Steps for small yellow croaker:

1. Parameterize the operating model to match observed catch, given changes in life history, exploitation.
2. Input

Known: Growth, weight at length, natural mortality? (probably not), selectivity, maturity

Estimated: Rzero

Tuned/sensitivities: natural mortality

1. Fit production model to data derived from that operating model.
2. Show differences in reference points estimated from production model and the true underlying dynamics.

1. TUNE OPERATING MODEL

Find\_rzero<-function(x,…)

{

Write\_CTL() # takes input of x, makes GeMS CTL

Run\_GeMS() # you know what that does

Gather\_output() # pull ‘true’ catch from GeMS--

Calc\_like() # calculate the likelihood for fitting to observed catch data

Return(calc\_like)

}

Nlminb(x,find\_rzero…)

FINISHED—AND WE GET A VECTOR OF RZERO THAT FITS THE OBSERVED CATCH.

Need to do this for several ‘realities’ looking over trends in natural mortality and steepness.

2. Fit GeMS

How well does a production model fit these sorts of data?

IMMA GIVE YOU A HINT. NOT WELL.

How big of a change

Projection for plastic vs. selection

OM1: Population parameters stay the same starting at the year of projection (selection hypothesis)

OM2: Population parameters are linked to fishing mortality (or biomass or selectivity?) (plastic hypothesis)

HCR1: Status quo fishing (hard and indiscriminate)

HCR2: Reform toward single species reference points (optimal selectivity and F)