

Fish 577: Applied Stock Assessment II (2-5 credits), Spring Quarter

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Prerequisites

Applied Stock Assessment I (Fish 600 for Winter 2021) or permission of instructor.

Overview

Applied Stock Assessment II is the second part of a two-quarter applied stock assessment series offered in collaboration with stock assessment scientists in the Fishery Resource Analysis and Monitoring Division at the Northwest Fisheries Science Center. This course focuses on developing, running, evaluating and documenting the base and sensitivity Stock Synthesis models required for a stock assessment update submitted to the Pacific Fishery Management Council (PFMC) for use in management. During this second term, students will:

1. Complete catch-only stock assessment projections.
2. Run the update stock assessment model and sensitivities.
3. Build decision tables to provide catch advice to managers.
4. Report results through a document and presentations.

Students will focus on running the stock assessment model under different configurations, ensuring model convergence, interpreting and comparing results and underlying assumptions, and documenting the stock assessment update in a document and presentations before the PFMC's Scientific and Statistical Committee's Groundfish Subcommittee. The PFMC's Scientific and Statistical Committee and its Groundfish subcommittee review both the update stock assessment and catch-only projections.

Format

One 1.5-hour lecture and one 1.5 hour laboratory each week in which the instructors first introduce the theory behind the topic being discussed and the practical approach including decision points and code. Depending on the topic, students start the process of applying the methods to the stock assessment update and/or catch only projections and possibly additional examples during the laboratory session.

Learning Goals

Upon successful completion of the course, students will be able to:

1. Read, understand and revise Stock Synthesis input files.
2. Modify Stock Synthesis input files to reflect sensitivity runs, and run them.
3. Run likelihood profiles in Stock Synthesis
4. Produce forecasts using Stock Synthesis.
5. Run R4SS software to produce plots from Stock Synthesis output.
6. Write catch-only assessment projections and update stock assessment reports.
7. Present stock assessment results to the PFMC.

Texts

There are no prescribed texts. Students will be assigned readings at the beginning of the class. Material is also covered in PowerPoint slides and example R scripts which will be posted on the class web-site.

Evaluation (CR/NC or Graded)

This is a CR/NC class. Students should sign up for a number of credits reflecting their expected involvement in the class and contributions to the projections and update stock assessment. Credit will depend upon participation in class and in the projections and update assessment. For variable credits, see requirements below:

2 credits: Attend and participate in class, read material, turn in homework assignments.

3 credits: Attend and participate in class, read material, turn in homework assignments. Participate in work up/write up of at least one data type/source for update stock assessment, run a sensitivity model and projection in Stock Synthesis and use R4SS to produce output figures.

4 credits: Attend and participate in class, read material, turn in homework assignments. Participate in work up/write up of at least one data type/source for update stock assessment, run a sensitivity model and projection in Stock Synthesis and use R4SS to produce output figures. Lead one section of the document preparation for data or sensitivity analyses

5 credits: Attend and participate in class, read material, turn in homework assignments. Serve as a lead on the update assessment, overseeing and reviewing each of the data analyses, sensitivity analysis, and document preparation. Develop decision tables for update assessment. Serve as a lead on development of presentation of update assessment.

Enrolling in the two and three credit versions of this course requires background in the R language for statistical computing, gained through course FISH 552, Introduction to R Programming for Natural Scientists or approval from the instructor.

Enrolling in the four and five credit versions of this course requires background in the R language for statistical computing, gained through courses FISH 552, Introduction to R Programming for Natural Scientists, and FISH 553, Advanced R Programming for Natural Scientists. Additional required course work includes FISH 555, Age-Structured Models in Fisheries Stock Assessment, and/or FISH 558, Decision Analysis in Natural Resource management, or approval from the instructor.

The expected hours of coursework per week for the credit hours options, as well as the breakdown of hours spent on course tasks are provided in the table below.

| Credit Hours | Hours Per Week | Lecture | Laboratory | Other |
|---------------------|-----------------------|----------------|-------------------|--------------|
| 2 | 6 | 1.5 | 1.5 | 3 |
| 3 | 9 | 1.5 | 1.5 | 6 |
| 4 | 12 | 1.5 | 1.5 | 9 |
| 5 | 15 | 1.5 | 1.5 | 12 |

Syllabus

| Week | Topics |
|------|--|
| 1 | Review data and catch only update topics from Advanced Stock Assessment I |
| 2 | Bridge modeling: Run a set of models transitioning from the previous assessment model to the current by updating one new piece of data at a time and running the model. Plot the previous assessment as well as each subsequent model runs until each dataset has been updated. Produce a full set of r4ss output for the fully updated model. |
| 3 | Maturity, Fecundity, Recruitment, and Growth in SS Sensitivity modeling: Produce a set of model runs that include 1) model sensitivities from the last full assessment, 2) any issues noted in the STAR or SSC reports, 3) runs that you are interested in completing. Plot results against the base model. |
| 4 | Catchability and Selectivity in SS Retrospective modeling: Complete a 5-year retrospective analysis. |
| 5 | Initial conditions in SS; Natural and fishing mortality in SS Likelihood Profiles: Complete likelihood profiles that were included in the last full assessment. |
| 6 | Lecture: Management history/changes in management – states/industry/PFMC Harvest Projections: Complete harvest projections and decision tables as included in the last full assessment. |
| 7 | Update stock assessment document preparation - Internal Review Deadline May 19 |
| 8 | Update stock assessment document preparation |
| 9 | Update stock assessment document preparation - SSC GF review meeting TBD and PFMC briefing book deadline for documents (May 26) |
| 10 | Prepare and practice presentations for the PFMC SSC |

Religious accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/) (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>). Accommodations must be requested within the first two weeks of this course using the [Religious](#)

[Accommodations Request form \(https://registrar.washington.edu/students/religious-accommodations-request/\)](https://registrar.washington.edu/students/religious-accommodations-request/).

Email and computer use

All students are expected to have an email address and you will receive email relevant to this course on a regular basis.

Academic Integrity

Trust between student and instructor is of paramount importance in academic settings. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120) and your personal contract as a student. I expect that you will know and follow the university's policies on cheating and plagiarism. Please review the College of the Environment website on academic integrity so that you are clear on what constitutes academic misconduct. Any suspected cases of academic misconduct will be handled per University of Washington regulations. For more information, see the College of the Environment Academic Misconduct Policy and the University of Washington Community Standards and Student Conduct website. Be advised that as an instructor at the UW, I have the responsibility to notify University Conduct committees about any suspected student misconduct.

Disability Accommodations

It is crucial that all students in this class have access to the full range of learning experiences. At the University of Washington, it is the policy and practice to create inclusive and accessible learning environments consistent with federal and state law. Full participation in this course requires: 1) the ability to attend all lectures per week; 2) participate in small group discussions on topics relevant to the course, 3) participate in all laboratory/discussion sections and 3) prepare stock assessment documents and make short presentations that synthesize results and discussion orally. If you anticipate or experience barriers to your learning or full participation in this course based on a physical, learning, or mental health disability, please immediately contact the instructor to discuss possible accommodation(s). A more complete description of the disability policy of the College of the Environment can be found [here](#). If you have, or think you have, a temporary or permanent disability that impacts your participation in any course, please also contact Disability Resources for Students (DRS) at: 206-543-8924 (V), 206-543-8925 (TDD), uwdss@uw.edu.