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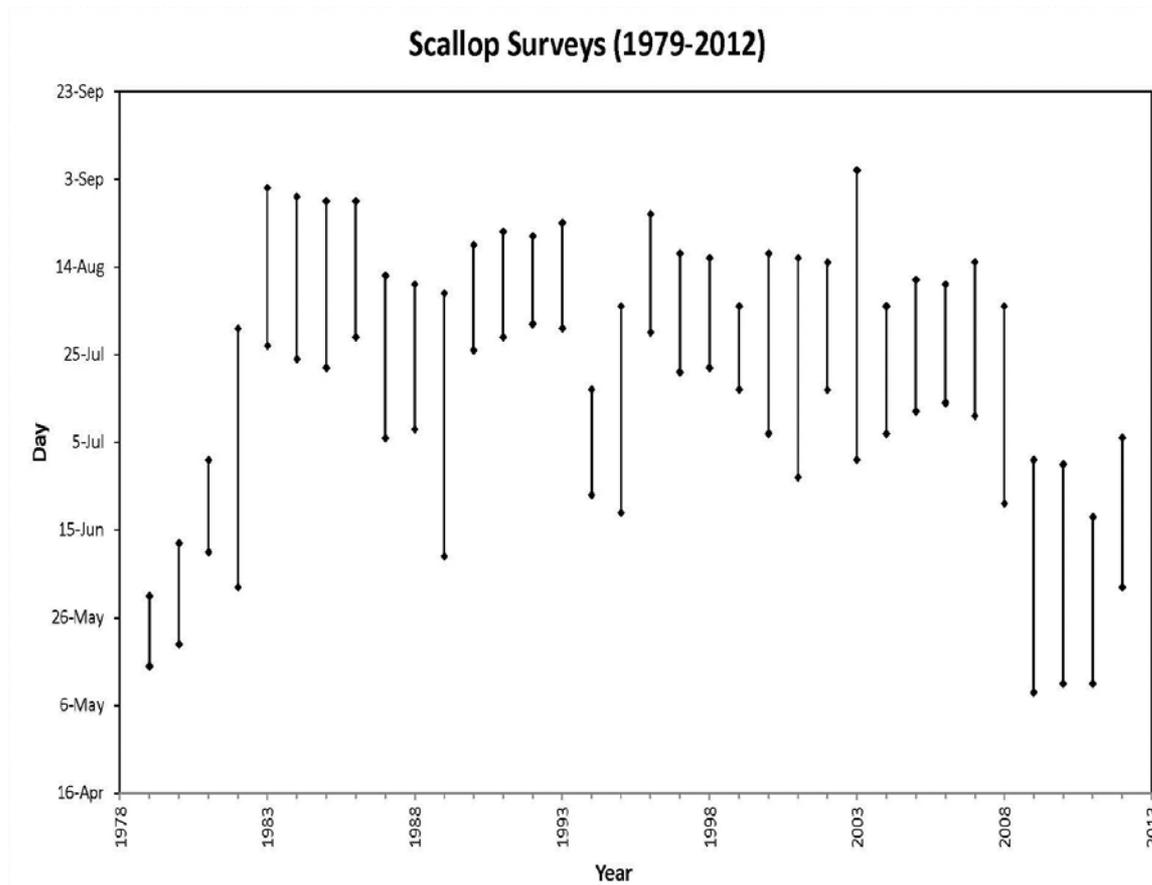
Northeast
Fishery
Science Center

Ecosystems Surveys Branch Data Collection Programs Sea Scallop Survey

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August 5, 2013

Sea Scallop Survey: Longevity



Sea Scallop Survey: Vessel Changes

NOAA Ship Albatross IV
1977 - 2007
187' LOA
33' Breadth
16' Depth
21 Officers and Crew
14 Scientific Staff



RV Hugh R. Sharp
Autumn 2008 – present
146' LOA
32' Breadth
9.5' Depth
8 Officers and Crew
14 Scientific Staff



Sea Scallop Survey: Calibration Efforts

In early 2007 the NEFSC learned the *Albatross IV* (AIV) would be retired prior to the 2008 sea scallop survey.

