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Northeast Fisheries Science Center

2017 Autumn Bottom Trawl Survey: Decision to Utilize NOAA Ship Pisces

Northeast Trawl Advisory Panel

January 16, 2018

NOAA Ship *Henry B. Bigelow* Mechanical Issues 2017

- Mid-July 2017: Bigelow's electric propulsion motor failed
  - Required dry-docking, removal of the motor and specialized parts from Italy
  - Estimated 6 week repair (best case)
  - Plan was still to utilize Bigelow to conduct autumn survey – late start date and extended end date
    - Mid-October was latest possible start time (survey coverage would have been modified)
- August 2017
  - Discussions began regarding use of Pisces to conduct autumn survey as 'worst-case scenario'
    - Similar hull configurations, auto-trawl winch systems, vessel endurance, lab space and freezer capacity to Bigelow
    - Ability to sample in Canadian waters
  - Two site visits to Pisces to evaluate vessel and feasibility
- September 2017
  - Clear that Bigelow would be delayed longer than expected (estimate of November availability)
  - NEFSC requested use of Pisces to conduct autumn bottom trawl survey
    - Modifications would be required
- October 2017
  - Bigelow's second electric propulsion motor diagnosed and required removal and repair
  - Estimate of January 2018

NEFSC Decision to Utilize NOAA Ship *Pisces*

- August 2017
  - Discussions began regarding use of Pisces to conduct autumn survey as 'worst-case scenario'
  - Hope was still to utilize Bigelow
- Vessels are same size and class
  - Identical hulls, auto-trawl winch systems, lab space, endurance, freezer capacity
    - Vessel effect on catchability assumed minimal
    - Confident trawl geometry could be replicated
  - Adequate scientific berthing
  - Clearance to sample in Canadian waters
  - Winch capacity allowed sampling of full depth range of the survey
- No other vessels of similar spec available
  - Limited options to conduct a 2017 autumn survey
- Site visits to Pisces to evaluate platform suitability
    - Confirmed trawl winch system sized identical to Bigelow
      - Rapp Marine inspection and maintenance required
    - Incorrect trawl wire (3/4" vs 1")
    - Minimal fish processing capabilities
    - No trawl mensuration

Survey Implementation on Pisces

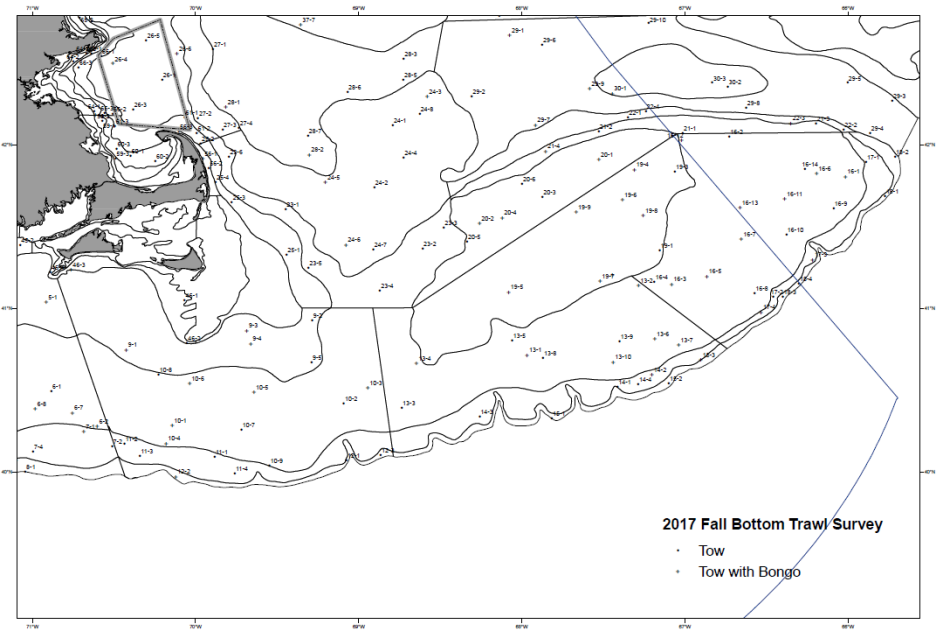
- Mid-September: Confirmed 33 sea-days on Pisces
  - 10/16-11/3 and 11/7-11/20
  - 2 week modification and shakedown cruise prior to survey – 10/1-10/15
- Modifications to Pisces
  - Removed ¾" trawl wire and spooled on Bigelow's 1" trawl wire
    - Trawl wire will remain on Pisces and Bigelow will get new trawl wire
  - Purchased and installed Scanmar acoustic hydrophones
    - Purchased Scanmar SanBas system and required licenses
    - Utilized NEFSC Scanmar sensors
  - Modified fish processing system
    - Installed Bigelow's three sampling tables
      - Utilized Pisces conveyor
    - Utilized Pisces' deck checker with some modifications for flow
  - Rapp Marine inspected, performed maintenance and calibrated auto-trawl winch system
  - Participation from Bigelow's Officers and Crew

