

3 - Request

Re-compute the WCGBTS index by including the depth effect (WCGBTS_depth). Compare the time series estimate between the current index and the WCGBTS_depth in a single plot including confidence intervals.

3 - Rationale

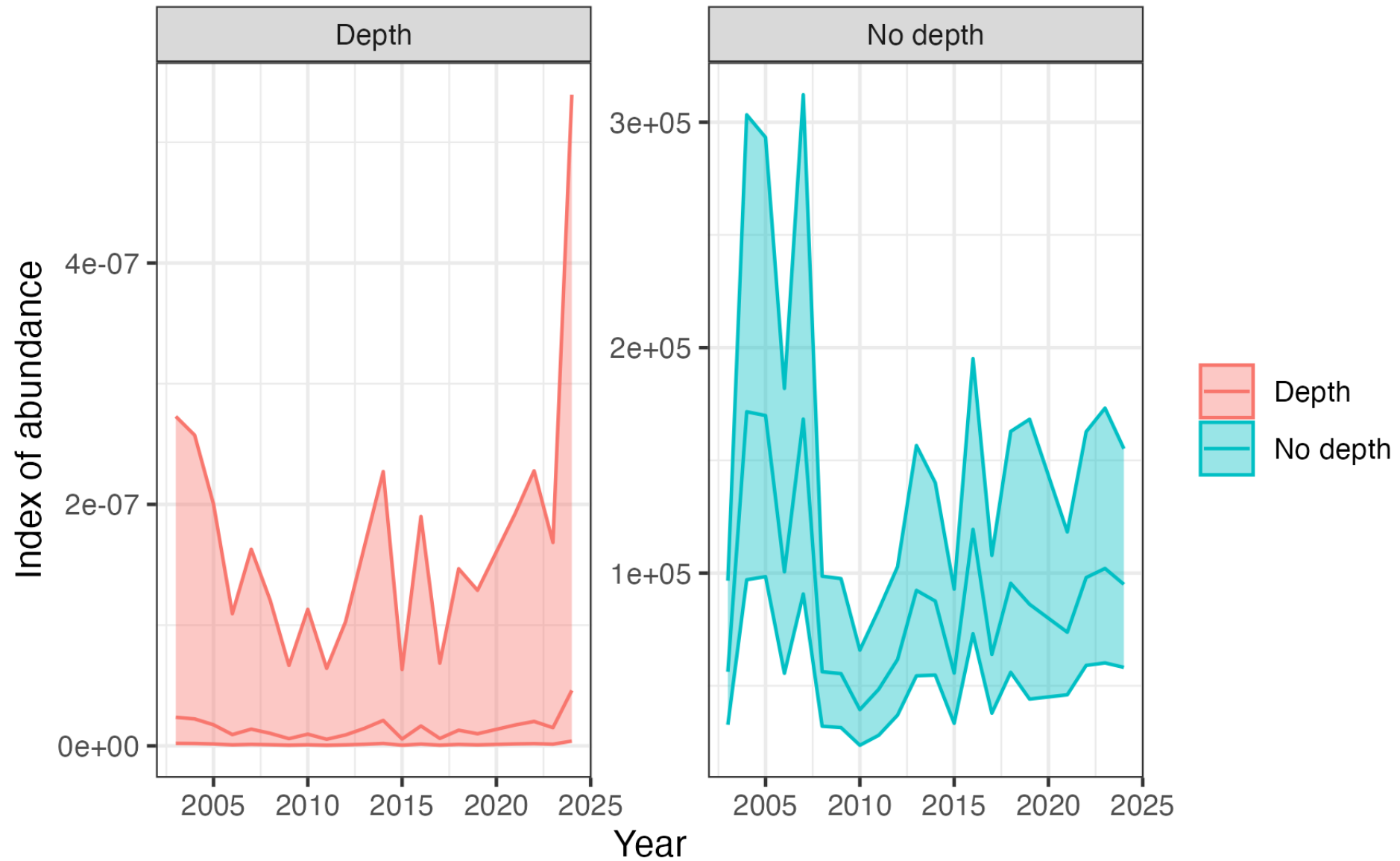
Depth is an important habitat variable for rockfish species. Although the spatial model can capture much of the depth effects (via anisotropy and spatial field), previous work (Johnson et al. 2019) has shown that it may be beneficial to include.

3 - STAT Response

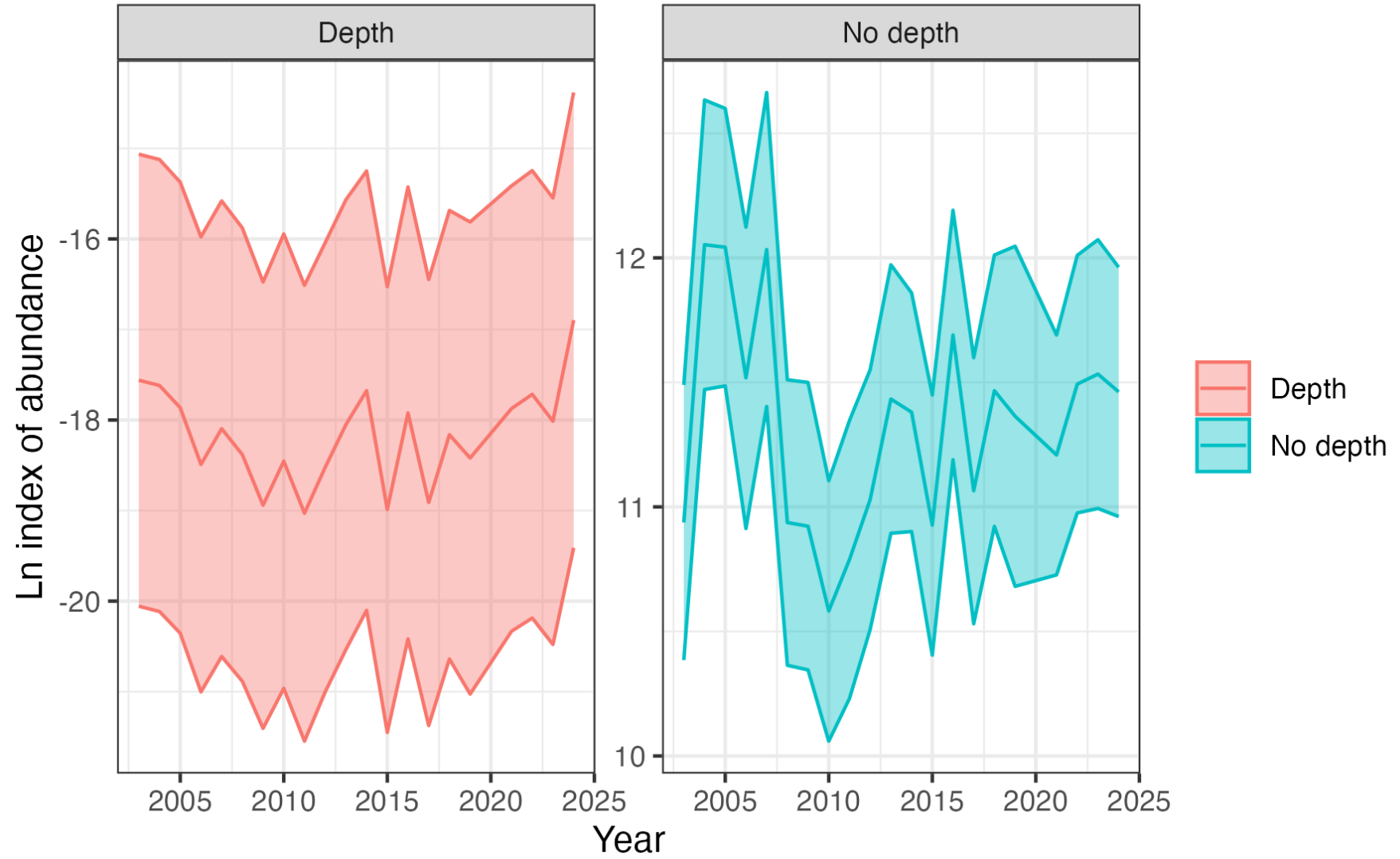
Eric Ward and Chantel Wetzel (NWFSC) provided a run with depth included as a covariate instead of the spatial field (Thank you Eric and Chantel!!). The indices are on pretty different scales (model with depth much smaller) and the uncertainty is different (model with depth is much more uncertain). Despite these differences the indices are pretty correlated (coastwide index ~ 0.7 in normal space, ~ 0.75 in log space).

They tried running some models without a spatial field (they are concerned that the spatial field and depth are confounded), but are having problems getting versions of this to converge (specifically some of the spatial parameters - range, anisotropy, etc) in the very short period of time from which we asked them...

Chilipepper Rockfish



Chilipepper Rockfish



6 - Request

Run an additional sensitivity replacing the CalCOFI index with the Southern CaCOFI index but without the early (1950s) estimates. Please plot fits without confidence intervals. Investigate why the terminal years in the coastwide index are increasing while the separate indices are decreasing.

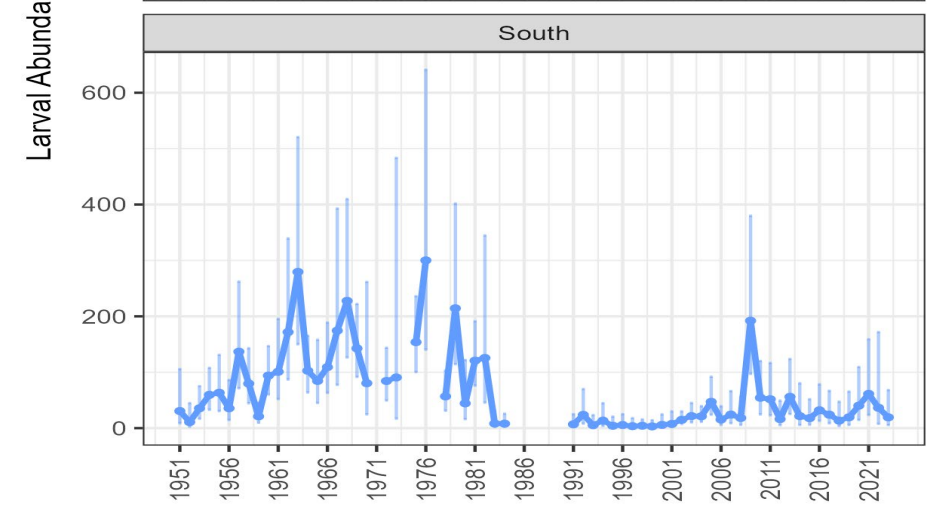
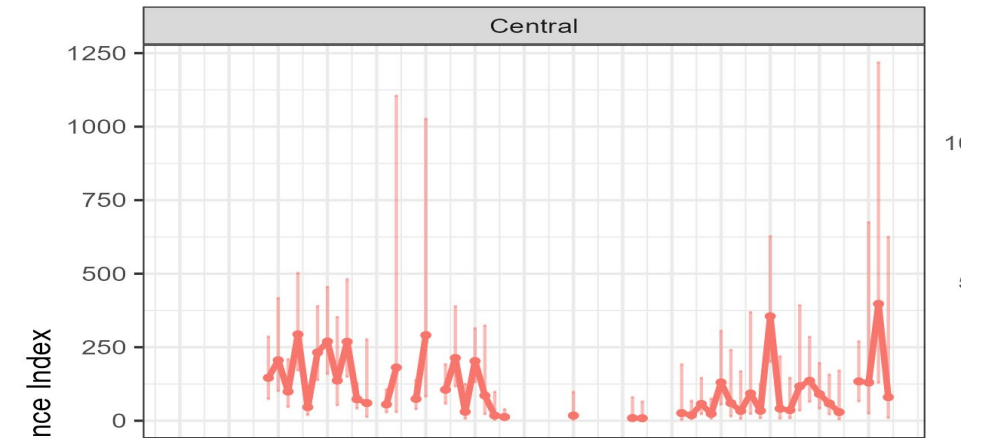
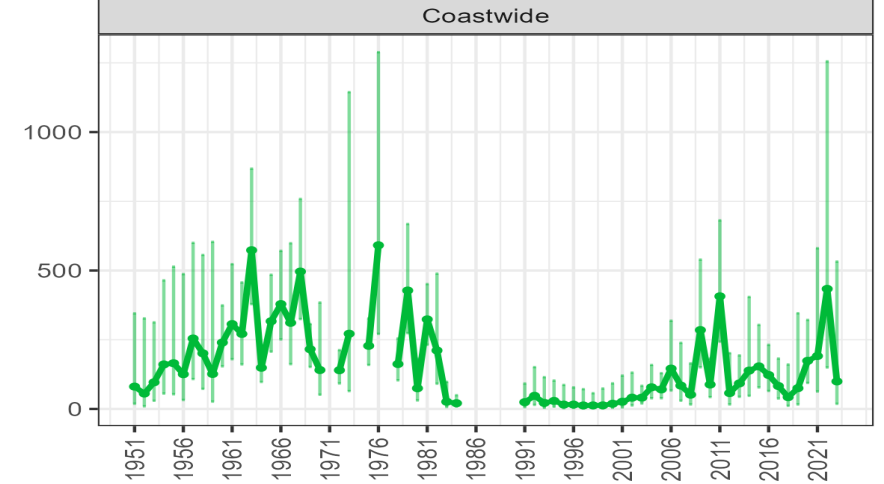
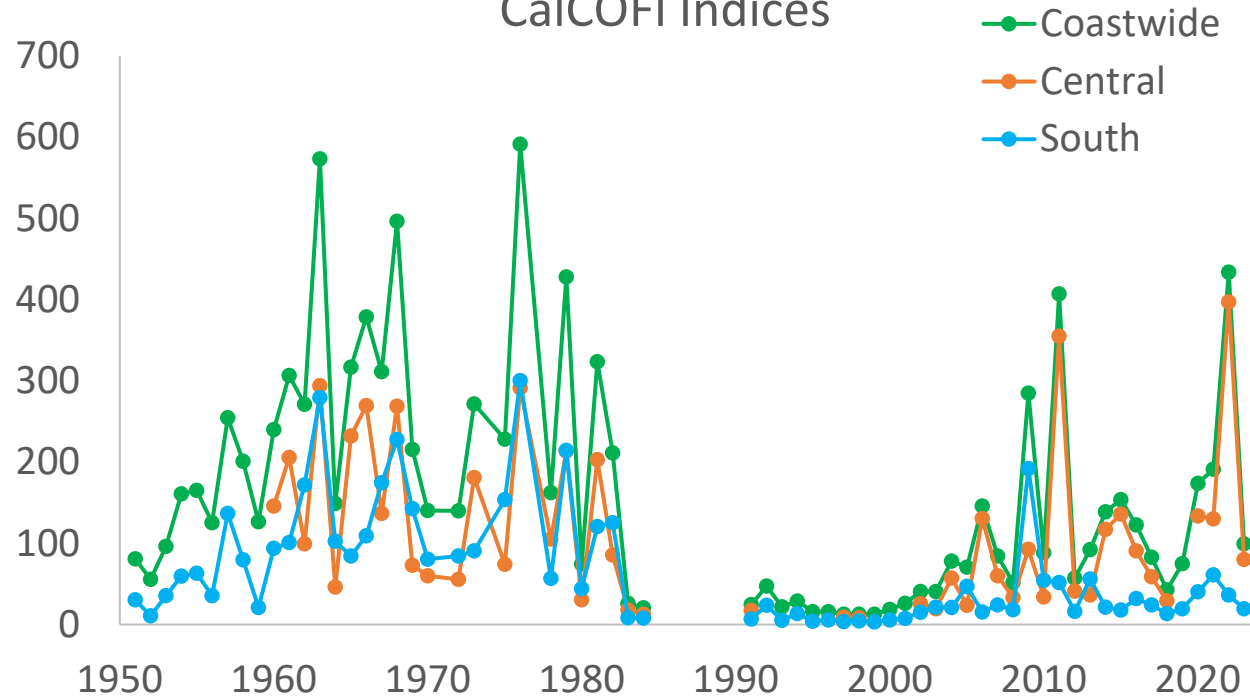
6 - Rationale

