American Samoa Model Checks

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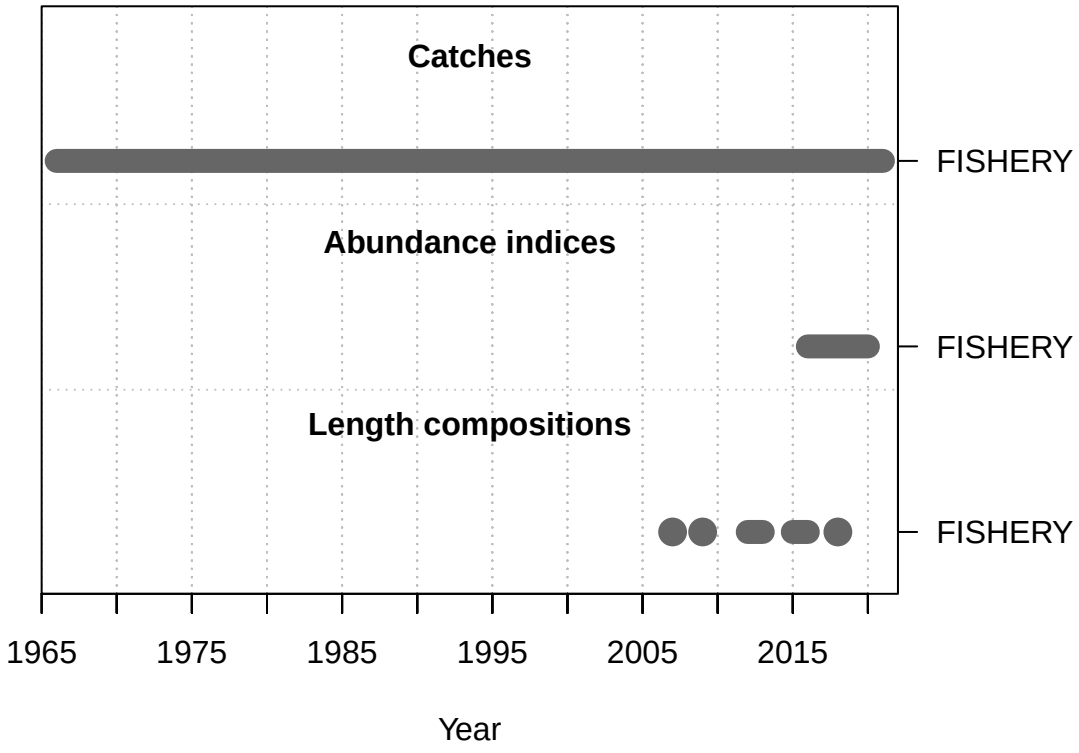
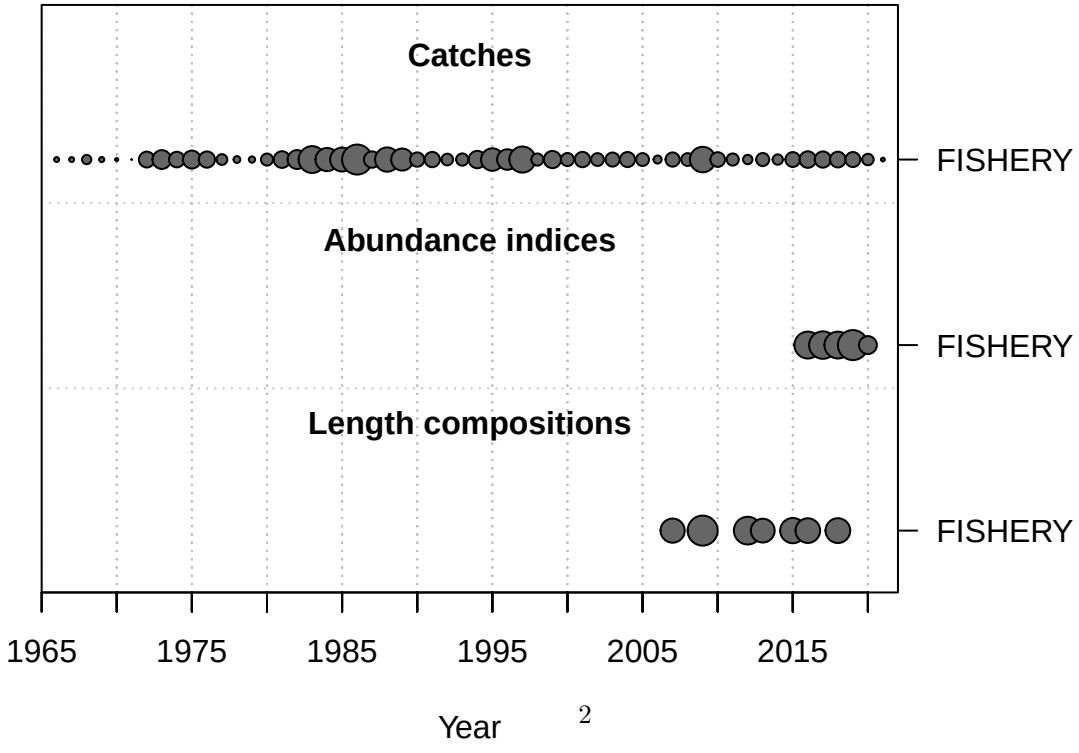
This is a summary report for the CALU base model run.

Model Output

Input Data





Convergence Check

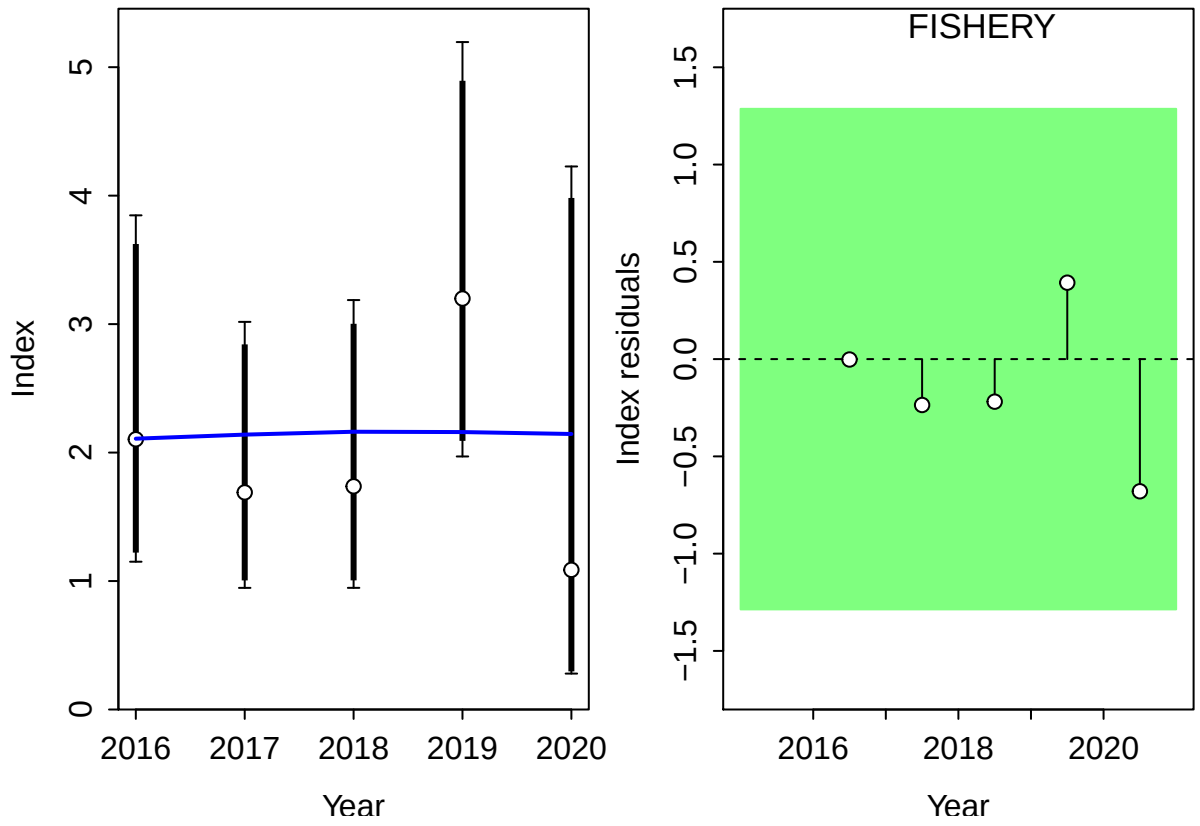
```
##   Converged     MaxGrad
## 1      TRUE 7.36708e-06
```

```
## [1] "1 NOTE:  Max data length bin: 65  < max pop len bins: 72; so will accumulate larger pop len bins
## [2] "2  Main recdev biasadj is >2 times ratio of rmse to sigmaR"
## [3] "3  Early recdev biasadj is >2 times ratio of rmse to sigmaR"
## [4] "4 warning: poor convergence in Fmsy, final dy/dy2= -0.00141533"
## [5] " N parameters are on or within 1% of min-max bound: 1; check results, variance may be suspect"
## [6] "N warnings: 4"
```

