

**Independent Peer Review Report on the
Stock Assessment Review Committee (SARC) for Atlantic Mackerel (NAFO Subareas 3-6)**

Prepared for:
The Center for Independent Experts

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Dr Kevin Stokes
Stokes.net.nz Ltd
59 Jubilee Rd
Khandallah
Wellington 6035
New Zealand
Ph: +64 (021) 222 0926
E-mail: kevin@stokes.net.nz

EXECUTIVE SUMMARY

The independent peer review report shall be prefaced with an Executive Summary providing a concise summary of whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.).

The SARC for Atlantic Mackerel took place at the Northeast Fisheries Science Center (NEFSC), Woods Hole, MA, from 28th to 30th November 2017. The review was hosted by the NEFSC. The draft stock assessment report is clear and reasonably comprehensive. It and multiple working papers were sent in advance of the review. At the review, the lead analyst, supported by the Working Group (WG) Chair, delivered a confident and well-organized presentation, responded thoughtfully to all questions, and responded carefully to all requests. The review considered only one stock, greatly facilitating the process.

There is no stock assessment and status determination, the previous assessment in 2009 having not been accepted. The 2017 SAW/SARC process was greatly enhanced by collaboration between Canadian and US scientists and participation of industry.

Data are limited for the northwest Atlantic mackerel stock. It is thought there are two stock contingents, with spawning centered in Canada and the USA, but overlapping on the over-wintering ground. Fishing has a long and complex history with high early catches by distant water fleets, joint venture arrangements, and full domestication of fisheries from both Canada and the USA.

The 2017 assessment makes necessary simplifications and then applies standard techniques to all available, potentially informative data. The tuning has used standard approaches which have been expertly applied and consideration of diagnostics has been good. Assessment estimates of SSB, R, and F are credible, and MCMC has been used to define credibility intervals. Resulting estimates of status are robust, using proposed, standard BRPs. Projections are limited to alternative F scenarios rather than alternative states of nature, but the wide CI on the projections likely covers any alternative scenarios that might be developed.

The new assessment is suitable as a basis for management advice. It suggests the stock is overfished and experiencing overfishing.

BACKGROUND

The report must contain a **background section**, description of the individual reviewers' roles in the review activities, summary of findings for each TOR in which the weaknesses and strengths are described, and conclusions and recommendations in accordance with the TORs. The independent report shall be an independent peer review, and shall not simply repeat the contents of the SARC Summary Report.

- a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.
- b. Reviewers should discuss their independent views on each TOR even if these were consistent with those of other panelists, but especially where there were divergent views.
- c. Reviewers should elaborate on any points raised in the SARC Summary Report that they believe might require further clarification.
- d. The report may include recommendations on how to improve future assessments.

Northwest Atlantic mackerel (*Scomber scombrus*) is distributed from Labrador, Canada, in the north to North Carolina, USA, in the south. The species is migratory, spending spring and summer typically within 80nm of the shore before migrating further offshore to the continental shelf in fall and winter. Mackerel typically form large pelagic shoals and are found in single species aggregations or below herring shoals. Shoals are typically formed of similarly sized/aged fish. Stock structure of Atlantic mackerel in the northwest Atlantic has been much studied. It is generally recognized that there are two spawning "contingents". One in the Gulf of St Lawrence, Canada, and one in coastal New England and the Mid-Atlantic area of the USA. As the fish move offshore in winter months, they mix in USA waters. As noted in ToR 1, recent work has shown distinctions between the fish from spawning areas, and the fish are largely separated throughout their first year, before mixing occurs from age two onwards. The fish are not distinguishable when they are caught together, and the stock assessment assumes a single stock with no mixing.

The northwest Atlantic mackerel stock has historically supported major commercial fisheries; during the late 1960s and early 1970s annual catches were all more than 250,000 tonnes, with a peak of more than 400,000 tonnes from 1971-1973. Those catches were largely by distant water fleets. With the cessation of distant water fisheries by 1978, the commercial fishery (Canada and the USA) declined to less than 50,000 tonnes in the late 1970s and early 1980s, rising to near 100,000 tonnes in the late 1980s through joint venture arrangements and declining again through the 1990s. The mid 2000s saw an increase in USA domestic fisheries, and the combined USA and Canada catch increased to over 100,000 tonnes before declining and reaching very low levels in recent years. Recreational catches are small compared to commercial. Mackerel is targeted by a variety of gears in the USA and Canada, and is caught cleanly, mixed with herring, or as bycatch in ground fisheries.

The stock was last assessed, jointly by Canadian and USA scientists, in 2009 using an ADAPT VPA within the Transboundary Resources Assessment Committee (TRAC) process. It was previously assessed in 2005. The 2009 assessment process suggested considerable uncertainty in estimates of the most recent spawning stock biomass (SSB) and fishing mortality (F), and the assessment was not considered appropriate as a basis for providing management advice. At the time, reviewers noted conflicts among data sources (CPUE, NEFSC spring bottom trawl survey, and fishery catch-at-age time series) which the

model could not adequately resolve. In the absence of an accepted assessment in 2009, there were no existing overfishing and overfished status determinations coming into this 2017 assessment round.

Given the lack of an accepted assessment and status determination, the recent low catches of mackerel, and fishing constraints due to multiple management requirements (restricted areas, omnibus limits, etc.), there is considerable interest by managers and the industry in this new assessment. It is notable for this assessment that apart from a change in model approach and movement away from age-dependent natural mortality (as used in 2009), the new assessment does not use CPUE and is informed by a new, egg survey series.

REVIEW PROCESS AND ROLE OF REVIEWER

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The SARC for Atlantic Mackerel took place at the Northeast Fisheries Science Center (NEFSC), Woods Hole, MA, from 28th to 30th November 2017. The review was hosted by the NEFSC.

Participants in the review are listed in Appendix 3. The SARC comprised a MAFMC SSC appointed Chair (J Boreman) and three CIE reviewers (R Cook, J Powers and K Stokes). The rapporteurs for the meeting were provided by the NEFSC. Notification of the meeting and dissemination of papers followed closely the schedule laid out in the CIE Statement of Work (see Appendix 2). Materials were provided in advance *via* a dedicated server (see Appendix 1). Overall, administration of the review was sound.

The Terms of Reference (ToR) for the review are given in Appendix 2, Annex 2. The ToR are now well-established for the SARC process and follow a general template with stock specific adjustments. The ToR were clear and well explained by the SARC Coordinator (J Weinberg) during a pre-SARC meeting. Clarification during the meeting was made as necessary. My only comment on the ToR is that at ToR 7, on projections, there is a difference in NEFSC practice compared with the letter of the ToR. This was discussed during the meeting and the SARC Coordinator is aware of the (minor) issue.

Reviews are typically fluid by necessity but in this case, with only one stock to review and excellent preparation by all involved, the meeting followed very closely the agenda (Appendix 2, Annex 3). Daily

meetings started at 9:00am and continued to around 5:30-6:00pm. Reviews typically cover two or even more stocks and time may be highly constrained and report writing compromised. With only one stock to consider, this review ran smoothly, and it was a pleasant departure from the norm to be able to complete all activities in an unhurried manner. The SARC Panel Report was largely finalized within the time allotted on the final day, and it even proved possible to depart in good time, leaving only final editing to be done after the meeting. The Panel chair managed proceedings expertly and the SARC Panel report was finalized quickly in the following week following fact checking with the assessment team. The Panel report was written in bullet form. This greatly aided the final discussion and allowed fast turnaround. In my view, the report was not just simpler to produce than an extensive text, but it is also simpler to read. I would encourage this approach more generally. Though I recognize the costs involved and desire to maximize review of multiple stocks, I am also of the strong opinion that focus on the single stock allowed a far better review than is typical and would encourage single stock review where possible.

