NOAA FISHERIES

Alaska Fisheries Science Center

Stock Assessment Science Program Review

Alaska Fisheries Science Center Summary and Response – April 2014

Introduction

On March 24-28, 2014, the Alaska Fisheries Science Center (AFSC) hosted a panel of experts to conduct a programmatic review of the stock assessment science conducted under the auspices of the Magnuson-Stevens Act.

This review was the second in a series of annual reviews, conducted on a different theme each year over a five-year cycle, designed to maximize the transparency and effectiveness of major science programs located at the six Science Centers as well as those located in or coordinated through NOAA Fisheries' Office of Science and Technology. Fishery stock assessment science is a major endeavor for NOAA Fisheries and the science supporting it is extensive. Therefore, the review of the process was split between 2013's focus of data collection and management and 2014's focus on the modelling approaches, review processes, and responsiveness to Magnuson-Stevens Act mandates.

This was not a review of any particular stock assessment but rather a review of the overall program, centered on the following seven themes from Terms of Reference agreed on by the NOAA Fisheries Science Board:

1) Does the AFSC apply a suitable scientific/technical approach to fishery stock assessment modeling?
2) Is the assessment process efficient, effective and clearly described, including terms of reference for assessment reports?
3) Does the AFSC, in conjunction with other entities such as the North Pacific Fishery Management Council's (NPFMC) Scientific and Statistical Committee (SSC), have an adequate peer review process?
4) Is the AFSC's program organization effective at accomplishing needed assessments according to a set of assessment priorities?
5) Does the AFSC achieve adequate assessment accomplishments relative to mandates particularly with respect to the number of Fishery Management Plan (FMP) species assessed?
6) Does the assessment program adequately communicate their results, needs, and research?
7) Are there opportunities for improving stock assessments and the stock assessment process?

To conduct the review, we selected experts in the topic area who were not associated with the AFSC. The panel was provided with presentations from AFSC staff covering the state of AFSC's stock assessment program. Panelists were also provided with background material for more in-depth information and had time to discuss the state of the AFSC's stock assessment program – and its utility – with AFSC management and staff during the review. Comments and responses to questions from the public participants who attended the review were also considered by the panelists.

More information regarding the AFSC review may be found at:
http://www.afsc.noaa.gov/program_reviews/2014/default.htm

The results from this year's review, along with those being conducted at each of the other five fishery science centers and the Office of Science and Technology, will be used to prepare a national summary, to highlight best practices and to inform decisions on opportunities for improving stock assessment science programs across NOAA Fisheries. The full suite of these reports will be found at: http://www.st.nmfs.noaa.gov/science-program-review/

Acknowledgements

We would like to thank the review panelists who devoted a significant amount of time to prepare for, and participate, in this review. Their observations and recommendations provide valuable feedback on how our stock assessment program is performing relative to our stated goals and objectives. We also greatly appreciate the time and thought that participating stakeholders put into this review; their questions and comments sparked many conversations and their perspective was invaluable particularly when addressing the issues of priority setting and communications.

The panelists for this review were:

- Bruce Leaman (Chair) – International Pacific Halibut Commission
- Bill Clark - International Pacific Halibut Commission (Retired)
- David Fluharty – University of Washington
- Paul Rago – NOAA Fisheries Northeast Fisheries Science Center
- John Stein – NOAA Fisheries Northwest Fisheries Science Center (Panelist from 2013)
- Christopher Sabine – NOAA Pacific Marine Environmental Laboratory

Finally, we would like to express our appreciation to the AFSC staff for their contributions, insights, and candor during this week-long review. Several comments in the reports written by the panelists reflect the additional effort that staff are putting forth to maintain and advance the state of the AFSC's stock assessment science, and the information developed for this review is an excellent example of this commitment.

Remarks

Overall, the reviewers provided overwhelmingly positive comments on the AFSC's stock assessment program. The panel's summary and individual reports provide reinforcement and validation of the AFSC's commitment to maintaining stock assessments as a core scientific priority, despite declining budgets. The results of this review will encourage and motivate staff and AFSC leadership to continue to pursue excellence in all aspects of fish stock assessment.

Response to Recommendations and Other Observations

The panelists' reports recognized the AFSC's effective stock assessment program as a model for producing high-quality advice for conservation and management. They also highlighted the challenges the agency has in maintaining such an intensive program, and provided valuable recommendations.

Here, we provide our initial response to the substantive points identified in the summary report. A number of additional issues were included within the individual reports, and although these are not addressed here, they will be taken into consideration as we respond to the larger issues.