Fit to Model

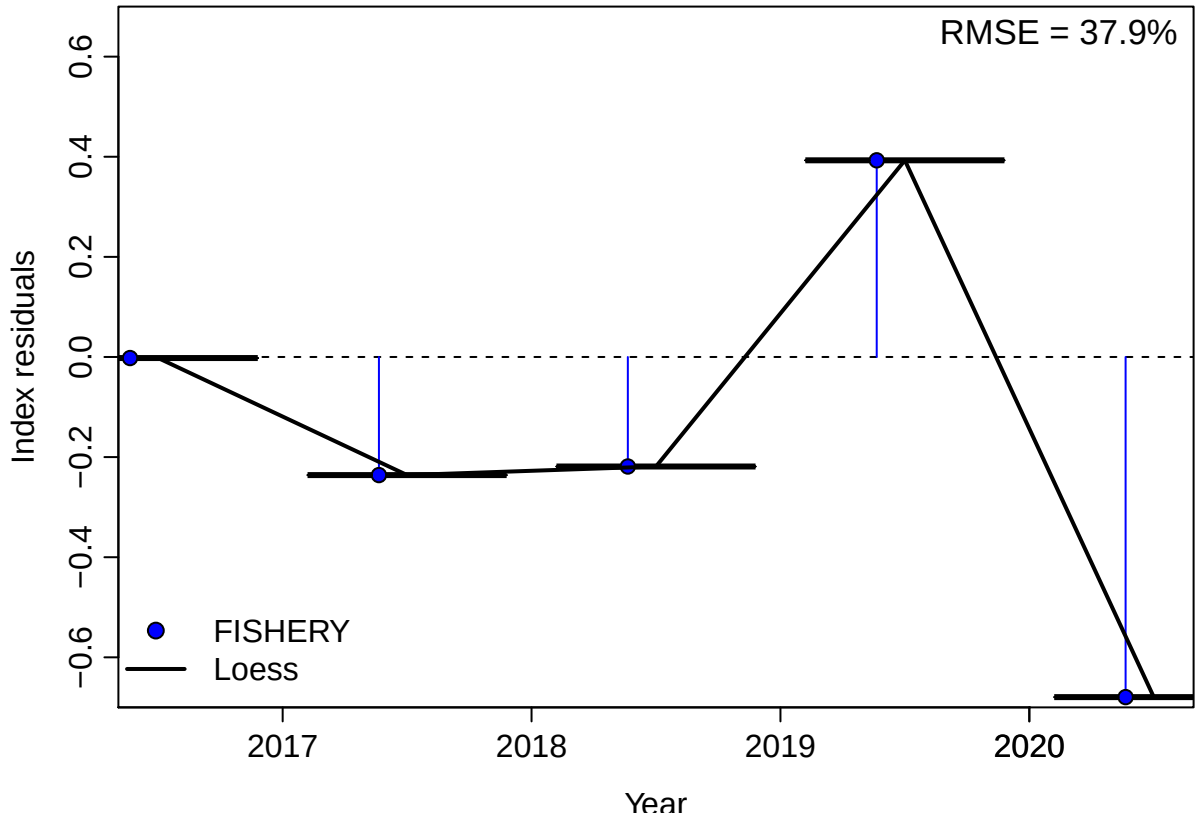
CPUE

```
##
##  Running Runs Test Diagnosics for Index
## Plotting Residual Runs Tests
```




```
##
## Runs Test stats by Index:
## Plotting JABBA residual plot
```

```
## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : span too small. fe

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : pseudoinverse used

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : neighborhood radiu

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : reciprocal conditi

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : There are other nea
```



