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NEFSC Fishery Independent Surveys

Kathryn Ford (PEMAD Chief) & Peter Chase (ESB Chief)

Thank you to: Philip Politis (NEFSC Bottom Trawl Survey Lead), Chad Keith (NEFSC Shellfish Survey Program Lead), Nathan Keith (NEFSC Vessel Coordinator), Jon Hare (NEFSC Center Director), Tim Miller (NEFSC PopDy), Lyle Britt (AFSC RACE Division Chief), Anna Mercer (NEFSC CRB Chief), NTAP (Dan Salerno & Wes Townsend, Co-chairs)

NEFMC, Sept 26, 2023

Outline

1. Overview of decisions regarding surveys (Jon)
2. Overview of fishery independent surveys (Kathryn)
3. Bigelow survey (multispecies bottom trawl) (Kathryn)
 - *performance, spring 2023 challenges, contingency planning, future scheduling*
4. Scallop survey (Pete)
 - *performance, spring 2023 challenges, contingency planning, future scheduling*
5. Question and answer session



NEFSC Intent

Intent is to consider multiple options 1) for mitigating the effect of wind energy development on Northeast Fisheries Science Center fisheries independent surveys and 2) for building resiliency for fisheries independent surveys in the northeast region to accommodate short-term and medium-term disruptions

Work collaboratively with partners and stakeholders

Work adaptively to develop long-term options

Take actions to meet needs as quickly as possible



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Elements of Decisions

- Scientific value (data collected can be used in regional stock assessments / fisheries management)
- Funding & funding mechanism
 - current funding
 - additional funding (from whom, what direction)
 - contracts / grants / NEFSC funds / OMAO funds / other
- Personnel - who will support survey activities
- Data management considerations
- Long-term viability of platform, funding, personnel
- Flexibility (short-term reactivity)
- Need for calibration
- Permitting/protected species concerns



NEFSC fishery independent surveys



14 surveys
All 4 NEFSC science divisions



Multisp. Bottom Trawl



Coop. Bottom Longline



MM&ST Aerial & Vessel



Shark Bottom Longline

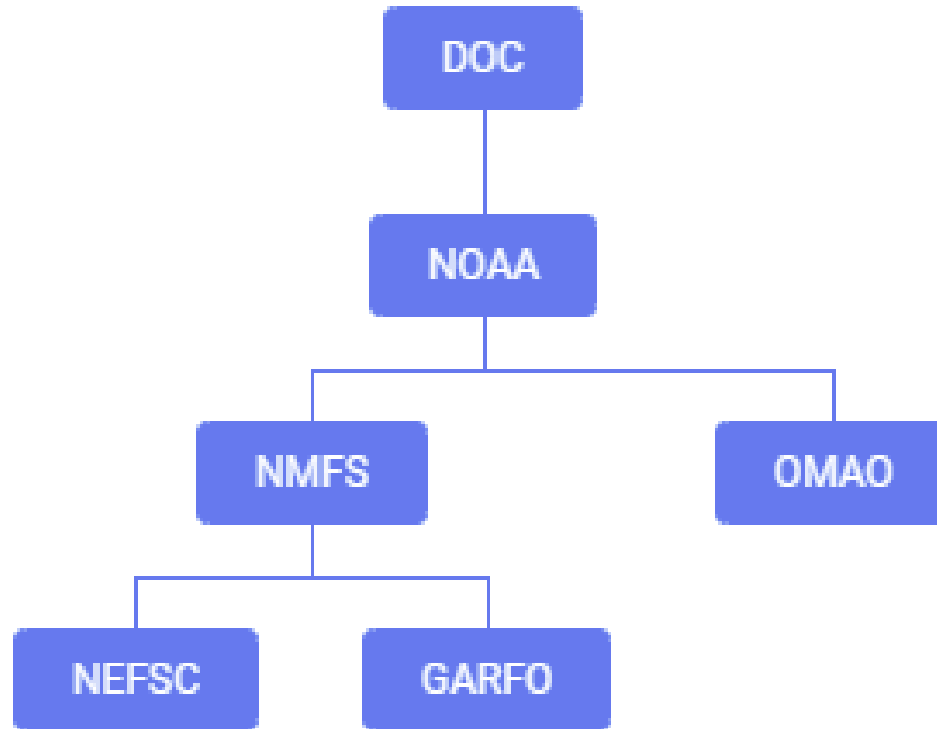
Fishery independent surveys

Multisp. Bottom Trawl



- use gear and deployment protocols that differ from commercial fishing practices, e.g.:
 - smaller mesh size to catch smaller fish
 - sampling areas with “no fish”
- goal is continuity from year to year
 - so changes in catch are not attributable to change in method
- we use commercial fishing vessels, contract research vessels, NEFSC vessels, and NOAA white ships