Presentations of the stock assessment were by the lead assessment scientist for the primary (ASAP) model (K Curti), supported by the chair of the Working Group (WG) (G Shepherd), both NEFSC staff. Participants included a representative from the MAFMC, Canadian scientists who had participated in the WG, multiple NEFSC staff, and a strong and helpful industry contingent. A webinar was used throughout the meeting, but I do not have a record of participation. I am not aware of any problems with notification of the meetings. The agenda included specific opportunities for public comment. However, all participants were able to contribute throughout the meeting when relevant. Many participants contributed usefully to the discussion, and I believe that all were provided appropriate opportunity for involvement.

Although it is often said, it is worth repeating that the NEFSC staff involved should all be thanked for ensuring an excellent process. So too should the chair of the SARC for a light but efficient touch; the meeting was cordial throughout and met its mandate.

The role of the reviewer is set out in the CIE Statement of Work, Attachment A, attached here in Appendix 2, Attachment A. CIE reviewers are tasked with producing an independent report to the CIE. The reviewers were additionally tasked with contributing to the Summary Assessment Report and the SARC Panel Report.

In addition to becoming familiar with the draft stock assessments(s) and background materials, I participated in all discussions, including in the main review of ToR, editing of the Assessment Summary Report (the draft was provided by the assessment team/WG), and development of the SARC Report.

SUMMARY OF FINDINGS

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ToR 1 *Spatial and ecosystem influences on stock dynamics:*

a. Evaluate possible spatial influences on the stock dynamics. Recommend any need to modify the current stock definition for future stock assessments.

The WG report includes a brief but informative section on considerations of spatial dynamics and stock structure. During review, the presentation included further consideration of all available information on migration patterns, distributions of eggs in the US Ecosystem and spring trawl surveys, as well as on otolith microchemistry. The WG recognized a change in the center of gravity of mackerel in the northwest Atlantic and considered investigations to uncover causes of the change. None were conclusive. The WG also considered otolith microchemistry work as a potential basis for changing stock structure. While the work supports the two-contingent working framework, it does not support a change from the assumption of a single stock. There is no genetic information available.

Having considered the available materials on stock distribution and structure, the WG chose to continue the assessment with a single stock, noting also that it is in any case impossible to separate catches into two stocks in the winter fisheries.

In my view, the WG was thorough and, having considered pertinent information, made the right decision to proceed with a single stock for assessment.

Without considerably more information, notably genetic, it does not appear feasible to move beyond the single stock working assumption. I note that in the research recommendations there is an emphasis on stock structure research and on models with spatial components. While I agree such work would be interesting, I am less clear that it is imperative. It is already known that there are two contingents, and that there is a degree of spawning separation with different microchemistry signatures depending on spawning location. It is not clear there is natal fidelity and only genetic studies rather than otolith microchemistry might reveal this. However, if stock separation were revealed, lack of separation in fisheries data would remain a problem for assessment and forecasting/management.

b. Describe data (e.g., oceanographic, habitat, or species interactions) that might pertain to Atlantic mackerel distribution and availability. If possible, integrate the results into the stock assessment (TOR-4).

The WG report and the review presentation included a good description of work on the distribution of mackerel and mackerel eggs. Work included consideration of positive tows in the NEFSC surveys, which influenced the decision on strata to be included in the index used for the assessment. I am not wholly

convinced that the index should use positive tows only, but given the relative unimportance of the index in the current assessment (now that the new combined egg survey is available) do not regard this as problematic. The survey age composition data are more important than the survey index.

As noted at ToR1a, the WG noted the change in center of gravity/distribution of mackerel. The WG considered multiple analyses attempting to link this change with both abiotic and biotic factors. The various studies all suggest underlying changes that may relate to the observed mackerel changes, but none were able to be integrated into the assessment. In my view, the WG report, presentation, and review discussion, all indicate the WG considered the studies in detail, and reasonably concluded that while none could be integrated into the assessment, there is an underlying change in productivity and that the high recruitment levels of the late 1960s and early 1970s may no longer be possible. The WG reasonably took account of this when carrying out projections (ToR5 and 7).

The WG report briefly describes the limited predation information available from NEFSC bottom trawl surveys, and concludes that no derived index might be used as an index of mackerel abundance. This seems reasonable. With respect to the ToR, there seems little that might be said on species interactions and mackerel distribution or availability.

However, though not strictly part of this ToR, and perhaps more appropriate at ToR 4, I note that the WG report background section includes a brief history of assumptions about natural mortality in the assessment models. In 2009, the TRAC assessment used an age-dependent natural mortality (reflecting predation). In this new assessment, only different age-constant values have been considered. I do think the WG could have done more to compare the implications of moving from the previously used age-dependent to the constant natural mortality formulation.

ToR 2: Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

The WG report includes descriptions of data used for all fishery components (commercial, discards, recreational), types (aggregate, at-age, at-length), and country (USA, Canada). However, except for an estimate of precision for US discards, uncertainty in catch data is not discussed. The WG does describe raising methods and handling of missing data. Because the assessment (ASAP, ToR 4) treats catches as with error, lack of consideration of uncertainty in catches is likely not a problem unless any catch estimates are biased. Given other, gross uncertainties in the assessment (e.g., stock structure), and the robustness of general conclusions (notably stock status, ToR 5), I do not consider this a problem and so make no recommendation.

I note for completeness and compatibility with the SARC report that the WG report covers all sources of fishery removals, but the ASAP model used in the assessment does not include unreported catch from the recreational, bait, and commercial discards in Canada.

The WG report and review presentation included good spatial and temporal splits of data, well portrayed in figures for aggregate catch components and for at-age data. With so few at-length and at-age data, visual tracking of cohorts is unusually straightforward.

A notable strength of the assessment is the collaboration between US and Canadian scientists, including in data preparation, stock assessment, and through participation in the review.

Given the nature of commercial and other fisheries, changing distribution of the stock, and history of management measures, it is not expected that fishery-dependent CPUE would be a good index of the stock. Nevertheless, and especially as the previous (TRAC, 2009) assessment included CPUE, it is notable that the WG report did not include any information on or consideration of effort data and CPUE. This is to an extent covered in the excellent material (Appendix 9 of the WG report) on industry perspectives on factors driving catchability and landings, but I am surprised the report did not include an explicit consideration.

ToR 3: Evaluate fishery independent and fishery dependent indices being used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.). Characterize the uncertainty and any bias in these sources of data.

[Aside: Neither under ToR 2 (on fishing effort), nor here (on fishery dependent indices) does the WG report include any information relevant to the ToR. I do not make any recommendation but, as noted above, find this unusual.]

The WG reports that several fishery-independent indices derived from trawl surveys, egg and larval studies, and ecosystem studies, were considered but ultimately not used. Many assessment reports include extensive documentation of considered but not used indices, and it is refreshing to read a report where the multiple indices are reported in just two paragraphs. Nevertheless, even if as a separate appendix, more detail on the potential indices and reasons for their non-use would not be unreasonable. The review discussion did not include any greater consideration, instead focusing on the indices used in the assessment. It would have been potentially instructive if the WG had reviewed the dismissed surveys *post hoc* to see if any do in fact reflect the assessment estimates of biomass. This might assist future considerations of whether to include indices or not.

The single trawl survey retained to provide an index is the NEFSC spring bottom trawl survey. The WG reasonably split the survey into two periods to allow for the change of vessel in 2009. The earlier series, based on the *Albatross* and terminating in 2008, is essentially the same as available to the previous assessment in 2009. The later series, based on the *Bigelow*, starts in 2009 and is new for this assessment. The WG considered use of tows for inclusion in the indices, including spatial and diel factors, and positive/negative tows. The WG reasonably decided to use 3+ indices due to concerns that the 1 and 2-year-old fish caught would be representative only of the southern (USA) contingent, rather than the whole stock. Use of positive tows only is somewhat unusual and justification in the report is lacking. Discussion during the review was not conclusive, but revealed the WG considered such issues in more detail than is apparent from the report. If the index had been weighted and were influential in the

assessment, I would suggest review of this and further justification for use of positive tows only. However, given the low influence of the trawl survey indices, I do not see it as a major issue.

