



Center for the Advancement of Population Assessment Methodology (CAPAM)

Biannual Report
January – June 2013

CAPAM
NOAA/IATTC/SIO
8901 La Jolla Shores Dr.
La Jolla, CA 92037, USA
www.CAPAMresearch.org

Background

The Center for the Advancement of Population Assessment Methodology (CAPAM) was formally established and began project work in February 2013. The CAPAM's mission involves research, education, and outreach that addresses animal population dynamics, models, and assessments associated with marine fishery resources. Presently, primary CAPAM staff includes: three Principal Investigators representing the three founding institutions, Mark Maunder (IATTC), Paul Crone (NOAA), and Brice Semmens (SIO); two Research Associates, Jenny McDaniel (NOAA) and Devon O'Meara (SIO); and one Post-doctoral researcher, Juan Valero (CAPAM). Graduate students (SIO) are also involved with CAPAM in various capacities, e.g., Lynn Waterhouse is working on both selectivity research and applied assessment work as part of her PhD program. Only the post-doctoral position and some graduate research work are supported directly through CAPAM funds, with all other appointments, support, and services provided by the main institutions. At the onset, the highest priority was to establish an infrastructure for CAPAM that would allow appropriate and efficient processing of funds for supporting project work conducted by staff and collaborators, including salaries, purchasing computers, travel-related costs, hosting visiting scientists, coordinating technical workshops/working groups/short courses, and website development. Much work remains for streamlining this effort, given the different administrative requirements and stipulations. Finally, general information regarding CAPAM operations and deliverables to date is presented in Appendix A.

Programs and Projects

Good Practices in Stock Assessments Modeling Program

Presently, a major program for CAPAM is modeling research addressing the theories, estimators, and assumptions used in contemporary integrated stock assessment models, whereby 2-3 year research projects are conducted on important topics/parameterizations associated with developing stock assessments used to provide management advice on exploited marine populations.

Selectivity Project

The first project has focused on modeling selectivity in stock assessments. Selectivity research by CAPAM staff and collaborators includes modeling work on functional forms (splines), alternative composition/selectivity choices and management, spatial structure/ F/\hat{f} forms, and time-varying vs. -invariant selectivity.

Workshop: A 4-day workshop was held at the Southwest Fisheries Science Center (SWFSC) in La Jolla, CA in March 2013. Over 70 researchers attended the forum (35 remotely participated

online via WebEx), which included: a one-day technical session for using simulation analysis with the assessment model Stock Synthesis and an evening session on AD Model Builder library development; 4 keynote presentations; 25 research presentations; group discussion periods; and final workshop report. The workshop report is available online at www.CAPAMresearch.org.

- Special Issue Publication: A special issue on selectivity in the journal *Fisheries Research* is under development, which will include peer-reviewed papers based on research presented at the workshop (submission deadline is September 2013).
- Good Practices Guide: The current selectivity research needs to be synthesized and included in the *Good Practices Guide (GPG)*. This will be addressed through a working group forum and two meetings that bring together a range of stock assessment experts (5-8 researchers anticipated for this effort). The first working group meeting will identify existing research published in the professional literature, outline needed research, and assign tasks for preparing a complete section on modeling selectivity in the overall *GPG*. Roughly one year following the initial working group meeting, a final meeting will be required to produce a draft of the selectivity section in the *GPG*, which is expected to provide immediate assistance to analysts conducting stock assessments for providing management advice (first meeting in late 2013 and second meeting in late 2014).
- Visiting Scientists: Sheng-Ping Wang (Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University) served as a visiting scientist with CAPAM earlier this year, staying for one month from late February – March 2013, working on two projects: selectivity's distortion of the production function and its influence on management advice; and virgin recruitment profiling as a diagnostic for selectivity curve misspecification in integrated stock assessment models. Arrangements are currently underway for hosting two visiting scientists, with each visit focusing on uncertain and influential areas surrounding selectivity, e.g., asymptotic vs. dome-shape selectivity and parameterization of fishery composition data in stock assessments (1-month visits, producing minimum of two papers, completed by late 2014/early 2015).
- Growth Project: The next project will focus on modeling growth in stock assessments (research to begin late 2013, with a workshop scheduled tentatively for November 2014).

Education and Outreach Program

The CAPAM staff is involved with various projects supporting stock assessment education and outreach.