A quick note on NOAA white ships



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Survey costs

| Survey | Staff costs | Vessel costs(1) | Operating costs(2) | Total | Notes |
|-------------------------------|-------------|-----------------|--------------------|-----------|---------------------------|
| Fall bottom trawl (60 days) | \$576,000 | n/a | \$250,000 | \$826k | Usually fully base funded |
| Spring bottom trawl (60 days) | \$576,000 | n/a | \$250,000 | \$826k | Usually fully base funded |
| Shrimp (21 days) | \$207,000 | \$120,000 | \$50,000 | \$377k | No base funding |
| Scallop (36 days) | \$495,000 | \$720,000 | \$200,000 | \$1.4 mil | Base funding for staff |
| Clam (15 days) | \$400,000 | \$555,000 | \$70,000 | \$1.0 mil | Base funding for staff |
| GOM bottom longline (55 days) | \$300,000 | \$325,000 | \$185,000 | \$810k | Base funding for staff |

(1) FY23 approximate

(2) Includes contractors, overtime, equipment, repairs, travel, expendables



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NEFSC Multispecies Bottom Trawl Survey

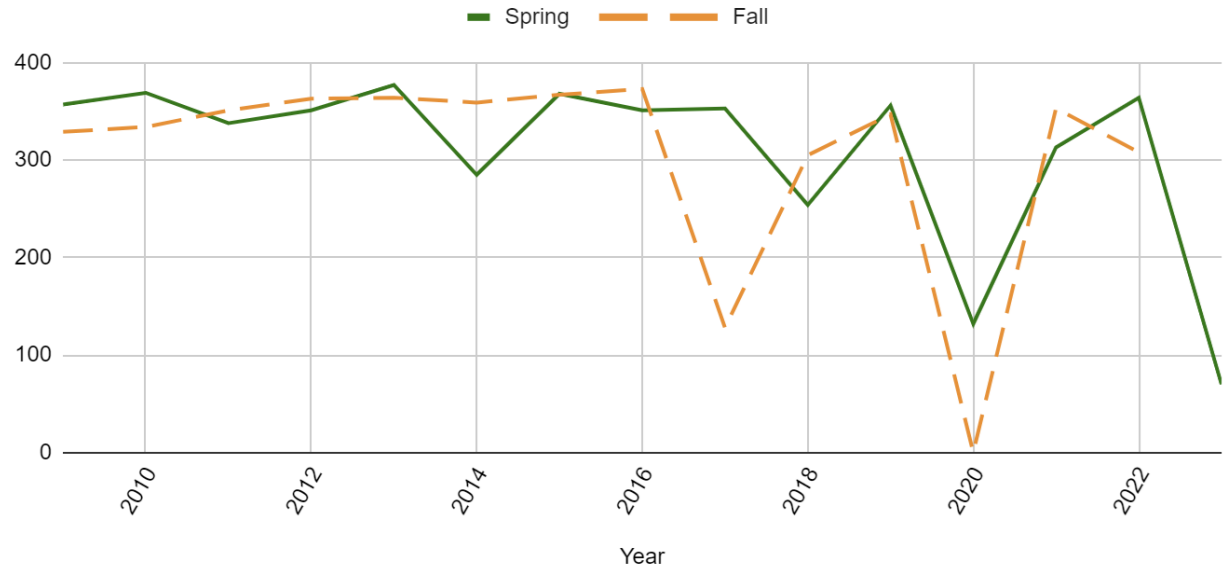
- Monitor ecosystem changes and trends in abundance, distribution, and life history for demersal fish - information for 63 stocks and collects more than 600 species
- Informs status of ecosystem reports, stock assessments and climate assessments
- 120 survey days per year (60 each in fall and spring) on the **Bigelow**
- Has a sister ship, **Pisces**
- Trawl gear designed by NTAP and is also used on VIMS NEAMAP, ChesMMAP, and is expanding to other regions



Bigelow survey performance

| | |
|-----------|---------------------|
| 2009-2015 | 351 stations (n=14) |
| 2016-2023 | 267 stations (n=15) |

