

**DRAFT AMENDMENT 23 TO THE NORTHEAST MULTISPECIES
FISHERY MANAGEMENT PLAN
PUBLIC HEARING DOCUMENT**



Prepared by the New England Fishery Management Council
50 Water Street, Mill #2; Newburyport, Massachusetts 01950

The New England Fishery Management Council (Council) is conducting public hearings to solicit comments on the alternatives under consideration in Draft Amendment 23 to the Northeast Multispecies (Groundfish) Fishery Management Plan (FMP). More specifically, the Council is asking for feedback on which alternatives should be selected and why. Following these hearings, additional opportunities for review and comment on Draft Amendment 23 and the Draft Environmental Impact Statement (DEIS) may be provided by the National Marine Fisheries Service (NMFS).

The Council plans to take final action on the amendment during its September 29-October 1, 2020 meeting.

The amendment will adjust the groundfish monitoring program to improve the accuracy and accountability of catch reporting in the commercial groundfish fishery.

This public hearing document is a summary of Amendment 23. **Relevant sections from the main Amendment 23 DEIS document have been highlighted in red.** The public is encouraged to review the full DEIS when evaluating the potential impacts of alternatives and making comments on the measures under consideration in Amendment 23. This public hearing document has been prepared as an overview only and does not cover the wide range of issues and impacts that are more thoroughly described in the DEIS.

SCHEDULE OF PUBLIC HEARINGS

Date and Time	Location/Geographical Focus
<p>Wednesday, April 15, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing Register to participate – https://register.gotowebinar.com/register/8766043774885604099. Call in information: +1 (213) 929-4232 Access Code: 771-577-358</p>
<p>Tuesday, May 12, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing Register to participate – https://attendee.gotowebinar.com/register/8772759592748925200. Call in information: + (562) 247-8422 Access Code: 987-794-789</p>
<p>Thursday, May 21, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing Register to participate – https://attendee.gotowebinar.com/register/7652592539533592848. Call in information: +1 (914) 614-3221 Access Code: 251-355-036</p>
<p>Thursday, July 16, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing Register to participate – https://attendee.gotowebinar.com/register/7740866831961614094 Call in information: +1 (415) 655-0060 Access Code: 379-868-247</p>
<p>Wednesday, July 29, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing – RI and CT/Mid-Atlantic (NY/NJ/DE/MD/VA/NC)* Register to participate – https://attendee.gotowebinar.com/register/4552271017165912332 Call in information: +1 (562) 247-8422 Access Code: 632-535-527</p> <p>* CT and Mid-Atlantic presented as a region.</p>
<p>Thursday, July 30, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Webinar Hearing - MA Register to participate – https://attendee.gotowebinar.com/register/3530306844985146892 Call in information: +1 (415) 930-5321 Access Code: 230-075-756</p>
<p>Thursday, August 6, 2020 4:00 p.m. – 6:00 p.m.</p>	<p style="text-align: center;">Conference Call Option with Webinar Hearing – General/All States Link to attend (no registration needed) – https://global.gotomeeting.com/join/697496061 Call in information: +1 (408) 650-3123 Access Code: 697-496-061</p>

Date and Time	Location/Geographical Focus
<p>NOTE: New Time and Date Monday, August 10, 2020 6:00 p.m. – 8:00 p.m.</p>	<p>Webinar Hearing – NH and ME Register to participate – https://attendee.gotowebinar.com/register/1484010152577816332 Call in information: +1 (415) 930-5321 Access Code: 587-188-268`</p>
<p>Wednesday, August 26, 2020 3:00 p.m. – 5:00 p.m.</p>	<p>Outdoor In-Person Hearing** Four Points by Sheraton One Audubon Road Wakefield, MA 01880</p> <p>Webinar back-up and listen-only option Register to participate – https://attendee.gotowebinar.com/register/6531724000508905997 Call in information: +1 (415) 655-0052 Access Code: 116-998-067</p>

** The Council will hold an outdoor in-person public hearing under a large tent on the grounds of the Sheraton Four Points in Wakefield, MA. Severe weather, revised outdoor public gathering restrictions by the Commonwealth of Massachusetts, or other factors as determined by the Executive Director and Council Chair may force the Council to hold this hearing by webinar. The Council has taken every precaution possible to conduct this in-person hearing safely, and all attendees are required to follow safety precautions to comply with COVID-19 guidelines.

HOW TO COMMENT

Members of the public may submit oral and/or written comments at any of the public hearings. You may also choose to submit written comments directly to the Council, in lieu of or in addition to comments provided at the hearings. Written comments must be received no later than close of business Monday, August 31, 2020.

During each hearing, Council staff will brief the public on the draft amendment before receiving comments. The hearings will begin promptly at the time indicated above. If all attendees who wish to do so have provided their comments prior to the end time indicated, the hearing may conclude early. To the extent possible, the Council may extend hearings beyond the end time indicated above to accommodate everyone who wishes to speak. During the hearings that are listed with a geographical focus, Council staff will present vessel profiles specific to that state or region to illustrate estimates of economic costs. During general webinars, Council staff will present profiles based on the entire fishery. Participants are encouraged to attend the webinar for their respective state or region but may attend any webinar. Vessel profile information for all states will be provided on the Council website as an appendix to this document.

The Council is conducting public hearings during April-August 2020, and will accept comments on the Draft Amendment 23 alternatives and document through August 31, 2020. When selecting final management measures, the Council will review and consider all public comments – those received during the Council’s public hearings as well as any additional comments received during the 164-day comment period. The Council will also consider comments and recommendations from its Groundfish Committee, Groundfish Advisory Panel, and Groundfish Plan Development Team. Those meetings will likely take place early to mid-September.

Written comments can be submitted via mail, email, or fax:

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New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Email: comments@nefmc.org

Fax: (978) 465-3116

***Please note on your correspondence
“DEIS for Amendment 23 to the Northeast Multispecies FMP”***

***Written comments must be submitted
no later than Monday, August 31, 2020.***

The complete DEIS and information about the amendment is posted on the Council’s website at <https://www.nefmc.org/library/amendment-23>.

For questions, contact the Council office at (978) 465-0492.

WHAT HAPPENS AFTER THE COMMENT PERIOD?

Final action by the Council is planned for the September 29-October 1, 2020 Council meeting. Following final action, after review and approval of the final EIS, NMFS will publish proposed and final rule announcements in the Federal Register. Tentatively, Amendment 23 is expected to be implemented during the 2021 fishing year. Depending what the Council selects for final alternatives, there may be phased-in implementation of some requirements.

CONTENTS

1.0 INTRODUCTION	8
2.0 BACKGROUND	8
2.1 GROUND FISH MONITORING	8
3.0 WHAT ARE THE GOALS OF AMENDMENT 23?	9
4.0 WHAT IS THE PURPOSE OF AMENDMENT 23?	9
5.0 OVERVIEW OF AMENDMENT DEIS	10
6.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION (SECTION 4.0 OF DEIS)	10
6.1 COMMERCIAL GROUND FISH MONITORING PROGRAM REVISIONS (SECTORS ONLY) (SECTION 4.1 OF DEIS)	12
6.1.1 Sector Monitoring Standards (Section 4.1.1 of DEIS)	13
6.1.2 Sector Monitoring Tools (Section 4.1.2 of DEIS)	14
6.1.3 Total Monitoring Coverage Level Timing (Section 4.1.3 of DEIS)	15
6.1.4 Review Process for Sector Monitoring Coverage (Section 4.1.4 of DEIS).....	15
6.1.5 Addition to List of Framework Items (Section 4.1.5 of DEIS)	16
6.2 COMMERCIAL GROUND FISH MONITORING PROGRAM REVISIONS (SECTORS AND COMMON POOL) (SECTION 4.2 OF DEIS).....	16
6.2.1 Dockside Monitoring Program (Section 4.2.1 and Section 4.2.2 of DEIS).....	16
6.3 SECTOR REPORTING (SECTION 4.3 OF DEIS)	18
6.4 FUNDING/OPERATIONAL PROVISIONS OF GROUND FISH MONITORING (SECTORS AND COMMON POOL) (SECTION 4.4 OF DEIS).....	18
6.5 MANAGEMENT UNCERTAINTY BUFFERS FOR THE COMMERCIAL GROUND FISH FISHERY (SECTION 4.5 OF DEIS).....	18
6.6 REMOVE COMMERCIAL GROUND FISH MONITORING REQUIREMENTS FOR CERTAIN VESSELS FISHING UNDER CERTAIN CONDITIONS (SECTION 4.6 OF DEIS)	19
7.0 OVERVIEW OF MAJOR IMPACTS OF THE MEASURES UNDER CONSIDERATION (SECTION 7.0 OF DEIS)	23
7.1 HOW WERE IMPACTS ANALYZED?	23
7.2 WHAT ARE THE EXPECTED BENEFITS?	27
7.3 WHAT COULD IMPACTS BE ON THE FLEET?	28
7.4 HOW COULD VESSELS BE AFFECTED?	31
7.5 OVERALL SUMMARY OF ECONOMIC AND SOCIAL IMPACTS ON HUMAN COMMUNITIES	34
8.0 GLOSSARY	35
9.0 ACRONYMS	37

TABLES

Table 1 – Management uncertainty buffers for sector sub-ACLs for each allocated groundfish stock under No Action and Option 2.	19
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FIGURES

Figure 1 - Schematic showing identified short-term and long-term biological impacts identified by the amendment.	24
Figure 2 - Schematic of different quantitative approaches for estimating economic impacts on the fishery.	25
Figure 3 - Example compliance scores for a range of ASM (blue) and DSM (orange) monitoring coverage alternatives in the document.	26
Figure 4 - Mean estimated fleetwide costs of select at-sea monitoring options under various modelling approaches, based on FY 2018 fishery data (sector vessels only). Costs are not predictions of future costs.	29
Figure 5 - Mean estimated fleetwide operating profits (gross revenues on groundfish trips minus operating costs) of select alternatives under various modelling approaches, based on FY2018 fishery data (sector vessels only). Operating profits are not predictions of future operating profits.	30
Figure 6 - Mean estimated dockside monitoring (DSM) costs under select alternatives. Lowest, Base, and Highest bars represent a range of potential costs for a comprehensive DSM program (sectors and common pool). Other bars estimate possible costs under alternatives which consider exemptions.	31

Figure 7 - Number of sector vessels by size class and days absent category. Day absent category is calculated using the average number of days absent over fishing years 2016-2018. 32

Figure 8 - Costs as a proportion of revenue for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 spends less than 5 days absent fishing in the groundfish fishery, vessel 2 spend between 20 and 50 days per year, and vessel 3 spends more than 160 days per year..... 33

MAPS

Map 1 - Groundfish Broad Stock Areas (BSAs) – sector trips fishing exclusively with extra-large mesh (ELM) gillnets fishing exclusively in the SNE/MA and/or Inshore GB BSA are exempt from the at-sea monitoring coverage requirement. 21

Map 2 - 72 degrees 30 minutes west longitude boundary (Option 2) and 71 degrees 30 minutes west longitude boundary (Option 3). 22

1.0 INTRODUCTION

The Council is considering a range of measures that would adjust the groundfish monitoring program to improve the reliability and accountability of catch reporting in the commercial groundfish fishery and to ensure the monitoring program is providing accurate catch information.

This document summarizes the management measures under consideration as well as their expected impacts. The larger, more comprehensive Draft Amendment 23 document, including the Draft Environmental Impact Statement (DEIS) is available from the Council's website: <https://www.nefmc.org/library/amendment-23>. Amendment 23 details the background information, purpose and need for this action, goals, management alternatives under consideration, alternatives considered but rejected, affected environment and expected environmental impacts of the measures. There is also a description of the required provisions of federal laws that this action is subject to. The Council has identified its "preferred alternatives" for most of the measures under consideration. A preferred alternative identifies the Council's favored approach to managing the groundfish fishery at this time to focus public comment; however, the Council has not made final decisions on draft Amendment 23. The Council will consider all public comments before making final recommendations on Amendment 23. The Council plans to take final action on the amendment during its September 29-October 1, 2020 meeting.

2.0 BACKGROUND

The Northeast Multispecies (Groundfish) Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. Some of these species are sub-divided into individual stocks that are attributed to different geographic areas. Commercial and recreational fishermen harvest these species. The commercial groundfish fishery consists of primarily "sectors" as well as the "common pool." Sectors are voluntary cooperatives that individuals with a limited access groundfish permit can join. Each sector receives a total amount (in pounds) of fish it can harvest for each groundfish stock and that may be traded within and across sectors. Fishermen who do not join a sector fish in the "common pool" and are allocated a certain number of Days at Sea (DAS) and are managed by other input and effort controls.

Amendment 16, which became effective on May 1, 2010, updated the requirements for sector and common pool monitoring programs, including at-sea monitoring and dockside monitoring requirements. Several actions followed that adjusted different aspects of the groundfish monitoring program (Framework 45, Framework 48, and Framework 55).

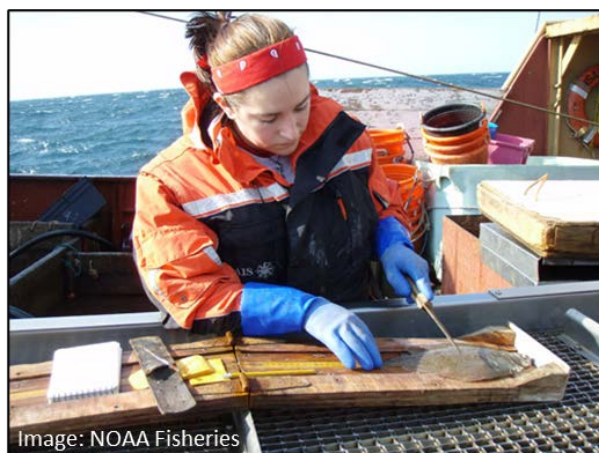
2.1 GROUNDFISH MONITORING

Amendment 16 to the Northeast Multispecies FMP implemented monitoring and enforcement provisions for sector fishing activity, which is primarily controlled by limits on how much the sector can catch – annual catch entitlement (ACE). There are two components to catch – landings and discards. In order to ensure that sector catches are actually limited to the ACE, both landings and discards must be accurately monitored. To increase confidence that sector catches are accurate, Amendment 16 implemented the requirement that sectors land all legal-sized fish to discourage sectors from discarding

catches to avoid exceeding ACE and required that sectors adopt an at-sea monitoring program. Amendment 16 reported that while admittedly difficult to monitor or enforce, this measure does encourage sectors to land all catch of legal-size fish.

The current groundfish monitoring program collects fishery-dependent data from multiple sources including the vessel monitoring system (VMS), the interactive voice response (IVR) system, vessel trip reports (VTR), dealer reports, industry-funded at-sea monitors (ASM), and Northeast Fishery Observer Program (NEFOP) observers (see [Section 6.6.10.1 of DEIS](#)). The current monitoring system includes the following issues (see [Section 6.6.10.4 of DEIS](#) for more information):

- Unreported / misreported catches (landings and discards);
- Observed trips are not representative of unobserved trips;
- Incentives to illegally discard are greater for certain stocks, and;
- Lack of an independent verification of landings can and has led to catch reporting conspiracy/collusion between a dealer and a vessel.



Observer collecting biological samples.

3.0 WHAT ARE THE GOALS OF AMENDMENT 23?

This action would maintain the current goals and objectives of the groundfish monitoring program (described in [Section 3.3.2 of DEIS](#)) and consider measures to better achieve Goal #1: improve documentation of catch, described as “improved catch accounting.” The objectives associated with that goal are: 1) determine total catch and effort, for each sector and common pool, of target or regulated species; and 2) achieve coverage level sufficient to minimize effects of potential monitoring bias to the extent possible while maintaining as much flexibility as possible to enhance fleet viability.

4.0 WHAT IS THE PURPOSE OF AMENDMENT 23?

This action was developed to implement measures to improve the reliability and accountability of catch reporting in the commercial groundfish fishery to ensure there is precise and accurate representation of catch (landings and discards). Accurate catch data are necessary to ensure that catch limits are set at levels that prevent overfishing and to determine when catch limits are exceeded.

This action would adjust the current monitoring program to improve accounting and accuracy of collected catch data. It is the Council's intent that the catch reporting requirements are fair and equitable for all commercial groundfish fishermen, while maximizing the value of collected catch data, and minimizing costs for the fishing industry and the National Marine Fisheries Service.

5.0 OVERVIEW OF AMENDMENT DEIS

Amendment 23 is extensive and the DEIS includes detailed analyses required by various federal laws. Volume I of the DEIS is about 600 pages, the content of which is briefly described here.

- **Section 1.0** – executive summary, summarizes the DEIS.
- **Section 2.0** – table of contents.
- **Section 3.0** - background information, the goals of the Groundfish FMP and the Groundfish Monitoring Program, why Amendment 23 was initiated, and a summary of the scoping process.
- **Section 4.0** - the alternatives under consideration; the alternatives are organized into six sections. The Council's preferred alternatives are denoted in each relevant section.
- **Section 5.0** – the alternatives that were considered by the Council but rejected.
- **Section 6.0** – the Affected Environment, summarizes the components of the ecosystem: 1) regulated groundfish species (target and non-target or bycatch); 2) non-groundfish species caught by the groundfish fishery; 3) essential fish habitat (EFH) and physical environment of this ecosystem; 4) protected species in the region such as marine mammals and sea turtles; 5) human communities including the commercial groundfish fishery (primarily sectors but also common pool), as well as groundfish dealers.
- **Section 7.0** – the potential impacts of the alternatives under consideration on all the various components of the ecosystem described in Section 4.0.
- **Section 8.0** – data and research needs – to be completed after the Council selects final measures.
- **Section 9.0** - how the proposed measures comply with various federal laws – to be completed after the Council selects final measures

In addition, Volume II of the DEIS includes seven appendices with more detailed information including the individual scoping comments, and several appendices with analyses and supplemental information related to groundfish monitoring.

6.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION (SECTION 4.0 OF DEIS)

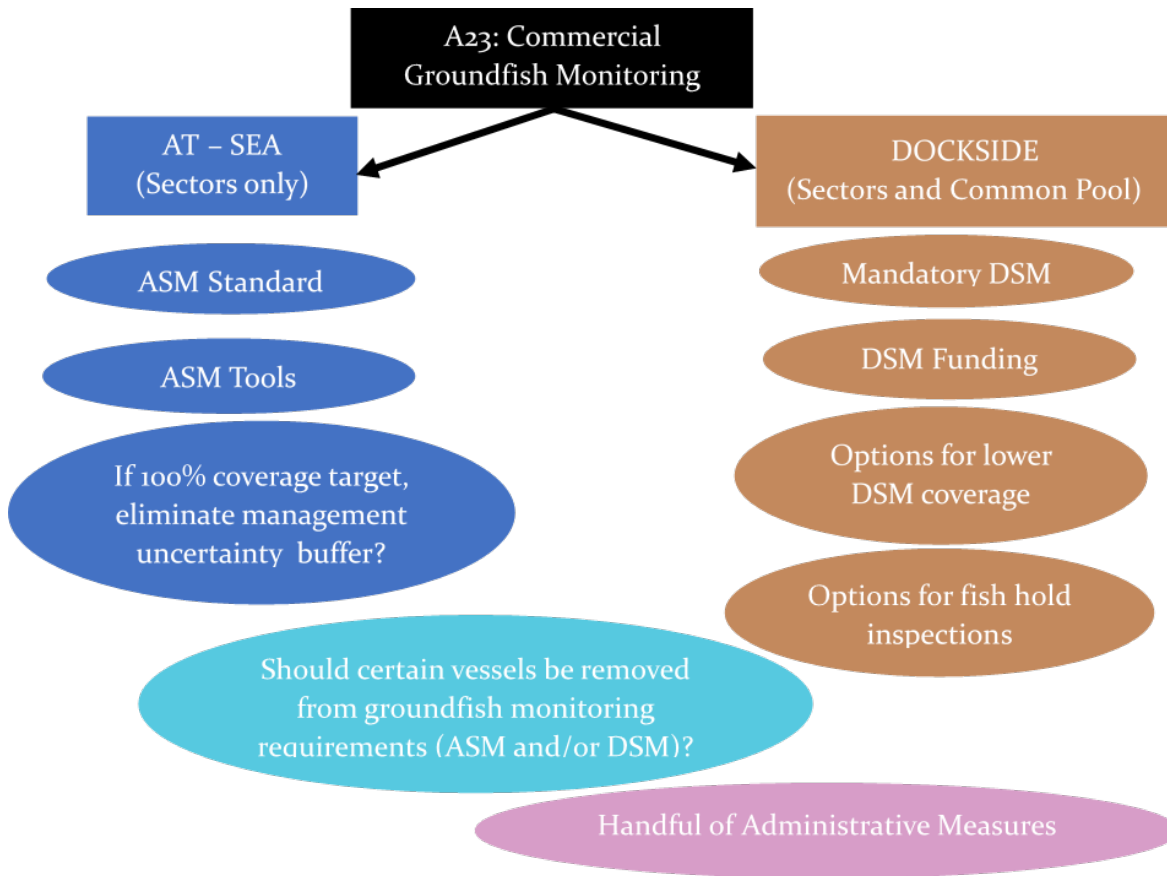
The management alternatives in this amendment include a range of possible revisions to the commercial groundfish monitoring program. The alternatives include:

- Measures that would primarily affect sector participants, and some that would affect common pool participants as well;
- Some measures that would affect federally registered dealers;
- Administrative measures regarding sector reporting requirements and funding/operational provisions of groundfish monitoring;
- An option that considers changes to the management uncertainty buffers for the commercial groundfish fishery if 100% coverage target is selected; and
- Options that would remove monitoring program requirements for vessels fishing under certain conditions, the premise being that groundfish catch composition on these trips is low.

