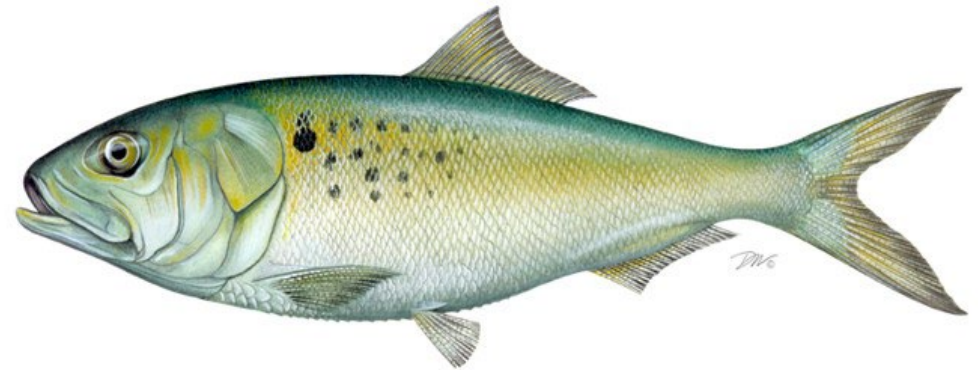


Atlantic Menhaden Draft Addendum II to Amendment 3 for Board Review

May 5, 2026



- Overview and Timeline
- Review Draft Options
 - Chesapeake Bay Cap
 - Chesapeake Bay Cap Distribution
- PDT Additional Information
- **Board action for consideration today:**
 - **Consider approval of Draft Addendum II for public comment**

- Caitlin Craig (NY)
- Coly Ares (RI)
- Jeff Brust (NJ)
- Harry Rickabaugh (MD)
- Brooke Lowman (VA)
- James Boyle (ASMFC)

Draft Addendum I Timeline

Date	Action
October 2025	Atlantic Menhaden Board Tasks Staff to Develop Draft Addendum II
November 2025 – April 2026	Staff Develops Draft Addendum II for Board Review
May 2026	Atlantic Menhaden Board Reviews Draft Addendum II and Considers Its Approval for Public Comment
June– July 2026	Board Solicits Public Comment and States Conduct Public Hearings
August 2026	Board Reviews Public Comment, Selects Management Options and Considers Final Approval of Addendum II
TBD	Provisions of Addendum II are Implemented

3.1.1 One Time Reduction of Chesapeake Bay Cap

3.1.2 Automatic Cap Adjustment with Changes to TAC

3.1.1 One Time Bay Cap Reduction

- Option A. Status Quo: Chesapeake Bay Cap remains at 51,000 mt.
- Option B. Reduce the Cap
 - Sub Option 1: Reduce by 10% to 45,900 mt
 - Sub Option 2: Reduce by 20% to 40,800 mt
 - Sub Option 3: Reduce by 30% to 35,700 mt
 - Sub Option 4: Reduce by 50% to 25,500 mt

3.1.2 Automatic Cap Adjustment

- Option A. Status Quo. The Cap can only be changed through Adaptive Management.
- Option B. Automatic Cap Adjustment
 - Selected in combination with Cap set in 3.1.1
 - New Bay Cap = $\frac{\text{Chosen Bay Cap in 3.1.1}}{186,840 \text{ mt}} \times \text{TAC}$
 - **Example:** If 3.1.1 Option B Sub Option 2 selects Cap of 40,800 mt and TAC lowered to 150,000 mt
 - Bay Cap = $\frac{40,800 \text{ mt}}{186,840 \text{ mt}} (150,000 \text{ mt}) = 32,755 \text{ mt}$

3.1.2 Automatic Cap Adjustment

- Option B. Automatic Cap Adjustment (continued)
 - Sub Option 1: Bay Cap cannot exceed 51,000 mt
 - Sub Option 2: Bay Cap cannot exceed 51,000 mt or be less than 25,500 mt
 - Sub Option 3: Bay Cap cannot exceed 87,216 mt,
 - Sub Option 4: Bay Cap cannot exceed 87,216 mt or be less than 25,500 mt
 - Sub Option 5: Bay Cap cannot exceed 75,000 mt or be less than 29,000 mt*



Questions?

3.2 Chesapeake Bay Cap Distribution

3.2.1 Quota Periods

3.2.2 Overages and Rollovers

3.2.1 Quota Periods

Option	Description	Length of Quota Periods*	Percentage of total Bay Cap
A	Status Quo	No quota periods	
B	Even Length, Even Harvest, 3 Quota Periods	9 weeks	33%
		10 weeks	33%
		9 weeks and 5 days	34%
C	Even Length, Even Harvest, 4 Quota Periods	7 weeks	25%
		7 weeks	25%
		7 weeks	25%
		7 weeks and 5 days	25%
D	Even Length, Uneven Harvest, 3 Quota Periods	9 weeks	25%
		10 weeks	25%
		9 weeks and 5 days	50%
E	Even Length, Uneven Harvest, 4 Quota Periods	7 weeks	20%
		7 weeks	20%
		7 weeks	30%
		7 weeks and 5 days	30%
F	Uneven Length, Even Harvest, 3 Quota Periods	11 weeks	33%
		6 weeks	33%
		11 weeks and 5 days	34%
G	Uneven Length, Uneven Harvest, 3 Quota Periods	11 weeks	25%
		6 weeks	50%
		11 weeks and 5 days	25%

3.2.2.1 Overages

- Option A. Status Quo. No paybacks
- Option B. Any overage of a quota period would be deducted from the same quota period in the following year and redistributed to the final quota period in the following year. If the final quota period of the year incurs an overage that does not result in an overage of the total Bay Cap, there would be no adjustments to the final quota period in the following year.