During 2007 a multi-vessel multi-technology calibration was undertaken during the scallop survey.

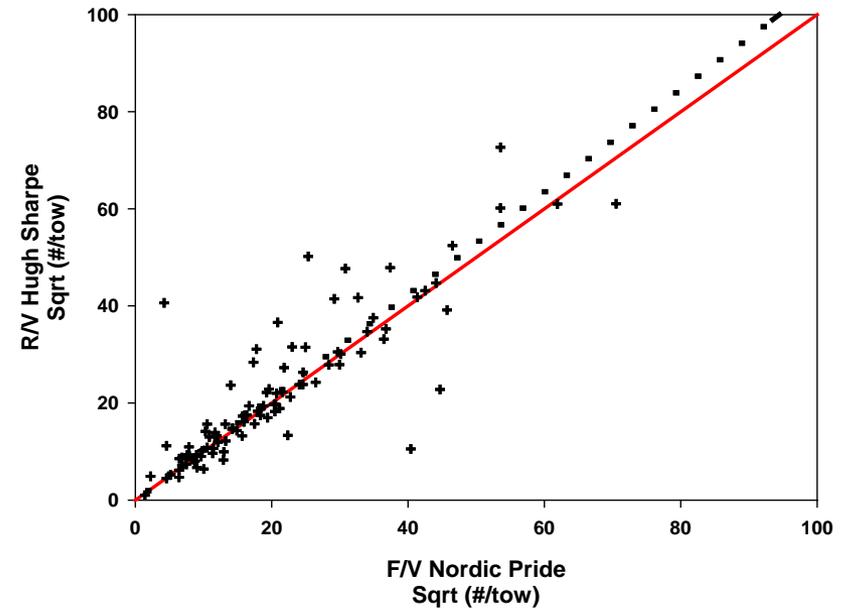
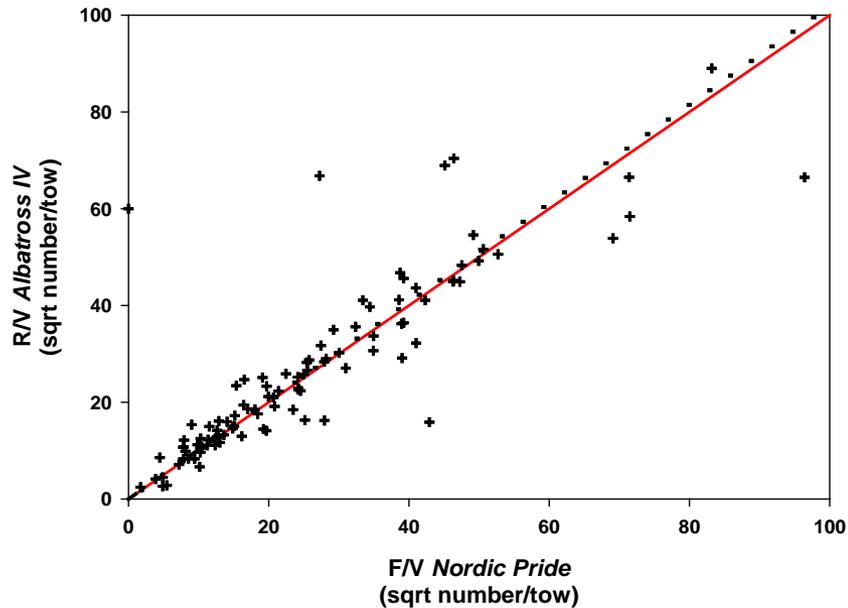
The AIV was calibrated against a commercial vessel using both our standardized dredges and HabCam.

A new dredge was introduced at this time which included some minor industry supported refinements.

Later in the year, when the RV *Sharp* was identified as a long term replacement for the AIV, the *Sharp* was calibrated against the commercial vessel using both technologies.