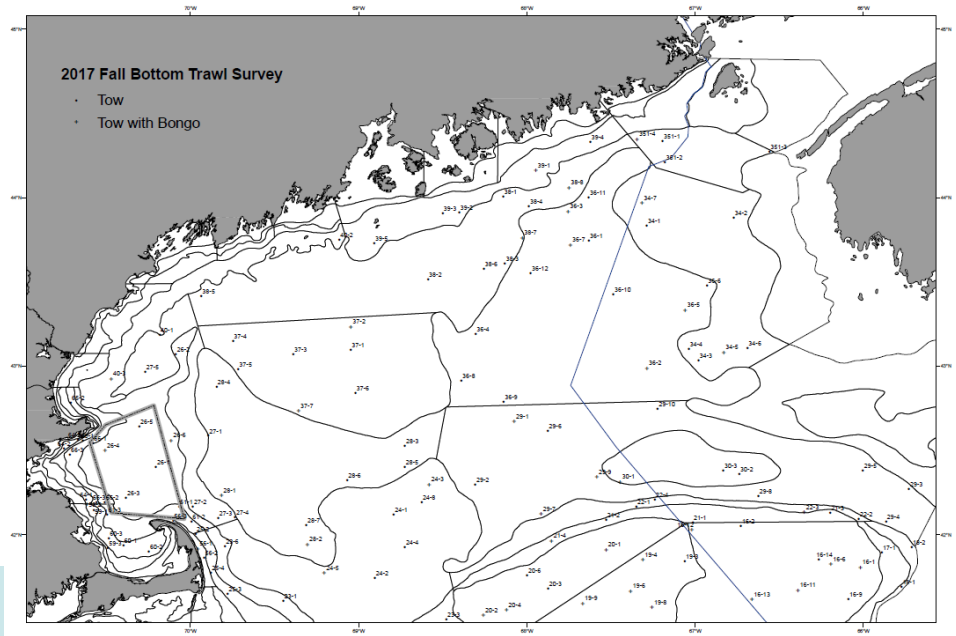
Decision of Where to Survey on Pisces

- Limited to 33 sea-days
  - Mid-October to mid-November
  - Extension of time not an option
- Broad NEFSC input regarding options
  - Survey Branch, Populations Dynamics Branch, Oceanography Branch, Vessel Coordinator, and Center Directorate
  - Multiple options considered
  - Determined that allotted sea-days were not enough for full area coverage even with reduced station density
- Best available option was to survey Georges Bank and Gulf of Maine at full station density
  - Pros:
    - Coverage for 20 assessed fish stocks at full station density
    - Timing of survey effort on GB and GoM remains consistent with historical timing
    - Meets TRAC obligations for stock sharing agreement
  - Cons:
    - No survey data obtained for stocks south of GB

2018 Survey Plan on Pisces

- 20 stocks covered:
  - Atlantic cod-easternGB, Atlantic cod-GB, Atlantic cod-GoM, American plaice, winter flounder-GB, winter flounder-GoM, windowpane flounder-GB/GoM, witch flounder, yellowtail flounder-CC/GoM, yellowtail flounder-GB, goosefish-north, haddock-easternGB, haddock-GB, haddock-GoM, red hake-north, white hake, silver hake-north, Atlantic halibut, redfish, Atlantic pollock
- 178 planned stations in the following strata:
  - 1130,1140,1150,1160,1170,1180,1190,1200,1210,1220,1230,1240,1250,1260,1270,1280,1290,1300,1340,1351, 1360,1370,1380,1390,1400,3560,3590,3600,3610,3640,3650,3660.





