American Samoa Model Checks

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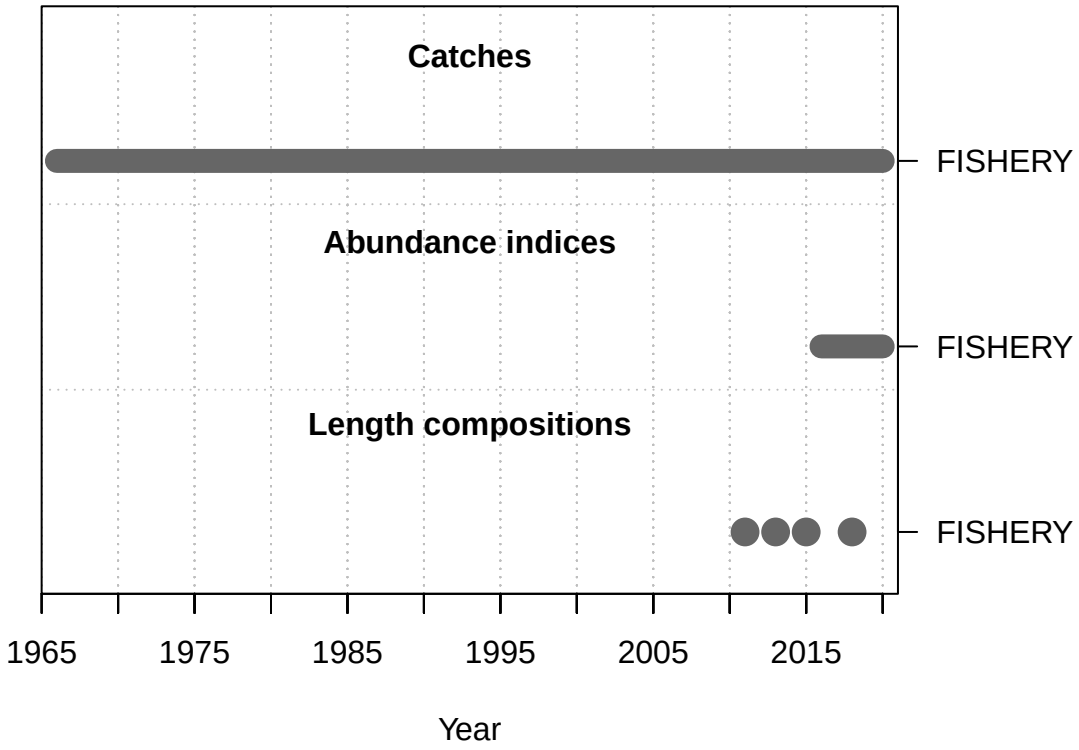
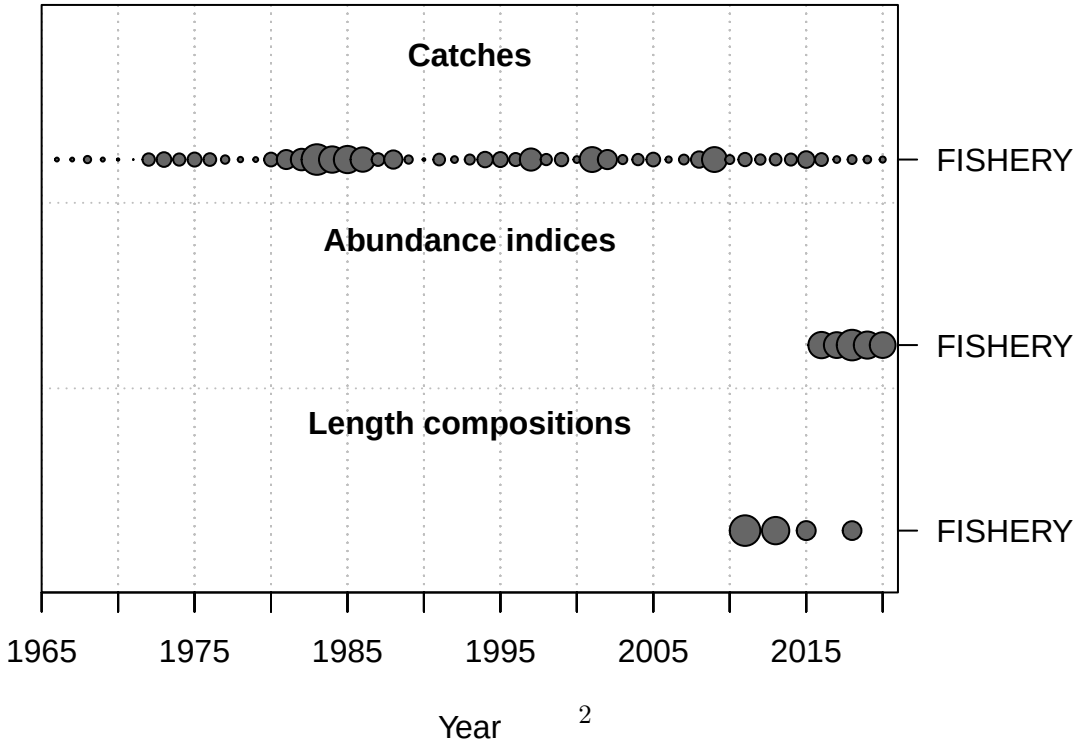
This is a summary report for the PRFL base model run.

