



NEFSC Cooperative Research Branch Update



NOAA
FISHERIES

NEFSC

Anna Mercer, PhD
Chief, Cooperative Research Branch
Director, Narragansett Laboratory
Northeast Fisheries Science Center
NOAA Fisheries



NOAA FISHERIES

NEFSC Cooperative Research Branch

Long Term Programs (10+ years):

- Gulf of Maine Bottom Longline Survey
- Study Fleet
- Industry Based Biological Sampling Program (InBios)
- Environmental Monitors on Lobster Traps and Large Trawlers (eMOLT)

New Initiatives:

- Pilot Hook and Line Survey
- Offshore Wind Impacts on Fishing Operations
- Shortfin Squid Electronic Size Monitoring Project (ILXSM)
- Oceanographic Drivers of Shortfin Squid
- Longfin Squid Biological Sampling Program (SQUIBS)
- Recreational Biological Sampling Program (RecBio)
- CPUE Indices for Stock Assessments
- Monitoring Scallop Disease and Reproduction (ScallApp)
- Black Sea Bass Stakeholder Knowledge Synthesis
- Collaborative Golden Tilefish Length Monitoring
- Groundfish Conversion Factor Validation
- Northeast Cooperative Research Summits

*Expanding data use
and feedback
mechanisms*



NEFSC Cooperative Research Branch

Long Term Programs (10+ years):

- Gulf of Maine Bottom Longline Survey
- Study Fleet
- Industry Based Biological Sampling Program (InBios)
- Environmental Monitors on Lobster Traps and Large Trawlers (eMOLT)

New Initiatives:

- **Pilot Hook and Line Survey**
- **Offshore Wind Impacts on Fishing Operations**
- **Shortfin Squid Electronic Size Monitoring Project (ILXSM)**
- **Oceanographic Drivers of Shortfin Squid**
- **Longfin Squid Biological Sampling Program (SQUIBS)**
- **Recreational Biological Sampling Program (RecBio)**
- **CPUE Indices for Stock Assessments**
- **Monitoring Scallop Disease and Reproduction (ScallApp)**
- **Black Sea Bass Stakeholder Knowledge Synthesis**
- **Collaborative Golden Tilefish Length Monitoring**
- **Groundfish Conversion Factor Validation**
- **Northeast Cooperative Research Summits**

*Expanding data use
and feedback
mechanisms*



Offshore Wind and Fisheries



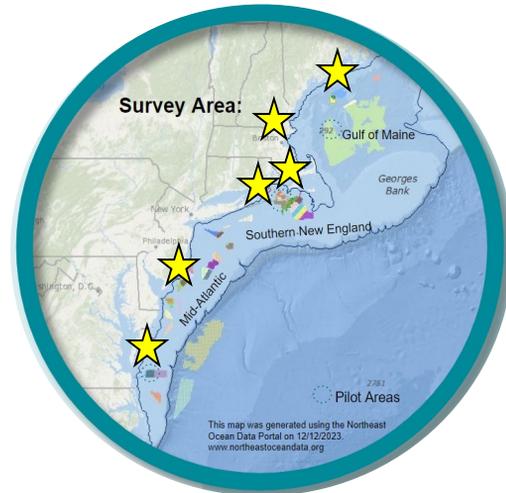
Pilot Hook and Line Survey

Motivation:

- Many historical fisheries surveys will be unable to operate within and around offshore wind farms
 - Preclusion of fisheries surveys will impact data availability for stock assessments and fisheries management
- New survey tools are necessary to provide data continuity as offshore wind progresses

Goal:

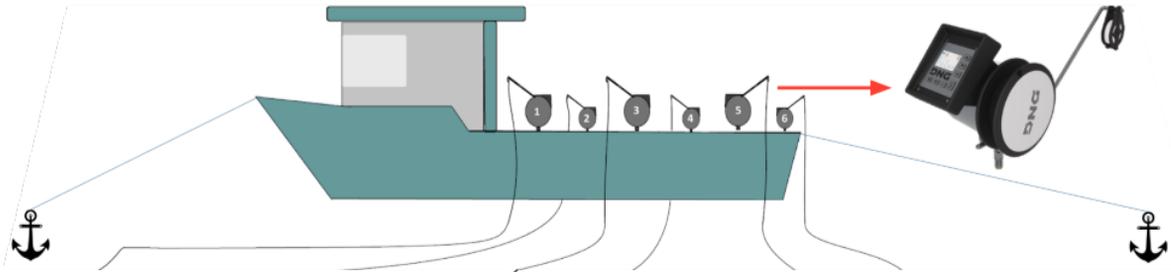
- Develop and test the methodology for a new hook and line survey to provide data continuity for multiple resources species in complex habitats and alongside offshore wind turbines



Approach:

- ✓ Develop and document draft hook and line survey plan as part of the NEFSC's offshore wind survey mitigation initiative
- ✓ Refine survey design, gear, and operations in partnership with fishing and science communities → 9 workshops from ME to VA in November 2023

Pilot Hook and Line Survey

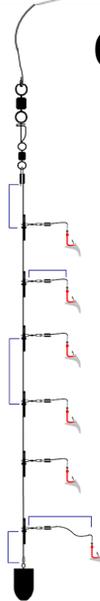


Gear:

- 6 DNG jig machines
- Highly programmable
- Standardized fishing effort
- Pilot testing: 3 jig configurations (tackle and jigging pattern)
 - Two hook sizes to target wide size range of fish

Operations:

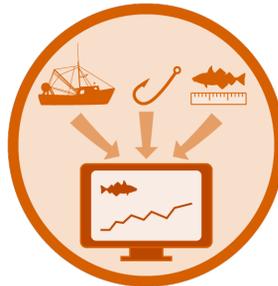
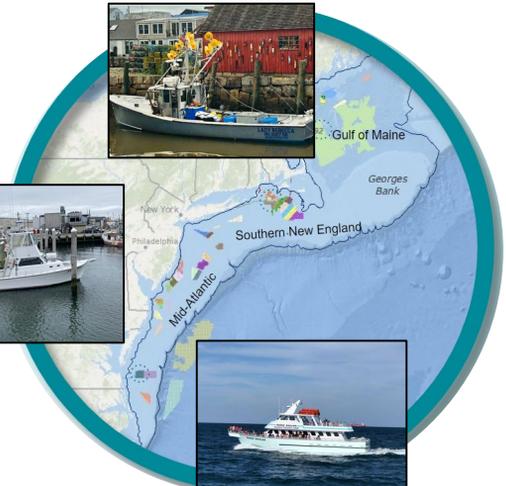
- Depth Range: 50-500 feet
- Stations: 50 per area (150 total)
- Fishing Time: 20 min total bottom time per reel
- Catch Data: All catch identified to species, weighed, and measured
- Environmental Data: CTD profiles, current measurements, and bottom habitat video



Pilot Hook and Line Survey

Approach:

- ☑ Recruit 3 vessels to support the pilot hook and line survey
 - ☐ GOM: F/V Lady Rebecca, Newburyport, MA
 - ☐ SNE: F/V Frances, Point Judith, RI
 - ☐ Mid-Atlantic: F/V Rudee Whaler, Virginia Beach, VA
- ☐ Conduct pilot hook and line survey in the Gulf of Maine, Southern New England, and Mid-Atlantic in April-May 2024
- ☐ Review operational successes and challenges, analyze data to assess gear selectivity, and identify necessary modifications to achieve survey goals



Impacts of Offshore Wind Energy Development on Fishing Operations

Partners: UMass SMAST, Study Fleet captains, GARFO

Goal: Use Study Fleet data to improve the quantification of fishing footprints and impacts of offshore wind energy development

Approach:

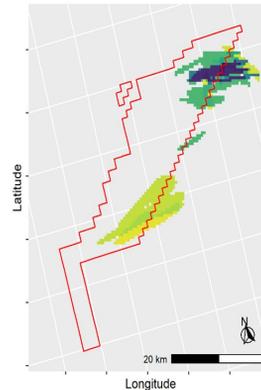
- Measure intersections of Study Fleet fishing footprints and wind farms to quantify economic exposure of longfin squid fishery
- Compare to fishing and wind farm intersections and revenue derived using coarse logbook footprints