Bigelow # of Valid Tows



29 surveys

9 (30%) with <300 stations

3 late spring starts

3 COVID

2 staffing limitations

2 ship repairs



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Spring 2023

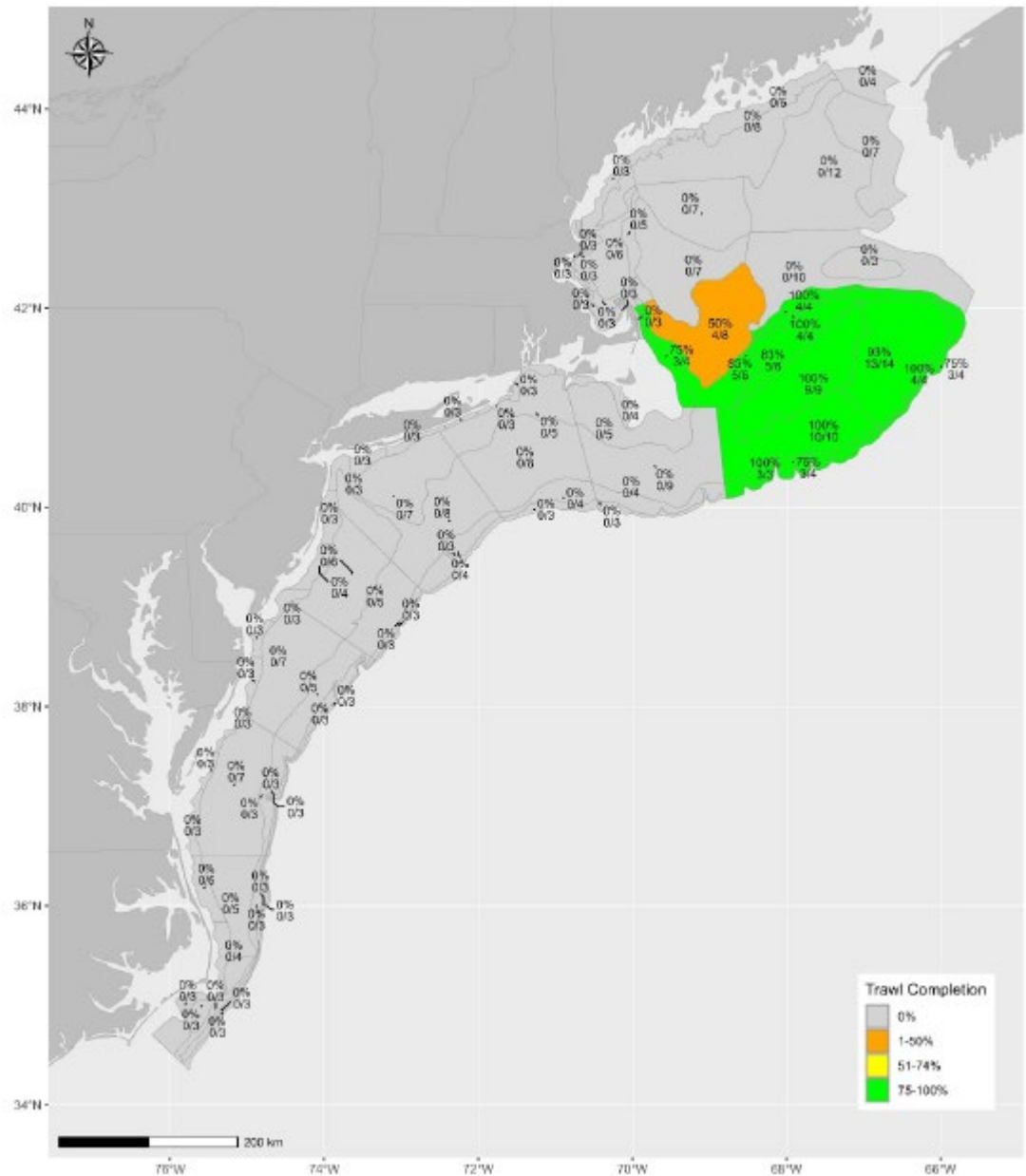
Started May 8 and did 12 hour daytime ops (instead of 24 hour)