Additional details about the alternatives are provided below. The section numbers in the amendment document, which includes additional information about the alternatives, are noted in each section below.

Decision Tree for A23 Alternatives:

The alternatives are summarized below by section in the full draft amendment document. They can generally be thought of as a series of decision points the Council will make in considering revisions to the groundfish monitoring program.



The Council recommends the following as preferred alternatives:

- *Commercial Groundfish Monitoring Program Revisions (Sectors Only)* (Section 4.1 of DEIS). Sets the standard at a fixed total at-sea target monitoring (ASM) coverage level, at 100% coverage of trips. Allows additional sector monitoring tools, in addition to human at-sea monitors, including the audit model electronic monitoring (EM) and maximized retention electronic monitoring (which has a dockside monitoring (DSM) component). Establishes a review process to evaluate the monitoring coverage rate. Allows for additional monitoring tools and vessel specific coverage levels through a future framework adjustment.
- *Commercial Groundfish Monitoring Program Revisions (Sectors and Common Pool)* (Section 4.2 of DEIS). No action would maintain the status quo, no mandatory dockside monitoring program for sectors and the common pool.
- *Sector Reporting* (Section 4.3 of DEIS). The Council did not select a preferred alternative in this section. No action would maintain current sector reporting requirements.
- *Funding/Operational Provisions of Groundfish Monitoring (Sectors and Common Pool)* (Section 4.4 of DEIS). Allows for waivers from monitoring requirements for sectors and common pool under certain conditions.
- *Management Uncertainty Buffers for the Commercial Groundfish Fishery (Sectors Only)* (Section 4.5 of DEIS). With 100% monitoring of all sector trips, this alternative eliminates the management uncertainty buffer for sector sub-ACLs of allocated stocks only.
- *Remove Commercial Groundfish Monitoring Requirements for Certain Vessel Under Certain Conditions* (Section 4.6 of DEIS). Removes monitoring program requirement for vessels fishing exclusively west of 71 degrees 30 minutes west longitude from at-sea and dockside monitoring coverage requirements. Establishes a review process for vessel to be removed from commercial groundfish monitoring program requirements

The Council is seeking public comment on all management alternatives/options under consideration in Draft Amendment 23, which are included in full below. The Council's Preferred Alternatives are noted.

6.1 COMMERCIAL GROUND FISH MONITORING PROGRAM REVISIONS (SECTORS ONLY) (SECTION 4.1 OF DEIS)

This section of the DEIS includes alternatives that determine the coverage levels for at-sea monitoring and the tools that can be used to provide coverage (human at-sea monitors, electronic monitoring). It also includes alternatives that address administration of the program.

Amendment 23 does not propose any changes to the Standardized Bycatch Reporting Methodology (SBRM), and these sector monitoring standards would not change the process for determining Northeast Fishery Observer Program (NEFOP) coverage rates. Target coverage levels are total coverage levels – combined at-sea monitoring (ASM) program and NEFOP coverage.

6.1.1 Sector Monitoring Standards (Section 4.1.1 of DEIS)

Alternatives that may replace the current method for determining groundfish at-sea monitoring coverage levels (the CV precision standard) include a standard that would set a fixed rate of coverage as a percentage of trips, and an alternative that would set an annual fixed rate of coverage as a percentage of catch (see tables below). The fixed percentage of catch is for each allocated groundfish stock, which results in requiring an overall coverage level that is higher to reliably achieve the target for each stock (see simulation analysis in Section 7.5.3.1.3 of DEIS).

The Council selected as its **preferred alternative** Option 2: Fixed total at-sea monitoring coverage level based on a percentage of trips, Sub-Option 2D: 100% coverage of trips. This option increases the accuracy of catch estimates and reduces the potential for bias more than all the other options considered in this action. Coverage of 100 percent of trips is the only option that completely removes bias, and this option scores the highest in terms of compliance and enforcement of the monitoring program. The Council identified this option as preferred to get a sense of what is possible in this action under the maximum level of coverage. This option has the highest estimated cost; therefore, the Council hopes to get the broadest range of public comment possible to better understand the maximum costs associated with this action. In addition, the Council discussed that more data is needed in this fishery to improve the overall science; improved monitoring will not solve all of the management problems, but this option will provide more information to improve management of this fishery. Finally, when this option is combined with other measures in this document; specifically, additional monitoring tools (Section 4.1.2 of DEIS) and removal of management uncertainty buffers (Section 4.5 of DEIS), the increased costs to industry are minimized.

Brief Description of Sector Monitoring Standards Alternatives in Amendment 23	
Sector Monitoring Standard Option 1 (No Action)	Minimum coverage levels must meet CV precision standard specified in SBRM using fishery performance criteria, and other factors can be considered
Sector Monitoring Standard Option 2 (Fixed total at-sea monitoring coverage level based on <u>% of trips</u>) (Preferred alternative)	Fixed total % of trips would be identified for deploying human observers at-sea. Sectors would achieve the standard through use of human at-sea monitors or options for substitute sector monitoring tools (Section 4.1.2)
Sub-option 2A – 25%	
Sub-option 2B – 50%	
Sub-option 2C – 75%	
Sub-option 2D – 100% (Preferred alternative)	
Sector Monitoring Standard Option 3 (Fixed total at-sea monitoring coverage level based on <u>% of catch</u>)	Fixed total % of catch for each allocated groundfish stock would be identified for deploying human observers at-sea. Sectors would achieve the standard through use of human observers or options for substitute sector monitoring tools (Section 4.1.2)
Sub-option 3A – 25%	
Sub-option 3B – 50%	

Brief Description of Sector Monitoring Standards Alternatives in Amendment 23	
Sub-option 3C – 75%	
Sub-option 3D – 100%	

6.1.2 Sector Monitoring Tools (Section 4.1.2 of DEIS)

This action is also considering a range of additional sector monitoring tools that sectors could choose to use in place of human at-sea monitors to meet the selected monitoring standard.

The Council selected as its **preferred alternatives** Option 2: Audit Model EM and Option 3: Maximized retention EM mainly to get monitoring costs down because of comments that the cost of human at-sea monitors is not considered feasible for this fishery. The analyses suggest when both Sector Monitoring Tools Option 2 and Option 3 are available to vessels, costs of 100% monitoring may be considerably cheaper—between 44% and 60% less than using only human at-sea monitors when costs are compared over a three-year period.

Brief Description of Sector Monitoring Tools Alternatives in Amendment 23	
Sector Monitoring Tools Option 1 – EM in place of human at-sea monitors	Sectors could choose EM to monitor catch in place of human at-sea monitors (but not to replace NEFOP human observers). EM would only be required to run on trips selected for coverage under the selected coverage rate selected above.
Sector Monitoring Tools Option 2 – Audit model EM (Preferred alternative)	Approve the use of audit model EM in place of human at-sea monitors (but not to replace NEFOP human observers). EM runs 100% of trips and subset of hauls or trips reviewed to verify VTR reported discards. Video review rate would be determined by NMFS and could be reduced through evaluation by NMFS. The Council supports the initial review rates provided from NMFS in its proposed EM option for sectors.
Sector Monitoring Tools Option 3 – Maximized retention EM (Preferred alternative)	Approve the use of maximized retention EM in place of human at-sea monitors (but not to replace NEFOP human observers). EM runs 100% of trips and verifies that all allocated, non-prohibited GF are landed, paired with dockside monitoring to sample catch. Vessels would be required to land all GF of all sizes, no discarding of non-prohibited fish.

6.1.3 Total Monitoring Coverage Level Timing (Section 4.1.3 of DEIS)

The timing for announcing the required total monitoring coverage has varied over time (see Section 6.6.10.2 of DEIS). This measure would consider a time certain for knowing the total monitoring coverage level. This alternative does not apply to a fixed rate of coverage, since the rate would be known each year. The Council did not select any preferred alternatives in this section.

Brief Description of Coverage Level Timing Alternatives in Amendment 23	
Coverage Level Timing Option 1 (No Action)	Announced when necessary analyses are available.
Coverage Level Timing Option 2 – Knowing total monitoring coverage level at a time certain	3 weeks prior to annual sector enrollment deadline – this option would only apply to current CV method for target coverage levels (4.1.1.1 of DEIS).

6.1.4 Review Process for Sector Monitoring Coverage (Section 4.1.4 of DEIS)

This measure would establish a review process to evaluate the sector monitoring coverage rates. Currently, the groundfish monitoring program is to be reviewed as part of the goals and objectives of the groundfish sector monitoring program through Goal 6: Perform periodic review of monitoring program for effectiveness (see Section 3.3.2 of DEIS for the complete list of goals and objectives of the groundfish monitoring program), but is not reviewed on a prescribed basis.

The Council selected as its **preferred alternative** Option 2 – Establish a review process for monitoring coverage rates to ensure the Council evaluates this program to be sure enhanced levels of monitoring data are working as intended and the increased costs to industry are providing expected benefits from improved accuracy and reduced potential for bias in catch data.

Brief Description of Coverage Review Process Alternatives in Amendment 23	
Coverage Review Process Option 1 (No Action)	No official schedule – sector monitoring coverage rates would be reviewed periodically as part of the goals and objectives of the sector monitoring program
Coverage Review Process Option 2 – Establish a review process for monitoring coverage rates (Preferred alternative)	Once 2 years of fishing year data is available and periodically after that. Metrics would be developed and indicators for how well program has improved accuracy while minimizing costs. This review would most likely be done by the Groundfish PDT with substantial support by NEFSC and GARFO.

6.1.5 Addition to List of Framework Items (Section 4.1.5 of DEIS)

This alternative would add the following to the list of measures that can be changed in a framework adjustment in the future:

- Addition of new sector monitoring tools that meet or exceed the Council’s selected monitoring standard; and
- Vessel specific coverage levels.

The Council selected as its **preferred alternative** Addition to list of framework items because should new monitoring tools become available in the future, allowing these to be considered for use by sectors through a framework adjustment facilitates more efficient incorporation of new monitoring tools into the groundfish monitoring program. Additionally, there is interest in considering vessel specific coverage levels, which may be best done in a future action after the monitoring coverage level and monitoring tools have been selected in this action.

Brief Description of Addition to Framework Items Alternatives in Amendment 23	
Addition to list of framework items (Preferred alternative)	Council would be able to consider adding new sector monitoring tools that meet or exceed monitoring standards or vessel specific coverage levels by framework action.

6.2 COMMERCIAL GROUND FISH MONITORING PROGRAM REVISIONS (SECTORS AND COMMON POOL) (SECTION 4.2 OF DEIS)

These alternatives would establish a dockside monitoring program that would apply to the entire commercial groundfish fishery (sectors and common pool).

6.2.1 Dockside Monitoring Program (Section 4.2.1 and Section 4.2.2 of DEIS)

There is currently no requirement for dockside monitoring for the commercial groundfish fishery. However, any sector can choose to develop and implement a dockside monitoring program as part of its operations plan, with approval by NMFS. More information on the previous dockside monitoring program can be found in [Section 6.6.10.1.1 of DEIS](#) and in the Groundfish Plan Development Team Dockside Monitoring Discussion Paper ([Appendix III](#)). This action considers whether to establish a dockside monitoring program ([Section 4.2.1 of DEIS](#)), and should the Council select a dockside monitoring program, measures that specify the design and structure of such a program ([Section 4.2.2 of DEIS](#)).

The Council selected as its **preferred alternative** Option 1: No Action because at this time there are concerns that there may not be enough resources to review and use the data from a dockside monitoring program. The data may be collected, but if the resources are not there to review it to verify landings, the utility of the program is reduced. In addition, there are concerns that the economic burden of this program would likely become a trip expense that would be paid for by the crew, regardless of whether the program is funded by dealers or vessels. Depending on how the program is implemented, there may be unintended consequences from effort shifts and changes in where vessels land as a result of a mandatory dockside monitoring program. Overall, there are still many concerns surrounding the previous dockside monitoring program that was implemented and removed several years ago.

Brief Description of Dockside Monitoring Program Alternatives in Amendment 23	
Dockside monitoring program (DSM) (Sectors and Common Pool)	
DSM Option 1 (No Action) (Preferred alternative)	No current requirement, but a sector can develop as part of its operations plan, and NMFS can approve.
DSM Option 2 – Mandatory DSM for entire commercial GF fishery	Mandatory DSM for entire GF fishery (sectors and common pool) at 100% of all trips.
Dockside monitoring program structure and design	
DSM funding responsibility	
DSM Funding Responsibility Option A – Dealer responsibility	Dealers responsible for DSM costs.
DSM Funding Responsibility Option B – Vessel responsibility	Vessels responsible for DSM costs.
DSM program administration	
DSM Administration Option A – Individual contracts with DSM providers	Dealers or vessels contract directly with third-party dockside monitor providers.
DSM Administration Option B – NMFS administered DSM program	Single DSM program administered by NMFS, through approved independent third-party dockside monitor providers.
Options for lower dockside monitoring coverage levels (20% coverage)	
Lower coverage levels Option A – Lower coverage levels for ports with low volumes of groundfish landings	DSM would be randomly assigned to ports with low volumes of groundfish landings (2016-2018) - all ports except New Bedford, MA; Gloucester, MA; Boston, MA; Portland, ME; Chatham, MA; Point Judith, RI; Seabrook, NH; Rye, NH; and Portsmouth, NH - at a lower coverage level, 20%. Periodic re-evaluation of what constitutes a low volume port would occur after 2 years of data available, every 3 years after that.
Lower coverage levels Option B - Lower coverage levels for vessels with total groundfish landings volumes in the 5th percentile of total annual landings	Vessels with less than 46,297 pounds annual average (2016-2018) or dealers that receive landings from vessels with less than 46,297lbs pounds would have lower coverage, 20%. Periodic re-evaluation of what constitutes a low volume vessel would occur after 2 years of data available, every 3 years after that.
Options for DSM fish hold inspections	
Fish hold inspection Option A – DSM fish hold inspections required	Would be allowed access for inspection, they must have insurance, they can refuse but must document reason.
Fish hold inspection Option B – Alternative methods for inspecting fish holds (cameras)	Cameras can be used to verify all retained catch is offloaded, as an alternative to dockside monitors directly accessing fish holds.
Fish hold inspection Option C – No fish hold inspection required, captain signs affidavit	Captain certify all catch has been removed, subject to penalties

6.3 SECTOR REPORTING (SECTION 4.3 OF DEIS)

This action is considering changes to the administration of the groundfish sector reporting system. The Council did not select any preferred alternatives in this section.

Brief Description of Sector Reporting Alternatives in Amendment 23	
Sector Reporting Option 1 (No Action)	Weekly reporting of landings and discards and year end reports.
Sector Reporting Option 2 – Grant RA authority to streamline sector reporting requirements	Regional Administrator (RA) could revise reporting requirements if specific details are deemed sufficient by the RA.

6.4 FUNDING/OPERATIONAL PROVISIONS OF GROUND FISH MONITORING (SECTORS AND COMMON POOL) (SECTION 4.4 OF DEIS)

This action has provisions for when there are either increases or decreases in federal funding of the groundfish monitoring program.

The Council selected as its **preferred alternative** Sub-option 2B – Waivers for Monitoring Requirements Allowed because it is not the Council’s intent of this action to prevent vessels from fishing if target coverage levels are not being met, or if NMFS does not have funding for their share of shoreside costs. NMFS will continue to work with sectors during the year to help maintain target coverage levels to the extent possible.

Brief Description of Funding/Operational Provisions Alternatives in Amendment 23	
Funding Provisions Option 1 (No Action)	Industry is required to fund at-sea monitoring costs (although to date, federal funds have reimbursed most monitoring costs).
Funding Provisions Option 2 – Provisions for an increase or decrease in funding for the GF monitoring program	
Funding Provisions Sub-option 2A – Higher monitoring coverage levels if NFMS funds are available (Sectors Only)	At-sea monitoring could be set at higher coverage levels than required if NMFS gets additional funds. Could be done on a limited basis to evaluate bias.
Funding Provisions Sub-option 2B – waivers for monitoring requirements allowed (Sectors and Common Pool) (Preferred alternative)	Vessels could be issued waivers to exempt them from industry-funded monitoring requirements, for either a trip or the fishing year, if coverage was unavailable due to insufficient funding for NMFS shoreside costs for the specified target coverage level.

6.5 MANAGEMENT UNCERTAINTY BUFFERS FOR THE COMMERCIAL GROUND FISH FISHERY (SECTION 4.5 OF DEIS)

This action considers measures to eliminate the management uncertainty buffer for the sector ACL for each allocated groundfish stock, only if the option for 100% monitoring coverage level is selected (in Section 6.1.1 above and **Section 4.1.1 of DEIS**). The Council selected as its preferred alternative under Sector Monitoring Standards (**Section 4.1.1 of DEIS**) Option 2: Fixed total at-sea monitoring coverage

level based on a percentage of trips, Sub-Option 2D: 100% coverage, which allows the Council to select Option 2 in this section.

The Council selected as its **preferred alternative** Option 2 - Elimination of management uncertainty buffer for Sector ACLs with 100% monitoring of all sector trips because some Council members commented that eliminating the management uncertainty buffer for the sector ACL for all allocated groundfish stocks helps to directly provide benefits with the increased costs of 100 percent monitoring coverage. Providing additional catch in the form of eliminating the management uncertainty buffer is a way to give the industry something back for their investment in 100 percent at-sea monitoring. Coupling this alternative with 100 percent at-sea monitoring helps to minimize some of the costs on enhanced monitoring.

Brief Description of Management Uncertainty Buffers Alternatives in Amendment 23	
Management Uncertainty Buffer Option 1 (No Action)	Process for setting management uncertainty buffers remains in place – currently 5% of the ABC by default, and for stocks with less uncertainty it is set at 3% (no state water catch), for stocks with more it is set at 7% (zero possession and discard only stocks) (see Table 1 below)
Management Uncertainty Buffer Option 2 – Elimination of management uncertainty buffer for Sector ACLs with 100% monitoring of all sector trips (Preferred alternative)	Revise the management uncertainty buffer for the sector ACL for each allocated groundfish stock to be zero, if the option for 100 percent at-sea monitoring is selected. No changes would be no changes for non-allocated groundfish stocks.

Table 1 – Management uncertainty buffers for sector sub-ACLs for each allocated groundfish stock under No Action and Option 2.

Management Uncertainty Buffer: Sector Sub-ACLs		
Allocated Stocks	No Action	Option 2 (Preferred Alternative)
GB cod, GOM cod, GB haddock, GOM haddock, SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, American plaice, witch flounder, GOM winter flounder, SNE/MA winter flounder, redfish, white hake, and pollock	5%	0%
GB yellowtail flounder and GB winter flounder	3%	0%

6.6 REMOVE COMMERCIAL GROUND FISH MONITORING REQUIREMENTS FOR CERTAIN VESSELS FISHING UNDER CERTAIN CONDITIONS (SECTION 4.6 OF DEIS)

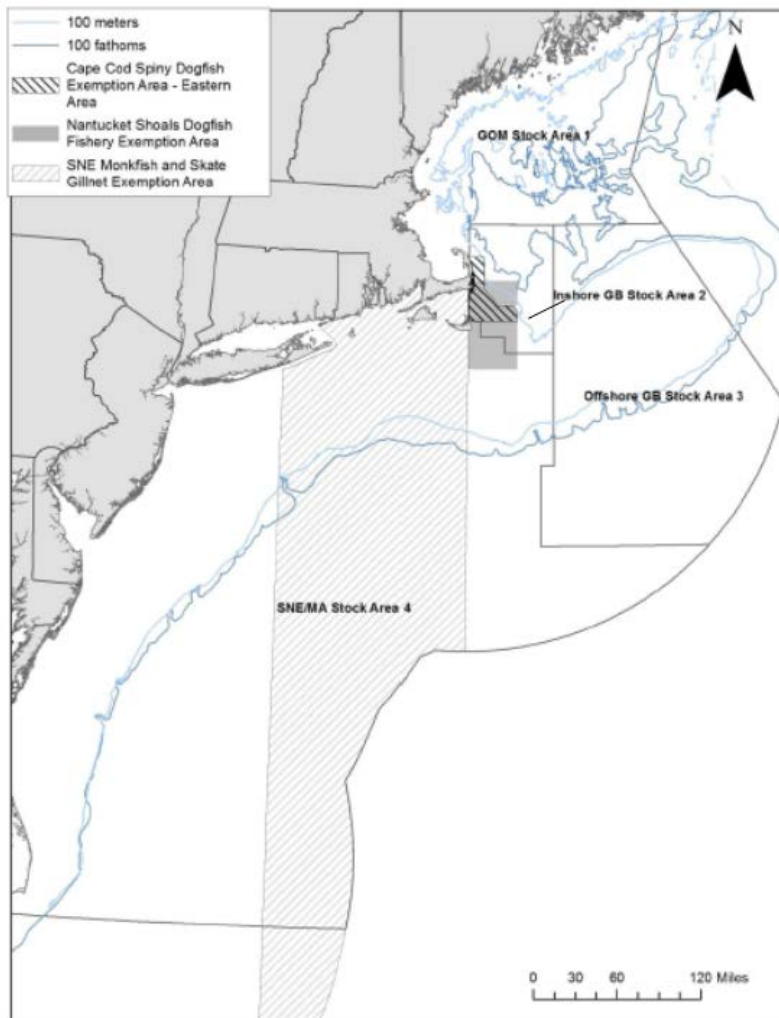
This action considers alternatives that would remove commercial groundfish monitoring program requirements for certain vessels fishing under certain conditions. These measures are geographic in nature and include two different options. Each would remove monitoring requirements for vessels fishing on a trip exclusively west of the line in either option (shown in **Map 2**). Under each option, there is a sub-option to remove at-sea monitoring requirements and a sub-option to remove dockside monitoring requirements (if implemented). The Council could select both sub-options. Both options

would maintain the existing measures for removal of monitoring program coverage requirements described in the No Action (see **Map 1**). Additionally, this action considers a review process for vessels that are removed from monitoring requirements.

