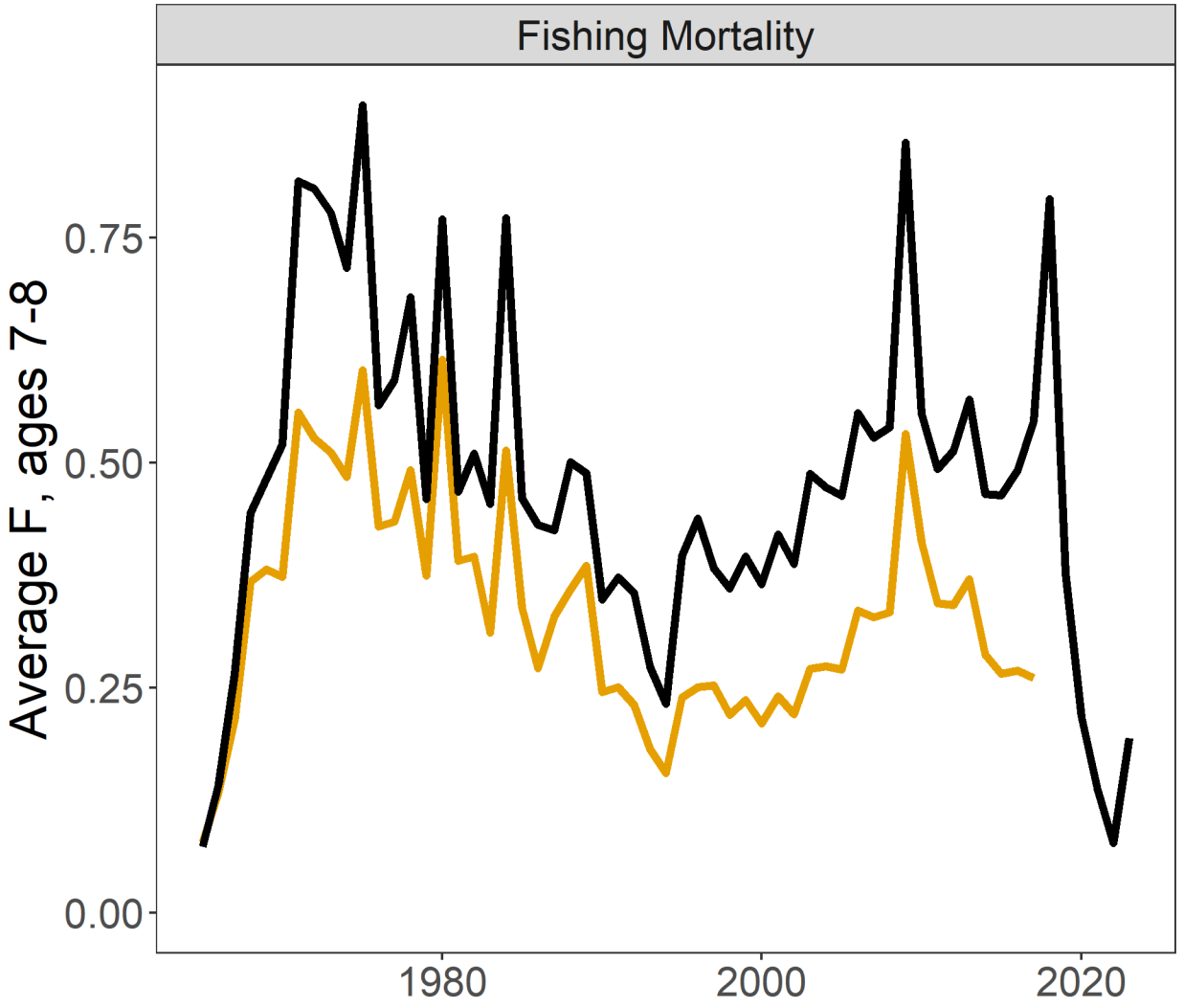
Atlantic Herring





2020 Benchmark 2025 Benchmark

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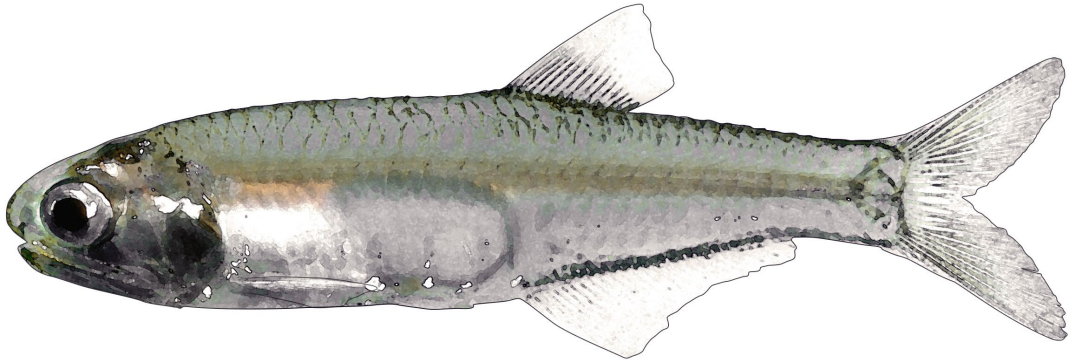
Anchovies

- *Anchoa mitchilli, A. hepsetus, Engraulis eurystole*
- Small, pelagic forage species that are most abundant in inshore/nearshore waters
- Not assessed or commercially fished on the Atlantic coast but encountered in a number of surveys
- Used a species distribution model to combine survey data into an estimate of annual total biomass