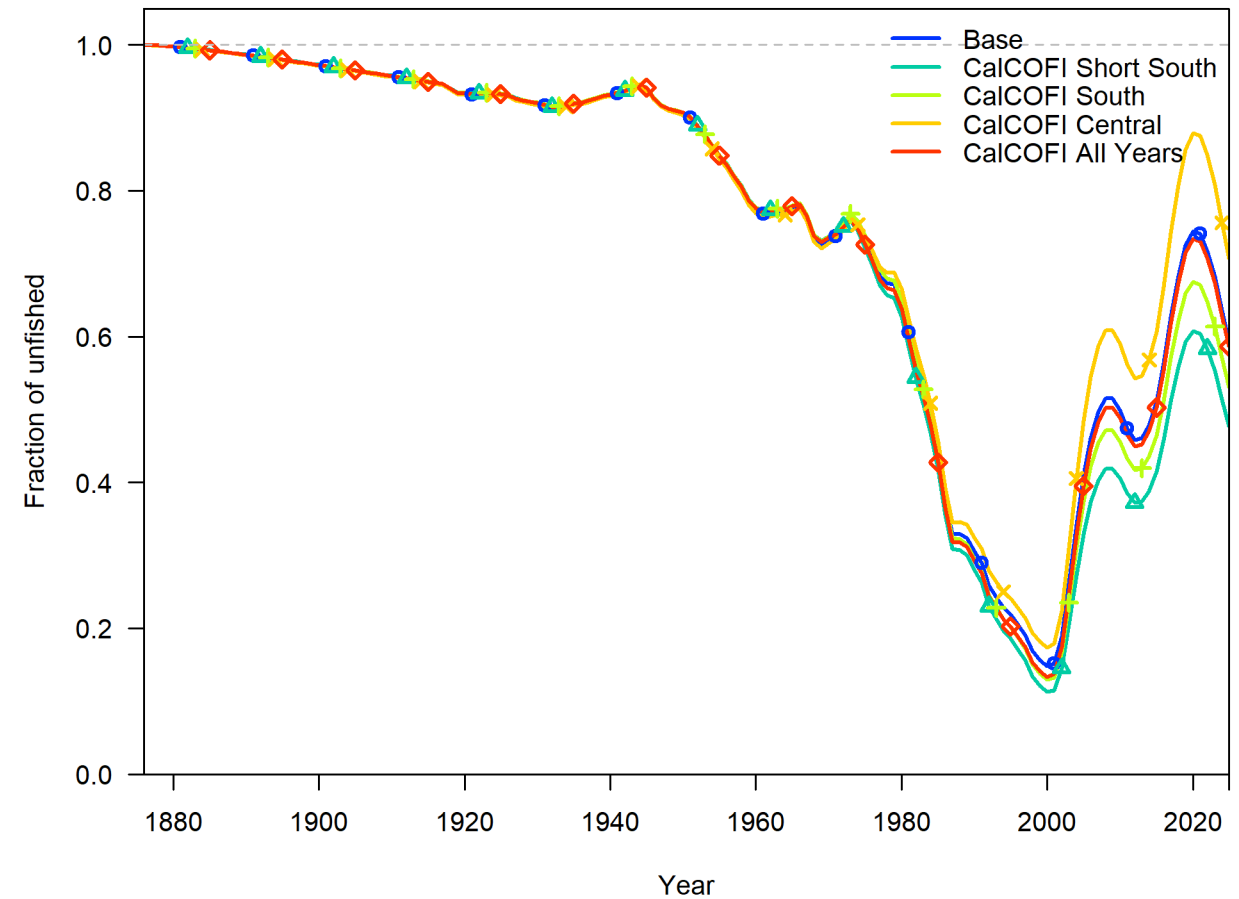
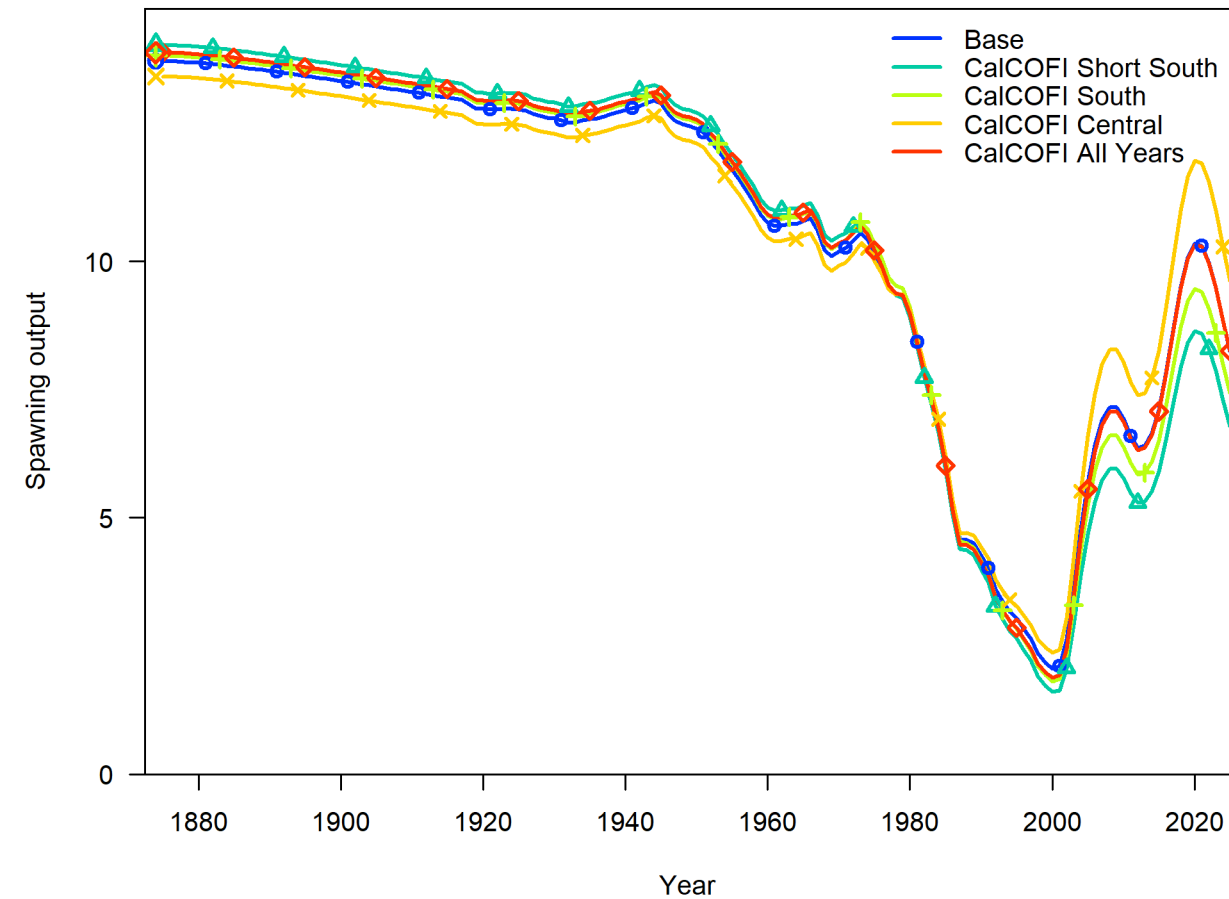
To inform on why removing the whole area CalCOFI index results in an increase in stock status and why adding central and southern CalCOFI separately results in a decrease, when covering different time periods.

6- Response. The odd terminal year discrepancies were an error! Somehow STAT (John) used the short southern index rather than the central in the sensitivity runs. The corrected runs and additional runs are shown and results are now a bit more intuitive. The requested runs and graphs are provided.

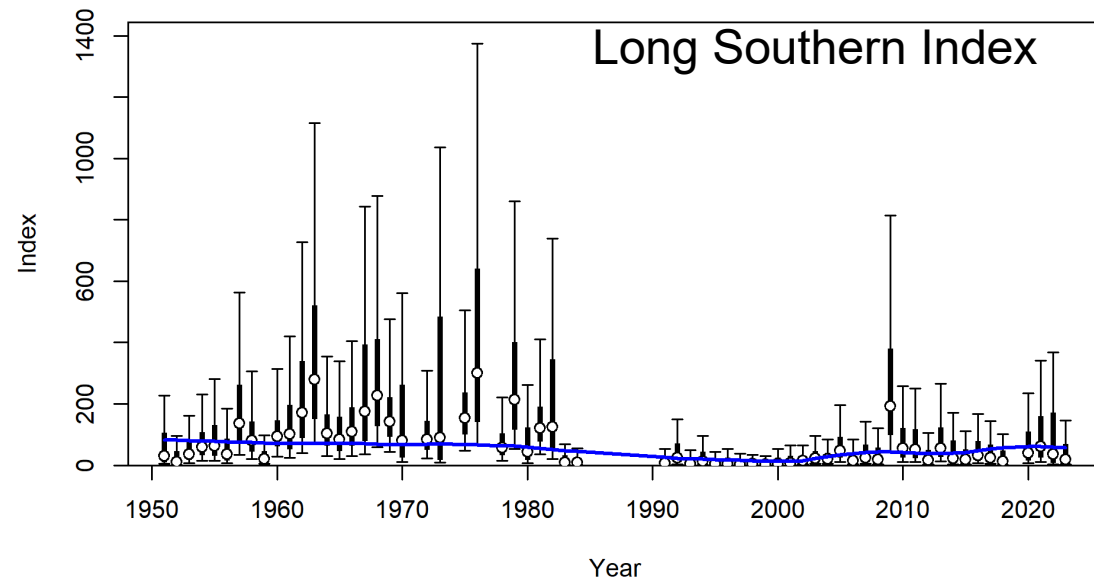
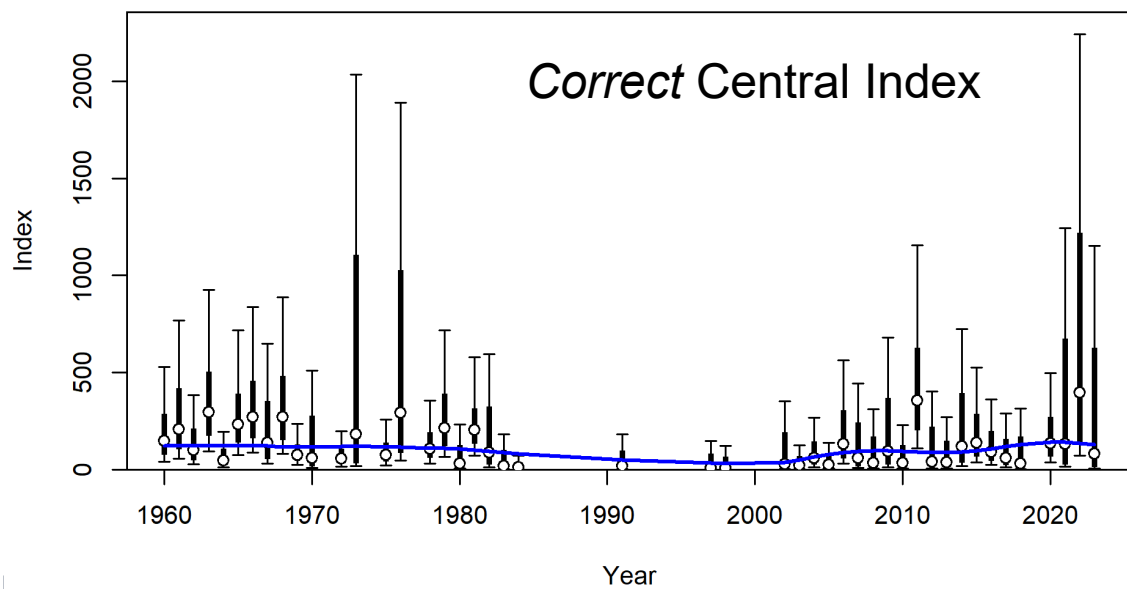
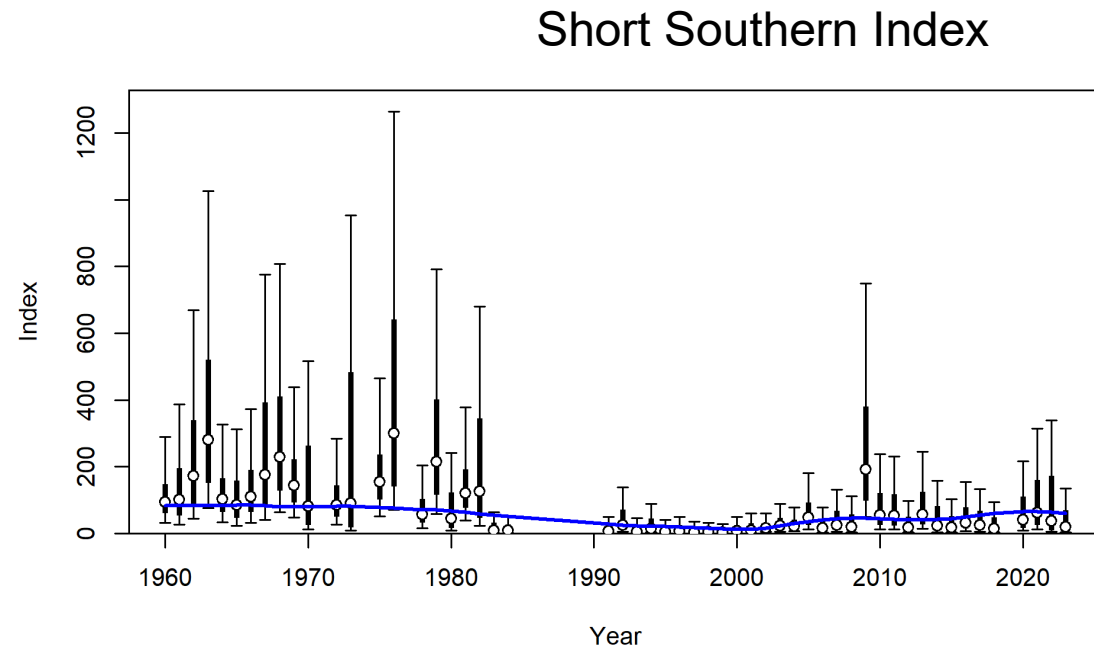
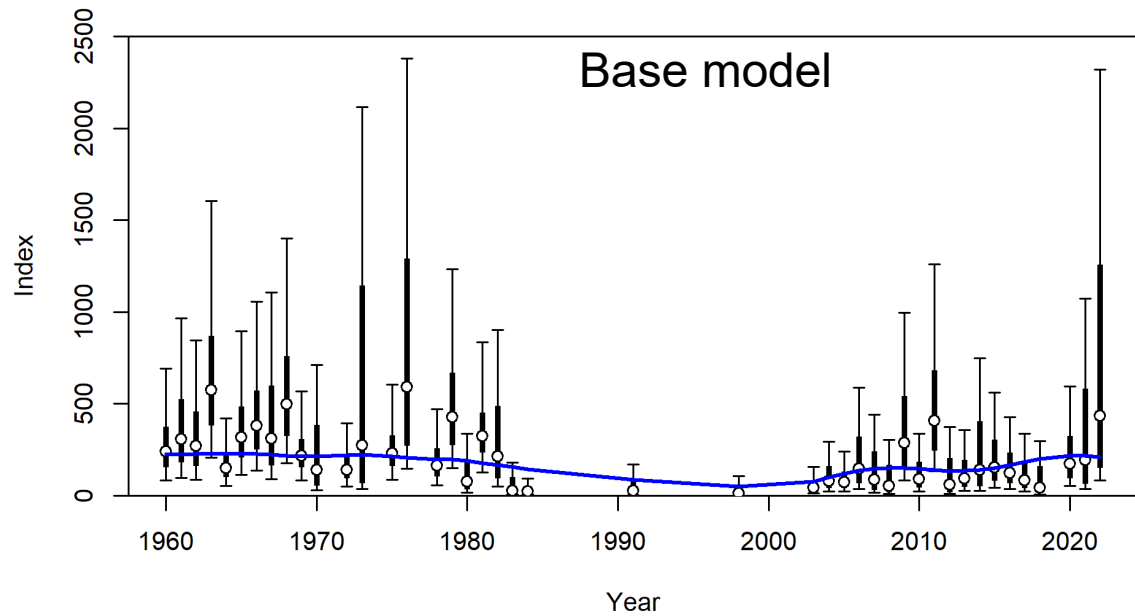
Refresher slide

