



Mid-Atlantic Fishery Management Council
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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: September 18, 2018
To: Council
From: Jason Didden
Subject: Industry-Funded Monitoring (IFM) Amendment

Action: At this meeting, the Council will consider whether it wants to continue developing IFM measures for its fishery management plans (FMPs), in particular the Atlantic mackerel (mackerel) fishery.

In 2013, the Mid-Atlantic and New England Fishery Management Councils initiated a joint omnibus amendment to allow for IFM in all of the FMPs managed by the Councils. The joint amendment was intended to standardize the process to develop and administer future IFM programs for Council FMPs and consider implementing IFM in the mackerel and Atlantic herring (herring) fisheries.

Any IFM would be in addition to monitoring requirements associated with the Standardized Bycatch Reporting Methodology, the Endangered Species Act, and the Marine Mammal Protection Act. The Councils were interested in increasing monitoring in certain FMPs to reduce uncertainty around catch estimates. NOAA's National Marine Fisheries Service (NMFS) disapproved previous Council IFM proposals because they would have required NMFS to spend money that was not yet appropriated or split monitoring costs between the fishing industry and NMFS in ways that were inconsistent with existing Federal law.

In April 2017, the Mid-Atlantic Council decided to postpone action on the joint amendment until the mid-water trawl electronic monitoring (EM) study was completed. The Mid-Atlantic Council's decision was based, in part, on its desire to have more information on the data-gathering potential and costs of EM.

In contrast, the New England Council selected preferred alternatives at its April 2017 meeting. The preferred alternatives included a standardized process to implement and administer future IFM programs and a 50% IFM coverage target for vessels with Category A or B herring permits. As such, the joint amendment became the New England IFM Omnibus Amendment (NE IFM Amendment) and the recommended measures would only apply to New England Council FMPs.

Analysis by Council staff indicates that 84% of total 2008-2017 mackerel landings were associated with currently active vessels with Category A or B herring permits. Therefore, the recommended IFM coverage requirements for the herring fishery would likely have provided increased monitoring for the majority of recent mackerel landings. The remaining 16% of mackerel landings

were harvested by several gear types; 59% with paired mid-water trawl gear, 19% with jig gear, 12% with bottom trawl gear, and 10% with various other gears. The mackerel landings from paired mid-water trawl vessels without current Category A or B herring permits were on vessels that previously held those permits but are no longer active. This suggests that the proportion of mackerel landings during 2008-2017 that would have been covered by the recommended IFM herring requirement is probably closer to 93%. If vessels can fish mackerel without declaring into the herring fishery (i.e., not retaining herring) then the herring IFM provisions theoretically would not apply to mackerel fishing. This seems unlikely given recent operation of these fisheries.

In March 2018, a panel consisting of NMFS and Council staff reviewed the mid-water trawl EM study conducted by NMFS during 2016-2018. The panel concluded that EM is suitable for detecting discarding events aboard mid-water trawl vessels. The EM study also evaluated costs associated with using EM. Based on the study, NMFS estimated the industry's costs for EM at approximately \$296 per coverage day, not including the initial costs of purchasing and installing equipment. The NE IFM Amendment estimated the industry's annual costs for portside sampling at \$96,000 for the mid-water trawl fleet and \$8,700 per vessel. Therefore, NMFS estimated the industry's costs for using EM and portside sampling would be approximately \$515 per coverage day, which is an estimated 27% lower than industry's costs for using at-sea monitoring coverage (\$710 per coverage day).

On April 19, 2018, the New England Council considered whether EM and portside sampling, would be an adequate substitute for at-sea monitoring coverage aboard mid-water trawl vessels. The purpose of EM would be to confirm catch retention and verify compliance with slippage restrictions, while the purpose of portside sampling would be to collect species composition data along with age and length information. After reviewing the mid-water trawl EM study, the New England Council approved EM and portside sampling as an IFM option for mid-water trawl vessels and recommended NMFS use an exempted fishing permit to further evaluate how to best permanently administer a combined EM and portside sampling program.

The NE IFM Amendment is currently with NMFS for review. Pending final approval by NMFS, the amendment would likely be implemented during 2019.

Council Staff Recommendation: Given the high proportion of mackerel landings caught by vessels that would be subject to the 50% IFM coverage requirement in the herring fishery, Council staff recommends no further action at this time. The effects of IFM coverage on the mackerel fishery would be evaluated by the Council when it considers mackerel specifications. If the Council determines that IFM coverage in the herring fishery does not address monitoring concerns in the mackerel fishery, then it could consider IFM in a future action.