White Seabass Assessment Project

A collaborative project is underway with the Pfleger Institute of Environmental Research (PIER) and California Department of Fish and Wildlife (CDFW) on a white seabass assessment that will be formally reviewed and ultimately, used to assist management of the coastal population off southern California. Motivation for CAPAM's involvement with this project was to assist SIO's

education-related goals to prepare students for stock assessment employment, and develop joint projects that address critical marine resources actively managed by the state of California (completed and reviewed by Summer/Fall 2014).

Training the Next Generation of Stock Assessment Scientists Project

A NOAA-motivated, national-level project involving several research/education institutions. Work in support of this general project is conducted on a continual and informal basis by CAPAM staff through arranging, developing, and coordinating: hands-on sessions in workshops; graduate student research and classes (SIO and University of Washington); stock assessments for management agencies (CDFW); and comprehensive short courses for students and stock assessment practitioners with state, federal, and international agencies (short course preparations are underway for SIO, Chile, and Argentina).

APPENDIX A

Presentations, Short Courses, Collaborative Work

- World Conference on Stock Assessment Methods, Boston, July 2013. Work of CAPAM staff (in **bold**) was presented in the following oral presentations:

Maunder, M. N. *Challenges for fisheries stock assessment.*

Crone, P. R., M. N. Maunder, J. L. Valero, J. D. McDaniel, and B. X. Semmens. *Selectivity: theory, estimation, and application in fishery stock assessment models.*

Valero, J. L., I. G. Taylor, **M. N. Maunder, P. R. Crone.** *Using simulation analysis to evaluate the use of cubic spline selectivity in integrated stock assessments.*

Hurtado, F., **J. L. Valero,** C. Szuwalski, K. Johnson, C. McGilliard, C. Monahan, R. Licandeo, M. Muradian, A. Whitten, K. Ono, K. Vert-Pre, S. Anderson, C. Cunningham. *What generates retrospective patterns in statistical catch-at-age assessment models?*

Johnson, K., C. Monahan, C. McGilliard, K. Vertpre, **J. L. Valero,** C. Szuwalski, R. Licandeo, M. Muradian, A. Whitten, K. Ono, S. Anderson, F. Hurtado Ferro, C. Cunningham. *Time-varying natural mortality in fisheries stock assessment models: identifying a default approach.*

Ono, K., K. Vert-Pre, S. Anderson, C. Cunningham, **J. L. Valero,** C. Szuwalski, K. Johnson, C. McGilliard, C. Monahan, F. Hurtado Ferro, R. Licandeo, M. Muradian, A. Whitten. *Better data yields better yields?: why the type, quantity and quality of data matters in fisheries stock assessments.*

Whitten, A., C. McGilliard, **J. L. Valero,** S. Anderson, C. Cunningham, F. Hurtado Ferro, K. Johnson, R. Licandeo, C. Monahan, M. Muradian, K. Ono, C. Szuwalski, K. Vertpre. *Lessons Learned from a Stock Assessment Simulation Study.*

- Stock Synthesis model setups contributions for the ICES Strategic Initiative on Stock Assessment Methods (SISAM). Juan Valero collaborated with Richard Methot to implement alternative Stock Synthesis setups for North Sea Cod, North Sea Herring, and Spurdog shark to contribute to a SISAM (ICES) project and associated two-day technical workshop of the WCSAM.
- Southwest Fisheries Science Center - Opening Ceremony, La Jolla, August 2013
- Stock Assessment Modeling Short Courses (SIO, October 2013; Argentina, February 2014; Chile, March 2014)
- ADMB Project and Stock Synthesis Model Development

Publications

Crone, P. R., M. N. Maunder, J. L. Valero, J. D. McDaniel, and B. X. Semmens (Editors).

Selectivity: theory, estimation, and application in fishery stock assessment models. *Workshop Series Report 1. Center for the Advancement of Population Assessment Methodology (CAPAM)*. NOAA/IATTC/SIO, 8901 La Jolla Shores Dr., La Jolla, CA 92037. 46 p.

Maunder, M. N. and Deriso, R. B. 2013. A stock–recruitment model for highly fecund species based on temporal and spatial extent of spawning. *Fisheries Research* 146:96-101Co.

Fisheries Research - Special Issue (Selectivity)

- Thirteen manuscripts submitted, several more expected by submission deadline (September 7, 2013)