NOAA FISHERIES

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Improving the SEDAR Process

Better efficiency, greater throughput, and more timely management advice

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Rationale and Targets

- The Southeast Data, Assessment and Review (SEDAR) process is thorough and transparent, but challenged to achieve high timeliness and throughput:
    - High cost, both in terms of human resources and money
    - Insufficient number of stock assessments per year
    - Time between assessments is too long (5-10 years for many stocks)
    - Assessments take too long to complete

- We estimate that, with several specific changes:
    - SEDAR throughput could be improved by 50% or more, and
    - the frequency of ABC advice could be increased another 50-100% by the use of interim monitoring analyses based on updates of key fishery indicators rather than full assessments.

A Potential Solution

We propose a cycle of regularly scheduled Operational Assessments and Interim Analyses supported by as-needed Research Assessments similar to that used effectively to support the North Pacific Fishery Management Council, and more recently the NE and Mid-Atlantic Councils.

For SEDAR, we keep the following guiding principles in mind:

- **Consistency with national guidance** from NOAA, as outlined in Lynch et al.(1)
- **High quality stock assessments** with scope of peer-review tied to the degree of novelty
- **Timely Operational assessments**, providing regular and more frequent ABC advice using updated data.
- **Transparency**, with well-organized public access to documentation of data, model, results and reviews.
- **Innovation introduced in Research Assessments.** Maintain an orderly approach to implementing new stock assessment methods or new ideas, to incorporate advances in population dynamic modeling, statistical applications, or multispecies approaches.
- **Regular, predictable assessment cycle.** This will help managers in knowing when to expect new ABC advice, and will help data providers in planning their efforts.

(1) A draft of Lynch et al. is available from https://www.st.nmfs.noaa.gov/Assets/stock/documents/SAIPCompleteDraft_2-16-17_ExSumm.pdf
(A more recent version -- soon to be released – is available upon request.)

Recommended changes

1. Implement Research and Operational Assessments
   - increase quality and increase throughput by 10-20%

2. Conduct Interim (monitoring) Analyses that provide updated ABC advice based on regularly-updated indices of abundance and/or mortality
   - increase throughput 50-100% (depending on how often they are implemented)

3. Schedule assessments well in advance
   - increase throughput by 10-20%, and decrease the time to conduct each assessment by 10-20%

4. Consistently employ the Interdisciplinary Plan Team (IPT) style of decision
   - assessments to decrease the duration of assessments 10-20% and reduce postponements in the assessment schedule

5. Research assessments for data-limited species are most efficient when methods are reviewed and vetted through previous processes, and then many (e.g., 15) species are addressed simultaneously at one workshop.

Illustrative example of Research Track, Operational Assessments and Interim Analyses. In this example using three assessment analysts, management advice (ABCs) is updated every year for one species (Red Snapper), every other year for seven other stocks, and Research Assessments are completed for two new stocks. Note that once a Research Assessment is completed for the unassessed species, then they enter into the Operational-Interim cycle.

Analyst 1
Analyst 2
Analyst 3

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Red Snapper	Operate	Interim	Interim	Interim	Operate	Interim
Black Sea Bass		Operate		Interim		Operate
Red Porgy	Interim		Operate		Interim	
Gag Grouper		Interim		Operate		Interim
Vermilion Snapper	Operate		Interim		Operate	
Snowy Grouper		Operate		Interim		Operate
Tilefish	Interim		Operate		Interim	
Red Grouper		Interim		Operate		Interim
Scamp	Research	Operate		Interim		Operate
Gray Triggerfish			Research	Operate		Interim
Greater Amberjack			Interim		Operate	

Summary

The proposed process can improve SEDAR and the Southeast assessment enterprise:

1. Most stock assessments would be conducted through Operational-Interim analyses, such that timely management advice would be provided for the maximum number of stocks possible.

2. The regular and predictable Operational-Interim cycle will benefit data providers and managers alike. Additional efficiencies can be gained by streamlining the Operational assessment reports:
    a. These assessments would be reviewed by the Council's SSC.
    b. Research assessments would be conducted when stocks are assessed for the first time, or when high priority issues are identified for previously assessed stocks.

3. Research assessments allow for innovation in methodology, and for new ideas to be vetted through external review, as well as by the SSCs, prior to implementation for management advice.

