Jitter analysis guidance

General Crab Comments

The SSC suggests the following guidance for constructing and interpreting jitter analyses.

1) In a good jitter analysis, many models should fail to converge to the maximum likelihood estimates (MLE), which is indicative of exploring a broad region of the parameter space; conversely, if all models return to the MLE, the analysis was not a strong test. All those that do converge have to be at the MLE being used as the base, as there would never be a better solution than at the MLE. This is a one-sided test that doesn't indicate the model converged, only that a better solution was not found than the one reported.

2) The results of models that fail to return to the best solution (the MLE) are not useful for statistical inference; restarting those models from the local minima in which they stopped with a perfect solving algorithm would always return to the MLE, and so the results are an artifact of imperfect diagnostic tools.

3) Uncertainty in management quantities (e.g. small changes in the likelihood can correspond to large changes in biomass) is best expressed with likelihood profiles on key model scaling quantities, not unconverged model results.

The SSC would like to see additional residual diagnostics other than raw residuals for length composition data from GMACS models. The SSC encourages crab authors to collaborate with groundfish assessment authors regarding the use of One-Step-Ahead and Pearson residuals.

The SSC requests that the CPT consider whether distinguishing between full and update assessments, as in the protocol recently adopted for groundfish assessments, would be useful for crab assessments. Flagging an assessment as an update when the model from the previous assessment is carried forward with no or minor modification would reduce the effort required of the author, and potentially lead to efficiencies in CPT and SSC review.

The SSC suggests the CPT live link assessments and other documents in their report to facilitate review.

The SSC reiterates their request from previous reports, including the October 2023 SSC Report, that the CPT develop a process for ensuring that authors have provided a response to all previous (including at least, the last assessment) SSC recommendations, even those for which no work has been completed, so these requests can be more easily tracked over time.

Jan modeling discussion

Jittering and MCMC

“The group discussed performing jittering to first ensure model convergence at the MLE, and secondarily to determine the distribution of management quantities. The default jitter level in GMACS is 0.10 sd; however, the participants discussed what this means as far as variability for all model parameters and suggested the authors do a smaller subset at a wider level of variability.

For diagnostics of jittering results the discussion covered presenting the distribution of the likelihood (to ensure the MLE model), distribution of the management quantities, and encouraged likelihood profiling for models at the MLE. “

Proposed guidance (TBD, edit during discussion)

- Jitter – using multiple ranges of variability (0.1, 0.2, 0.3) for a small number of jitters to find an appropriate level
- Number of jitters?
- Report jitter results for a small range of likelihood values (don’t need to include those that are far away)
- Plots should include: ?
- Likelihood profiles as a tools for looking at management quantities (SSC suggestion)