Given the strong spatial patterning by age of the contingents and design of the survey for groundfish rather than mackerel, it is not *a priori* expected that the abundance indices would necessarily be good indices of total mackerel abundance. Far more compelling as a potential indicator is the new, range-wide egg index.

The range-wide egg index combines data from an annual, dedicated Canadian egg survey which has been operating since 1979 and has been used previously in Canadian stock assessments. There is no equivalent US survey, but two ichthyoplankton surveys do sample the southern contingent's spawning area in most years. The WG developed a range-wide index by combining Canadian and US data for the years in which there is comprehensive sampling of the southern contingent. The index developed is for SSB rather than egg production for consistency with the assessment model. This is a major step forward and allows for the first time an assessment for the single mackerel stock with a fishery-independent index expected to reflect overall stock abundance. At ToR 8, the single most important recommendation is to ensure continuity of this index.

I note that the combined index has a gap through the 1990s (see Figure 1, below) and the southern contingent contribution to the total index is ten per cent (10%) or less except in the first two years (1978 and 1983). While the continued use of the range-wide index is important, it is natural to consider why the Canadian index alone, especially as it also covers the 1990s, was not presented to the assessment or used in sensitivity testing. The index appears to be a good reflection of the estimated SSB through time (ToR 4).

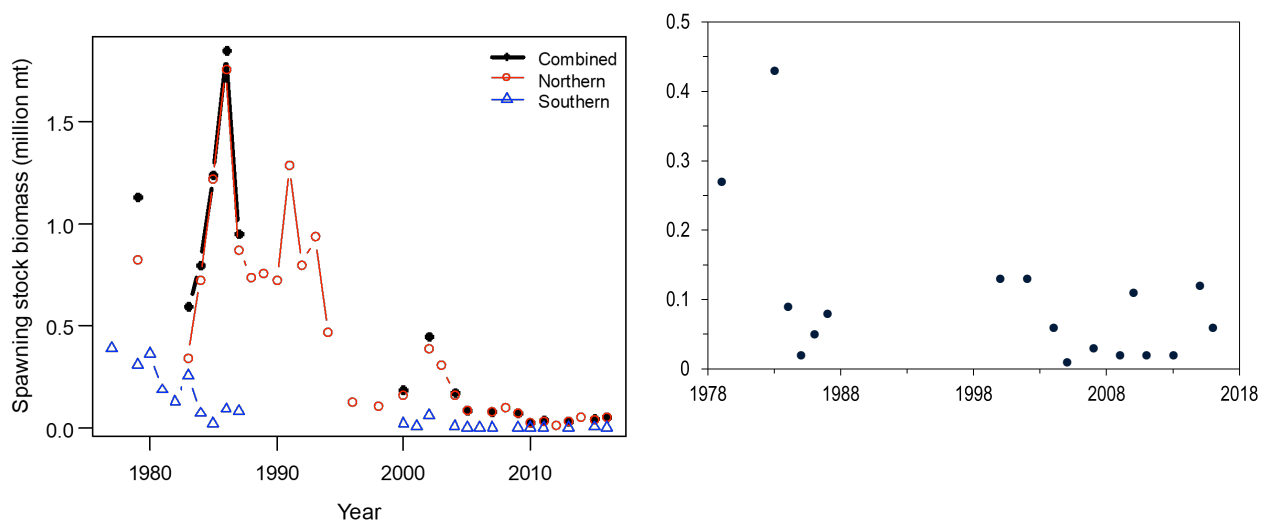


Figure 1. SSB estimates from Canadian and USA egg surveys (left hand panel) and proportion of SSB of southern contingent to total (right hand panel).

The ToR requires that uncertainty and any bias in indices be characterized. The WG does not do this explicitly though does touch on issues causing potential bias and uncertainty in the choice of tows for

the survey indices, and also does show CVs for all indices in all years. Generally, however, as for ToR 2, the report provides good descriptions of what was done and how, and to an extent why, but does not take the extra step of discussing potential bias and uncertainty. The assessment (ToR 4) covers the issues to an extent through tuning and sensitivity testing, but consideration in these early ToR is necessary to help guide decisions in model selection and in setting up projections.

ToR 4: Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Develop alternative approaches which might also be able to estimate population parameters. Include a comparison of new assessment results with those from previous assessment(s).

The WG report and appendices provide thorough descriptions of models (ASAP, SAM and CCAM) and tuning processes. The main and ultimately base case assessment uses ASAP, a now common statistical catch-at-age package. The WG also considered two, alternative state-space models SAM and CCAM, the latter estimating missing catch (CC stands for Censored Catch) using information from survey catch-at-age.

The standard catch-at-age model assumes only observation error, with tuning being an exercise in balancing alternate data sets through varying the weight afforded to each data component. Tuning followed standard approaches with iterative readjustments and consideration of residuals, log-likelihoods, etc and, as described in the report and at the review, these have been thoughtfully implemented. The WG considered more than 150 alternative model configurations in developing a base case. More were considered during the review.

The state-space models assume both observation and process error, allowing through the latter for stochasticity in population dynamics and model misspecification. The review panel expressed a lot of confidence in the assessment analyst and presenter. The state-space models have been used to add insight but not to inform management directly.

In addition to a very readable WG report being provided, the main analyst and presenter provided an excellent presentation to the review panel and was helpful and responsive throughout the review.

All models include ages 1-10+ with removals data from 1968-2018. As noted at ToR 1, the assessment assumes a single, homogenous stock. Natural mortality is fixed at 0.2, though alternative fixed values were considered. As noted at ToR 1, no age-dependent natural mortality was considered. Maturity is input as an annual proportion at-age, reflecting considerable change through time in US data.

The overall removals drive the fits, with the range-wide egg survey also well fit. Trawl survey indices are poorly fit, especially the pre-2008 *Albatross* index. It is hard to judge the utility of the *Bigelow* index at this time, but it appears potentially to have utility and even if the range-wide egg survey is available in future, the *Bigelow* index should still be explored at the next assessment. Age compositions for the fishery and surveys are well fit, providing further reason not to prematurely remove the trawl surveys from future assessments. Large year classes are evident moving through the population, but there are no compelling or worrying patterns in at-age residuals.

The WG-chosen base case has just the one combined fishery/fleet, with flat-topped selectivity in a single block. The base case run estimates a dramatic decline in Biomass and SSB from the late 1960s until recent years, with peaks in 1972, 1985, and 2001. Instantaneous fishing mortality is estimated to have peaked in 2010 at 2.1 per year, consistently exceeding 1 from 2006 until 2014.

Use of a single fleet is unusual given the numerous country and gear combinations which have varied through time. However, selectivity time blocking offers an approach to dealing with this and discussions during the review suggested selectivity variation may not be as great between gears as expected.

The WG presented a wide range of sensitivity runs which showed the robustness of the trend estimation for SSB and F. During the review, these were further explored, especially focusing on selectivity form and blocking. The base case estimates a flat-topped selectivity from age 6 for commercial fisheries, but with a declining pattern at age for the surveys. Runs were conducted during the review with fishery selectivity blocks from 1968, from 1978 (after distant water fishing ceased), after 1992 (after joint venture fishing stopped), and after 2000 (reflecting changing regulations). The choice of years is “natural” given changes in the fishery, but also supported by consideration of the rescaled F-at-age from the SAM model (see Figure 2, below). The SAM model suggests potential full selectivity by age 4, but with possible variations in the age 2 and 3 selectivity by time block.