70 of 377 stations completed;
George's Bank only

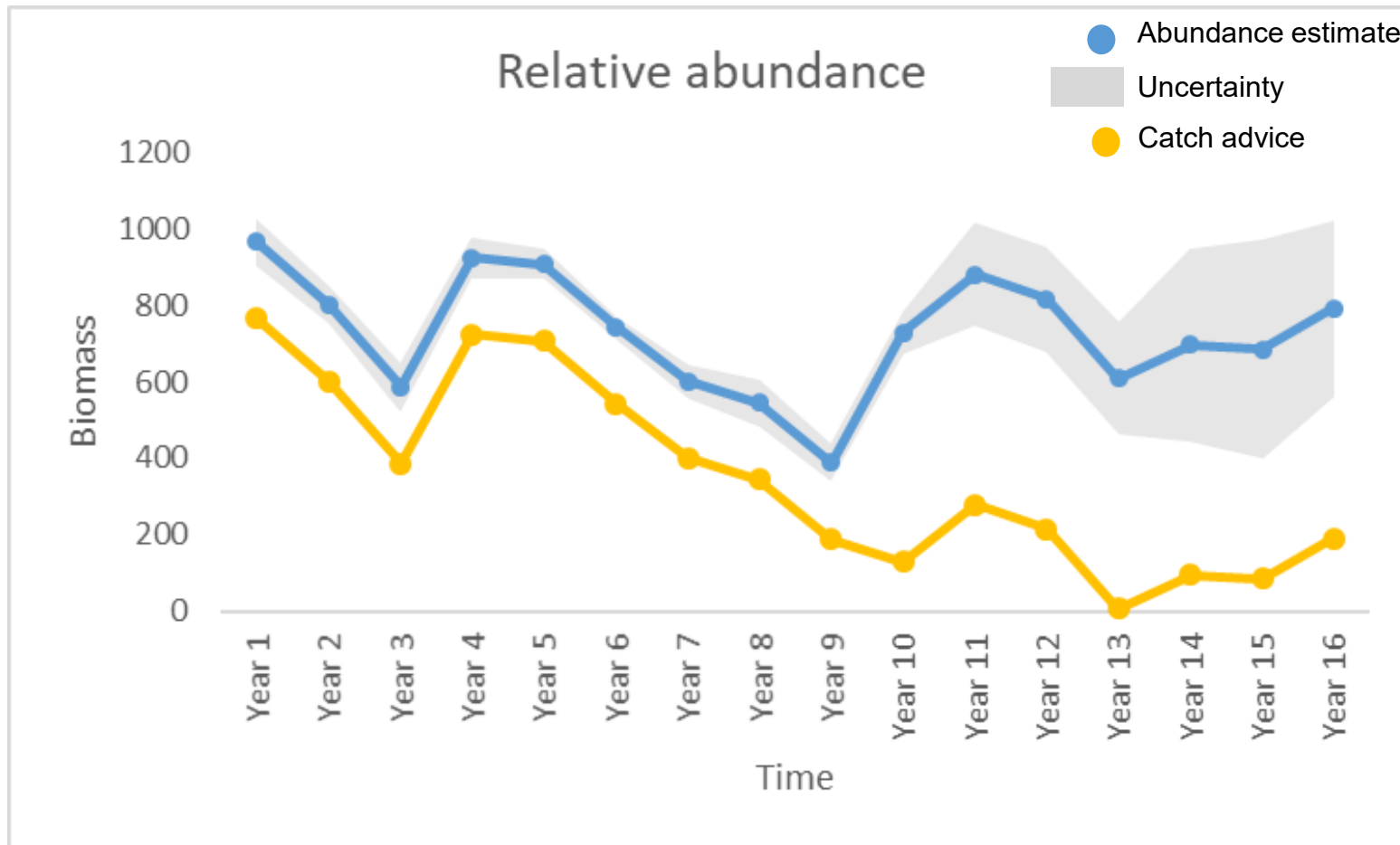
Vessel mechanical issues and vessel staffing shortages

Last minute changes in start date

Back up plan (Pisces) wasn't ready



Impact on assessments



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Do we have money leftover this year?