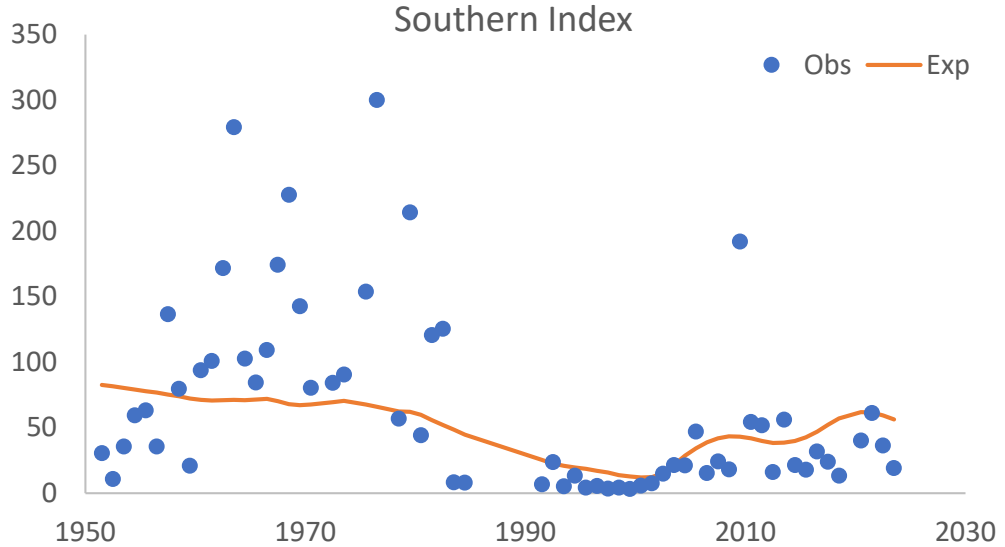
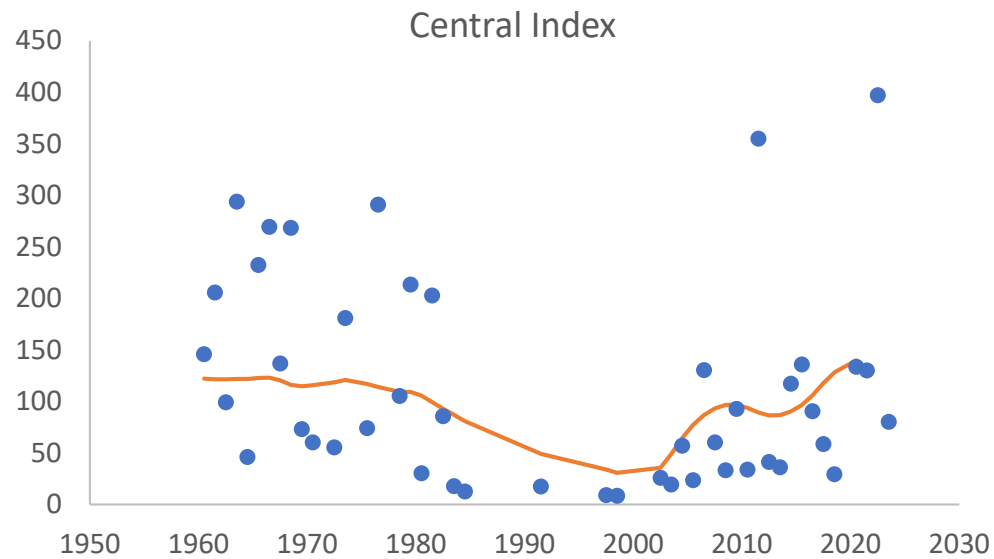
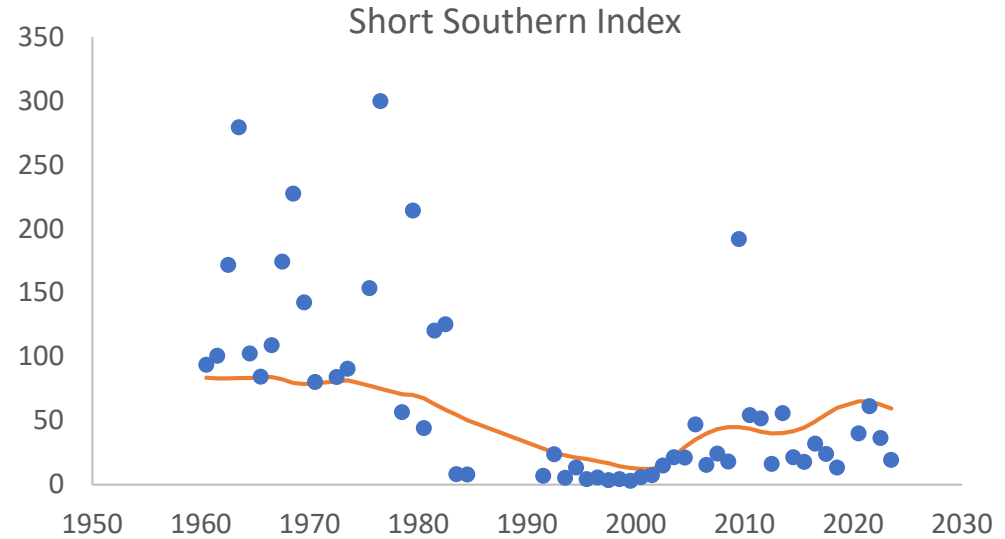
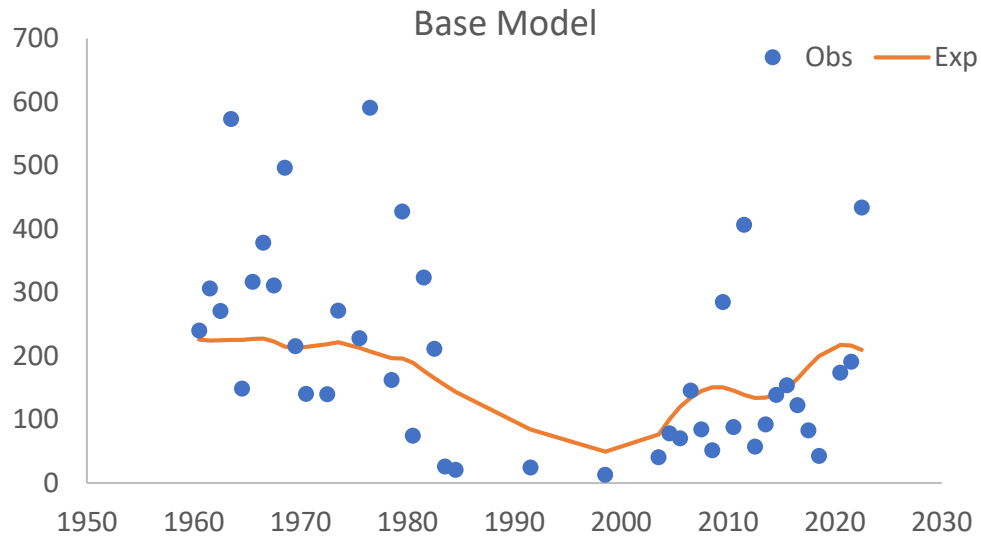
CalCOFI Indices



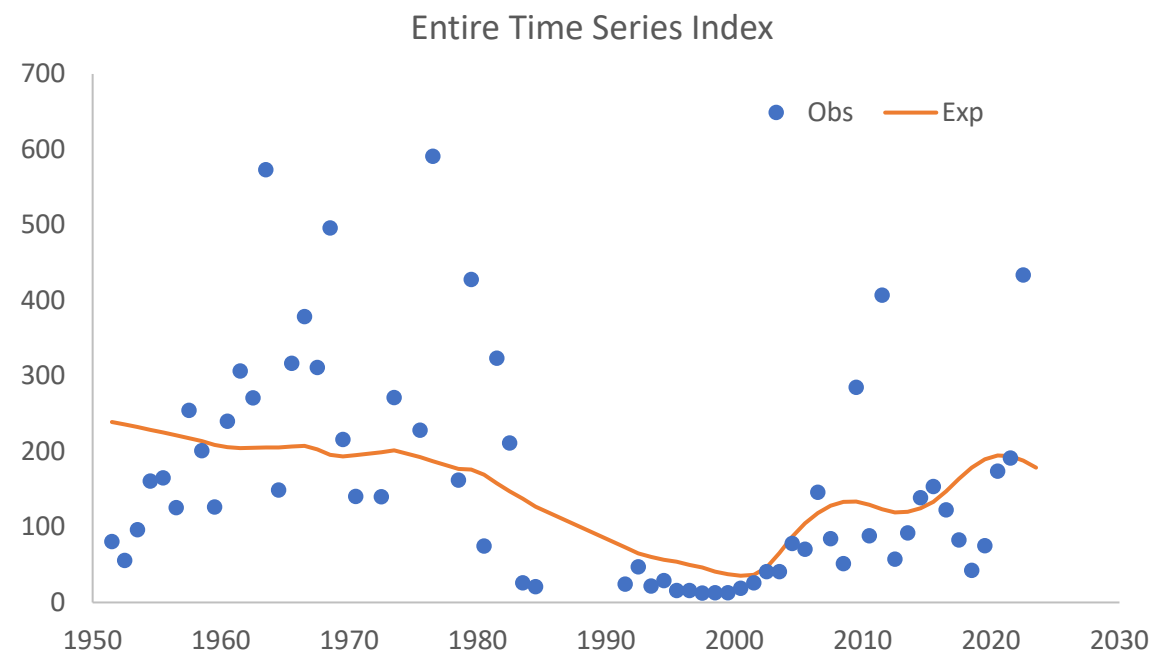
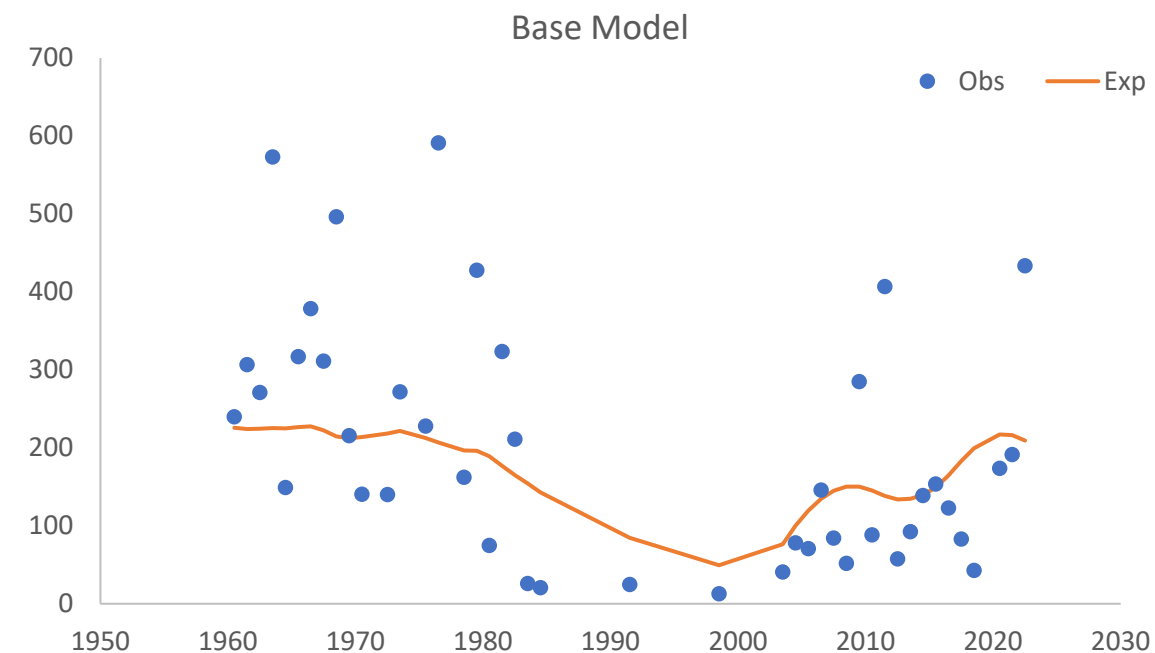