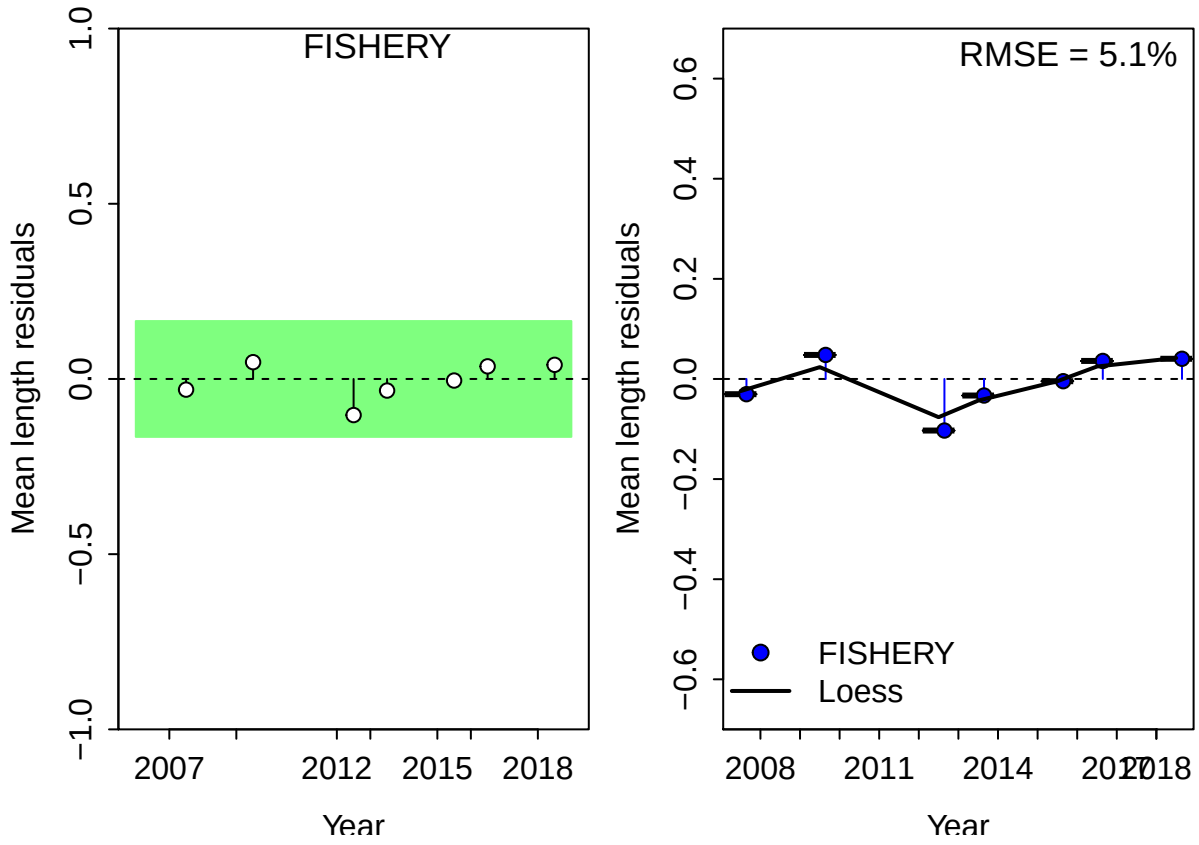

```
##
## RMSE stats by Index:
```

Length Comp

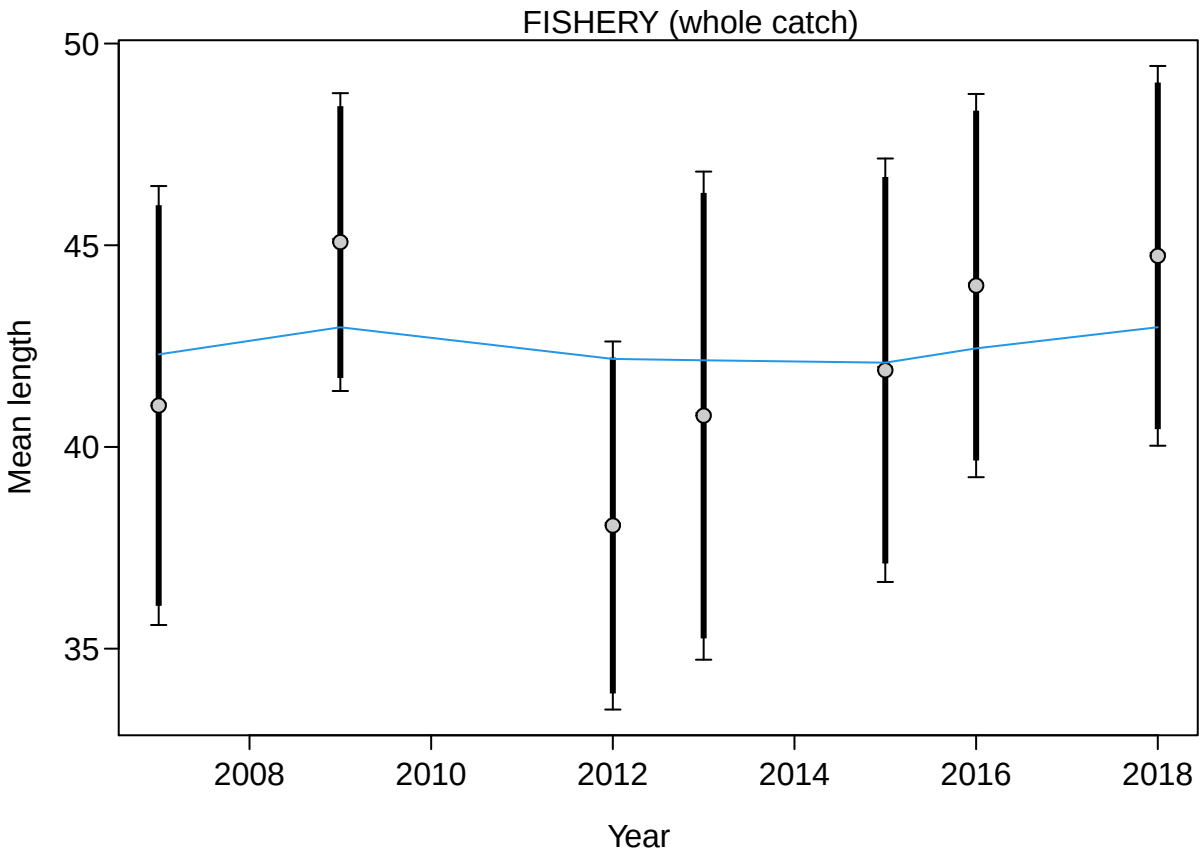
#Factor	Fleet	New_Var_adj	Type	Name
4	1	0.224899	len	FISHERY

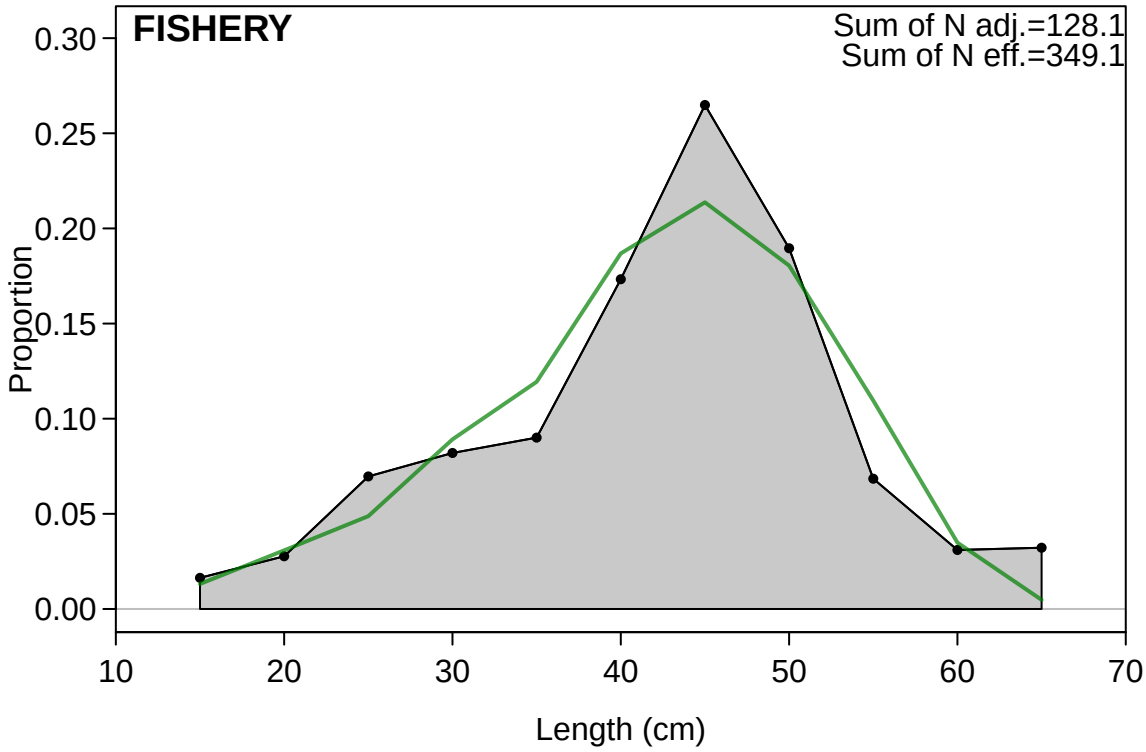
```
##
##  Running Runs Test Diagnosics for Mean length
## Plotting Residual Runs Tests
```

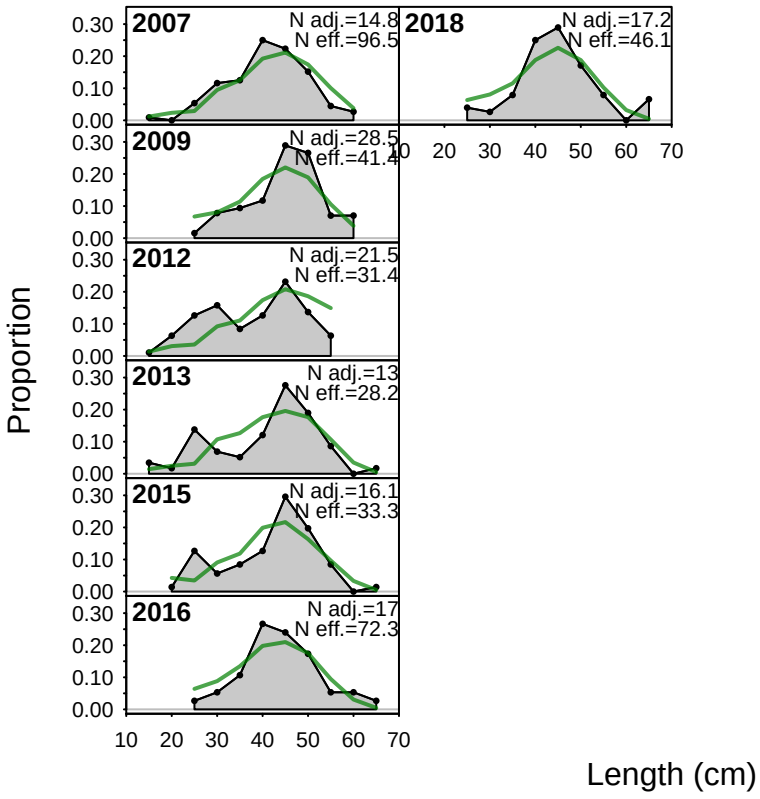
```
##
## Runs Test stats by Mean length:

##     Index runs.p   test  sigma3.lo sigma3.hi type
## 1 FISHERY  0.358 Passed -0.1652344 0.1652344  len

## Plotting JABBA residual plot
```




```
##
## RMSE stats by Index:

##    indices RMSE.perc nobs
## 1  FISHERY       5.1    7
## 2 Combined       5.1    7
```


FISHERY (whole catch)
Mean length
50
45
40
35
2008
2010
2012
2014
2016
2018
Year


FISHERY
Sum of N adj.=128.1
Sum of N eff.=349.1
Proportion
0.30
0.25
0.20
0.15
0.10
0.05
0.00
10
20
30
40
50
60
70
Length (cm)

