Update onCross Validation Papers

Laurence Kell, Rishi Sharms, Carolina Minte-Vera

June 21, 2018

Cross validation: Bluefin Case Study

- The aim of the paper is use prediction residuals to evaluate model misspecification, over parameterisation and prediction skill.
- Two procedures are used

  Leave-one-out to calculate the prediction residuals and then compare these to the model residuals; if the prediction residuals are much greater than the model residuals then the model is overfitted.

  Hindcast, or step 1,2,3 ahead predictions to compare prediction skill using the Mean Absolute Scaled Error.
- The models and datasets used are those form the 2017 East Atlantic and Mediterranean bluefin stock assessment.
- Three stock assessment models with different treatments of process and measurement error are considered, namely Stock Synthesis, SAM and VPA.
- The Stock Synthesis analysis is based on two runs, one with 160 and another with 90 estimated parameters.
- The two Stock Synthesis runs are then reconfigured as an Age Structured Production Model by fixing the selection pattern parameter in order to evaluate wether dynamics are driven by a production function or recruitments

To Do

Carolina & Rishi

- Set up ASPMs so they run
- **SS** Implement LOO/JK procedure and agree what to save
- Set up hindcast for **SS**

Iago

- Run LOO for **SS**
- Run Hindcast for **SS**

Laurie

- Draft Material and Methods
- **VPA** Implement LOO/JK procedure and agree what to save
- Run Hindcast for **VPA**

Anders

- **SAM** Implement LOO/JK procedure and agree what to save
- Run Hindcast for **SAM**

A1 & Toshi

- Proof read Material and Methods

Parsimonious OM Grid

- When conducting Management Strategy Evaluation using an Operating Model conditioned on a stock assessment often a full factorial design is used based on scenarios reflecting uncertainty in difficult to estimate parameters, data weights and model specification.
- The aim of this paper is to evaluate the use of more parsimonious designs using the OM grids developed for Atlantic bluefin tuna, North Atlantic and Indian Oceans albacore and swordfish.
- The Operating Models are grouped into clusters based on their i) production functions and ii) time series
- If the performance of a MP depends on i) production functions or ii) time series then it is only neccessary to run a limited number of OM from each cluster.
- This hypothesis is tested by performing a cross validation where an OM is selected from each cluster and a MSE conducted. This is then repeated for another set of OMs by cluster and the performance of the MPs compared.

To Do

Rishi & Iago

- Provide OM grids for IOALB, IOSWO, NAALB, NASWO and EABFT.

Polina

- Create Table summarising grids

Laurie

- Perform cluster analysis on production functions and time series
- Implement an emprical and model based MP

Iago

- Run MSE