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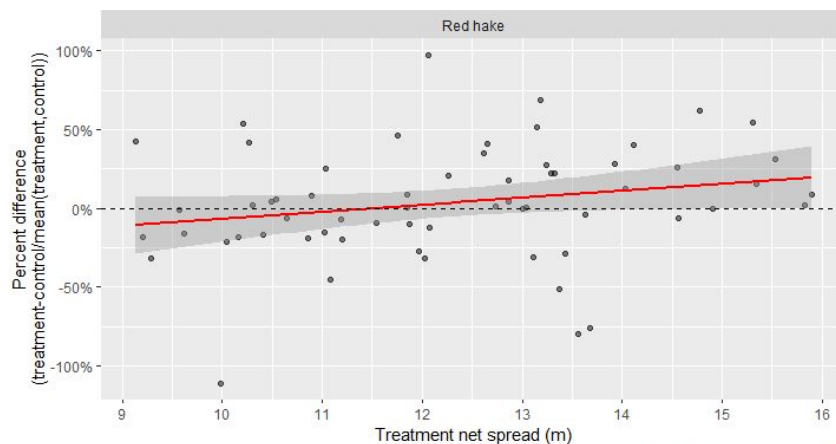
NEFSC
Woods Hole, MA

Implementing swept area standardized bottom trawl survey indices

NTAP meeting January 14, 2021

Background

- Analyses did not provide evidence of wingspread on efficiency, but confirmed effect on total catch
- NTAP recommended that indices should account for variation in wingspread (and therefore swept area)
- Jon Hare sent a letter to Councils affirming the NEFSC's commitment to phasing in the new method for index calculation



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
165 Water Street
Woods Hole, MA 02543-1026

January 7, 2021

Christopher M. Moore, Ph.D.
Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901-3910

Mr. Robert E. Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St., Suite 200 A-N
Arlington, VA 22201

Mr. Thomas A. Nies
Executive Director
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950

Dear Chris, Bob, and Tom,

The Northeast Fisheries Science Center will begin to add actual swept-area in the calculation of bottom trawl survey indices from the NOAA Ship *Henry Bigelow*. This decision is based on a recommendation provided by the Northeast Trawl Advisory Panel (NTAP). Previously, swept-area was assumed constant based on standardized tow duration and tow speed and an assumed trawl wingspread.

In 2019, NTAP advised that this assumption be tested and the group designed and conducted a field experiment to evaluate the effect of trawl gear wingspread on the gear's ability to catch fish.¹ There was a small increase in total catch with wider wingspread: the wider the wingspread, the greater the area swept, and the more fish captured. When catches were adjusted for area swept, there was no additional detectable effect of wingspread on gear efficiency. This study was based on 170 paired tows using a twin-trawl set-up aboard the *F/V Karen Elizabeth*, which has been successfully used in other gear efficiency studies conducted by NTAP and the NEFSC.² The results were reviewed and

¹ [Science Spotlight](https://www.fisheries.noaa.gov/feature-story/2019-net-spread-study-targets-flatfish-reveals-subtle-differences) <https://www.fisheries.noaa.gov/feature-story/2019-net-spread-study-targets-flatfish-reveals-subtle-differences>

² <https://www.fisheries.noaa.gov/new-england-mid-atlantic/science-data/improving-bottom-trawl-survey-northeast>

