

Greater Atlantic Regional Fisheries
Office and Northeast Fisheries
Science Center

Electronic Technology
Implementation Plan

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1.0 Purpose of Electronic Technology Plan

The purpose of this plan is to modernize fishery dependent data collections to ensure collections are timely, correct/validated, optimally automated, vertically and laterally integrated/unified, adaptable to emerging needs, and capable of providing data at a scale that will support anticipatable management and scientific needs of the agency and our partners.

Transition from the current state to future state while preserving archived data and ensuring data from all systems, old and new, are accessible and utile.

2.0 Objectives of Monitoring Regime

The monitoring programs in the northeast region are designed to fulfill many objectives, but the primary purposes are to provide information about the state and performance of the fishery (fish and fishermen) and full catch accounting for regional fisheries to support the region's scientific and management missions. Other objectives of the monitoring programs include:

- Provide stock-specific data needed for stock assessments on kept and discarded catch, including size and age composition by gear type.
- Characterize all aspects of the fishing industry.
- Quantify fishing effort.
- Maintain fishing history at individual and aggregate levels.
- Support evidentiary needs for enforcement.
- Provide the data needed by fishing industry members to facilitate their business planning.
- Facilitate research by independent organizations regarding fishery science and operation.
- Provide flexibility to ensure that data can be adapted to support future needs such as ecosystem-based management.

3.0 Current State of Data Collections

The fishery dependent data collections (FDCC) in the northeast region have been developed over the past 20 years. Some collections have evolved from even older structures. Over that time, reporting requirements and the supporting systems have been expanded and refined, as needed, in response to new statutory requirements and the scientific and management initiatives of the agency and our two councils.

Current fishery dependent data collections comprise a variety of electronic and paper submission systems, such as:

- Electronic systems
 - Seafood dealer reports
 - Vessel monitoring system
 - Groundfish sector reports
 - Fishery-specific catch reports

- Exempted fishery permit reports
- Observer pre-trip notification systems (PTNS, Scallop IVR, Herring)
- Electronic and paper submissions
 - Vessel trip reports
 - Catch-share transfer requests and transaction reports
 - Observer reports and at-sea monitor reports
- Paper, other
 - Biological data from port sampling
 - Marine recreational information program
 - Vessel, operator and dealer permits

This suite of independently developed systems now requires substantial investment, often including manual interventions, to reconcile and integrate data. Spatial and temporal resolution of these collections varies, but historically has been highly aggregated.

Recent scientific and management requirements over the last several years have stretched the adequacy of those monitoring and reporting systems. After decades of region-wide management and seasonal catch accounting at an aggregated level, we are now moving to management schemes that require timelier, complete, and correct catch accounting, with some management programs calling for accounting at the individual vessel and activity level. The demand for more timely and frequent stock assessments has increased in response to required specifications of annual catch limits, and the need for more efficiently integrated regional fishery dependent data streams has been highlighted in a national peer review of data for stock assessment needs in the northeast region. Our current suite of FDDC tools is not as efficiently integrated as needed. It is only through substantial investment in data reconciliation processes that we are able to achieve fuller data integration, higher data quality, speedier delivery, and finer spatial and temporal granularity are required to support management and scientific applications.

This plan includes a description of current activities and future plans for: (1) An overarching revision to regional fishery dependent data collection and (2) evaluation and integration of electronic technologies.

3.1 Ongoing (December 2014) FDDC Improvement Initiatives

In 2013, the Greater Atlantic Regional Fisheries Office (GARFO) and the Northeast Fisheries Science Center (NEFSC) launched two major initiatives focused on improving fishery dependent data in the region – the Fishery Dependent Data Committee and the FDDC Modernization Project. Both are introduced below, along with a description of our ongoing effort to integrate electronic (camera-based) monitoring as a management tool in association with other data collection methodologies in a part of the Northeast multispecies fisheries and, potentially, in other fisheries. The Fishery Dependent Data Committee is charged with making incremental changes to improve the current fishery-dependent data systems. The FDDC Modernization Project is an integrated revamping of the entire FDDC program, currently in the early phases of organizing the requirements of a new system to be implemented in 2017. Electronic monitoring is moving toward experimental operation under the current system. Electronic monitoring and other electronic technologies, described below, will be evaluated for potential inclusion as tools

to implement the modernized data system. Other, more narrowly focused, projects are discussed in our implementation plan below.

3.1.1 Fishery Dependent Data Committee

The responsibilities for the various FDDC programs noted above fall to both the GARFO and the NEFSC. Over the years, as the various FDDC programs were developed and refined on an as-needed basis, different branches (and even individual staff) within the GARFO and NEFSC took on the duties of running the program, monitoring the data quality, making corrections to the data, archiving, and distributing the data to other staff for analysis and other functions. Due to the somewhat independent (non-integrated, though related) nature of many of the various reporting, monitoring and data management systems and due to the distributed work assignments, the GARFO and NEFSC staff have not always treated the suite of FDDC programs as a system and have not always coordinated fully and well with one another.

In 2013, recognizing that recent trends in fisheries management and stock assessments are placing more demands on our fisheries dependent data, the GARFO and NEFSC initiated a working group “to ensure that all of our data collection, data quality control/assurance and correction, and data management functions are executed with optimum efficiency, consistency, and with full consideration of managers’ and users’ interests and needs.” The Committee consists of staff from each program in the GARFO and NEFSC that has data collection and management responsibilities, as well as a few staff representing users of the data. A representative of the Office of Law Enforcement’s VMS program is in the group, and the deputy regional administrator and deputy science director are the co-chairs.