Typical cost of spring survey \$250k

Cost of spring 2023 survey \$181k

All normal costs leading up to a survey were expended

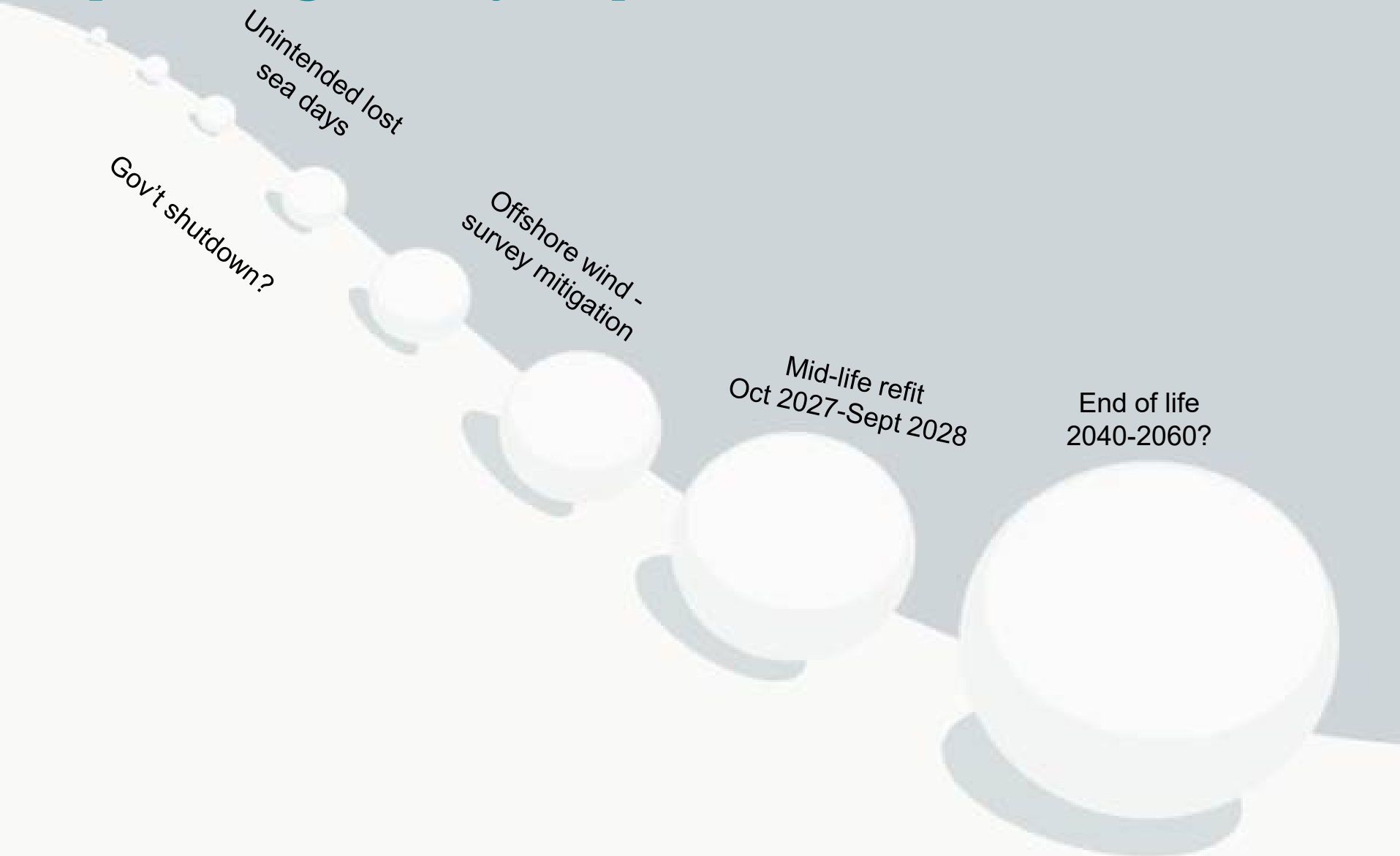
Travel and hotels (incl. contract labor) waiting to sail

How was the remaining \$69k spent?

FY24 spring bottom trawl contract labor



Upcoming survey impacts



Developing survey solutions: projects underway

Formal agreement with NMFS and OMAO that Pisces will be primary backup for Bigelow and will be staffed and ready.

Development of survey contingency fund to assist with additional costs created if contingency options are needed.

National survey prioritization for distribution of funds.

Survey simulation and redesign models; optimizing station allocation and adapting to offshore wind.

Contingency planning



NTAP working group formed to have ongoing discussion

Members: Terry Alexander, Dan Salerno, David Goethel, Vito Giacalone, Eric Reid, Jim Gartland, Kathryn Ford, Anna Mercer, Phil Politis, Tim Miller (with additional NMFS and OMAO support as needed)

TOR:

Describe vessel platforms that can support completing the NEFSC spring and fall BTS when the Bigelow is unavailable. Assess the viability of the platform(s) and platform deployment needs from logistical and scientific perspectives and identify where additional information is needed to fully develop a given option. Consider options that at a minimum meet stock assessment needs. This effort should produce a relatively high level overview of options and identify information gaps.



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What options are on the table?

1. Pisces - sister ship to Bigelow
2. NEFSC research vessel
3. Industry-based survey (same gear and sampling design; more focused data collection)
 - a. As-needed fill-in for Bigelow (supplemental)
 - b. Conducted routinely in parallel to Bigelow (complementary)
4. Other options that need further development
 - a. Augmenting surveys like BLLS
 - b. Alternative surveys
 - New survey designs and/or gear types
 - Non-extractive technologies (eDNA, acoustics)
 - c. Funding - survey contingency fund
 - d. Communication needs
 - e. Vessel staffing? (incorporate as relevant in each section)



Elements of Decisions

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- Personnel - who will support survey activities
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Offshore Wind Planning

Survey simulation experimentation and evaluation project (SSEEP)

- Analytical results expected this winter

Survey restratification and optimizing station allocation

- Workshop with assessment biologists in late August
- Restratification and station allocation options being analyzed

Survey specific mitigation plans for all fishery independent surveys

- New hire to focus on fully developing the plans and establishing a full program



Now until next year

Multispecies bottom trawl survey:

- Fall 2023
- Spring 2023
- Fall 2024

Gulf of Maine ecosystem (shrimp) survey:

- Summer 2024 Cancel
- Try to fund in 2025 (hire 1.5 staff, find survey operational funds)



Consequences

Having multiple sources of fishery independent information strengthens the overall data used in our stock assessments.