Example:

- 3 quota periods
- Period 1 exceeded by 1,000 pounds and Bay Cap not exceeded.
- Following year: Period 1 reduced by 1,000 pounds and Period 3 increased by 1,000 pounds.

3.2.2.2 Fishery Closure

- Option A. No fishery closure.
- Option B. When 90% of the quota period allocation is projected to be harvested, that period's reduction fishery would be closed. The reduction fishery would reopen at the start of the next quota period.

- Option A. Unused quota rolled to last quota period
- Option B. Unused quota split amongst all subsequent periods.
 - Sub Option 1: For 4-period options, unused quota split amongst last two quota periods.

Rejected Options

- Final Quota Period Overage Deducted from Total Bay Cap: Any overage of a quota period will be deducted from the same quota period in the following year.
- Rollover Prohibited: No rollover of unused quota is permitted within a year. This would lead to unused quota not being available later in the year. If the final quota period is exceeded, then there is a pound for pound payback in the Cap the following year.
- Proportional Redistribution of Quota Period Overage Payback: All quota that is deducted from early periods in the following year will be redistributed to the remaining quota periods based on the proportion of the remaining quota periods that did not need a reduction. See table for example.



Questions?

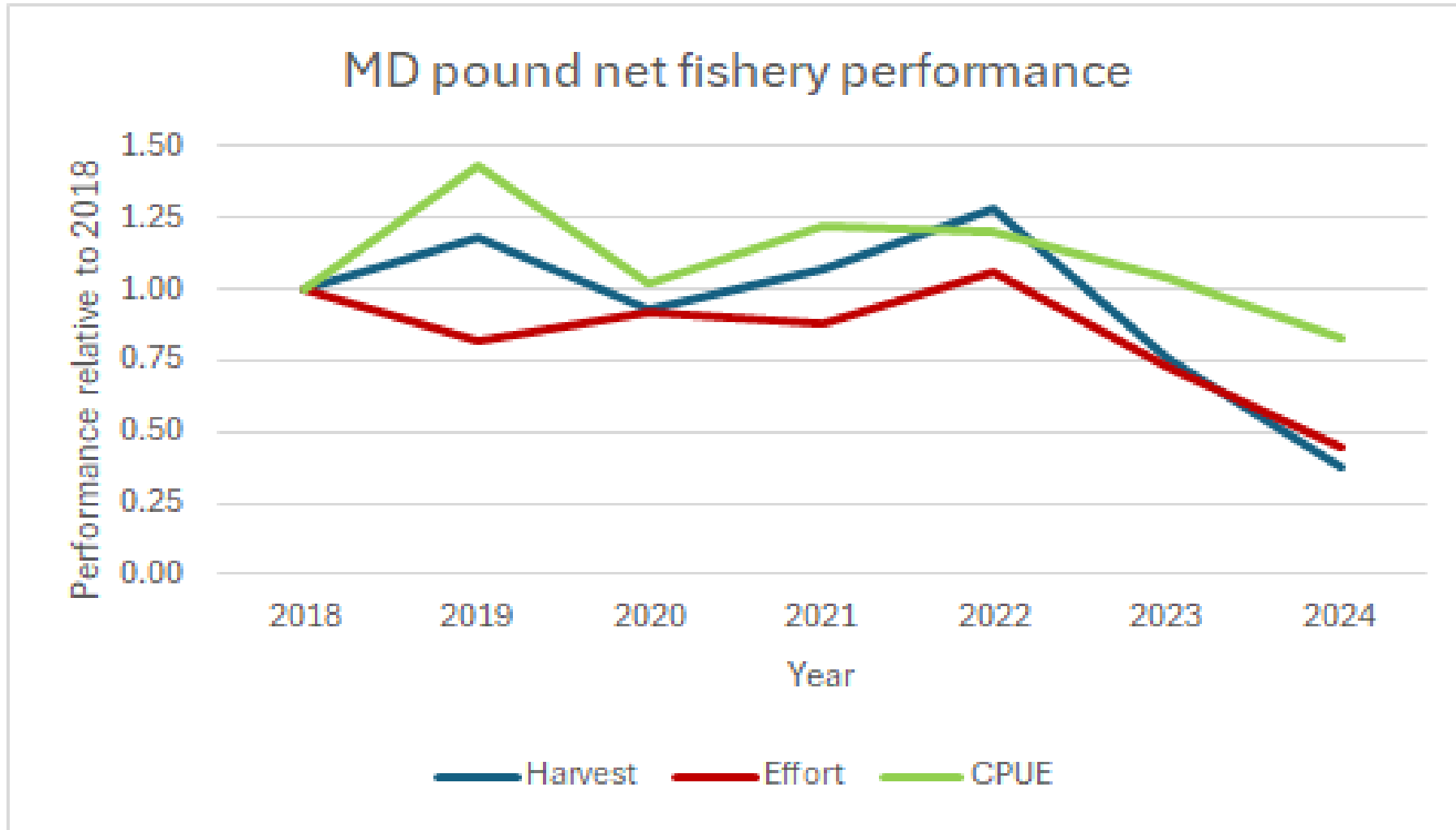
- Compare reduction effort with harvest data within quota periods
- Investigate pound net and reduction catch rates to determine if pound net landings are correlated with the timing of the reduction fishery
- Pound net participation over time