If an IFM program in the mackerel or other fishery were to be considered in the future, the omnibus measures in this amendment would also need to be incorporated/addressed.

Several documents follow this memo, including the executive summary of the Herring and Mackerel EM Study (with a link to the full document) and several correspondences related to EM and portside sampling.

Herring and Mackerel Fishery Electronic Monitoring Project

Full report available at <http://www.mafmc.org/council-events/2018/october-2018-council-meeting>

Contract EA-133F-16-SE-1143

Prepared for:

U.S. Department of Commerce

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

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ACRONYMS

ASM	At-Sea Monitor
AWS	Amazon Web Service
EM	Electronic Monitoring
ESA	Endangered Species Act
ET	Electronic Technology
FMP	Fishery Management Plan
FOIA	Freedom of Information Act
GARFO	Greater Atlantic Regional Fisheries Office
GPS	Global Positioning System
GUI	Graphical User Interface
HDD	Hard Disk Drive
IFM	Industry Funded Monitoring
IP	Internet Protocol
MADMF	Massachusetts Division of Marine Fisheries
MAFMC	Mid-Atlantic Fisheries Management Council
MEDMR	Maine Department of Marine Resources
MMPA	Marine Mammal Protection Act
NAS	Network Attached Storage
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NMFS	National Marine Fisheries Service
NFWF	National Fish and Wildlife Foundation
PoE	Power-over-Ethernet
RSA	Research Set-Aside

SBRM	Standardized Bycatch Reporting Methodology
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VMP	Vessel Monitoring Plan
VMS	Vessel Monitoring System
VTR	Vessel Trip Report

I. EXECUTIVE SUMMARY

SUMMARY OVERVIEW

Electronic Monitoring (EM) is increasingly being used as a tool for catch monitoring and reporting compliance in fisheries around the world. There are several EM initiatives and programs underway in the United States, but full program implementation in the Northeast remains limited. As part of the Greater Atlantic Region's Electronic Technology (ET) Implementation Plan, the New England Fishery Management Council (NEFMC) and the National Marine Fisheries Service (NMFS) are considering implementation of EM in the Atlantic herring midwater trawl fishery to improve catch monitoring. In the Industry Funded Monitoring (IFM) omnibus amendment, the New England Fishery Management Council recommended increased monitoring in the herring fishery to address the following goals: 1) accurate estimates of catch (retained and discarded), 2) accurate catch estimates for incidental species for which catch caps apply, and 3) affordable monitoring for the herring fishery. The IFM amendment evaluates how different coverage target alternatives meet the specific monitoring goals identified by the New England Council while comparing the costs of the monitoring programs, particularly costs that would be borne by the fishing industry. The herring coverage target action alternatives include Northeast Fisheries Observer Program-level (NEFOP-level) observer, at-sea monitoring (ASM), EM, and portside sampling (PS) coverage. Because midwater trawl vessels discard only a small percentage of catch at sea, EM and portside sampling have the potential to be a cost effective way to address monitoring goals for the midwater trawl vessels harvesting herring. EM would be used to verify retention of catch on the midwater trawl fleet and portside sampling would be used to verify amount and species composition of landed catch.

Additionally, the Mid-Atlantic Fishery Management Council is considering EM as a monitoring option in the mackerel fishery pending the results of this study. While EM has been successfully deployed in other fisheries, its suitability for use in the Atlantic herring (and potentially mackerel) has not been explored. To this end, the NMFS Northeast Fisheries Science Center (NEFSC) and the Greater Atlantic Regional Fisheries Office (GARFO) designed a project to simulate, test and refine an operational EM program.

In August 2016, the NEFSC contracted Saltwater Inc. (Saltwater) to conduct a project to determine if EM is an appropriate tool to improve monitoring and address bycatch issues in the Atlantic herring and Atlantic Mackerel midwater trawl fisheries. Specifically, the goals of this project were to inform:

- Development of EM program requirements;
- Development of a data program and EM service provider performance standards;
- The establishment of roles and responsibilities for the fishing industry, service providers, and NMFS;
- How EM data collected in this project could be integrated into other reporting requirements; and
- How information could be provided to enhance fishery-wide implementation requirements.