- Loss of survey data and reduction in commercial port sampling are concerning

Survey is valuable for training NOAA Corps Officers for trawling

Gulf of Maine is warming faster than other places on Earth

- Importance of the survey from an ecosystem perspective may be underestimated

Offshore wind development is happening in the Gulf of Maine

- Having a consistent time series could be important for impact assessment



| Assessment | How shrimp survey data is used | Will losing the survey be a major problem? |
|-------------------------------------|--|---|
| Northern shrimp | Uses survey in assessment | <ul style="list-style-type: none"> • Would result in the loss of fine scale data that may be problematic for an actively managed open fishery • No huge effect dropping the summer survey qualitatively but models using bottom trawl are more optimistic, so if stock appears to recover in a model with the bottom trawl, it might result in overly optimistic management |
| White hake | Tuning index, first used in 2022 | Losing it at this time would be a setback for the assessment. |
| Thorny, barndoor, and smooth skates | Indirectly used as additional index of biomass | Not a major loss because it is not used directly in analysis |
| Lobster & Jonah crab | Has been examined to support assessment | Not core data, cost of losing this data would be minimal |
| Atlantic herring | Uses survey in assessment | Redundant to other data sources (spring and fall BTS) |
| Monkfish | Indirectly used as additional index of biomass | Not a major loss because it is not used directly in analysis |
| Loligo & illex | Indices have been included in both stock assessments | No major impact on either stock assessment |
| Red crab | Not used in assessment, checks catches for average sizes | No impact on assessment |
| Witch flounder | not used directly in the current empirical approach assessment | the loss of shrimp survey data would not represent a major problem for witch flounder assessment |
| Status of ecosystem | EcoMon and shrimp survey are the summer surveys in Gulf of Maine; EcoMon cuts summer regularly | Not currently used in Status of Ecosystem reports |

NEFSC Sea Scallop Survey

1. Overview of survey
2. Review of performance over past 10 years
3. Recap of issues with 2023 survey
4. Update on planning for 2024 survey
5. Question and answer session