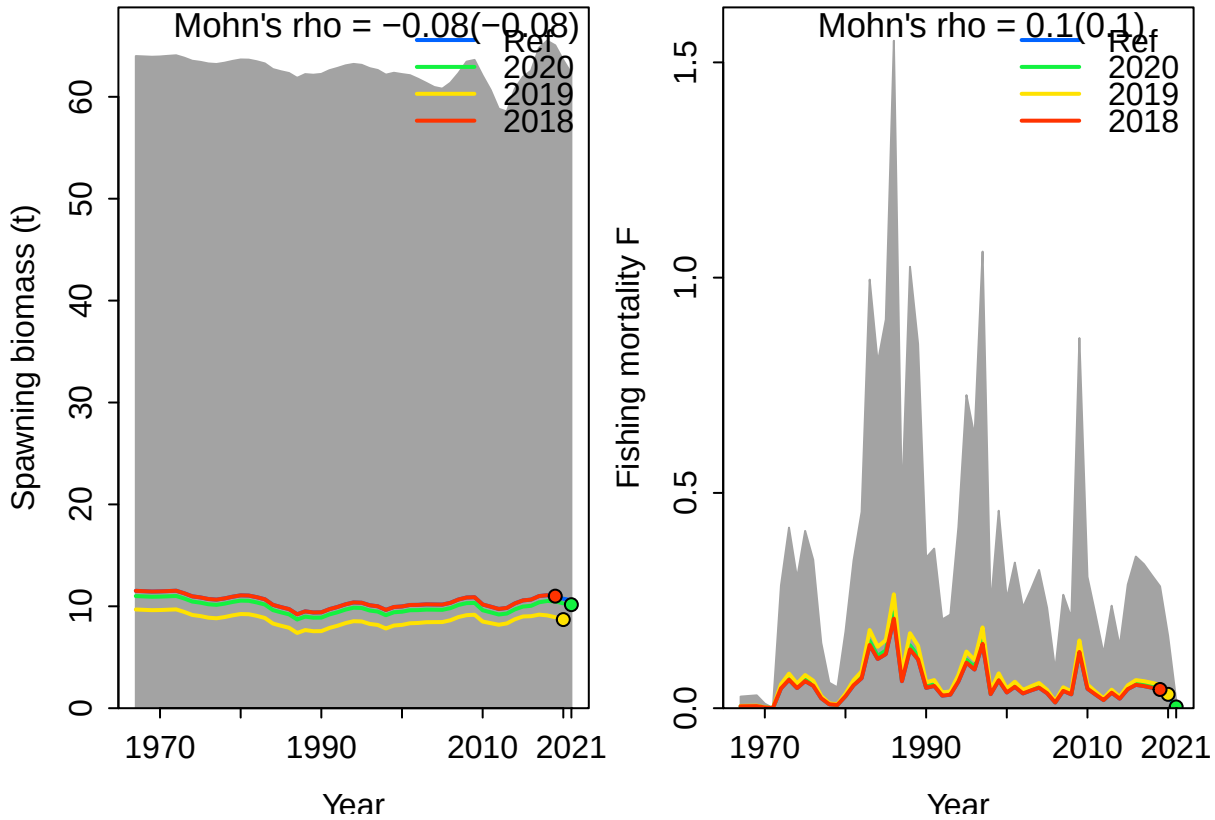


Retrospective and Hindcasting

Retrospective

```
## Plotting Retrospective pattern
```

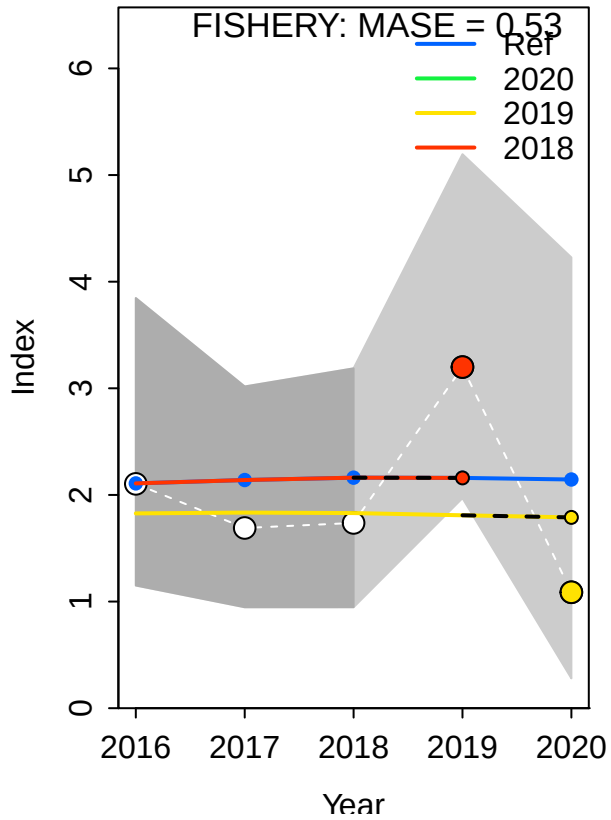
```
##
## Mohn's Rho stats, including one step ahead forecasts:
## Plotting Retrospective pattern
```




```
##
## Mohn's Rho stats, including one step ahead forecasts:

##   type     peel        Rho ForecastRho
## 1    F     2020 0.05344035  0.05201467
## 2    F     2019 0.24823460  0.24844607
## 3    F     2018 0.00000000  0.00000000
## 4    F Combined 0.10055832  0.10015358
```

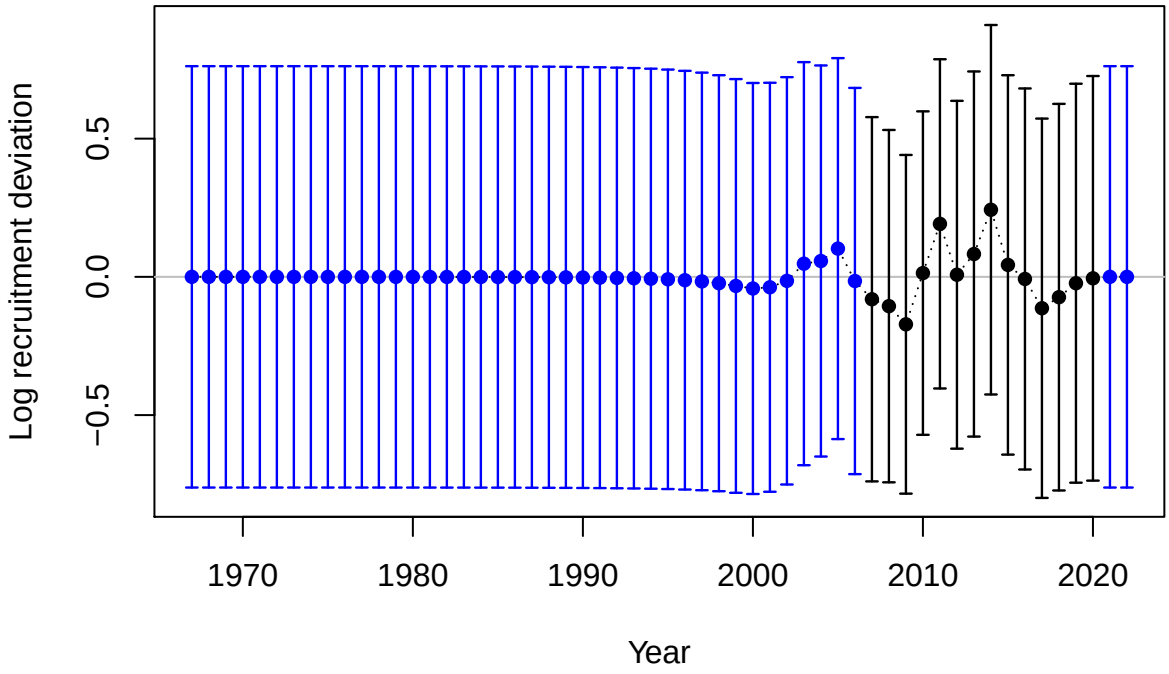
Hindcasting

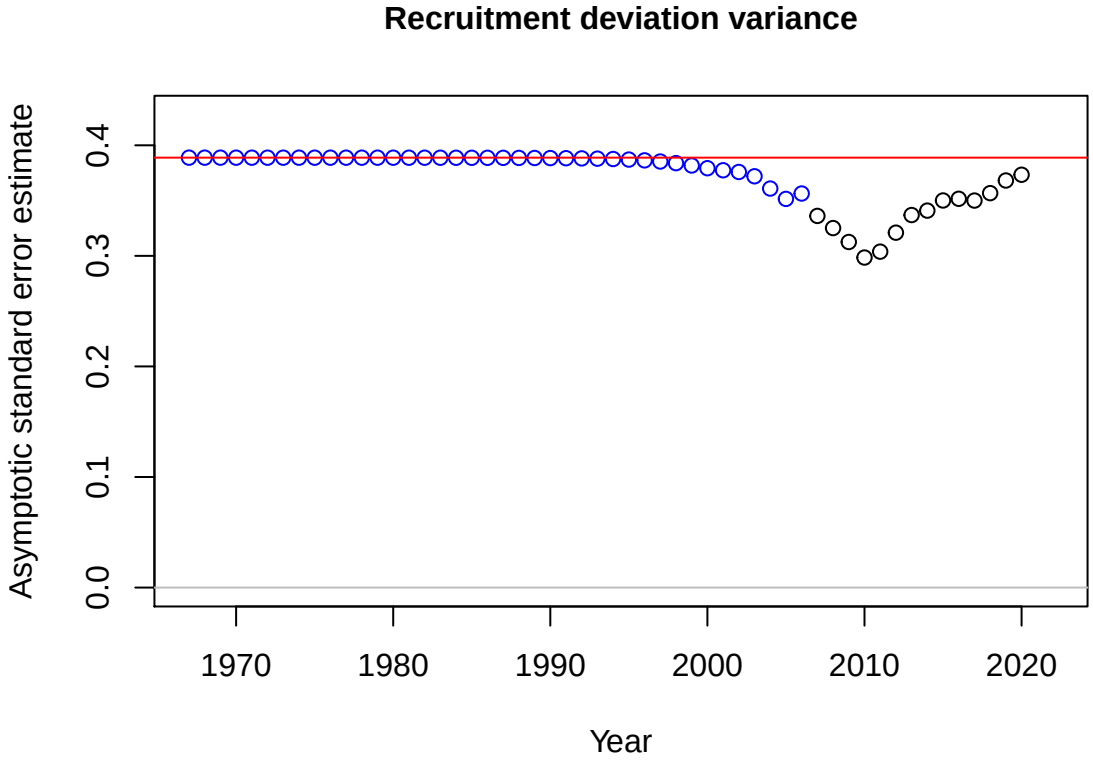
```
## Plotting Hindcast Cross-Validation (one-step-ahead)
##
##  Computing MASE with only 2 of 3  prediction residuals for Index FISHERY
##
##  Warning:  Unequal spacing of naive predictions residuals may influence the interpretation of MASE
```




```
##
## MASE stats by Index:
## Plotting Hindcast Cross-Validation (one-step-ahead)
##
## No observations in evaluation years to compute prediction residuals for Index FISHERY
##
## MASE stats by Index:
```