Reduction Harvest vs. Effort

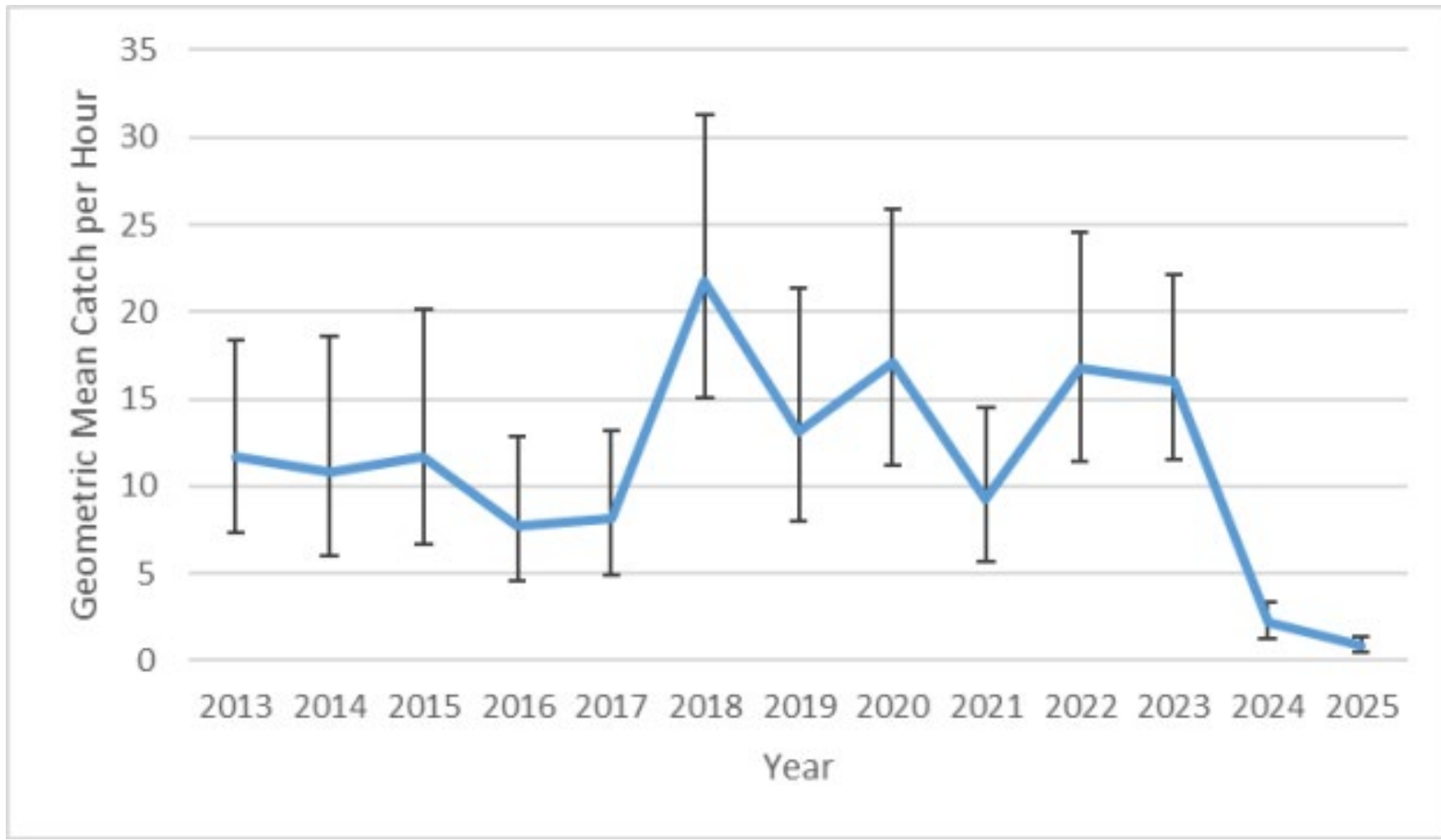
Table 1. Average percent reduction fishery landings and effort in the Chesapeake Bay (2018-2024) during the quota periods presented in Options B-G in Section 3.1.1 of Draft Addendum II.

Option	Length of Quota Period	Average (2018-2024) Percent Landings	Average (2018-2024) Percent Effort
B/D	9 weeks	30%	39%
	10 weeks	54%	48%
	11 weeks	16%	13%
C/E	7 weeks	20%	31%
	7 weeks	33%	28%
	7 weeks	41%	35%
	8 weeks	7%	7%
F/G	11 weeks	38%	44%
	6 weeks	36%	34%
	12 weeks	26%	22%