Model Output

Input Data





Convergence Check

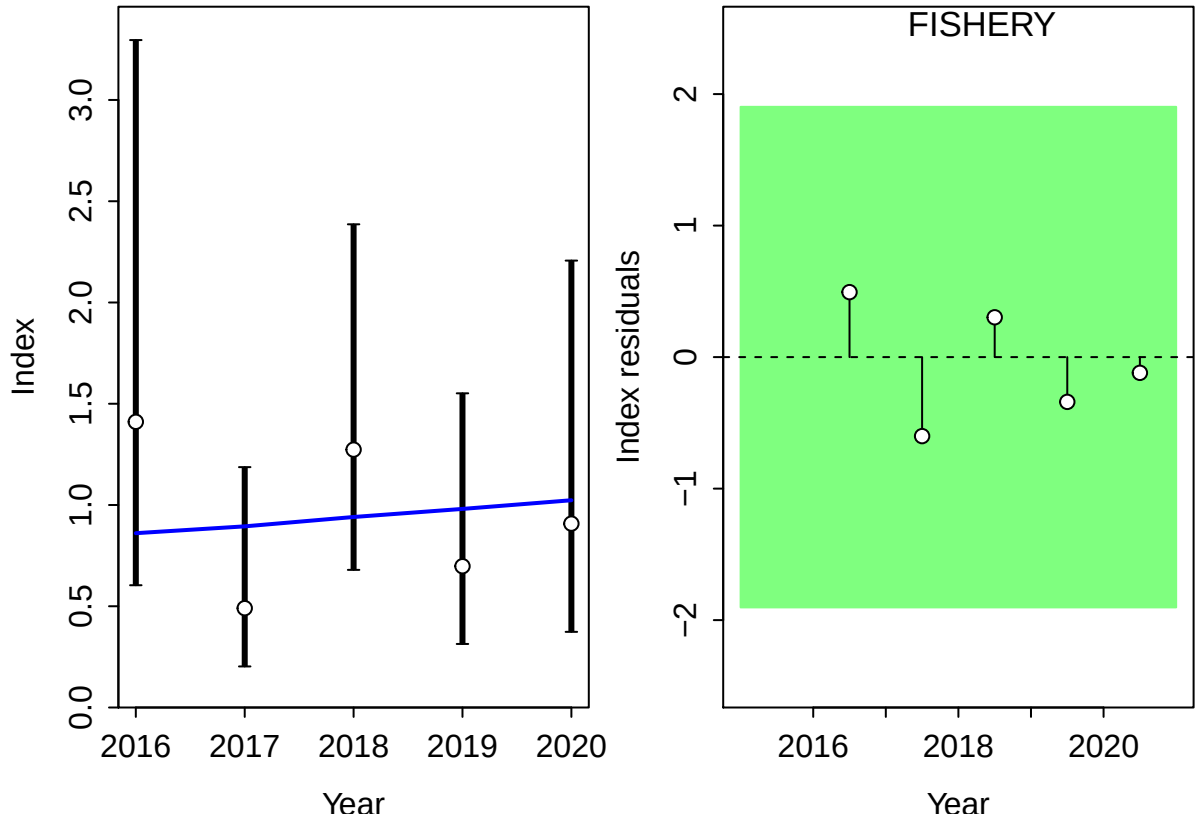
```
##   Converged    MaxGrad
## 1      TRUE 8.3318e-05
```

```
## [1] "1 catch is 0.0 in endyr; this can cause problem in the benchmark and forecast calculations"
## [2] "2 NOTE:  Max data length bin: 48  < max pop len bins: 53; so will accumulate larger pop len bins