The Committee provides a forum for sustained conversation and cross-divisional coordination to make incremental improvements to our existing FDDC programs and supporting systems. The relevance of this working group to the Electronic Technology Implementation Plan is that this group:

- Promotes integration of the existing FDDC programs to better ensure that data associated with a particular trip are aligned, correct, and timely.
- Initiates and coordinates efforts to improve our existing collections, including electronic collections.
- Advances and improves the current state of FDDC programs, while the future state (under our modernization initiative, see below) is being developed.
- Develops and refines best practices for data management and internal coordination, which will provide a basis for our work under this implementation plan.
- Evaluates proposed management measures and how to most effectively integrate them into existing, revised, or new FDDCs and associated databases.

3.1.2 FDDC Modernization Initiative

This effort contemplates a comprehensive overhaul and modernization of our entire FDDC program. In order to develop a vision for an improved FDDC system, GARFO and NEFSC staff sought to better understand the data needs and uses of all internal and external data users, to

identify the strengths and weaknesses of the existing data collections and systems, and to elicit the desired characteristics of an ideal fishery dependent data system.

Staff interviewed NMFS scientists and managers throughout the Atlantic and Gulf coasts, the Atlantic Coastal Cooperative Statistics Program, state fishery scientists and managers, regional fishery management council and fishery commission staff, and individuals from non-governmental organizations and academic/research institutions. In addition, GARFO and NEFSC staff worked collaboratively with a project team established by the Gulf of Maine Research Institute (GMRI) to conduct surveys and interviews with vessel owners, operators, and crew; seafood dealers and auction house staff; representatives of commercial fishing organizations/associations; and third party software developers/providers. Together, the GMRI project team and GARFO and NEFSC staff hosted a two-day workshop (June 30 – July 1, 2014) in which industry, agency staff, and other interested parties could delve more deeply into our collective data needs and uses in an attempt to identify operational considerations that affect the timeliness and accuracy of FDDC, as well as opportunities for enhanced efficiency in data collection, organization, and distribution.

GARFO and NEFSC staff are in the process of evaluating the information collected through interviews, surveys, and a workshop to develop a requirements document that outlines what data are needed, when they are needed, and how they are used in the Northeast. We are compiling a requirements catalog for our FDDC systems. This document will characterize the modernized fishery dependent data system, identify policy and programming issues that need to be resolved, and recommend solutions to identified issues that affect system development, as appropriate. This work will then feed into efforts to design and build an improved fishery dependent data system, as further discussed below.

To develop the vision for an improved data collection system, all options are being considered, including software revisions, changes to policy/regulations, process refinements, and staffing/resource adjustments. We emphasized this point during our interviews and workshop with internal and external data stakeholders, enabling us to elicit candid and unfettered feedback that will help us develop a truly efficient and progressive system for the future. Preliminary feedback indicates that most respondents support a move to a system that would integrate existing data systems, and that there is broad support for various forms of electronic data collection to reduce manual data entry, collect more precise fishing area data, and automate data validation.

The next steps and a timeline for the completion of this initiative are provided in the implementation plan details below.

3.1.3 Electronic Monitoring Initiative

Beyond the two efforts that take a comprehensive approach to FDDC programs, we have another significant initiative underway to advance electronic monitoring (EM), initially in the Northeast multispecies fishery and potentially in the Atlantic herring and Atlantic mackerel fisheries. Our efforts focus on these fisheries because both the New England and Mid-Atlantic Councils and fishery participants and stakeholders have expressed an interest in using EM. Other fisheries could be included as they are identified, following the same general implementation plan.

In early 2013, GARFO and the NEFSC developed a white paper outlining two potential uses of EM in regional FDDC programs: (1) In a full-retention (no discard) fishery, all catch would be observed by dockside monitors, and EM would be used to verify that no discarding occurred at sea and (2) in a logbook program, fishermen would record kept catch and discard data electronically, and discard estimates would be verified using EM.

In 2013, the NEFSC completed an extensive pilot study testing the applicability of EM in the groundfish fishery (<http://www.nefsc.noaa.gov/fsb/ems/>) including evaluation of these two potential applications. From this study, and the many others like it, we have identified the necessary components to support an operational EM program (e.g., catch handling protocols, technical specifications). Despite all of these investigations and efforts to work through EM program details, we still need to figure out the other aspects of a comprehensive EM program before we can develop the appropriate performance standards, regulations, and infrastructure. Some outstanding questions include:

- What are the detailed roles and responsibilities of the various parties involved?
- Will EM data be able to meet the data quality standards of the MSA and other laws?
- Who will have responsibility to store the video 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?

Several of these questions were highlighted as informational needs and action items at a recent National EM Workshop (<http://www.eminformation.com/>) and Northeast EM Workshop (May 7-8, 2014) (<http://www.greateratlantic.fisheries.noaa.gov/stories/2014/ElectronicMonitoring.html>).

A key take-home message of both the national and regional workshops was the need for performance standards to reduce uncertainty, and facilitate innovation and investment. We have several projects underway with the objective of answering these questions and informing regional performance standards for EM programs.

