NOAA FISHERIES

Stock Assessment Science Program Review

Southeast Fisheries Science Center Summary and Response – December 2014

Introduction

In July, 2014, the Southeast Fisheries Science Center (SEFSC) hosted a panel of experts charged with conducting a programmatic peer review of stock assessment activities supporting stocks managed under the Magnuson-Stevens Act (2006) and International Commission for the Conservation of Atlantic Tunas (ICCAT). This peer review is part of a five-year cycle of reviews designed to strengthen the SEFSC's science programs and generate valuable insights to help guide strategic planning. This review process is harmonized across NOAA Fisheries' six fisheries science centers and the Office of Science and Technology, which enables us to tune our efforts across the science enterprise.

The review was organized around six themes:

1. Science and Technical Approaches
2. Assessment Process
3. Peer Review Process
4. Communication
5. Research Opportunities
6. Ecosystem Considerations and Next-Generation Assessments
7. Organization, Priorities, and Accomplishments

More information about the review, including the Terms of Reference, background materials and review presentations may be found at:

http://www.sefsc.noaa.gov/program_reviews/2014/default.htm

Acknowledgements

Thanks go to the panelists for the time they invested in preparing for and conducting this review. The experience and the unique perspectives each of these individuals brought to the table enabled them to provide valuable insights that have already made a mark on the SEFSC stock assessment programs. The panelists for this review were:

- Michael Hansen – US Geological Survey - Great Lakes Science Center (Chair)
- Ewen Bell - United Kingdom, Center for Environment, Fisheries and Aquaculture Science
- Joe Hightower - North Carolina State University, Cooperative Fish and Wildlife Research Unit

- Bob Atlas - NOAA Atlantic Oceanographic and Meteorological Laboratory, Oceanic and Atmospheric Research
- Bill Karp - NOAA Fisheries, Northeast Fisheries Science Center

Thanks also go to Stephanie Oakes for her role as the national coordinator for this review. We're also grateful to the several partners and stakeholders who attended and to those who agreed to serve on discussion panels and provide their perspectives to the panelists. Finally, the stock assessment and data teams from the SEFSC are recognized for the considerable amount of planning and preparation they put into presenting the program to the reviewers, addressing questions and synthesizing the panel reports to position us for implementing the advice they provided. The full suite of recommendations will be maintained as a reference to help guide decisions regarding the stock assessment program going into the future, and as a benchmark against which to measure our progress in improving the program for the next programmatic review five years from now.

Response to Key Panel Recommendations

The collection of observations and recommendations made by the panelists provided invaluable insights from a fresh perspective on the stock assessment enterprise in the SEFSC. The recommendations have been analyzed with respect to their impact n improving the stock assessment process and the quality of scientific advice and products the assessments generate as well as their cost and complexity to execute. Some key recommendations and comments on them are highlighted here.

❖ SEDAR needs to streamline its process wherever possible. The proposed national prioritization approach for stock assessments should be adopted and implemented. Along these lines, the emphasis should be shifted from benchmarks to updates and SEDAR should consider an approach to identify and prioritize when certain stock assessments need to be updated.

We agree that one means of managing the growing demand for stock assessments within available means is to apply a rigorous set of criteria to determine assessment priorities for any given year and to determine the most appropriate level for each assessment. The SEFSC will continue to collaborate with the national-scale effort to refine and ultimately finalize the stock assessment prioritization tool, and will work through the Council and the SEDAR process to adapt or adopt it.

❖ Simplified harvest control rules should be considered that would potentially require less complex stock assessments and similar or higher levels of policy effectiveness.

Execution of this recommendation can make analyses less onerous and more approachable without sacrificing management/policy effectiveness. This recommendation must be carried out through the Council process with substantive input from each of the three Council's Scientific and Statistical Committees.

- SEDAR should adopt plans for the proposed Methods Working Group, which would peer review methods for the purpose of creating standard operating procedures (SOPs). The SOPs should go through the peer review only once, and not for each stock assessment that relies on approved SOPs thereafter.

Evaluating key decisions for handling data and for modeling approaches in a framework setting could improve the efficiency of the SEDAR process. By evaluating options, landing on best practices and peer reviewing and documenting those decisions, they become the standardized best practice. This was discussed as an approach at the last two SEDAR meetings and during the fall 2014 meeting, agreement was reached to schedule a Data Methods Workshop for spring of 2015. Holding an assessment methods workshop has been discussed for the following year. Establishing a standing Methods Working Group would be a strong step to maintain the momentum these workshops gained.

- Greater emphasis on communicating stock assessment methods and results to stakeholders should be encouraged. The Marine Resources Education Program (MREP) has been successful in this regard and the program should be continued and, if possible, expanded.

We agree that ensuring stakeholders understand the role the stock assessment process and products have in managing their fisheries is an important undertaking. Reviews and comments from MREP program participants have been very positive and indicate this program has been and effective communications tool. We would endorse its continuation and expansion. The SEFSC will also continue to seek means of improving outreach and communications regarding stock assessments.

- Simplify stock assessment documentation by referring to standard methods whenever possible. Departures from standard methods and earlier assessments should be summarized early in the documentation. A concise summary of each assessment that is understandable to stakeholders and cooperators should be added to the documentation.

