

Chesapeake Bay Program | Indicator Analysis and Methods Document
Striped Bass Abundance (Coastwide) | Updated July 2016

Indicator Title: Striped Bass Abundance (Coastwide)

Relevant Outcome(s): N/A

Relevant Goal(s): N/A

Location within Framework (i.e., Influencing Factor, Output or Performance): N/A

A. Data Set and Source

(1) Describe the data set. What parameters are measured? What parameters are obtained by calculation? For what purpose(s) are the data used?

The coastwide striped bass abundance indicator is based on female spawning stock biomass (SSB) data from the Atlantic States Marine Fisheries Commission (ASMFC). These data are part of results from regular stock assessments that are used to assess the health of Atlantic striped bass along the East Coast. Two types of stock assessments are conducted: (1) a benchmark stock assessment and (2) a stock assessment update. A benchmark stock assessment is a full analysis and review of the stock condition, focusing on the consideration of new data sources and newer or improved assessment models. This assessment is generally conducted every three to five years and undergoes a formal peer review by a panel of independent fisheries scientists who evaluate whether the data and methods used to produce the assessment are scientifically sound and appropriate for management use (peer-reviewed stock assessment). A stock assessment update incorporates data from the most recent years into the peer-reviewed assessment model to determine current stock status (abundance and overfishing level).

Estimates of spawning stock biomass are updated as striped bass benchmark stock assessments and assessment updates are completed by ASMFC. This indicator update is based on the 2015 assessment update that includes best available data through 2014. A statistical-catch-at-age (SCA) model is used for striped bass benchmark stock assessments and assessment updates. The SCA model is a forward projecting model which uses catch-at-age data and fishery-dependent and -independent survey indices to estimate annual population size and fishing mortality. Updated data inputs from the most recent years are used to run the model for each stock assessment update. The updated 2015 assessment produced slightly higher female spawning stock biomass estimates from 2005-2012 than the 2013 benchmark assessment.

Female SSB index values are derived from the SCA model and are a relative measure of mature female (4-15 years old) biomass. Weight at age data from jurisdictions' commercial/recreational catches is the model input that is primarily used to calculate female SSB estimates.

(2) List the source(s) of the data set, the custodian of the source data, and the relevant contact at the Chesapeake Bay Program.

- Source: ASMFC Atlantic Striped Bass Technical Committee
- Custodian: Max Appelman (Fishery Management Plan Coordinator, ASMFC)
- Chesapeake Bay Program Contact (name, email address, phone number): Emilie Franke, emilie.franke@noaa.gov, 410-267-5643

(3) Please provide a link to the location of the data set. Are metadata, data-dictionaries and embedded definitions included?

Yes, all information on the data can be found on the ASMFC striped bass [webpage](#). The 2013 benchmark stock assessment and 2015 assessment update can be found at the following links:

2013 benchmark:

http://www.asmfmc.org/uploads/file/529e5ca12013StripedBassBenchmarkStockAssessment_57SAWReport.pdf

2015 update:

http://www.asmfmc.org/uploads/file/564106f32015AtlStripedBassAssessmentUpdate_Nov2015.pdf

B. Temporal Considerations

(4) Data collection date(s): 1982-2014

(5) Planned update frequency (e.g., annual, biannual, etc.):

- Source Data: When a benchmark stock assessment or assessment update is conducted (approx. every 2 years).
- Indicator: When a benchmark stock assessment or assessment update is conducted (approx. every 2 years).

(6) Date (month and year) next data set is expected to be available for reporting: early 2017

C. Spatial Considerations

(7) What is the ideal level of spatial aggregation (e.g., watershed-wide, river basin, state, county, hydrologic unit code)? Coastwide (Atlantic)

(8) Is there geographic (GIS) data associated with this data set? If so, indicate its format (e.g., point, line polygon). No

(9) Are there geographic areas that are missing data? If so, list the areas. No

(10) Please submit any appropriate examples of how this information has been mapped or otherwise portrayed geographically in the past. N/A

D. Communicating the Data

(11) What is the goal, target, threshold or expected outcome for this indicator? How was it established? The ASMFC Atlantic coast target level is a female spawning stock biomass (SSB) of 159 million pounds, which is equal to 125 percent of the 1995 SSB level, with a threshold not to go below 127 million pounds (the 1995 SSB level). These reference points were by the ASMFC 2013 benchmark stock assessment.

(12) What is the current status in relation to the goal, target, threshold or expected outcome? The 2014 estimate of 141 million pounds is above the threshold of 127 million pounds but below the target of 159 million pounds. The 2015 assessment update indicates that the stock is not overfished.

(13) Has a new goal, target, threshold or expected outcome been established since the last reporting period? Why? No, these are the same reference points developed in the 2013 benchmark stock assessment.

(14) Has the methodology of data collection or analysis changed since the last reporting period? How? Why? No.

(15) What is the long-term data trend (since the start of data collection)? Since the start of the data collection in 1982, female SSB increased from a time series low of an estimated 10.4 million pounds in 1983 to a peak of roughly 173.2 million pounds in 2003. Female SSB has been in excess of the threshold (127 million pounds) since 1995, but female SSB has shown a general decline for the past 10 years.

(16) What change(s) does the most recent data show compared to the last reporting period? To what do you attribute the change? Is this actual cause or educated speculation? Since the 2013 benchmark stock assessment (reported data through 2012), the female SSB has declined from an estimated 150 million pounds in 2012 to 141 million pounds in 2014.