This information will assist NMFS and the Fishery Management Councils in the development of EM program requirements and EM performance standards. To achieve these objectives, NMFS identified the following Contractor specific project deliverables:

- Installation and deployment of EM systems on up to twelve (12) Atlantic herring midwater trawl vessels;
- Develop local infrastructure for vessel and program support;
- Develop Vessel Monitoring Plans (VMPs) and establish standards and procedures for approving VMPs and equipment installations;
- Use EM to monitor fishing activity to determine if there are discards on herring and mackerel trips;

- Review sensor and video data; and
- Work with NMFS to review program performance for refinement.

NMFS and Saltwater staff conducted industry outreach and recruited volunteers willing to participate in the EM study during the 2016 and 2017 fishing years. Saltwater EM technicians installed systems on eleven commercial herring and mackerel midwater trawl fishing vessels in Maine, Massachusetts and New Jersey. Video and sensor data were collected for over 12 months on 192 trips and reviewed by Saltwater and NEFSC staff. Using the collected data, the project team evaluated the EM system’s ability to capture data to meet the forthcoming monitoring requirements in the herring fishery, evaluated the major drivers that could impact the costs associated with full implementation, and looked for applicability to other Northeast fisheries.

SUMMARY OF DATA FINDINGS

As a result of collaborative voluntary participation by the fleet and the diligent work of Saltwater and NMFS staff, an expansive and unique data set was collected as a part of this project.

- Data was collected on 192 trips across the 11 actively fishing midwater trawl vessels.
- These data were initially reviewed by both Saltwater and a secondary review was performed by NMFS reviewers; Saltwater staff performed a comprehensive ‘census’ review while NMFS staff performed a shorter ‘audit’ that focused exclusively on fishing events.
- ‘Dual reviews’ were successfully completed on 126 trips (i.e., both ‘census’ and ‘audit’ reviews were completed).
- Of the 126 dual reviewed trips in this study, 32 trips (25%) had overlapping Northeast Fisheries Observer Program (NEFOP) coverage.
- Video reviewers were tasked with identifying and documenting discard events to determine what information could be consistently gathered and which types of discard events could be accurately categorized using EM. Please refer to *Appendix 1* for descriptions used by reviewers to categorize discard events.
- In total, review staff performed more than 1,000 hours of video review and catalogued 1,461 discard records (902 census reviewer records, 559 audit reviewer records).
- Of the the discard events as reported by the audit review, the most frequently assigned category was “discarded after being brought onboard,” followed by “operational discards,” “other,” “unknown,” “partial release,” and “full release.”
- Fishing activity made up approximately 23% of trips, suggesting that a reduced portion of the total video could be reviewed in detail to detect discard events.

Following the completion of the data collection period, the project team compiled the data and performed a series of summaries and analyses. Initial results of this work suggest that video-based EM has potential to be an effective monitoring tool in this fishery.

- Census and audit EM reviewers agreed that approximately 41 slippage events (26 partial release and 15 full release) had occurred in addition to another estimated 88 operational discard events.
- There was a high level of agreement among EM reviewers in categorizing full release events (94%).
- For smaller release events reviewers were generally able to identify that a release event had occurred, but often did not use the same classification to describe the events. For partial release events reviewers agreed in approximately 55% of the cases. In cases of disagreement, one reviewer typically classified a discard event as a partial release and the other reviewer classified the event as operational discards. The comments entered by reviewers suggested that in many of these events, reviewers were viewing similar releases of catch but categorizing them differently.

- Data comparisons between EM reviewers and NEFOP observers showed general agreement in identifying and categorizing slippage events. A close comparison of these events highlights the strengths and weaknesses of each data stream.
- Agreement between reviewers (our primary metric of performance in this study) was often impacted by factors such as the total number and placement of cameras on a vessel; factors that could be better controlled in an operational program where vessels would be expected to meet required standards and protocols regarding camera set-up (EM system set-up varied by participating vessel as participation was voluntary and vessels have different layouts).

In addition to comparisons of event categorization, data collected in this project assisted with the development of recommended operational considerations to maximize the effectiveness of video-based monitoring systems in this fleet. Specifically, results provide valuable information on the average times for EM video review and potential drivers of increased review time (mainly individual annotations of discard after being brought on board events). Further, our results suggest that an audit approach to video review may be sufficient, and may substantially reduce total review time, program costs, and storage requirements.