The *Sharp* was also able to occupy AIV 2008 survey tow sites

Sea Scallop Survey: Calibration Efforts

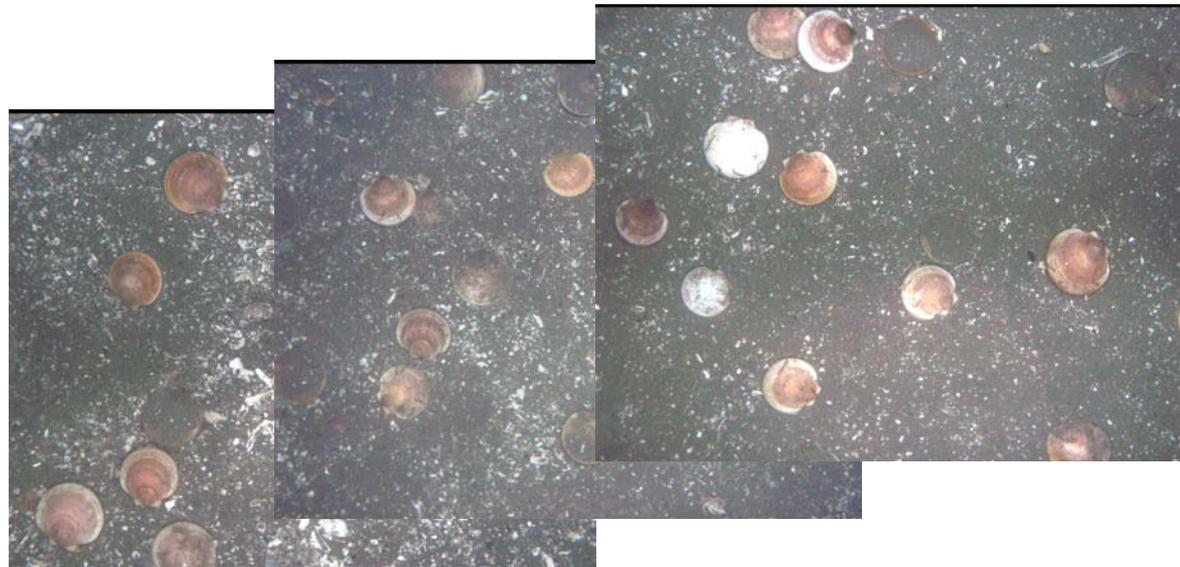


Sea Scallop Survey: Calibration Efforts

HabCam/Dredge Calibration

140 paired tows between survey
dredge and HabCam towed camera
system

Estimated efficiency (relative to
Albatross IV) :
0.38 (hard bottom)
0.44 (soft bottom)



Sea Scallop Survey: Dredge and Protocols

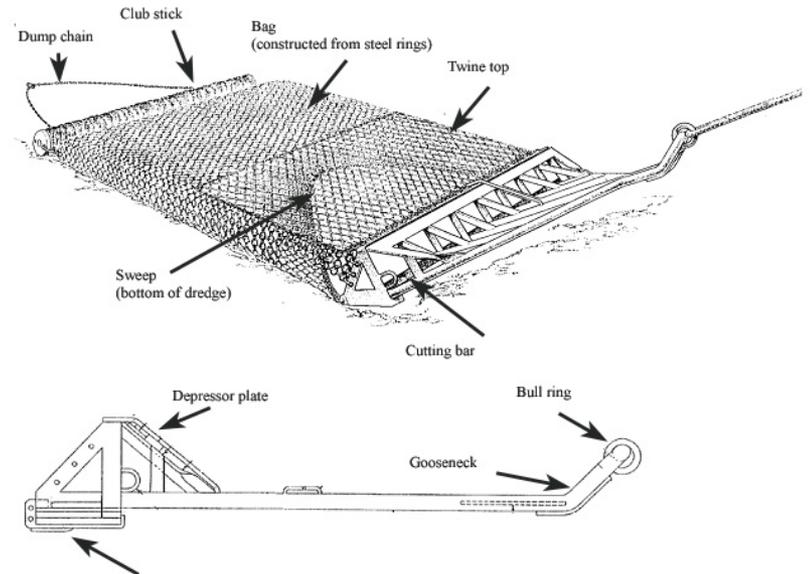
NOAA Scientific Dredge:
adaption of New Bedford type

Design Features:

- 8' Width
- 1.5' high
- 2" rings (i.d.)
- 1.5" twine liner
- 2,000 lbs.