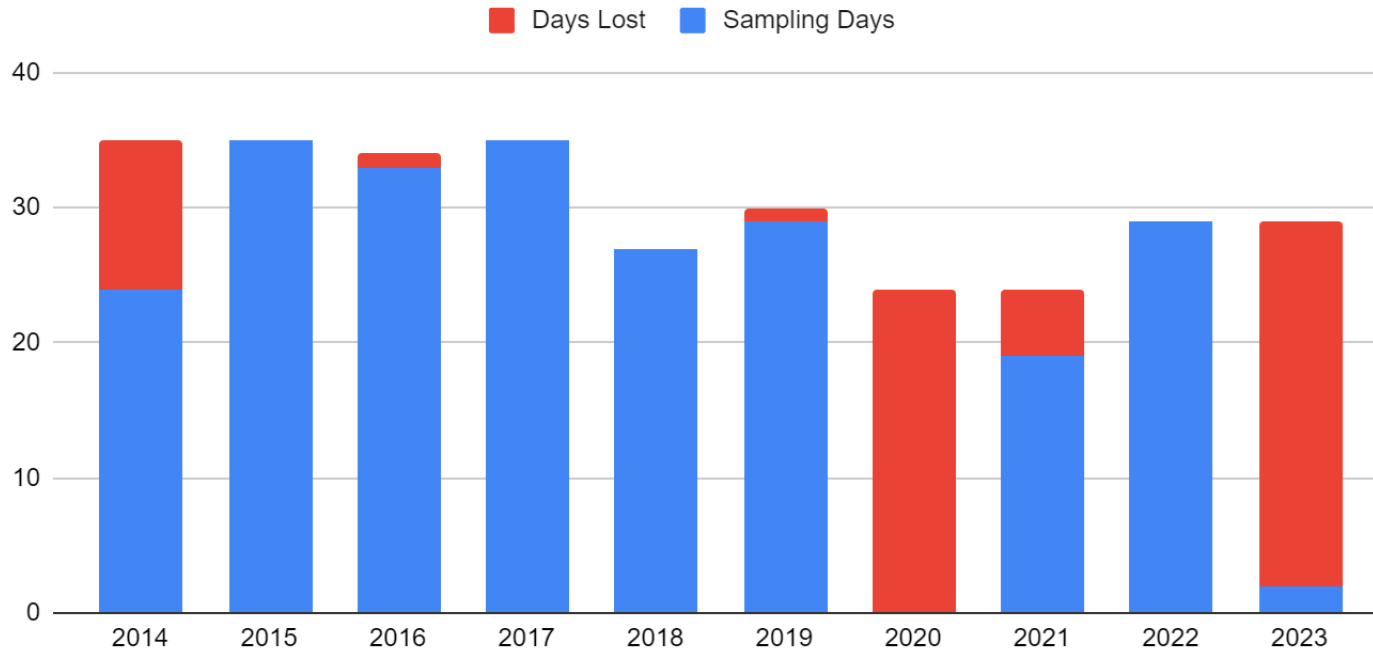
Scallop Survey Overview

- Primary objective is to collect data on abundance and distribution of sea scallops to support stock assessment and management
- Standardized operating protocols, dredge survey began in 1979
- Dredge survey transitioned from NOAA R/V Albatross IV to Hugh R. Sharp in 2008. HabCam was added in 2009.
- Both dredge and HabCam operations have been conducted aboard the Hugh R. Sharp since that time.
- Request funding for ~36 sea days per year in May/June



Review of Scallop Survey Performance 2014-2023

NEFSC Sampling Days and Days Lost for Scallop Surveys 2014-2023



*2014: Propulsion drive issue and bad weather led to loss of 11 sea days

*2020: No survey due to pandemic

*2021: 5 days lost due to medical issue with crew plus bad weather

*2023: Nearly all sea days lost due to vessel mechanical issues

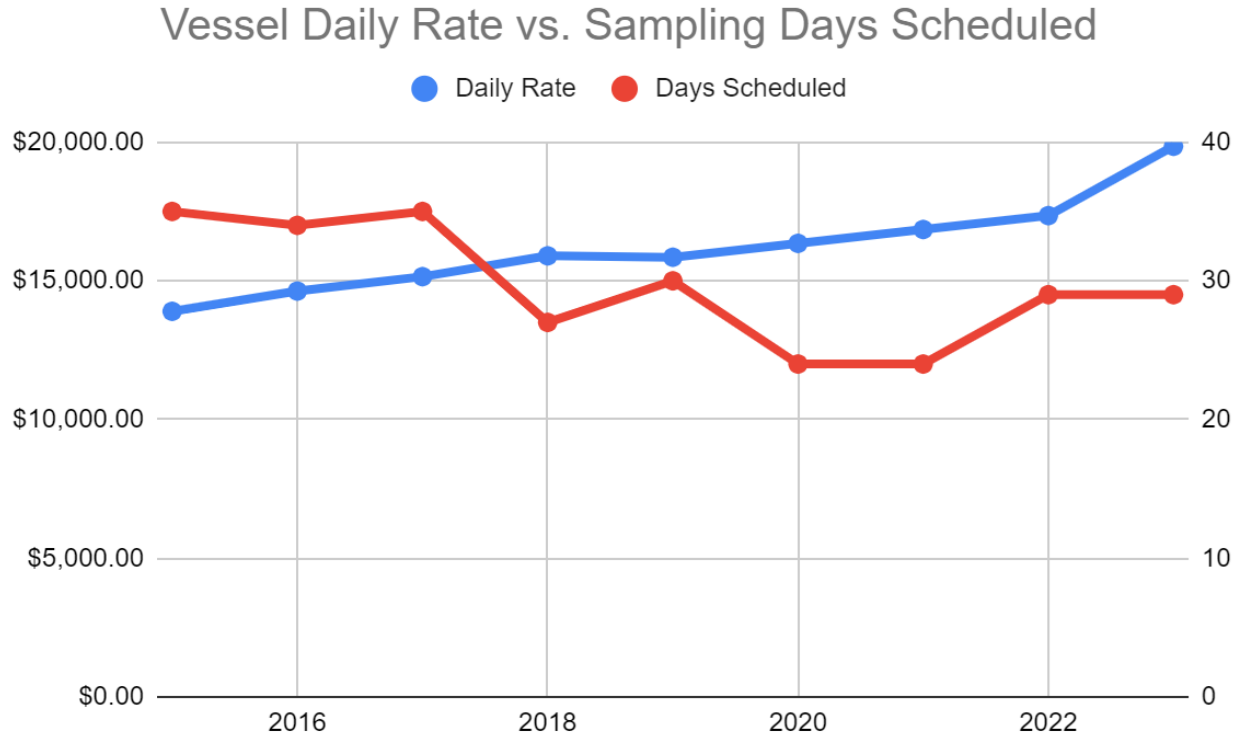


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Review of Scallop Survey Performance 2014-2023