2018 Sampling Plan on Pisces

- Biological sampling reduced due limited fish processing capabilities
  - Priority sampling focused on species with aged-based assessments
  - All NEFSC external sample requests denied
  - Age and maturity sampling eliminated for the following 13 species:
    - Black sea bass, fourspot flounder, weakfish, tilefish, offshore hake, Atlantic croaker, butterfish, striped bass, bluefish, Atlantic mackerel, windowpane flounder, spotted hake, ocean pout
  - Age and maturity sampling reduced for the following 5 species:
    - American plaice, goosefish, haddock, redfish, red hake
  - Feeding ecology sampling reduced from 51 to 17 priority species
    - Small reduction to sampling frequency of some species
- Oceanographic sampling
  - Vertical CTD casts made at all station locations
  - Plankton samples obtained at a subset of stations in GoM only

Survey Execution on Pisces

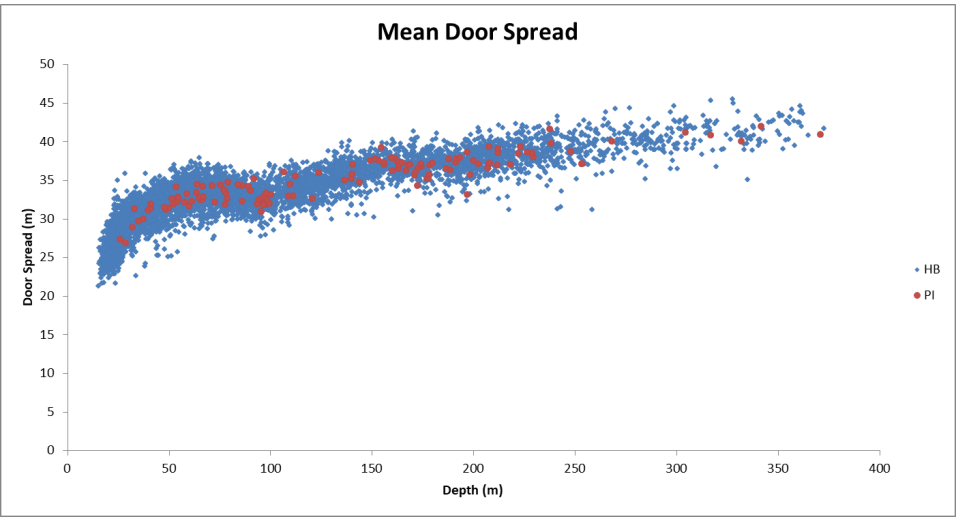
- 133 of 178 planned stations completed
  - Minor mechanical issue delayed start of survey
  - Significant strong and consistent wind throughout the survey season hindered progress