SUMMARY OF LESSONS LEARNED

A primary goal of this project was to determine if EM technology was a suitable monitoring option for this fishery. Throughout the project, feedback was collected from project participants and with that input, the project team identified what worked well and where improvements were needed. Overall, EM was effective in detecting and categorizing full release slippage events when EM cameras were appropriately situated and used as recommended. Furthermore, EM was effective in detecting and categorizing catch discarded after being brought onboard. While EM was effective in the detection of discard events, reviewers had some difficulty in differentiating between operational discards and partial release slippage events consistently. Incorporating a mechanism which allows vessel operators to provide information regarding discard events throughout the trip may further aid when distinguishing among these events. The following are recommendations to promote a successful EM program in the herring midwater trawl fishery.

Implementation

System components: The EM systems provided by Saltwater functioned reliably and captured high quality data that allowed reviewers to identify discard events. Unnecessary recording occurred when the vessels engaged in non-fishing activity at the dock that incorporated the vessel hydraulics and initiated camera recording. The incorporation of using geofencing technology to restrict the onset and completion of video recording eliminated these unintended recordings and should be required in an operational program.

System use and reliability: Power interruptions to the EM system caused incidences of data loss. The use of voltage conditioners and uninterruptible power supplies (UPS) decreased the risk of power loss to the EM system. Camera connectivity issues that occurred were due to high vibration on the rail mounted cameras. Vibration resistant cameras are recommended for boom mounted cameras in this fishery.

Compliance: The project had lower participation in the last quarter for a variety of reasons that are addressed later in this report, but ultimately were a result of the voluntary structure of the study. In an operational program, vessels would be required to operate their systems or would be subject to consequence measures. Another common issue we encountered was a lack of proper training for the vessel personnel responsible for operating the EM system. The vessel representative trained by Saltwater during the install was often the vessel owner or fleet manager, not the captain. For this reason, captains and crews did not always fully understand their responsibilities. Under full implementation, the captain should be present during the install for operator training.

To maximize the ability of EM reviewers to view all discards, we determined that cameras should be installed to capture all 4 possible discard locations as listed below;

- Fish pumping
- Dewatering box
- Full deck
- Stern

These four views can generally be captured by three properly placed cameras. On most vessels, getting the required views will require the installation of a boom arm mount (as described in section III below).

Data Management and Review:

Data review: It is important for all project partners to work together at the onset of any EM project to determine which data fields should be collected and how they should be reported. Doing this early ensures the EM systems are installed with the best possible configuration to collect the necessary information and that data is properly documented in the review process. All events of interest should be clearly defined to prevent variation in the classification of discard events among reviewers. Data reviewers should be trained to ensure categorization of events and species identification is standardized.

Data retrieval: In fisheries with complex logistics where the vessels are not all located in the same port, in person data retrieval can be costly and logistically complicated. Mailing EM data to the review center can simplify this process and result in cost savings. However, mailing the data diminishes the opportunity for face to face contact, which allows vessel operators to ask questions, build working relationships with technicians and facilitates advantageous system performance checks. This issue may be mitigated by more frequent communication with the vessel operators early in the project (after the first few trips) to ensure EM responsibilities are understood and data collection is optimized. In an operational EM program with required compliance, vessel operators would be required to perform a “system check” prior to each trip, and ensure that any issues with the system are reported immediately to the EM service provider. In a fleet that makes frequent, short trips and is somewhat migratory, sufficient spare hard drives should be made available to the vessels to ensure data collection is not hindered due to HDD resource limitations.



March 19, 2018

MEMORANDUM FOR: Dr. Jon Hare
 Science and Research Director
 Northeast Fisheries Science Center

Michael Pentony
 Regional Administrator
 Greater Atlantic Regional Fisheries Office

FROM: Atlantic Herring and Mackerel Electronic Monitoring
 Review Panel (NMFS, NEFMC, MAFMC)

SUBJECT: Atlantic Herring and Mackerel Electronic Monitoring Project
 Review Panel Notes

Currently, multiple organizations are partnering to establish industry-funded monitoring in the Atlantic herring fishery (including the NEFMC, NEFSC, and GARFO). Electronic Monitoring (EM) has been proposed as a means to help verify catch retention and reduce the costs of increased monitoring. To evaluate the suitability of EM for the herring fishery, NMFS (NEFSC and GARFO) contracted Saltwater Inc. (Saltwater) to complete a study exploring the utility of EM technology for monitoring midwater trawl vessels participating in the herring and mackerel fisheries. Saltwater, in collaboration with NMFS, prepared a report summarizing the results of the study. This study was then reviewed by individuals from NEFSC, GARFO, and the NEFMC and MAFMC. This document represents the notes from that review.