Basic Protocols:

- 15 minute tow duration (winch lock to haulback)
- 3.8 knots
- Average tow distance of 1.0 nm
- Generally towed in direction of next station
- Tow success determined after completion



Sea Scallop Survey: Survey Design

June-July

Cape Hatteras, NC to Georges Bank

200 (450) dredge stations

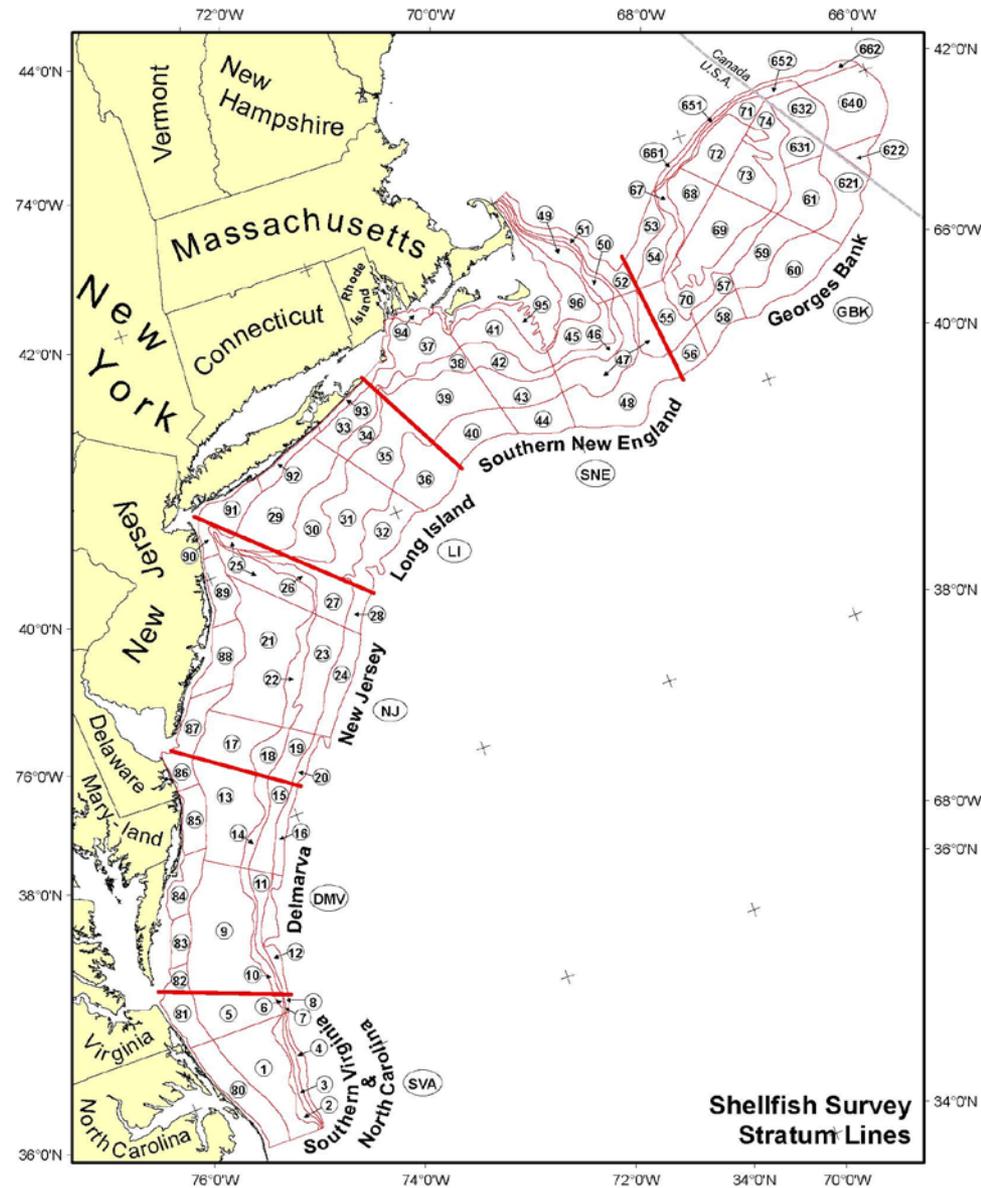
36 sea days

Stratified Random Design:

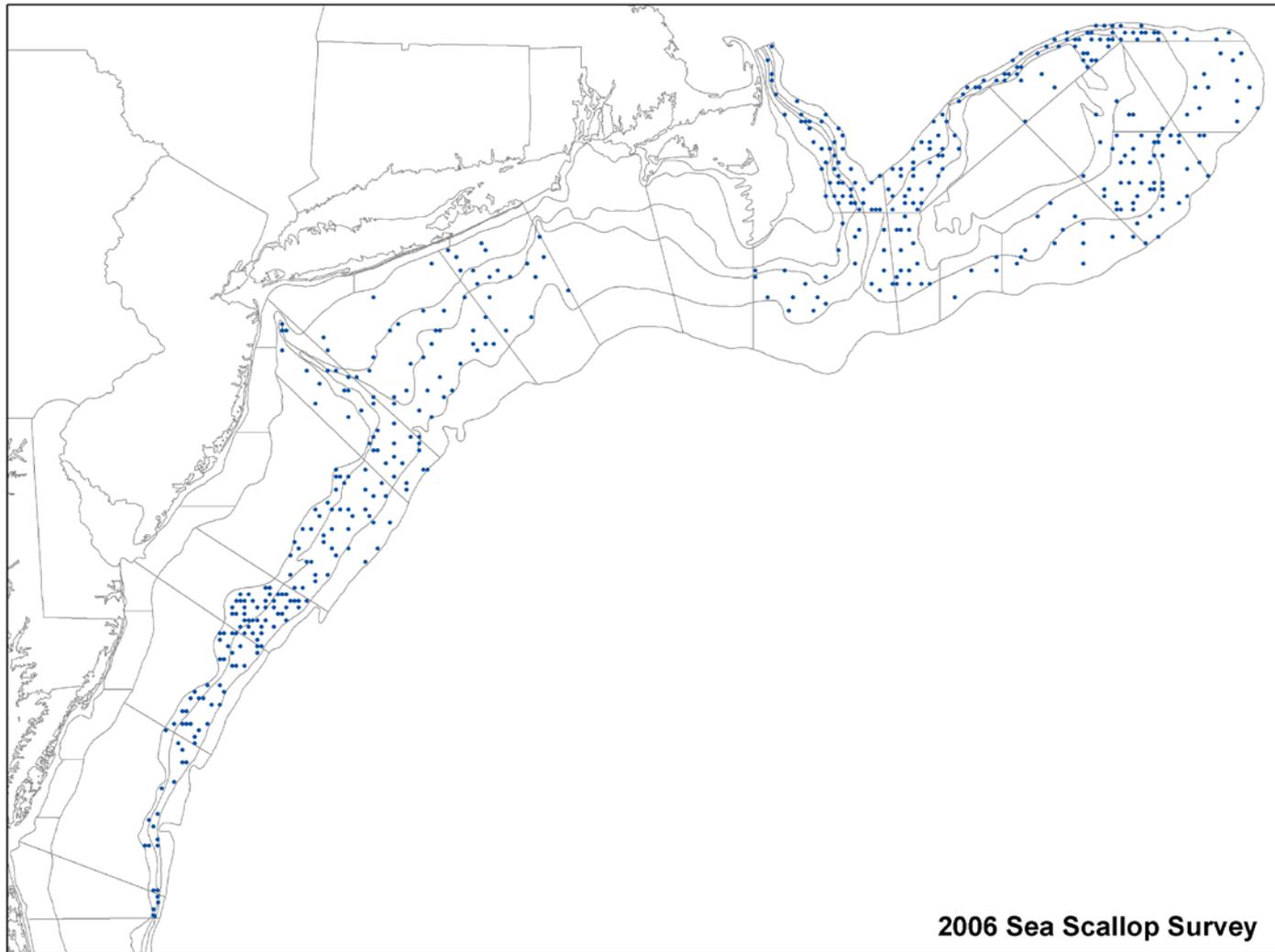
- Strata are delineated by depth and region
- Station locations are randomly selected within strata.