4. The combination of Research and Operational assessments, along with Interim Analyses, allows for both innovation and for timely, efficient, high quality assessments to meet the needs of NMFS, the Councils, and stakeholders in the fisheries.

Appendix

Background Material

Definitions 1: Research Assessments

… allow for innovation and new ideas to be built into the assessment models. Such assessments would occur as needed to provide a first assessment of a stock or to improve existing Operational Assessments, or to establish a data source or procedure that can be implemented in many assessments .

Research Assessments are vetted through fully independent review (e.g., CIE), and if the innovations are found to be acceptable, the new methodology would be used subsequently in Operational Assessments.

Definitions 2: Operational Assessments

- … **provide management advice.** They are designed to be timely and efficient, and address the deficiencies of the current SEDAR process. The Operational Assessment schedules put key stocks into a regular assessment cycle(1). These key stocks include those that have already been through a Benchmark or Research Assessment, and for which the Councils desire regular and timely ABC advice.

- Operational Assessments are similar in scope to the current SEDAR Update Assessments, taking a previous Benchmark or Research Assessment and updating all relevant data, but making no or minimal change to methodology.

(1) The frequency of that advice will depend on the number of stock assessment analysts and the number of key stocks, and could also reflect expected annual rates of changes in abundance (e.g., a short-lived species like black sea bass could be assessed more frequently than a long-lived species like tilefish).

Definitions 3: Interim Analyses

- … adjust ABCs between Operational Assessments.
- This innovation is expected to as much as double throughput by allowing annual or biennial updates of ABC advice using the most recent data available instead of relying on assumptions about fishing practices and recruitment for several years into the future (as with current projection approaches).
- More frequent Interim Analyses would also permit a wider interval between Research and Operational Assessments. Interim Analyses are not full assessments in the sense of revising model structure or re-estimating all model parameters, but instead provide updated ABCs based on current trends in critical data sources, such as landings, fishery independent indices of abundance, or age/length data.
- Interim Analyses offer the biggest “bang-for-the-buck” in terms of providing timely management advice with the largest savings in cost.

Characteristics of an Ideal Assessment (1/4)

1. Preparation of Data for Operational Assessment

a. Keep key data streams (e.g., fishery independent abundance surveys and fishery CPUE indexes) are updated and readily available so everyone can see trends for relevant stocks. This is in sync with efforts to provide Public Access to Research Results (PARR);

b. Pre-processed data is put in the hands of analysts quickly and with little need for additional processing. Improved regional databases are key to this and step 1a.

Characteristics of an Ideal Assessment (2/4)

2. Conduct of Operational Assessment

a. Use the method investigated and approved in the research process. Similar stocks with similar data sources may be able to use the same approaches.

b. Don't modify the assessment method unless there is a clearly documented and compelling reason for the change and it fits within the scope of the approach developed in the research stage.

c. Don't redo and re-document all the sensitivities that were done during the development of the assessment model during the research phase. Do what is needed to update estimates of assessment uncertainty.

Characteristics of an Ideal Assessment (3/4)

3. Conduct of Research Assessment

a. Evaluate suitability of a broad range of data, but don't accept more than is necessary to get a good operational assessment approach.

b. Consider alternative models or model configurations and be open to advancing an ensemble.

c. Look at ecosystem and environmental drivers, especially where contrary trends in indexes are detected.

d. If building off a previous assessment, focus on what is new and don't re-investigate old issues for which nothing has obviously changed.

Characteristics of an Ideal Assessment (4/4)

4. Review and Documentation

a. Review of Operational Assessments should focus on QA/QC for implementation of the accepted assessment model and can be done by a knowledgeable regional team (e.g., the SSC). Flag discrepancies for future investigation.

b. External, fully independent reviewers are best reserved for review of:
   - new or substantially modified modeling methods,
   - new data sources,
   - hindsight look at performance of past assessments to advise on research to improve the assessments in future.

c. Don't re-document all the data sources in the Operational Assessment. Rather, refer to previous documents and provide simple tables with latest information.

d. Post-mortem: gather input from the assessment process, closely related disciplines (e.g., ecosystem, socioeconomic sciences), data providers, and fishermen about what people are seeing versus what the assessment is showing. Use discrepancies to guide research investigations; not simply a quick redo using the same assessment method.