- Operational use in a groundfish sector - We are working with sectors to prepare a proposal to use EM to meet their at-sea monitoring requirements in fishing year 2015. This project will build on pilot projects by integrating EM data into the sector's and NMFS's monitoring and reporting programs.
- EM Data Analysis – The NEFSC will be contracting an analyst to begin working on outstanding analytic questions, such as how much video should be reviewed, using existing data from the pilot project.
- Cost Analysis – We are developing estimates of potential costs for EM programs in the Northeast groundfish and Atlantic herring fisheries compared to traditional observer models to provide fishermen, the Councils, and the government with a better understanding for decision-making.
- Atlantic Herring/Mackerel – There has been considerable interest in increasing monitoring of bycatch and discarding events in the Atlantic herring and mackerel fisheries because of interactions with groundfish, river herring, shad, and other species.

EM holds promise as a cost-effective means of monitoring compliance with slippage restrictions and members of the herring industry have begun a pilot project. Both Councils have expressed interest in exploring this option, though it is not currently part of any ongoing Council action. We will continue to encourage the Councils to keep this option under consideration.

- NEFMC EM Working Group – The NEFMC convened a workgroup in 2013 to identify and develop solutions to barriers to implementing EM in groundfish sectors. The group has representation from industry, conservation organizations, the Council, GARFO, NEFSC, enforcement, and General Counsel. The workgroup will report to the Council and may provide recommendations on next steps for EM implementation for sectors.

The next steps and a timeline for completion of this initiative are provided in the implementation plan details below.

3.1.4 Observer Electronic Reporting System Development

The NEFSC is developing an Observer Electronic Reporting System (OBERS). Its observer data collection systems are a combination of paper-based and electronic reporting systems, with the electronic reporting being duplicative of the paper systems. In addition, existing electronic systems only collect a subset of the data to meet immediate needs and are not comprehensive. Processing of these data are time consuming and prone to data entry and transcription errors.

The objective of OBERS is to provide the end-user access to the core observer data and access to the additional data elements collected through this flexible/dynamic data acquisition system. This project will include the conversion of the legacy data to the new presentation model so all of the data can be presented in the same structures.

The design of this system will improve the flexibility of the current northeast U.S. fisheries observer data collection program. A flexible database and dynamic at-sea data acquisition application will improve data quality, decrease processing time while adapting more quickly to the changes needed for effective fisheries management. The NEFSC expects to complete the system so it can be deployed within the next 12 months.

3.1.5 Bio-sampling Monitoring System Development

The NEFSC and GARFO are jointly developing a new Bio-sampling Monitoring (BSM) system. Currently, the BSM collection system is a combination of paper-based and electronic reporting systems, with sample requesters using a web-based data entry program and port samplers using both paper and electronic systems. The existing system can be slow to respond to additional requests and slow to acknowledge which requests have been fulfilled, resulting in both over and under sampling. Processing of these data by port samplers are time consuming and prone to data entry and transcription errors.

The new data collection system is designed to eliminate redundant data collection and improve data timeliness and quality with a new database design and software applications that take advantage of electronic measuring boards, scales, and barcode scanners.

3.1.6 Electronic Vessel Trip Reports

Electronic Vessel Trip Reports (eVTRs) have been developed extensively through the region's Cooperative Research Program. The software system developed by NEFSC and called Fisheries Logbook Data Recording Software (FLDRS) supports both sub-trip and tow-by-tow reporting, which supports analyzing fishery data on stock-by-stock and fine-scale management area bases. Under some applications of EM, tow-by-tow reporting is a critical element for cost-effective analysis of video data for validation purposes. Several vendors have also developed eVTR applications that have been found compliant with GARFO's eVTR technical requirements and may be used by vessels for the purpose of eVTR submission.

In use since 2002 by the study fleet and authorized for broad scale use in 2011, acceptance of eVTRs has been slow. The GARFO and NEFSC are currently working to improve our existing eVTR system and to expand its use. Also, the use of vessel monitoring systems is expanding in the region.

These systems capture all the data elements currently required under the paper VTR system and operator reports can be validated through vessel electronics (e.g., GPS). They are a significant improvement over a land-based web reporting system that could improve timeliness but also potentially suffer from increased recall bias compared to systems (paper or electronic) that require the recording of data while at sea.

4.0 Plans for Expanding Technological Capabilities in the Region

4.1 FDDC System Modernization

4.1.1 Project outline, phases, timeline towards May 2017 implementation

The overall project plan for modernizing our FDDC and associated data systems will take place between 2014 and 2017, and will involve the following fundamental steps:

1. Develop data system requirements document (December 2014)
 - List current and expected data uses and needs of internal and external users
 - Identify strengths and weaknesses of current fishery dependent data system
 - Characterize ideal fisheries dependent data system and necessary outputs
2. Create project plan and appropriate business rules to implement idealized fishery dependent data system (Spring/Summer/Fall 2015)
 - Optimize data collections
 - i. Streamline data collections to provide needed data in a more effective manner
 - ii. Identify regulatory changes to achieve optimized data collection plan