## [3] "3 parameter init value is less than parameter min 1 < 5 for parm: 2 ; search for <now check> in
## [4] "4 warning: poor convergence in Fmsy, final dy/dy2= -0.016284"
## [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

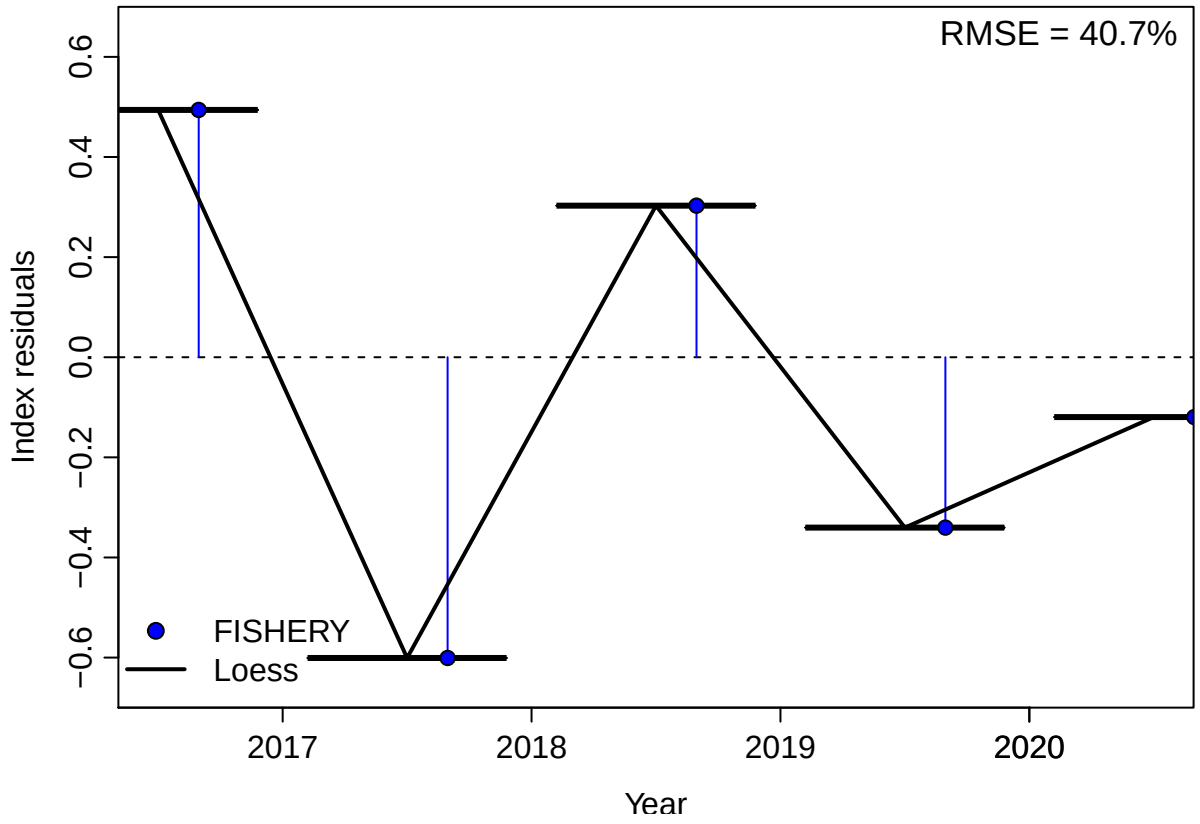
CPUE

```
##
##  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
## of freedom.