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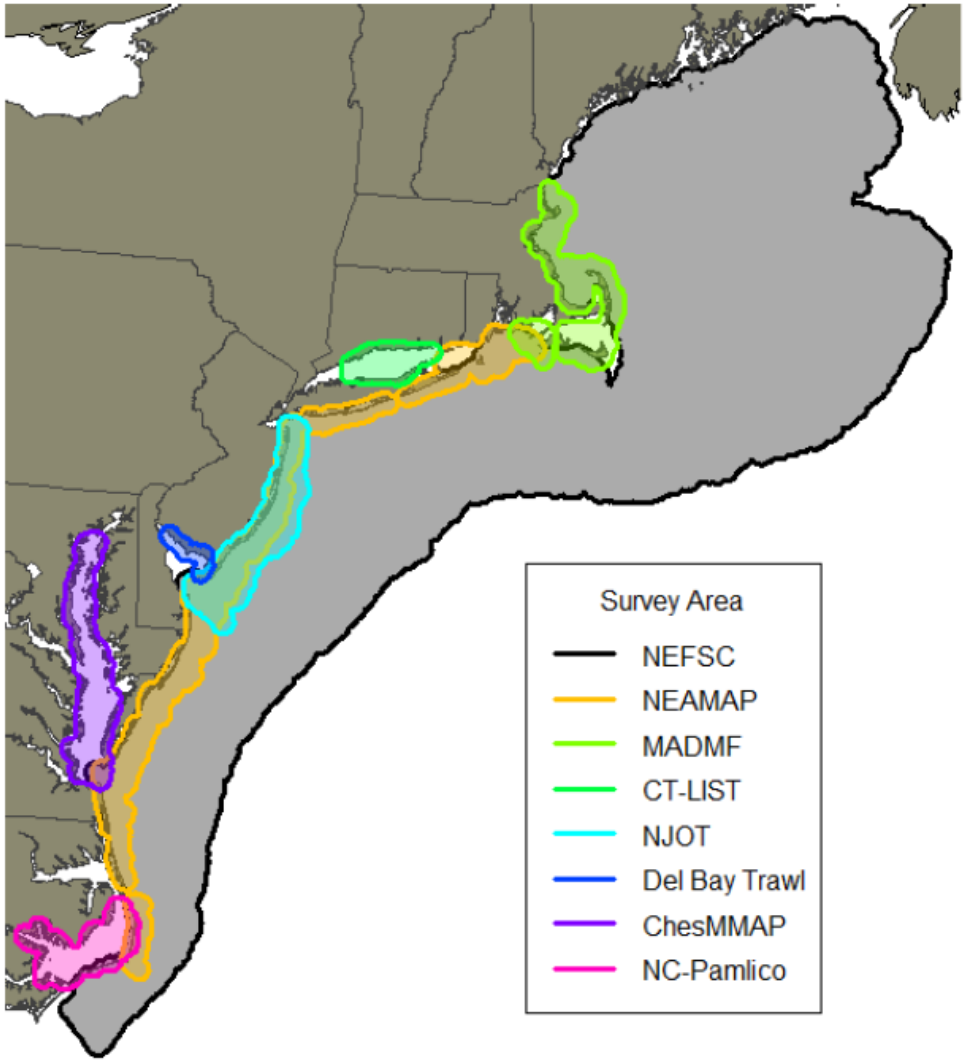
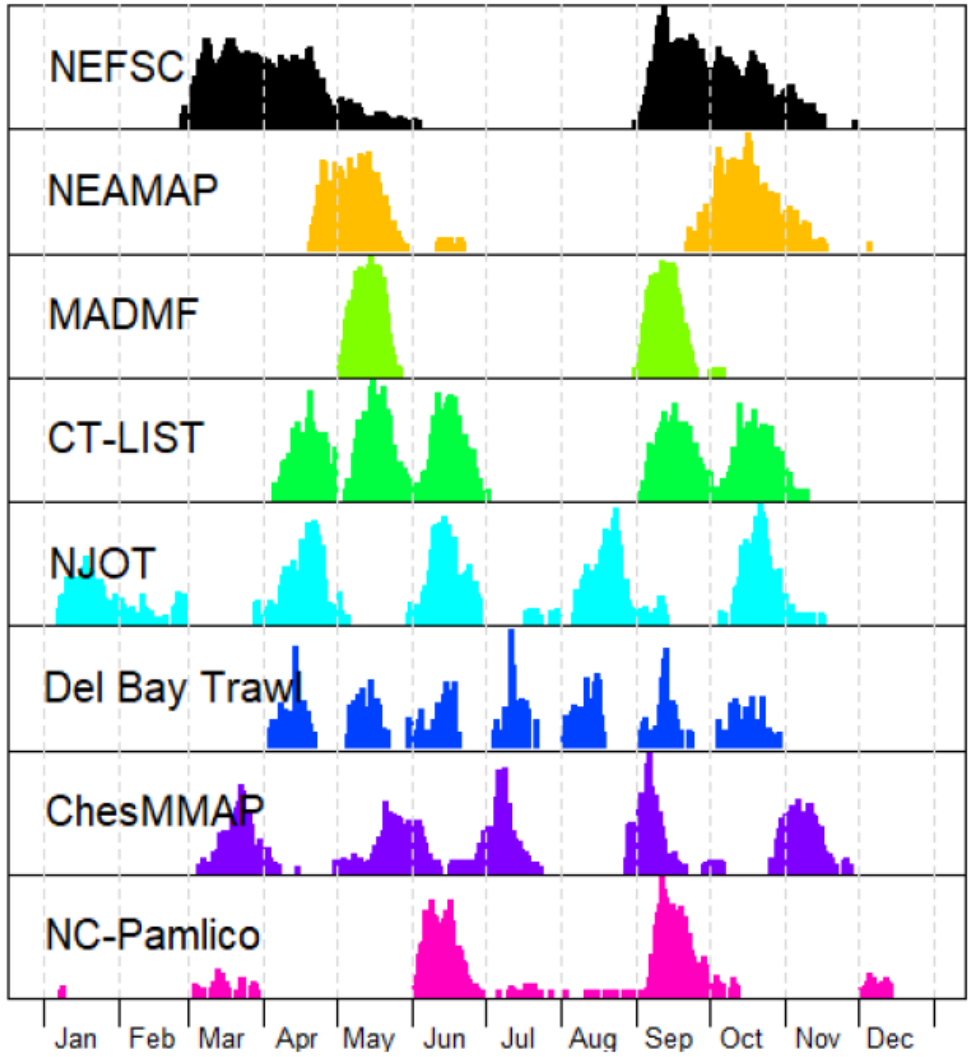
Anchovies





Anchovies

- SDM was used to predict anchovy CPUE across the EwE model domain as a function of season and bottom temperature

- Previous studies that estimated total biomass of anchovies in the Chesapeake Bay were used to scale the CPUE/km^2 up to total biomass for the EwE model domain