- Map integrated fishery dependent data system
 - i. Identify relationships between data collections and tables
 - ii. Determine standards by which data will be collected, transmitted, and stored
 - iii. List programming changes necessary to more effectively link data tables
- Ensure business rules/programming maintains linkage with legacy data
- Integrate other initiatives related to fishery dependent data collections/systems
 - i. National ER/EM strategies
 - ii. Regional electronic monitoring initiatives
- 3. Identify and prioritize system implementation modules (Spring 2016)
 - Develop work break-out structure identifying how project plan will be implemented
 - Identify priority tasks based on available resources and greatest benefits to NMFS
- 4. Program and test updates to fishery dependent data system (Summer/Fall 2016/Spring 2017)
 - Ensure data system can accommodate data from external sources (e.g., state data)
 - Evaluate effectiveness of integration with data from previous systems (legacy data) to ensure consistent and reliable data queries
- 5. Communicate and explain modernization initiative and idealized system (2014-2017)
 - Develop outreach materials and conduct information sessions throughout the coast to explain future changes to data collections and system outputs
 - Discuss real-world examples of how new or revised system/collections will affect dealers and vessel operator activities
 - Highlight the benefits of streamlined and primarily electronic reporting
 - Demonstrate data products and other outputs that will be useful to industry
 - Conduct training sessions with NMFS, Council, Commission, state, and ACCSP staff that will be affected by new database design and storage
 - Conduct training sessions with permit holders who will be affected by new reporting requirements.

4.1.2 Project planning contract

A planning and IT development firm, Ambit Group, LLC (<http://www.theambitgroup.com/>), has been contracted (fall 2014) to organize and create the supporting documentation for an overall project plan and work break-down structure that will include a list of initiatives in sufficient detail to implement solutions to achieve the objectives of the fishery dependent data visioning project. The contractor will work with GARFO and NEFSC staff to translate the requirements document and needs assessment mentioned above into business rules as part of an enterprise solution focused on collecting and making available all data associated with the operation of a single commercial fishing trip. The enterprise solution must be able to support the collection, organization, evaluation (quality control and analysis), and dissemination of the affected data collected during the course of a fishing trip for both internal and external uses.

4.1.3 Fisheries in the Northeast to be included

All regional fisheries managed in federal waters will be affected by the modernization initiative, with all fisheries likely subject to a baseline data collection. This includes species managed by the New England and Mid-Atlantic Fishery Management Councils, but also the Atlantic States Marine Fisheries Commission. Some fisheries, such as the American lobster fishery, may be subject to reporting requirements for the first time, while others (e.g., Northeast multispecies, Atlantic herring, and Atlantic sea scallop) will likely require additional or revised data collections based on the data collection optimization recommendations outlined in the requirements document. Please see Appendix 1 for a complete list of FMPs in the region and corresponding EM and modernization status.

4.1.4 Council coordination and regulatory conformance

The New England and Mid-Atlantic Councils, the Atlantic States Marine Fisheries Commission, and the Atlantic Coastal Cooperative Statistics Program have been involved with the development of the data needs/requirements document and an industry workshop to solicit further input regarding future fishery dependent data system characteristics. All bodies have been, and will continue to be, briefed on the ongoing progress of the modernization initiative and their direct involvement will be sought throughout. Upon the completion of the internal review, these groups will have the opportunity to review the requirements document and provide further input, as appropriate.

The need to update regulations to implement improvements to the fisheries dependent data collections will be assessed during the development of the business rules and project plan during the fall of 2014 and spring of 2015. Regulatory updates will likely be necessary, and could be implemented through omnibus amendments to several fishery management plans (FMP), or through the administrative authority granted to the Secretary under the Magnuson-Stevens Fishery Conservation and Management Act, whichever is appropriate. Please see Appendix 2 for a summary of GARFO and NEFSC engagement with the Councils regarding this initiative.

4.1.5 Evaluation

The modernized fishery dependent data system will be routinely evaluated to ensure it continues to meet our evolving data needs as management actions are developed over time. Occasional updates may be necessary, but should be infrequent if the modernized system is designed with sufficient flexibility and adaptability, as intended. The Fishery Dependent Data Committee will be responsible for the continued maintenance of the modernized system, including any changes necessary to implement future management actions or address unanticipated data needs. We will continue to periodically seek input from affected data stakeholders to ensure the system is meeting our ongoing needs.

4.2 Electronic Monitoring

The implementation plan for the groundfish fishery focuses on using the sector operations plans model laid out by the Northeast Multispecies FMP. This is consistent with the model the two sectors and NMFS are developing, which requires the least amount of resource investment by NMFS, no regulatory changes and the fewest new data streams. However, if policy issues cannot be resolved through the sector's operations plan, or if the Council or industry wishes to pursue a

different model due to costs or logistical issues (e.g., full retention), additional Council action would be needed. We will keep the New England Council apprised of our progress and will work with the Council and their EM workgroup to make whatever regulatory changes are necessary to support the implementation of EM in the groundfish fishery.

In the Atlantic herring and mackerel fisheries, no EM program is currently authorized under the regulations, so Council action would be needed to design such a program. Both Councils have expressed preliminary interest in exploring EM for monitoring slippage events in the mid-water trawl fishery, but no Council action has been initiated. We will continue to discuss this idea with the Councils and support development of a program if the Councils decide to move forward. In the meantime, the implementation schedule below assumes that some form of program will move forward for herring, mackerel, and groundfish fisheries contingent on available funding. Other fisheries could be added if identified and would require Council amendments to be implemented. Other fisheries would follow the same general implementation phases.