With the correct data, the run with central only is more optimistic than the base model (all data, but only years with data from both regions), and the south only model is more pessimistic. The “Short south” model is slightly more pessimistic than the southern model with all data (makes sense as the “Long south” model would scale down unfished biomass). The data with all years (all data, regions) is still nearly identical to the base model.





To plot without error bars we took observed and predicted from report file and just plotted in Excel (doing in r4ss a bit tricky)



Comparing “base model” with a model that includes the entire time series (e.g., add years with only south). Not requested, but available so shared.

10 - Request

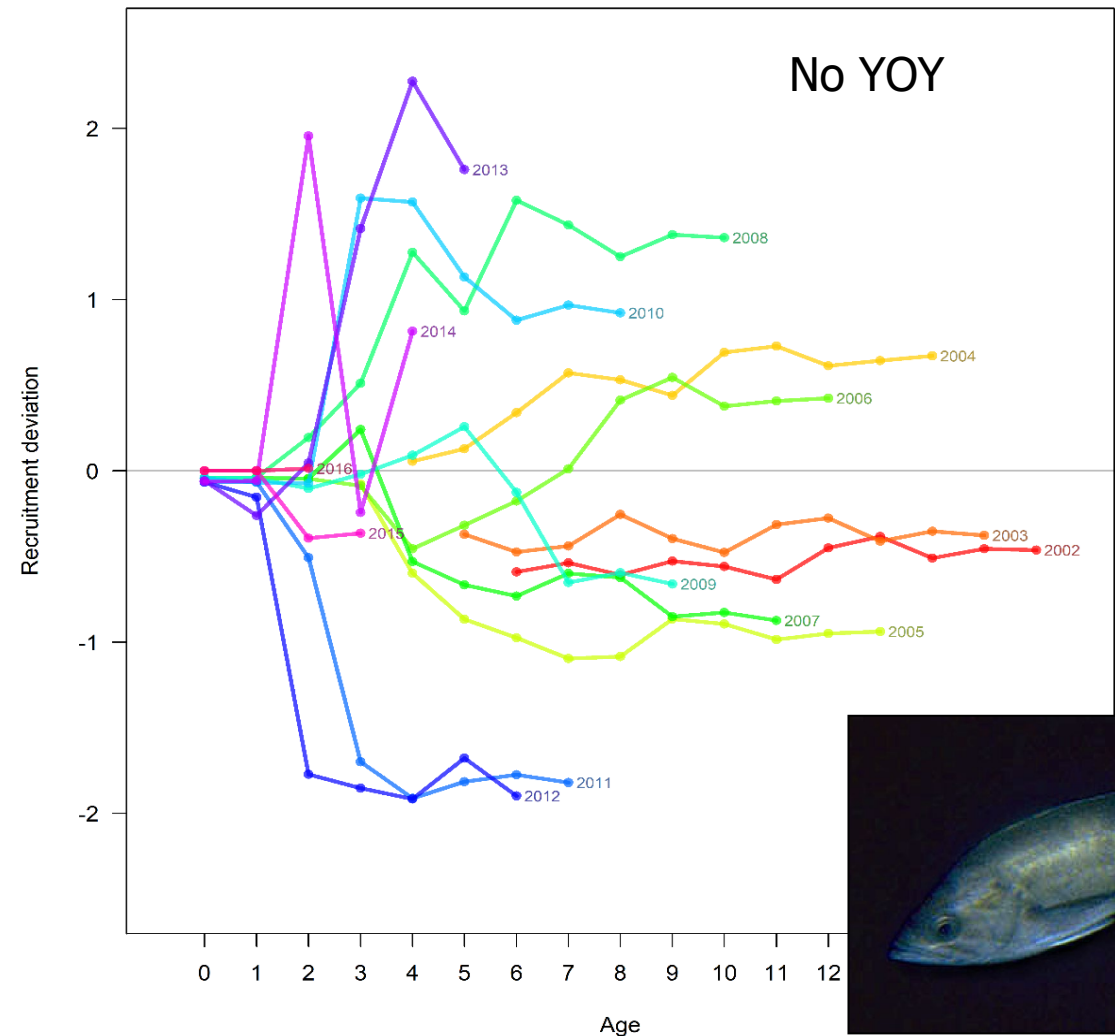
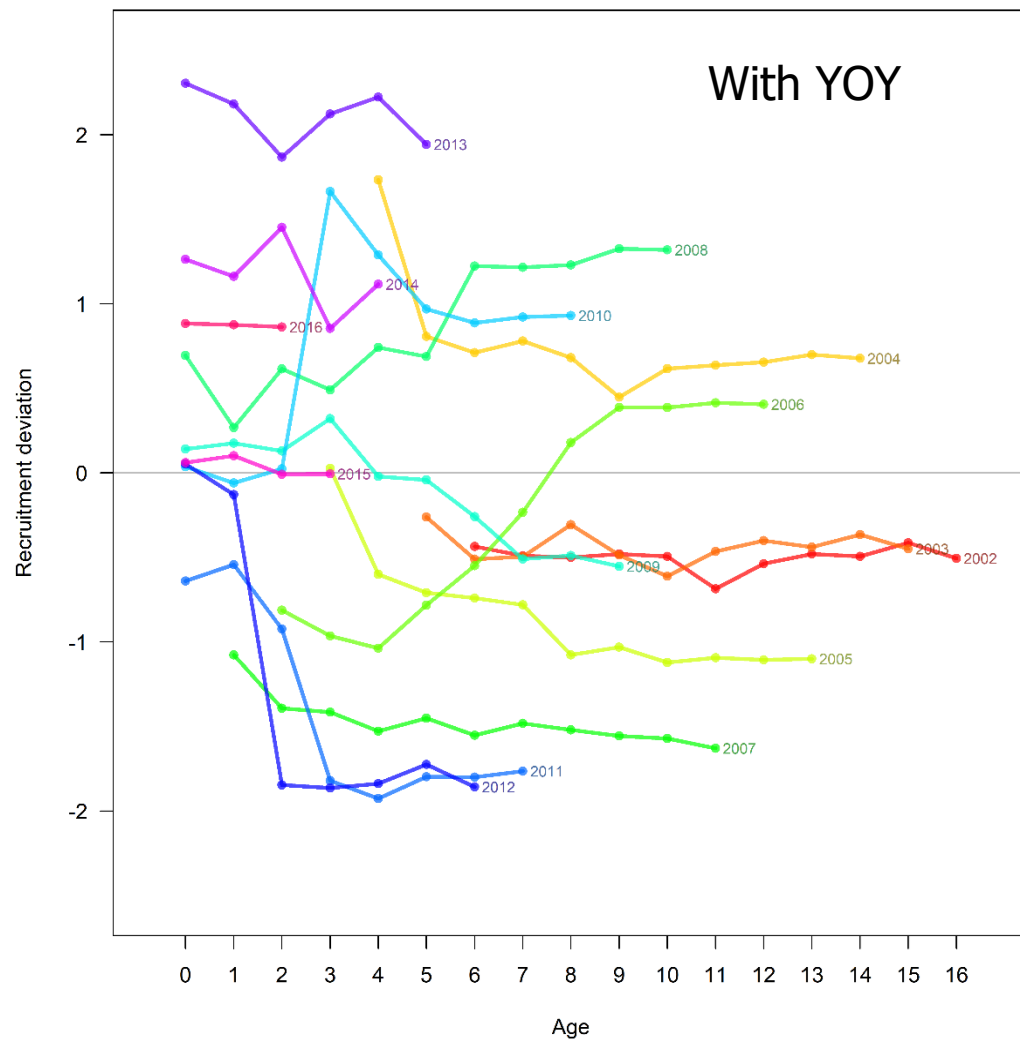
Create a squid plot using a 15-year retrospective analysis. This plot has the recruitment deviation on the y-axis and age on the x-axis, which shows the age at which estimated recruitment begins to be informed by data.

10 - Rationale

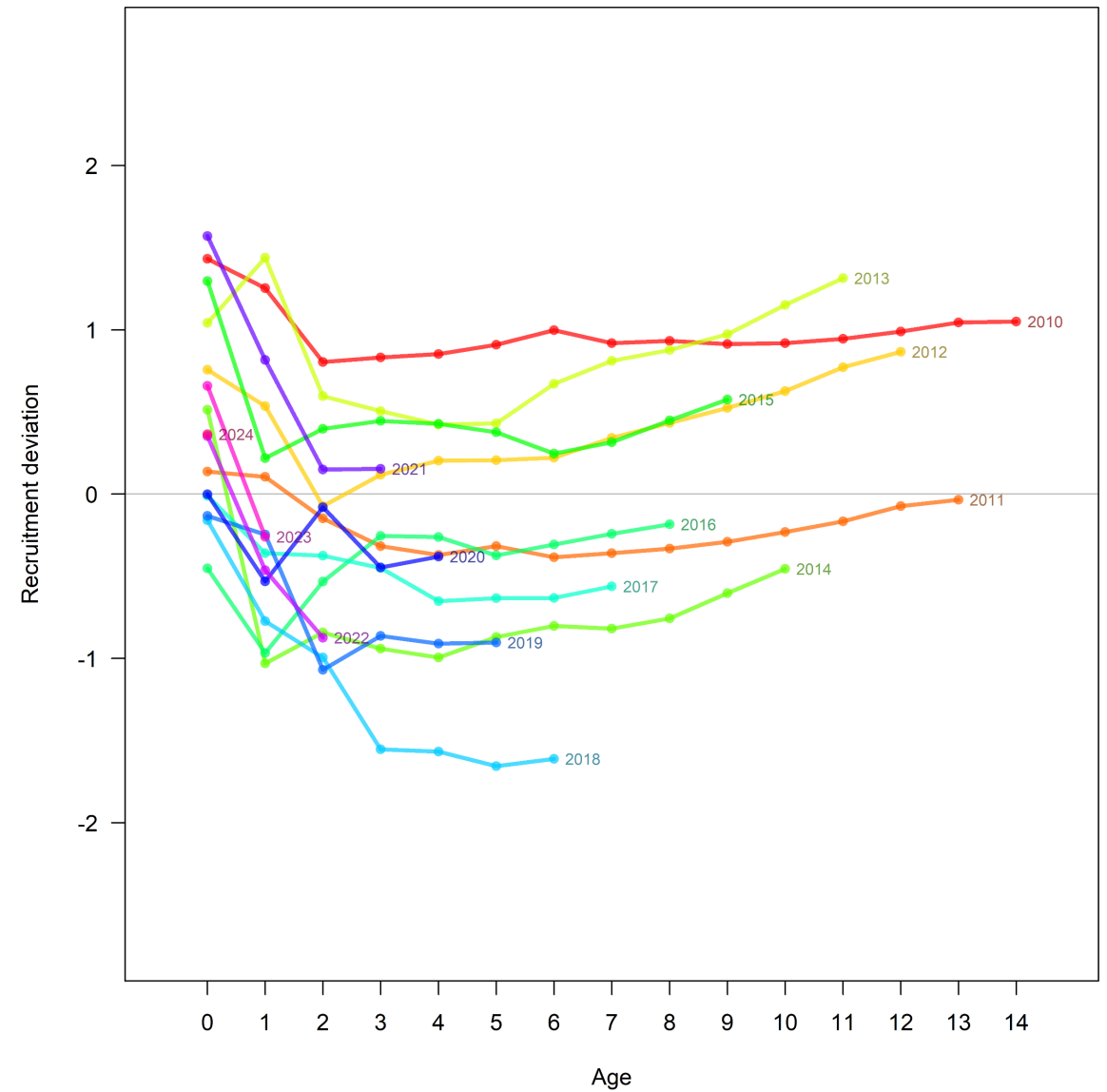
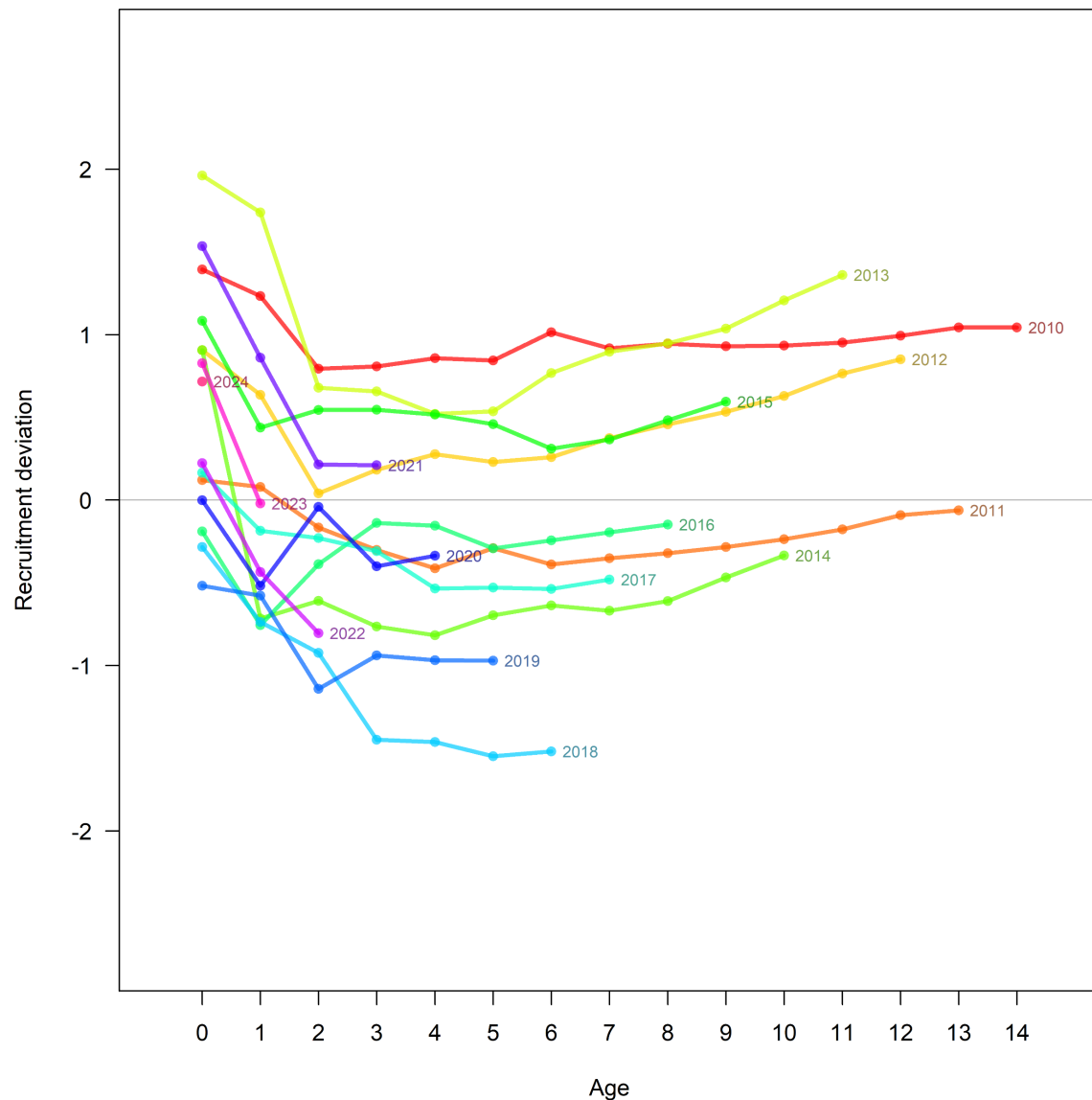
There are a few large year classes that are important to the population trend, one of which is a recent 2013 year class. It is useful to know how long it takes to have a reasonable estimate of recruitment, whether low or high.