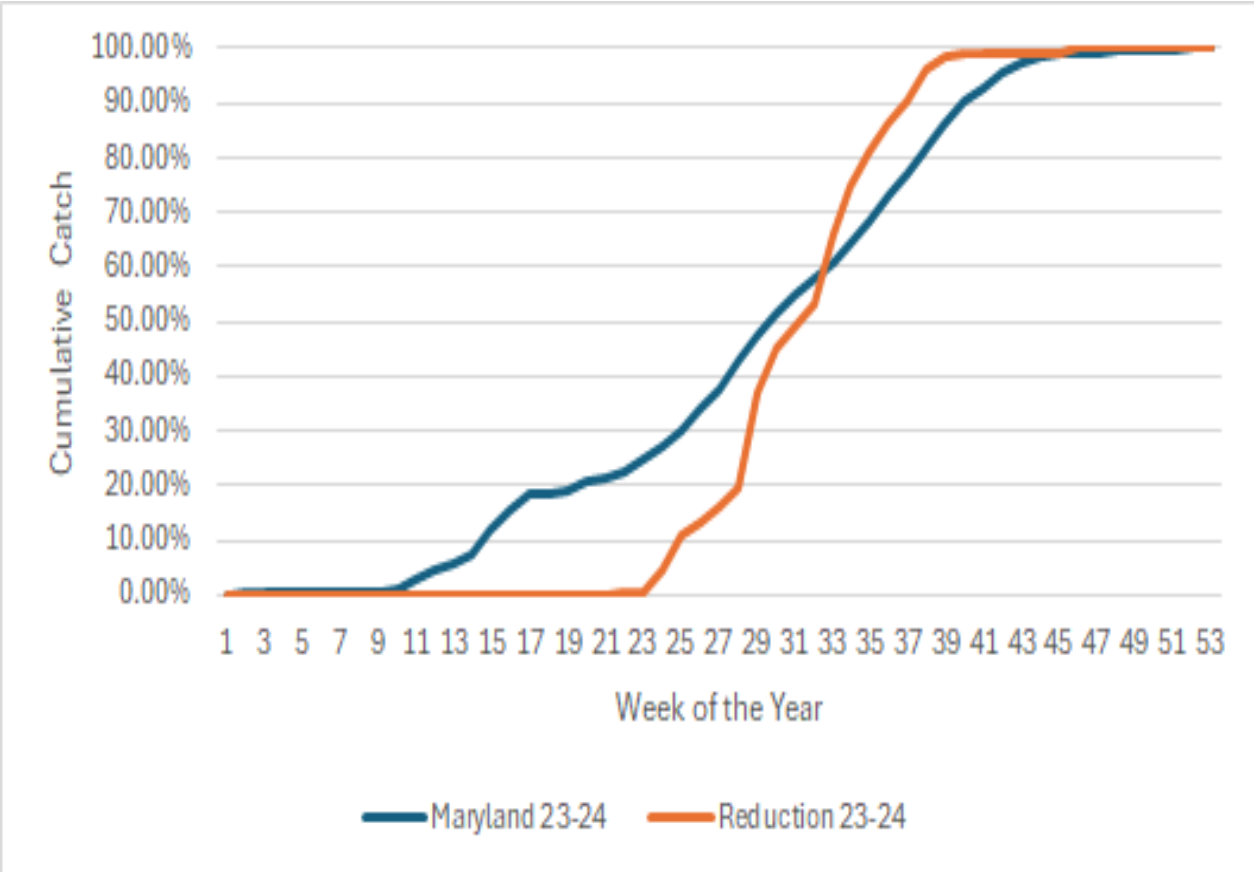
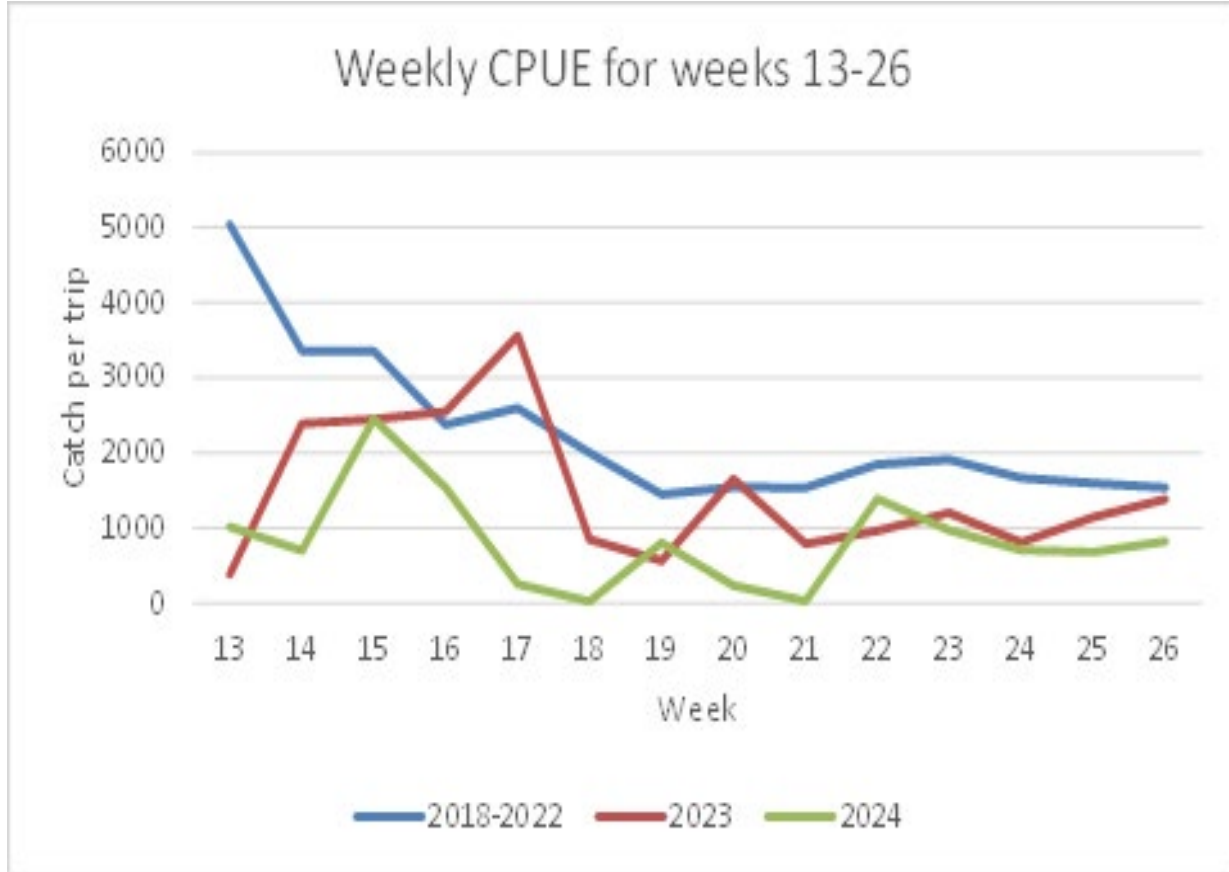
Pound Net and Reduction Catch Rates