Panel Review Date: March 5, 2018

Attendees in Person: Nichole Rossi¹, Jonathan Deroba¹, Dan Linden², Brant McAfee², Dan Luers², Fiona Hogan³, Justin Potter⁴, Joan Palmer¹, Glenn Chamberlain⁴, Sara Weeks¹, Carrie Nordeen², Andy Jones⁴

Attendees on the Phone: John Hoey¹, Jason Didden⁵, Felipe Arzayus⁶

Review Panel Affiliations

¹ National Marine Fisheries Service, Northeast Fisheries Science Center

² National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office

³ New England Fishery Management Council

⁴ Integrated Statistics

⁵ Mid-Atlantic Fishery Management Council

⁶ National Marine Fisheries Service, Office of Science and Technology

Next Steps

- Revise Terms of Reference (**completed**)
- Work with EM service provider (Saltwater) to incorporate recommended changes to report (**completed**)
- Compile and disseminate review panel notes (**completed**)
- Provide revised report to review panel (**completed**)
- Provide documents to NEFSC and GARFO leadership;
 - Panel review summary notes (tentatively scheduled for week of March 12th)
 - Revised EM herring report (tentatively scheduled for week of March 12th)

Summarized notes from Panel Review and follow-up discussion have been organized into 3 sections: 1) Data Analysis & Report Follow-up, 2) Considerations for Operational Program Development, and 3) Recommendations for Letter Composition. Each section describes discussion points for consideration.

Review Panel Conclusion:

At the conclusion of the panel meeting members agreed that “EM was suitable for detecting discard events in the Atlantic Herring Midwater Trawl Fishery.”

Report Follow Up (presented in the order they arose):

1. The Industry-Funded Monitoring (IFM) Omnibus Amendment, as highlighted in the TORs, describes the goal of increased monitoring in the herring fishery as generating accurate estimates of catch, including herring, haddock, and river herring/shad. Panel members felt that having a primary objective of the project that focused on slippage was limiting and inconsistent with the goals of the IFM Amendment.
2. The panel did not understand that under the IFM, EM would be paired with portside sampling (they felt that this needed to be added to the initial sections of the report), and that the motivation for the project was to increase the precision of catch caps. Members felt that the report needed to better describe how EM would be used in this fishery (discard estimation or catch retention), the purpose, what data will be used by who and how.
3. Panel members felt that the report did not suitably address/discuss the use of Vessel Monitoring Plans (VMPs) and how for the purpose of an EM operational program, VMPs could be utilized to ensure structured data collection to meet monitoring requirements.

4. Panel members felt that the NEFOP specific sections of the report held merit, but needed to be amended to more clearly summarize an EM and NEFOP comparison. In addition, the report needed to include estimated weight ranges for each discard event category. Members also felt that if EM in the herring fishery is ostensibly for ensuring catch retention, most readers will want a simple summary of how EM compares to NEFOP observed discarding events.
5. Panel members noted that there were no quantitative or measurable objectives specified in the report. They suggested that at a minimum the report should describe in more detail the means by which EM can improve “monitoring and catch accountability” in a high-volume pelagic fishery (based on IFM Amendment goals).
6. Generally, panel members were interested in what types of events constituted ‘discarded after being brought onboard’ and what existing NEFOP data suggests about the frequency and type of these events (are there more occurrences of catch falling out nets or tank overflows, than animals removed from dewatering box, etc.). There was some discussion of how these events would be classified if EM was used in the herring fishery.
7. Panel members wanted more information on what drove differences in discard event counts among EM reviewers (Table 4). There was interest in determining the reasons for not being able to detect discard events and describing reasons that might have driven differences among reviewers related to “Operational Discards” events.
8. There was a request by panel members to summarize slippage release events in terms of the number of times an event occurred within and outside of camera view. In addition, a request was made to summarize the scale (weight) of discard events and the estimation method used to determine the weight for NEFOP observers and EM reviewers.
9. There was some discussion about the current status of the mackerel fishery. The group discussed the state of the most recent assessment.
10. There was some confusion about what proportion of the EM data was used for video review. Specifically, members were interested in the figure on page 49 that referenced equipment functionality. They felt that the description was not sufficient to determine how much footage was actually used for video annotation.
11. There was interest from panel members in what events constituted partial release discard events (safety issues, mechanical issues, undesired species).