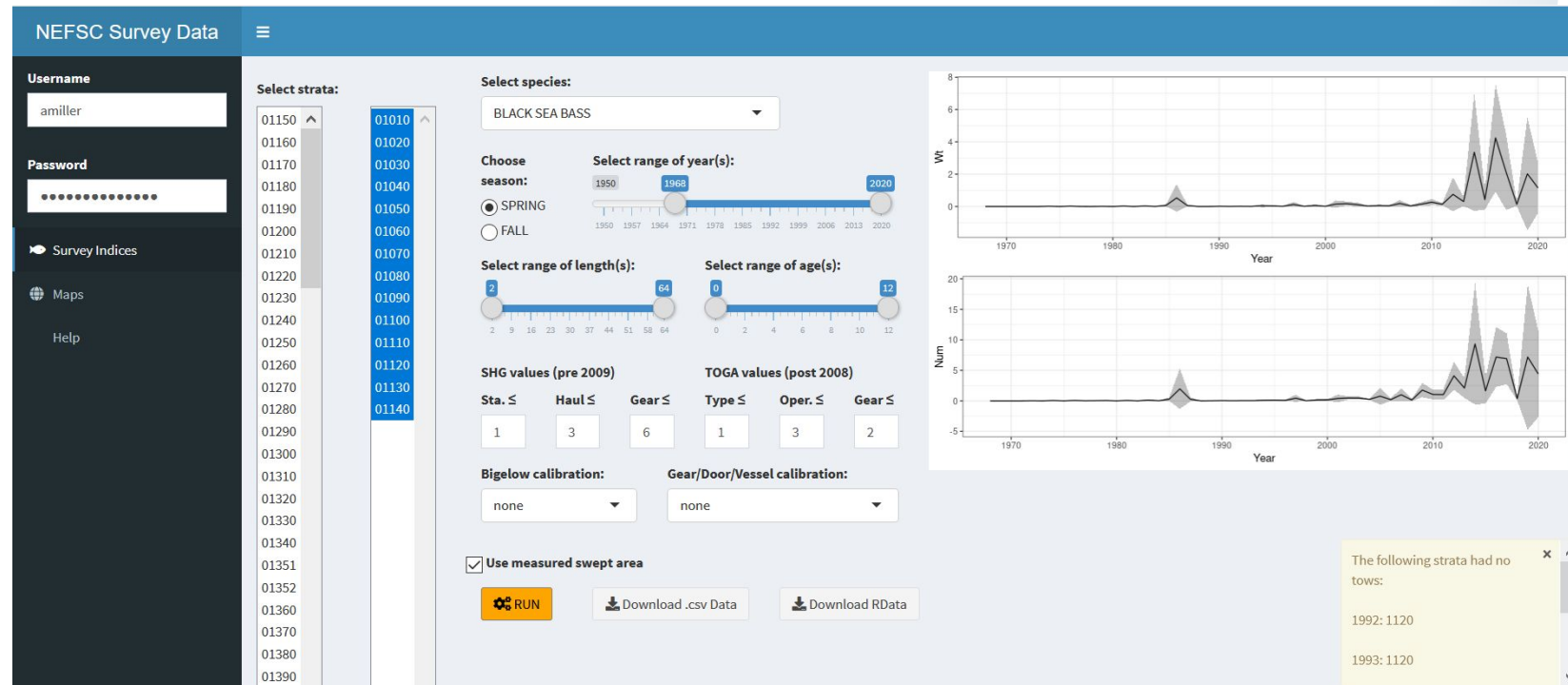


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Short and long-term approaches

Short Term: An interface has been created for analysts to easily calculate variable swept-area indices for

- each stock
- Bigelow years (2009-)
- alternative strata sets
- alternative TOGA criteria
- alternative size and age ranges



Short and long-term approaches

Long Term:

- The time series of standardized indices will be provided automatically as current survey information is for each stock.
- Updated seasonally and annually for each survey.
- Standardized data will also be used for a variety of other products e.g.,
 - length and age composition
 - weight at age
 - length at age



ADIOS!

Assessment Data Input and Output System

[Click to return to the stock selection page](#)

Flounder, Winter - Southern New England/Mid-Atlantic Bight (Sex: None)

[Click to view all survey specifications](#)

**Click on an individual output below to launch product*

Category	Product	Data output	Product description
Stratified mean indices	Stratified mean indices	strat_mean.csv	Stratified mean survey indices with bootstrap uncertainty estimates (CVs and CIs)
	Survey consistency plots	consistency_plot.csv	Overlay of normalized survey indices showing the level of agreement between available survey indices
	Stratified mean indices-at-length	strat_mean_length.csv	Stratified mean survey indices-at-length (post calibration)
	Stratified mean indices-at-age	strat_mean_age.csv	Stratified mean survey indices-at-age (post calibration)
	ALK holes	alk_holes.csv	Summary of existing ALK holes in need of filling
Calibration effects	Cohort tracking of individual surveys	cohort_tracking.csv	Cohort tracking capacity of individual surveys
	Comparison of calibrated and uncalibrated indices	uncalibrated_indices.csv	A comparison of the calibrated stratified mean survey indices to the uncalibrated indices (vessel, door, gear and Bigelow calibrations removed)
Day-night effects	Bigelow length-based calibration impacts	bigelow_length_calibr.csv	Plot of Bigelow-calibrated and uncalibrated indices at length (2009 to present)
Summary	Day-night effects on stratified indices	daynight_station_data.csv	Stratified mean indices broken down by day/night along with associated summary diagnostics (CVs, stations sampled, strata sampled)
	Survey timing, depth and temperature trends	survey_annual_stats.csv	Time series of basic survey-level statistics on the annual timing of the survey, mean depth and stratified mean bottom temperature
Spatial distribution	Survey distribution maps (time series)	survey_dist_map_fixed.csv	Map(s) showing the distribution of survey catches over the time series of the survey
	Survey distribution maps (animated)	survey_dist_map_animated.csv	Animated map(s) showing the changes in distribution of survey catches over the time series of the survey (10-year moving window)
	Oceanographic annual summaries	oceanographic_data.csv	Map(s) showing the distribution of annual survey catches in relationship to the distribution of oceanographic parameters like bottom temperature and salinity
	Stratum-level summaries	stratum_summary.csv	Summary of stratum-level statistics
	Percent positive stations	percent_positive.csv	Time series analysis of the percentage of survey stations with positive catch



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Under the hood

Just standardizing catch data:

- $n^* = n \times (\text{standard swept area}) / (\text{station swept area})$
- Then stratified indices are calculated with scaled catch per tow.



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2021 assessments:

June Management Track Assessments:

Atlantic Mackerel: no

Bluefish: intend to

Fluke: yes

Scup: no (level 1)

Tilefish: no BTS indices

Black sea bass: no (level 1)

TRAC Assessments:

EGB Cod, EGB Haddock, GB yellowtail:
Working paper to be presented

Research Track:

Butterfish: yes

Shortfin squid: yes

GB Haddock: TBD

GOM haddock: TBD



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