4.2.1 Project outline, phases, timeline towards May 2017 implementation

The overall project plan for implementing EM will take place between 2014 and 2017, and will involve the following fundamental steps:

Fall 2014

- Develop and review sector proposal
- Atlantic herring industry pilot conducts data collection
- Discuss Council action to develop EM program for herring and mackerel fisheries (under existing or new action)

Winter 2014/Spring 2015

- Complete cost analysis and present to NEFMC and MAFMC
- NEFMC's EM workgroup provides report, identifies next steps
- If Councils decide to move forward, develop goals and objectives and program design for a herring/mackerel EM program
- Conduct EM trial with sectors during 2015 fishing year to aid in development of an operational EM program for fishing year 2016

Summer/Fall 2015

- Continue tuning infrastructure and training as sector program precedes, contingent on available funding and continued interest of industry
- Evaluate initial performance of sector program and make adjustments for 2016 proposal, if data quality and timeliness is adequate to continue
- Councils continue development of herring/mackerel EM program, if applicable
- Integrate EM efforts with FDDC project plan, as appropriate

Winter/Spring 2016

- Publish rulemaking to approve sector program v2.0
- Councils complete development and submit herring/mackerel EM program

Spring/Summer/Fall 2016

- Develop and publish EM performance standards and program requirements for herring/mackerel and groundfish,
- For comparative purposes, in fishing year 2016 operate EM program for groundfish and herring concurrent with at-sea monitoring
- Conduct outreach on EM program requirements
- Sectors and NMFS work on sector operations plans
- Industry, providers, and NMFS work on infrastructure implementation, contingent on available funding

Winter/Spring 2017

- Publish rulemaking to approve sector operations plans
- Implementation of herring/mackerel EM program (January 2017), contingent on available funding and continued interest of industry
- Implementation of additional sector EM programs (May 2017), contingent on available funding and continued interest of industry

Summer/Fall 2017

- Evaluate initial performance of programs and make adjustments to operational protocols, as needed
- Step up compliance assistance and outreach

We will also implement a communications plan (see Section 6.0) to educate stakeholders on what we do know about EM systems to reduce uncertainty and facilitate broader engagement in the development of EM programs.

Broad scale EM implementation will require the resolution of a number of issues described at the National EM Workshop and echoed at our regional workshop and other fora. There is a need for national policies to address: (1) Data access and confidentiality; (2) record retention and documentation requirements; and (3) data quality standards, and cost responsibilities (see section 5.0). Nationally consistent technical standards could lead to economies of scale if EM equipment and service providers are able to operate the same systems in multiple regions. Councils and the public should be consulted and allowed to comment on such national policies before they are finalized.

4.2.2 Fisheries in the NE to be included

As indicated above, we are working implement EM in part of the Northeast multispecies (groundfish) fishery, beginning in 2015. Also, we are working with members of the large volume mid-water trawl fisheries – Atlantic herring and mackerel – towards EM initiatives in those fisheries. Please see Appendix 1 for a complete list of FMPs in the region and corresponding EM and modernization status.

There is ambivalence in the region about EM, even within a fishery. Some industry members attach great promise to EM. Many view it as an alternative to carrying and bearing the costs of carrying traditional observers or at-sea monitors. Other industry members are skeptical of the

reported cost savings, and some view the idea of cameras on their boats as unwelcome intrusions. Given this ambivalence, implementation of EM is likely to be selective, rather than widespread.

We must also determine how EM can meet data obligations under the Marine Mammal Protection Act and Endangered Species Act, and the advantages of biosampling, serious injury comments and gear entanglement details for protected species may be lost if video replaces observers in some fisheries.

4.2.3 Council coordination and regulatory conformance

Amendment 16 to the Northeast Multispecies FMP provided for the possibility of using EM in the fishery. The New England Fishery Management Council has an EM workgroup, of which GARFO and NEFSC are members. As Council members are interested in this initiative and the chair is supportive, coordination is already part of the routine Council process.

The herring and mackerel FMPs do not provide for the possibility of EM. As our work with industry members progresses, we will look first to initiating pilot studies of EM in these fisheries under exempted fishing permits (EFPs). The EFPs would exempt the participating vessel for some of the requirements related to carrying an observer. Broader implementation of EM in the fishery will require amendments to the management plans.

We will work with the New England and Mid-Atlantic Fishery Management Councils and stakeholders through the Council process to develop solutions to regional or FMP-specific policy issues, including: (1) Establishing shared goals and objectives; (2) defining roles and responsibilities; and (3) designing program elements. Additional regional workshops would also provide a forum to increase EM literacy and to brainstorm solutions to regional issues. Please see Appendix 2 for a summary of GARFO and NEFSC engagement with the Councils regarding this initiative.

4.2.4 Evaluation

As noted in the timeline above, evaluation will be continuous, as will coordination with industry on improvements. EM is likely to remain at a small scale for several years. During that time GARFO and NEFSC staff will continue to work directly with industry proponents towards analyzing and perfecting the systems and the shoreside business rules, with an eye towards broader implementation. The comparability between the quality of data collected with a system using EM as a component and the quality of data collected under the current at-sea monitoring program needs to be evaluated.

Evaluation must include determining costs for all parties involved in EM. For many, the motive for EM is to avoid the cost and inconvenience of carrying a traditional observer or at-sea monitor. We must test the notion that EM is more cost-effective during the initial year of its use in the groundfish fleet.

5.0 Funding Requirements

5.1 FDDC Modernization Initiative

The modernization of the region's fishery dependent data collection systems is a monumental, multi-year project. Costs will be determined as system requirements are finalized and program details will be adjusted as cost/benefit analyses are completed for each component. The ability of the agency and industry to develop and adopt the new systems will depend upon costs and the availability of funding to cover such costs. The target date for completion of the projects assumes adequate funding will be available to advance the project at a rapid rate. As costs, resources, project details, and project plans are better known, we will work with the Councils and within NMFS to ensure expectations for the project scope and delivery timeline are clear and understood.