The resulting flat top selectivity curves plateau at age 6 and are very similar to the single selectivity estimate in the base case. Only the early period shows a lower plateau age. Allowing domed selectivity resulted in a very domed first period selectivity and the other three periods are effectively flat topped, but with a dip at 10+, reflecting the highly curtailed age-structure since 2000. There is a hint here that the interaction between selectivity and age-dependent natural mortality might be further explored, but it is clear that estimates of BRP and status will be little impacted, and certainly not in a material way.

The most perplexing feature of the assessment is the peak in fishing mortality in 2010, implying removals of circa 90% of the stock in one year. The age data, with few old fish from about 2000 until 2010, drive the high F estimate, but given descriptions of the fishery and the multiple constraints on fishing, the removal percentage is not credible.

Comparisons using ASAP, SAM and CCAM suggest differences in interpretation in earlier years, but not to any significant degree over the past few decades. All models interpret the clear signals in the data as a major decline in biomass, increasing fishing mortality until around 2010, and more recent decline in F with small indications of a recent increase in recruitment (though recruitment is still at a low level). The ASAP retrospective analysis does not indicate any strong patterns. Comparison with previous assessments (2005, 2009) is difficult as different methods and assumptions were used. The current assessment uses the range-wide egg index for SSB and an effectively new trawl survey. These, together with age composition data with strong signals, mean the new assessment needs to be looked at in its own right, with comparison to earlier assessments providing little insight.

In my view, the WG has undertaken a thorough analysis and has well justified its suggested base case model. I agree with the Review panel’s acceptance of that base case model as a basis for management advice.

The final estimates of fishing mortality, recruitment, and stock biomass (see Figure 3, below) include estimates of precision from the single ASAP base run, and uncertainty due to model assumptions/formulation has been explored with extensive sensitivity runs using ASAP and by comparison to two state-space models (SAM and CCAM). MCMC has been used to characterize the distributions of critical model outputs, which feed into the BRP calculations and projections.

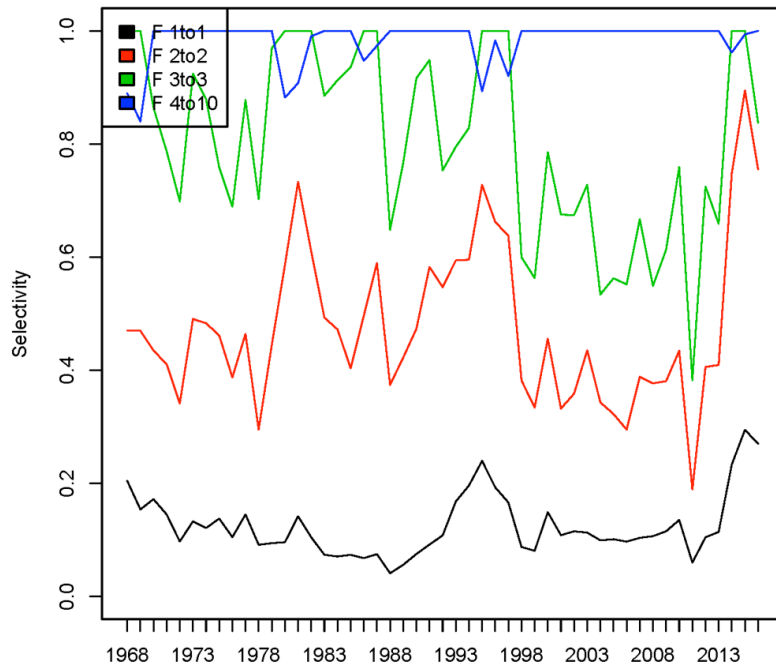


Figure 2. *F-at-age* estimated by the SAM model.

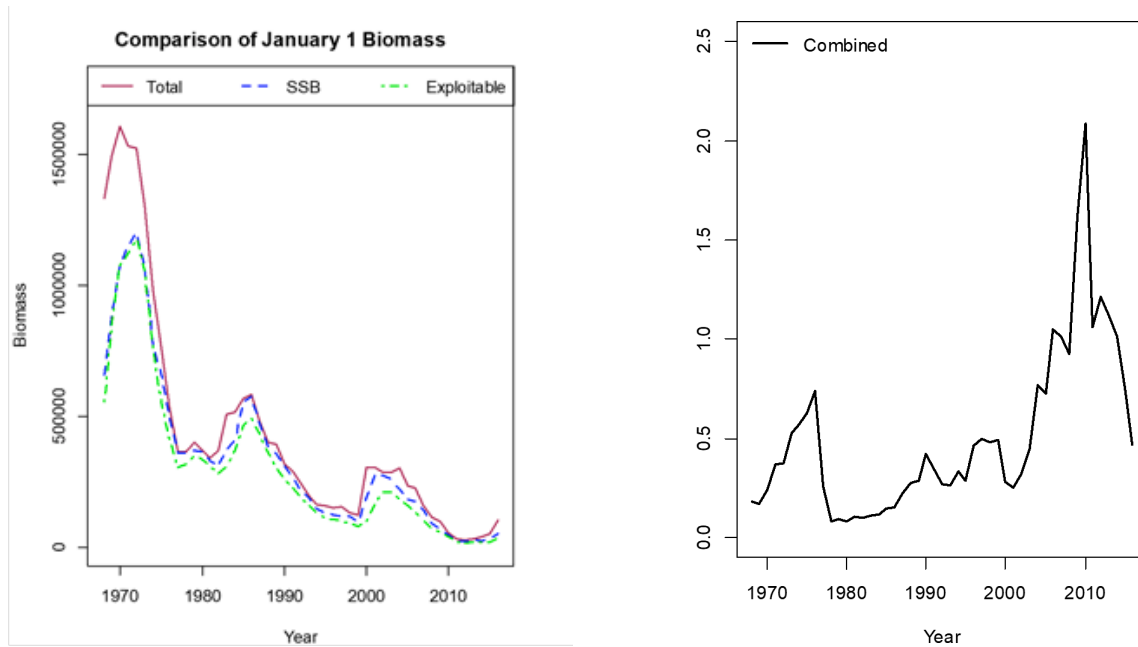


Figure 3: Base case runs estimates of January 1 Biomass in tonnes (left panel) and Fishing mortality per year (right panel) from the base case run. Both figures are from the review presentation file.

ToR 5: State the existing stock status definitions for “overfished” and “overfishing”. Then update or redefine biological reference points (BRPs; point estimates or proxies for $BMSY$, $BTHRESHOLD$, $FMSY$ and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the “new” (i.e., updated, redefined, or alternative) BRPs.

The WG correctly noted the lack of an existing, accepted assessment and consequent lack of biological reference points (BRP) and status definition.

The WG-proposed and Panel-accepted stock assessment (see ToR 4) does not fit a stock recruitment relationship and there are therefore no analytically-derived MSY -related BRPs.

The WG proposed an F_{MSY} proxy of $F_{40\%}$, and a SSB_{MSY} proxy calculated from long-term projections (100 years) using the F_{MSY} proxy and starting with biomass distributions and age-structure taken from the MCMC results for the adopted base case model. The definitions follow standard practice used in the USA and elsewhere. It is always possible to suggest alternatives, such as an $F_{x\%}$ derived from simulations to achieve given performance. In the absence of any definitive guidance, the WG choice of $F_{40\%}$ is reasonable and I see no need to suggest an alternative.

Alternative (sensitivity) model runs were conducted by the WG and during the review. Results obtained from model runs during the review indicated a strong tendency for the $F_{40\%}$ estimate to be at 0.26 or slightly higher, near 0.30. $SSB_{40\%}$ in the base case is estimated as 196,894 (108,161-429,550) tonnes, the wide 90% CI reflecting the wide MCMC distribution on final year SSB in the base case run.

In my view, the suggested proxy BRPs are reasonable. I note the runs conducted during the review all indicate that status determination is robust (ToR 6).

ToR 6: Make a recommended stock status determination (overfishing and overfished) based on new results developed for this peer review. Include qualitative written statements about the condition of the stock that will help to inform NMFS about stock status.