Results:

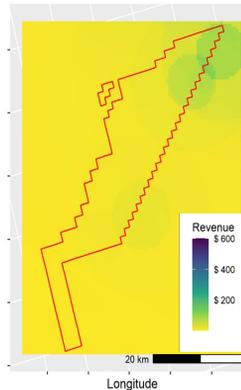
- Study Fleet data can be used to improve economic explore estimates for the longfin squid fishery, which are underestimated by logbook data
- *Allen-Jacobson et al. 2023. Spatial analysis of fishing tows to inform offshore wind layouts. Marine & Coastal Fisheries*
- New postdoc will focus on expanding analyses to the summer flounder and whiting fisheries and integrating VMS data



Study Fleet Footprint



Logbook (VTR) Footprint



Biological Sampling



Shortfin Squid Electronic Size Monitoring Project

Partners: Lunds Fisheries, Sea Freeze Shoreside, Sea Freeze LTD, The Town Dock/Norpel, Amory Seafood

Goals:

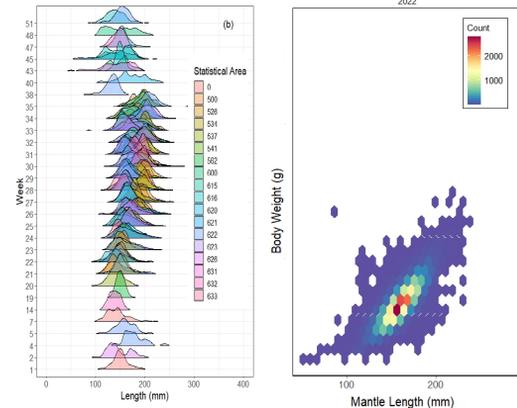
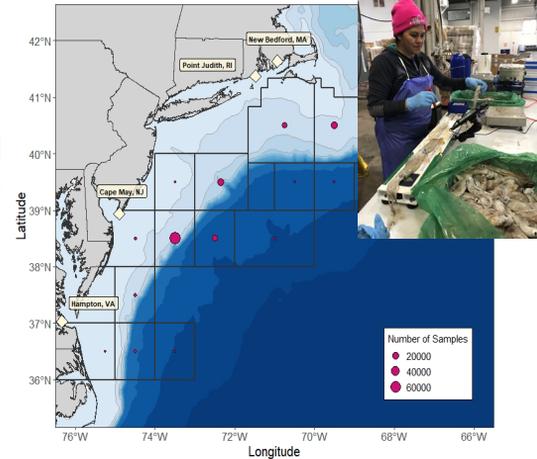
- Produce a standardized data stream of paired *Illex* mantle lengths and gram weights to better understand the fishery and population structure

Approach:

- Develop electronic size monitoring technology (BLISS app, BigFin measuring boards, Marel scales)
- Train *Illex* processors to use equipment
- Processor staff independently collect data throughout fishing season and submit data to NEFSC databases
- Audit and match ILXSM data to VTR data

Products:

- >173,000 *Illex* lengths and weights collected since 2021
- Technology application: Refined ILXSM technology for longfin squid
- Publications:
 - *Mercer et al. 2023. Design, Implementation, and Results of a Collaborative Shortfin Squid (*Illex illecebrosus*) Electronic Size Monitoring Pilot Project. NEFSC TM331*
- Data Use:
 - Data shared with squid length-based stock assessment modeling team (Wilberg et al.)
 - Data paired with oceanographic data to ID environmental drivers (Squid Squad)



Longfin Squid Biological Sampling Program (SQUIBS)

Motivation: Longfin squid do not have a functional stock assessment due to an unusual life history and dearth of data at the necessary spatial and temporal scales. Enhanced biological data are needed to develop a stock assessment model for this economically and ecologically important species.

Partners: MAFMC, UMCES, VIMS, Over 24 F/Vs

Goal: Advance understanding of longfin squid life history and provide data to support the 2026 longfin research track stock assessment.