12. There seemed to be consensus that, based on the findings of the project and report, EM can detect when a discard event occurs; however, EM cannot reliably identify the reason for the discard events (which is essential for discerning operational discards and partial release events under the current definitions). The group agreed that detection of discard events is likely sufficient to inform the portside sampling monitoring requirement.
13. Panel members were confused by some of the choices in displaying totals (events summed to include records from both reviews - not unique events).
14. The panel discussed possible technological advancements (outside the scope of this study) to EM and ER technology that would benefit midwater trawl vessels, including;
 - a. Net mensuration, VMS, eVTR, and EM in one integrated product
 - b. Use sensors to estimate pumping time/fishing activity w/out cameras

NMFS worked with Saltwater to incorporate additional data to support the report and to provide further clarification on issues identified by the review panel.

Considerations for Operational Program Development

- In April 2017, the New England Council selected Herring Alternative 2.7 as a preferred alternative for the herring fishery. Herring Alternative 2.7 would specify a 50% monitoring coverage target on vessels with Category A or B herring permits. The 50% coverage target would apply to at-sea monitoring coverage or electronic monitoring in conjunction with portside sampling. Existing slippage consequence measures would apply on all trips with at-sea monitoring coverage and the existing requirement to move 15 nautical miles following a slippage event would apply on all trips selected for portside sampling.
- At the April 2018 meeting, the New England Council will decide if electronic monitoring, used in conjunction with portside sampling, is an adequate substitute for at-sea monitoring coverage aboard vessels using midwater trawl gear. If the New England Council decides at-sea monitoring coverage and electronic monitoring/portside sampling are equivalent methods to meet the monitoring goals for the herring fishery, then Category A and B vessels using midwater trawl gear would be able to choose either at-sea monitoring coverage or electronic monitoring/portside sampling coverage starting in 2018.
- During the portside sampling of midwater trawl vessels, basket samples would be collected from the vessel's dewatering box at specified intervals throughout the duration of the offload. Basket samples would be sorted and weighed by species and extrapolated

based on vessel haul weight to represent the total trip. Actual weights could be verified against the vessel trip report and/or dealer data. Age and length data would be collected consistent with current portside sampling methodology.

- If EM and portside sampling are an approved monitoring tool in the herring fishery, then NMFS would require additional resources and staff to support an operational IFM EM and portside sampling program. Currently, portside data are collected by the states of Massachusetts and Maine, but not directly incorporated into quota management (although there are plans to use these data for monitoring the herring fishery in 2018). Resources and staffing to support the IFM EM and portside sampling program would be devoted to developing the infrastructure (database, APIs, data collection, data integration, standards, reporting mechanisms, QA/QC, etc.) and management process to support the IFM, EM and portside program in this fleet.
- With such small discard amounts in operational discard events and most of the partial releases, it seems reasonable to entertain altering the slippage rules for EM observed trips to only include high impact slippage events which appear to be easily and consistently identified by EM (full release and large partial release). In addition, given the relative range and scale of full release slippage events documented by this study, the current definition for slippage may benefit from refinement.

Recommendations for Letter Composition (from NMFS to Council)

1. Present study results through a series of summary points and an overall recommendation from the NMFS on the report findings.
2. Identify the strengths and challenges of EM aboard midwater trawl vessels in the herring fishery and how challenges can be addressed - through mitigation measures.
3. Determine if EM in the herring fishery is a suitable tool to verify catch retention to inform the portside sampling program.
4. Note project goals were to identify primary EM cost drivers and inform operational costs, not to provide actual EM costs. NMFS is currently using costs provided in the report to analyze project costs and scale them to estimate costs for an operational EM program. NMFS expects to make the work related to EM cost analysis available to the Council and public in time to inform the Council's April 2018 decision on EM as a monitoring option for the herring fishery
5. Panel identified a Center Reference Document (CRD) as the most effective means to disseminate the report information (long term). The report will need to be released (by some other means) to the Council, general public, and the herring industry prior to the April Council meeting (short term).





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

April 2, 2018

Dr. John F. Quinn, Chairman
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear John:

At the upcoming April 2018 meeting, we encourage the Council to approve electronic monitoring (EM) and portside sampling as a substitute for at-sea monitoring (ASM) coverage aboard midwater trawl vessels participating in the Atlantic herring fishery.