The WG correctly reported status determination, based on its suggested stock assessment. The stock is defined as overfished and experiencing overfishing.

This determination is robust across all sensitivity tests and alternative modeling approaches considered and reported by the WG and considered during the review. During the review, results were looked at for runs including the base case, an assessment with no trawl survey, the trawl survey aggregate age changed from three to two (allowing more southern stock contribution), the range-wide index used to reflect egg production instead of SSB, an alternative maturity-at-age relationship, four (instead of one) selectivity blocks, separated Canadian and US “fleets”, catch censoring, 1981 and 1989 start points, domed (cf flat) selectivity, and both four selectivity blocks and two fleets.

As noted at ToR 2, the WG report covers all sources of fishery removals, but the ASAP model used in the assessment does not include unreported catch from the recreational, bait, and commercial discards in Canada. The WG, however, included the SAM and CCAM models in the sensitivity analysis; the CCAM model effectively considers the missing catch issues, as does the censored catch sensitivity run using ASAP.

There was some minor confusion between the WG and SARC coordinator about the inclusion in the ToR of the sentence about qualitative information. The WG report did not therefore contain any qualitative statements at this ToR. During the review, the summary assessment report was edited and accepted; the opportunity was taken to add some qualitative statements.

The review panel accepted the status determination of overfished and experiencing overfishing. In my view, the status determination is robust.

ToR 7: Develop approaches and apply them to conduct stock projections.

- a. Provide numerical annual projections (3 years) and the statistical distribution (e.g., probability density function) of the catch at FMSY or an FMSY proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important*

uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).

The WG provided a description of projections undertaken. It considered three-year runs using the MCMC realizations of stock size, with catches assumed at the 2017 stock-wide ABC plus an additional 2,000 tonnes for a recent TAC increase in Canada. Projections were conducted for F_0 , F_{MSY} , and F_{SQ} . Median and 5th and 95th intervals were calculated for SSB, recruitment, January 1st biomass, and catch, for each F scenario. Estimates of the probability of exceeding BRPs were not provided, though these can reasonably be seen (Figure 4) or inferred. Fishing mortality is estimated in 2016 to be approximately three times $F_{40\%}$, and is highly unlikely to fall below $F_{40\%}$ in the near term. The median estimate of SSB is currently near half $SSB_{40\%}$ (i.e. near the proposed overfishing target, OFT). At $F_{StatusQuo}$, it is forecast to remain around that level while at $F_{40\%}$ or F_0 it would likely increase. However, at the lower CI, only F_0 would result in SSB greater than the proposed OFT by 2020.

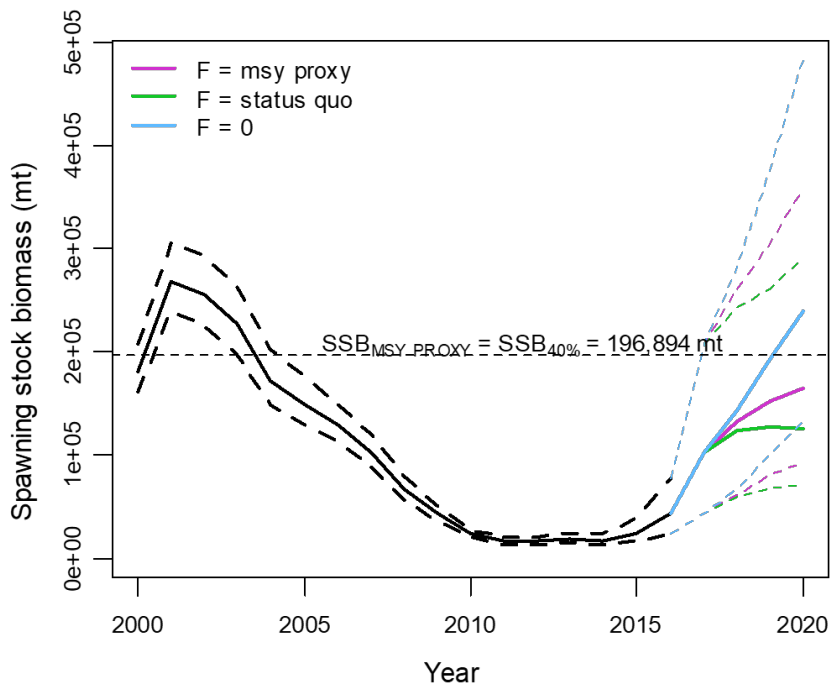


Figure 4. 3-year projections for the base case assessment model, at three F levels. Solid lines are medians. Dashed lines show 5% and 95% CI.

During the review,

- b. *Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.*

The WG undertook projections from just one model, though using three F scenarios, but did not include projections from alternative models. My interpretation of this ToR is that it is seeking comment on the feasibility and realism of alternative models, with differing assumptions or formulation (for example, such as inclusion of age-dependent natural mortality). I am confident that the projections undertaken are well done and accurately described. They are realistic only to the extent that the base case assessment is realistic. It assumes a single stock with unchanged dynamics, fished by a single fleet with constant selectivity. The WG has well justified the selection of that base case and more complex models are likely unable to be fitted.

In terms of reasonable projection parameters, the WG has fulfilled its brief. The WG has recognized that the projection results depend on the estimate of the 2015 year class, which is highly uncertain as thus far there is little information on it in the available data.

Despite the limitations, my view is that the projections are a reasonable basis for management advice and decision-making.

- c. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.*

The WG did not address this ToR. However, the stock is considered currently overfished having experienced high fishing mortality, which is evidence that the stock is vulnerable to becoming overfished due to its susceptibility to fishing. Further, the projections indicate the potential for recovery based on the productivity potential of the stock.

ToR 8: Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent peer reviewed assessment and review panel reports. Identify new research recommendations.

The WG provided comments on sixteen (16) previous recommendations. These are from the 2009 TRAC assessment, some carrying over from even earlier recommendations. Many have become outdated or have been finalized. The WG also made ten (10) new recommendations. Where relevant, the new recommendations incorporate outstanding older ones.

In my view, the WG has reasonably identified key areas for research. The WG recommendations essentially fall in to the following general areas.

- Continue work to allow range-wide egg indices to be used in future assessment. I would afford this a high priority at least until the *Bigelow* trawl survey index may be proved to have utility or not. I would also temper it to include provision for investigating use of the Canadian egg survey index directly; it may not be necessary to expand this to a range-wide index given the low proportion of the southern contingent (so long as the stock is assessed as a single unit).
- Continue investigations of NW Atlantic mackerel stock structure and distribution. This is intrinsically interesting and important to be understood, but needs to be accompanied by

consideration of how stock assessments can inform management if catches cannot be separated. If a stock assessment considers two stocks, mixing on feeding grounds but with separated spawning, some way of estimating both migration and stock proportions would be needed, and management would still need to consider likely-unmodeled allocation.

- Continue engagement with fishing industry. This (as seen in appendix 9 of the WG report) was a positive feature of the assessment. I would suggest expanding the WG recommendation to be a general one for all WGs. The work for this assessment and positive involvement of industry in the review could be a useful model for other fisheries.
- Recreational catch sampling – agreed.
- Further work on environmental conditions and stock distribution – agreed.

CONCLUSIONS AND RECOMMENDATIONS

*The report must contain a background section, description of the individual reviewers' roles in the review activities, summary of findings for each TOR in which the weaknesses and strengths are described, and **conclusions and recommendations in accordance with the TORs**. The independent report shall be an independent peer review, and shall not simply repeat the contents of the SARC Summary Report.*

- a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.*
- b. Reviewers should discuss their independent views on each TOR even if these were consistent with those of other panelists, but especially where there were divergent views.*
- c. Reviewers should elaborate on any points raised in the SARC Summary Report that they believe might require further clarification.*
- d. The report may include recommendations on how to improve future assessments.*

Usually, I highlight my recommendations and suggestions in **bold, red** in the preceding sections. I distinguish between recommendations as necessary activities and suggestions as desirable ones, recognizing that research planning and prioritization requires consideration of multiple factors and applies to many stocks, fisheries and other factors. In this case I have made no recommendations.

