Introduction to PBSsynth

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What is PBSsynth?

'PBSsynth' provides R-code support for running NOAA's Stock Synthesis 3 (SS3) software, including its complementary packages ('r4ss', 'adnuts'). Currently, the 'PBSsynth' repo is a collection of code to facilitate the Offshore Rockfish program's use of SS3 and should be considered a work in flux. The added functionality includes:

1. reweighting abundance data (by weighting survey and commercial index CVs directly in the 'data.ss' file) and composition data (by providing weights in the 'control.ss' file to adjust sample sizes of proportion-at-ages);
2. launching MCMC (Monte Carlo Markoff Chain) simulations using the 'adnuts' package (switched to Chris Grandin's code on a Linux server);
3. calculating B_{MSY} (biomass at maximum sustainable yield) and u_{MSY} (exploitation rate at MSY); and
4. customising 'Sweave' files for individual runs and reweightings from various master 'Sweave' files.

The semi-automation offers substantial time-saving when trying numerous model runs.

'PBSsynth' requires the R packages 'PBSmodelling', 'PBSmapping', 'PBStools', 'PBSdata', and 'r4ss'. Additional packages for importing functions include 'adnuts' and 'xtable', although the dependencies have not yet been formalised.

'PBSsynth' borrows heavily the functionality from the 'r4ss' package by adopting the code from a collection of functions and creating variants. We try to acknowledge the original source wherever possible.

The GitHub web site features the most recent revisions to 'PBSsynth'.

'PBSsynth' represents just one of a series of R packages developed at the Pacific Biological Station (PBS). For futher information about the series, see PBS Software on GitHub.

What is PBS?

The initials **PBS** refer to the Pacific Biological Station, a major fisheries laboratory operated by Fisheries and Oceans Canada on the Pacific coast in Nanaimo BC, Canada.

Reference

Taylor, I.G., Doering, K.L., Johnson, K.F., Wetzel, C.R., Stewart, I.J., 2021. Beyond visualizing catch-at-age models: Lessons learned from the r4ss package about software to support stock assessments. *Fisheries Research*, **239**:105924