- *Internal review and development of assessments should take advantage of the proximity of the Alaska Fisheries Science Center and the Northwest Fisheries Science Center (NWFSC).*
    - Collaborating and communicating more routinely with the NWFSC is a priority for AFSC leadership and we are committed to expanding on the opportunities to do so, in both scientific and operational capacities and doing so benefits both Centers. To accomplish this, we will work with the NWFSC to design a framework in which stock assessment scientists can review and provide expert input during proposed model changes. An additional opportunity exists through conducting post-assessment desk reviews between the two Centers. By January 2015, the AFSC will provide the NWFSC with a proposed strategy for sharing technical review expertise between the two centers.
    - The panelists also identified that sharing approaches to assessment of data-limited stocks could be a focus for an inter-Center working group. The AFSC agrees that sharing approaches is important and is currently involved in NMFS working groups both regionally and nationally to address this concern. The AFSC will be contributing to a North Pacific Fishery Management Council regional workshop scheduled for January 2015 to evaluate data-poor techniques and possible use on North Pacific stocks. We will recommend to the workshop planners that NWFSC experts should be included so that they can share their expertise. Based on the outcomes of the workshop and the current national working groups addressing data-poor techniques, we will evaluate whether an inter-Center working group might be helpful to provide further progress in this area.
    - The AFSC and NWFSC will continue to share information through participation in the weekly UW SAFS mini-workshops and quantitative seminars. These seminars are broadcast over the web to provide input to scientists who couldn't make the meetings. These seminars accelerate the exchange of information between the University, the NWFSC and AFSC.

- *The panel noted that assessment scientists on Plan Teams were almost exclusively AFSC scientists; more diversity is desirable.*
    - We agree with this observation and will work with the North Pacific Fishery Management Council (NPFMC), International Pacific Halibut Commission, and our university partners to identify non-NMFS scientists to enhance the Plan Team membership, bringing other voices to the process. By December 2014, the AFSC Science Director will send a letter to NPFMC Executive Director, Chris Oliver, that outlines the panel's recommendations in this regard and request that the Council assist in this effort.

- *The panelists expressed concern about the long-term viability of assessment frequency and the sustainability of the assessment production and review in a compressed time frame.*
    - We acknowledge that the AFSC is unique in the frequency with which it provides stock assessments, and the effort in terms of days at sea we put into collecting the data underpinning these assessments. We believe that the value of the fisheries supported by these core AFSC programs justify this expense and effort. We will continue to prioritize assessment frequency based on input from the Region and Council, the life history features of the stock, associated fishing pressures, and the value to the industry of conducting a given survey. This

approach has allowed the AFSC to reduce the frequency of assessment for several stock groupings in recent years.

- *The rapid pace of climate change in Alaska and the concurrent need to understand the impacts of emerging spatial structure in stocks and biological processes is a major challenge.*
  - Alaska is on the forefront of climate change, and incorporating climate information will be critical for the AFSC to continue to provide the scientific information and forecasts required to support sustainable fisheries. We are currently conducting and reviewing our information on stock structure of managed species and incorporating this information into evaluating harvest strategies. The AFSC fully supports the recent climate-science initiative between the Office of Oceanic and Atmospheric Research (OAR) and NOAA Fisheries. This collaboration presents an opportunity to develop operational forecasts despite constrained budgets.
  - The AFSC is in the process of reviewing and updating our Strategic Science Plan and will complete this update by January 2015. Incorporating climate impacts by developing mid- and longer-term (20 year) forecasts will be a new emphasis.
  - The AFSC has initiated a hiring recruitment for an ecosystem modeler to better address climate impacts on fisheries. The incumbent will be engaged in developing quantitative methods for ecosystem-based approaches to management and methods to assess climate-change impacts on fisheries. We hope to have this position filled within the first quarter of the 2015 fiscal year.
  - In 2015, the AFSC will revisit, revise, and update the Implementation Plan for the AFSC's Loss of Sea Ice (LOSI) Program[1] to provide more focus on the impacts of climate-influenced ecosystem processes on commercially and culturally important species. Modifications to the program will include a long-term time series monitoring the distributions and abundances of species in the northern Bering Sea ecosystem and increased modeling efforts to provide information on how species distribution and marine food webs are altered by climate and seasonal ice.

- *Although the review did not focus explicitly on the fiscal and personnel resources required for stock assessment, concern about impacts of reduced fiscal resources on maintenance of product quality, staff retention, assessment scientists' career advancement, and staff succession arose.*
  - The AFSC will continue to prioritize fishery stock assessment and meeting the information needs of the Alaska Regional Office and North Pacific Fishery Management Council as two of our core research activities. And, we will continue to devote the necessary resources toward maintaining this endeavor to the extent possible. In the short-term, this model will require continued partnerships to leverage resources allowing us to push the science forward and expand into Next Generation Stock Assessments. Staff retention, career advancement, and eventual succession are major concerns for all aspects of the AFSC, and we are currently conducting succession planning exercises and identifying high priority capabilities to maintain at the AFSC. Regarding career advancement, NOAA Fisheries is working on a Science Career Track Policy, which would likely be applicable to the AFSC's stock assessment program.