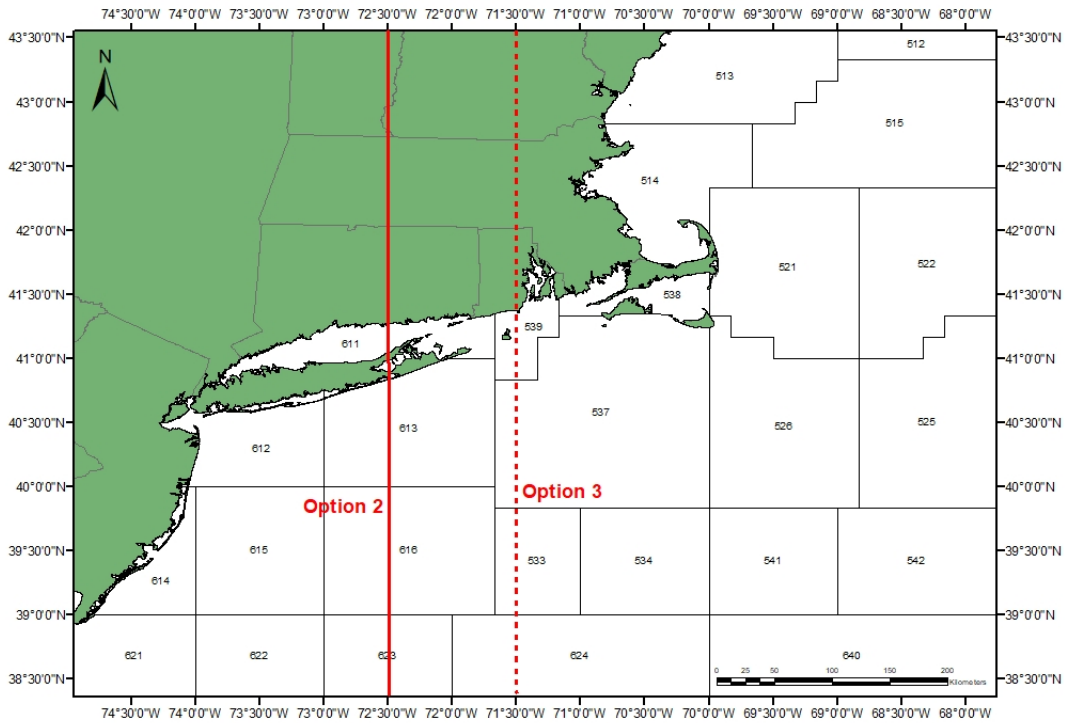
The Council selected as its **preferred alternative** Option 3 – Remove Monitoring Program Requirement for Vessels Fishing Exclusively West of 71 Degrees 30 Minutes West Longitude, Sub-option 3A: Remove At-Sea Monitoring Coverage Requirement and Sub-option 3B: remove Dockside Monitoring Program Requirement because while there may be higher catches of some groundfish stocks in this area, the Council identified this alternative as preferred to minimize the costs of increased monitoring overall. The majority of total groundfish is caught in waters east of this boundary, so this measure is viewed as one that minimizes cost with limited potential impacts on total groundfish. The Council also selected as its **preferred alternative** Review Process Option 2: Implement a Review Process for Vessels Removed from Commercial Groundfish Monitoring Program Requirements because the Council recognized the importance in including this measure if some vessels are removed from monitoring requirements to ensure that fishing behavior does not change and to verify if the intent of the measures (e.g. that the catch composition has little to no groundfish) is still being met.

Brief Description of Removal of Monitoring Program Requirements Alternatives in Amendment 23	
Removal of monitoring requirements Option 1 (No Action)	Sector vessels fishing exclusively with extra-large mesh gillnets greater than 10 inches and in the SNE/MA or inshore GB BSA are not subject to at-sea monitoring
Removal of monitoring requirements Option 2 – Vessels fishing exclusively west of <u>72 30 W</u> longitude would not be subject to monitoring requirements on trips in that area	
Removal of monitoring requirements Option 2A (Sectors only)	Sector vessels fishing exclusively west of 72 30 W longitude would not be subject to <u>at-sea monitoring</u> . Measures under No Action would remain in place.
Removal of monitoring requirements Option 2B (Sectors and Common Pool)	Vessels fishing exclusively west of 72 30 W longitude would not be subject to <u>DSM</u> . Measures under No Action would remain in place.
Removal of monitoring requirements Option 3 – Vessels fishing exclusively west of <u>71 30 W</u> longitude would not be subject to monitoring requirements on trips in that area (Preferred alternative)	
Removal of monitoring requirements Option 3A (Sectors only) (Preferred alternative)	Sector vessels fishing exclusively west of 71 30 W longitude would not be subject to <u>at-sea monitoring</u> . Measures under No Action would remain in place.
Removal of monitoring requirements Option 3B (Sectors and Common Pool) (Preferred alternative)	Vessels fishing exclusively west of 71 30 W longitude would not be subject to <u>DSM</u> . Measures under No Action would remain in place.

Brief Description of Removal of Monitoring Program Requirements Alternatives in Amendment 23	
Review process for vessels removed from commercial groundfish monitoring program requirements	
Review process for vessels removed from commercial groundfish monitoring program requirements Option 1 (No Action)	Currently there is no formal review process to verify that the catch composition from vessels fishing on trips not subject to monitoring requirements have little to no groundfish.
Review process for vessels removed from commercial groundfish monitoring program requirements Option 2: Implement a review process (Preferred alternative)	After two years of fishing data is available, and every three years after that, the PDT would review catch composition from vessels fishing on trips not subject to monitoring requirements to verify that the catch composition has little to no groundfish.



Map 1 - Groundfish Broad Stock Areas (BSAs) – sector trips fishing exclusively with extra-large mesh (ELM) gillnets fishing exclusively in the SNE/MA and/or Inshore GB BSA are exempt from the at-sea monitoring coverage requirement.



Map 2 - 72 degrees 30 minutes west longitude boundary (Option 2) and 71 degrees 30 minutes west longitude boundary (Option 3).

7.0 OVERVIEW OF MAJOR IMPACTS OF THE MEASURES UNDER CONSIDERATION (SECTION 7.0 OF DEIS)

7.1 HOW WERE IMPACTS ANALYZED?

The Amendment analyses the impacts of the alternatives on specific factors. These are referred to as Valued Ecosystem Components, or VECs. For this action, the factors are:

- Managed resources (groundfish and other species);
- Essential Fish Habitat (EFH) and the physical environment;
- Endangered and Other Protected Species; and
- Human communities, particularly economic impacts

The analyses in the document are both qualitative and quantitative. Some of the factors lend themselves well to quantitative analyses, while others do not. **Care should be taken not to discount qualitative analyses because they do not generate specific numerical estimates.**

In this document, the focus is on the impacts to managed resources and human communities. Other factors are only briefly discussed. The full Amendment 23 document contains thorough descriptions of all potential impacts.

Impacts to managed resources (i.e., groundfish stocks and other species) were assessed quantitatively and qualitatively. Amendment 23 discusses possible biological impacts of improvements in monitoring of the commercial groundfish fishery (described below). These possible impacts were used to analyze and qualitatively rank the coverage level options in the alternatives relative to each other in terms of biological impacts. When possible, additional analyses are referred to that provide further comparative ranking of the options for monitoring coverage – for example, Groundfish PDT monitoring analyses (described in [Section 6.6.10.5 of DEIS](#) and included in full in [Appendix V](#)).

Additionally, quantitative analyses were used to analyze certain alternatives where information is available – for the alternatives that consider removing groundfish monitoring requirements for certain vessels fishing under certain conditions (6.6 above and [Section 4.6 of DEIS](#)), groundfish catch reported on VTRs from trips fishing west of 72 30 W longitude and west of 71 30 W longitude is used to analyze the biological impacts of these alternatives.

Overall, comprehensive improvements in monitoring will likely influence two different factors:

- 1) It could potentially have positive biological impacts by lowering fishing effort on stocks that are overfished due to more accurate total catch reporting from improved monitoring of missing catch, and
- 2) Improvements in catch information should also improve stock assessments, stock status determination and the ability to quantify biological impacts in the future.

However, improvements to the stock assessments through improvements in monitoring will likely be different in the short-term relative to the long-term (**Figure 1**).

Improvements in monitoring which reduce fishing mortality through improved catch accounting will have positive biological impacts in the short-term. In the longer-term all assessments should improve with better catch data which should lead to subsequent improvements in groundfish catch advice and management.

Of note, catches by fishery components other than the commercial groundfish fishery (e.g., sea scallop fishery, recreational groundfish fishery) are not evaluated, since Amendment 23 focuses on improving monitoring in the commercial groundfish fishery.

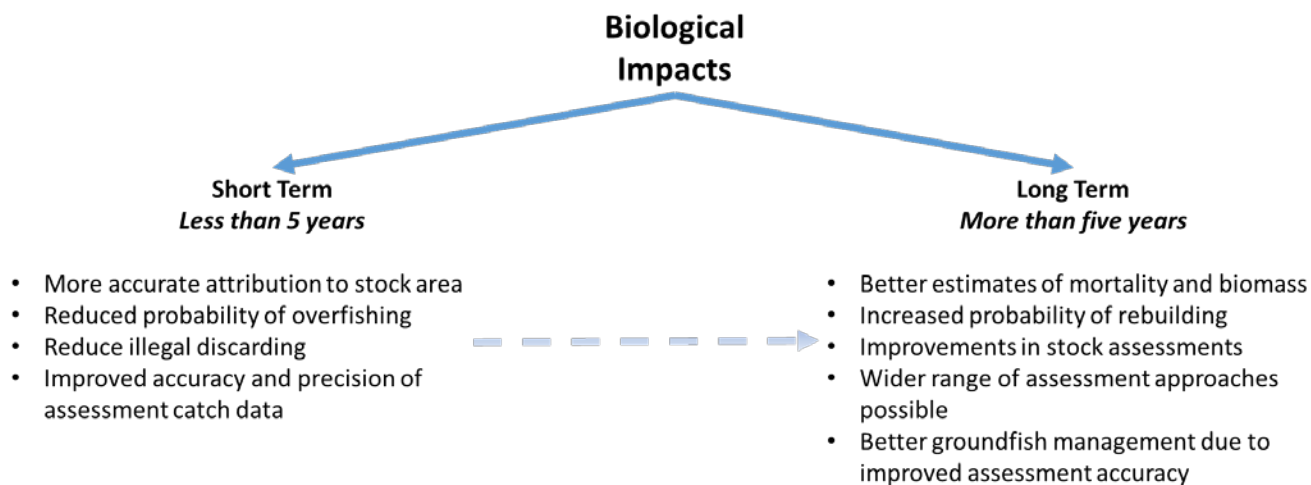


Figure 1 - Schematic showing identified short-term and long-term biological impacts identified by the amendment.

Key quantitative approaches in the economic impact analysis section included a static, dynamic, and blended approach. These three approaches were primarily used to analyze the potential impact of the different human ASM coverage levels as well as the electronic monitoring (EM) options).

The impact analyses generally assume that monitoring costs will be borne by the industry. The at-sea costs of the monitoring program adopted in Amendment 16 were designed to be funded by the industry beginning in 2012. To date, these costs have been primarily funded by the federal government. While there are some appropriated funds available for funding ASM in the short-term, the expectation is that in the future at-sea monitoring costs will be paid by the industry.

It should be noted that no approach represents a prediction of future costs, rather, each should be interpreted as a comparison of estimated costs and impacts under each alternative, in part because FY 2018 fishery information serves as the primary dataset and fishery conditions continue to change over time. The three approaches are extensively described in the amendment but are summarized here (**Figure 2**):

- **Static Analysis:** Estimates costs based on recent fishing effort: If all fishing vessels fished the same way they did in previous fishing years, what would monitoring costs be? This is helpful to examine how estimated costs might change under the various monitoring options, holding all else constant.
- **Dynamic Analysis:** Estimates costs based on effort shifts and other changes expected to occur across the fleet when fishery monitoring costs are imposed. This accounts for the fact that vessels may make different participation decisions (e.g., fish more or less) when faced with different cost burdens, affecting estimated operating costs and revenues.
- **Blended Analysis:** Estimates costs when multiple monitoring tools are available (i.e., humans or EM). Costs can be estimated either statically or dynamically, but in each case vessels are assumed to pick a monitoring tool based on individual cost-effectiveness. This approach is best suited to analyze the preferred alternative, since it would allow for vessels to choose between humans or EM. In addition, blended analysis which estimates the impact of a subsidy for EM equipment is also included in the amendment.

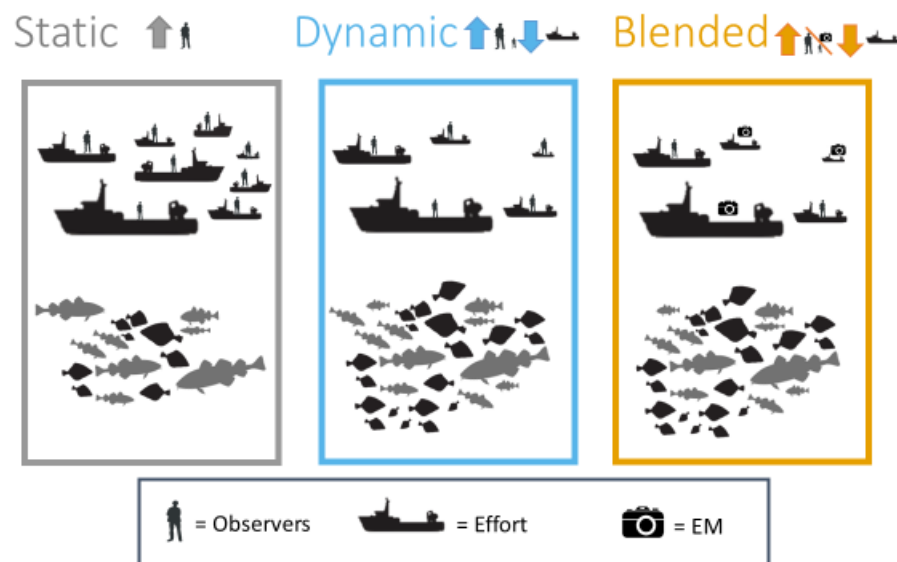


Figure 2 - Schematic of different quantitative approaches for estimating economic impacts on the fishery.

In addition to the direct, quantitative impacts stemming from changes in costs, there are expected to be other, difficult to measure impacts based on expected changes in compliance and enforceability of reporting requirements.

Compliance is defined as the extent to which participants activities are in accordance with all rules and regulations such as retention and reporting requirements both at-sea and dockside.

Enforceability is defined here as the ability for enforcement officials (NOAA OLE or US Coast Guard) to detect and prosecute violations.

To gauge possible trade-offs across the alternatives, compliance and enforceability scores were assigned (High to Low) based on both the opportunity for non-compliance as well as incentives for noncompliance (**Figure 3**). The risk of non-compliance is expected to still be high at low to medium (13%-50%) levels of coverage, since incentives for illegal discarding or misreporting may increase, thus all of these alternatives receive a 'low' compliance scores. Only 100% coverage receives a 'high' compliance score, since it carries a low risk of non-compliance.

Compliance and enforceability have potential economic, biological, and social impacts, and so benefits and costs are discussed in each relevant section of the DEIS.

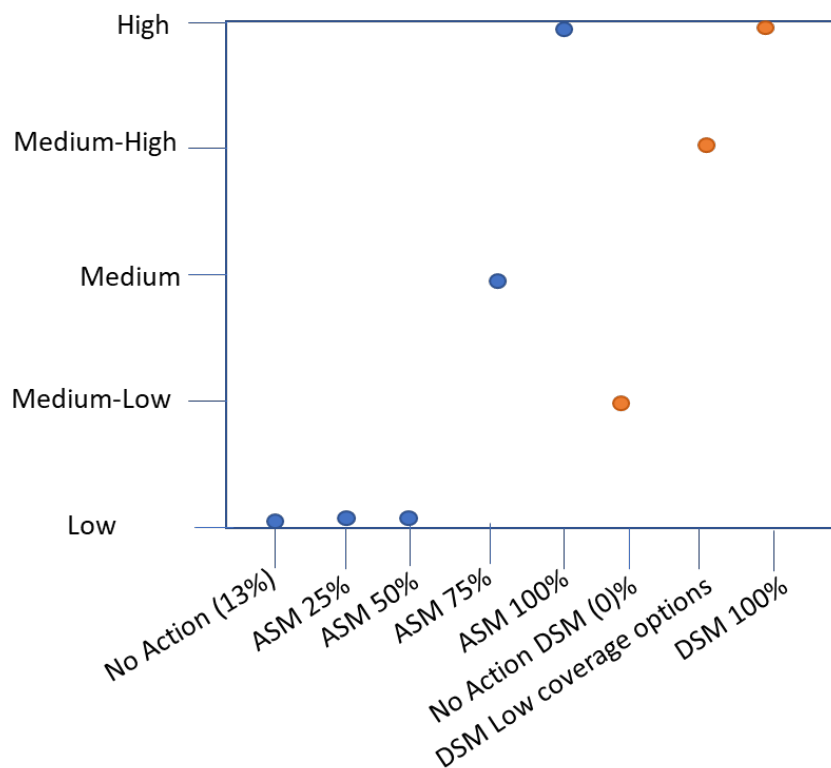


Figure 3 - Example compliance scores for a range of ASM (blue) and DSM (orange) monitoring coverage alternatives in the document.

Impacts on additional factors (EFH and the physical environment; and protected resources) were analyzed primarily qualitatively. Impacts on these factors are summarized very briefly below for certain alternatives and are included in detail in Draft Amendment 23. Impacts of the management measures considered in this amendment on essential fish habitat and the physical environment and on protected resources are largely indirect.

7.2 WHAT ARE THE EXPECTED BENEFITS?

The analyses throughout the DEIS illustrate a number of trade-offs across alternatives.

Specifically, the preferred alternatives may provide a suite of biological, economic, and social benefits:

- Short Term: Lower fishing mortality from improved catch accounting
- Long term: Improved information for stock assessments
- Increased long run fishery revenue
- Improved ACE lease market performance
- Increased ACE (removal of management uncertainty buffer)
- Level playing field
- Improved trust

Increased compliance with fishery reporting requirements is expected to reduce fishing mortality and improve information used in stock assessment. In turn, as the risk of overfishing decreases with improved catch accounting, long run fishery revenue may increase as attainment and utilization increases across stocks. In the short term, better catch information means the ACE lease market will ensure that prices reflect the true value of each pound to fishermen, a benefit to those who lease their quota, and incentivizes efficient harvesting practices (i.e., cost minimizing, profit maximizing). Full catch accounting and data on fishery catches also is expected to reduce the need for the management uncertainty buffer, which will increase ACE available to businesses. Furthermore, increased compliance and enforceability ensures that those who break the rules don't have an advantage over those who do comply with the rules. All around, better fishery data and a well-functioning ACE lease market means better outcomes for managers and fishermen, and hopefully improved trust in the system.

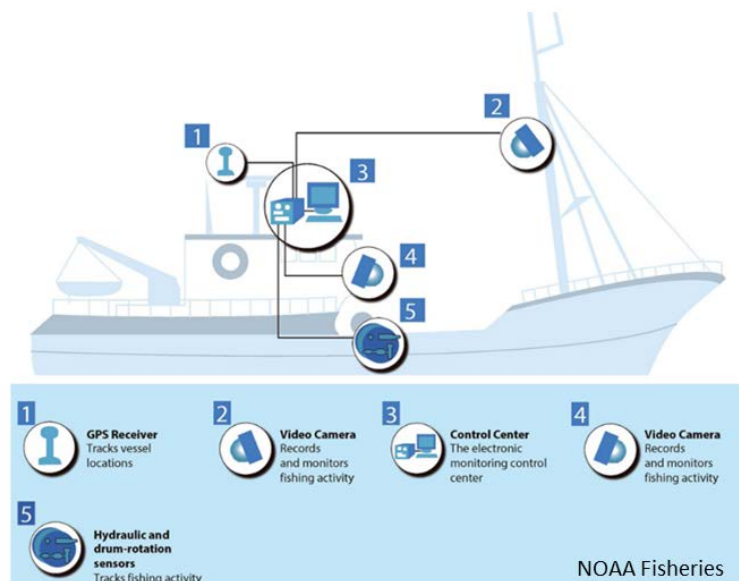
However, a move to comprehensive monitoring coverage means a commensurate increase in industry-borne monitoring costs. ASM costs averaged \$698 per day absent between FY2016 and FY2018. Therefore, the major drawbacks of the preferred alternative include:

- Comprehensive monitoring is expensive.
- Less than 100% coverage may prevent some benefits.
- Even 100% coverage does not ensure illegal behavior will not occur.

