Workshop on Stock Assessment Methods

7-11 November 2005.

IATTC, La Jolla, CA, USA

General Stock Assessment Models

- A-SCALA (IATTC)
- MULTIFAN-CL (SPC)
- Stock Synthesis II (NMFS)
- CASAL (NIWA)

Questions

- 1) How to model fishing mortality
- 2) How to model selectivity
- 3) Do we need to integrate across random effects
- 4) How to estimate uncertainty
- 5) How to include environmental data
- 6) How to perform forward projections
- 7) What likelihood functions to use and how to weight data sets
- 8) Spatial structure in the population dynamics

Changes of IATTC assessments

- Estimate sd for effort deviates/CPUE
- Effective sample size for C@L or cvs
- Treat catch as exact: Use popes approximation or solve catch equation
- Selectivity using splines or functional form /time varying
- Correct length selectivity
- Growth model/time varying
- Variable length bin size/compression of tails of LF bins
- Non-spatial tag data
- Aging error

Move to other models

- Spatial population dynamics
- Spatial Tag data
- Sex structure

Changes to assessments

- Estimate C@L cvs from bootstrapping data (add process error)
- Optimal number of fisheries
- Reduce size of length bins

Research priorities

- When do spatial structured models improve the assessment results?
  - What data is needed
- How to include environmental data in the model, particularly when there is missing environmental data.
  - Structural relationships vs index fitting
- How to estimate the sd of the effort deviates .
- Comparison of random effects versus penalized likelihood
  - Is integration needed
  - Should the sd be estimated

Research priorities

- Comparison of methods that use known catch vs those that model catch uncertainty
  - Computational demands
- Methods to model selectivity
  - Need to use model selection methods
  - Time varying
- Investigation of LF samples by space time and vessels etc
- Explore the interaction between flexibility in selectivity (time varying) and adjustments to likelihood variance and how this influences results.
- How to calculate confidence distributions, how well they perform, and how they compare to Bayesian analysis.
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