The assessment makes necessary simplifications and then applies standard techniques to all available, potentially informative data. The tuning has used standard approaches which have been expertly applied and consideration of diagnostics has been good. Assessment estimates of SSB, R, and F are credible and MCMC has been used to define credibility intervals. Resulting estimates of status are robust, using proposed, standard BRPs. Projections are limited to alternative F scenarios rather than alternative states of nature, but the wide CI on the projections likely covers any alternative scenarios that might be developed.

APPENDIX 1

BIBLIOGRAPHY

Prior to the Workshop, extensive materials were provided *via* a dedicated ftp server. The materials were well organized, extensive and relevant to all terms of reference in varying degrees, consisting of general and review-specific background materials, and draft assessments, including standard ASAP-produced diagnostics and plots for the proposed base case model using ASAP. Seventeen (17) background papers were provided. Sixteen (16) working papers were provided, including the benchmark assessment WG report and summary report, both of which were provided in both pdf and Word formats.

During the workshop presentations were given, and additional materials were provided on request, including further background documents and presentations as well as responses to Panel requests. All files were made available using the dedicated server which was accessed using guest cabled ethernet and Wi-Fi throughout the meeting. The access was very good.

In addition to responses to requests being integrated into the original presentation file, outputs with full diagnostics and plots for all model runs considered were provided.

APPENDIX 2
Statement of Work
National Oceanic and Atmospheric Administration (NOAA)
National Marine Fisheries Service (NMFS)
Center for Independent Experts (CIE) Program
External Independent Peer Review

64th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC)
Benchmark stock assessment for Atlantic mackerel

Background

The National Marine Fisheries Service (NMFS) is mandated by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act to conserve, protect, and manage our nation's marine living resources based upon the best scientific information available (BSIA). NMFS science products, including scientific advice, are often controversial and may require timely scientific peer reviews that are strictly independent of all outside influences. A formal external process for independent expert reviews of the agency's scientific products and programs ensures their credibility. Therefore, external scientific peer reviews have been and continue to be essential to strengthening scientific quality assurance for fishery conservation and management actions.

Scientific peer review is defined as the organized review process where one or more qualified experts review scientific information to ensure quality and credibility. These expert(s) must conduct their peer review impartially, objectively, and without conflicts of interest. Each reviewer must also be independent from the development of the science, without influence from any position that the agency or constituent groups may have. Furthermore, the Office of Management and Budget (OMB), authorized by the Information Quality Act, requires all federal agencies to conduct peer reviews of highly influential and controversial science before dissemination, and that peer reviewers must be deemed qualified based on the OMB Peer Review Bulletin standards.

(http://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf).

Further information on the CIE program may be obtained from www.ciereviews.org.

Scope

The Northeast Regional Stock Assessment Review Committee (SARC) meeting is a formal, multiple-day meeting of stock assessment experts who serve as a panel to peer-review tabled stock assessments and models. The SARC peer review is the cornerstone of the Northeast Stock Assessment Workshop (SAW) process, which includes assessment development, and report preparation (which is done by SAW Working Groups or Atlantic States Marine Fisheries Commission (ASMFC) technical committees), assessment peer review (by the SARC), public presentations, and document publication. This review determines whether or not the scientific

assessments are adequate to serve as a basis for developing fishery management advice. Results provide the scientific basis for fisheries within the jurisdiction of NOAA's Greater Atlantic Regional Fisheries Office (GARFO).

The purpose of this meeting will be to provide an external peer review of a benchmark stock assessment for **Atlantic mackerel**. The requirements for the peer review follow. This Statement of Work (SOW) also includes Appendix 1: TORs for the stock assessment, which are the responsibility of the analysts; Appendix 2: a draft meeting agenda; Appendix 3: Individual Independent Review Report Requirements; and Appendix 4: SARC Summary Report Requirements.

Requirements

NMFS requires three CIE reviewers under this contract to participate in the panel review. The SARC chair, who is in addition to the three reviewers, will be provided by either the New England or Mid-Atlantic Fishery Management Council's Science and Statistical Committee; although the SARC chair will be participating in this review, the chair's participation (i.e. labor and travel) is not covered by this contract.

Each reviewer will write an individual review report in accordance with the SOW, OMB Guidelines, and the TORs below. All TORs must be addressed in each reviewer's report. No more than one of the reviewers selected for this review is permitted to have served on a SARC panel that reviewed this same species in the past. The reviewers shall have working knowledge and recent experience in the application of modern fishery stock assessment models. Expertise should include forward projecting statistical catch-at-age models. Reviewers should also have experience in evaluating measures of model fit, identification, uncertainty, and forecasting. Reviewers should have experience in development of Biological Reference Points (BRPs) that includes an appreciation for the varying quality and quantity of data available to support estimation of BRPs. For mackerel, knowledge of migratory pelagics, spatial elements in a stock assessment, and data-limited assessment methods would be useful.

Tasks for Reviewers

- Review the background materials and reports prior to the review meeting
- Attend and participate in the panel review meeting
 - The meeting will consist of presentations by NOAA and other scientists, stock assessment authors and others to facilitate the review, to provide any additional information required by the reviewers, and to answer any questions from reviewers
- Reviewers shall conduct an independent peer review in accordance with the requirements specified in this SOW and TORs, in adherence with the required formatting and content guidelines; reviewers are not required to reach a consensus.

- Each reviewer shall assist the SARC Chair with contributions to the SARC Summary Report
- Deliver individual Independent Review Reports to the Government according to the specified milestone dates
- This report should explain whether each stock assessment Term of Reference of the SAW was or was not completed successfully during the SARC meeting, using the criteria specified below in the “Requirements for SARC panel.”
- If any existing Biological Reference Points (BRP) or their proxies are considered inappropriate, the Independent Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRPs are the best available at this time.
- During the meeting, additional questions that were not in the Terms of Reference but that are directly related to the assessments may be raised. Comments on these questions should be included in a separate section at the end of the Independent Report produced by each reviewer.
- The Independent Report can also be used to provide greater detail than the SARC Summary Report on specific stock assessment Terms of Reference or on additional questions raised during the meeting.

Requirements for SARC panel

- During the SARC meeting, the panel is to determine whether each stock assessment Term of Reference (TOR) of the SAW was or was not completed successfully. To make this determination, panelists should consider whether the work provides a scientifically credible basis for developing fishery management advice. Criteria to consider include: whether the data were adequate and used properly, the analyses and models were carried out correctly, and the conclusions are correct/reasonable. If alternative assessment models and model assumptions are presented, evaluate their strengths and weaknesses and then recommend which, if any, scientific approach should be adopted. Where possible, the SARC chair shall identify or facilitate agreement among the reviewers for each stock assessment TOR of the SAW.
- If the panel rejects any of the current BRP or BRP proxies (for B_{MSY} and F_{MSY} and MSY), the panel should explain why those particular BRPs or proxies are not suitable, and the panel should recommend suitable alternatives. If such alternatives cannot be identified, then the panel should indicate that the existing BRPs or BRP proxies are the best available at this time.
- Each reviewer shall complete the tasks in accordance with the SOW and Schedule of Milestones and Deliverables below.

Tasks for SARC chair and reviewers combined:

Review both the Assessment Report and the draft Assessment Summary Report. The draft Assessment Summary Report is reviewed and edited to assure that it is consistent with the

outcome of the peer review, particularly statements about stock status recommendations and descriptions of assessment uncertainty.