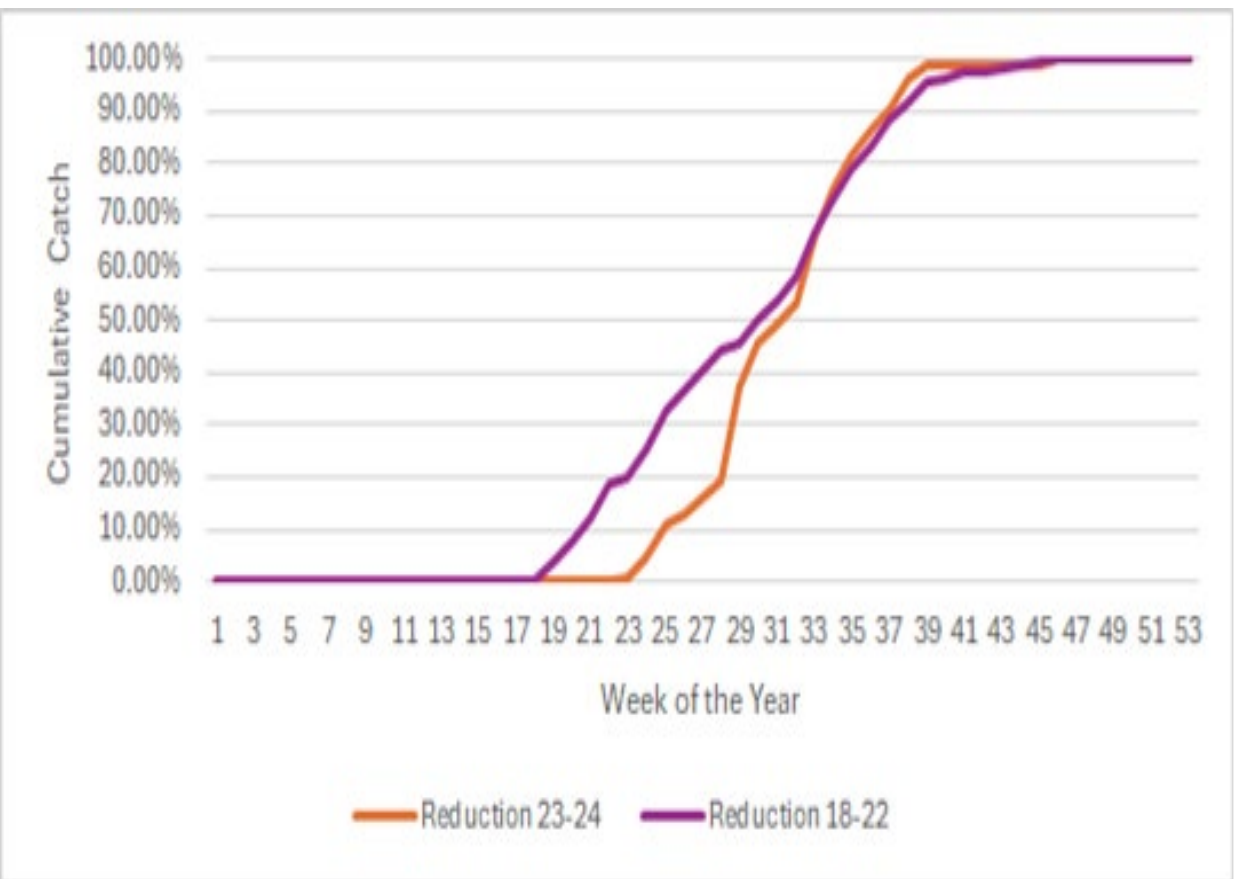
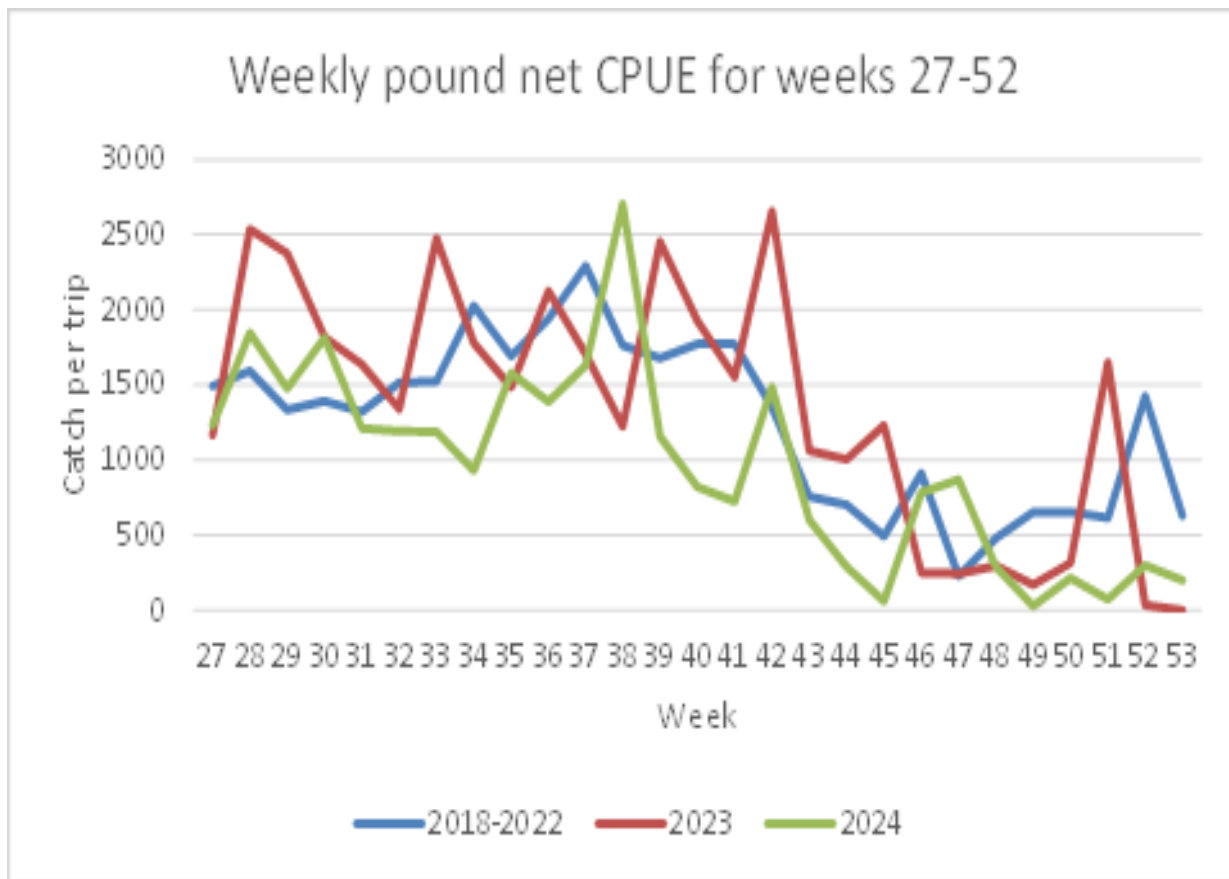
Pound Net and Reduction Catch Rates