Approach:

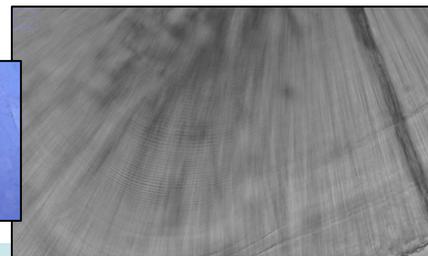
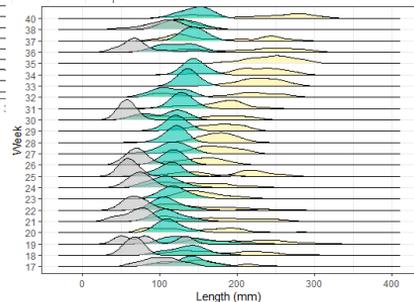
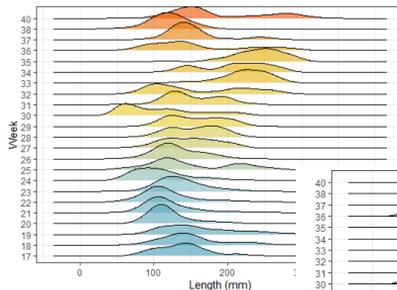
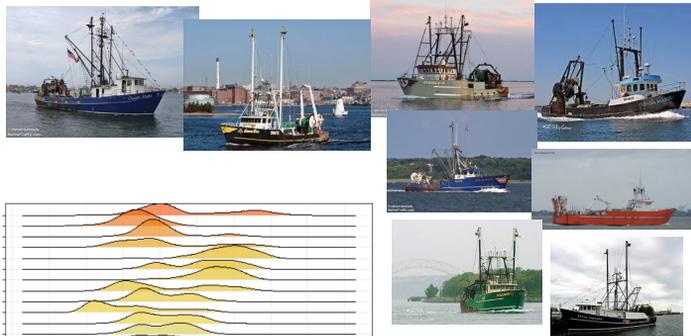
- Cooperative Research Branch team coordinates and collects ~300 longfin squid from fishing vessels at ports throughout MA, RI, and NJ every week for two years (May 2023 - May 2025)
- Technicians collect biological data from longfin squid using an electronic data collection system
 - Mantle length, mantle width, weight, nidamental gland length, testes length, accessory gland length, spermatophore length, eggs quantity
- Technicians extract and store statoliths (squid age structures) for aging via partner in Spain
- Data summarized and provided to research partners monthly



Longfin Squid Biological Sampling Program (SQUIBS)

Preliminary Results:

- Electronic data collection system developed for longfin squid biological sampling
- Detailed documentation of dissection and analysis process developed
- Over 9,100 longfin squid sampled since May 2023
 - All data audited and matched to VTR records
- Samples collected by 24 fishing vessels
- Samples collected from 9 statistical areas
 - Precise locations available
- Over 900 statoliths collected since May 2023
 - 10 statoliths from squid caught in May aged by Angel Gonzalez
 - 4-5 months old (born in November 2022)
- Data provided to partners at UMCES and VIMS for new length-based assessment model for longfin squid (collaboration with UMCES, VIMS, Lunds Fisheries, The Town Dock, Sea Fresh USA, Sea Freeze)
- Cooperative Research Branch staff serving on Longfin Squid Research Track Stock Assessment Working Group



Recreational Biological Sampling Program (RecBio)

Motivation:

- The recent change in Atlantic cod stock structure (2 → 4 stock units) and stock assessment requires additional biological data (length and ages for kept and discarded fish) for each stock unit

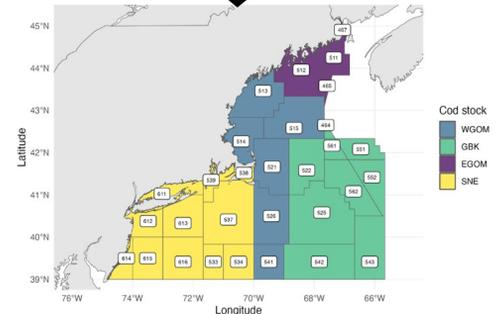
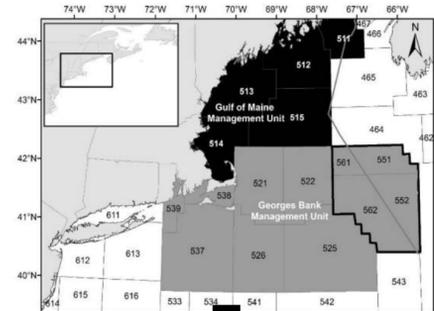