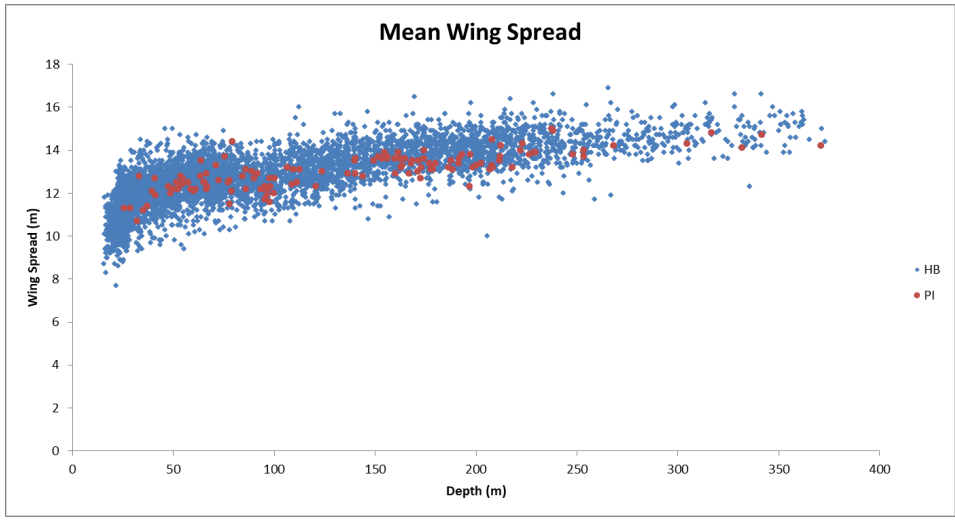
- Survey effort prioritized on Georges Bank and offshore Gulf of Maine
  - Limited or no survey tows made in the following strata:
    - 3560, 3590, 3640, 3650, 3660
  - Three stocks that were expected to be complete do not have full survey coverage:
    - Winter flounder-GoM, yellowtail flounder-CC/GoM, windowpane flounder-GB/GoM
    - Remaining 17 stocks have sufficient sampling in all strata to be used in analysis

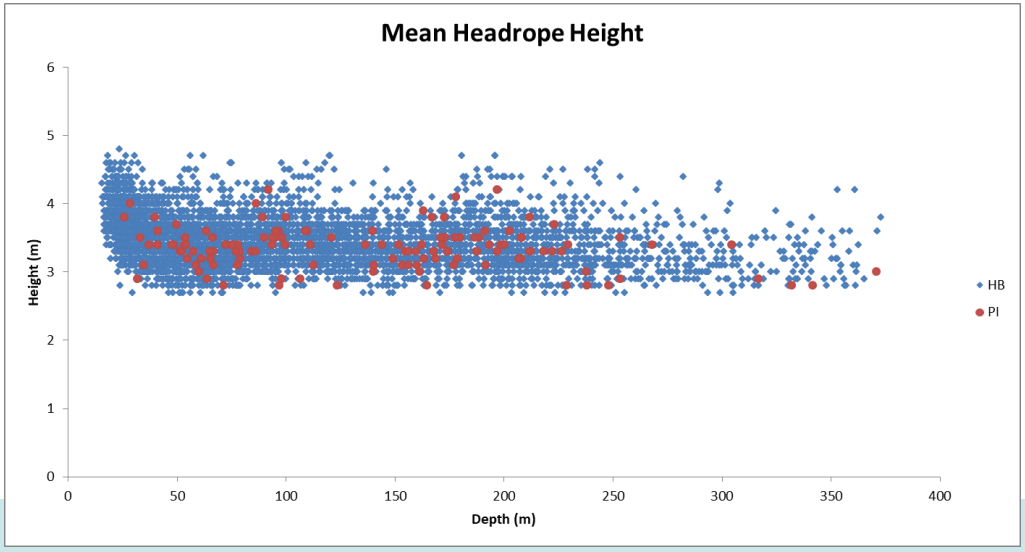
Vessel and Trawl Performance

- Confident Pisces matched Bigelow trawl performance characteristics
  - Followed NEFSC standard scope ratio table
  - Survey tows met NEFSC standard trawl performance evaluation criteria
    - Monitored, evaluated and validated in real-time at-sea, immediately post tow
      - No adjustments to vessel or trawl performance criteria or evaluation
      - Identical Tow Evaluation software as used on Bigelow
    - Tows outside of standard tolerance ranges were failed in the identical manner as Bigelow