The SARC Chair, with the assistance from the reviewers, will write the SARC Summary Report. Each reviewer and the chair will discuss whether they hold similar views on each stock assessment Term of Reference and whether their opinions can be summarized into a single conclusion for all or only for some of the Terms of Reference of the SAW. For terms where a similar view can be reached, the SARC Summary Report will contain a summary of such opinions. In cases where multiple and/or differing views exist on a given Term of Reference, the SARC Summary Report will note that there is no agreement and will specify - in a summary manner – what the different opinions are and the reason(s) for the difference in opinions.

The chair's objective during this SARC Summary Report development process will be to identify or facilitate the finding of an agreement rather than forcing the panel to reach an agreement. The chair will take the lead in editing and completing this report. The chair may express the chair's opinion on each Term of Reference of the SAW, either as part of the group opinion, or as a separate minority opinion. The SARC Summary Report will not be submitted, reviewed, or approved by the Contractor.

If any existing Biological Reference Points (BRP) or BRP proxies are considered inappropriate, the SARC Summary Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRP proxies are the best available at this time.

Foreign National Security Clearance

When reviewers participate during a panel review meeting at a government facility, the NMFS Project Contact is responsible for obtaining the Foreign National Security Clearance approval for reviewers who are non-US citizens. For this reason, the reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, passport number, country of passport, travel dates, country of citizenship, country of current residence, and home country) to the NMFS Project Contact for the purpose of their security clearance, and this information shall be submitted at least 30 days before the peer review in accordance with the NOAA Deemed Export Technology Control Program NAO 207-12 regulations available at the Deemed Exports NAO website: <http://deemedexports.noaa.gov/> and http://deemedexports.noaa.gov/compliance_access_control_procedures/noaa-foreign-national-registration-system.html. The contractor is required to use all appropriate methods to safeguard Personally Identifiable Information (PII).

Place of Performance

The place of performance shall be at the contractor's facilities, and at the Northeast Fisheries Science Center in Woods Hole, Massachusetts.

Period of Performance

The period of performance shall be from the time of award through January 26, 2018. Each reviewer's duties shall not exceed 14 days to complete all required tasks.

Schedule of Milestones and Deliverables: The contractor shall complete the tasks and deliverables in accordance with the following schedule.

No later than October 24, 2017	Contractor sends reviewer contact information to the COR, who then sends this to the NMFS Project Contact
No later than November 14, 2017	NMFS Project Contact will provide reviewers the pre-review documents
Nov. 28-30, 2017	Each reviewer participates and conducts an independent peer review during the panel review meeting in Woods Hole, MA
Nov. 30, 2017	SARC Chair and reviewers work at drafting reports during meeting at Woods Hole, MA, USA
Dec. 14, 2017	Contractor receives draft reports
Dec. 14, 2017	Draft of SARC Summary Report, reviewed by all reviewers, due to the SARC Chair *
Dec. 21, 2017	SARC Chair sends Final SARC Summary Report, approved by reviewers, to NMFS Project contact (i.e., SAW Chairman)
Jan. 4, 2018	Contractor submits final reports to the Government

* The SARC Summary Report will not be submitted to, reviewed, or approved by the Contractor.

Applicable Performance Standards

The acceptance of the contract deliverables shall be based on three performance standards: (1) The reports shall be completed in accordance with the required formatting and content; (2) The reports shall address each TOR as specified; (3) The reports shall be delivered as specified in the schedule of milestones and deliverables.

Travel

All travel expenses shall be reimbursable in accordance with Federal Travel Regulations (<http://www.gsa.gov/portal/content/104790>). International travel is authorized for this contract. Travel is not to exceed \$10,000.

Restricted or Limited Use of Data

The contractors may be required to sign and adhere to a non-disclosure agreement.

NMFS Project Contact

Dr. James Weinberg, NEFSC SAW Chair
Northeast Fisheries Science Center
166 Water Street, Woods Hole, MA 02543
James.Weinberg@noaa.gov

Appendix 1. Stock Assessment Terms of Reference for SAW/SARC-64

The SARC Review Panel shall assess whether or not the SAW Working Group has reasonably and satisfactorily completed the following actions.

A. Atlantic mackerel (NAFO Subareas 3-6)

1. Spatial and ecosystem influences on stock dynamics:
 - a. Evaluate possible spatial influences on the stock dynamics. Recommend any need to modify the current stock definition for future stock assessments.
 - b. Describe data (e.g., oceanographic, habitat, or species interactions) that might pertain to Atlantic mackerel distribution and availability. If possible, integrate the results into the stock assessment (TOR-4).
2. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.
3. Evaluate fishery independent and fishery dependent indices being used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.). Characterize the uncertainty and any bias in these sources of data.
4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Develop alternative approaches which might also be able to estimate population parameters. Include a comparison of new assessment results with those from previous assessment(s).
5. State the existing stock status definitions for “overfished” and “overfishing”. Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY} , $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are

unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the “new” (i.e., updated, redefined, or alternative) BRPs.

6. Make a recommended stock status determination (overfishing and overfished) based on new results developed for this peer review. Include qualitative written statements about the condition of the stock that will help to inform NMFS^a about stock status.
7. Develop approaches and apply them to conduct stock projections.
 - a. Provide numerical annual projections (3 years) and the statistical distribution (e.g., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F , and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).
 - b. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.
 - c. Describe this stock’s vulnerability (see “Appendix to the SAW TORs”) to becoming overfished, and how this could affect the choice of ABC.
8. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent peer reviewed assessment and review panel reports. Identify new research recommendations.

^aNMFS has final responsibility for making the stock status determination based on best available scientific information.

Clarification of Terms used in the Stock Assessment Terms of Reference

Guidance to SAW WG about “Number of Models to include in the Assessment Report”:

In general, for any TOR in which one or more models are explored by the WG, give a detailed presentation of the “best” model, including inputs, outputs, diagnostics of model adequacy, and sensitivity analyses that evaluate robustness of model results to the assumptions. In less detail, describe other models that were evaluated by the WG and explain their strengths, weaknesses and results in relation to the “best” model. If selection of a “best” model is not possible, present alternative models in detail, and summarize the

relative utility each model, including a comparison of results. It should be highlighted whether any models represent a minority opinion.

On “Acceptable Biological Catch” (DOC Nat. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

Acceptable biological catch (ABC) is a level of a stock or stock complex’s annual catch that accounts for the scientific uncertainty in the estimate of Overfishing Limit (OFL) and any other scientific uncertainty...” (p. 3208) [In other words, $OFL \geq ABC$.]

ABC for overfished stocks. For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. (p. 3209)

NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. (p. 3180)

ABC refers to a level of “catch” that is “acceptable” given the “biological” characteristics of the stock or stock complex. As such, Optimal Yield (OY) does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. (p. 3189)

On “Vulnerability” (DOC Natl. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

“Vulnerability. A stock’s vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce Maximum Sustainable Yield (MSY) and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality).” (p. 3205)

Participation among members of a Stock Assessment Working Group:

Anyone participating in SAW meetings that will be running or presenting results from an assessment model is expected to supply the source code, a compiled executable, an input file with the proposed configuration, and a detailed model description in advance of the model meeting. Source code for NOAA Toolbox programs is available on request. These measures allow transparency and a fair evaluation of differences that emerge between models.