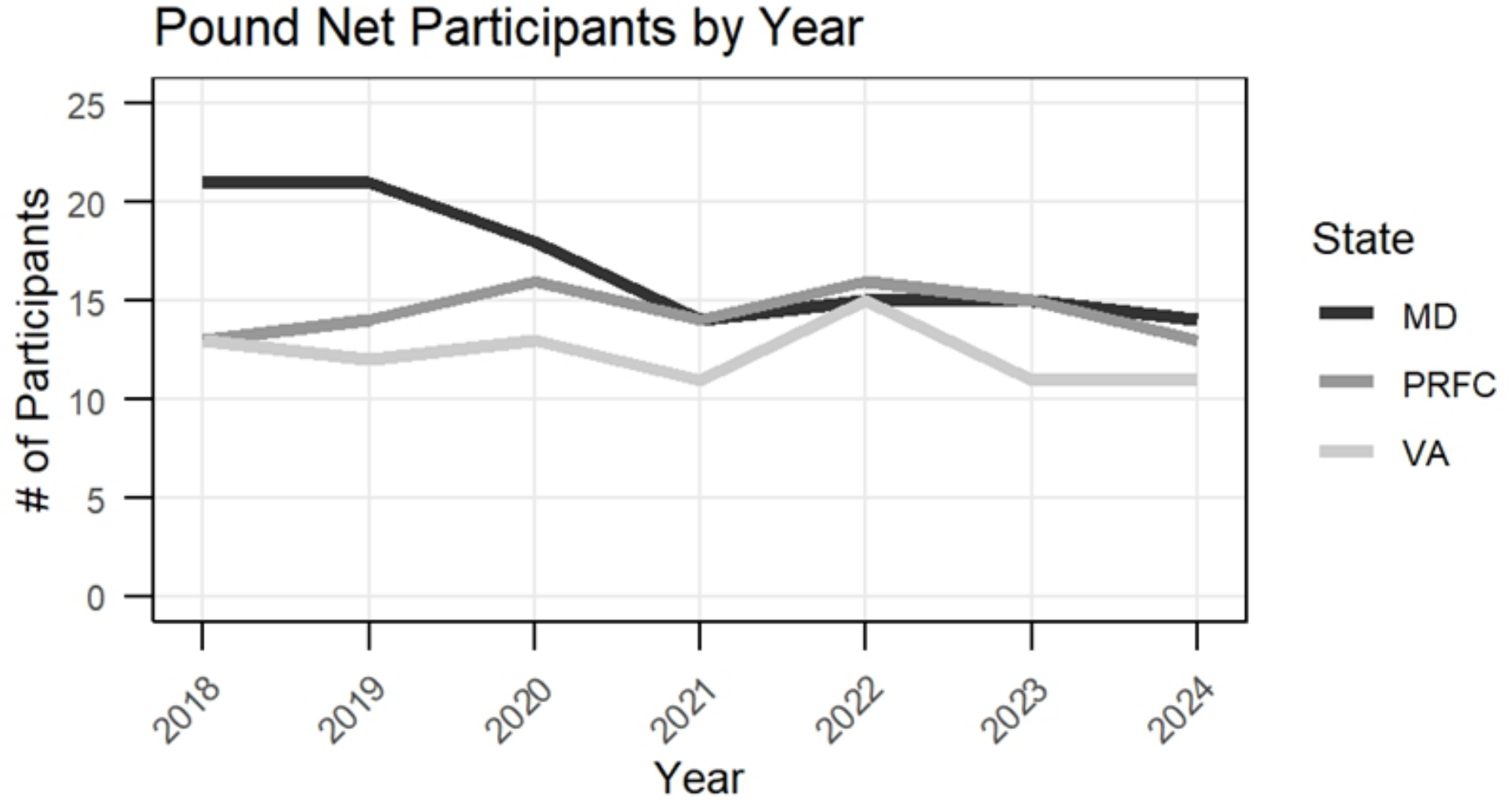
Pound Net and Reduction Catch Rates



Pound Net and Reduction Catch Rates



Pound Net Participation





Questions?