Partners:

- Willy Goldsmith, Pelagic Strategies
- Jeff Kneebone, Cabot Center for Ocean Life
- Mike Pierdnock, Stellwagen Bank Party and Charter Boat Association
- Rick Bellavance, RI Party and Charter Boat Association

Goal:

- Pilot the use of electronic technology to collect lengths and age structures from the for-hire fleet
- Produce a standardized data stream of Atlantic cod lengths and ages to better characterize the catch from the recreational fishery for the stock assessment



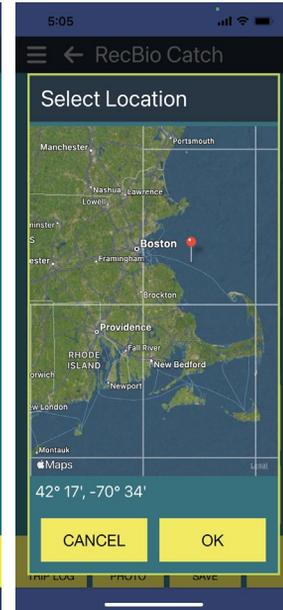
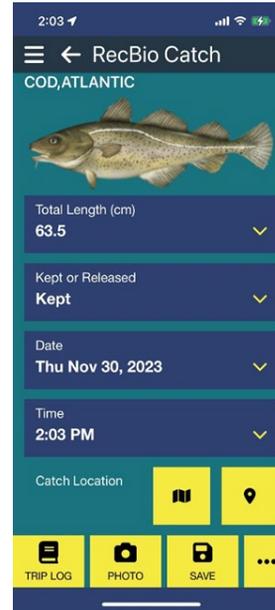
Recreational Biological Sampling Program (RecBio)

Approach:

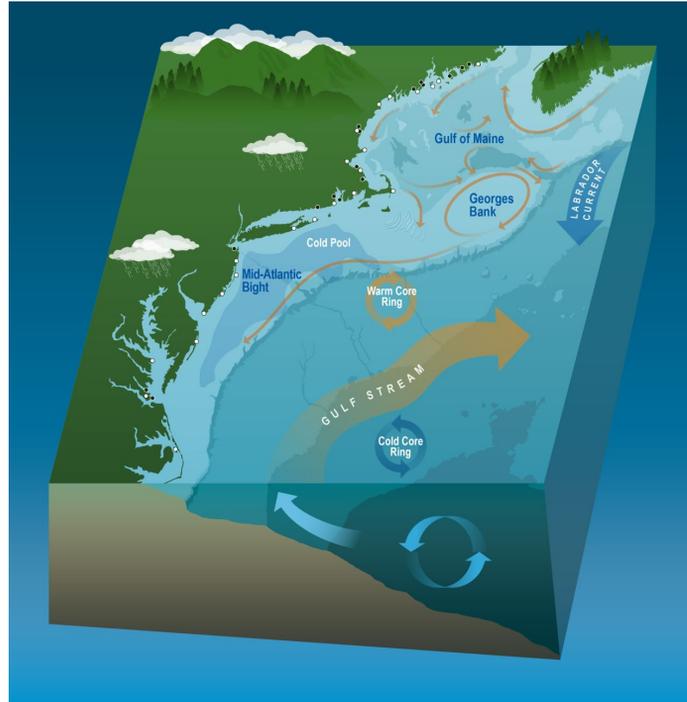
- Develop electronic tools to enable for-hire vessels to collect cod lengths and otoliths
- Train 10 vessels to use equipment and collect data
 - 5 Gulf of Maine vessels
 - 5 Southern New England vessels
- Vessels independently collect length data and otoliths throughout fishing season
 - Heads of retained fish tagged and kept for otolith extraction
- Otoliths aged by NEFSC