Recruitment Deviations





Likelihood Profile

```
## [1] "SR_LN"
```

```
## Parameter matching profile.string=SR_LN: SR_LN(R0)
```

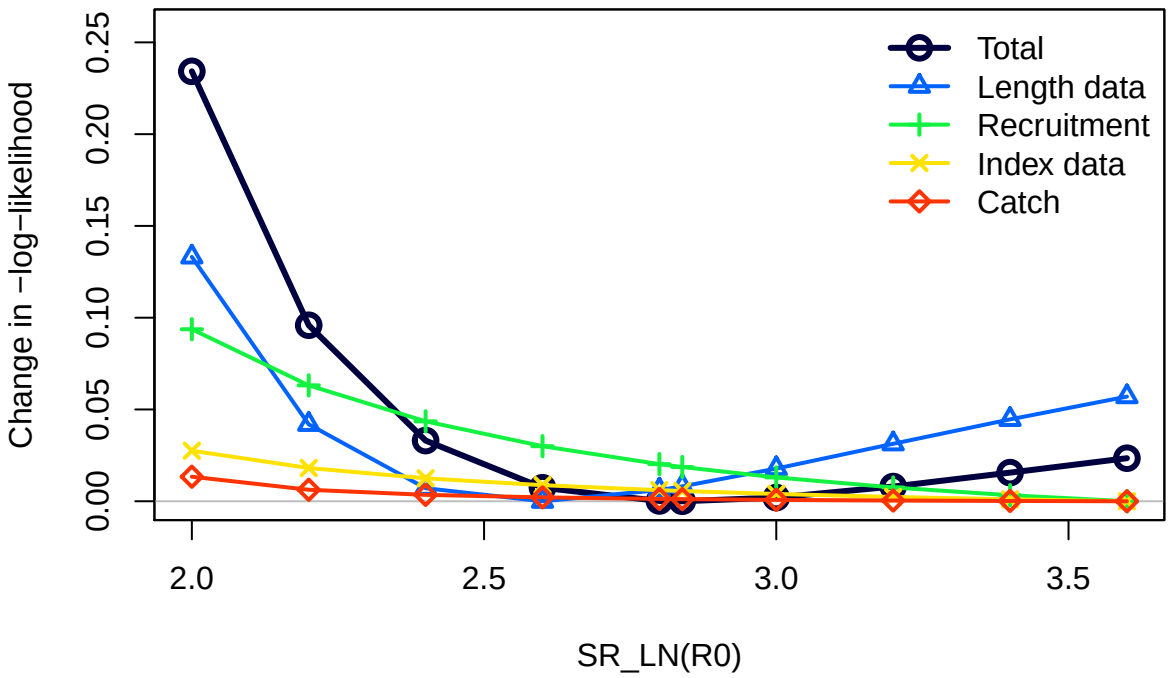
```
## Parameter values (after subsetting based on input 'models'): 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6
```

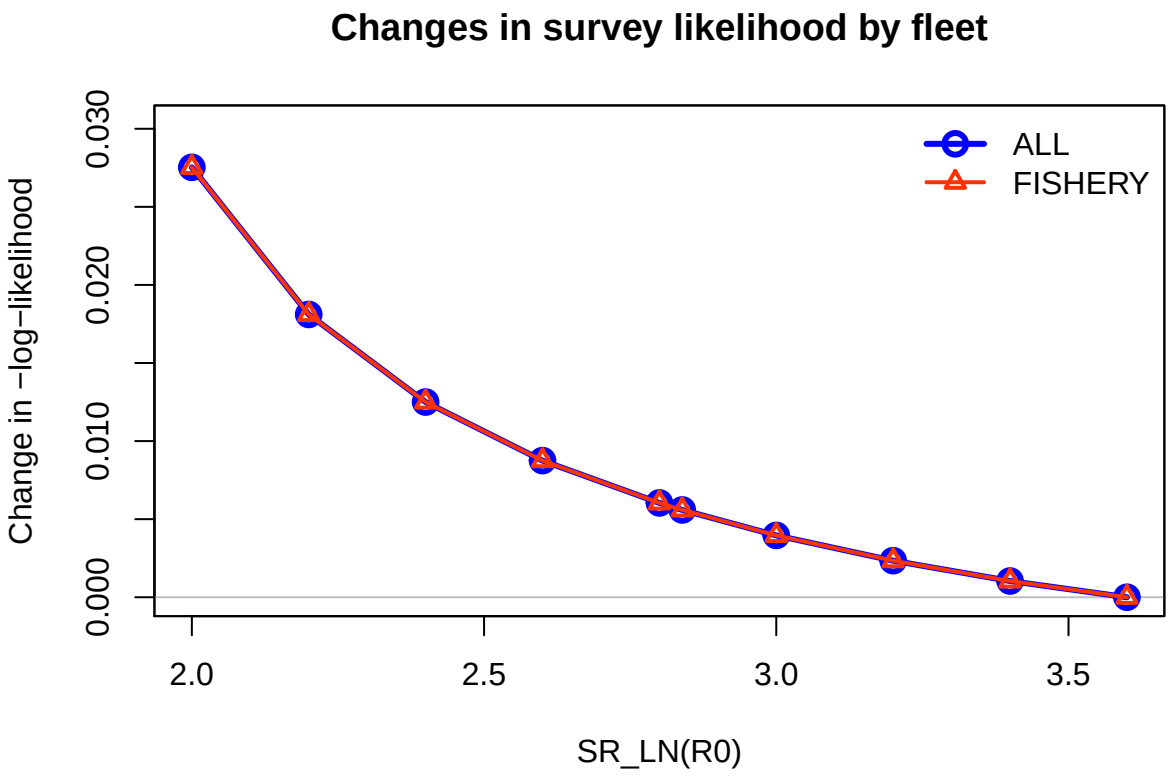
```
##
## Likelihood components showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
```

```
##                       frac_change include                            label
## TOTAL                      1.0000    TRUE                            Total
## Catch                      0.0571    TRUE                            Catch
## Equil_catch                0.0000   FALSE                Equilibrium catch
## Survey                     0.1175    TRUE                       Index data
## Length_comp                0.5683    TRUE                      Length data
## Recruitment                0.4001    TRUE                      Recruitment
## InitEQ_Regime              0.0000   FALSE Initital equilibrium recruitment
## Forecast_Recruitment       0.0000   FALSE             Forecast recruitment
## Parm_priors                0.0000   FALSE                           Priors
## Parm_softbounds            0.0003   FALSE                      Soft bounds
## Parm_devs                  0.0000   FALSE             Parameter deviations
## Crash_Pen                  0.0000   FALSE                    Crash penalty
```

```
## Parameter matching profile.string = 'SR_LN': 'SR_LN(R0)
## Parameter values (after subsetting based on input 'models'): 2, 2.2, 2.4, 2.6, 2.8, 3, 3.2, 3.4, 3.6
```