Appendix 2. Draft Review Meeting Agenda

(Final Meeting agenda to be provided at time of award)

64th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) Benchmark stock assessment for A. Atlantic mackerel

Nov. 28-30, 2017

Stephen H. Clark Conference Room – Northeast Fisheries Science Center
Woods Hole, Massachusetts

DRAFT AGENDA

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR
<u>Tuesday, Nov. 28</u>			
10 – 10:30 AM			
Welcome	James Weinberg , SAW Chair		
Introduction	Paul Rago , SARC Chair		
Agenda			
Conduct of Meeting			
10:30 – 12:30 PM	Assessment Presentation (A. Mackerel) Kiersten Curti		TBD
12:30 – 1:30 PM	Lunch		
1:30 – 3:30 PM	Assessment Presentation (A. Mackerel) Kiersten Curti		TBD
3:30 – 3:45 PM	Break		
3:45 – 5:45 PM	SARC Discussion w/ Presenters (A. Mackerel) Paul Rago , SARC Chair		TBD

5:45 – 6 PM Public Comments

7 PM (Social Gathering)

TOPIC PRESENTER(S) SARC LEADER RAPPORTEUR

Wednesday, Nov. 29

9:00 – 10:45 Revisit with Presenters (A. Mackerel)
Paul Rago, SARC Chair **TBD**

10:45 - 11 Break

11 – 11:45 Revisit with Presenters (A. Mackerel)
Paul Rago, SARC Chair **TBD**

11:45 – Noon Public Comments

12 – 1:15 PM Lunch

1:15 – 4 Review/Edit Assessment Summary Report (A. Mackerel)
Paul Rago, SARC Chair **TBD**

4 – 4:15 PM Break

4:15 – 5:00 PM SARC Report writing

Thursday, Nov. 30

9:00 AM – 5:00 PM SARC Report writing

*All times are approximate, and may be changed at the discretion of the SARC chair. The meeting is open to the public; however, during the Report Writing sessions on Nov. 29 and 30, we ask that the public refrain from engaging in discussion with the SARC.

Appendix 3. Individual Independent Peer Review Report Requirements

1. The independent peer review report shall be prefaced with an Executive Summary providing a concise summary of whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.).
2. The report must contain a background section, description of the individual reviewers' roles in the review activities, summary of findings for each TOR in which the weaknesses and strengths are described, and conclusions and recommendations in accordance with the TORs. The independent report shall be an independent peer review, and shall not simply repeat the contents of the SARC Summary Report.
 - a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.
 - b. Reviewers should discuss their independent views on each TOR even if these were consistent with those of other panelists, but especially where there were divergent views.
 - c. Reviewers should elaborate on any points raised in the SARC Summary Report that they believe might require further clarification.
 - d. The report may include recommendations on how to improve future assessments.
3. The report shall include the following appendices:
 - Appendix 1: Bibliography of materials provided for review
 - Appendix 2: A copy of this Statement of Work
 - Appendix 3: Panel membership or other pertinent information from the panel review meeting.

Appendix 4. SARC Summary Report Requirements

1. The main body of the report shall consist of an introduction prepared by the SARC chair that will include the background and a review of activities and comments on the appropriateness of the process in reaching the goals of the SARC. Following the introduction, for each assessment reviewed, the report should address whether or not each Term of Reference of the SAW Working Group was completed successfully. For each Term of Reference, the SARC Summary Report should state why that Term of Reference was or was not completed successfully.

To make this determination, the SARC chair and reviewers should consider whether or not the work provides a scientifically credible basis for developing fishery management advice. If the reviewers and SARC chair do not reach an agreement on a Term of Reference, the report should explain why. It is permissible to express majority as well as minority opinions.

The report may include recommendations on how to improve future assessments.

2. If any existing Biological Reference Points (BRPs) or BRP proxies are considered inappropriate, include recommendations and justification for alternatives. If such alternatives cannot be identified, then indicate that the existing BRPs or BRP proxies are the best available at this time.
3. The report shall also include the bibliography of all materials provided during the SAW, and relevant papers cited in the SARC Summary Report, along with a copy of the CIE Statement of Work.

The report shall also include as a separate appendix the assessment Terms of Reference used for the SAW, including any changes to the Terms of Reference or specific topics/issues directly related to the assessments and requiring Panel advice.

APPENDIX 3
PERTINENT INFORMATION FROM THE REVIEW

1) Participants List

SARC 64 ATTENDEE LIST (Mackerel Assessment Review, Nov. 28-30, 2017)

NAME	AFFILIATION	EMAIL
Panel		
John Boreman	MAFMC SSC	jgboremanjr@gmail.com
Kevin Stokes (Chair)	Center for Independent Experts	kevin@stokes.net.nz
Robin Cook	Center for Independent Experts	melford@clara.co.uk
Joe Powers	Center for Independent Experts	j.powers.fish@gmail.com
SARC		
Jim Weinberg	NEFSC	james.weinberg@noaa.gov
Assessment Team		
Kiersten Curti	NEFSC	kiersten.curti@noaa.gov
WG Chair		
Gary Shepherd	NEFSC	gary.shepherd@noaa.gov
MAFMC		
Jason Didden	MAFMC	jdidden@mafmc.org
Public		
Greg DiDomenico	GSSA	gregdi@voicenet.com
Meghan Lapp	Seafreeze Ltd.	meghan@seafreezeld.com
Martin Castonguay	DFO, Canada	martin.castonguay@dfo-mpo.gc.ca
Andrew Smith	DFO, Canada	andrew.d.smith@dfo-mpo.gc.ca
NEFSC Staff		
Russ Brown	NEFSC	Russell.brown@noaa.gov
Dan Hennen	NEFSC	Daniel.hennen@noaa.gov
Chris Legault	NEFSC	chris.legault@noaa.gov
Alicia Miller	NEFSC	alicia.miller@noaa.gov
Toni Chute	NEFSC	toni.chute@noaa.gov
Mark Terceiro	NEFSC	mark.terceiro@noaa.gov
Doug Christel	NMFS/GARFO	douglas.christel@noaa.gov
Katherine Sosebee	NEFSC	katherine.osebee@noaa.gov
Mike Simpkins	NEFSC	michael.simpkins@noaa.gov
Jason Boucher	NEFSC	jason.boucher@noaa.gov
John Manderson	NEFSC	john.manderson@noaa.gov
Chris Sarro	NEFSC	christopher.sarro@noaa.gov
Tony Wood	NEFSC	anthony.wood@noaa.gov
Charles Adams	NEFSC	charles.adams@noaa.gov

Sarah Gaichas
Paul Nitschke
Brian Linton

NEFSC
NEFSC
NEFSC

sarah.gaichas@noaa.gov
paul.nitschke@noaa.gov
brian.linton@noaa.gov

2) Final Agenda

64th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) Benchmark stock assessment for A. Atlantic mackerel

Nov. 28-30, 2017

Stephen H. Clark Conference Room – Northeast Fisheries Science Center
Woods Hole, Massachusetts

AGENDA* (version: 11/19/2017)

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR
<u>Tuesday, Nov. 28</u>			
10 – 10:30 AM			
Welcome	James Weinberg , SAW Chair		
Introduction	John Boreman , SARC Chair		
Agenda			
Conduct of Meeting			
10:30 – 12:30 PM	Assessment Presentation (A. Mackerel) Kiersten Curti		TBD
12:30 – 1:30 PM	Lunch		
1:30 – 3:30 PM	Assessment Presentation (A. Mackerel) Kiersten Curti		TBD
3:30 – 3:45 PM	Break		
3:45 – 5:45 PM	SARC Discussion w/ Presenters (A. Mackerel) John Boreman , SARC Chair		TBD
5:45 – 6 PM	Public Comments		
7 PM	(Social Gathering)		

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Wednesday, Nov. 29

9:00 – 10:45		Revisit with Presenters (A. Mackerel) John Boreman, SARC Chair	TBD
10:45 - 11	Break		
11 – 11:45		Revisit with Presenters (A. Mackerel) John Boreman , SARC Chair	TBD
11:45 – Noon		Public Comments	
12 – 1:15 PM	Lunch		
1:15 – 4		Review/Edit Assessment Summary Report (A. Mackerel) John Boreman , SARC Chair	TBD
4 – 4:15 PM	Break		
4:15 – 5:00 PM		SARC Report writing	

Thursday, Nov. 30

9:00 AM – 5:00 PM	SARC Report writing
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*All times are approximate, and may be changed at the discretion of the SARC chair. The meeting is open to the public; however, during the Report Writing sessions on Nov 29-30, we ask that the public refrain from engaging in discussion with the SARC.