Other, non-monetary costs include that exceptions to comprehensive monitoring may erode expected benefits. Notably, exemptions and a lack of dockside monitoring may reduce costs somewhat, but may increase the opportunity and incentive for non-compliant behavior on unobserved trips and to misreport landings shoreside. In addition, even if 100% ASM and DSM coverage were selected this does not ensure that illegal behavior cannot occur, limiting the degree of expected benefits.

The ability for vessels to select EM tools (audit or max retention), as an alternative to meet the ASM coverage requirement may also have several trade-offs for vessels. EM is estimated to be less expensive than human ASMs for vessels who fish more than 20 days per year. Vessels may additionally have to spend less time on logistics preparing for and carrying an observer on a trip. Fewer people on board may also mean improved safety conditions for both crew and observers. Finally, because cameras don't sleep, EM may increase the amount of data available for fishery management.

Potential drawbacks of EM include the introduction of different costs, including installation and maintenance costs, as well as time to learn how to properly use the equipment and changing crew tasks, as necessary.



Schematic of typical electronic monitoring set-up.

Impacts on Physical Environment and Essential Fish Habitat

Impacts of the modification of management measures in Amendment 23 on the physical environment and EFH are based on changes in the amount or location of fishing that might occur as a result of the implementation of the various alternatives. The preferred alternative may result in reduced groundfish fishing activity through increased costs of higher monitoring, and provide some minor short-term benefits to habitat. More detail on EFH impacts is provided in the Amendment 23 document.

Impacts on Protected Resources

The modifications in management measures may affect protected resources, but the preferred alternatives identified in this action are not expected to have substantial impacts on protected resources. Improvements in monitoring have indirect benefits to protected resources by providing additional information on interactions with fishing gear, which should reduce uncertainty in bycatch estimates. More detail on protected resource impacts is provided in the Amendment 23 document.

7.3 WHAT COULD IMPACTS BE ON THE FLEET?

A major impact across the alternatives is potential changes in industry monitoring costs and how these changes may affect profitability. Under No Action (13% average ASM coverage), fleetwide costs are estimated to be approximately \$0.9 million per year if all sector vessels fished the same as in FY 2018 and all took human monitors (static model, **Figure 4**). Under this approach, costs could increase to \$5.7 million and under 100% ASM coverage. Alternatively, if every vessel selected either one of the EM tools, costs could be substantially lower, around \$3 million per year.

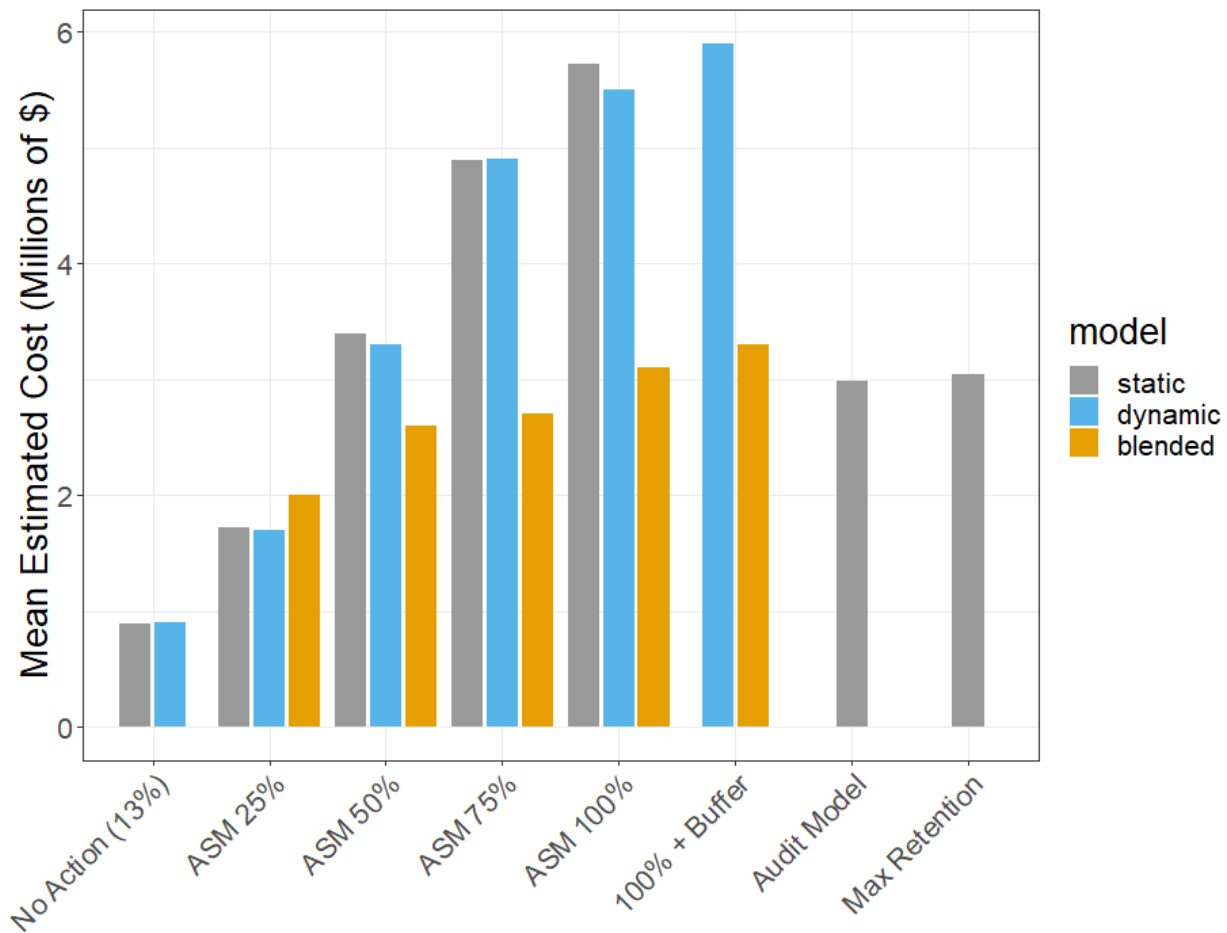


Figure 4 - Mean estimated fleetwide costs of select at-sea monitoring options under various modelling approaches, based on FY 2018 fishery data (sector vessels only). Costs are not predictions of future costs.

When changes in effort are modelled under each alternative (dynamic model), costs are generally lower than under the static model (**Figure 4**). Under 100% ASM coverage, effort shifts may reduce costs by \$0.2 million. In addition, as effort shifts revenue generation and other operating costs may change on groundfish trips¹, mitigating the overall impact of increased monitoring costs on operating profit (**Figure 5**). Under 100% ASM coverage operating profits may be \$1 million higher under the dynamic model than under the static model, but still \$4 million less than under No Action.

The Council’s preferred alternative selects 100% monitoring coverage as the target monitoring coverage level, allows for EM tools to be used in place of human ASMs, and also eliminates the management uncertainty buffer. This combination of alternatives is analyzed using the blended model (**Figure 4**, **Figure 5**). Under most alternatives analyzed with the blended model monitoring costs are estimated to be lower than if only human ASMs could be selected. Under the preferred alternative, monitoring costs are estimated to be around \$3.3 million, and because of effort shifts, reductions in other operating costs, and additional ACE available to fishermen after the management uncertainty buffer is removed,

¹ Operating costs included ice, fuel, food, sector/landing fees, and the value of utilized ACE, but do not include crew wages/shares or owner shares, due to data availability.

operating profits are estimated to be higher than under No Action—increasing from \$50 million to \$51.7 million.

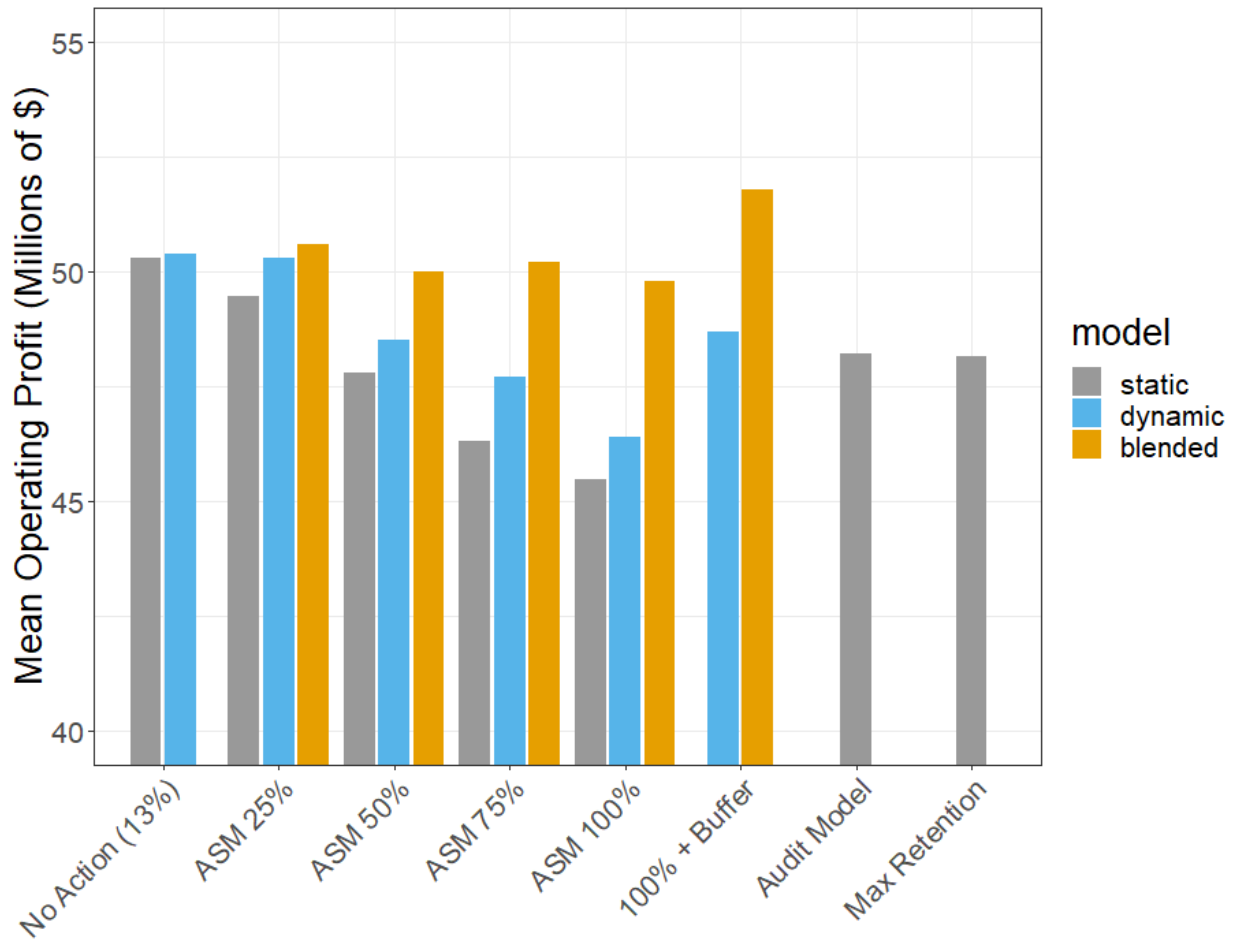


Figure 5 - Mean estimated fleetwide operating profits (gross revenues on groundfish trips minus operating costs) of select alternatives under various modelling approaches, based on FY2018 fishery data (sector vessels only). Operating profits are not predictions of future operating profits.

The Council did not select any option for dockside monitoring (DSM) as part of its preferred alternative, but several options for dockside monitoring exist in the document, all of which would apply to both the sector and common pool components of the fishery. A comprehensive DSM program was estimated to cost between \$0.84 to \$1.0 million, based on a static analysis of fishing effort between FY2016 and FY2018 (**Figure 6**). DSM costs could be reduced to around \$0.6 million dollars by selecting a lower coverage rate for low-volume vessels or low-volume ports, which each accounted for 1.5% and 2.3% of total landed groundfish pounds over the last three fishing years. Exempting effort west of 72.5 or 71.5 degrees west longitude could also reduce costs, to \$0.87 or \$0.63 million, respectively.

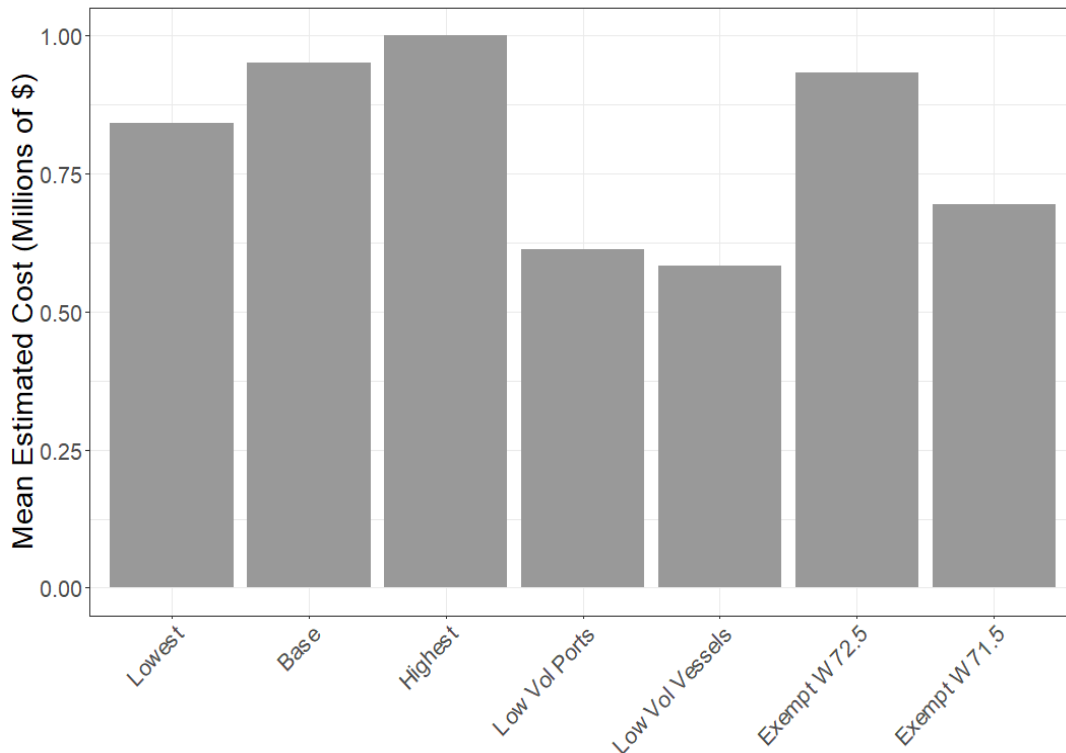


Figure 6 - Mean estimated dockside monitoring (DSM) costs under select alternatives. Lowest, Base, and Highest bars represent a range of potential costs for a comprehensive DSM program (sectors and common pool). Other bars estimate possible costs under alternatives which consider exemptions.

7.4 HOW COULD VESSELS BE AFFECTED?

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast region. A vessel’s groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year. For ASM and EM alternatives, costs have been calculated specifically across these dimensions, and also across vessel homeport and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels, but much more information is available in the DEIS.

For comparison purposes, we highlight three example vessel types to highlight what estimated monitoring costs might be.



- **Vessel 1:** Low level of engagement in the groundfish fishery, spends less than 5 days absent fishing in the groundfish fishery per year. 38 sector vessels fell into this category between 2016 and 2018 (**Figure 7**).



- **Vessel 2:** Spends between 20 and 50 days absent per year, most likely 50 feet in length or less. Between 2016 and 2018, 59 sector vessels fell into this category.



- **Vessel 3:** Highly engaged in the groundfish fishery, spending over 160 days absent per year. All 21 vessels in this category were over 50 feet in length, most were over 75 feet.

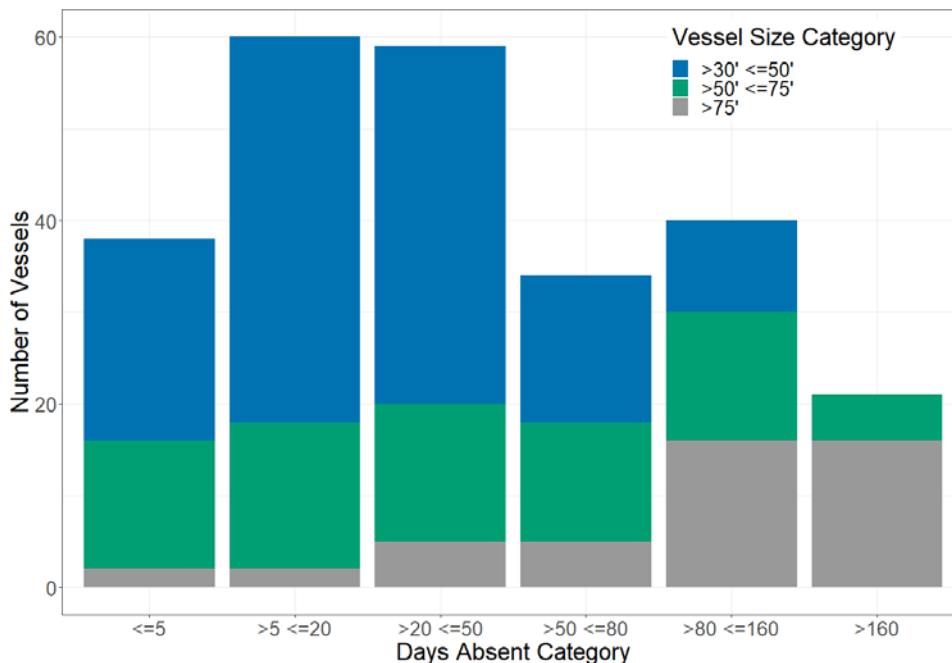


Figure 7 - Number of sector vessels by size class and days absent category. Day absent category is calculated using the average number of days absent over fishing years 2016-2018.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the median vessel) was used as the basis for approximating vessel-level impacts for each Day Absent Category.

For **Vessel 1**, estimated monitoring costs as a proportion of revenue is the highest of our three example vessels. Under No Action, monitoring costs of roughly 13% ASM coverage might amount to 3% of all revenue (\$275) on that vessel’s groundfish trips, but increase to 22% (\$1,800) under 100% ASM coverage (**Figure 8**). Vessel 1 earned approximately \$8,000 per year on groundfish trips over FY2016-FY2018, on average. Unlike the other example vessels, costs under EM might be even higher (\$3,700 or 46% of revenue) than if only human monitors are used because their activity level does not justify

upfront investment of the EM equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who fish less than 5 days per year generally are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (Table 24 in Section 6.6.4 of the DEIS of the amendment).

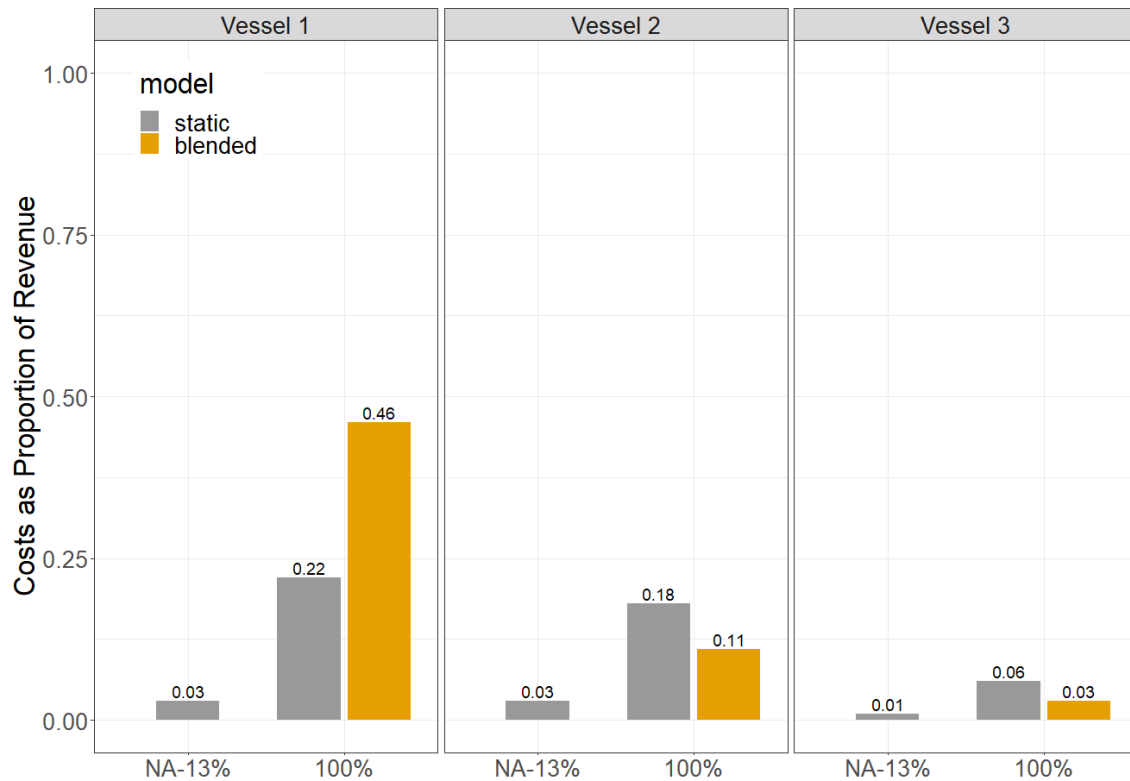


Figure 8 - Costs as a proportion of revenue for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 spends less than 5 days absent fishing in the groundfish fishery, vessel 2 spend between 20 and 50 days per year, and vessel 3 spends more than 160 days per year.