10 - STAT Response

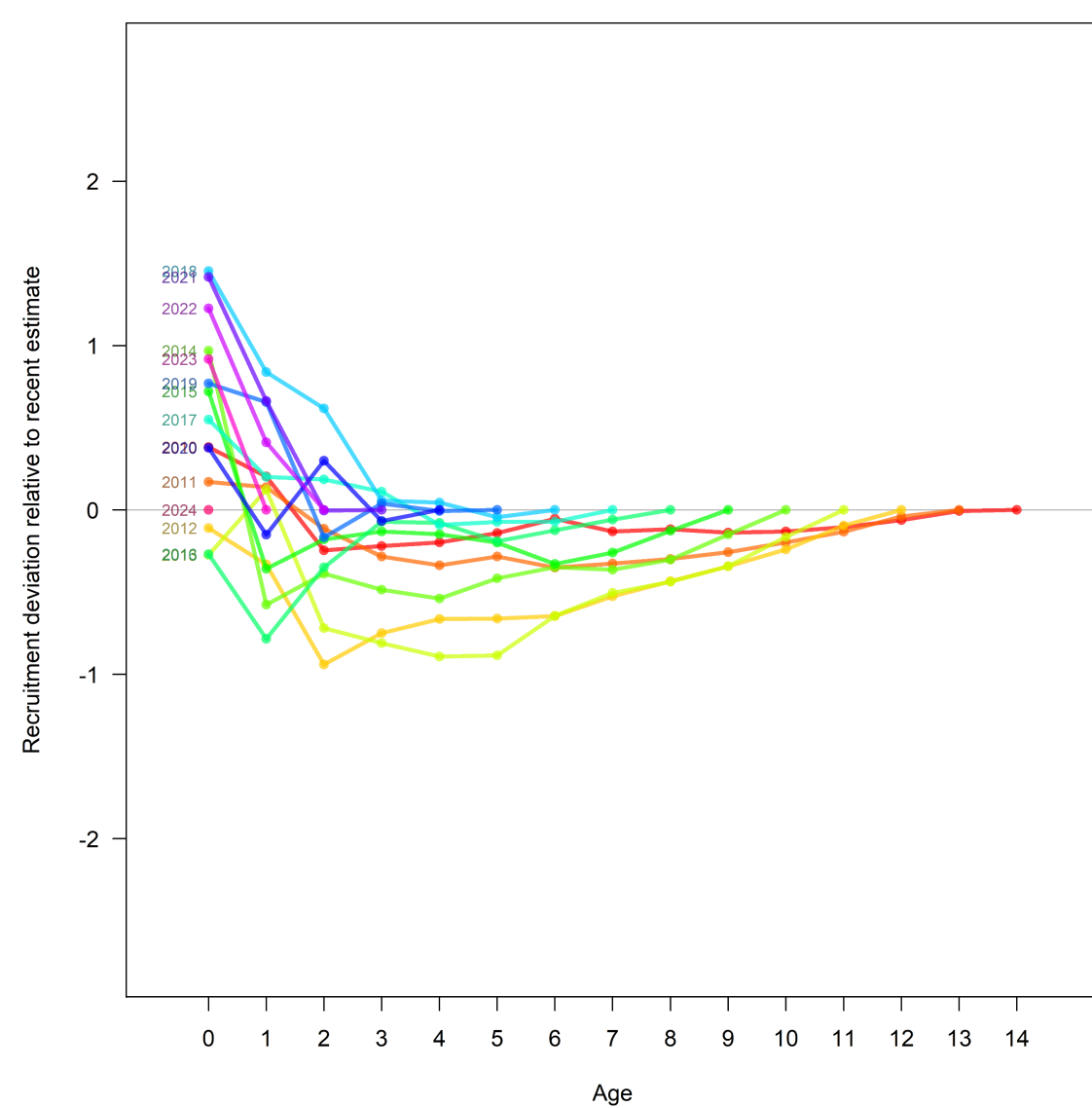
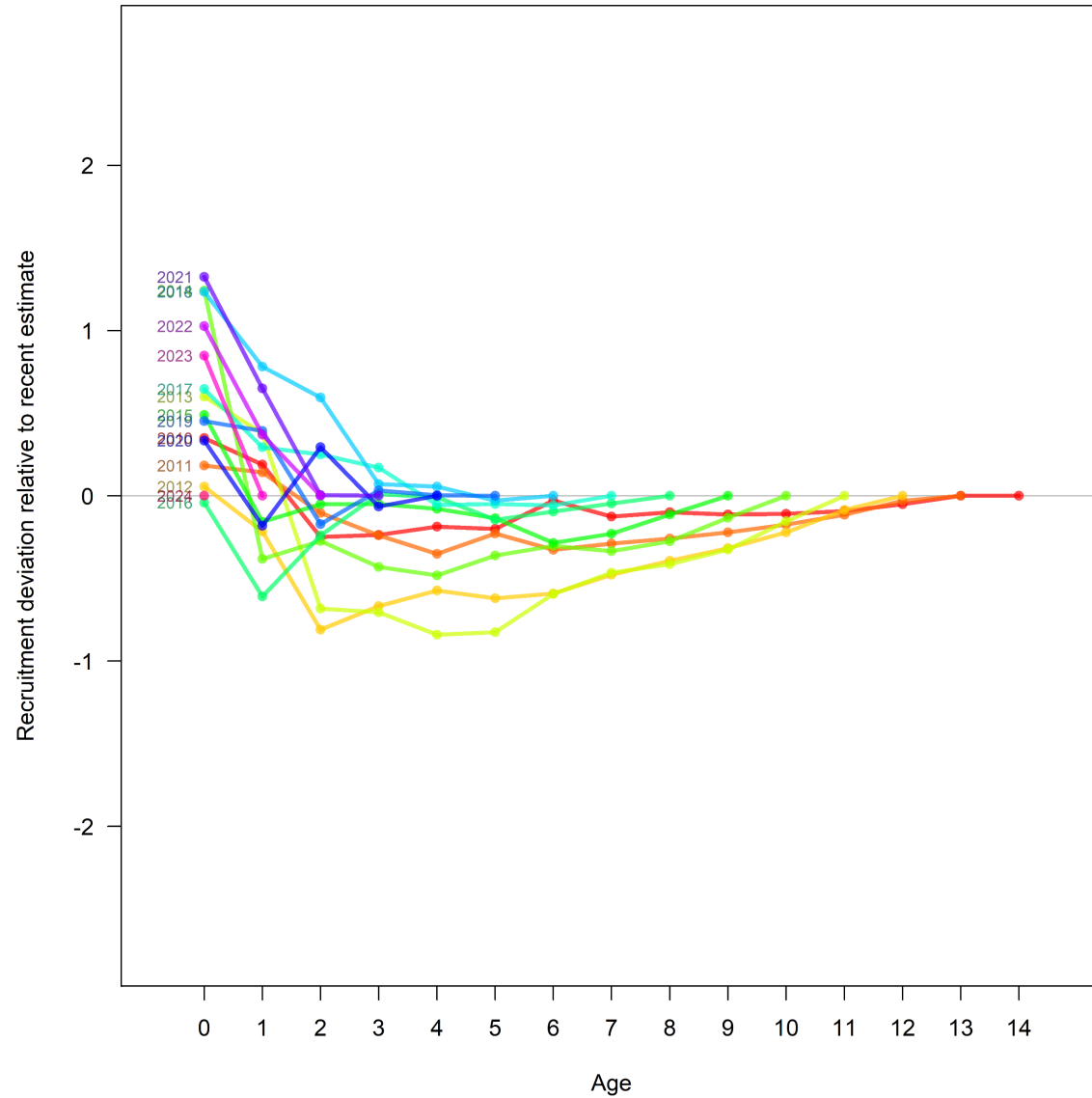
We ran 15 year retrospectives with and without the RREAS YOY index, the difference was surprisingly small. On a bit more investigation it appears that there is quite a bit of information in the bottom trawl survey for age 0 and 1 fish, and the combination of tuning RREAS and not tuning WCGBTS essentially upweights the trawl information. We did several additional runs with WCGBTS tuned, and RREAS upweighted, to better understand how each index is informing near term recruitments.