(17) What is the key story told by this indicator? Overfishing and negative impacts from environmental conditions led to a collapse of the Atlantic coast striped bass stock in the 1980s. Commercial and recreational fishermen in the coastal jurisdictions worked to successfully rebuild the stock by 1995. The 2013 benchmark stock assessment indicated a steady decline in SSB, so the jurisdictions implemented harvest reductions for the 2015 season. The 2015 assessment update indicates that the stock is not overfished and not experiencing overfishing. A new 2016 assessment update will provide another review of the stock status.

E. Adaptive Management

(18) What factors influence progress toward the goal, target, threshold or expected outcome? A variety of factors influence stock biomass including population dynamics, environmental factors and fishing pressure.

(19) What are the current gaps in existing management efforts?

Atlantic Striped Bass are managed by the coastal jurisdictions through the Atlantic States Marine Fisheries Commission. Chesapeake Bay jurisdictions include Maryland, Virginia and the Potomac River Fisheries Commission.

(20) What are the current overlaps in existing management efforts? N/A

(21) According to the management strategy written for the outcome associated with this indicator, how will we (a) assess our performance in making progress toward the goal, target, threshold or expected outcome, and (b) ensure the adaptive management of our work? N/A

F. Analysis and Interpretation

Please provide appropriate references and location(s) of documentation if hard to find.

(22) What method is used to transform raw data into the information presented in this indicator? Please cite methods and/or modeling programs.

A statistical-catch-at-age (SCA) model is used for the striped bass stock assessments. The SCA model is a forward projecting model which uses catch-at-age data and fishery-dependent and -independent survey indices to estimate annual population size and fishing mortality. Indices of abundance track relative changes in the population over time while catch data provide information on the scale of the population size. Age structure data (numbers of fish by age) provide additional information on recruitment (number of age-1 fish entering the population) and trends in mortality. Description of the model inputs, outputs and methods can be found in the 2013 benchmark stock assessment and 2015 assessment update:

2013 benchmark:

http://www.asmfc.org/uploads/file/529e5ca12013StripedBassBenchmarkStockAssessment_57SAWReport.pdf

2013 benchmark assessment overview:

<http://www.asmfc.org/uploads/file/pr49StripedBassBenchmarkAssmt.pdf>

2015 update:

http://www.asmfc.org/uploads/file/564106f32015AtlStripedBassAssessmentUpdate_Nov2015.pdf

(23) Is the method used to transform raw data into the information presented in this indicator accepted as scientifically sound? If not, what are its limitations? Yes.

- (24) How well does the indicator represent the environmental condition being assessed? See model details in the answer to question 22 of this document.
- (25) Are there established reference points, thresholds, ranges or values for this indicator that unambiguously reflect the desired state of the environment? See stock assessment reports in the answer to question 22 of this document.
- (26) How far can the data be extrapolated? Have appropriate statistical methods been used to generalize or portray data beyond the time or spatial locations where measurements were made (e.g., statistical survey inference, no generalization is possible)? See model details in the answer to question 22 of this document.

G. Quality

Please provide appropriate references and location(s) of documentation if hard to find.

- (27) Were the data collected and processed according to a U.S. Environmental Protection Agency-approved Quality Assurance Project Plan? If so, please provide a link to the QAPP and indicate when the plan was last reviewed and approved. **If not, please complete questions 29-31.** No.
- (28) *If applicable:* Are the sampling, analytical and data processing procedures accepted as scientifically and technically valid? Yes.
- (29) *If applicable:* What documentation describes the sampling and analytical procedures used?
Description of the model inputs, outputs and methods can be found in the 2013 benchmark stock assessment and 2015 assessment update:
2013 benchmark:
http://www.asmfmc.org/uploads/file/529e5ca12013StripedBassBenchmarkStockAssessment_57SAWReport.pdf
2015 update:
http://www.asmfmc.org/uploads/file/564106f32015AtlStripedBassAssessmentUpdate_Nov2015.pdf
- (30) *If applicable:* To what extent are procedures for quality assurance and quality control of the data documented and accessible?
See stock assessment reports in the answer to question 29 of this document.
- (31) Are descriptions of the study design clear, complete and sufficient to enable the study to be reproduced? Yes.
- (32) Were the sampling, analytical and data processing procedures performed consistently throughout the data record? Stock assessments are updated regularly.

See the ASMFC striped bass webpage for a list of all stock assessment reports for striped bass: <http://www.asmfc.org/species/atlantic-stripped-bass>

(33) If data sets from two or more sources have been merged, are the sampling designs, methods and results comparable? If not, what are the limitations?

Yes, see the stock assessment reports in the answer to question 29 of this document.

(34) Are levels of uncertainty available for the indicator and/or the underlying data set? If so, do the uncertainty and variability impact the conclusions drawn from the data or the utility of the indicator?

Yes, see the stock assessment reports in the answer to question 29 of this document.

(35) For chemical data reporting: How are data below the MDL reported (i.e., reported as 0, censored, or as < MDL)? If parameter substitutions are made (e.g., using orthophosphate instead of total phosphorus), how are data normalized? How does this impact the indicator? N/A

(36) Are there noteworthy limitations or gaps in the data record? No.

H. Additional Information (*Optional*)

(37) Please provide any further information you believe is necessary to aid in communication and prevent any potential misrepresentation of this indicator. Striped bass are managed by each jurisdiction through the Atlantic States Marine Fisheries Commission (ASMFC). Please see the ASMFC [website](#) for more details.