Implementing Electronic Monitoring in the New England Groundfish Fishery

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In 2010, the National Marine Fisheries Service (NMFS) implemented Amendment 16 in the New England groundfish fishery, which revised and expanded the sector management system and established annual catch limits and accountability measures for each stock in the fishery. A sector is a voluntary group of limited access permit holders, and each sector has different compositions of vessel size, gear type, geography, and/or business relationship. Sectors are allocated quota for 15 of the 20 groundfish stocks, and are exempt from numerous regulations, such as trip limits. The sector system allows for more efficient fishing operations and catch utilization (e.g., reduced discards) by providing vessels with flexibility in harvesting the sector’s allocation. In order to reliably estimate sector catch and monitor sector operations, Amendment 16 included new requirements for the fishing industry to implement and fund an at-sea monitoring (ASM) program.

The Northeast Fisheries Science Center (NEFSC) manages the groundfish ASM program and the Northeast Fisheries Observer Program (NEFOP). NEFOP observers collect biological and scientific information across all of the Northeast fisheries, whereas ASM monitors are focused only on catch monitoring in the groundfish fishery. NEFOP resources are finite and allocation of NEFOP coverage is guided by national and program priorities and the standardized bycatch reporting methodology by law. Therefore, NEFOP provides some monitoring for sectors, and ASM supplements the remaining portion of required sector monitoring. Overall, 20-32% of sector trips have been monitored between 2010 and 2014. Despite the differences in data collection goals, NEFOP and ASM both identify species and account for the weight of both kept and discarded fish, for each sector, with assumed discard rates applied to unobserved trips. The original intention was for NMFS to fund ASM in 2010 and 2011, with the industry to begin paying in 2012. However, NMFS has funded ASM through 2014 and is projected to do so for a portion of 2015. In fall 2015, industry is expected to begin paying for ASM costs for the first time.

The need to balance the financial viability of sectors with the expectation to have the fishing industry fund ASM has precipitated several efforts to explore electronic monitoring (EM) as an alternative to ASM. There are likely different visions for what an EM system entails, but generally, EM incorporates video cameras, sensors, and electronic reporting systems into a vessel’s fishing operations. Depending on program design, EM has the potential to reduce the expenses associated with monitoring groundfish sectors. However, moving away from human observers has its trade-offs, the types and quality of data can be different between EM and observers. Simply stated, EM may be a suitable replacement to ASM, provided EM has the ability to identify species, and verify weights and counts of discards in the New England groundfish fishery. Balancing management data needs with the costs of a comprehensive EM system that satisfies monitoring requirements remains an ongoing endeavor.

EM is being used for catch monitoring and reporting compliance in fisheries worldwide, but implementation in the United States has been somewhat limited, specifically in the Northeast. There have been regional and national workshops to explore the technology and capabilities of EM, examine how EM can meet scientific and management needs, and understand the legal requirements, data integration, and costs of implementing EM. In the Northeast, there have also been several pilot projects to address some of the many challenges to implementing EM. From 2004-2006, the Cape Cod Commercial Fishermen’s Alliance (CCCFA) and Archipelago Marine Research Ltd. (AMR)
tested EM systems on longline and gillnet vessels and compared EM and observer data. Beginning in 2010, NMFS and Archipelago conducted a more comprehensive study in three phases. Phase one identified baseline metrics for detecting fishing events, counting fish, and identifying species. Phase two addressed issues such as weight estimation and expanded species identification methods through catch handling. The third phase tested catch handling methods to simulate an operational EM program. Currently, the Gulf of Maine Research Institute (GMRI), the Maine Coast Community Sector (MCCS), The Nature Conservancy (TNC), and Ecotrust Canada (EC), have collaborated to operationalize an EM program using open-source software. Their model uses EM to validate captain-reported data on vessel trips reports and has introduced a new EM provider to the fishery. The first year (2013) was designed to be a training period for captains. For 2014 and 2015, the project’s goal is to complete the necessary data collection and analysis to demonstrate the ability that EM can replace ASM for sectors in the New England groundfish fishery.

Since these pilot projects, EM proponents have supported implementation of EM in the New England groundfish fishery. However, given legal, analytical, and logistical obstacles that remain, EM has not yet been approved for implementation as an alternative to ASM. In January 2015, NMFS’ Greater Atlantic Regional Fisheries Office (GARFO) and the NEFSC released a Regional Electronic Technologies Implementation Plan that articulated the remaining aspects of a comprehensive EM program that need to be addressed. Some outstanding questions include:

- What are the detailed roles and responsibilities of the various parties involved?
- Who will have responsibility to store the data and for how long?
- Who will have access to the data and for what purpose?
- How much will it cost the government and the industry?

In concert with the release of the Plan, GARFO and NEFSC partnered with GMRI, MCCS, TNC, and EC as they continue their project to address these final issues and fully develop an EM model. This pre-implementation group has worked from an agreed set of questions and tasks, which has facilitated a fully transparent and coordinated process. The group holds monthly face-to-face meetings to discuss data collection, retrieval, review, and storage, the roles and responsibilities in a functional program, and the process for approving and implementing EM for 2016. These partnerships have provided GARFO and NEFSC with an understanding of how reasonable certain program requirements may be for a fisherman or an EM provider, and have also provided insight to non-NMFS partners on the existing gaps between the pilot projects and fully implementing EM. The intention is that this group will continue to move forward, adding additional partners such as CCCFA and AMR, to develop the final data and provider standards, EM monitoring plans, and regulatory framework for implementing EM for a portion of the groundfish fishery.

