

Summary of U.S. Stock Assessment Workflows

Tools and Templates

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Citation

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1 Summary

Developing and producing a stock assessment report requires a considerable amount of data consolidation, analysis, and research. Reports can range from 10 pages to well over 300, but the goal of the process remains to provide management advice with the current and projected status of the stock, catches, and other important parameters to ensure its sustainability. There have been many efforts done to improve the reproducibility of workflows and reduce time it takes to produce these reports. So far, improvements and efforts have ranged considerably by region of the U.S. Specifically, each of the seven regional fishery science centers across the U.S. have their own workflows to assess a stock and produce its report. Many of these workflows are guided by requirements from fishery management councils and other involved managing bodies that utilize these reports to delegate fishery regulations.

Workflows across the country not only range from region to region, but from scientist to scientist. There is no current standardized or accepted best practice for producing a stock assessment report. Some centers rely on the use of latex, a common software to produce documents with in-text calculations, while others utilize more recently developed programs like Rmarkdown and quarto, which both use latex as a basis for their production. Others utilize the capacity of Microsoft word which restricts the reproducibility of a report as well as increases work time since figures, tables, and other associated resources must be compiled outside of the word document.

Description of interaction and list of fishery management councils across the US

2 General Stock Assessment Workflow Structure

- Description of stock assessment workflows from input to bringing the report to the SSC and council(s) for evaluation and adoption of formal management measures resulting from recommendations

3 Stock Assessment Models

[Short descriptions of commonly used stock assessment models within the U.S. including acknowledgement of smaller used models and FIMS for the future]

- WHAM
- SS
- BAM
- ASAP
- AMAK
- Bespoke
- FIMS

4 Alaska Fisheries Science Center (AFSC)

4.1 Resources

AFSC takes advantage of multiple packages and templates built to help produce stock assessment reports. They have also built their own tools to improve and streamline their workflows. These tools include:

- afscdata
- afscassess
- safe
- r4ss

4.1.1 afscdata

[Github Repository](#)

This R package was developed in order to extract fishery data for use in analyses and stock assessment models. Various functions query data from a connected database. There are various functions dependent on the target species which extract .csv files with a time stamp of the query.

Other tools to describe:

- afscassess
- safe reporting

4.2 Workflow

- Full assessments vs. partial assessments vs. model review
- Add'l harvest projections
- Operational & stock monitoring update
- Annual and bi-annual assessments (+ some every 4 yrs)

- bespoke and SS models

4.2.0.1 Assessment Outlines

- Outlines as agreed upon in the TOR from council

5 Northeast Fisheries Science Center (NEFSC)

- Summary of their process and broken down by subregion if applicable
- Discuss impact of multiple fishery management councils and other RFMOs for document guidance and content delegation

5.1 Resources

- table of current resources that guide their workflow?
- Alternative is descriptions of different resources used in the process as described in the AFSC section example

Tools to describe:

- ASAPplots

5.2 Workflow/TOR

- Discussion of the process for the workflow in the region - described like methods
 - Subsections for 508 compliance efforts and tools?
-

Adding example citation in a sentence to test using them and allowing render (Clark 1993).

6 Northwest Fisheries Science Center (NWFSC)

- Summary of their process and broken down by subregion if applicable
- Discuss impact of multiple fishery management councils and other RFMOs for document guidance and content delegation

6.1 Resources

- table of current resources that guide their workflow?

Tools to describe:

- r4ss
- sa4ss
- SASINF
- Other tools used in process?

6.2 Workflow/TOR(s)

- Discussion of the process for the workflow in the region - described like methods
 - Subsections for 508 compliance and tools?

7 Pacific Islands Fisheries Science Center (PIFSC)

- Summary of their process and broken down by subregion if applicable
- Discuss impact of multiple fishery management councils and other RFMOs for document guidance and content delegation

7.1 Resources

- table of current resources that guide their workflow?

Tools to describe:

- [bottomfish report script](#)
- Stock assessment report repo

7.2 Workflow/TOR

- Discussion of the process for the workflow in the region - described like methods
 - Subsections for 508 compliance and tools?

8 Southeast Fisheries Science Center (SEFSC)

- Summary of their process and broken down by subregion if applicable
- Discuss impact of multiple fishery management councils and other RFMOs for document guidance and content delegation

8.1 Resources

- table of current resources that guide their workflow?

Tools to describe:

- r4ss*
- SEDAR-Assessment-Report template (GOM)
- Latex template (SA)
-

8.2 Workflow/TOR(s)

- Discussion of the process for the workflow in the region - described like methods
 - Subsections for 508 compliance and tools?

9 Southwest Fisheries Science Center (SWFSC)

- Summary of their process and broken down by subregion if applicable
- Discuss impact of multiple fishery management councils and other RFMOs for document guidance and content delegation

9.1 Resources

- table of current resources that guide their workflow?

Tools to describe:

- [Stock assessment template](#)
- [R process output](#)
- [swfscMisc](#)
- r4ss*

9.2 Workflow/TOR

- Discussion of the process for the workflow in the region - described like methods
 - Subsections for 508 compliance and tools?

10 Conclusions

- Conclusions about how workflows operate in the U.S.
 - Both pros and pitfalls of current workflows
 - Incorporating perspectives from regional scientists?
- Additional hope for greater look into the inputs and pulling together the entire stock assessment workflow process

10.1 Future Work

- Discuss the upcoming/in development tool for automated workflows and plan for the future including stock assessment modelling for the future

References

Clark, W. G. 1993. "The Effect of Recruitment Variability on the Choice of a Target Level of Spawning Biomass Per Recruit." In, 233246. Alaska Sea Grant College Program AK-SG-93-02.