SAW66 SUMMER FLOUNDER STOCK ASSESSMENT

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Summary – SCeMFiS funded the finfish stock assessment team to participate in the 66th Northeast Regional Stock Assessment Workshop as members of the Summer Flounder Assessment Working Group. The team attended Working Group meetings during 2018 and participated in the Stock Assessment Review Committee. Major revisions to the 2018 assessment were 1) a revised time series of recreational catch estimates that is substantially greater than estimates in previous assessments, and 2) considering the Bigelow survey to be a separate index of abundance from the previous Albatross survey. Several alternative stock assessment methods, including sex-structured models, were considered, but the Working Group and Review Committee accepted an analytical stock assessment that is similar to the method used to assess summer flounder since 2008 because of some unresolved problems with sex-structured models. The stock assessment concluded that the stock is not overfished and overfishing was not occurring in 2017 (Figure 1).

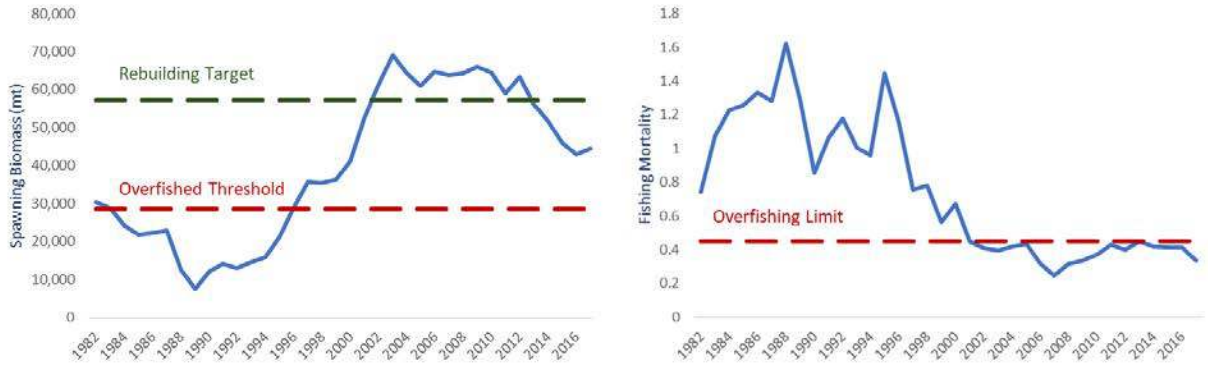

Figure 1. Estimates of summer flounder spawning stock biomass and fishing mortality rates relative to maximum sustainable yield reference points (from SAW66 summary report).

Notes:

1. ***This report presents the perspectives of the authors - not necessarily the Summer Flounder Working Group, the stock assessment review committee, or SCeMFiS.***
2. ***This summary includes information developed by the SAW66 Summer Flounder Working Group.***

Data – Fishery and survey data were updated through 2017. The major data change was revising the time series of recreational catch based on the new Marine Recreational Information Program (MRIP) system of estimating recreational effort. Revised estimates of recreational catch are substantially greater, approximately doubling the perception of landings, and tripling the estimates of discards in the last decade (Figure 2).