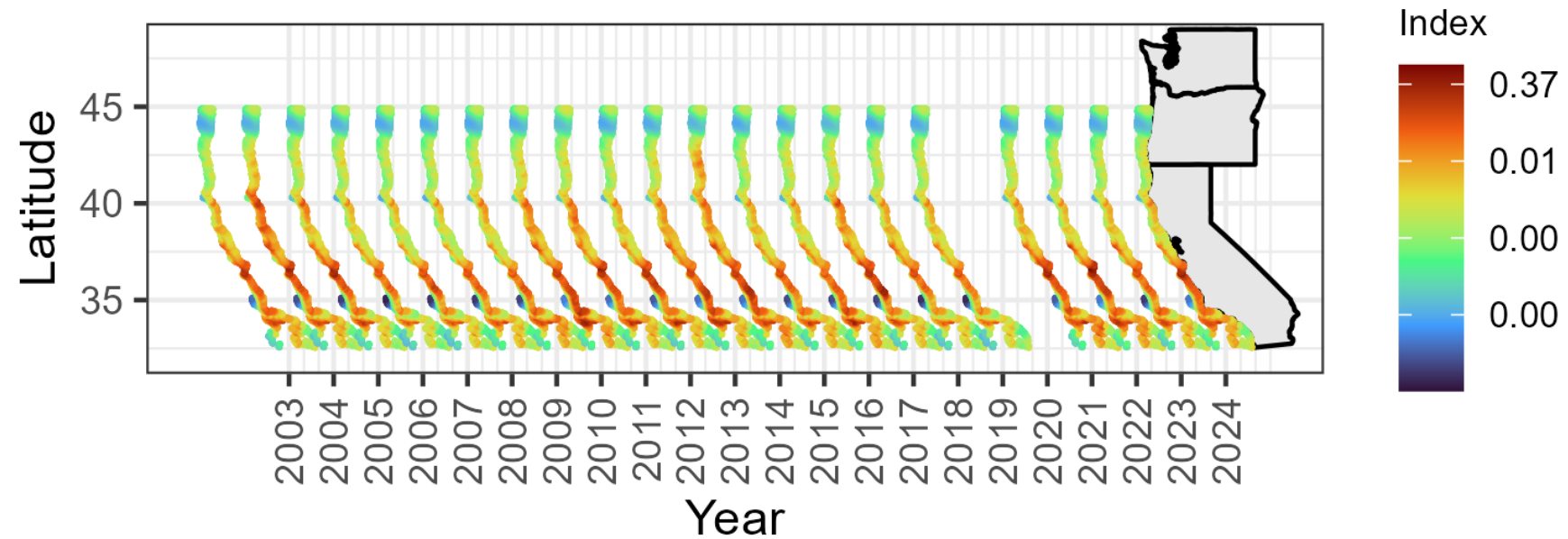
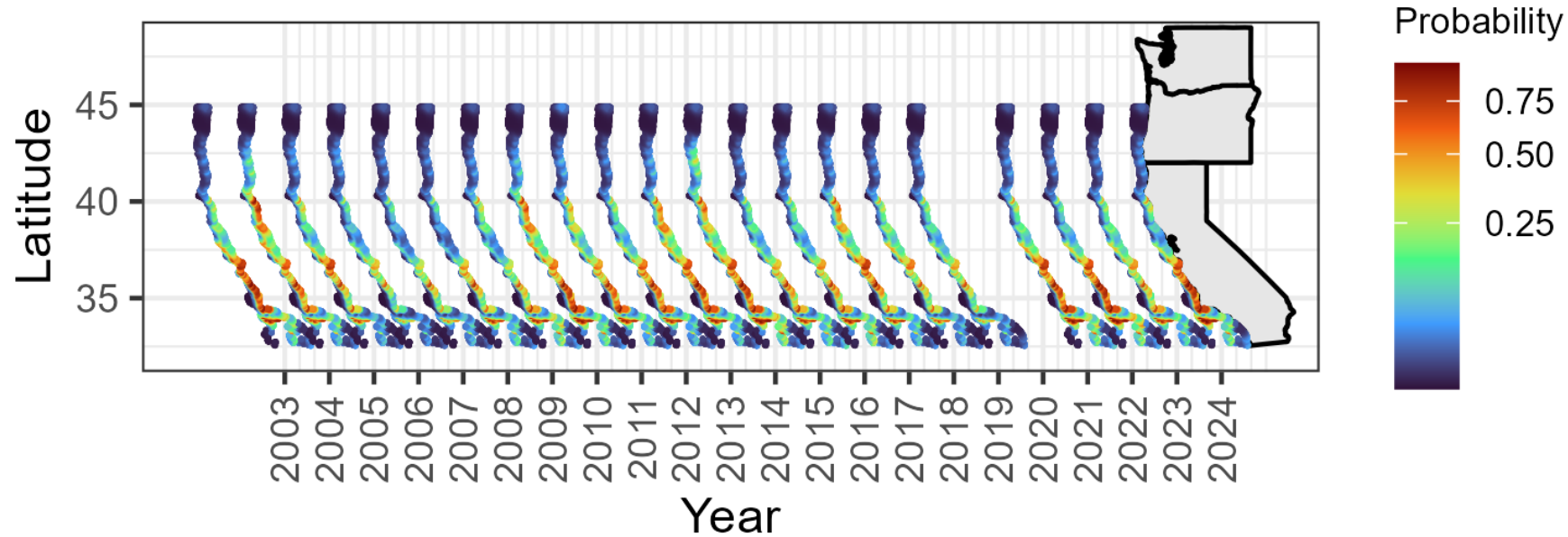
This is *not* chilipepper, this is widow rockfish (from 2019 assessment), but this is a good example “squid plot,” showing recruitment deviations from zero for different age classes. With the recruitment index, the model estimates deviations even for age-0 fish, but without it there is no recruitment signal for age-0 fish (for this stock...)



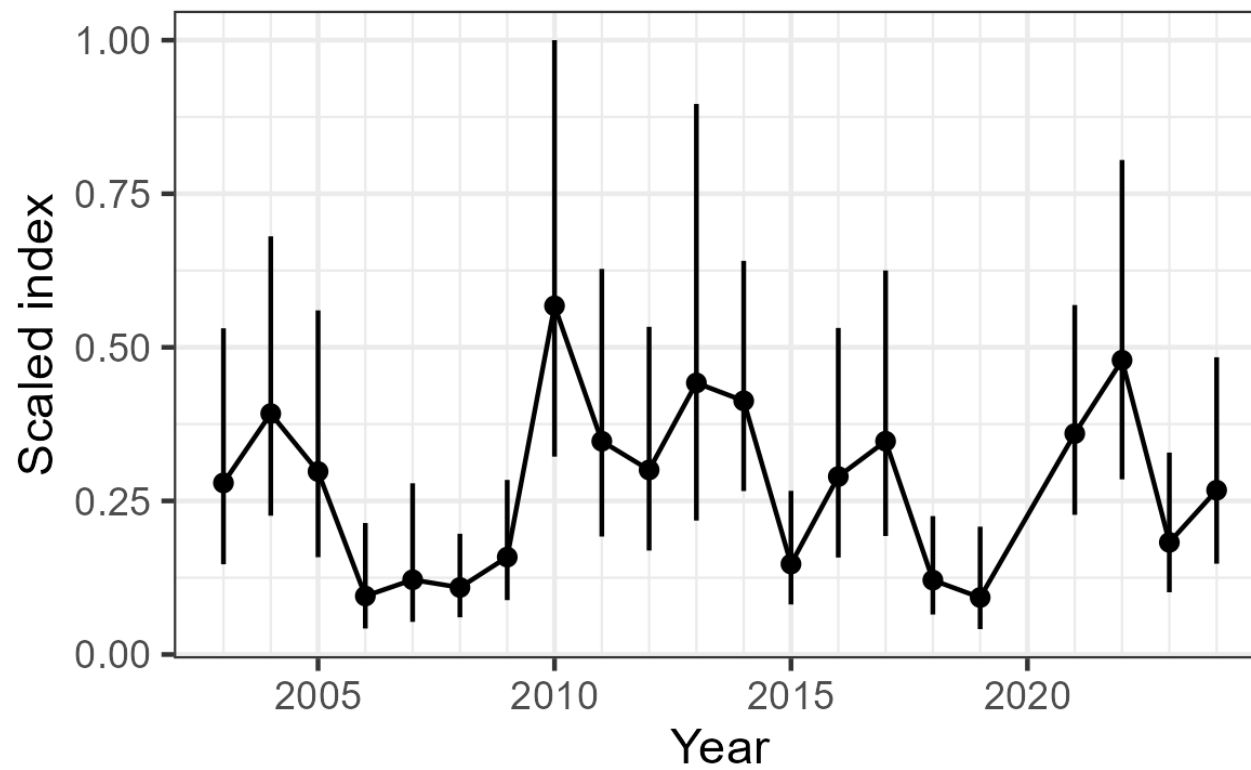
On left is base model (includes RREAS), on right is with RREAS turned off- there is still apparently quite a bit of recruitment signal in the model (age 0 and 1 fish from WCGBTS).



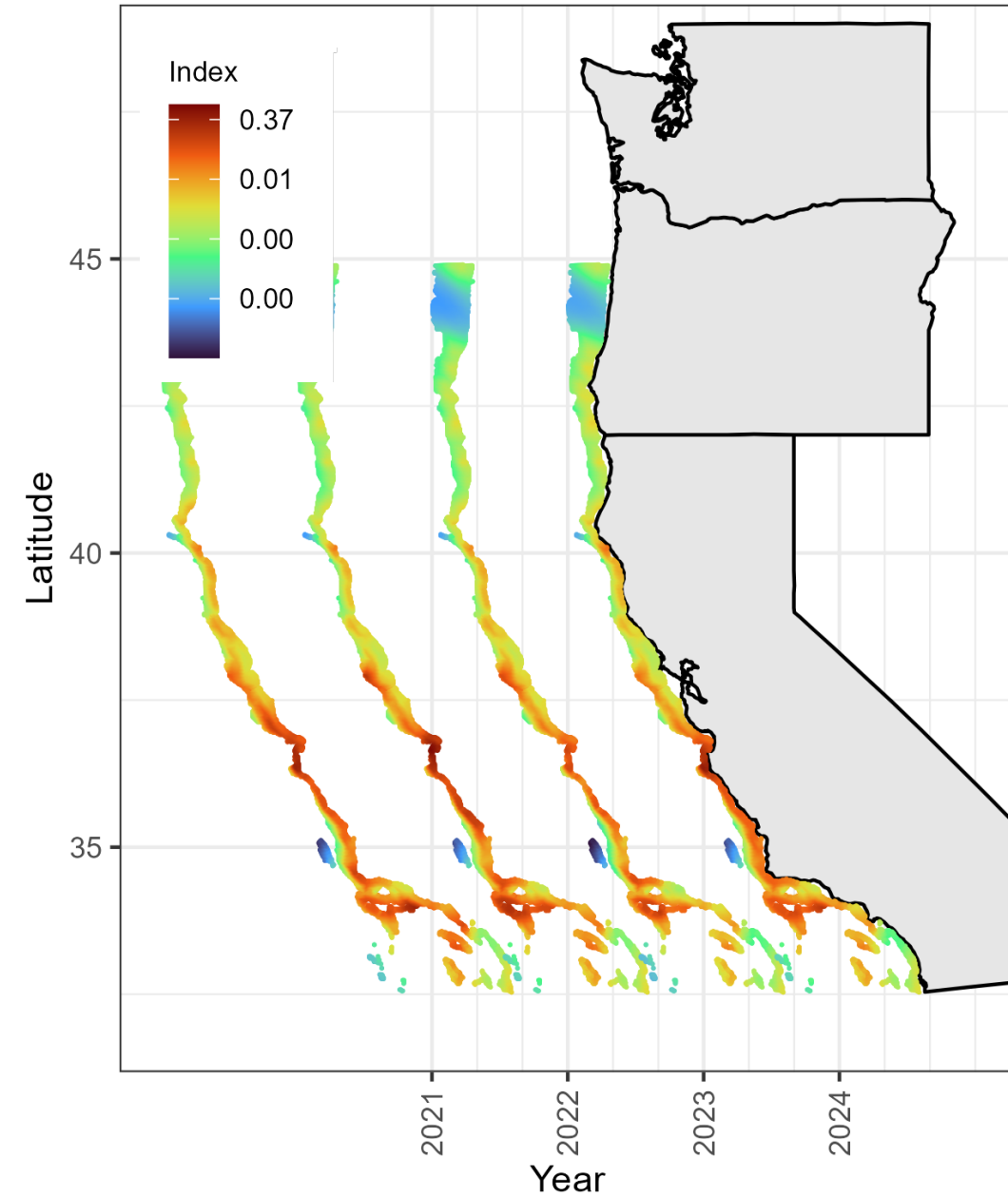
Relative plots associated with previous- they are different if you look closely!