Menhaden Environmental Literature Review

Caitlin Craig, NY DEC

Atlantic Menhaden Technical Committee Chair

May 5, 2026

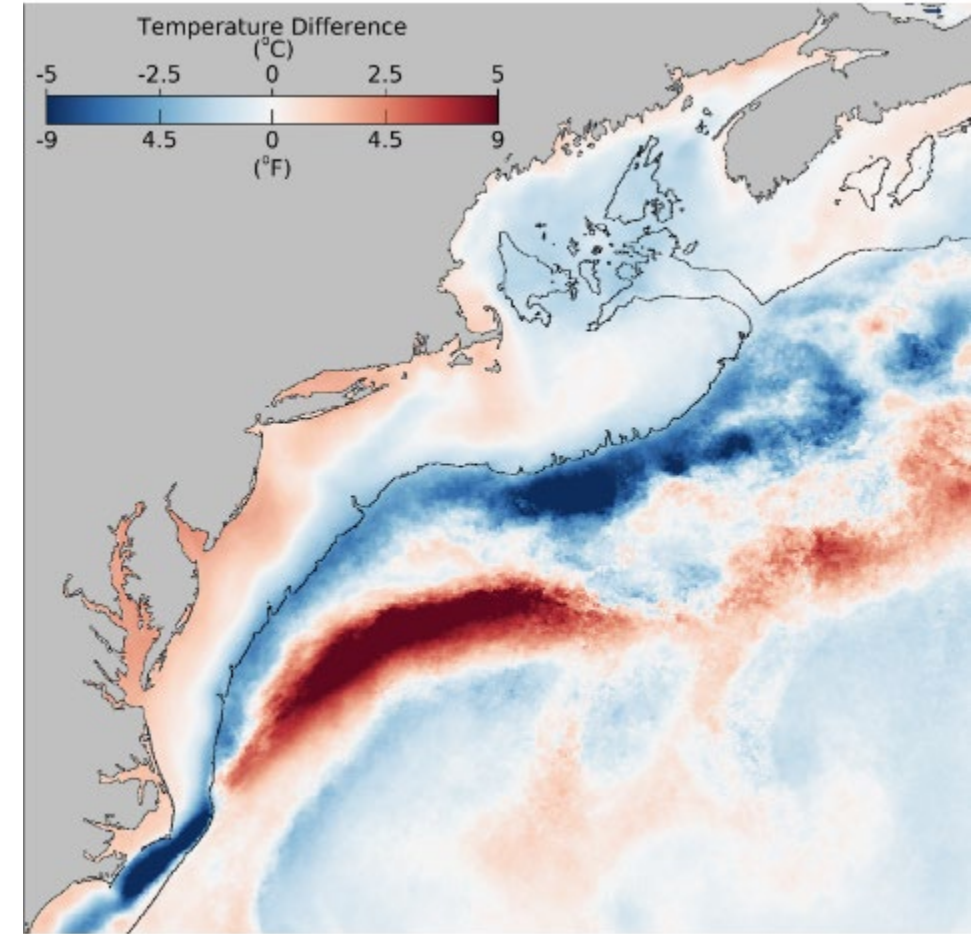
- Evaluate the possible effect of cold water on the Continental Shelf on menhaden migration and migratory patterns, particularly in relation to the timing of osprey arrival, nesting, and breeding
- Consider what role water temperature, dissolved oxygen levels, shoreline hardening, and other environmental factors play in the local abundance of menhaden and other forage species in the Chesapeake Bay

- To provide a comprehensive, quantitative answer to these tasks requires a significant amount of time and data
- As a first step, the TC prepared this literature review on the key topics identified by the Board

- 2025 State of the Mid-Atlantic Ecosystem
- Menhaden environmental preferences
- Osprey timing/milestones
- Environmental preferences of other forage species
- Shoreline hardening impacts
- TC discussion

- NE US shelf waters have experienced a long-term warming trend in annual and seasonal temperatures
- 2024 shelf environment was unusual compared to 2020-2022
 - Shelf waters were cooler, less saline, and less buffered
 - Cold pool was larger and more persistent
 - Timing in availability of some species to the fishery was reported
- 2024 Chesapeake Bay did not experience a similar anomaly
 - Continued trend of above-average water temps and low DO

- 2024 shelf conditions related to variability in the Gulf Stream
 - Gulf Stream further north = warmer waters in mid-Atlantic
 - Gulf Stream further south = cooler waters in mid-Atlantic
- This variability will continue in the future, but won't reverse the long-term warming trend
- Makes short-term predictions about environmental conditions more difficult



- Adult migration patterns have been documented from tagging, fishery, and ichthyoplankton survey data
 - Spawn offshore of the Carolinas in winter then being migrating inshore and northward in early spring, some reaching the Gulf of Maine by June
 - Larger, older fish migrate further
 - In fall, begin migrating south to the Carolinas again
 - Not all adults migrate: tagging data, larval data, and recent survey data indicate many adults stay in the mid-Atlantic or southern New England region over the winter and spawn there
 - Highest larval abundance in south in winter, but larvae present almost year-round up to southern New England, indicating a protracted spawning season across a wide spatial range

- Larvae are carried inshore to the nursery grounds, so recruitment to any one estuary or region is influenced by numerous environmental and biological factors
 - Time/location of spawning, number of eggs produced, Gulf Stream patterns, temperature, winter storms, etc.