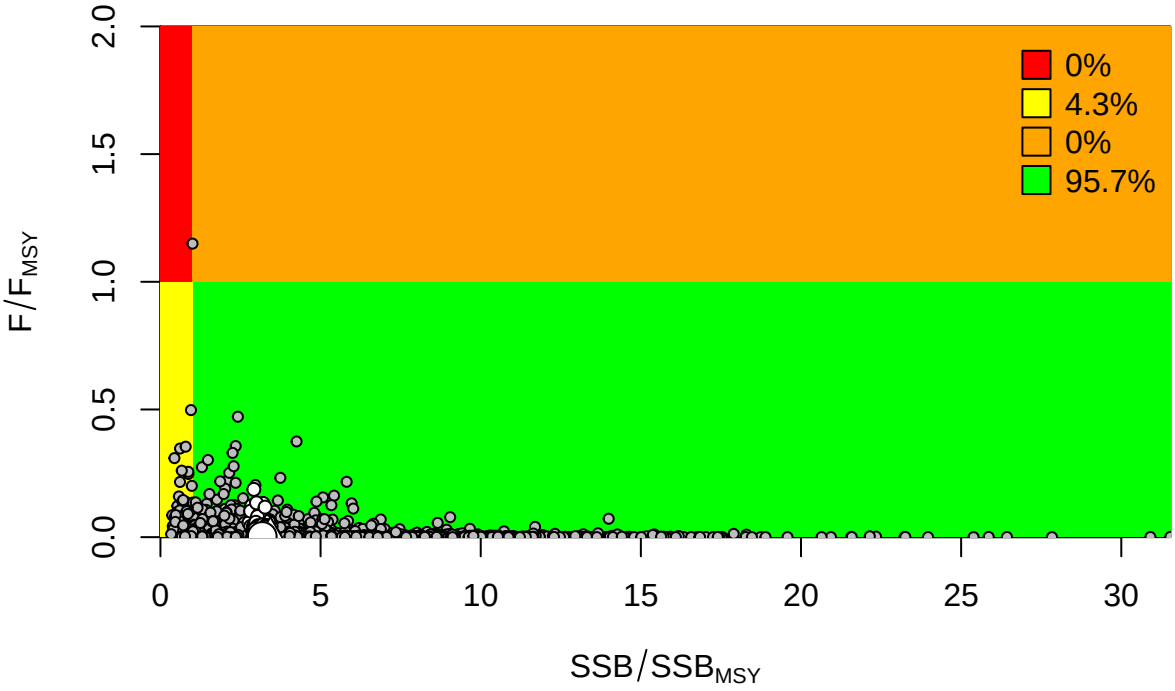
```
## Fleet-specific likelihoods showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
##                         frac_change include
## prof.table....c.1.3..           1    TRUE
```


Change in −log−likelihood
0.00
0.05
0.10
0.15
0.20
0.25
2.0
2.5
3.0
3.5
SR_LN(R0)
Total
Length data
Recruitment
Index data
Catch

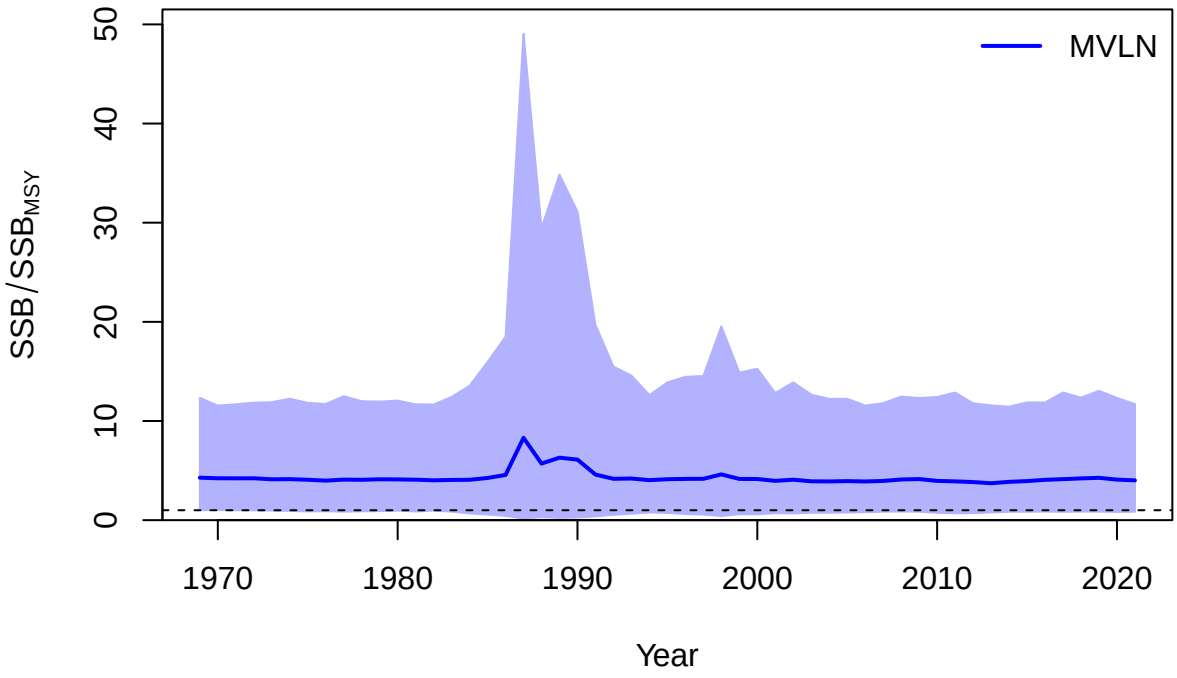


Management Quantities

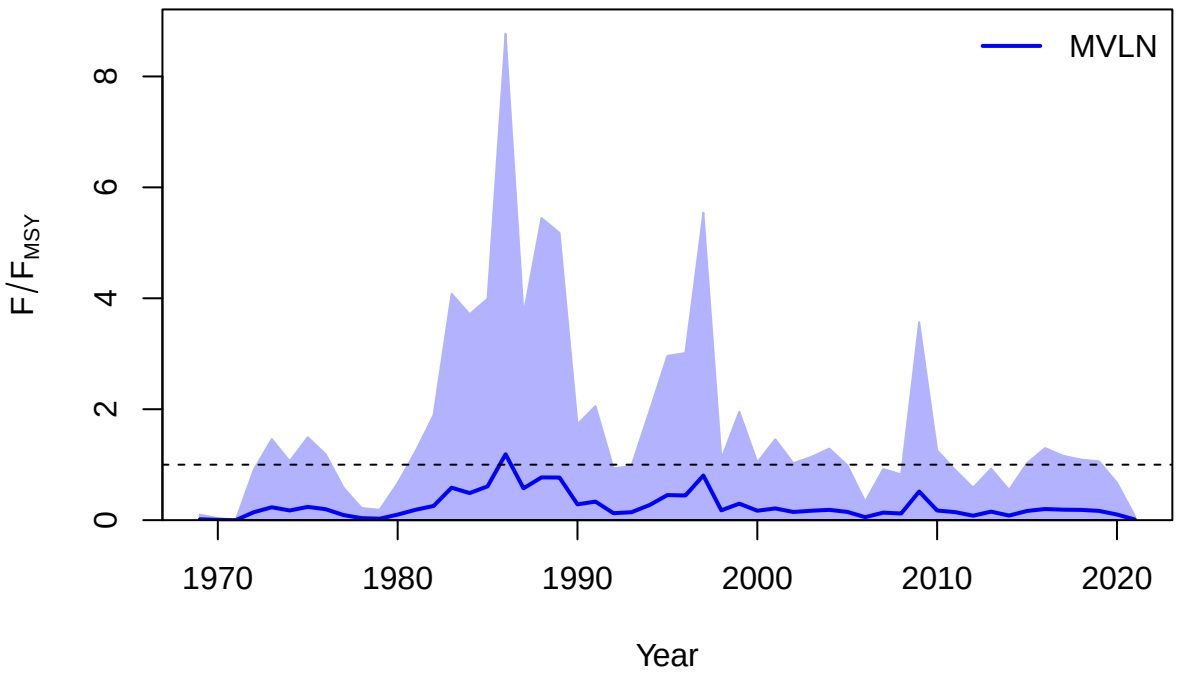
```
##
##  starter.sso with Bratio: SSB/SSBMSY and F: _abs_F
##
```