Products:

- New software for biological data collection from recreational fisheries
 - Modified Anglers Catch
- Data collection began in December 2023
- Preliminary data:
 - 33 lengths collected to date
 - 10 otoliths collected to date



Ecosystem Research



Oceanographic Drivers of Northern Shortfin Squid

Partners: UMass SMAST, WHOI, CFRF, F/V Dyrsten, dozens of industry members (processors, fishermen)

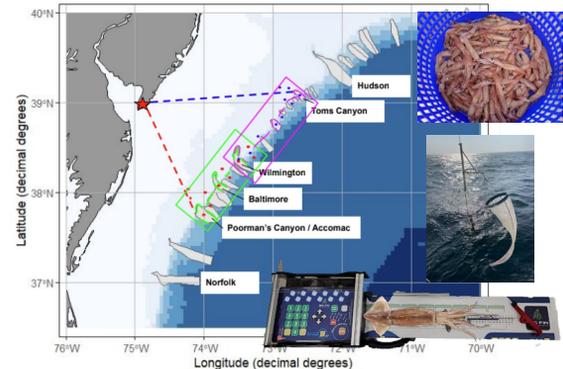
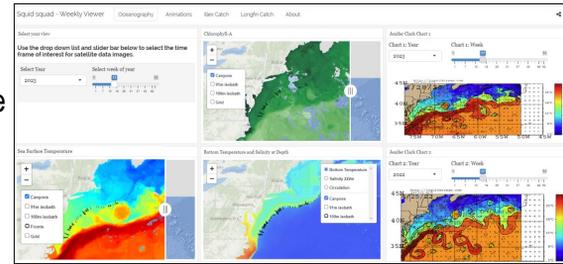
Goal: Combine industry and scientific expertise to better understand the oceanographic drivers and fishery dynamics of northern shortfin squid

Approach:

- Weekly meetings with industry and science partners to discuss current oceanographic conditions and fishery dynamics
- Concurrent research cruises on R/V Armstrong and F/V Dyrsten in August 2022 to map a mid-depth salinity maximum intrusion and explore associations with shortfin squid
- Upcoming research cruise on F/V Dyrsten to map oceanographic conditions in and around Illex fishing grounds (May 2024)
- Standardized bottom trawls, biological sampling (size, maturity, genetics), CTD casts, plankton tows, acoustics

Products:

- Website to track weekly oceanographic and fishery conditions: <https://connect.fisheries.noaa.gov/content/bbd89359-6376-42cf-8d3d-6300f4c5b454/#section-oceanography>
- Salois et al. 2023. Shelf break exchange processes influence the availability of the northern shortfin squid in the Northwest Atlantic. *Fisheries Oceanography*
- Mercer et al. 2023. Bringing in the experts: application of industry knowledge to advance catch rate standardization for northern shortfin squid *Front Mar Sci*
- Data and results from research cruise on F/V Dyrsten – coming soon!



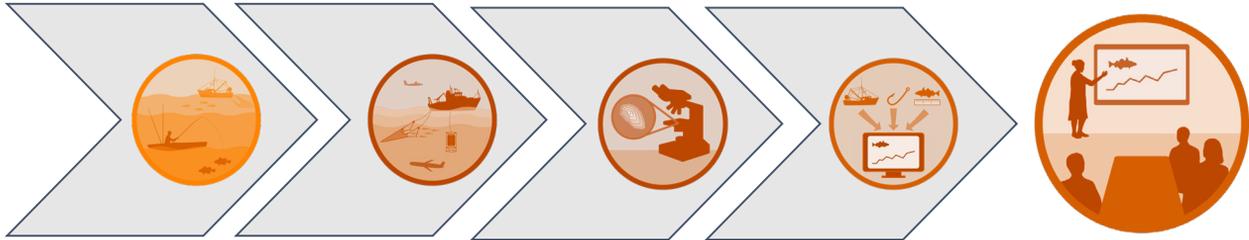
Stock Assessment Contributions

**Fishery
Catch**

**Indices
of Abundance**

Biology

Modeling



Thank You! Questions?