5.2 Electronic Monitoring

Under the initiative to make EM operational in a portion of the groundfish fleet in 2015, the industry participants intend to bear a significant portion of the program costs. As noted above, the participants will enter a contract with a third-party who will provide EM technical services, including sampling of the video data, analysis of discarding events, and reporting to NMFS. The agency will bear costs accommodating changes to our data processing to handle the data from the EM service provider. These programming changes have been initiated under existing contract task orders and no new funds are required for this activity. New funding will be required to support NEFSC costs as the sector program moves toward an operational model, in part because of spending restrictions to occur under the Standardized Bycatch Reporting Methodology Omnibus Amendment.

There continues to be uncertainty about the ability of the industry and NMFS to fund broad implementation of EM programs, with no significant revenue or budget increases expected in the near future. The cost analysis we are developing will help the industry, Councils, and NMFS better understand what potential EM program costs might be. From the workshops, we know that start-up costs tend to be higher than broadly believed, as vessel owners have to buy or install equipment and potentially pay for additional video review, and as vessel operators get used to the catch handling protocols. Development of performance standards will allow innovation, which could produce cost savings as technology advances or open-source software is developed. The cost analysis may also provide information to help industry identify private partners to fund different program components. If discretionary federal funds are identified to offset implementation costs for industry, it will be important to subsidize traditional, as well, EM program implementation, to ensure neither program model is undermined.

6.0 Communications Strategies

The GARFO and NEFSC are collaborating on the development of a broad-based communications plan for the next three years (see Appendix 3). This multifaceted

communications strategy will be adaptive and will serve both major electronic technology initiatives. It will guide our engagement efforts towards:

- Encouraging industry members to get involved in the development of these new FDDC systems.
- Ensuring these FDDC initiatives are embedded in Council priorities in the coming years.
- Inviting private companies with expertise in the development data and communications systems to work on FDDC solutions with industry members.
- Supporting the two Councils' consideration of FDDC improvements relative to management questions before them and their work priorities.
- Familiarizing industry members with the importance and benefits of FDDC modernization.
- Guiding industry members towards selecting appropriate onboard FDDC systems to support their reporting requirements and ensuring they receive training in their use.
- Continuing to look for ways to improve FDDC systems and their use.
- Supporting data users and management partners as they adapt to new collections.

A draft of the communications plan is under review in the GARFO. Investment to date in engagement with stakeholders regarding these initiatives has been considerable. Examples include:

- Staff interviewed over 150 data users and industry members to identify data requirements.
- Issued a grant to GMRI to survey and interview industry members, seafood dealers, sector managers and others about the needs of industry relative to FDDC.
- In partnership with GMRI and the University of Massachusetts at Dartmouth, hosted a two day workshop (June 2014) with stakeholders on FDDC modernization and data requirements.
- Participated in the New England Fishery Management Council's workgroup on EM.
- Along with The Nature Conservancy, hosted a two day regional EM workshop (May 2014) to promote understand of EM in the region, identify/refine objectives for its use, and develop strategies for future implementation.
- Staff reported to the NEFMC on progress of the EM workgroup and the findings/results of the regional EM workshop.
- Leadership and staff reported to both northeast councils about the FDDC modernization initiative and conducted a listening session with the MAFMC on the subject.

We are committed to working closely with the industry and all stakeholders as these initiatives develop.

Appendix 1 – List of FMPs and Corresponding EM Status

Fishery Management Plan	Electronic Monitoring?	Modernized Data Collection?
American Lobster	No	All fishery dependent data collections are subject to modernization.
Atlantic Herring	Yes	
Atlantic Salmon	No	
Atlantic Sea Scallop	No	
Bluefish	No	
Mackerel/Squid/Butterfish	Yes – Mackerel Only	
Monkfish	No	
Northeast Multispecies	Yes – Sectors Only	
Skates	No	
Small Mesh Multispecies	No	
Spiny Dogfish	No	
Summer Flounder/Scup/Black Sea Bass	No	
Surfclams & Ocean Quahogs	No	
Red Crab	No	
Tilefish	No	

Appendix 2 – Summary of Fishery Management Council Engagement Process

Date	Council Engagement
Fall 2013 – Spring 2014	Interviewed over 180 data users, including Atlantic States Marine Fishery Commission and New England and Mid-Atlantic Council staff members, to identify data requirements.
Throughout 2013 – 2014	GARFO staff participated in the New England Fishery Management Council’s workgroup on electronic monitoring.
April 2014	At New England Council Meeting, staff provided a summary of new and ongoing efforts to implement electronic technologies in Northeast fisheries.
May 2014	In conjunction with the Nature Conservancy, hosted a two day regional electronic monitoring workshop to promote understand of electronic monitoring in the region, identify/refine objectives for its use, and develop strategies for future implementation. Several New England Fishery Management Council members were in attendance.
June 2014	Provided the New England Fishery Management Council an overview and opportunity to comment on electronic monitoring efforts.
June/July 2014	Held Northeast Federal Fishery Dependent Data Visioning Workshop to explore the current and future fishery dependent data needs of the fishing industry, science, and management in the region. Workshop participants included New England and Mid-Atlantic Council Staff.
August 2014	GARFO conducted Mid-Atlantic Fishery Management Council Listening Session on Fishery Dependent Modernization Plan
November 2014	Provided the New England Fishery Management Council an overview and opportunity to comment on GARFO’s Draft Strategic Plan, which includes electronic monitoring objectives.
December 2014	Provided the Mid-Atlantic Fishery Management Council an overview and opportunity to comment on GARFO’s Draft Strategic Plan, which includes electronic monitoring objectives.