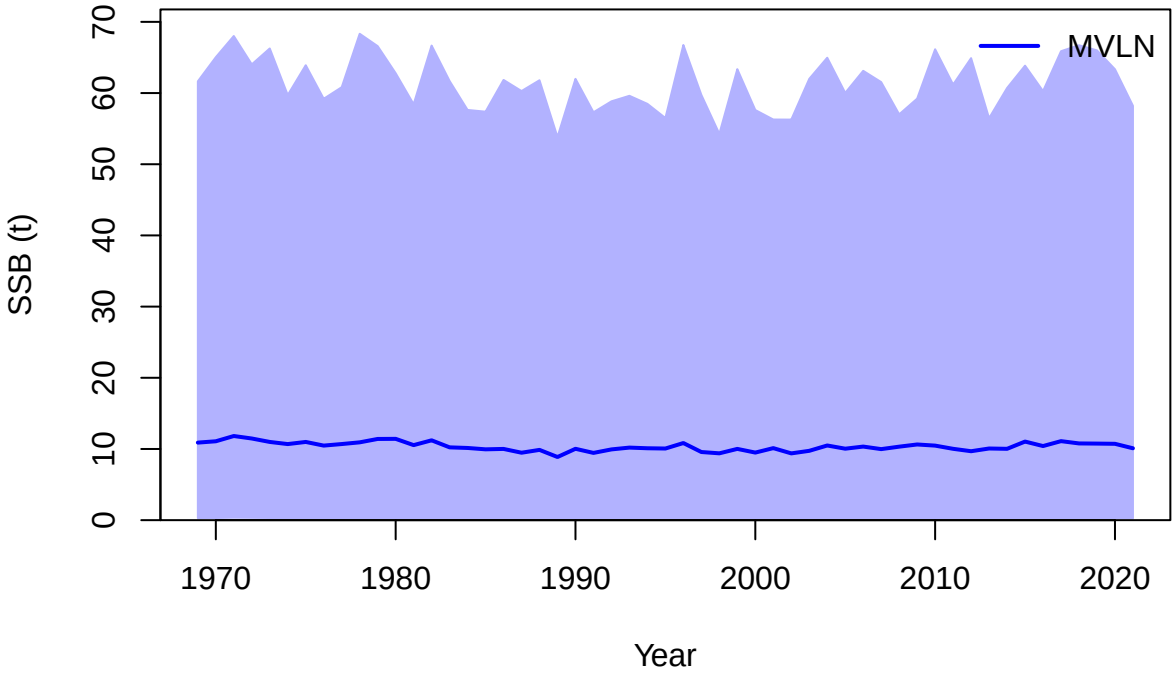

```
##
## Plot Comparison of stock
```



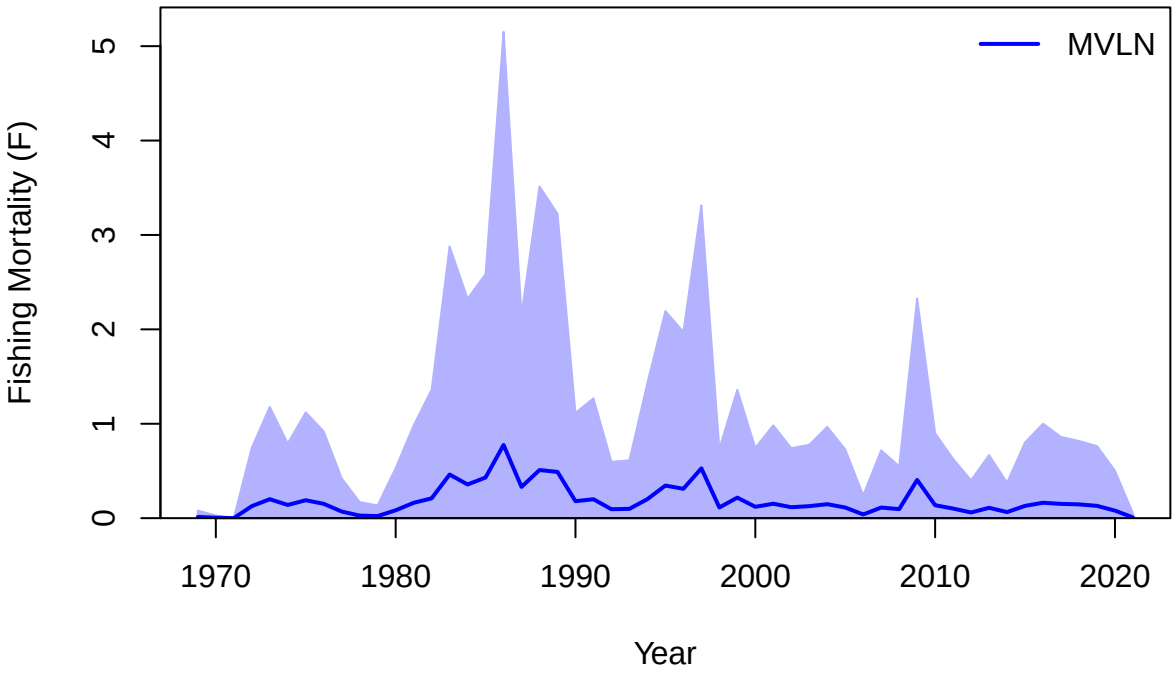

```
##
## Plot Comparison of harvest
```




```
##
## Plot Comparison of SSB
```