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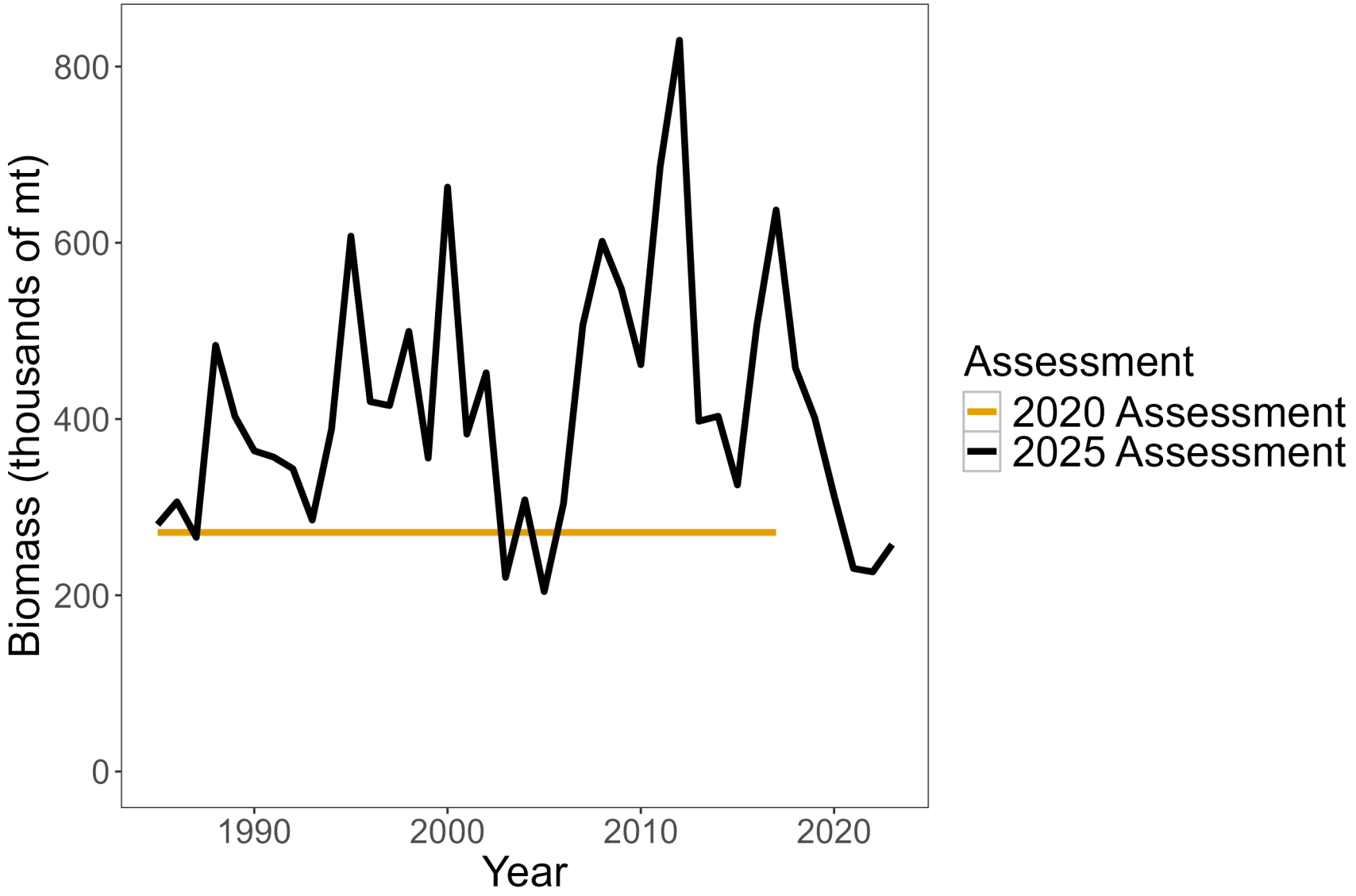
Anchovies