Strata depth ranges:

- 9 - 27 meters (5 - 15 Fm)
- 27 - 45 meters (15 - 25 Fm)
- 45 - 55 meters (25 - 30 Fm)
- 55 - 73 meters (30 - 40 Fm)
- 73 - 110 meters (40 - 60 Fm)



Sea Scallop Survey: Survey Design



Sea Scallop Survey: HabCam Approach

June-July

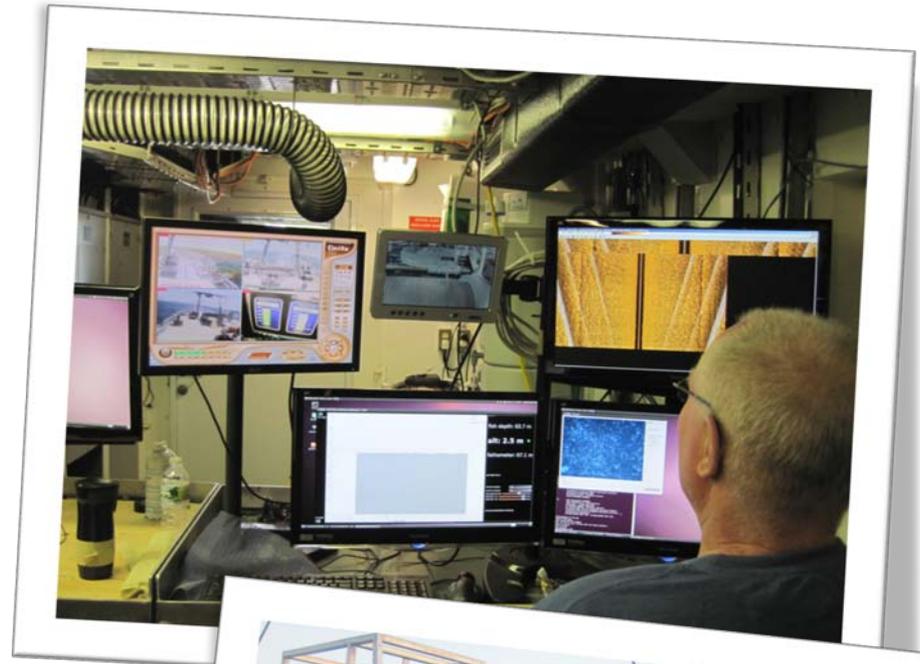
Cape Hatteras, NC to Georges Bank

36 sea days

NOAA HabCam:

Towed stereo photographic array

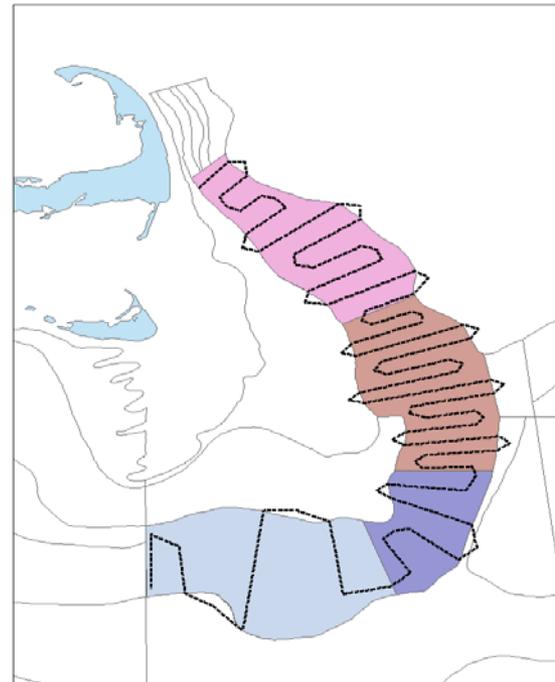
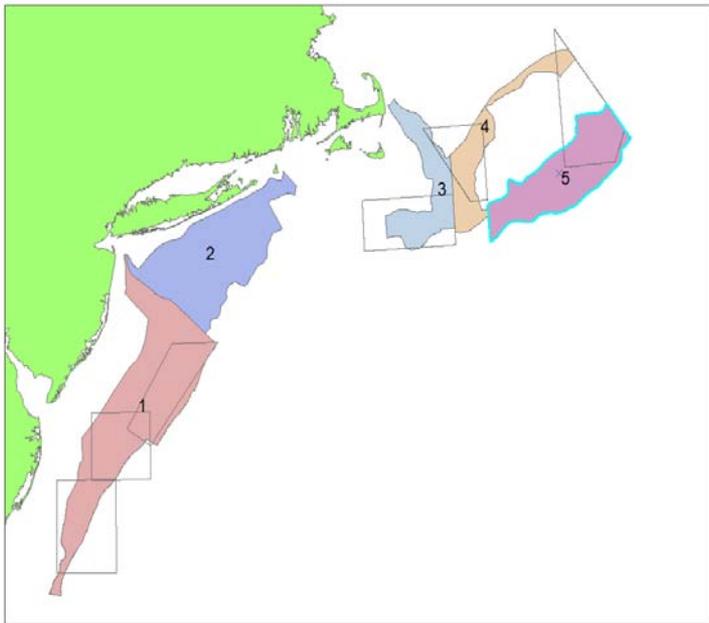
- 6 - 7 knots
- 1.5 – 3 meters above sea floor
- 6 images/sec.
- Location, alt., roll, pitch and yaw captured
- Other features include side-scan, CTD, fluorometer
- 3,700 Km transect with 7.5 million image pairs (2012)



Sea Scallop Survey: HabCam Approach

Stratification scheme:

- Five sub-regions
- Modified systematic zig-zag approach
- Main transects run perpendicular to isobaths
- Target of one image | purposes



Sea Scallop Survey: Catch Sampling Processes

All catch is sorted to the species level

Each species or component is weighed

Generally, every effort is made to measure every scallop captured. When that is not practical we have several sub-sampling options:

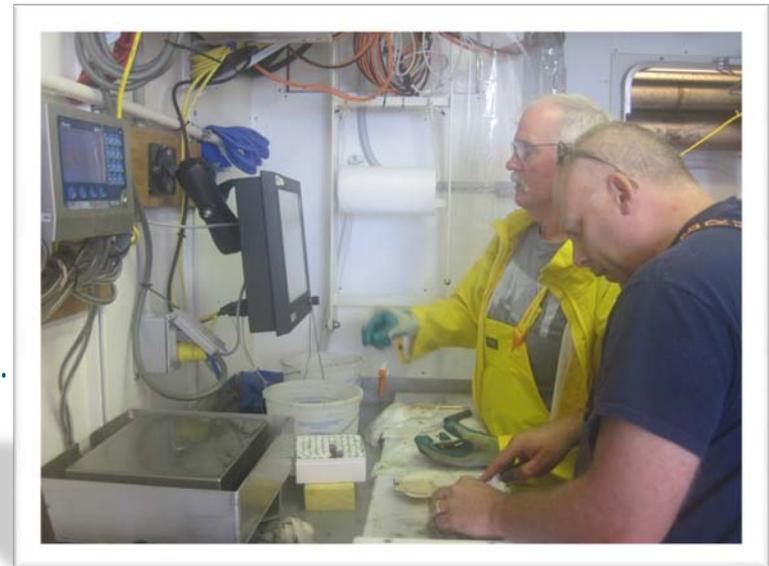
“By Volume” Sub-Sample Method

“By Length” Sub-Sample Method

Meat weight sampling:

Meat weights are used to calculate a yearly meat weight/ shell height relationship for assessment models.

