READ ME

There are a bunch of folders and subfolders…

**00\_Prepare\_Fish\_Data.** This just manipulates the fish data into the proper format. You may or may not need this file. There is a lot of historical gibberish in it, like calculating the residuals from the stock recruitment curve.

**01\_ROMS\_prelim:** This file does some of the preliminary calculations to prepare the ROMS data. For example, we received the ROMS variables as 4-day averages for the entire year. The file calculates the means or whatever for specific time periods and names stuff. You will need to customize or might do it totally separately.

**02\_Stats\_prelim:** This file does some of the preliminary stats like looking at correlations between predictors, and looking for non-linear (quadratic) relationships between predictors and recruitment.

**03\_Dredge:** This file runs the main model comparison analysis.

1. Build the equation (line 24). You could do this by hand, but it is easier just to use the colnames from the ROMS variables.
2. Write out the formula for the full model (line 33). You would specify the dependent variable here (we used recruitment deviations, hence ‘dev’) and add any quadratic terms.
3. Fit the full model (line 52). This is a preliminary step to ‘dredge’
4. Run dredge from the MuMIn library (line 57). ‘dredge’ is a handy little package that will run all possible combinations of the variables in the full model. You can specify the maximum number of terms in the model (here, 5: m.lim=5) and other options to limit the number of models the analysis runs. The current code prevents certain highly correlated ROMS variables from being in the same model. It also requires that quadratic terms have their linear version as well. It the asks for certain output.
5. dredge then output a big table with R2s and AIC etc. You can subsample the table to look at just those models with a delta AIC of <=2, for example. NOTE the weight will change based on the number of models you request in the subsample.

**Figure\_1-5:** These files will make all of the paper figures. Run them later. See below. At the moment, they need another file to run.

**04\_Model.Testing:** This folder contains a bunch of files. The primary on is *000\_Run\_Diagnostics.r*. It will source all the other files and should run all the diagnostics described in the papers and produces most of the figures. You do have to set a bunch of stuff right at the beginning, but the file should create subdirectories and run all the diagnostics.

**000\_Run\_Diagnostics:** This is a ‘master’ file that will run all the others. At the beginning, you need to set some information like the names of directories etc, most importantly the ‘best-fit’ model. The file will then source all the other files and run them.

**00\_Initial\_Diagnostics:** This files runs some standard stuff like QQ plots, autocorrelation factor, getting standardized coefficients, variance inflation factor, and then various refits leaving out the last 5-years.

**01a\_Bootstrap\_Random\_Data:** This file bootstraps just the recruitment deviations to find the r2 for the best-fit model predictors, if things were totally random. Mostly for reference.

**01b\_Bootstrap\_Bias:** This file does a standard boostrap analysis (bootstrapping rows, with replacement) to calculate bias.

**02\_Jackknife:** This file re-fits the best-fit model leaving out one year at a time. The point is to check for influential years.

**03\_Resamle\_Recruitment\_w\_error:** This file re-samples the recruitment deviations based on their error (from the stock assessment) and refits the best-fit model. The process determines how the precision of the recruitment estimates from the stock assessment affects the fit of the best-fit model.

**04\_Jackknife\_and\_ReDredge:** This procedure re-runs the entire model-fitting procedure leaving out one year at a time. Determines whether individual years affect which terms appear in the best-fit model.

**05\_Resample\_Reruitment\_and\_ReDredge:** Like 03 but resamples recruitment then re-runs the entire model-fitting process to determine whether the precision of the recruitment estimates influences which terms appear in the final model.

**06\_Jack\_and\_ReDredge\_to\_2005:** As 05 but only predicts to 2005. Then, predicts 2006-2010 to test how the model works as a predictor of recruitment.

**Figures:** The final part of the **000\_Run\_Diagnostics** code will run and produce all the figures. The figures contain output from the various diagnostics, so they need to be run last. They also require input from the beginning of this file, so it is best to run them as sourced here.

**Figure\_4.** I think this works to automatically select predictors for the partial-correlation plots. However, if you want to adjust sizes, and margins, and X-axis labels, you will need to go into the code.