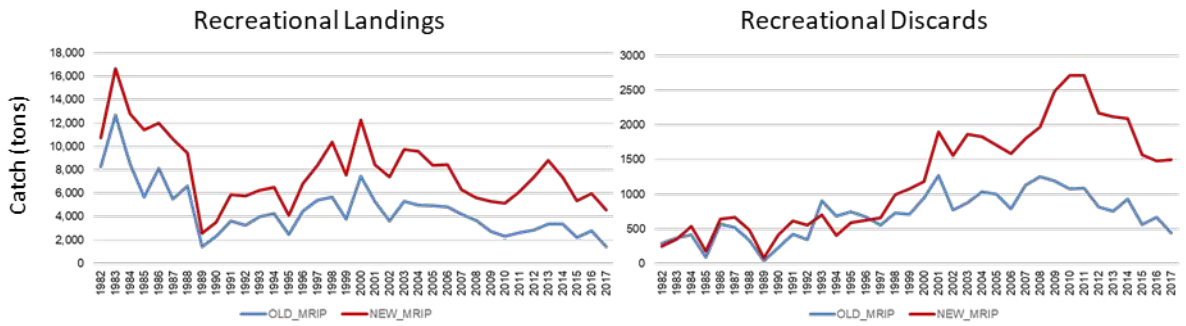

Figure 2. Time series of recreational landings (left) and discards (right) from the previous method (blue) and the revised method (red).

The revised estimates of recreational catch provide a new perspective on total catch and the relative contributions of commercial and recreational fisheries (Figure 3). Revised estimates of recreational catch are greater than estimates of commercial catch since 1996.

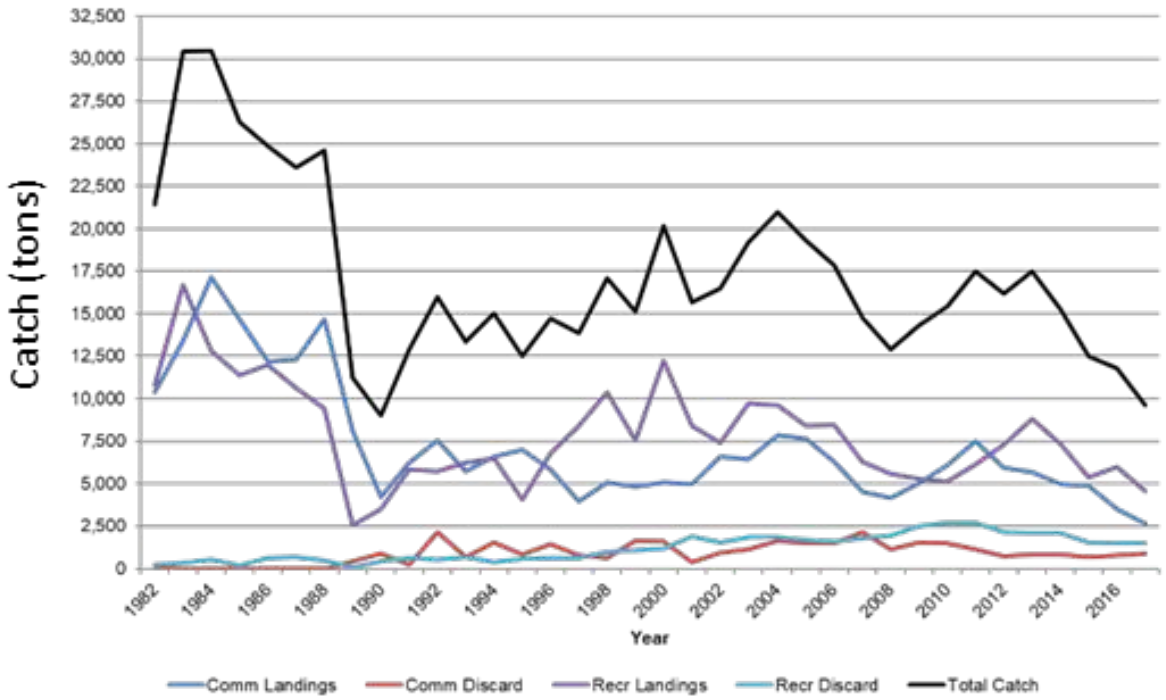

Figure 3. Estimates of summer flounder catch.

Age structure of fishery catch (Figure 4) suggests negligible catch of juveniles since the transition to large mesh regulations in the mid 1990s and a rebuilding of age structure from the mid 1990s to the early 2000s (e.g., increased proportion of fish age 4 and older).

