
IOTC Basic and Advanced Stock Assessment Training

PREPARED BY: IOTC SECRETARIAT & BOBLME

Course outline

The course will cover basic fisheries stock assessment principles and types of data analyses. This will include statistical evaluations of data leading to estimates of stock abundance and productivity. Methods will build from simple surplus production models through yield per recruit and age structured approaches.

Overview

The objectives of this course are the following:

- 1) To understand basic concepts of population dynamics models and how to develop them on a species context for management.
- 2) The second part of the course is designed to introduce cutting edge computational tools to evaluate and understand how to collect and analyze data for ecological and environmental studies. This will primarily be done with the help of labs and tools in Excel and R.
- 3) An advanced version of this course will focus on programming, visualizing data, using integrated assessment models like SS-III and Multifan-CL. So, more in depth learning will occur on Topic 5 and 8 so that length based models are also included.

Course outline

- 1) Introduction Day 1 AM
 - a. Workshop participants overview- Rishi
 - b. IOTC Process Overview- Rishi
 - c. Data sets and fishery issues- Jim & Rishi
 - d. Defining management objectives, pretty good yield - Jim
- 2) Survey of population dynamics and stock assessment applications Day 1 PM
 - a. Ocean habitats and species interactions - Rishi
 - b. Fisheries management definitions - Rishi
 - c. Ecosystem and multispecies methods - Jim
- 3) Data analysis
 - a. Use of R <http://www.statmethods.net/> Dale
 - b. Excel basics- Jim
 - c. Fishery exploratory analysis-Jim
- 4) Sampling systems
 - a. Estimating catch - Rishi
 - b. Survey methods - Jim
 - c. Introduction to tagging programs - Dale
- 5) Growth estimation and life history Day 2 AM
 - a. Organizing available data - Jim
 - b. Approaches to growth estimation - Jim
 - c. Maturity/spawning characteristics- Jim
 - d. Sharing information from other stocks -Jim
- 6) Population models Day 2 PM
 - a. $B_{t+1} = B_t + R_t + G - C_t$ - Rishi
 - b. Extend by age - Jim
 - c. Depletion methods - Jim

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- 7) Per recruit analysis
 - a. Spawning biomass – Jim/Dale/Rishi
 - b. Yield – Jim/Dale/Rishi
 - c. Harvest rate – Jim/Dale/Rishi
 - 8) Age Structured Models Day 3 AM
 - a. Basics - Jim
 - b. Fitting w/ assumptions - Jim
 - 9) Length-based extensions Day 3 PM
 - a. Overview of principles - Jim
 - b. Available complex packages – Jim/Dale
 - c. Fitting an age structured model to length frequencies in excel - Jim
 - 10) The Management Strategy Evaluation Process & Simulations Overview - Dale Day 4 AM
 - 11) Estimating spawning stock and recruit relationships (SR) - Rishi
 - 12) Climate Forcing and Effects - Rishi
 - 13) Dataset examinations Part I - All Day 4 PM
 - 14) Dataset examinations Part II -All Day 5 AM