Simplification of data, assessment and peer review reports, and including an executive summary will help streamline the SEDAR process and make those reports more approachable for stakeholders and partners. Coupled with the first recommendation, can be expected to improve the efficiency of the stock assessment process.

- Management Strategy Evaluations (MSE) should be conducted of the stock assessment process and associated fishery management system overall. It should

also be used to evaluate assessment models, particularly those used for data-poor stocks (e.g., length based estimators).

This would be a very valuable effort and would create a feedback loop to improve the overall process. It would also take a significant amount of time and resources and would have an impact on the SEFSC's stock assessment throughput, given the staff most suited to conduct the MSE are the SEFSC's stock assessment analysts. Means to carry out this recommendation will be explored. Meantime, extramural funds for MSEs on smaller scale questions pertaining to stock assessments are being sought.

- Current level of research needs to be expanded, through options such as hiring of more personnel, streamlining the stock assessment process, and increased partnering. Research should be considered a priority that is not diminished if the demand for additional stock assessments increases.

Research is an important element in maintaining and improving the stock assessment process, and is also important for strengthening the scientific status and capabilities of the SEFSC stock assessment scientists. Each stock assessment conducted, includes a list of research recommendations for improving the assessment the next time it is conducted. The evolution toward an ecosystem approach to science and management hinges on sound research to guide that progression. Striking a balance between operational stock assessments and making progress on these research demands is also important for the professional development of our stock assessment scientists and to building job satisfaction that leads to staff retention.

- Wherever possible, environmental variables should be tested as correlates of apparent changes in the temporal pattern of catchability or recruitment. Large-scale, long-term trends in ocean currents may be especially useful for both correlating to trends in catchability and recruitment, and by following a predictable nonlinear pattern of change through time.

This is a good example of the type of research needed to strengthen stock assessments in the region. Evaluating stock responses to long-term, environmental trends is an important step in describing the patterns observed and improving the ability to project changes into the future. Care must be taken to carry this work out as research supporting stock assessments rather than within the assessment process to avoid assessments from becoming exploratory and bogging them down.

- Ultimately, stock assessments in the Southeast are most limited by the sparse data often available for inclusion. Expanding fishery independent surveys, improving catch data, analyzing the potential behavioral interaction around survey gear, and conducting tagging studies could improve the quality of and potentially the throughput for stock assessments.

The quantity and quality of data feeding our stock assessments continues to be a significant, limiting factor in the stock assessments conducted in the region. In some

cases, we're overly dependent on landings data, and in the Caribbean, the reliability of those data come into question. Investments must be made to ensure the long-term viability of current data streams and expand their geographic and temporal scales. Care must be taken to tend to the data collection partnerships to maintain the shared vision and resources required to maintain them. Resources should be sought for expansion beyond current collections, informed by research priorities within the SEFSC, the Fishery Management Councils' Scientific and Statistical Committees and the "Research Recommendations" sections of specific stock assessments.

A second component to this is captured in another related recommendation to, "Match assessment and management complexity to data quality. Spend time internally and with partners to categorize species based on a realistic assessment of data quantity and quality. This categorization should help in setting realistic expectations about assessment and management approaches." Paring these two recommendations equates to either garnering the resources to increase fishery-independent data collections, or if this is not possible, ensuring that the management measures implemented and the stock assessment approaches used are commensurate with the quality and quantity of data available.

Conclusions:

This is the second in the series of programmatic peer reviews carried out under the new, nationally-standardized program review process within NOAA Fisheries. Progress has been made in implementing recommendations from the first review in the cycle, which focused on the data collection programs that feed stock assessments carried out under the Magnuson-Stevens Act. The connectivity between these first two peer reviews is strong and opportunities for synergies will be explored. Examination of the collective set of recommendations will also be important for resourcing and staging their implementation. In some cases, improvements in the data collection processes may be a prerequisite for more effectively carrying out a recommendation for the stock assessment process. An example of this is the emphasis that both review panels put on the importance of high quality fishery-independent data.

Some of the recommendations can be implemented via discrete actions, others require long-term, continuous investments. Hence, timelines for carrying these out range from discrete to continuous. Based on the evaluation of the recommendations, a suite of actions and timelines has been generated (Table 1).

Table 1: Summary of Action Items and Schedules

Action	Timeline
Contribute to completion of the national stock assessment prioritization tool and adopt/adapt it into the SEDAR process	2016
Conduct a Data Methods Workshop to establish, peer review and document standard practices and decrease the inconsistencies in methodologies among the different assessment groups within the Center.	Spring, 2015
The Marine Resources Education Program (MREP) approach, used to increase awareness of the stock assessment process in the stakeholder community should be continued and potentially expanded.	2015 - continuing
Simplified harvest control rules should be considered that would potentially require less complex stock assessments and similar or higher levels of policy effectiveness.	2015 - 2016
Documentation requirements should be clearly defined with an emphasis placed on brevity and clarity. A concise summary for each assessment that is understandable to stakeholders and cooperators should be included.	2015
Make consistent investments in research that improve stock assessments and advance the professional capabilities and status of assessment scientists	Continuous
Continue to invest in maintaining and improving the fishery-dependent and fishery-independent data that are crucial inputs for stock assessments.	Continuous