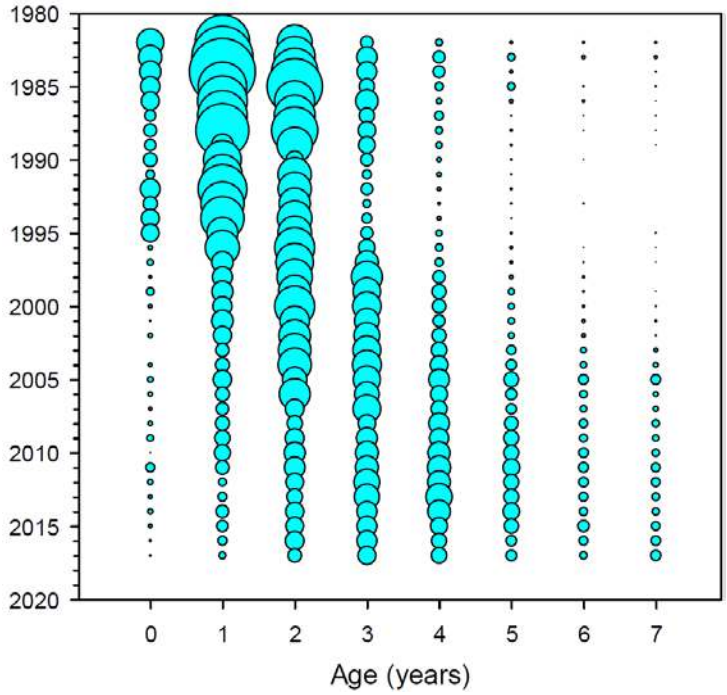

Figure 4. Age composition of the fishery (circles indicate relative magnitude).

Several federal and state surveys are available for information on relative stock trends. Surveys indicate an increase in the stock since the mid 1990s. The previous benchmark assessment method attempted to calibrate the new Bigelow survey with the previous Albatross survey, and the converted series suggested a decrease in the stock since 2004 (Figure 5). However, the Bigelow series (2009-2017) was considered sufficiently long to be considered a separate index of abundance, which does not indicate a stock decrease. Similar to fishery age composition, survey data indicate a rebuilding of age structure from the mid 1990s to the early 2000s.

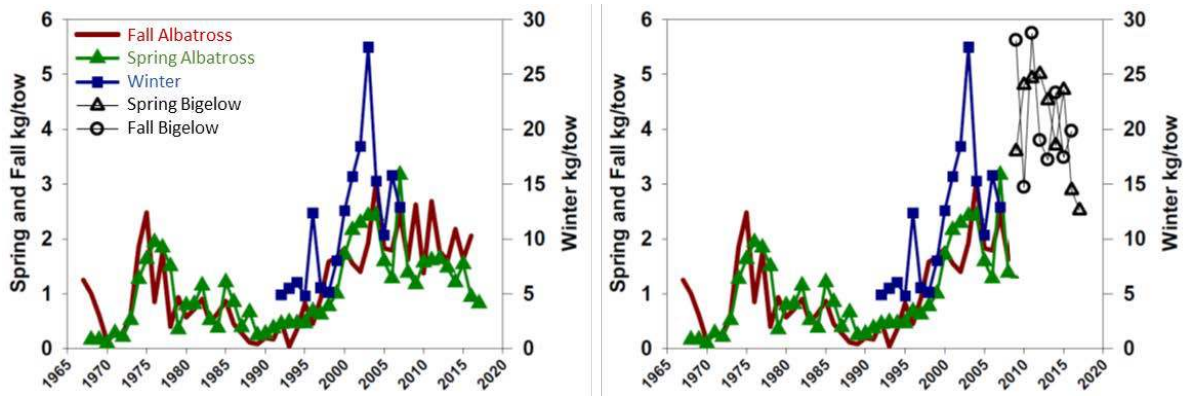

Figure 5. Survey abundance indices, treating NEFSC surveys as a single series (left) or separate Albatross and Bigelow surveys (right).