Vessel 2 represents one of the most common vessel categories, and similar to Vessel 1, monitoring costs as a percentage of revenue is estimated to increase from around 3% to 18% under 100% ASM coverage (\$4,000 and \$24,000, respectively **Figure 8**). Vessel 2 earned \$131,000 per year on groundfish trips over FY2016-FY2018, on average. Vessels who choose EM instead of human monitors may be able to cut costs, decreasing the cost burden to 11% of revenue (\$15,000 per year). Similar to Vessel 1, vessels in this days absent category are generally not very reliant on groundfish fishery revenue— the typical vessel obtains 20% of their total revenue from groundfish.

Vessel 3 represents a smaller, but highly engaged vessel category. Costs as a proportion of revenue are estimated to be the lowest for Vessel 3 compared to the other example vessels, with costs increasing from 1% of revenue to 6% of revenue under 100% ASM coverage (\$13,100 and \$83,000, respectively). Vessel 3 earned \$1.4 million per year on groundfish trips over FY2016-FY2018, on average. Costs could be reduced if EM is selected by these vessels to 3% of revenue (\$38,335). Vessels in this category are highly reliant on groundfish fishery revenue, the median vessel obtained 75% of their revenue from groundfish, therefore could be more impacted by increased monitoring costs than other vessels.

7.5 OVERALL SUMMARY OF ECONOMIC AND SOCIAL IMPACTS ON HUMAN COMMUNITIES

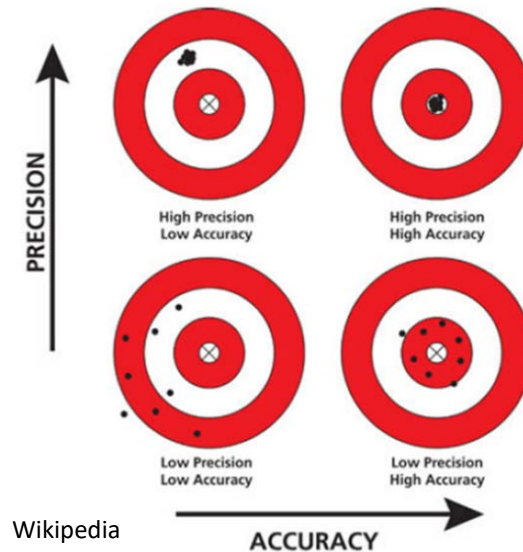
Overall, several alternatives in this action may have substantial effects on aggregate revenues and costs as well as the distribution of operating profits within the fishery.

- Overall, if the industry bears the cost for monitoring (No Action) there will be negative impacts relative to status quo, since industry has been reimbursed for monitoring costs.
- Overall, operating costs are higher (**negative** impacts from reduced profits) under higher coverage standards.
- EM is substantially less costly than ASM for all vessels fishing in the (non-FW55 exempt) groundfish fishery more than 20 days per year.
- The ability to select into EM reduces cost by 44% - 60% when costs are averaged over three years, noting that even this cost reduction is based on an estimate that is not optimized (ASM alone could be roughly 70% more expensive to industry than the low-cost frontier when equipment and installation are subsidized).
- Subsidizing equipment and installation in year 1 brings the three-year average cost of comprehensive monitoring below the cost of partial monitoring as they were initially analyzed in A16.
- Gross revenues and operating profits are all higher for comprehensive (100%) monitoring than they are estimated to be under the Status Quo (no industry funded monitoring) scenario when the option to remove management uncertainty buffers is selected. Note that these increased profits are not uniformly distributed across the fishing fleet.
- Dockside monitoring is expected to cost between \$0.8 and \$1 million dollars per year.
- Lower DSM coverage level options for low-volume ports or vessels may reduce DSM costs by 35% to 39%, and carry low risk of non-compliance due to the low-volume of groundfish caught (<5%).
- Exempting effort west of 71.5 degrees west longitude may reduce potential DSM costs, but comes at the risk for higher non-compliance and lack of enforceability on those trips. Exempting effort west of 72.5 degrees west longitude carries less risk since a smaller proportion of groundfish effort takes place in that area.
- Some DSM cost components may be reduced or eliminated if the DSM program is coupled with the ASM program, particularly if a high overall coverage rate is selected. In addition, under high ASM coverage, incentives for non-compliance with shoreside regulations may increase, reducing the overall compliance and enforceability benefits of the program.
- Trade-offs exist with respect to the benefits obtained from high levels of coverage. While lower coverage level options, such as 50%, may reduce costs, they may also reduce, if not eliminate some expected benefits--as shown by the compliance and enforceability scores. Only 100% ASM and DSM monitoring receives a 'high' compliance and enforceability score (**Figure 3**, above).
- Higher monitoring coverage levels could produce **negative** social impacts on crew attitudes if the increased costs result in decreases in crew compensation and could exacerbate negative attitudes towards fisheries management.
- Alternatives that are more administrative in nature (establishing a review process, funding provisions) for the most part have no direct economic and social impacts.

8.0 GLOSSARY

Acceptable biological catch: The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. The MSA interpretation of ABC includes consideration of biological uncertainty (stock structure, stock mixing, other biological/ecological issues), and recommendations for ABC should come from the NEFMC SSC.

Accuracy: The closeness of the estimated value of some quantity to the true value.



Annual Catch Limit (ACL): The limit of each groundfish stock that can be harvested by all vessels during each fishing year.

Annual Catch Entitlement (ACE): The sum of the PSC for each MRI participating in a sector, multiplied by the commercial groundfish fishery ACL each stock for that year. The product of that multiplication is the ACE for that sector for each stock — the amount of stock in pounds that the sector is allowed to catch for that fishing year. The ACE of each stock equals the sum of PSC times the ACL.

Bias: Systematic difference between the estimated value of some quantity and the true value being estimated. Bias can be due to: 1) a statistical estimator that is not properly tuned, such that the expected value does not align with the true value; or 2) a sample that is not representative of the true population.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Discards: Animals returned to sea after being caught; see *bycatch (n.)*.

Fishing effort: The amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Landings: The portion of the catch that is harvested for personal use or sold.

Limited-access permits: Permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Moratorium Right Identifier (MRI): A unique identifying number that is attached to a Northeast multispecies permit. Each permit has its own MRI, and a given MRI is attached to only one permit. When NMFS calculates Potential Sector Contribution, it uses the MRI history, because this is the best way to determine how much multispecies groundfish has been associated with that permit over time.

Multispecies: The group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Potential Sector Contribution (PSC): The proportion of the total landings of a particular groundfish stock (in live pounds) associated with an individual MRI over a particular period. For most stocks managed by the Northeast Multispecies FMP the PSC is based on a MRI's landings history during fishing years 1996-2006, divided by the landings history of the entire fleet for each stock.

Precision: How much estimates of the same quantity differ from each other across multiple samples, due both to sample variation and sample size. See figure under *Accuracy*.

Regulated groundfish species: Cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock area: A group of connected statistical areas that defines the geographic distribution of a particular population of an individual species. For example, the Gulf of Maine (GOM) cod stock area comprises statistical areas 464, 465, 467, 510, 511, 512, 513, 514, and 515. All catch of cod in any of these stock areas is attributed to the GOM cod stock.

Valued Ecosystem Component: An element of the environment that has scientific, economic, social or cultural significance. Example valued ecosystem components are: the species targeted by a particular fishery; the non-target or bycatch species caught incidentally; protected species.

9.0 ACRONYMS

ABC	Acceptable Biological Catch
ACE	Annual Catch Entitlement
ACL	Annual Catch Limit
ASM	At-sea Monitoring (Program)
ASMFC	Atlantic States Marine Fisheries Commission or Commission
DA	Days Absent
DAS	Days-At-Sea
DEIS	Draft Environmental Impact Statement
DSM	Dockside Monitoring
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EM	Electronic Monitoring
ESA	Endangered Species Act
FMP	Fishery Management Plan
FW	Framework
FY	Fishing Year
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GOM	Gulf of Maine
MRI	Moratorium Right Identifier
MSA	Magnuson-Stevens Fishery Conservation and Management Act
mt	Metric Tons
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PDT	Plan Development Team
PTNS	Pre-Trip Notification System
SNE/MA	Southern New England/Mid-Atlantic Bight
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
VEC	Valued Ecosystem Component
VTR	Vessel Trip Report

Appendix 1: Fishing Vessel Profiles by Homeported State

In the main public hearing document, several example fishing vessel profiles were created based on the composition of all sector vessels fishing in the groundfish fishery over the last few fishing years. These profiles compare cost estimates for different alternatives in the Draft Amendment 23 (A23) document based on different days absent categories, and compared them to the characteristics of typical vessels in each category (vessel size, gear types used, number of trips, total revenue, etc.). These profiles were created so that participants may better understand how cost estimates might relate to different types of operations in the groundfish fleet. This appendix creates fishing vessel profiles specific to different states or regions where sector vessels are homeported. Individual state profiles were created for the state of Maine, New Hampshire, Massachusetts, and Rhode Island, and a regional profile was created for all vessels homeported south of Connecticut (Connecticut, New York, New Jersey, Delaware, and North Carolina.)

The goal of these fishing vessel profiles is to place A23 cost estimates in context with operation types in that state or region, using the same metric that is used for the general profiles. Cost estimates based on general engagement levels (days absent categories) were compared to engagement levels of homeported vessels in each state or region to derive a few example profiles. Engagement levels are based on the average number of days absent spent fishing on groundfish trips per year, on average (e.g., a trip 12 hours long would equal .5 days absent.)

In most cases, three different engagement levels were selected for each state or region as examples. The six different engagement levels are:

- **Lowest level of engagement:** Less than 5 days absent
- **Low level of engagement:** More than 5 but less than, or equal to 20 days absent
- **Low-moderate level of engagement:** More than 20 but less than, or equal to 50 days absent
- **High-moderate level of engagement:** More than 50 but less than, or equal to, 80 days absent
- **High level of engagement:** More than 80 but less than, or equal to 160 days absent
- **Highest level of engagement:** Greater than 160 days absent

It is important to note that all costs presented are estimates based on models and data from previous fishing years, so they are unable to predict what future costs will be under any given alternative. Cost estimates should be used for comparison purposes to see how costs could change across alternatives. Cost estimates presented in this document are modeled results from the A23 document, specifically those generated from static or static-blended models, and each represents the mean estimated cost by days absent category, in terms of 2018 dollars (adjusted for inflation). The estimates of costs presented in this appendix are therefore gross approximations of cost based on general engagement levels and are not specific to any given state or region, gear type, or vessel size. These additional factors are presented for contextual purposes only. Other cost estimates based on vessel size, homeport, or sector are available in the full A23 document. For more information about the cost estimates and the methods used to generate them, please see the full Draft Amendment 23 document¹.

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https://s3.amazonaws.com/nefmc.org/200304_Draft_Groundfish_A23_DEIS_formal_submission_corrected_200312.pdf

MAINE SECTOR VESSEL PROFILES

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast region. A vessel's groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year. For ASM and EM alternatives, costs have been estimated based on days absent and can be visualized across vessel engagement levels (days absent categories), as well as across different vessel size classes, vessel homeports, and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels homeported in Maine, but much more information is available in the Draft Amendment as well as the main public hearing document.

In fishing year (FY) 2018, Portland was the most engaged homeport area in Maine, with nearly 1,000 days absent from homeported sector vessels. Across the entire state 29 sector vessels participated in the fishery across 10 homeports (**Figure 1**).

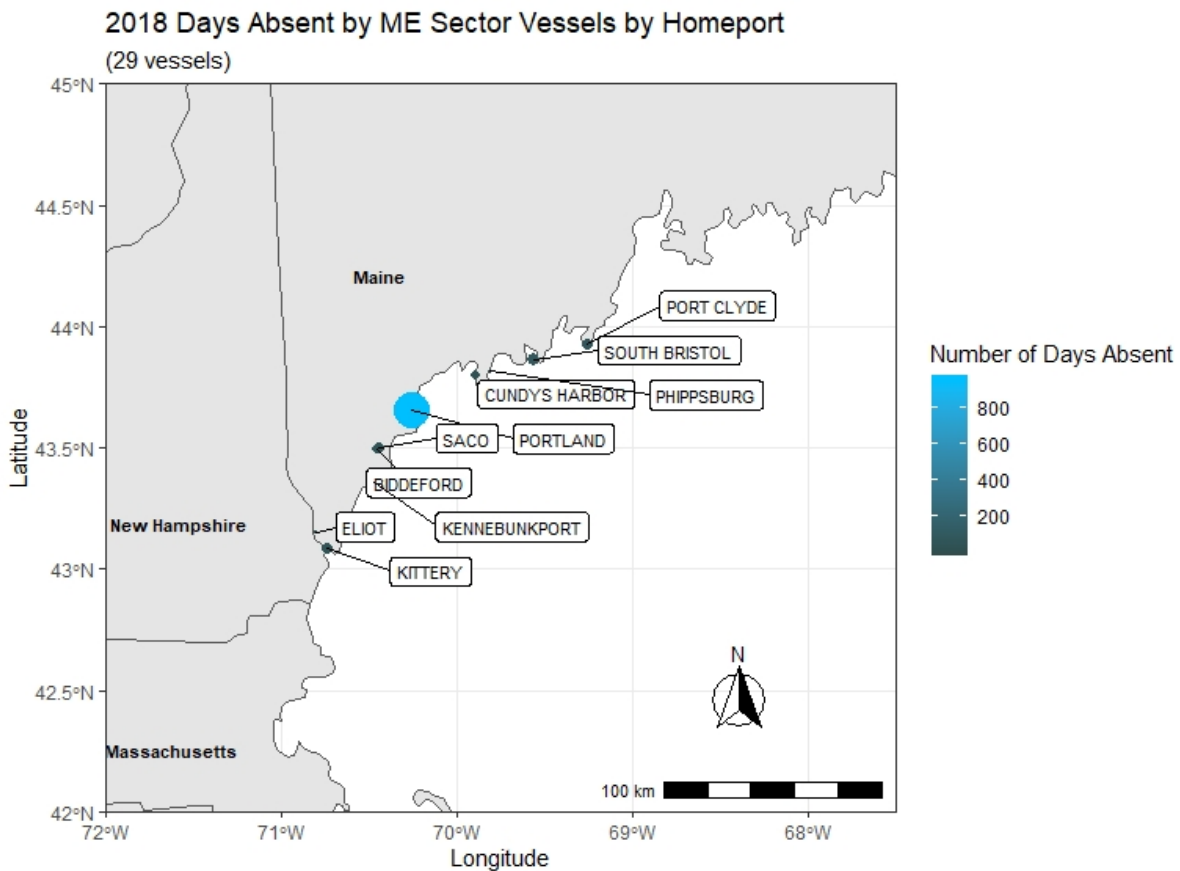


Figure 1. Number of days absent by sector vessels by homeport location. Only days absent from vessels homeported in Maine that took at least one groundfish trip in FY 2018 are shown.

For comparison purposes, we highlight three example vessel types to highlight what estimated monitoring costs might be, noting that these are rough estimates for comparing alternatives and are not predictions of future costs. Vessel example types span a range of different engagement levels (days absent category), as both an indicator of reliance on the groundfish fishery as well as potential

monitoring cost burdens since it is expected that as time spent fishing increases monitoring costs will also increase (Figure 2).



- Vessel 1:** Least engaged in the groundfish fishery. Vessels in this class spend less than 5 days absent fishing in the groundfish fishery per year. For Maine vessels in this category, they spent 2.7 days absent in the groundfish fishery, usually using handgear, and were 38 feet in length, on average (Table 1, Figure 3). 7 sector vessels fell into this category between FY 2016 and FY 2018 (Figure 2).



- Vessel 2:** Low level of engagement. Spends between 5 and 20 days absent per year fishing on groundfish trips. In Maine, vessels in this category spend 12.2 days absent per year, primarily used gillnets, and are 42 feet in length, on average (Table 1, Figure 3). Between FY 2016 and FY 2018, 11 sector vessels fell into this category (Figure 2).



- Vessel 3:** High level of engagement. Spends between 80 and 160 days absent on groundfish trips per year. In Maine, the 5 vessels in this category spent 108.8 days absent per year, primarily used gillnets, and were 51 feet in length, on average (Table 1, Figure 3).

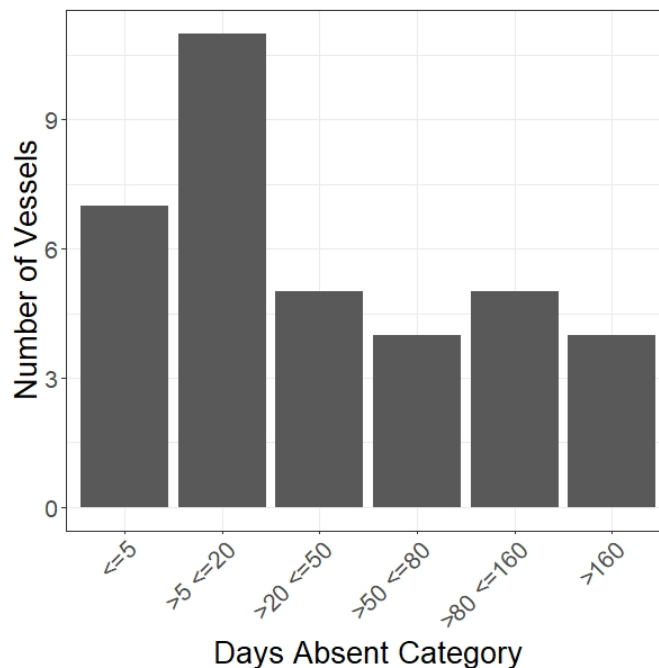


Figure 2. Number of vessels across different days absent categories. Data includes all sector vessels that took at least one groundfish trip and were homeported in Maine in fishing years 2016-2018.

Table 1. Number of Maine sector vessels per days absent (DA) category as well as mean days absent, and length. Total number of trips, and gear type used on trips between fishing years 2016 and 2018 also shown.. Note: The number of trips with each gear type may not sum to the total number of trips in a given category because multiple gear types (including types of trawl gear) may be used on the same trip. Other gear includes gear types such as pots or longlines.

DA category	Example Vessel	Vessels (#)	DA (mean)	Length (ft)	Total trips (#)	Gillnet trips (#)	Trawl trips (#)	Handgear trips (#)	Other gear trips (#)
<=5	Vessel 1	7	2.7	37.8	46	2	4	26	14
>5<=20	Vessel 2	11	12.2	42.3	306	179	84	9	45
>80 <=160	Vessel 3	5	108.8	51.4	327	232	91	4	1

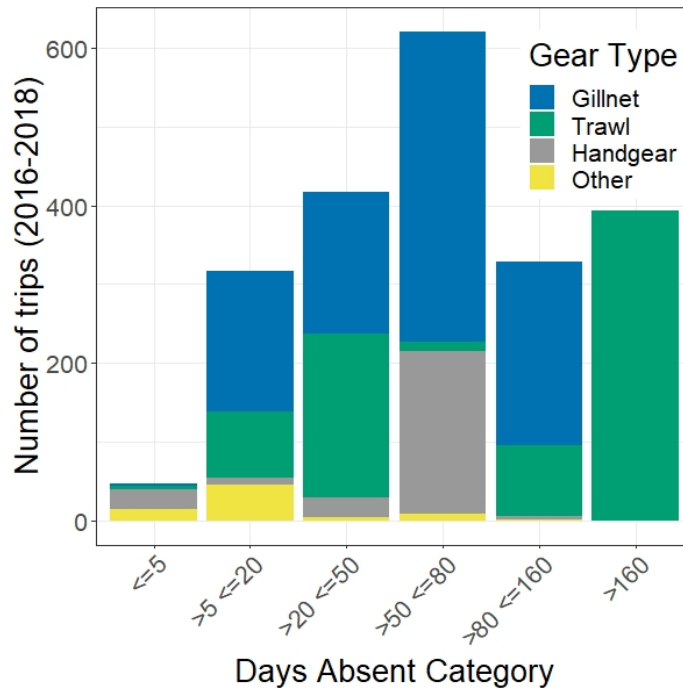


Figure 3. Number of groundfish trips by sector vessels homeported in Maine by days absent category. Gear type used on each trip or subtrip also shown.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the mean vessel) was used as the basis for approximating vessel-level impacts for each days absent category.