Monitoring goals for the herring fishery in the Council's Industry-Funded Monitoring (IFM) Omnibus Amendment are accurate estimates of catch, including the catch of haddock and river herring/shad, and affordability.

The purpose of EM aboard midwater trawl vessels would be to confirm catch retention for portside sampling and verify compliance with slippage requirements. In 2016-2018, we conducted an EM study aboard midwater trawl vessels participating in the herring fishery. The recent review of that study concluded that EM is suitable for detecting discarding events aboard midwater trawl vessels. The ability to detect discarding events is consistent with confirming catch retention and verifying compliance with slippage restrictions.

The purpose of portside sampling midwater trawl vessels would be to collect species composition data along with age and length information. Even in the absence of EM, the Council supports the use of portside sampling data to monitor catch in the herring fishery. In a February 2016 letter, the Council requested that we use Northeast Fisheries Observer Program data and portside sampling data to monitor catch in the herring fishery.

The EM study also evaluated costs associated with using EM, especially the sampling costs that would be paid by the fishing industry. NMFS used information from the study to estimate EM costs for midwater trawl vessels participating in the herring fishery. As such, we estimate the industry's costs for EM at approximately \$296 per coverage day, including the review of video footage around fishing activity but not the initial costs of purchasing and installing equipment. The IFM Amendment estimated the industry's annual costs for portside sampling at \$96,000 for the midwater trawl fleet and \$8,700 per vessel. Therefore, we estimate the industry's costs for using EM and portside sampling would be approximately \$515 per coverage day.

The analyses in the IFM Amendment and the EM study suggest that the industry's costs for EM and portside sampling are comparable to the industry's costs for ASM (i.e., \$710 per coverage day). In addition, midwater trawl vessels using EM and portside sampling would have minimal sampling costs on trips resulting in no fishing effort, while vessels using ASM would pay the same amount for a coverage day whether or not fish were caught.



Currently, the draft IFM Amendment regulations would require all vessels with Category A or B herring permits to use ASM coverage to comply with the 50-percent IFM coverage target recommended by the Council. Additionally, the draft regulations do not contain any EM or EM service provider requirements because we wanted the EM study to inform those requirements.

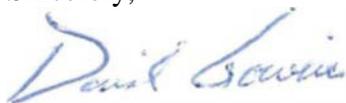
Implementing and administering a Federal EM and portside sampling program for the herring fishery would be a new undertaking for us. National policies on EM cost responsibilities, data retention, and data confidentiality are still being refined. Additionally, we are still developing regional EM recommendations for such things as technical specifications, vessel monitoring plans, and service provider requirements. If the Council approves EM and portside sampling for the herring fishery and if we approve and implement the IFM Amendment, we are considering using an exempted fishing permit (EFP) to administer the EM and portside sampling program for the next two years. The EFP would exempt vessels from the proposed requirement for IFM ASM coverage and would allow midwater trawl vessels to use EM and portside sampling coverage to comply with the Council-recommended 50-percent IFM coverage target.

Other NMFS offices administering EM programs have shared with us that EM programs need flexibility upon implementation. Our recent EM study gives us a good foundation for an EM program, but using an EFP would allow us the flexibility to further develop program standards and best practices as the program evolves. An EFP would also enable us to evaluate other monitoring issues in the herring fishery that are of interest to the Council and herring industry. We could use an EFP to evaluate the utility of EM and portside sampling when midwater trawl vessels switch to purse seining and/or fish in Northeast Multispecies Closed Areas.

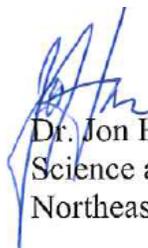
In April 2017, the Council recommended reconsidering IFM requirements two years after implementation. If we administer the EM and portside sampling program for herring midwater trawl vessels via an EFP for those two years, the Council could consider establishing EM program requirements, as well as any additional portside sampling program requirements, into regulation via a framework adjustment at that time.

In summary, we encourage the Council to approve EM and portside sampling as a monitoring option for midwater trawl vessels participating in the herring fishery. We also request the Council support us using an EFP to administer an EM and portside sampling program for midwater trawl vessels participating in the herring fishery. Additionally, we appreciate the midwater trawl fleet's participation in the EM study and Council staff's participation in the EM review panel.