Model – Summer flounder has been assessed using a statistical catch at age model since 2008 (SAW47) which had a retrospective pattern of inconsistency but estimated that the stock was not overfished and overfishing was not occurring. The 2011 update assessment indicated that the stock had rebuilt to the spawning biomass target in 2010. The 2013 SAW57 benchmark assessment maintained the same

assessment method but had no retrospective pattern and concluded that the stock was not overfished and overfishing was not occurring. The 2016 update assessment indicated that the stock was not overfished but overfishing was occurring.

The 2008 SAW47 benchmark assessment had several research recommendations related to sex structure of the resource, including an investigation of sex ratios and sex-specific modeling. The 2013 SAW57 benchmark also included recommendations for sampling catch by sex and incorporating sex - specific differences in size at age into the stock assessment. In response, SCeMFiS funded Pat Sullivan (Cornell Univ.) to develop a sex-age-length based fisheries stock assessment model for application to summer flounder.

Alternative modeling approaches were considered, including several versions of sex-structured stock assessments. However, much more time and attention was invested in updating the statistical catch at age model than developing new sex-structured models, and each sex-based model had unresolved problems at the time of model selection. None of the problems appear to be unresolvable, and greater attention to the alternative models may resulted in a different model choice. The Review Panel was concerned that the data available on sex composition are limited, and their reports indicate that the documentation was insufficient to fully consider the sex-structured models as a basis for management advice. However, the Panel recognized that differences in growth among sexes have important implications for reference points, so efforts should continue to develop an appropriate separate-sex assessment model. We conclude that model development should continue for applying sex-structured assessment models for summer flounder, possibly to condition operating models for performance testing.

Fishery Management Advice – The Mid Atlantic Fishery management Council's Scientific and Statistical Committee met in January to provide recommendations for 2019-2021 overfishing limits and acceptable biological catch. Their recommendations were that catch can increase from the extremely low 2018 acceptable catch, back to approximately the magnitude of 2016 catch (Figure 6).

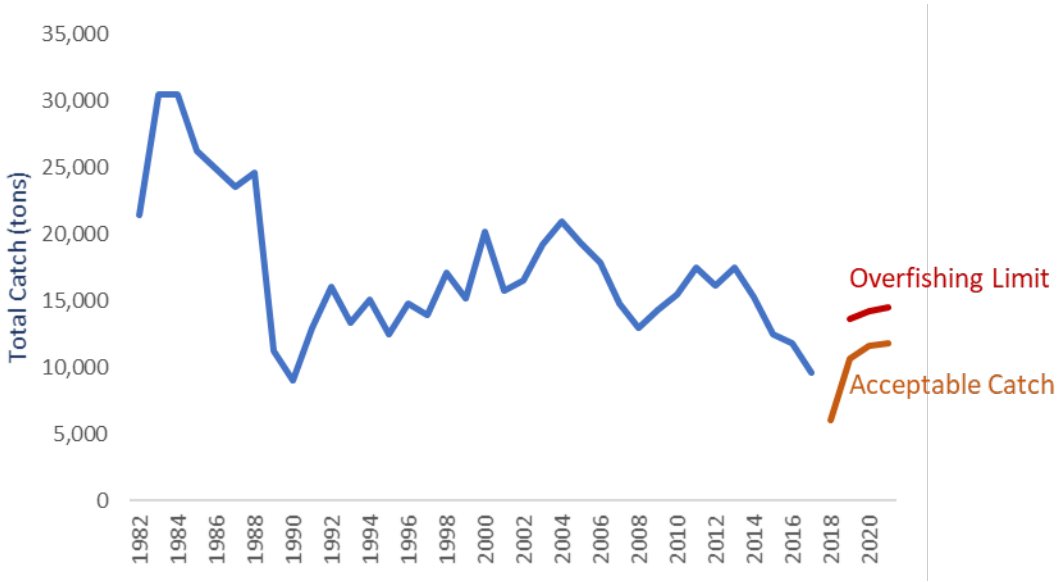

Figure 6. Time series of total catch in the stock assessment, as well as projections of overfishing limit and acceptable catch.