

GMACS: General Update and Progress on BBRKC

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Objectives

1. Stage 1: Using the initial values for the BBRKC model (rk75172b.tpl):


1. Match the values for growth, natural mortality, and selectivity 

2. Check the N-matrix given assumptions about fishing mortality by fleet (directed fishery, bycatch in the trawl fishery, bycatch in the fixed gear fishery, bycatch in the Tanner crab fishery). 

3. Check the model predictions that are included in the likelihood. 

4. Check the likelihood value.

2. Stage 2: Estimate the parameters 

3. Stage 3: Compare predicted values of management-related quantities. 

Changes to GMACS to match BBRKC

- Added the ability to estimate the numbers-at-length at the start of the first year.
- Added a new “block dev” option for M (offsets from the initial M).
- Added that discard exists before data on discard are collected as long as there is an F for the directed fishery.
- There was a bug in how molt probability was set.

Changes to RK75172b to match BBRKC

- The normalization of the initial conditions may create old shell males in the last class.
- The initial values of many of the parameters are set to the average of the bounds.
- Some variables (e.g. `sel_ret0`) are used but not initialized.
- The linear model for selectivity has several “if” statements.
- Need to check `sel_fit`.
- Replaced the BBRKC fishing mortality equation by the GMACS equation.
- “*`m_disc`*” is not consistently used and *`m_tc`* seems to be ignored.

Other GMACS issues

- Should the M-devs be devs or parameters?
- There are fewer female size-classes than male size-classes, but GMACS assumes the same number of size-classes (this is no a bug but slows things down for 2-sex models).
- Fishing mortality for EBS Tanner crab is related **directly** to effort in RK75172b.TPL, but this option does not exist (yet).
- Discard mortality is independent of sex, but read in by sex.
- No ability to have sex-specific recruitment distributions.
- No ability to have a maximum number classes to which recruitment occurs.
- No ability to have multiple size-transition matrices (needed for BBRKC)

Other GMACS issues

- Need a landed+discarded catch (case 3) option (Tanner and snow issue)
- The method to include effort-predicted F needs to be checked.
- What is the correct predicted catch-at-length for a continuous fishery with discard survival? If is NOT $(1-S)$ time numbers.