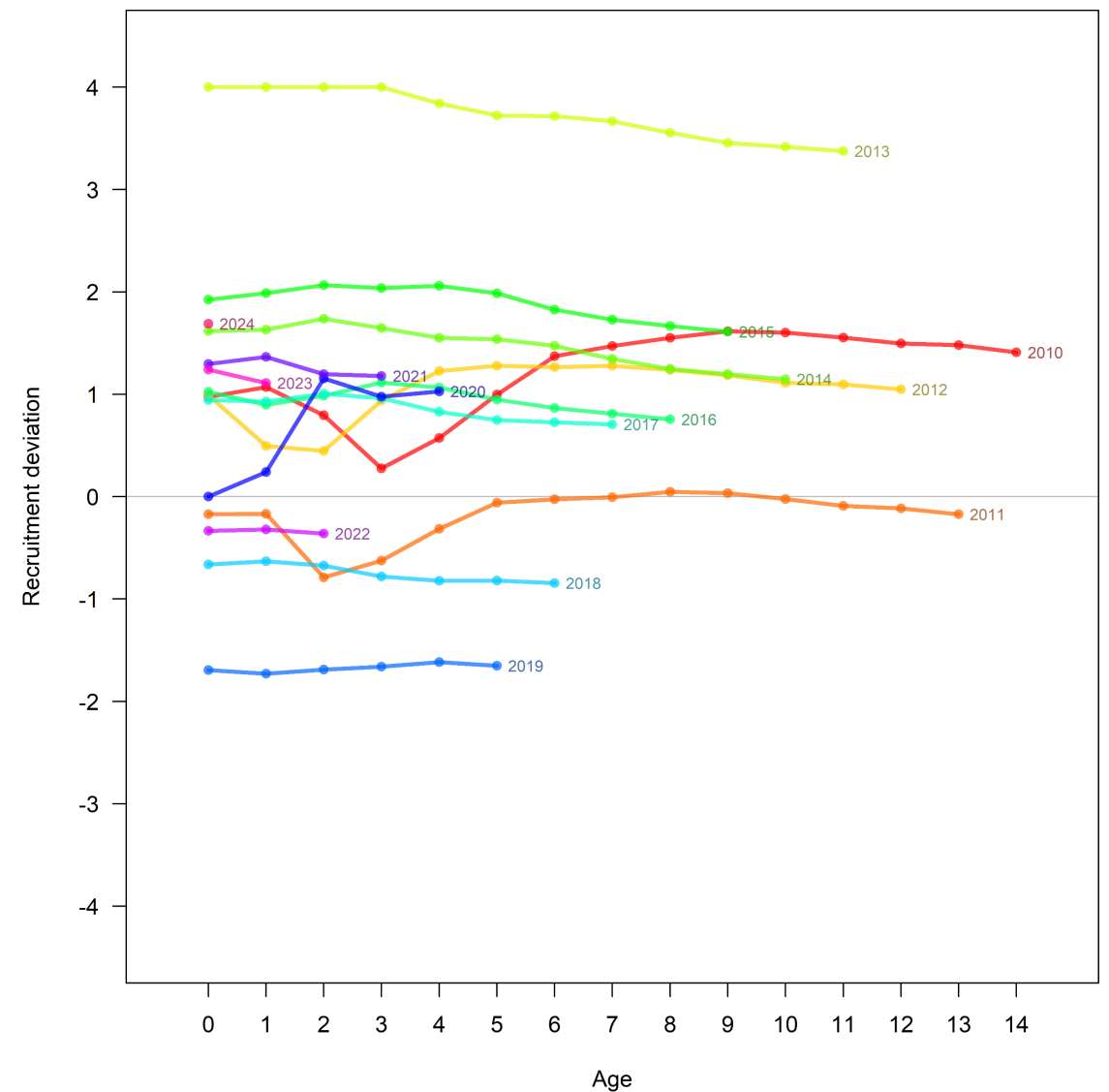
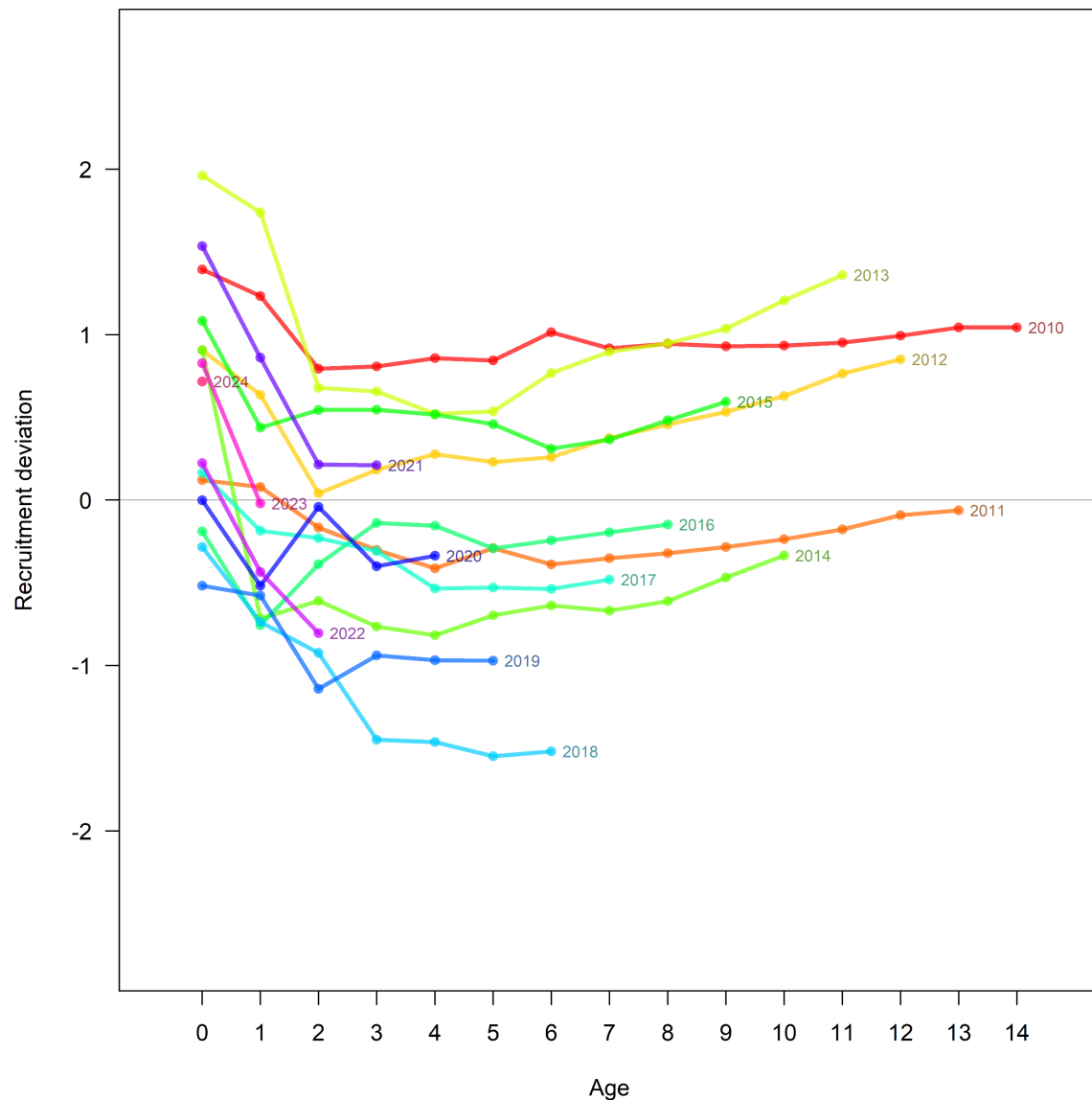


Settled age 0-1
chilipepper from
WCGBTS (N.
Tolimieri), probability
and catch rates for
fish 16 cm and
smaller, which should
be all age 0 fish,
~70% of age 1 fish

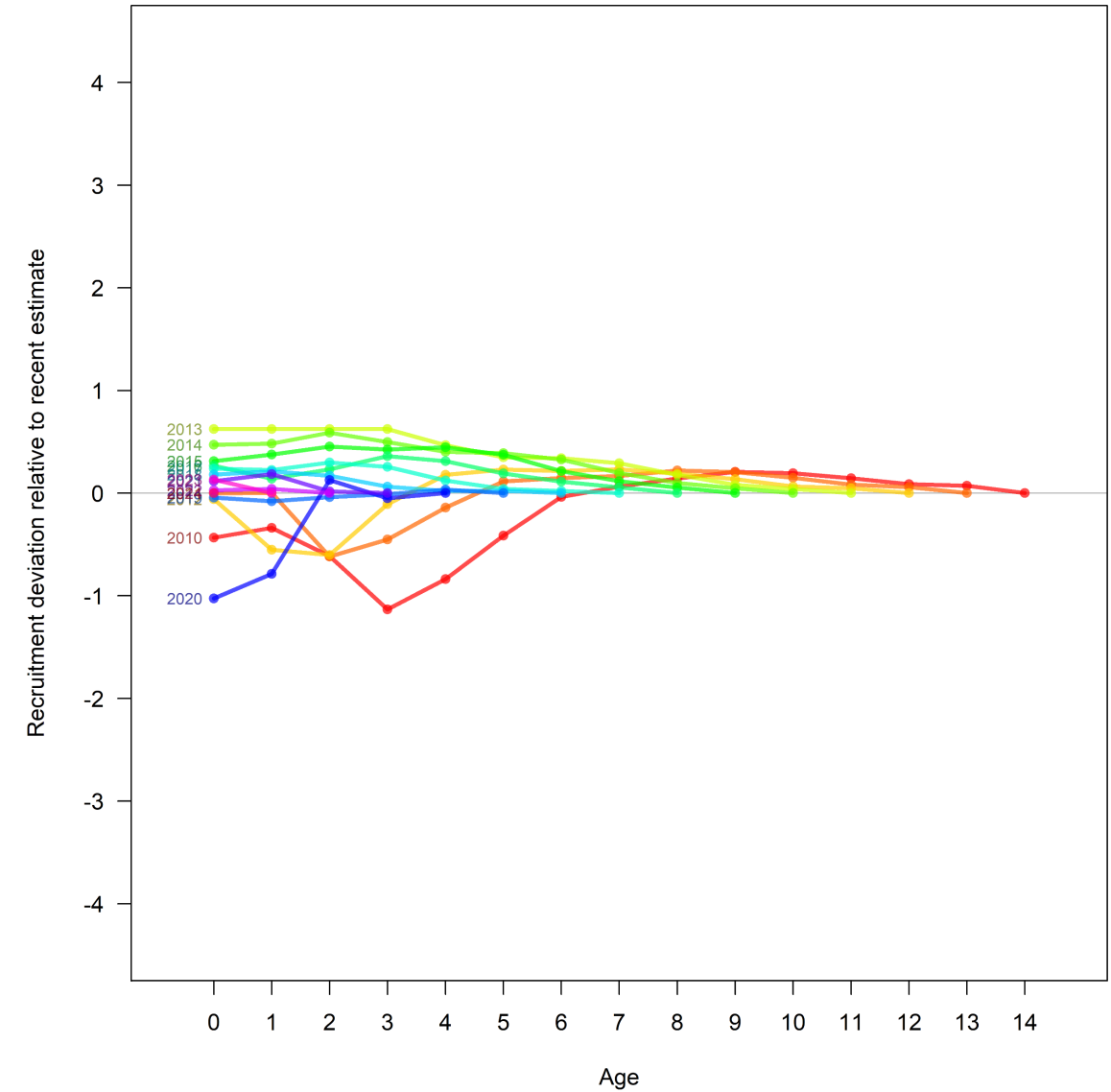
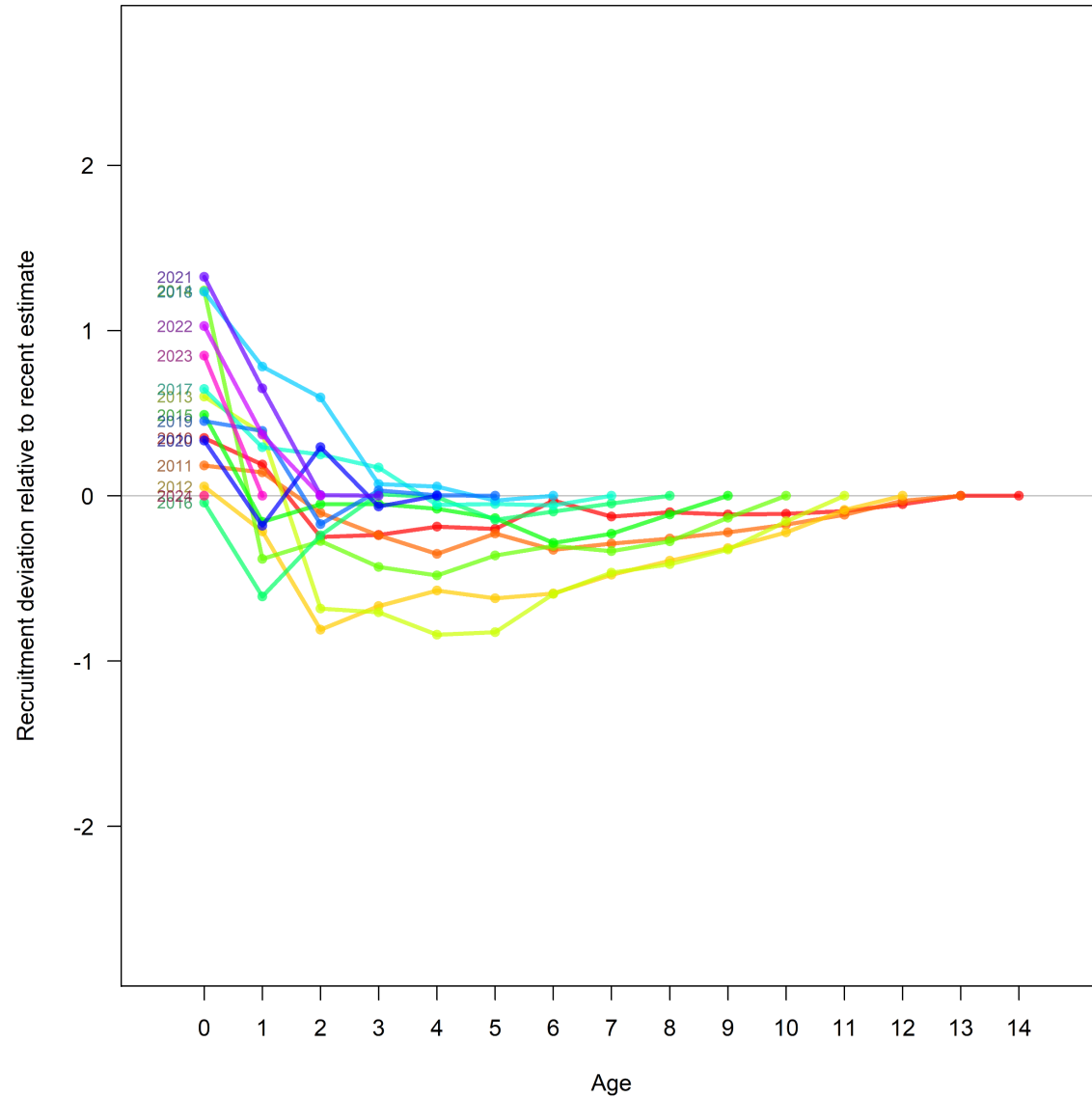


Settled age 0-1 chilipepper from WCG BTS (N. Tolimieri), catch rates for fish 16 cm and smaller, which should be all age 0, most age 1 fish (N. Tolimieri, NWFSC), recent years on the right.