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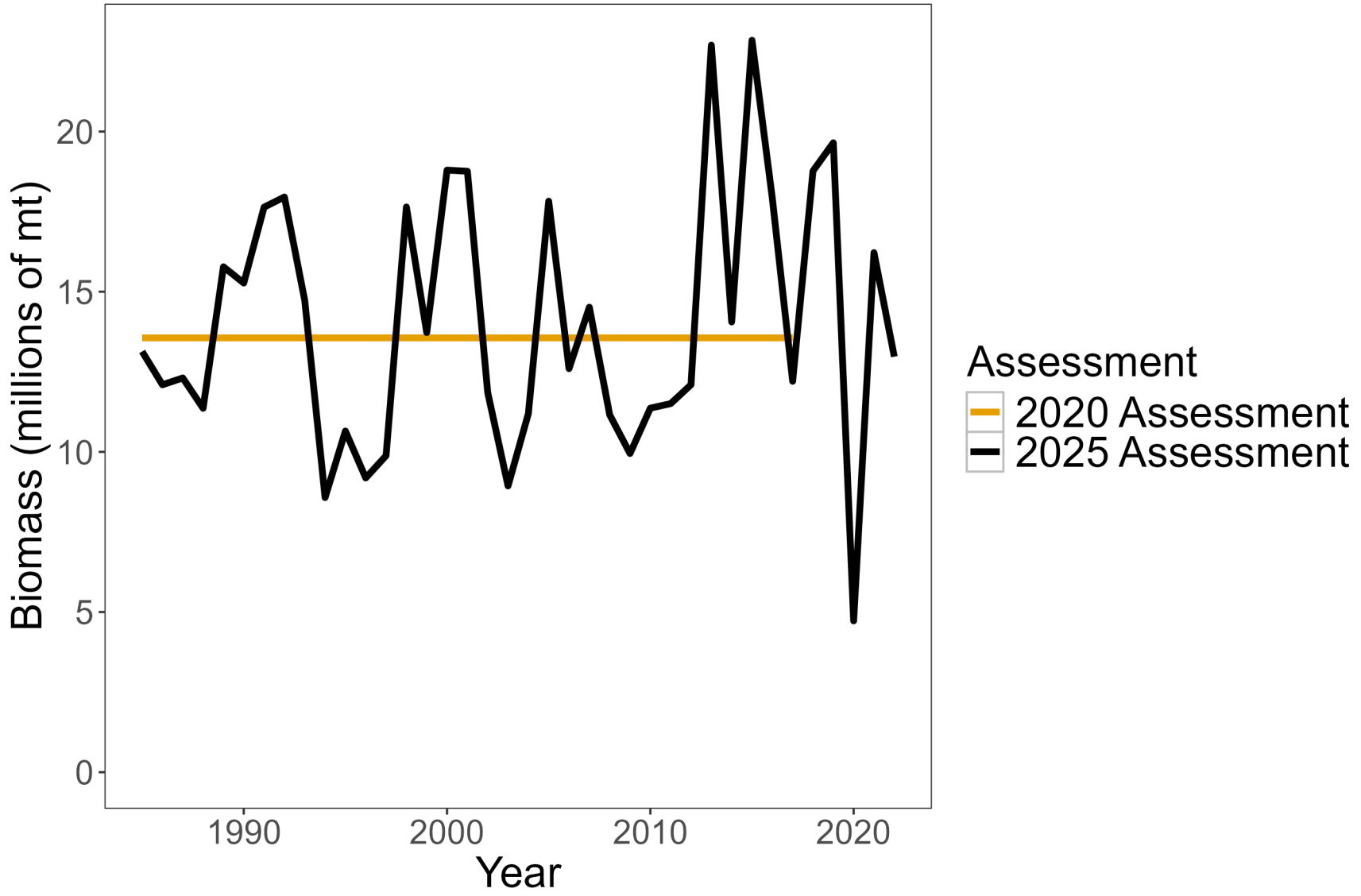
Zooplankton

- Developed estimates of density and total biomass for key zooplankton groups from the EcoMon survey



NWACS-FULL Input Updates

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New/Refined Species Groups

- Osprey
  - USGS Breeding Bird Survey: indices of osprey abundance (1966-2022)
  - Partners in Flight Population Estimates Database: absolute abundance for 10-year periods (2006-2015)
  - Scaled BBS index to absolute abundance using the PIF estimate and used the average weight of an osprey to estimate biomass
  - Added as a new functional group, separate from other nearshore piscivorous birds