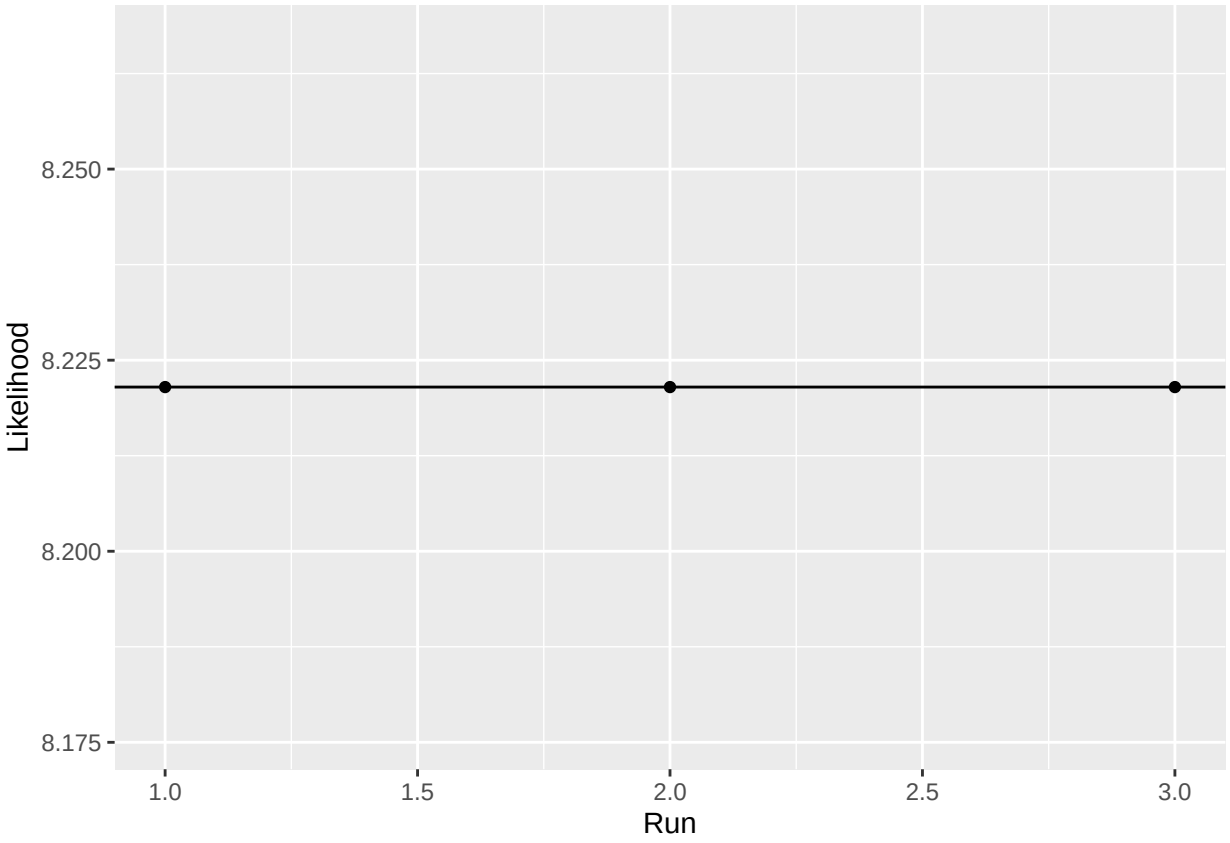


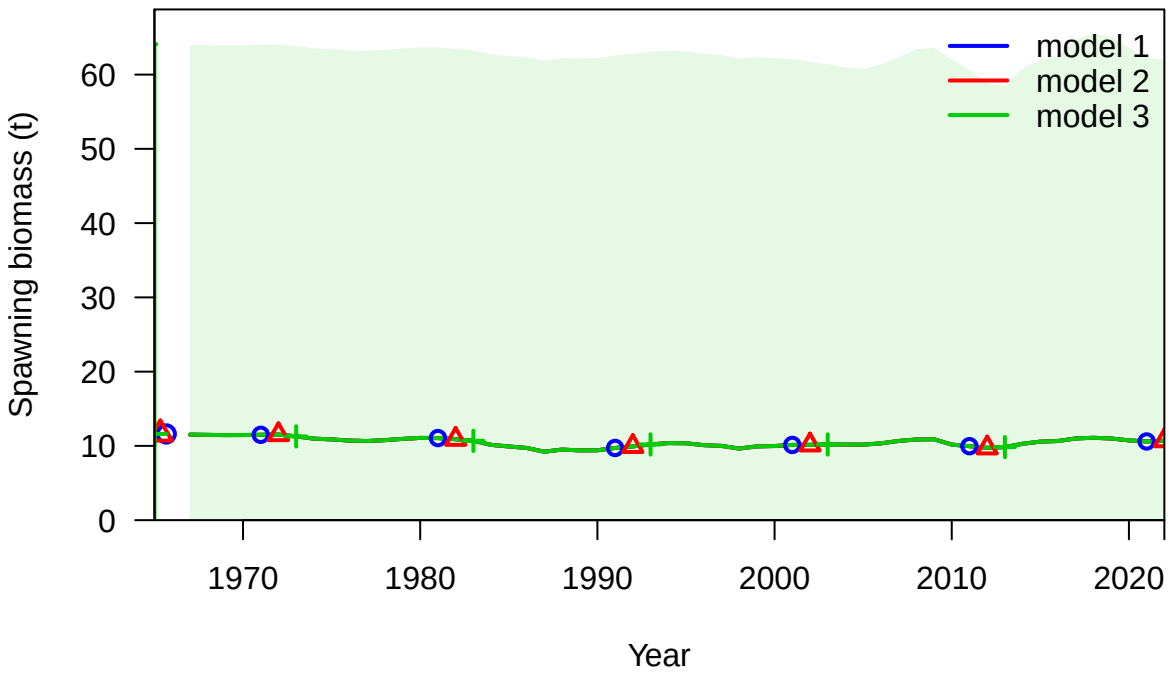

```
##
## Plot Comparison of F
```

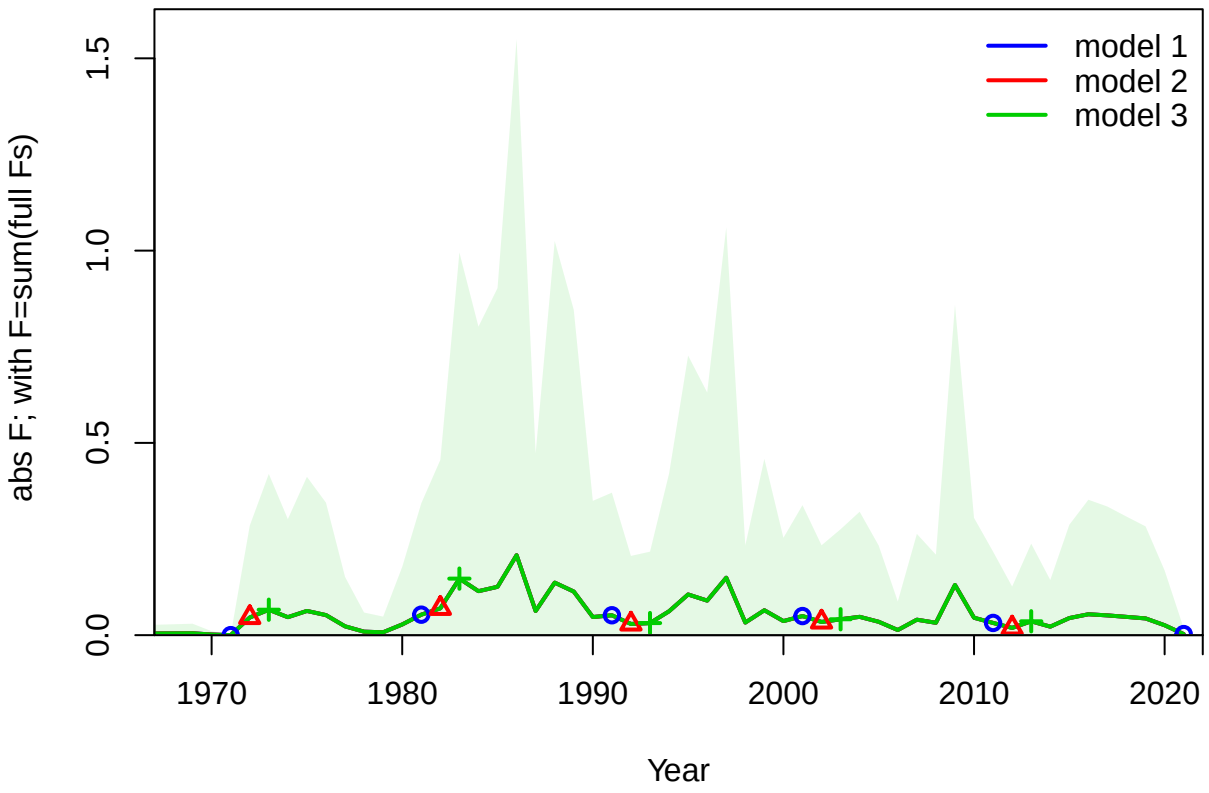

MVLN
Fishing Mortality (F)
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year

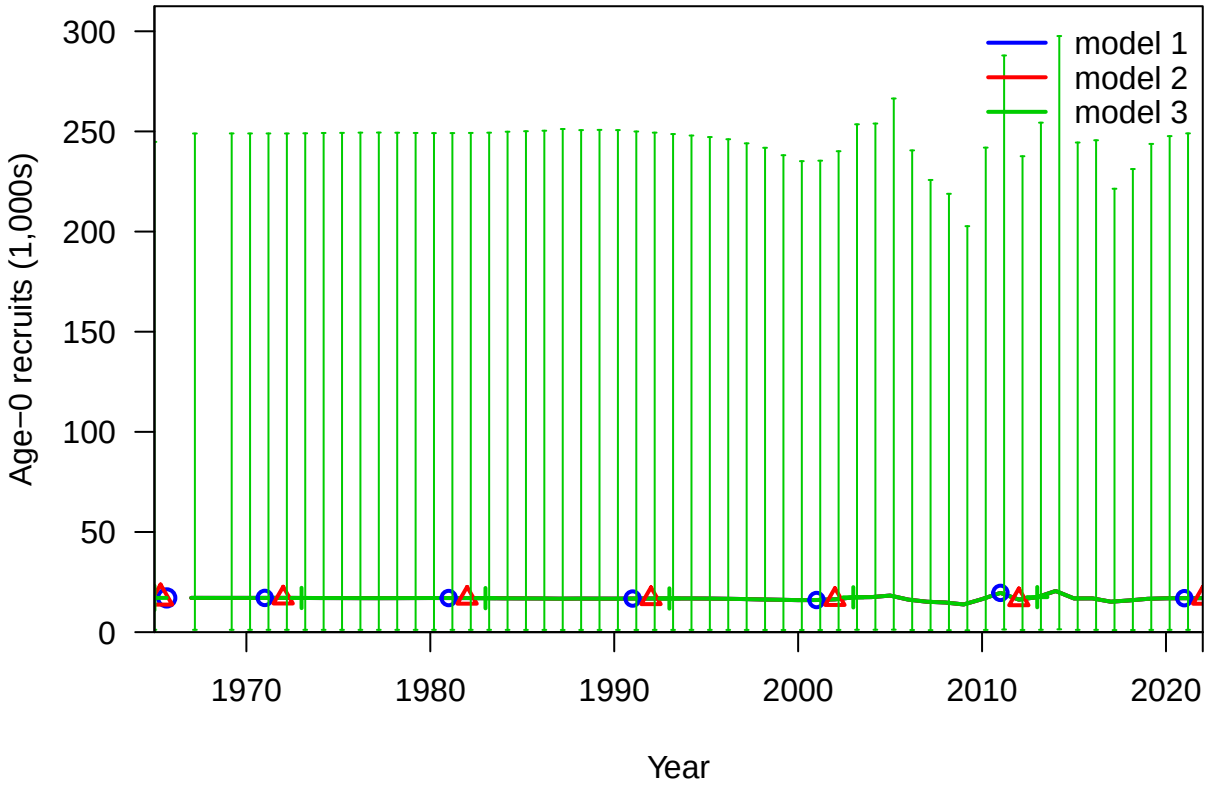
```
## RStudioGD
##         2
```

Jitter




model 1
model 2
model 3
Spawning biomass (t)
0
10
20
30
40
50
60
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
abs F; with F=sum(full Fs)
0.0
0.5
1.0
1.5
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
Age−0 recruits (1,000s)
300
250
200
150
100
50
0
1970
1980
1990
2000
2010
2020
Year