- Large body of literature on the environmental factors influencing Atlantic menhaden recruitment and growth
- Less information on environmental preferences of adults and how that affects abundance and migration patterns
 - Generally broad habitat envelopes with a preference for shallower/in-shore water

Osprey Timing in Chesapeake Bay

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arrival												
Egg laying												
Hatching												
Fledging												
Departure												

- No information on environmental cues that drive the timing of these events or whether the timing has changed over time

- TC focused on a limited number of species that have been identified as important forage within Chesapeake Bay, either currently or historically
 - Alewife and blueback herring
 - Bay anchovy
 - Juvenile spot and croaker

- Alewife and blueback herring:
 - Spawning migration and juvenile outmigration in the Bay triggered by temperature
- Bay anchovy
 - Wide range of suitable temperature and salinity conditions
 - Biomass in the Bay peaks in summer and fall
 - Winter biomass in the Bay correlated with water temperature
- Juvenile spot and croaker
 - Tolerant of a wide range of conditions, more so than adults

Shoreline Hardening Impacts

- Studies have found either no effect of shoreline hardening on menhaden abundance compared to natural sites, or higher abundance at hardened sites
- Effects of shoreline hardening are variable across species and estuaries, ranging from negative effects to no effects to positive effects on overall species diversity and individual species abundance at hardened sites compared to natural sites

- Many factors within a species' physical environment will influence abundance, distribution, and timing of population events such as spawning and migration
- If the Board would like more quantitative information, the TC requests guidance on the parameters and relationships of greatest interest to the Board
- Even with a more focused tasking, existing data sets may not be spatially/temporally sufficient to fully address the Board's questions



**Atlantic States
Marine Fisheries**
COMMISSION

Questions

Charge: Investigate how proposed measures in Addendum II could impact jobs in the fishery

Approach: Review relevant existing literature and draft a memo to the Atlantic Menhaden Management Board interpreting research

Relevant existing literature:

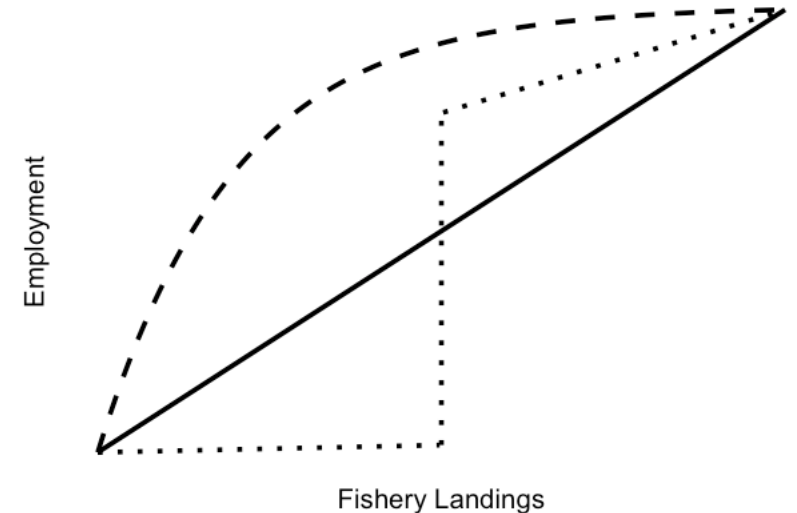
- Kirkley, J.E., Hartman, T., McDaniel, T., McConnell, K. and Whitehead, J., 2011. An assessment of the social and economic importance of menhaden (*Brevoortia tyrannus*)(Latrobe, 1802) in Chesapeake Bay region. Virginia Institute of Marine Science, College of William and Mary, School of Marine Science, Department of Fisheries.
- Whitehead, J.C. and Harrison, J., 2017. Socioeconomic Analysis of the Atlantic Menhaden Commercial Bait and Reduction Fishery: A Report to the Atlantic States Marine Fisheries Commission. Arlington, VA: Atlantic States Marine Fisheries Commission, 180.

Findings

- Kirkley et al. (2011)
 - Explored regional economic impacts of the menhaden industry, including effects of reductions in the Chesapeake Bay quota cap
 - Reduction sector supports 519 full- and part-time jobs, including 347 in Northumberland County, Virginia
 - Chesapeake Bay quota reductions correspond to job losses of ~3.7 total jobs per 1,000mt reduction, including 2.1 jobs in the reduction sector
- Whitehead & Harrison (2017)
 - Use similar approach to Kirkley et al. (2011) but do not specifically explore impacts of reductions in Chesapeake Bay quota cap
 - Employment changes in Northumberland County estimated at one job per \$45,000 in landings (~\$60k in 2026 USD)

Limitations and caveats

- Neither study explored potential impacts of seasonal harvest restrictions
 - Impacts may arise if seasonal restrictions constrain periods of high catch efficiency, limit ability to maintain processing throughput
- Both studies used Leontief input-output models, which do not account for market adjustments or adaptive industry behavior and may overstate long-term employment effects
 - Employment impacts likely non-linear and characterized by thresholds driven by high fixed costs and processing volume requirements
- Industry noted that the extreme scenario of no Chesapeake Bay harvest analyzed by Kirkley et al. (2011) was unrealistic as this should be expected to completely shut down the reduction sector



Final notes

- Reduction industry is critical economic driver in Northumberland County job losses could create structural unemployment
- Committee on Economics & Social Sciences recommends additional research:
 - Industry employment drivers
 - Cost and production structures (reduction & bait)
 - Bait demand drivers