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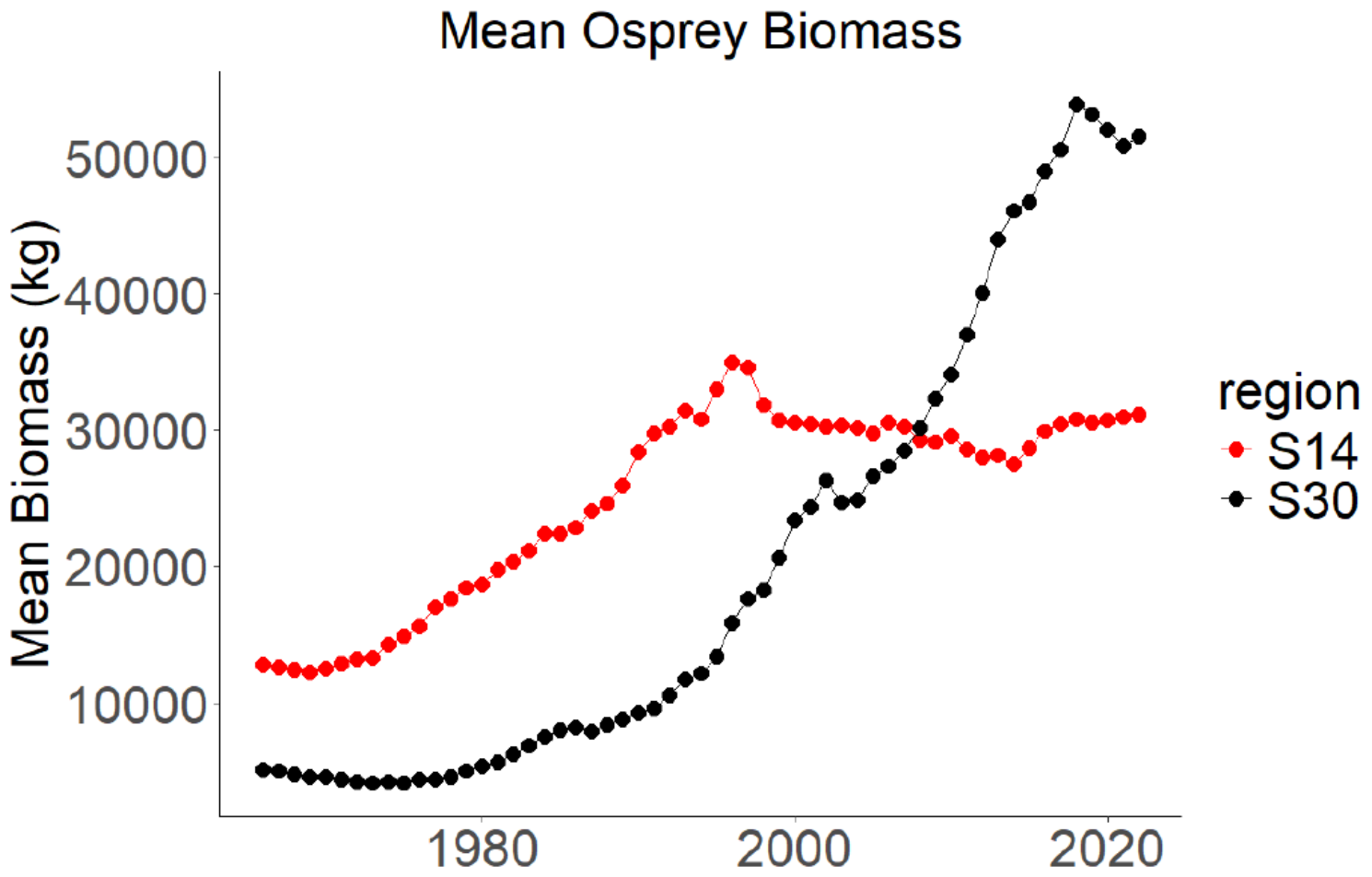
New/Refined Species Groups