For **Vessel 1**, under No Action, static monitoring costs of roughly 13% ASM coverage might amount to 5% of all revenue (\$275) on that vessel’s groundfish trips, but increase to 32% (\$1,765) under 100% ASM coverage (**Table 2, Figure 4**). Vessel 1 earned approximately \$8,200 per year on groundfish trips over FY 2016-FY 2018, on average. Static costs with EM might be higher (\$3,705 or 67% of revenue) than if only human monitors are used because their activity level may not justify upfront investment of the EM

equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who are less engaged in the groundfish fishery are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (Table 24 in Section 6.6.4 of the Draft Amendment 23).

Vessel 2 spends between 5 and 20 days absent on groundfish trips per year. For vessels in this category, monitoring costs as a percentage of revenue is estimated to increase from around 3% under No Action to 19% under 100% ASM coverage (Table 2). Maine vessels in in this category made \$47,800 per year on groundfish trips over FY 2016-FY 2018, on average. Vessels who choose EM instead of human monitors may pay roughly the same amount to slightly more (19% of revenue or around \$9,100 per year, Figure 4). Similar to Vessel 1, vessels in this category are generally not very reliant on groundfish fishery revenue.

Vessel 3 is more highly engaged than Vessels 1 or 2, spending between 80 and 160 days absent per year. Maine vessels in this category earned on average \$616,300 on groundfish trips between 2016 and 2018. Under 100% ASM, static monitoring costs would increase from approximately \$8,150 to \$51,800 per year, but could be reduced by nearly half, to \$27,600 per year if EM is selected instead (Table 2, Figure 4).

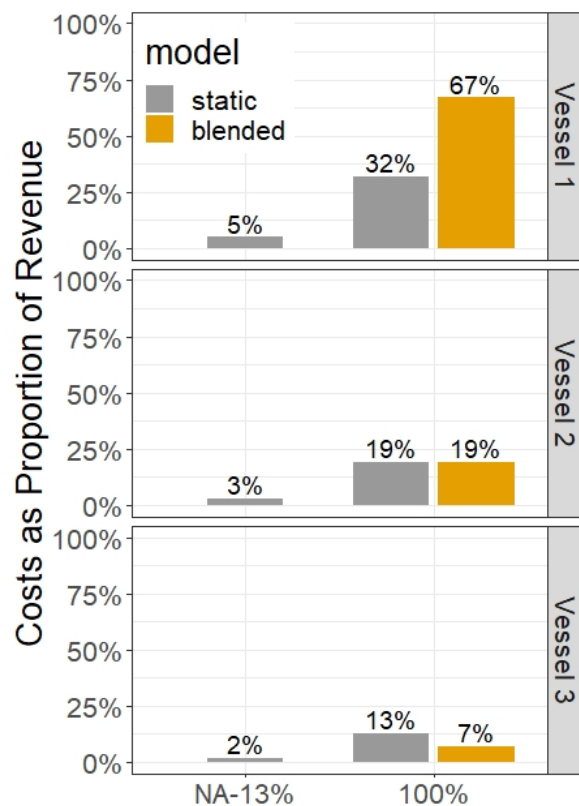


Figure 4. Estimated monitoring costs as a proportion of revenue on groundfish trips for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 represents a vessel that spends less than 5 days absent per year, Vessel 2 spends between 5 and 20 days absent, while Vessel 3 spends between 80 and 160 days absent per fishing year.

Table 2. Estimated static and static-blended monitoring costs for vessels by days absent category, average revenue (total revenue on groundfish trips) and landed pounds calculated for Maine sector vessels in FY 2016-2018. Estimated costs shown as a proportion of revenue. Estimated costs are not predictions of costs.

DA Category	Example Vessel	Alternative	Model	Monitoring cost (mean)	Landed lbs (mean)	Revenue (mean, \$2018)	Proportion of revenue
<=5	Vessel 1	NA_13	static	275	4,100	8,117	0.05
<=5	Vessel 1	ASM_100	static	1,765	4,100	8,117	0.32
<=5	Vessel 1	ASM_100	blended	3,705	4,100	8,117	0.67
>5<=20	Vessel 2	NA_13	static	1,350	38,268	47,783	0.03
>5<=20	Vessel 2	ASM_100	static	8,760	38,268	47,783	0.19
>5<=20	Vessel 2	ASM_100	blended	9,110	38,268	47,783	0.19
>80 <=160	Vessel 3	NA_13	static	8,145	446,404	616,306	0.02
>80 <=160	Vessel 3	ASM_100	static	51,770	446,404	616,306	0.13
>80 <=160	Vessel 3	ASM_100	blended	27,570	446,404	616,306	0.07

New Hampshire Sector Vessel Profiles

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast region. A vessel's groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year. For ASM and EM alternatives, costs have been estimated based on days absent and can be visualized across vessel engagement levels (days absent categories), as well as across different vessel size classes, vessel homeports, and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels homeported in New Hampshire, but much more information is available in the in the Draft Amendment document as well as the main public hearing document.

In 2018, Rye was the most active homeport in New Hampshire, with over 300 days absent from homeported vessels. Other active ports with lower levels of homeport activity included Portsmouth, Hampton, and Seabrook (Figure 5).

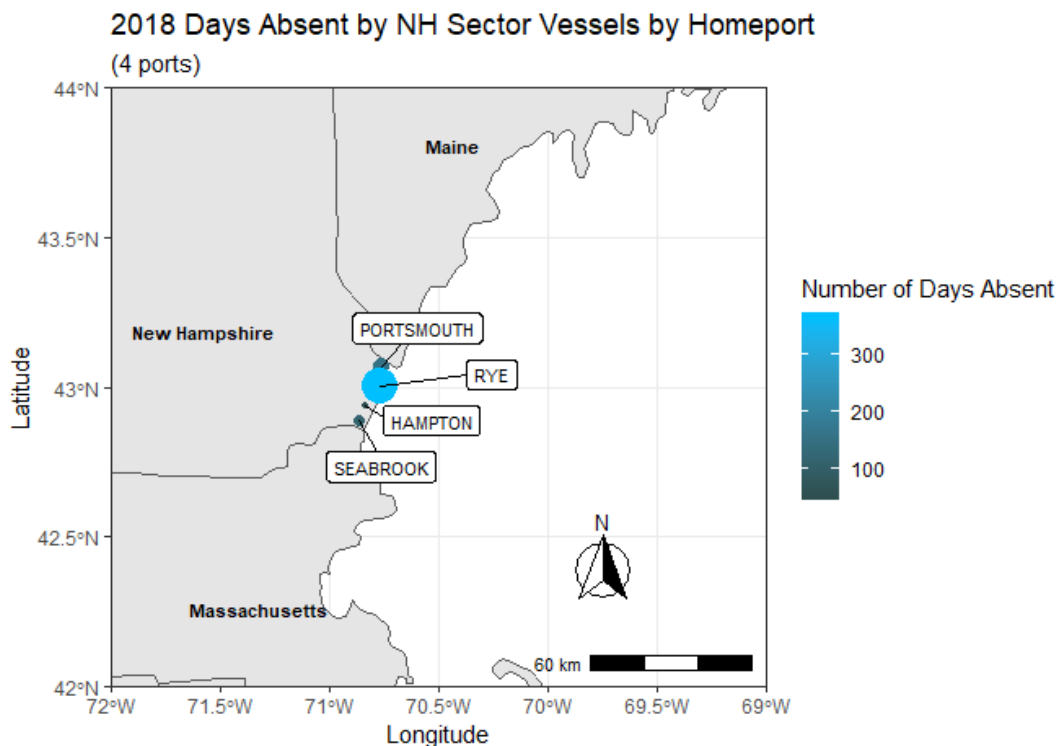


Figure 5. Number of days absent by New Hampshire sector vessels by homeport location. Only vessels homeported in New Hampshire that took at least one groundfish trip in 2018 are shown.

For comparison purposes, we highlight two example vessel types to highlight what estimated monitoring costs might be, noting that these are rough estimates for comparing alternatives and are not predictions of future costs. Where possible, vessel example types span a range of different engagement levels (days absent category), as both an indicator of reliance on the groundfish fishery as well as potential monitoring cost burdens. For other states and regions 3 example vessels were selected, but in

New Hampshire only two profiles could be generated, due to data confidentiality (groups with >3 vessels, **Figure 2**).



- **Vessel 1:** Low level of engagement in the groundfish fishery. Vessels in this class spend between 5 and 20 days absent fishing in the groundfish fishery per year. For New Hampshire vessels in this category, on average they spent about 11 days absent in the groundfish fishery, usually using gillnets (**Table 3**). Three New Hampshire sector vessels fell into this category between 2016 and 2018 (**Figure 6**, **Figure 7**).



- **Vessel 2:** Low-moderate level of engagement. Spends between 20 and 50 days absent per year, on average 42 feet in length (**Table 3**). Between 2016 and 2018, eight New Hampshire sector vessels fell into this category and used trawl gear on most trips (**Figure 6**, **Figure 7**).

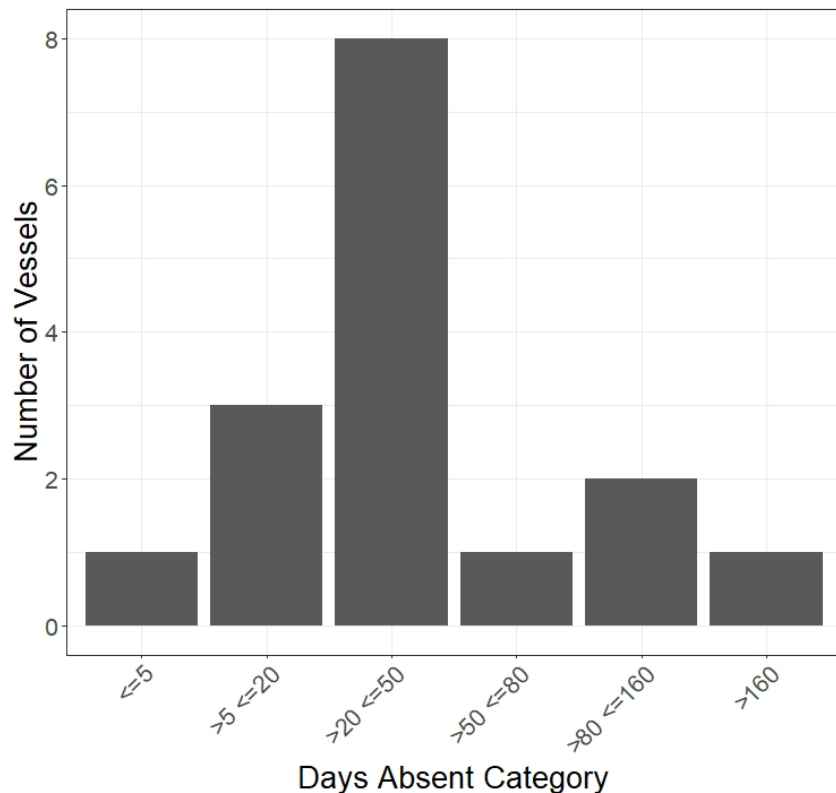


Figure 6. Number of vessels across different days absent categories. Data includes all sector vessels that took at least one groundfish trip and were homeported in New Hampshire in fishing years 2016-2018.

Table 3. Number of New Hampshire sector vessels per days absent (DA) category as well as mean days absent, and length. Total number of trips, and gear type used on trips between fishing years 2016 and 2018 also shown.. Note: The number of trips with each gear type may not sum to the total number of trips in a given category because multiple gear types (including types of trawl gear) may be used on the same trip.

DA category	Example Vessel	Vessels (#)	DA (mean)	Length (ft)	Total trips (#)	Gillnet trips (#)	Trawl trips (#)
>5<=20	Vessel 1	3	10.9	43.8	188	168	20
>20<=50	Vessel 2	8	32.9	42.1	976	294	682

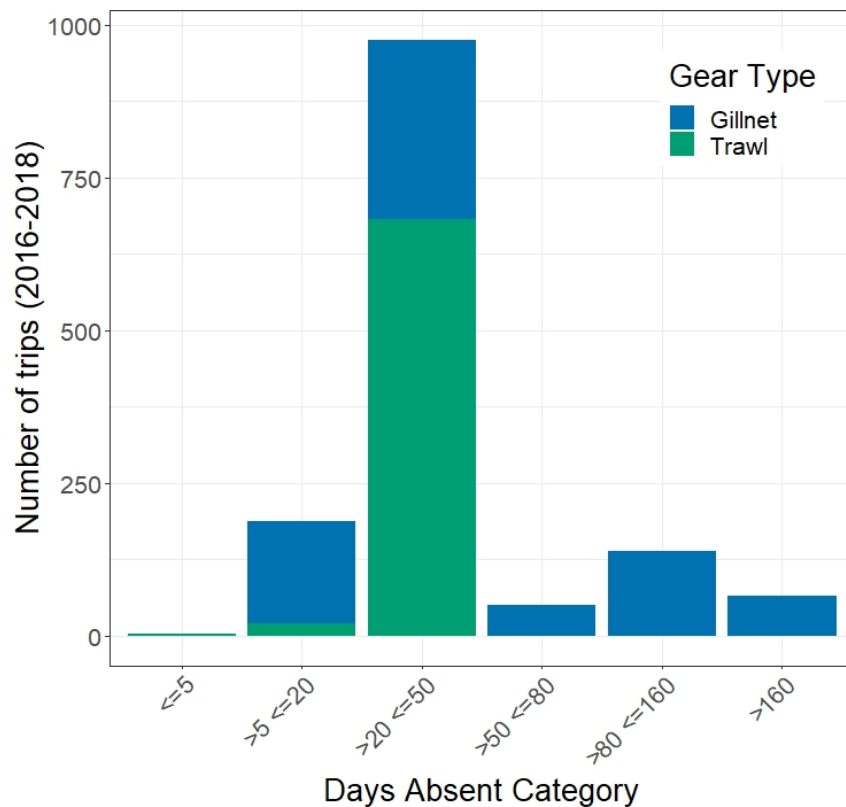


Figure 7. Number of groundfish trips by sector vessels homeported in New Hampshire by days absent category. Gear type used on each trip or subtrip also shown.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the mean vessel) was used as the basis for approximating vessel-level impacts for each days absent category.

For **Vessel 1**, under No Action, static monitoring costs of roughly 13% ASM coverage might amount to 3% of all revenue (\$1,350) on that vessel’s groundfish trips, but increase to 17% (\$8,760) under 100% ASM coverage (**Figure 8**). Vessel 1 earned approximately \$50,644 per year on groundfish trips over FY2016-FY2018, on average. Unlike Vessel 2, static costs with EM might be somewhat higher (\$9,110 or 18% of revenue) than if only human monitors are used because their activity level does not justify upfront investment of the EM equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who are less engaged in the groundfish fishery are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (**Table 24 in Section 6.6.4 of the Draft Amendment**).

Vessel 2 represents the most common vessel category in New Hampshire, spending between 20 and 50 days absent on groundfish trips per year. Similar to Vessel 1, monitoring costs as a percentage of revenue is estimated to increase from around 3% to 17% under 100% ASM coverage (\$3,725 and \$24,065, respectively, **Figure 8**). Vessel 2 earned \$96,960 per year on groundfish trips over FY2016-FY2018, on average. Vessels who choose EM instead of human monitors may be able to cut costs, decreasing the cost burden to 11% of revenue (\$15,000 per year). Similar to Vessel 1, vessels in this category are generally not very reliant on groundfish fishery revenue.

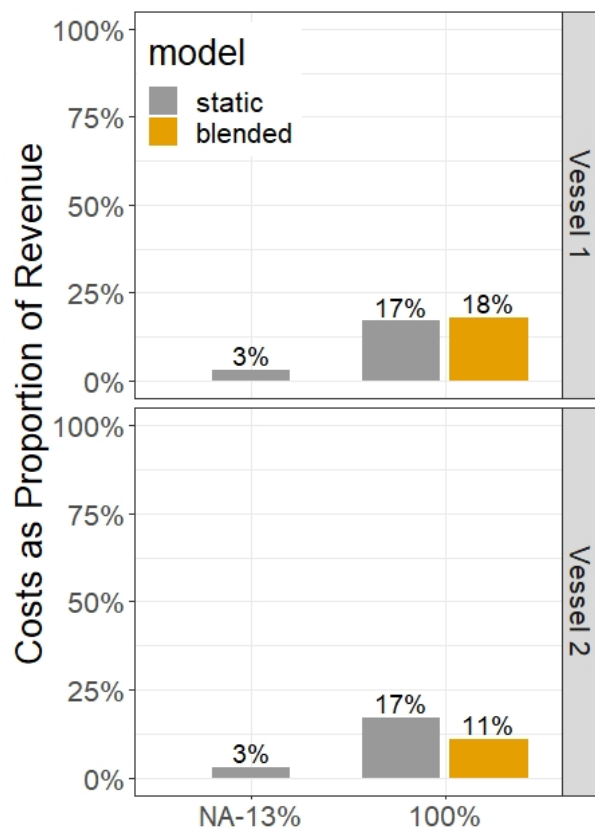


Figure 8. Estimated monitoring costs as a proportion of revenue on groundfish trips for two example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 represents a vessel that spends between 5 and 20 days absent while Vessel 2 spends between 20 and 50 days absent per fishing year.

Table 4. Estimated static and static-blended monitoring costs for vessels by days absent categories, average revenue and landed pounds calculated for New Hampshire sector vessels in 2016-2018 only. Estimated costs shown as a proportion of revenue. Estimated costs are not predictions of cost.

DA Category	Example Vessel	Alternative	Model	Monitoring cost (mean)	Landed lbs (mean)	Revenue (mean, \$2018)	Proportion of revenue
>5<=20	Vessel 1	NA_13	static	1,350	79,818	50,644	0.03
>5<=20	Vessel 1	ASM_100	static	8,760	79,818	50,644	0.17
>5<=20	Vessel 1	ASM_100	blended	9,110	79,818	50,644	0.18
>20<=50	Vessel 2	NA_13	static	3,725	96,960	137,806	0.03
>20<=50	Vessel 2	ASM_100	static	24,065	96,960	137,806	0.17
>20<=50	Vessel 2	ASM_100	blended	14,880	96,960	137,806	0.11

Massachusetts Sector Vessel Profiles

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast region. A vessel's groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year (days absent). For ASM and EM alternatives, costs have been estimated based on days absent and can be visualized across vessel engagement levels (days absent categories), as well as across different vessel size classes, vessel homeports, and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels homeported in Massachusetts, but much more information is available in the Draft Amendment 23 document as well as the main public hearing document.

In fishing year(FY) 2018, Boston was the most engaged homeport area in Massachusetts, with around 2,400 days absent from homeported vessels. Gloucester is the second most engaged port by homeport with 2,300 days absent in FY 2018. Across the entire state, 113 sector vessels participated in the fishery across 16 homeport areas (**Figure 9**).

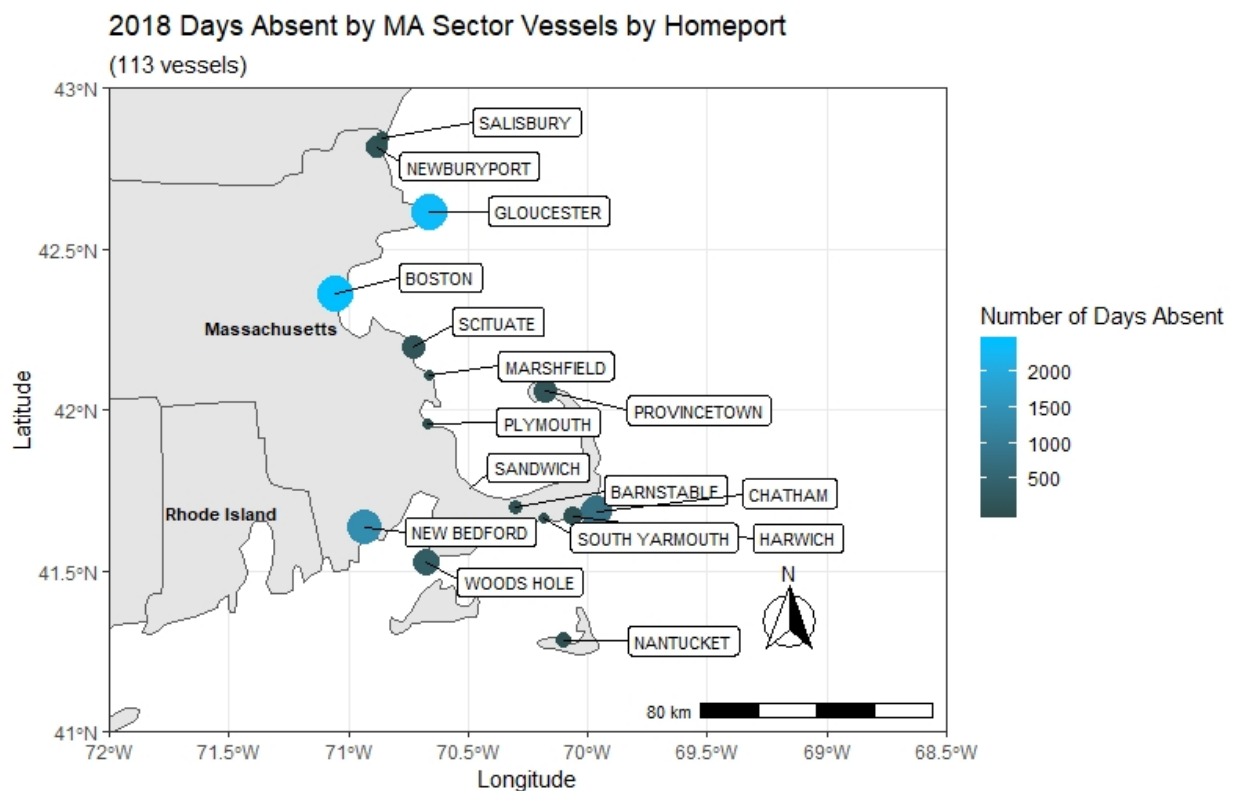


Figure 9. Number of days absent by sector vessels by homeport location. Only days absent from vessels homeported in Massachusetts that took at least one groundfish trip in FY 2018 are shown.