Appendix 3 – Draft Communications Plan

Draft Communications Plan for Northeast Electronic Technology Initiatives (Three Year Strategic Plan)

Introduction

Through a series of initiatives, NOAA Fisheries Greater Atlantic Regional Fisheries Office and Northeast Fisheries Science Center are undertaking a coordinated effort to improve the quality, usefulness, timeliness, and delivery of data collected from the fishing industry and used in science and management. These initiatives are being conducted under the umbrella of our Electronic Technology (ET) Implementation Plan. This ET Implementation Plan includes a description of current activities and future plans for: (1) An overarching revision to regional fishery dependent data collection and (2) evaluation and integration of electronic technologies.

To successfully make this transition, we need to keep our staff, partners and stakeholders fully informed and engaged in what we are doing. This communications plan lays out the various stages of communications that we will undertake for both internal and external audiences as we modernize our data collection systems and look towards implementing electronic technologies on a broader scale. The goals of this communications plan are:

1. Provide clear and timely information about these initiatives and their benefits to stakeholders, partners, and the agency;
2. Provide regular updates on the progress of each initiative to keep NOAA Fisheries staff, partners, and stakeholders informed and engaged;
3. Solicit input on these initiatives, where appropriate, through new and existing feedback mechanisms;
4. Provide necessary training for fishermen, seafood dealers, managers, scientists and other data users in the use of new applications, software, programs and technologies to advance these initiatives; and
5. Inform private companies with expertise in the development of data and communications systems of our efforts and encourage them to work on solutions with industry members.

Background

The primary two initiatives in our Electronic Technology Plan involve the region's fishery dependent data collections (FDDC). The northeast FDDC were developed over the past 20 years. During this time, the reporting requirements and systems that support our FDDC have been expanded and refined, as needed, in response to new regulatory requirements, and the scientific and management initiatives of NOAA Fisheries and the New England and Mid-Atlantic Fishery Management Councils. As a result, our current suite of FDDC consists of a variety of independently developed systems (both electronic and paper) that are not as efficiently integrated as needed. It is only through substantial investment in data reconciliation processes

that we are able to achieve fuller data integration, higher data quality, speedier delivery, and finer spatial and temporal granularity are required to support management and scientific applications.

Recent scientific and management requirements over the last several years have stretched the adequacy of our current monitoring and reporting systems. After decades of region-wide management and seasonal catch accounting at an aggregated level, we are now moving to management schemes that require timelier, complete, and correct catch accounting, with some management programs calling for accounting at the individual vessel and activity level. The demand for more timely and frequent stock assessments has increased in response to required specifications of annual catch limits, and the need for more efficiently integrated regional fishery dependent data streams has been highlighted in a national peer review of data for stock assessment needs in the northeast region.

To meet these increased data demands, we are undertaking two FDDC initiatives. The first initiative is an assessment of our current state and a coordinated approach for making improvements to our existing FDDC programs and supporting systems. This is being accomplished through the establishment of a cross-divisional Fishery Dependent Data Committee that is chaired by the deputy regional administrator and deputy science director. The second effort looks at the future of our FDDC needs and demands, and contemplates an overhaul and modernization of our entire FDDC program.

Beyond the two FDDC efforts, we have a significant initiative underway to advance electronic monitoring (EM) in the region. The monitoring programs in the northeast region are designed to fulfill many objectives, but the primary purposes are to provide information about the state and performance of the fishery (fish and fishermen) and to generate full catch accounting for regional fisheries to support the region's scientific and management missions.

Other efforts in ET Implementation Plan are development of an Observer Electronic Reporting System (OBERS), development of a new Bio-sampling Monitoring (BSM) system, and improve and expand use of our existing electronic vessel trip report (e-VTR) system.

Overarching Messages (needs revising)

- NOAA Fisheries Greater Atlantic Regional Fisheries Office is undertaking a coordinated effort to improve the quality, usefulness, timeliness, and delivery of data collected from the fishing industry.
- Fishery-dependent data are used to inform both fisheries management and the science on which management decisions are based.
- Our fishery-dependent data collection programs include a variety of information such as catch reports from commercial fishermen, fish purchase reports from seafood dealers, information from marine recreational fishermen and fishing permit information.
- The current systems used to collect and process these data were developed over the past 20 years to support science and region-wide management programs that required aggregate data, largely to account for seasonal catches.
- Over time, management needs have changed requiring more sophisticated, fine-scale catch data (e.g., at the vessel and trip levels).

- To meet these changing needs, we intend to undertake a multi-year effort to modernize our fishery-dependent data collection and distribution systems.
- Through this effort we will:
 - streamline our fishery-dependent data collections to provide needed data in a more effective manner and
 - shift from a paper-based system to an electronic-based data collection and distribution system.
- This will enable us to improve operating efficiencies by, among other things, reducing time spent on quality control (e.g. cross-checking dealer and vessel trip reports) to provide higher quality and more timely data for scientific and management purposes.
- We will also be able to provide the fishing industry with more fine-scale data for use in business planning, daily operations and its own catch accounting.
- We will provide on-going technical support to the fishing industry as these changes are implemented.