Gonad weight is used in fecundity studies and assessment models.



Sea Scallop Survey: Gear Standardization Efforts

Dredges are built to very exacting tolerances.

Each dredge is inspected immediately after manufacture.

Each dredge is inspected before and after each survey.

Dredges are inspected for damage and wear on a tow by tow basis. Any issues are resolved before the dredge is put back into rotation.

Dredges are taken out of rotation after 200 tows and are not used again until fully inspected and repaired on land.

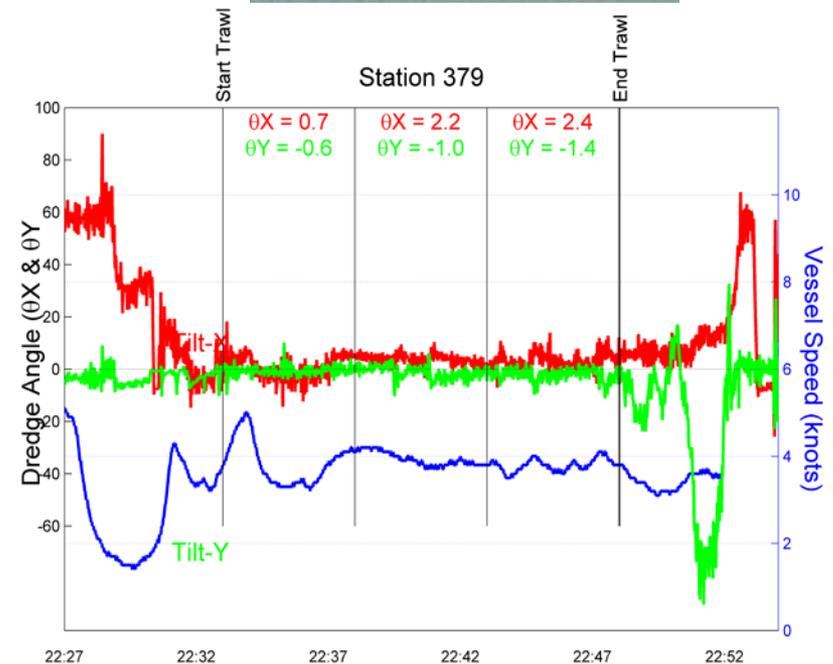


Sea Scallop Survey: Tow Standardization Efforts

A tow time of 15 minutes is based on winch lock to haulback.

Each dredge is equipped with a sensor that collects temperature, depth, tilt, and flip information.

This data is used to eliminate non-representative tows from analysis.



Sea Scallop Survey: Products

Biomass, abundance and distribution

- Scallop stock assessments

- Ecosystems management

- Habitat mapping

- Area closures

- Rotational management

Demographics – size, age, sex

- Scallop stock assessments

- Rotational management

- Effects of removals

Supplemental data for other species

- Yellowtail flounder

- Monkfish

- Lobster

- Skates

Sea Scallop Survey: Strengths

- General
 - Time-series length
 - Survey design
 - Standardization – gear, tow, catch processing
- HabCam
 - Reduced removals
 - Habitat information and association
 - Greater seafloor coverage (one image every 50m)
 - Improved CV's (combined with dredge survey = 5%)

Sea Scallop Survey: Challenges

- Expensive
- Funding difficulties (HabCam)
- Lack of real-time tow evaluation product (real-time sensors)
- Stakeholder confidence

Sea Scallop Survey: Potential Solutions

- Expensive – alternative vessel
- Funding difficulties (HabCam) – Headquarters support
- Lack of real-time tow evaluation product – survey sensor package
- Stakeholder confidence – 2014 scallop research review, outreach, cooperative research