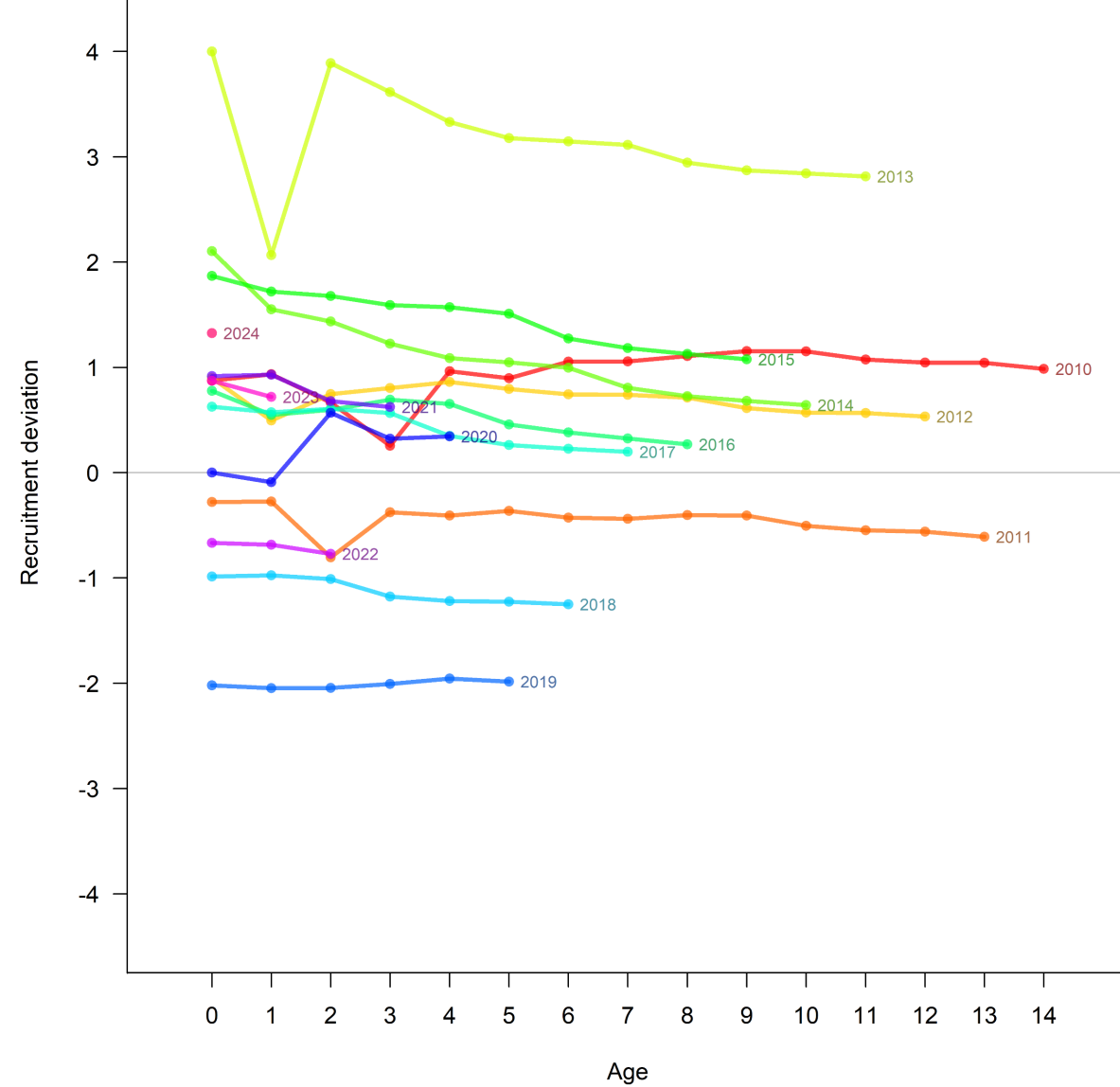
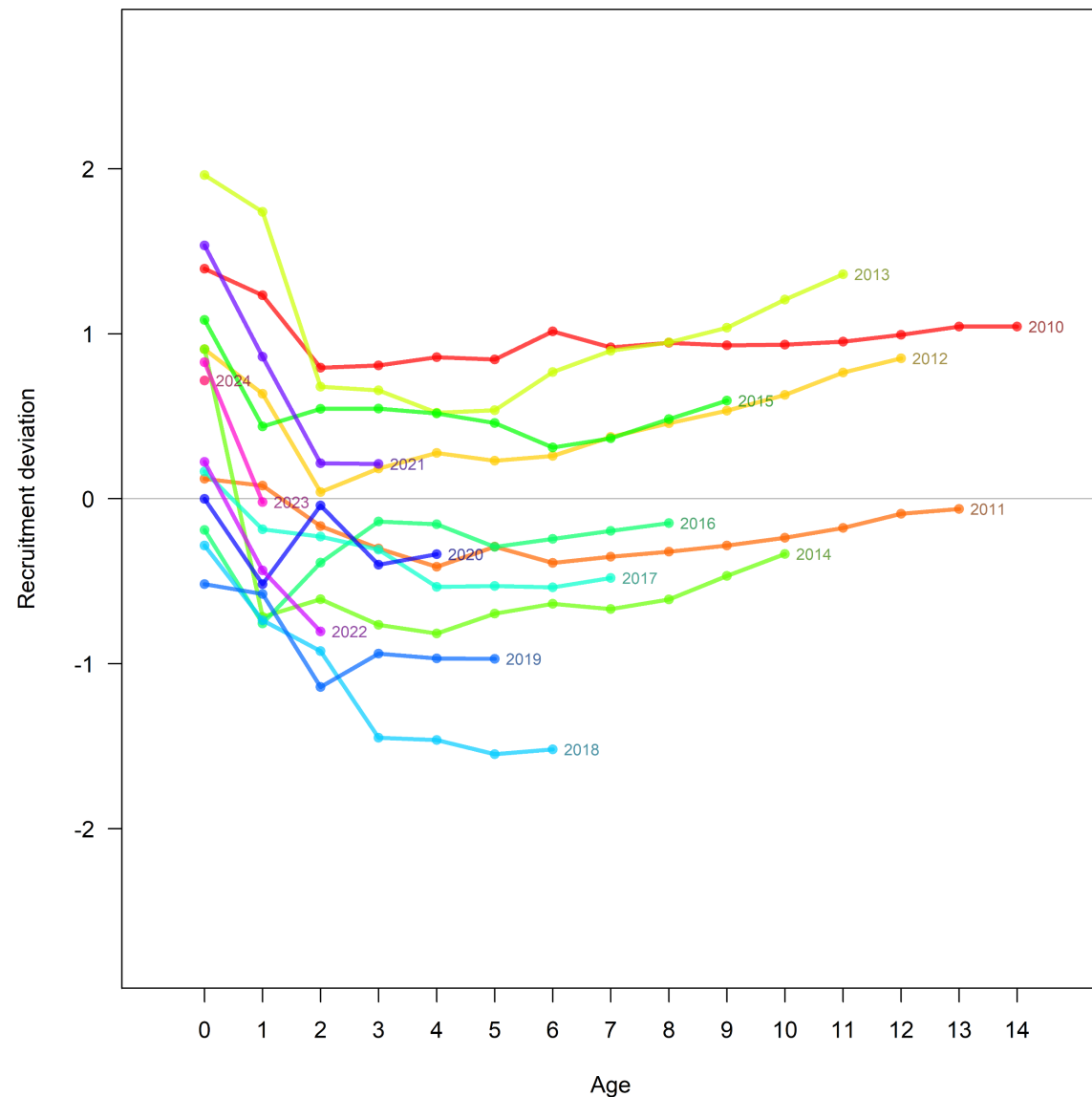




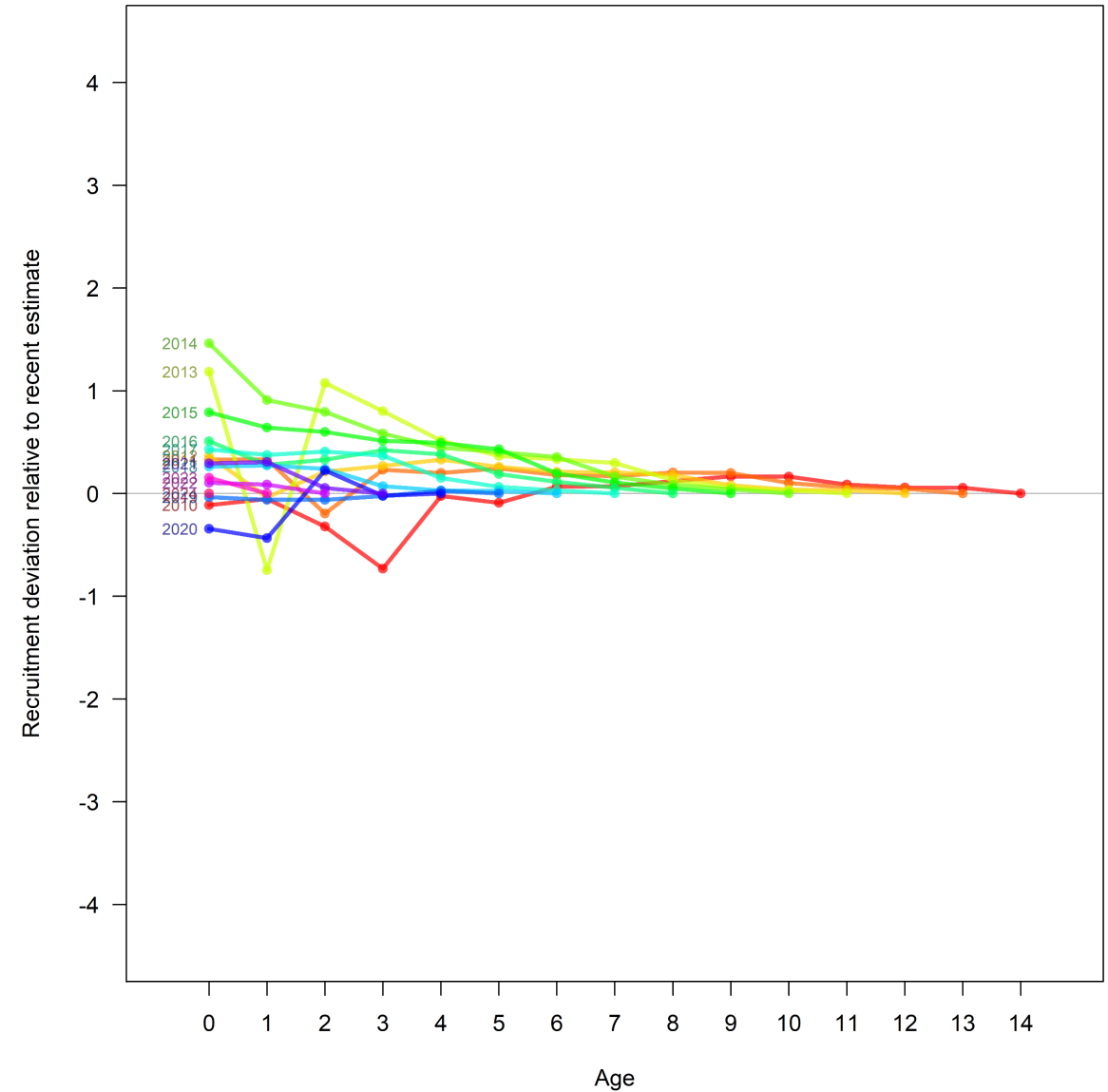
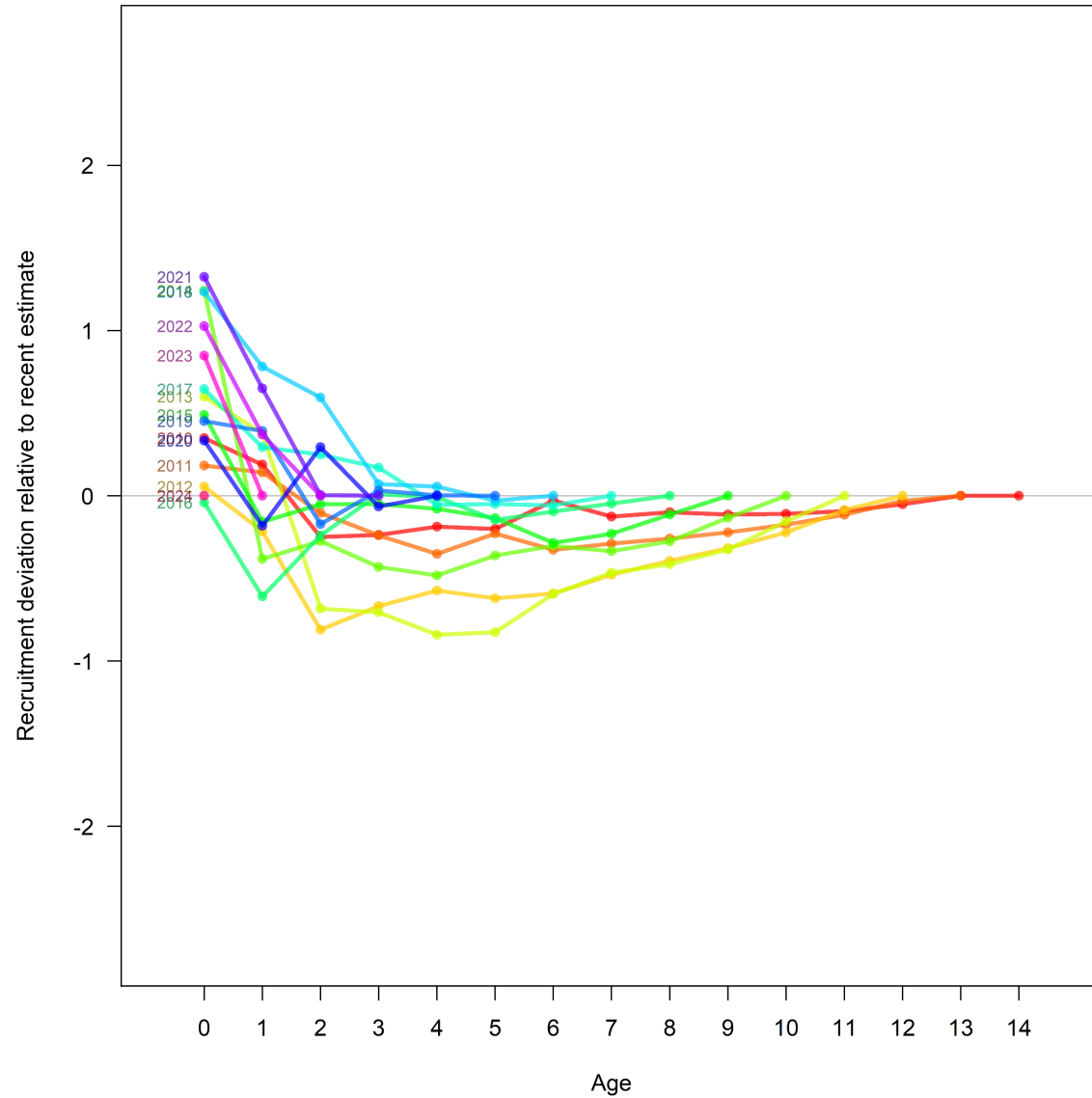
One option is to tune the WCG BTS (which was untuned in base) to slightly reduce that survey's estimate of recruitment- this starts looking a bit more different (although note difference in scale)- looks like 2013 quite different in this model..



Relative plots associated with previous- we need to rescale y-axis but you can see that RREAS is now having more, WCGBTS having less influence



Another option is to upweight RREAS (on the right, rel. to base on left)



Relative plots associated with previous- I need to rescale but you can see that RREAS is now having more, WCGBTS having less influence