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 direted 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 an 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.