Outreach tools

In communicating about and explaining this modernization initiative (2014-2017), we will use a variety of communications tools including:

- Briefings at Council meetings on status of initiative(s)
- Workshops to gather feedback on proposed FDDC system modernization.
- Public information sessions throughout the region to explain future changes to data collections and system outputs:
 - Use real-world examples to illustrate how new or revised system/collections will affect dealers and vessel operator activities
 - Highlight the benefits of streamlined and primarily electronic reporting
 - Demonstrate data products and other outputs that will be useful to industry
- Training sessions internally within NOAA Fisheries and externally with the Councils, Commission, state, and ACCSP staff, fishermen, sector managers, seafood dealers and other users that will be affected by FDDC modernization efforts.

Timeline for FDDC Modernization

December 2014 – Data system requirements document developed

January 2015 – Brief New England Council on status of modernization effort and next steps (Holly and Doug)

February 2015 – Brief Mid-Atlantic Council and ASFMC on status of modernization effort and next steps

Spring 2015

- Present electronic monitoring cost analysis to Councils.
- Brief NRCC and Congress on FDDC modernization effort and next steps, including relationship to EM.

- If Councils move forward with developing a herring/mackerel EM program, work with Councils to conduct public and media outreach about development of goals, objectives, and program design as they are available.
- If conduct EM trial with sectors during 2015 fishing year, conduct public and media outreach as appropriate (media pitches, webstories, develop outreach materials for field staff, etc.).

Spring/Summer 2015

- Inform Councils of regulatory changes necessary to achieve optimized data collection plan (formal letter and at Council meeting)
- Brief Councils, stakeholders and partners on project plan, highlighting where we will be seeking their input and how they can remain informed. Draw connections to regional and national electronic reporting and monitoring initiatives where appropriate. (Council meetings, webinar, email announcement, webstory).
- Host workshop with partners and stakeholders to gather feedback on project plan and draft business rules.
- Develop webpage dedicated to ET Implementation Plan related efforts. Links to webpage should be readily available through GARFO and NEFSC website homepages.
- Update partners, stakeholders and public regarding status of EM efforts, as appropriate.
- Reflect on what did and didn't work for communications/outreach during this phase of project and make adjustments to next phase as needed.

Fall/Winter 2015

- Brief Councils, NRCC, partners, stakeholders and Congress (Council/NRCC meetings and/or other appropriate venues) on status of modernization project. Are we on track with the plan? What the next opportunities for public input, etc.
- Host workshop (as needed) to inform partners and stakeholders about specific elements/modules of modernization plan and gather feedback.
- Update ET website with relevant materials and information.
- Update partners, stakeholders and public regarding status of EM efforts, as appropriate.
- Reflect on what did and did not work for communications/outreach during this phase of project and make adjustments to next phase as needed.

Spring 2016

- Once specifics on project implementation are available (i.e., modules and timeline), brief Councils and inform partners and stakeholders (Council meetings, webinar, email announcement, webstory).
- Update ET website with relevant materials and information, including project implementation plan.
- Update partners, stakeholders and public regarding status of EM efforts, as appropriate.
- Reflect on what did and didn't work for communications/outreach during this phase of project and make adjustments to next phase as needed.

Summer/Fall/Winter 2016

- Communicate status of implementation modules (as appropriate) with Councils, NRCC, partners, stakeholders, and Congress (briefings at Council/NRCC meetings, email announcements, webstories, etc.)
- Update ET website with relevant materials and information.
- Update partners, stakeholders and public regarding status of EM efforts, as appropriate. Conduct outreach on EM program requirements (if applicable).
- Reflect on what did and didn't work for comms/outreach during this phase of project (and prior phases) and use this information to plan for final implementation phase.

Winter/Spring 2016/17

- Conduct training and information sessions with NOAA Fisheries staff, Councils, partners and stakeholders throughout the region.
 - Use various tools to announce these training and information sessions (email announcements, Fish-Online posting, field staff outreach, webstory, outreach to key media outlets).
 - Develop outreach materials to support training and information sessions, as needed and appropriate.
- Update ET website with relevant materials and information.
- Update partners, stakeholders and public regarding status of EM efforts, as appropriate.
- Conduct EM training and information sessions (if EM to be implemented).
- Establish EM compliance assistance/outreach program (if EM to be implemented).

Summer/Fall 2017

- Brief Councils, NRCC, partners, stakeholders, and Congress on results of final project implementation, and seek feedback on how we can continue to improve moving forward (i.e., what is our long-term maintenance plan).
- If implemented, evaluate initial performance of EM programs and share this information with partners, stakeholders, and public. If adjustments to program are necessary as a result of evaluation, clearly communicate planned changes and next steps in a timely manner.
- Continue EM compliance and outreach, making adjustments to program as needed based on partner and stakeholder feedback.
- Reflect on what did and didn't work for comms/outreach during final phases of project. Use this information to develop ongoing communications strategy.
- Update ET website with relevant materials and information as needed.

Additional questions for thought to incorporate into this plan

At what stages is feedback appropriate during process?

At what stages are communications on each module important? Are there any "shovel ready" projects that we can start communicating about now to help partners and stakeholders engage sooner?

Where does EM fall in the list of priorities with respect to the overarching ET initiative? (i.e., there are potentially only 7 vessels participating in EM in short-term).

What are the benefits to partners, stakeholders and public overall and within each module? (need to frame communications so people can relate to it)