Currently, GARFO and NEFSC is building the database infrastructure and processing tools for data collected from EM video footage, conducting comparative analysis to the existing catch monitoring systems in the fishery, and addressing the final legal and logistical hurdles. For over a year, GARFO has been working to provide information to the public that compares EM and ASM costs. Given the importance of this cost analysis, an external peer review of this comparison is underway, and the final report is expected to be released in early fall 2015. Because EM would replace ASM for some vessels and/or sectors, GARFO is evaluating how best to implement EM in each sector’s operations plan and ensure that the plans are enforceable and adequate for reporting and monitoring sector catch. Pending the results of the pre-implementation work, GARFO intends to propose approval of EM standards and monitoring plans prior to next groundfish fishing year, set to begin May 1, 2016.
Implementing Electronic Monitoring in the New England Groundfish Fishery: A 10-Year Tale

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Amendment 16 and Sector Management

• Catch limits and accountability measures
• Sector management revisions and expansion
• What is a sector?
  • Voluntary group of permit holders
  • Diverse size, gear, geography, and business relationship
  • Allocated quota for 15 of the 20 groundfish stocks
  • Exempt from many regulations (e.g., trip limits)
  • Efficient fishing operations and catch utilization
• New reporting and monitoring
• Industry to implement/fund at-sea monitoring (ASM)
Current Monitoring in the Fishery

- **NEFOP (NMFS-managed)**
  - Collect biological and scientific information
  - Coverage guided by national and program priorities

- **ASM (NMFS-managed)**
  - Catch monitoring for sectors
  - Supplements NEFOP coverage

- **Sector Monitoring**
  - 20-32% of trips monitored 2010-2014
  - ASM/NEFOP identify species, and weight of kept/discards
  - Assumed discard rates applied to unobserved trips

- **Monitoring Costs**
  - NMFS funded ASM in 2010-fall 2015
  - Industry expected to begin funding
Trading Apples for Apples

• Why explore EM for groundfish?
  • ASM isn’t cheap
  • Phantom discards
  • No more room!

• What is EM in groundfish?
  • Video cameras, sensors, and electronic reporting systems
    • Captain reports haul-level discards
    • % of the EM video reviewed; summary report created
    • EM summary confirms the accuracy of captain

• Problem solved?
  • EM may reduce costs for sectors
  •Balancing costs with requirements
  • EM and ASM/NEFOP data is different
  • EM must identify species; verify weights/counts of discards
A History of EM Pilots in New England

- 2004 - 2006: CCCFA and Archipelago
  - Compared EM and observer data; species and counts
- 2010 - 2014: Northeast Fisheries Science Center and Archipelago
  - Phase 1: Detect fishing events, fish counts, and species ID
  - Phase 2: Weight estimates, catch handling, and haul-level data
  - Phase 3: Simulated an operational EM program
    - Audit or retention model
    - Field trials and data turnaround
    - Operational and cost considerations
- 2013 - Present: GMRI, MCCS, TNC, and Ecotrust Canada
  - Operationalize EM using open-source software
    - 2013 - Training period for captains
    - 2014 and 2015 - Data collection and analysis
    - Can EM replace ASM for sectors?
Getting on the Same Page

• EM works on the water

• Regional Electronic Technologies Implementation Plan (Jan. 2015)
  • Roles and responsibilities?
  • Data standards, storage, and for how long?
  • Data access and for what purpose?
  • Costs?

• EM and ASM cost comparison
  • Greater Atlantic Regional Fisheries Office drafting report
  • External peer review, final report in early fall 2015

• The EM Pre-Implementation Group
  • NMFS partnering with GMRI, MCCS, TNC, and EcoTrust Canada
  • Addressing the remaining questions
Getting on the Same Page

- Monthly face-to-face meetings
  - Technical, analytical, and policy
  - Breaking down barriers
  - And when we go live?

- Transparency and coordination
  - Roles and responsibilities
  - Data collection, retrieval, review, storage, and analysis
  - Enforcement
  - Process for approving and implementing EM for 2016

- Walking in each other’s shoes
  - How reasonable are program requirements?
  - Cost effective?
  - Understanding the existing gaps
Writing the Last Chapter

• Adding additional partners
  • CCCFA
  • New sectors? New EM providers?
  • Keeping a national perspective

• Program requirements
  • EM system and data standards
  • Vessel and sector monitoring plans
  • Pass and fail criteria
  • Incentives and penalties

• Trading apples for apples
  • EM > ASM for catch monitoring?
  • Implications from the split
Writing the Last Chapter

• Building the foundation
  • EM comparison with existing monitoring
  • Database infrastructure and processing
  • Match-o-matic? Blackbox?

• EM in sector operation’s plans
  • Ensure plans are enforceable
  • Adequate for reporting and catch monitoring
  • Allow for mid-season adjustments
  • EM plans not in the regulations

• Time is ticking
  • Fall 2015 – EM plans and provider applications
  • Winter 2015 – Propose to approve EM
  • Spring 2015 – Approve EM for May 1, 2016
In Summary.....

- New England groundfish is complex
- ASM being critically examined
- Mind the gap
- Diverse perspectives
- Transparency and communication
- Jump into EM together
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