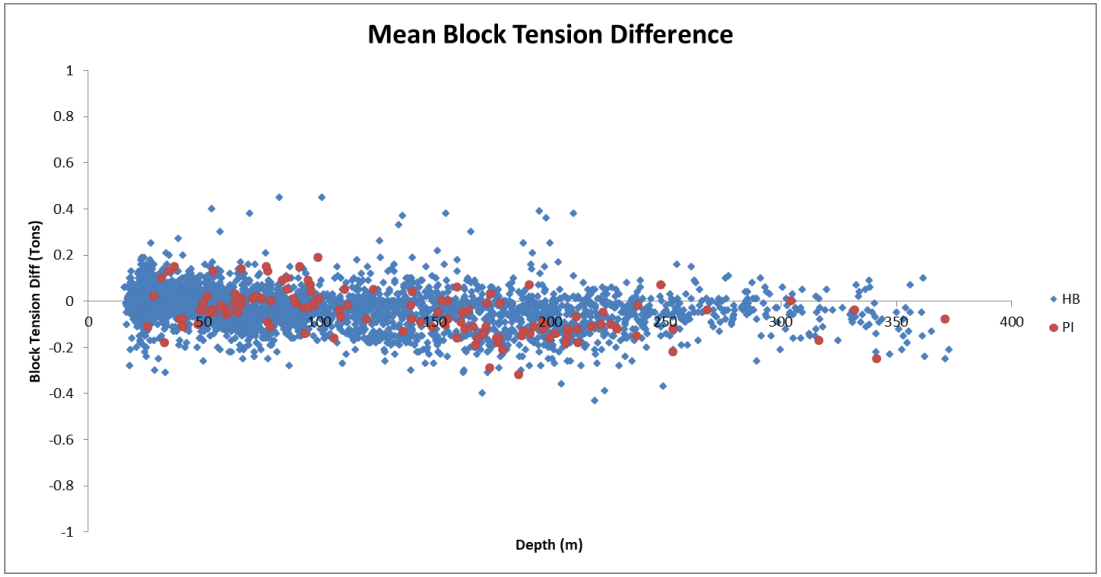
2009-2017 Autumn and Spring Survey Valid Tows
Trawl Geometry

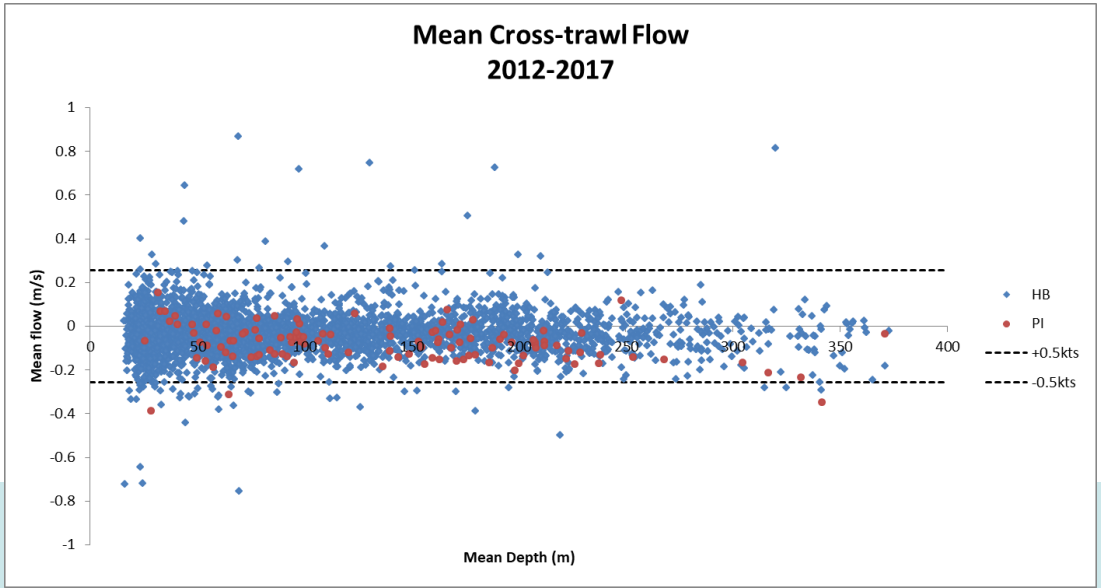






2009-2017 Autumn and Spring Survey Valid Tows
Winch Performance





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Questions?