| Year | Days Sampling | Days Lost | Dredge Stations Completed | Habcam Track (nm) | Notes |
|------|---------------|-----------|---------------------------|-------------------|-----------------------|
| 2023 | 2 | ~27 | 1 | 15 | Mechanical Issue |
| 2022 | 29 | 0 | 123 | 1425 | |
| 2021 | 19 | ~5 | 89 | 708 | Medical Issue/Weather |
| 2020 | 0 | 24 | 0 | 0 | COVID - NO SURVEY |
| 2019 | 29 | 1 | 121 | 1605 | |
| 2018 | 27 | 0 | 162 | 2019 | |
| 2017 | 35 | 0 | 128 | 1415 | |
| 2016 | 33 | ~1 | 152 | 1631 | |
| 2015 | 35 | 0 | 194 | 2500 | |
| 2014 | 24 | 11 | 140 | 1000 | Propulsion Issue |

Sharp Daily Rate vs Sea Days Scheduled 2014-2023



*Sharp daily rate in 2014 was \$12,900

*Sharp daily rate in 2023 was \$19,850



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Review of 2023 scallop survey challenges

- In spring of 2023, NEFSC was informed that Sharp would only be able to provide about 22 sea days in May/June due to vessel staffing issues.
- In response, NEFSC was able to schedule 9 days for towed HabCam/AUV work aboard Bigelow in late July
- Sharp experienced power issues prior to sailing in early May, resulting in continuous delays. Finally left dock for abbreviated survey on June 14 and encountered winch issues shortly after starting operations, ending the survey.
- A-frame issue was discovered on Bigelow in June, preventing use of towed HabCam system on July cruise. Bigelow days were used for HabCam AUV testing.
- RSA survey partners were able to expand coverage to include areas not covered by NEFSC, which provided both optical and dredge coverage in all areas.
- Huge thanks to VIMS and CFF!!



Changes for 2024 survey season

Hugh R. Sharp update:

- Vessel has not sailed since NEFSC cruise due to ongoing power and winch issues.
- Power issues have now been resolved, but winch issues may not be fixed until late fall/winter.
- NEFSC is not comfortable with this uncertainty. Will look to contract with alternate vessel for dredge work starting in 2024

NEFSC would prefer to separate dredge and HabCam operations for 2024 survey to ensure we have more than 1 vessel under contract

Sharp only charged for days underway in 2023, so funds currently on contract could be deobligated



Changes for 2024 survey season cont..

Dredge:

- NEFSC plans to contract with an alternate vessel in 2024
- NEFSC staff are beginning the process of setting up tours with vessels to get a feel for what platforms may be available
- Will be working with NEFMC staff to help identify industry vessels that we should consider touring
- Planning for contract to go out to bid later this fall

HabCam:

- NEFSC also plans to explore options available for conducting HabCam ops on alternate vessel
- Potential HabCam vessels will be toured this fall
- Suitable winch is a complicating issue for HabCam ops
- Redundancy:
 - Sharp is still on contract and as long as winch is repaired, they will be available for HabCam ops in 2024. Will know more by Nov/Dec
 - We have 13 days scheduled on Bigelow in June/early July, and A-frame will be repaired by then. Sea days can be used for AUV testing if not needed for towed HabCam.

COMMUNICATION:

- Will be having further discussion about our proposed plan with Council staff in the coming weeks
- Will provide regular updates to Council staff as plans progress
- Will include regular updates at Council meetings as part of NEFSC report
- Happy to provide updates to Scallop AP/Committee as things develop



Long Term: Wind mitigation

NEFSC staff are currently drafting survey mitigation plans for wind areas

Will not be able to conduct randomly selected dredge stations within WEA's

Use of dredge or towed HabCam within WEA's after construction is uncertain at this point

NEFSC has a HabCam AUV under development:

- Partnership between WHOI and NEFSC
- Funded through internal grant from OMAO UxS
- Successful testing completed from Bigelow in July 2023. R&D will continue this winter with additional testing
- Hoping to deploy during scallop survey next summer
- If testing continues to be successful, it will be an excellent tool for wind area monitoring (& potentially more) in the future
- AUV presentation was made to Scallop AP in August (Marinna Martini)