[1]The current version of the AFSC's Loss of Sea Ice Implementation Plan can be found at: http://www.afsc.noaa.gov/Publications/ProcRpt/PR2007-05.pdf

- ➢ In addition to stock assessment authors, the panelists noted that a loss of staff who produce, analyze, and manage the data used in stock assessments ultimately limits delivery of assessment products. We are actively mitigating this issue by transitioning staff into areas, such as age reading, where our capacity was not meeting data needs. We are committed to continuing this approach to the extent possible in order to meet our highest priorities without increasing costs.

- ❖ *Loss of graduate student stipends hampers development of future intellectual capital; restore this activity.*
  - ➢ The AFSC agrees that graduate student support is a useful way to ensure that NOAA Fisheries supports mission-critical career fields. The AFSC and NWFSC collaborate on supporting population dynamics and economics capacity building through the NOAA Fisheries QUEST (http://www.st.nmfs.noaa.gov/quest/) Program. Additionally, we provide funding to graduate students involved in specific projects on an *ad hoc* basis. We believe this to be a national issue, and will work with the Office of Science and Technology on improvements in this arena.

- ❖ *More explicit protocols for inclusion and removal of species in stock complexes is required, as well as further evaluation of the conservation efficacy of the stock complex approach.*
  - ➢ The review did not go into the full details of this process. Briefly, the vulnerability analysis used to identify species in the fishery was used to assist stock assessment authors in providing recommendations on splitting stocks out of stock complexes for Alaska stocks. The vulnerability of individual members of the complex is evaluated annually as part of the annual stock assessment review.

- ❖ *Center communications become increasing important during times of reduced fiscal resources and poor public understanding of issues. Communications staff should be enhanced to meet the challenge of increasing communication to non-traditional groups.*
  - ➢ The AFSC is committed to strengthening our Communications Program in by recruiting a Communications Director - a position which has been vacant for several years. The use of varied communication styles and tools will be a critical component of this position, as will appropriate training for our scientific staff so they are better able to communicate their science.

Conclusion:

This review was the second in a series of annual reviews at the AFSC and was focused on the Center's stock assessment program. The observations and recommendations of the panel members provided valuable feedback on how the Center's stock assessment program is performing relative to our stated goals and objectives, and how it can be improved. Overall, panel members were overwhelmingly positive in their comments. The following key recommendations were made:

1) Internal review and development of assessments should take advantage of the proximity of the Alaska Fisheries Science Center and the Northwest Fisheries Science Center.

2) Greater diversity in the source of scientists to populate the Groundfish and Crab Plan Teams is desirable.

3) AFSC leadership should be concerned about the possibility of overextending assessment staff and support staff, given the high number of assessments produced per year, the compressed time frame, and declining budgets.

4) AFSC leadership should, as possible, put more resources into process studies associated with climate change that would inform stock assessment forecasts.

5) Stock assessment research should continue, and expand as possible, its reliance on graduate students to provide a legacy for potential future hires.

6) Further evaluation of the merits of the existing protocols for identifying stock complexes and associated assessment strategies.

AFSC leadership agrees with these recommendations and is committed to implementing the necessary changes in existing protocols at the Center to realize significant benefits and efficiencies.

Table 1: Summary of Action Items and Schedules

Action Item	Schedule
AFSC to provide the NWFSC a proposed strategy for sharing technical review expertise during proposed model changes.	January 2015
AFSC will suggest a process of post-assessment desk reviews between the AFSC and NWFSC, and identify 2-3 assessments for an inaugural review.	January 2015
AFSC will recommend to North Pacific Fishery Management Council workshop planners that NWFSC staff be included in a January 2015 regional workshop to evaluate data-poor techniques and possible use on North Pacific stocks.	October 2014
The AFSC will continue to share information with the NWFSC and academia through participation in the weekly UW SAFS mini-workshops and quantitative seminars.	Ongoing
The AFSC will send a letter to the NPFMC Executive Director requesting assistance in broadening and enhancing the Plan Team membership.	December 2014
AFSC will work with the NPFMC and Alaska Region to prioritize assessment frequency.	Ongoing

Action Item	Schedule
AFSC will update our Strategic Science Plan to specifically incorporate climate impacts by developing mid- and longer-term forecasts.	January 2015
AFSC will hire an ecosystem modeler to better address climate impacts on fisheries.	First quarter of Fiscal Year 2015
AFSC will update our Implementation Plan for the AFSC's Loss of Sea Ice (LOSI) Program to provide focus on assessing the impacts of climate-influenced ecosystem on commercially and culturally important species.	March 2015
AFSC will transition staff into positions which produce, analyze, and manage data used in stock assessments to the extent possible.	Ongoing
AFSC will continue to support population dynamics and economics capacity building through the NOAA Fisheries QUEST Program.	Ongoing
AFSC will hire a Communications Director knowledgeable in varied communication styles and tools and develop appropriate communications training for our scientific staff.	Hire in first quarter of Fiscal Year 2015 Communications training by end of 2015