For comparison purposes, we highlight three example vessel types to highlight what estimated monitoring costs might be, noting that these are rough estimates for comparing alternatives and are not predictions of future costs. Vessel example types span a range of different engagement levels (days absent category, **Figure 10**), as both an indicator of reliance on the groundfish fishery as well as potential monitoring cost burdens since it is expected that as time spent fishing increases monitoring costs will also increase.



- **Vessel 1:** Low level of engagement. Spends between 5 and 20 days absent per year fishing on groundfish trips. For Massachusetts vessels in this category, they spent 12 days absent in the groundfish fishery, usually using trawl gear, and are 45 feet in length, on average (**Table 5, Figure 11**). 33 sector vessels fell into this category between 2016 and 2018 (**Figure 10**).



- **Vessel 2:** High-moderate level of engagement. Spends between 50 and 80 days absent per year fishing on groundfish trips. In Massachusetts, vessels in this category spent 61 days absent per year, primarily used gillnets, and were 58 feet in length, on average (**Table 5, Figure 11**). Between 2016 and 2018, 23 sector vessels fell into this category (**Figure 10**).



- **Vessel 3:** Highest level of engagement. Spends more than 160 days absent on groundfish trips per year. In Massachusetts, the 17 vessels in this category spent 179 days absent per year, primarily used trawl gear, and were 78.5 feet in length, on average (**Table 5, Figure 11**).

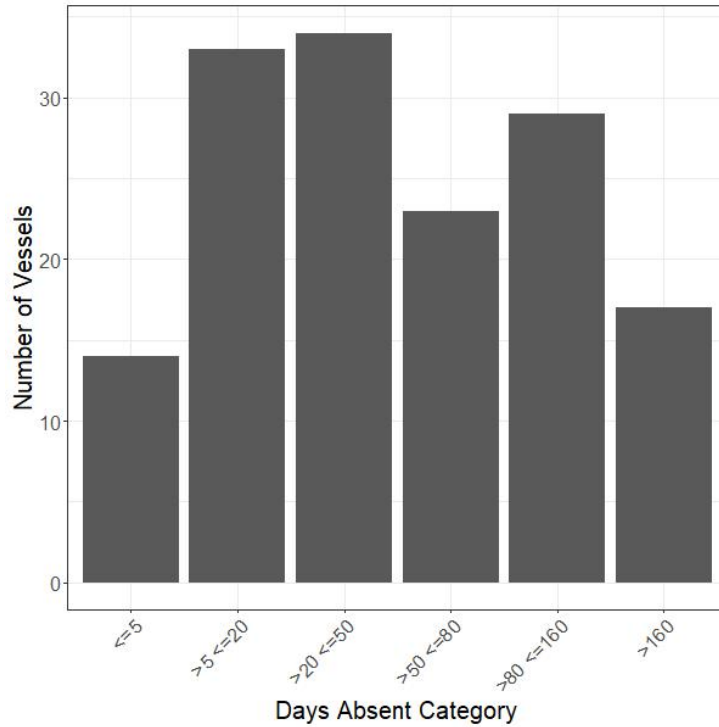


Figure 10. Number of vessels across different days absent categories. Data includes all sector vessels that took at least one groundfish trip and were homeported in Massachusetts in fishing years 2016-2018.

Table 5. Number of Massachusetts sector vessels per days absent (DA) category as well as mean days absent, and length. Total number of trips, and gear type used on trips between fishing years 2016 and 2018 also shown.. Note: The number of trips with each gear type may not sum to the total number of trips in a given category because multiple gear types (including types of trawl gear) may be used on the same trip. Other gear includes gear types such as pots or longlines.

DA category	Example Vessel	Vessels (#)	DA (mean)	Length (ft)	Total trips (#)	Gillnet trips (#)	Trawl trips (#)	Handgear trips (#)	Other gear trips (#)
>5 <=20	Vessel 1	33	12.0	45.4	1,721	374	869	188	305
>50 <=80	Vessel 2	23	60.8	57.9	3,392	2,103	1,286	26	6
>160	Vessel 3	17	178.9	78.5	1,604	24	1,670	0	1

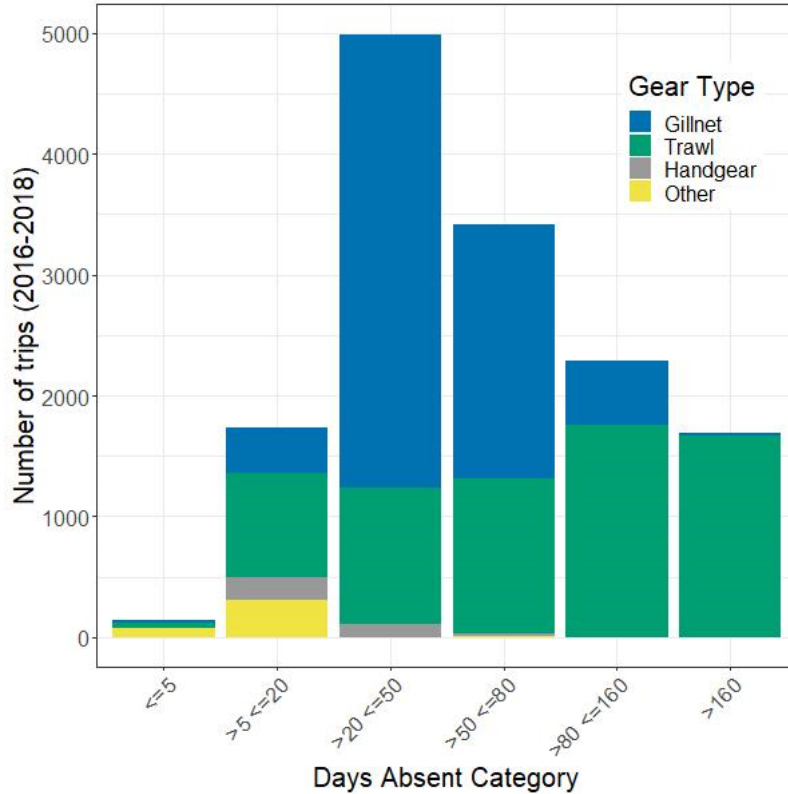


Figure 11. Number of groundfish trips by sector vessels homeported in Massachusetts by Days absent category. Gear type used on each trip or subtrip also shown.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the mean vessel) was used as the basis for approximating vessel-level impacts for each days absent category.

For **Vessel 1**, who is low to moderately engaged, under No Action, static monitoring costs of roughly 13% ASM coverage might amount to 2% of all revenue (\$1,350) on that vessel’s groundfish trips, but increase to 15% (\$8,760) under 100% ASM coverage (**Table 6, Figure 12**). Massachusetts vessels in this category earned approximately \$58,800 per year on groundfish trips over FY2016-FY2018, on average. Static costs with EM might be slightly higher (\$9,110) than the costs of 100% human monitoring, but both amount to approximately 15% of revenue. Vessels in this category may not see a cost savings from EM because their activity level may not justify upfront investment of the EM equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who are less engaged in the groundfish fishery are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (**Table 24 in Section 6.6.4 of the Draft Amendment 23**).

Vessel 2 is moderately to highly engaged, spending between 50 and 80 days absent on groundfish trips per year. For vessels in this category, monitoring costs as a percentage of revenue is estimated to increase from around 2% to 14% under 100% ASM coverage (**Figure 12, Table 6**). Massachusetts vessels in in this category made \$340,000 per year on groundfish trips over FYs 2016-FY2018, on average.

Vessels who choose EM instead of human monitors may see a cost reduction compared to human monitors (to 6% of revenue or \$21,700 per year).

Vessel 3 is the most engaged in the groundfish fishery, spending over 160 days absent per year. Massachusetts vessels in this category earned, on average, \$1.38 million on groundfish trips between FYs 2016 and 2018. Under 100% ASM, static monitoring costs would increase from approximately \$13,100 (less than 1% of revenue) to \$83,000 per year (6% of revenue), but could be reduced by more than half, to \$38,300 per year (3% of revenue) if EM is selected instead (**Table 6, Figure 12**)

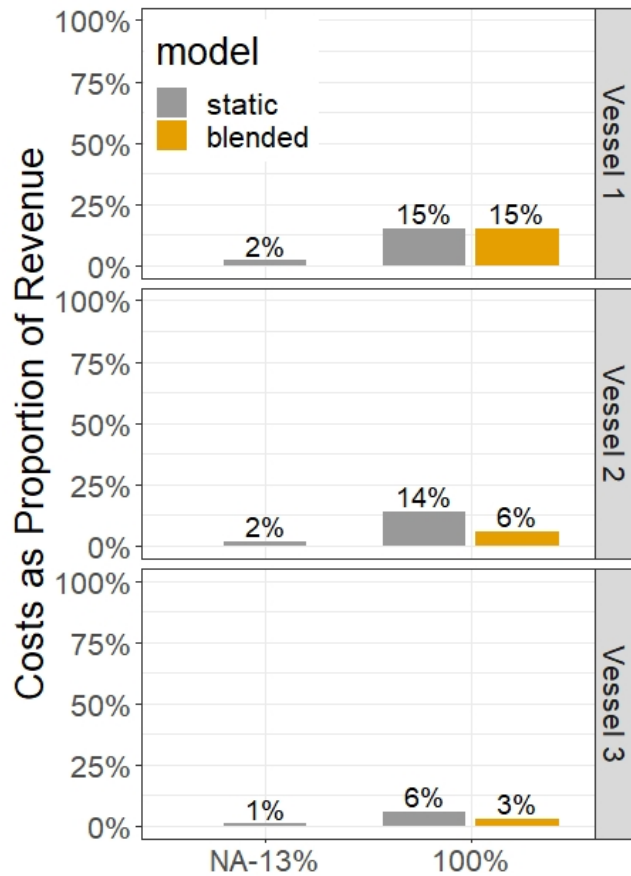


Figure 12. Estimated monitoring costs as a proportion of revenue on groundfish trips for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 represents a vessel that spends between 5 and 20 days absent, Vessel 2 spends between 50 and 80 days absent per fishing year, and Vessel 3 spends over 160 days absent per year.

Table 6. Estimated static and static-blended monitoring costs for vessels by days absent category, average revenue (total revenue on groundfish trips) and landed pounds calculated for Massachusetts sector vessels in FYs 2016-2018. Estimated costs shown as a proportion of revenue. Estimated costs are not predictions of cost.

DA Category	Example Vessel	Alternative	Model	Monitoring cost (mean)	Landed lbs (mean)	Revenue (mean, \$2018)	Proportion of revenue
>5 <=20	Vessel 1	NA_13	static	1,350	35,034	58,792	0.02
>5 <=20	Vessel 1	ASM_100	static	8,760	35,034	58,792	0.15
>5 <=20	Vessel 1	ASM_100	blended	9,110	35,034	58,792	0.15
>50 <=80	Vessel 2	NA_13	static	7,490	301,794	340,324	0.02
>50 <=80	Vessel 2	ASM_100	static	48,200	301,794	340,324	0.14
>50 <=80	Vessel 2	ASM_100	blended	21,700	301,794	340,324	0.06
>160	Vessel 3	NA_13	static	13,095	1,050,386	1,380,793	0.01
>160	Vessel 3	ASM_100	static	82,945	1,050,386	1,380,793	0.06
>160	Vessel 3	ASM_100	blended	38,335	1,050,386	1,380,793	0.03

Rhode Island Vessel Profiles

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast region. A vessel's groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year (days absent). For ASM and EM alternatives, costs have been estimated based on days absent and can be visualized across vessel engagement levels (days absent categories), as well as across different vessel size classes, vessel homeports, and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels homeported in Rhode Island, but much more information about the analyses and impacts is available in the Draft Amendment document as well as the main public hearing document.

In fishing year (FY) 2018, Point Judith was the most engaged homeport area in Rhode Island, with nearly 500 days absent from homeported vessels. In FY 2018 all of Rhode Island's 20 vessels were homeported in either Point Judith or in the Narragansett/Wakefield Area, with the majority of vessels homeported in Point Judith (17 vessels, **Figure 13**).

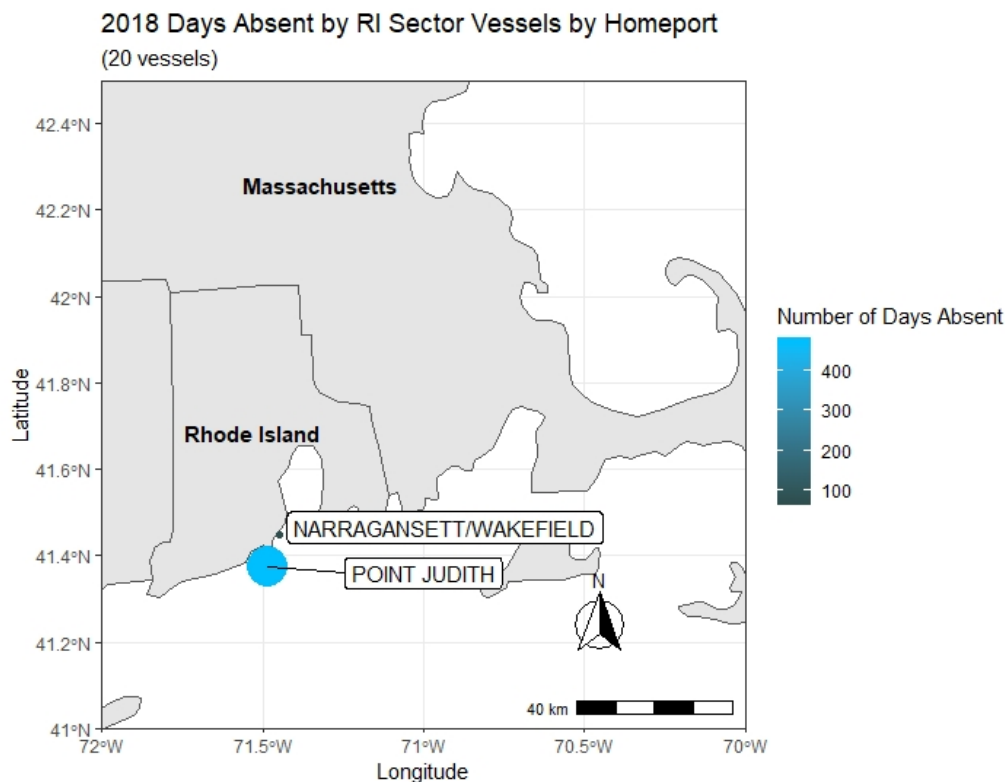


Figure 13. Number of days absent by sector vessels by homeport location. Only days absent from vessels homeported in Rhode Island that took at least one groundfish trip in FY 2018 are shown.

For comparison purposes, we highlight three example vessel types to highlight what estimated monitoring costs might be, noting that these are rough estimates for comparing alternatives and are not predictions of future costs. Vessel example types span a range of different engagement levels (days absent category, **Figure 14**), as both an indicator of reliance on the groundfish fishery as well as potential monitoring cost burdens since it is expected that as time spent fishing increases monitoring costs will also increase.



- **Vessel 1:** Lowest level of engagement. Spends 5 or fewer days absent per year fishing on groundfish trips. Between FYs 2016 and 2018 majority of Rhode Island sector vessels fell in this category (**Figure 14**). On average, each spent 2.7 days absent in the groundfish fishery, only used trawl gear, and were around 65 feet in length (**Table 7, Figure 15**).



- **Vessel 2:** Low-moderate level of engagement. Spends between 20 and 50 days absent per year fishing on groundfish trips. In Rhode Island, vessels in this category each spent 30 days absent per year, primarily used trawl gear, and were 58 feet in length, on average (**Table 7, Figure 15**). Between 2016 and 2018, 7 sector vessels fell into this category (**Figure 14**).



- **Vessel 3:** High-moderate level of engagement. Spends between 50 and 80 days absent on groundfish trips per year. In Rhode Island, the 3 vessels in this category each spent 57.5 days absent per year, only used trawl gear, and were 70.5 feet in length, on average (**Table 7, Figure 15**).

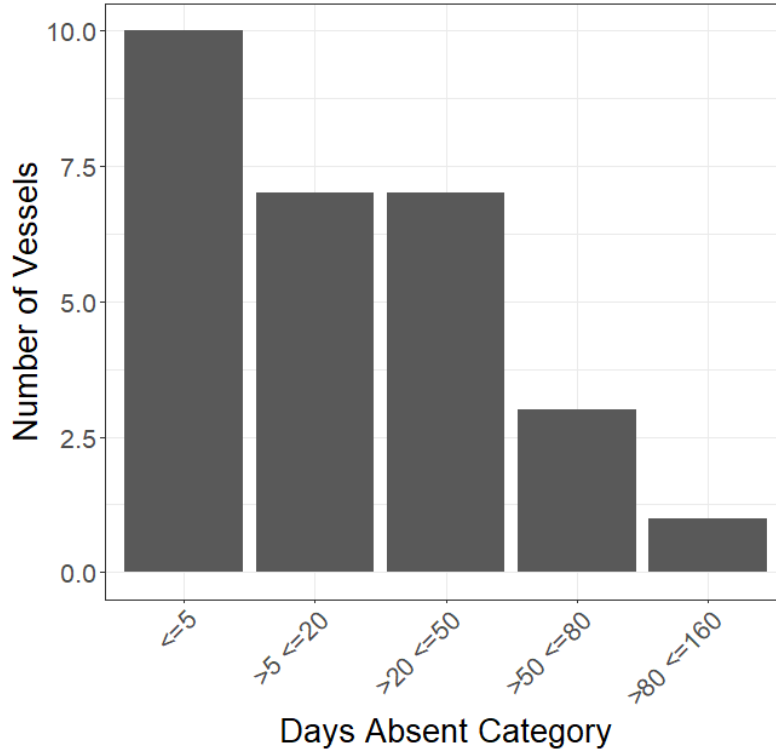


Figure 14. Number of vessels across different days absent categories. Data includes all sector vessels that took at least one groundfish trip and were homeported in Rhode Island in fishing years 2016-2018.

Table 7. Number of Rhode Island sector vessels per days absent (DA) category as well as mean days absent, and length. Total number of trips, and gear type used on trips between fishing years 2016 and 2018 also shown.. Note: The number of trips with each gear type may not sum to the total number of trips in a given category because multiple gear types (including types of trawl gear) may be used on the same trip.

DA category	Example Vessel	Vessels (#)	DA (mean)	Length (ft)	Total trips (#)	Gillnet trips (#)	Trawl trips (#)
<5	Vessel 1	10	2.7	65.5	76	0	76
>20<=50	Vessel 2	7	30.1	58.1	889	53	836
>50<=80	Vessel 3	3	57.5	70.5	792	0	792

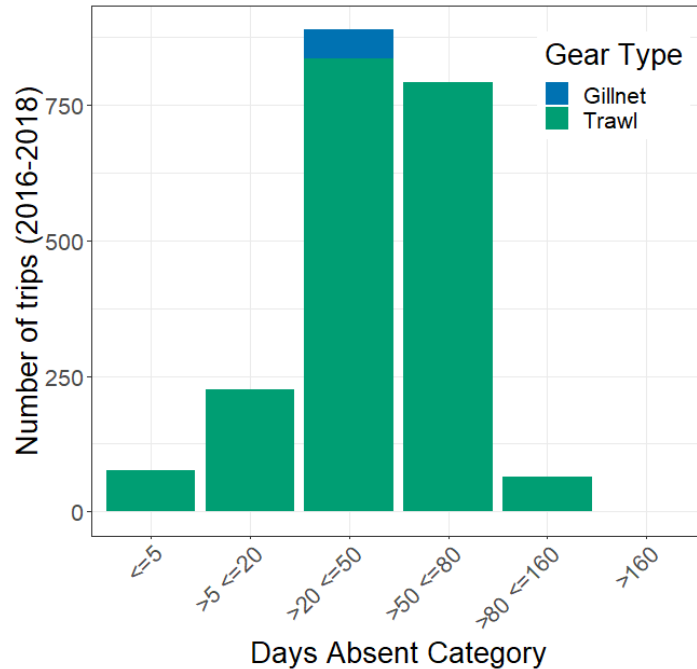


Figure 15. Total number of groundfish trips by sector vessels homeported in Rhode Island by days absent category in FYs 2016-2018. Gear type used on each trip or subtrip also shown.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the mean vessel) was used as the basis for approximating vessel-level impacts for each days absent category.