Sincerely,



Michael Pentony
Regional Administrator
Greater Atlantic Regional Fisheries Office



Dr. Jon Hare
Science and Research Director
Northeast Fisheries Science Center

Brad Schondelmeier
 Massachusetts Division of Marine Fisheries
 30 Emerson Ave.
 Gloucester, MA 01930

April 11, 2018

Tom Nies
 Executive Director
 New England Fisheries Management Council
 50 Water St., Mill 2
 Newburyport, MA 01950



Dear Mr. Nies,

The Massachusetts Division of Marine Fisheries (MADMF) has been conducting portside sampling of the midwater trawl (MWT) fishery for Atlantic herring and Atlantic mackerel since 2008. In 2011 the program increased sampling targets to 50% of MWT landings in MA ports, and has been funded by the Atlantic herring Research Set-Aside since 2014. Considering that portside sampling (paired with electronic monitoring) may become an approved monitoring method for the herring fishery, I have updated our MWT portside sampling cost analysis that appeared in the 2015 Regional Office/Science Center document, *A Cost Comparison of At-Sea Observers and Electronic Monitoring for a Hypothetical Midwater Trawl Herring/Mackerel Fishery*. This document stated that from 2010 through 2013 a total of 301 MWT trips and 61,759 metric tons (mt) of landings were sampled for an average cost of \$5.12/mt and \$1,040/trip. These figures include contracted port samplers, one full-time field coordinator, administration, supplies and support to SMAST for field support.

It is my understanding that many of these costs would not be borne by MWT vessels under the IFM amendment, so I have narrowed my estimates to only include costs for contracted port samplers. My analysis includes sampled (318) and landed (1514) MWT trips from 2013-2017, accounting for 58,385 mt of sampled landings.

MWT Trips 2013-2017	Trips Sampled by DMF (MA)	Trips Landed (All States)	MTs Landed (All States)	Avg. Trip Size (mt)	Offload Duration (Hrs)	Offload Rate (mt/hr)
Annual Average	63.6	302.8	49,567	163.7	7.01	28.9
Standard Deviation	18.3	56.9	14,083	22.5	5.00	12.9

Table1. Sampling and fishery characteristics during the most recent 5 year period.

Source: DMF and VTR data.

Costs for field support, data management, travel and other administration were not included. In-kind sampling performed by MADMF and SMAST staff was replaced with an appropriate hourly rate. Sampling under our program has been generally opportunistic and there remain a few sites within the state that are logistically difficult to sample. To account for the increased logistical burden of a coast-wide program I have added one standard deviation to cost estimates, where appropriate.

MWT Trips	Trips Sampled by DMF (MA)	Trips Landed (All States)	Avg. Cost/trip (+1SD)	Avg. Annual Cost for All States @50%	Avg. Annual Cost per Vessel
2013-2017	318	1514	\$ 252.28	\$ 38,196	\$ 3,131

Table2. Costs per trip based on DMF sampling costs scaled to MWT trips landed coast-wide. Source: DMF and VTR data

It is important to note that the cost to sample a particular trip is dictated by the amount of fish being landed, the rate of offloading and the duration of stoppages during an offload. Each offload site and fishing operation has unique characteristics that determine the speed and timing of offloads. In general, offloads to bait trucks at “dewatering boxes” average between 30-60 mt/hour offload rate, whereas fish processing plants average between 15-40 mt/hour. There can often be mechanical or logistical delays during offloads, which would increase costs per amount of fish offloaded. Again, one standard deviation was added to account for logistical issues surrounding expanding portside sampling to new vessels and ports. Due to the large differences in trip sizes and hail weights, sampling costs per volume/weight of landings may be a more accurate metric.

MWT Trips	Avg. Cost/100mt (+1SD)	Avg. MT Landed (All States)	Avg. Annual Cost for All States @50%	Max MT Landed (All States)	Max Annual Cost for All States @50%
2013-2017	\$ 174.88	49,567	\$ 43,341	62,049	\$ 54,255

Table3. Costs per 100mt sampled plus one standard deviation, applied to average and maximum annual landings from 2013-2017. Source: DMF and VTR data.

Please note that these updated costs figures do not represent a direct comparison to the figures cited in the 2015 GARFO/NEFSC document because they do not include administration costs, but I feel that they will be helpful towards informing upcoming decisions. Please do not hesitate to contact me with any questions or clarifications.

Sincerely,

Brad Schondelmeier

Massachusetts Division of Marine Fisheries
Field Coordinator, Portside Sampling Program

Cc: Deirdre Boelke
Dr. John Quinn
Dr. David Pierce
Melanie Griffin