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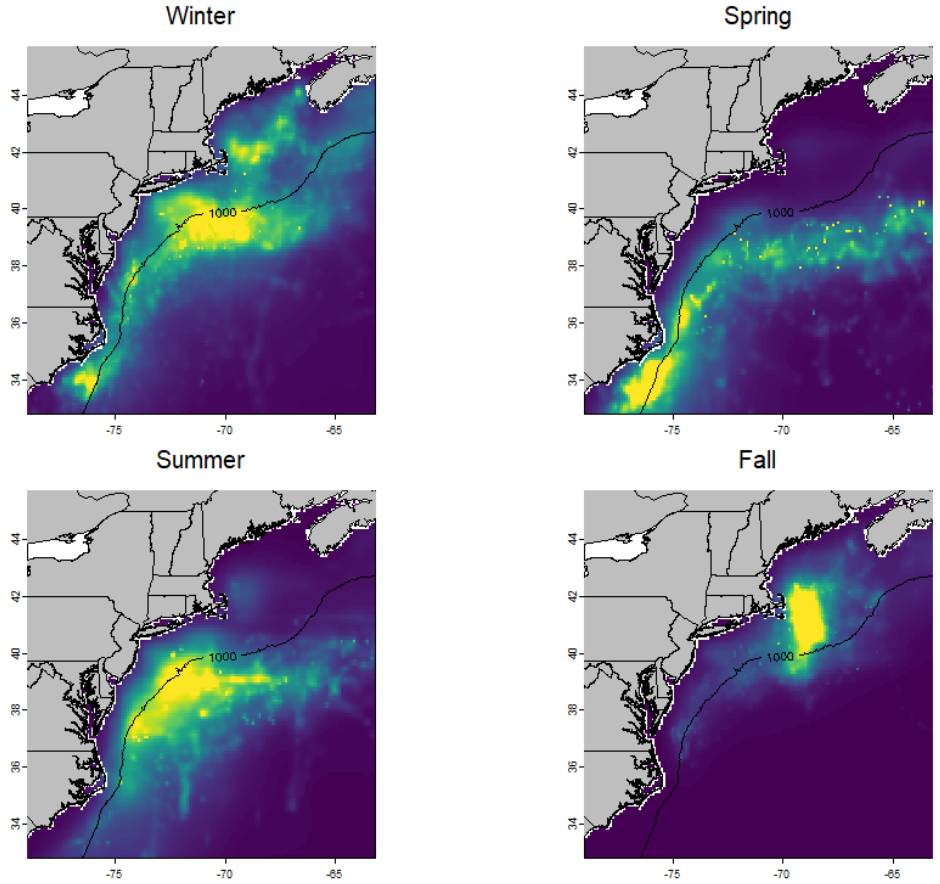
New/Refined Species Groups

- Bluefin tuna
  - Western Atlantic stock of bluefin tuna assessment for total population biomass (1950-2020, projected through 2024)
  - Seasonal habitat utilization distributions developed from PSAT tagging data (B. Galuardi, NOAA) and used to calculate the seasonal biomass of bluefin tuna within the NWACS model domain
  - Diet and biomass data used to parameterize the highly migratory species group



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Updated Assessments

Species Name	Stock	Assess. Year	Term. Year	Model Platform
Atlantic Cod	Western GOM	2024	2023	WHAM
	Eastern GOM	2024	2023	WHAM
	GB	2024	2023	WHAM
	SNE	2024	2023	WHAM
Atlantic mackerel	UNIT	2023	2022	ASAP
Butterfish	UNIT	2024	2023	WHAM
Haddock	GB	2022	2023	WHAM
	GOM	2022	2023	ASAP
Longfin (Loligo) squid	UNIT	2023	2022	Swept-area biomass
Hake, White	UNIT	2022	2021	ASAP
Hake, Red	Northern GB / GOM	2023	2022	Swept-area biomass
	Southern GB / MAB	2023	2022	Swept-area biomass
Summer flounder	UNIT	2023	2022	ASAP
Yellowtail Flounder	CC / GOM	2022	2021	VPA
	SNE / MAB	2022	2021	ASAP

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Updated Landings

- For species without a time-series of catch from an assessment, commercial catch of functional groups by gear was obtained from ACCSP

- ACCSP & NOAA public landings databases redact confidential data, so a non-confidential time-series was developed by pooling species within functional groups and using decade-specific gear composition data to apportion non-confidential annual totals

- Recreational landings of non-assessed species was obtained from MRIP

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Updated Effort

- Explored using estimates of effort from ACCSP, but for most gears, there was no consistent metric of effort over the time-series

- Used total gear-specific landings as a proxy for effort

- Recreational effort obtained from MRIP from the north and mid-Atlantic region