For **Vessel 1**, under No Action, static monitoring costs of roughly 13% ASM coverage might amount to 2% of all revenue (\$275) on that vessel’s groundfish trips, but increase to 13% (\$1,765) under 100% ASM coverage (**Table 8, Figure 16**). Rhode Island vessels in this category earned approximately \$13,650 per year on groundfish trips over FY2016-FY2018, on average. Static costs with EM might be higher (\$3,705) than the costs of 100% human monitoring, approximately 27% of revenue. Vessels in this category do not see a cost savings from EM because their activity level may not justify upfront investment of the EM equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who are less engaged in the groundfish fishery are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (**Table 24 in Section 6.6.4 of the Draft Amendment 23**).

Vessel 2 is low to moderately engaged, spending between 20 and 50 days absent on groundfish trips per year. For vessels in this category, monitoring costs as a percentage of revenue is estimated to increase from around 2% to 16% under 100% ASM coverage (from \$3,725 to \$24,065, **Table 8, Figure 16**). Rhode Island vessels in in this category made roughly \$150,000 per year on groundfish trips over FYs 2016-2018, on average. Vessels who choose EM instead of human monitors may see a cost reduction compared to human monitors (to 10% of revenue or \$14,880 per year).

Vessel 3 is moderately to highly engaged in the groundfish fishery, spending between 50 and 80 days absent per year. Rhode Island vessels in this category earned around, on average, \$300,000 on groundfish trips between FYs 2016 and 2018. Under 100% ASM, static monitoring costs would increase from approximately \$7,500 (3% of revenue) to \$48,200 per year (16% of revenue), but could be reduced by more than half, to \$21,700 per year (7% of revenue) if EM is selected instead (**Table 8, Figure 16**).

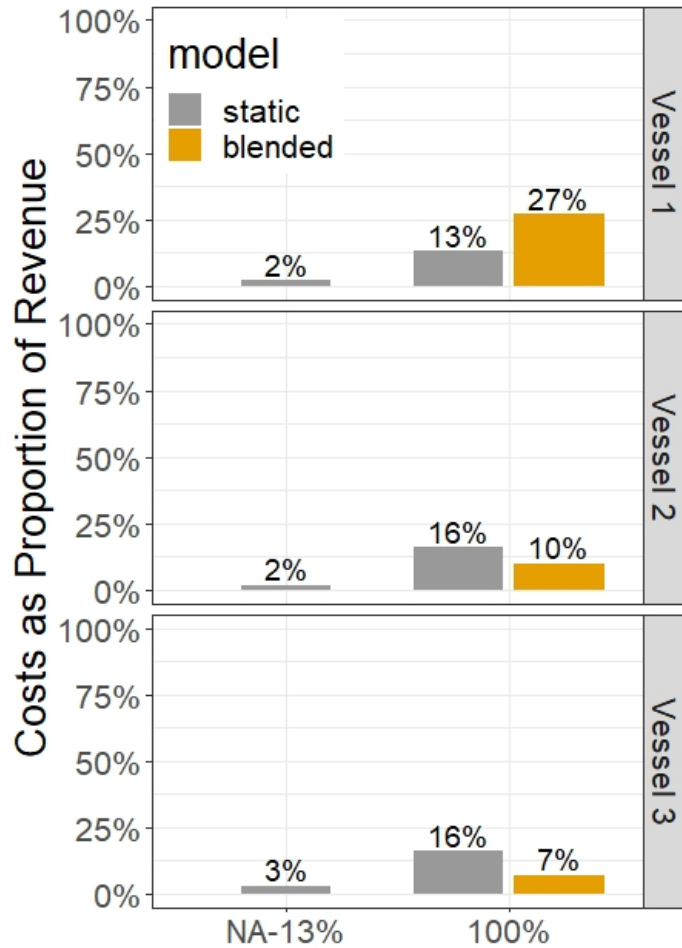


Figure 16. Estimated monitoring costs as a proportion of groundfish trip revenue for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 represents a vessel that spends 5 or less days absent per year, Vessel 2 spends between 20 and 50 days absent per fishing year, and Vessel 3 spends between 50 and 80 days absent per year.

Table 8. Estimated static and static-blended monitoring costs for vessels by days absent categories. Average revenue (total revenue on groundfish trips) and landed pounds calculated for Rhode Island sector vessels in FYs 2016-2018 only. Estimated costs shown as a proportion of revenue. Estimated costs are not predictions of cost.

DA Category	Example Vessel	Alternative	Model	Monitoring cost (mean)	Landed lbs (mean)	Revenue (mean, \$2018)	Proportion of revenue
<=5	Vessel 1	NA_13	static	275	7,608	13,653	0.02
<=5	Vessel 1	ASM_100	static	1,765	7,608	13,653	0.13
<=5	Vessel 1	ASM_100	blended	3,705	7,608	13,653	0.27
>20<=50	Vessel 2	NA_13	static	3,725	240,071	150,021	0.02
>20<=50	Vessel 2	ASM_100	static	24,065	240,071	150,021	0.16
>20<=50	Vessel 2	ASM_100	blended	14,880	240,071	150,021	0.1
>50<=80	Vessel 3	NA_13	static	7,490	698,092	295,731	0.03
>50<=80	Vessel 3	ASM_100	static	48,200	698,092	295,731	0.16
>50<=80	Vessel 3	ASM_100	blended	21,700	698,092	295,731	0.07

Connecticut and Mid-Atlantic State Sector Vessel Profiles

Impacts on individual vessels are expected to vary across the fleet, due to the diversity of vessel operations across the Northeast and greater Mid-Atlantic Region. A vessel’s groundfish operations may be more or less impacted depending on the size of their operations, including vessel size and the number of days spent fishing in the fishery in a given year. For ASM and EM alternatives costs have been estimated based on days absent and can be visualized across vessel engagement levels (days absent categories), as well as across different vessel size classes, vessel homeports, and sector. Here, a few example vessel profiles are created to give a sense of the breadth of impacts across sector vessels homeported in Connecticut, New York, New Jersey, Delaware, and North Carolina², but much more information is available in the in the Draft Amendment document as well as the main public hearing document.

Between fishing years (FYs) 2016 and 2018, Hampton Bays and Shinnecock was the most active homeport area in the region with over 200 days absent from homeported vessels. Across all three fishing years 17 vessels participated in the fishery across 9 homeports (**Figure 17**).

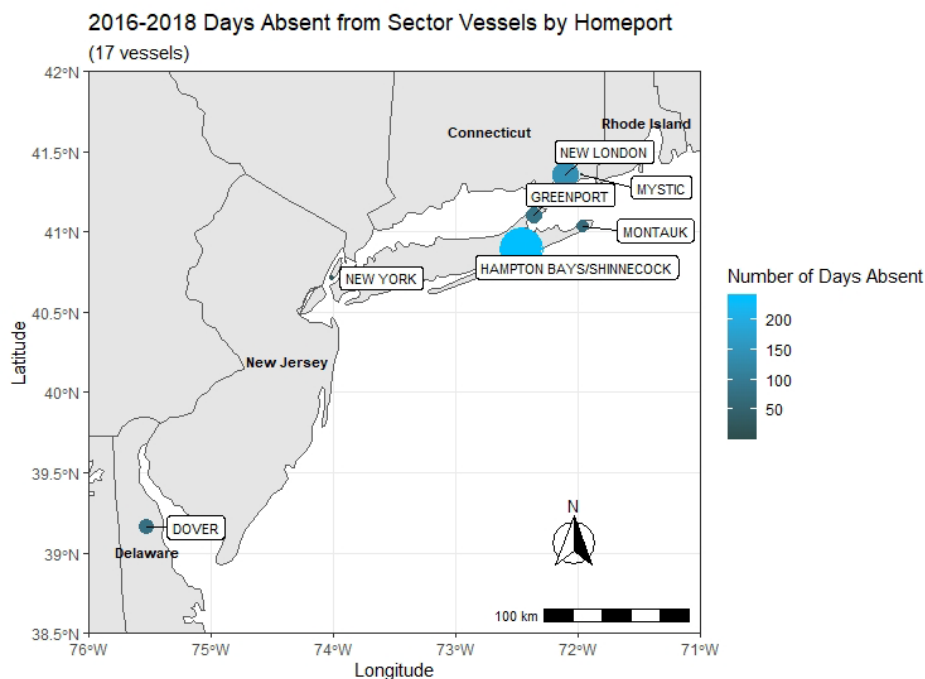


Figure 17. Number of days absent by sector vessels by homeport location. Only days absent from vessels homeported in CT, NY, NJ, and DE that took at least one groundfish trip in FYs 2016-2018 are shown. **Note vessels shown homeported south of DE not shown (one in North Carolina).

² These are all the states with homeported groundfish sector vessels between FYs 2016 and 2018.

For comparison purposes, we highlight three example vessel types to highlight what estimated monitoring costs might be, noting that these are rough estimates for comparing alternatives and are not predictions of future costs. Where possible, example vessel types span a range of different engagement levels (days absent category), as both an indicator of reliance on the groundfish fishery as well as potential monitoring cost burdens. Example vessels were limited to groups with 3 or more vessels, for the Connecticut and Mid-Atlantic Region, these groups were limited to those spending 50 days or less absent on groundfish trips per year, only two other vessels in the region spent more time absent per year—between 50 and 80 days absent (**Figure 18**).



- **Vessel 1:** Least engaged in the groundfish fishery. Vessels in this class spend less than 5 days absent fishing in the groundfish fishery per year. For Connecticut/Mid-Atlantic vessels in this category, on average they spent 2.3 days absent in the groundfish fishery, usually using trawl gear (**Table 9**). 5 sector vessels in this region fell into this category between FY 2016 and FY 2018 (**Figure 19**).



- **Vessel 2:** Low level of engagement. Spends between 5 and 20 days absent per year. In this region, vessels spent on average, 10.5 days absent in the groundfish fishery and were around 51 feet in length. Between FY 2016 and FY 2018, 5 sector vessels fell into this category and used exclusively trawl gear (**Table 9, Figure 19**).



- **Vessel 3:** low-moderate level of engagement. Spends between 20 and 50 days absent per year. The 6 sector vessels in this category were on average 47 feet in length, spent 24.3 days absent on groundfish trips, and used a combination of gillnet and trawl gear (**Table 9, Figure 19**).

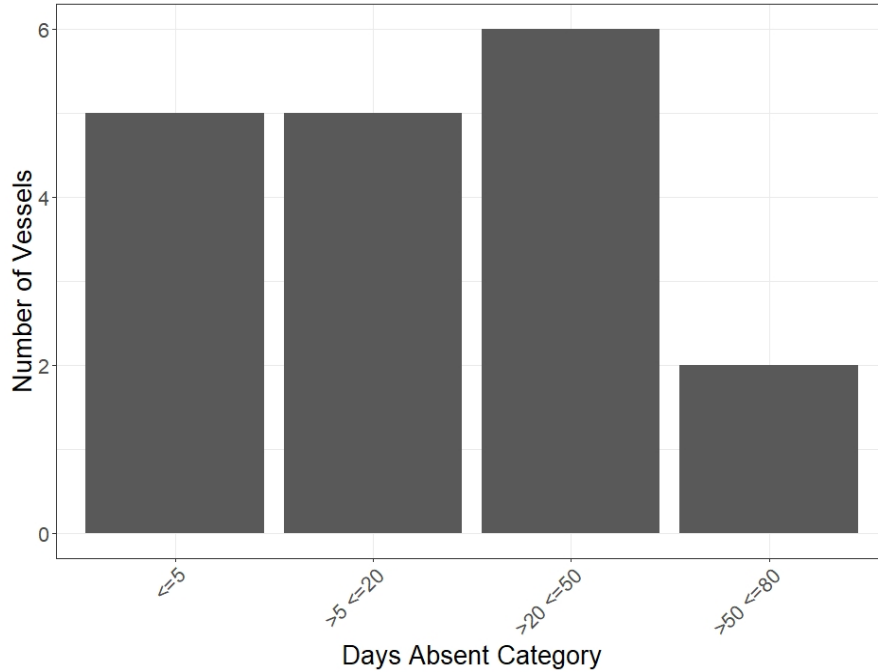


Figure 18. Number of vessels across different days absent categories. Data includes all sector vessels that took at least one groundfish trip and were homeported in CT or any Mid-Atlantic state in fishing years 2016-2018.

Table 9. Number of CT and Mid-Atlantic sector vessels per days absent (DA) category as well as mean days absent, and length. Total number of trips, and gear type used on trips between fishing years 2016 and 2018 also shown. Note: The number of trips with each gear type may not sum to the total number of trips in a given category because multiple gear types (including types of trawl gear) may be used on the same trip.

DA category	Example Vessel	Vessels (#)	DA (mean)	Length (ft)	Total trips (#)	Gillnet trips (#)	Trawl trips (#)	Handgear trips
<=5	Vessel 1	5	2.3	56.9	36	1	35	0
>5<=20	Vessel 2	5	10.5	51.2	169	0	169	0
>20<=50	Vessel 3	6	24.3	47.1	527	124	402	1

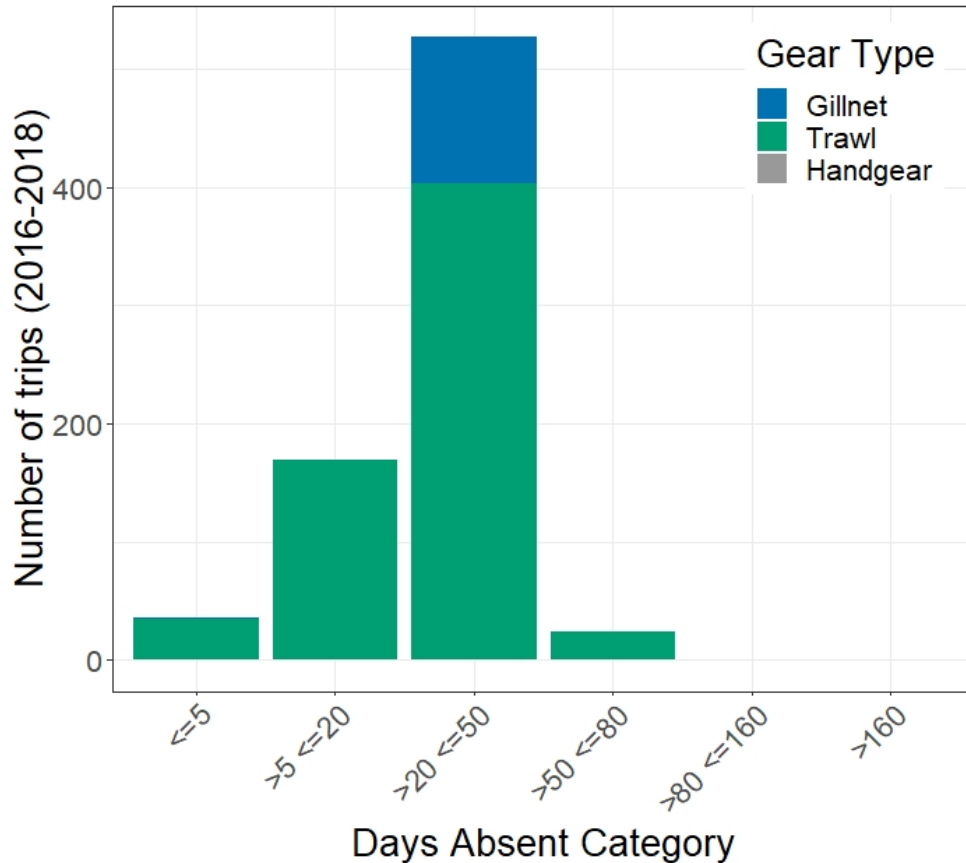


Figure 19. Number of groundfish trips by sector vessels homeported in CT or the Mid-Atlantic region by days absent category in FYs 2016-2018. Gear type used on each trip or subtrip also shown.

For each example vessel profile, information on total revenue on groundfish trips for a typical vessel (the mean vessel) was used as the basis for approximating vessel-level impacts for each days absent category.

For **Vessel 1**, under No Action, static monitoring costs of roughly 13% ASM coverage might amount to 2% of all revenue (\$275) on that vessel’s groundfish trips, but increase to 12% (\$1,765) under 100% ASM coverage (**Table 10, Figure 20**). Vessel 1 earned approximately \$14,400 per year on groundfish trips over FYs 2016-FY2018, on average. Static costs with EM might be higher (\$3,700 or 26% of revenue) than if only human monitors are used because their activity level may not justify upfront investment of the EM equipment (such as cameras). While such costs might affect Vessel 1’s decision to continue to participate in the groundfish fishery, vessels who are less engaged in the groundfish fishery are not solely reliant on the groundfish fishery and obtain a high proportion of their total revenue from other fisheries (**Table 24 in Section 6.6.4 of the Draft Amendment 23**).

Vessel 2 has a low engagement level, spending between 5 and 20 days absent on groundfish trips per year. For vessels in this category, monitoring costs as a percentage of revenue is estimated to increase from around 2% to 14% under 100% ASM coverage (**Table 10**). These types of vessels in Connecticut and in the Mid-Atlantic made \$61,200 per year on groundfish trips over FYs 2016-FY2018, on average.

Vessels who choose EM instead of human monitors may pay roughly the same amount to slightly more (15% of revenue or \$9,000 per year, **Figure 20**). Similar to Vessel 1, vessels in this category are generally not very reliant on groundfish fishery revenue.

Vessel 3 is low to moderately engaged, spending between 20 and 50 days per year. Vessels in this category earned \$127,800 on groundfish trips between 2016 and 2018, on average. Static monitoring costs would increase under 100% ASM from approximately \$3,700 to \$24,000 per year, but could be reduced to \$14,900 per year if EM is selected instead (**Table 10, Figure 20**).

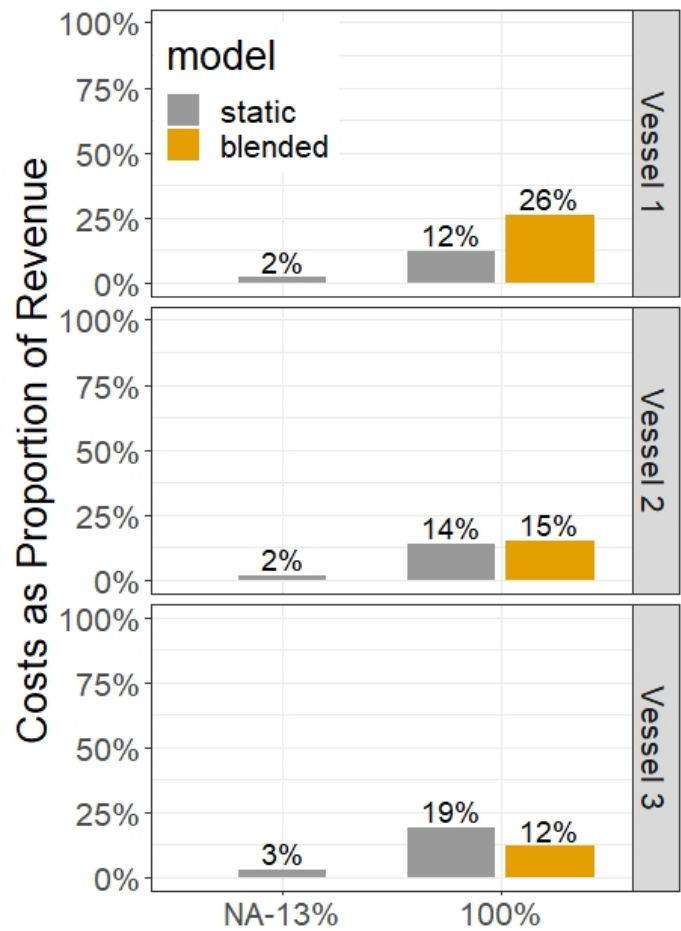


Figure 20. Estimated monitoring costs as a proportion of revenue on groundfish trips for three example vessel types under the No Action (NA) and 100% coverage alternatives. Static and static-blended model results are shown to show the difference in costs when EM is an option under 100% coverage. Vessel 1 represents a vessel that spends 5 or less days absent per year, Vessel 2 spends between 5 and 20 days absent while Vessel 3 spends between 20 and 50 days absent per fishing year.

Table 10. Estimated static and static-blended monitoring costs for vessels by days absent category. Average revenue and landed pounds calculated for CT and Mid-Atlantic sector vessels in FYs 2016-2018 only. Estimated costs shown as a proportion of revenue. Estimated costs are not predictions of cost.

DA Category	Example Vessel	Alternative	Model	Monitoring cost (mean)	Landed lbs (mean)	Revenue (mean, \$2018)	Proportion of revenue
<=5	Vessel 1	NA_13	static	275	6,054	14,428	0.02
<=5	Vessel 1	ASM_100	static	1,765	6,054	14,428	0.12
<=5	Vessel 1	ASM_100	blended	3,705	6,054	14,428	0.26
>5<=20	Vessel 2	NA_13	static	1,350	16,076	61,181	0.02
>5<=20	Vessel 2	ASM_100	static	8,760	16,076	61,181	0.14
>5<=20	Vessel 2	ASM_100	blended	9,110	16,076	61,181	0.15
>20<=50	Vessel 3	NA_13	static	3,725	52,422	127,840	0.03
>20<=50	Vessel 3	ASM_100	static	24,065	52,422	127,840	0.19
>20<=50	Vessel 3	ASM_100	blended	14,880	52,422	127,840	0.12