AlaskaHerring Folder Organization

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Model naming conventions:

Time block parameterization = # survival time blocks, # maturity time blocks, # selectivity time blocks
E.g. HER_123 = 1 survival time block, 2 maturity blocks, 3 survival blocks

The model number for model selection is shown before the time block parameterization.
E.g. HER 10_123 = Model 10 with 1 survival time block, 2 maturity blocks, 3 survival blocks

HER_bestLS_### = HER model with best-fitting parameterization of LS model by AICc

HER_best_condCatch.#_### = HER model with best-fitting parameterization of HER by AIC when conditioned on catch

HER_best_condEffort.#_### = HER model with best-fitting parameterization of HER by AIC when conditioned on effort

HER_condEffort_fixedmat.4_3 = HER model conditioned on effort with a50 fixed at 3.67 (form FishLife) and a95 = 4.48 from regression provided by SD. One time block for selectivity, 3 blocks estimated for survial

HER_confEffort_1929 = HER model conditioned on effort with data file going back to 1929. Still exploratory, not running well

HER_mature_catch = NEW EXPLORATORY MODEL that estimates selectivity from mature not total population. Assumes catch comps come from mature population (catch = 100% mature)

Folder directory (part 1): General overview

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- **YEAR_forecast** – all data, code, and results for a given forecast year
- **smartell_archive** – deprecated code from Steve Martell's contract
- **technical_docs** – documentation for project-level organization and model details
- **.gitignore** – all file types and folders not tracked by git
- **ReadMe.md** – Summary of repository

Folder directory (part 2): Forecast folders

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- **2019_forecast**
  - **admb** – all relevant admb files for final models including HER_bestLS, HER_best_conditionCatch, HER_best_conditionEffort
  - **data** – currently only includes LS model results for comparison with HER and historical data tables
  - **r** – all R scripts for running HER, generating figures, doing Bayesian analysis, running model selection, retrospective analysis, and sensitivity analysis
  - **results** – figures, csv output, and archive of all models run in model selection, retrospective, and sensitivity analyses

Folder directory (part 3):
2019 R scripts

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2019_forecast

r – all R code

helper.R– libraries, ggplot2 themes, and user-defined functions (sourced by all other script files)

her.R– Run any version/tpl of HER (MLE or Bayesian) and compare with LS. Saves output to sudirectory in results/ named after the HER version/tpl

model_selection.R– recreates model selection "loop code". Examines all permutations of time-varying parameters given user-defined time blocks. Saves output to subdirectory of results/model_selection/ named after the HER version/tpl

model_selection_natmat.R – same as model_selection.R, except only examines survival/natural mortality. Also saves output to subdirectory of results/model_selection/ named after the HER version/tpl.

retrospective.R – run retrospective analysis (peel years of data from assessment to compare current results with past results assuming the same model structure. Results in retrospective/ for given HER tpl versions.

pdo_breaks.R – get PDO breaks using STARS algorithm, which is sourced in **stars.R.** Results stored in results/stars_pdo

sensitivity_sigmaM.R – sensitivity analysis for sigmaM, parameter controlling variability in natural mortality deviations by block. Uses **create_ctl.R**. Results in results/sensitivity_sigmaM. sigmaM = 0.09 had best convergence diagnostics.

sensitivity_maturity.R – compare a range of fixed to estimated maturities. Results in results/sensitivity_maturity

presentation_figs.R – creates presentation-quality figs in presentation/ subdirectory of results/ under various model versions

Folder directory (part 3):
2019 results folder

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2019_forecast

results – figures, csv output, and archive of all models run in model selection, retrospective, and sensitivity analyses

HER_bestLS_321 – includes comparison figures of this model's results with LS best, HER-specific figures, diagnostics for the Bayesian analysis, and csv files of all the posterior sample summaries

HER_best_condCatch.12_322 – same as above

HER_best_condEffort.12_322 – same as above

model_selection – includes model selection results for HER conditioned on catch and effort

retrospective – results for the retrospective analysis for HER_bestLS_321, HER_best_condCatch.12_322, and HER_best_condCatch.12_322

sensitivity_sigmaM – results for sensitivity analysis examining convergence diagnostics and model output for sigmaM from 0.05-0.10. sigmaM = 0.09 had best convergence diagnostics

reference_points – currently only includes saved biological reference point output from posterior samples. This is still under development. Some reference pt results also in results/sensitivity_maturity/figures that show how maturity assumptions affect reference point assumptions

sensitivity_maturity – results from sensitivity analysis on maturity comparing a range of a50 and rate of maturation

Steps to run a new assessment

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1. Create new 2020_forecast or 2021_forecast folder
2. Create folders for data, r, results, text in forecast folder
3. Copy appropriate tpl, ctl, and dat files into correctly named subdirectory of admb/
4. Copy correctly formatted LS results into data/ subdirectory
5. Use her.R to run base model (the tpl copied into admb/ subdirectory). Be sure to update relevant user inputs in her.R.
6. If you want to run the traditional loop code, first run pdo_breaks.R then model_selection.R
7. If you want to examine a range of maturity values, use sensitivity_maturity.R – this code (as well as sensitivity_sigmaM) could be adapted to evaluate other model parameters and assumptions.
8. Any time you want to run her.R on a model (e.g. the results of a maturity analysis or model selection), you'll need to copy the resultant tpl, ctl, and dat files over to a subdirectory of admb/
9. Take best model and run it through her.R again to get final results.
10. Run a retrospective analysis on final model using retrospective.R
11. Use presentation_figs.R to get presentation quality figures.