## 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 ne
## 4.0804
```



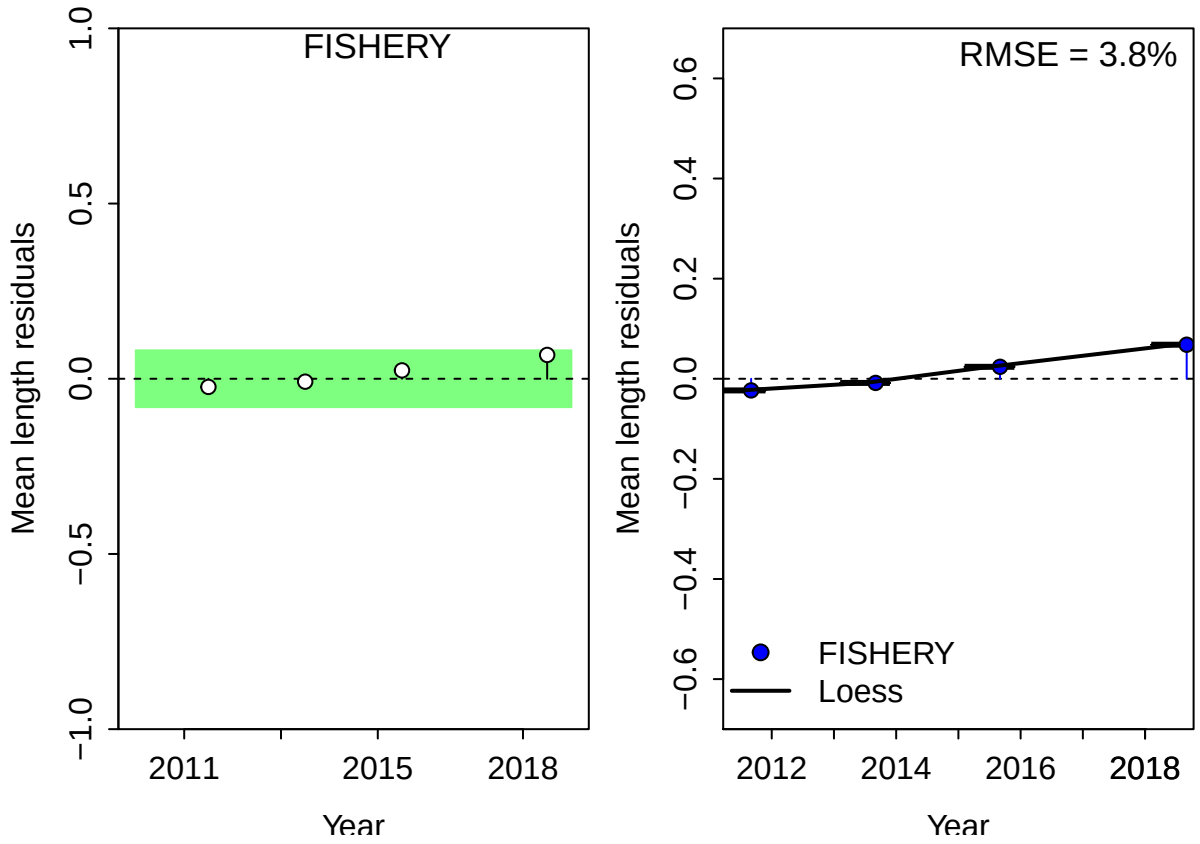

```
##
## RMSE stats by Index:
```

Length Comp

#Factor	Fleet	New_Var_adj	Type	Name
4	1	0.27962	len	FISHERY

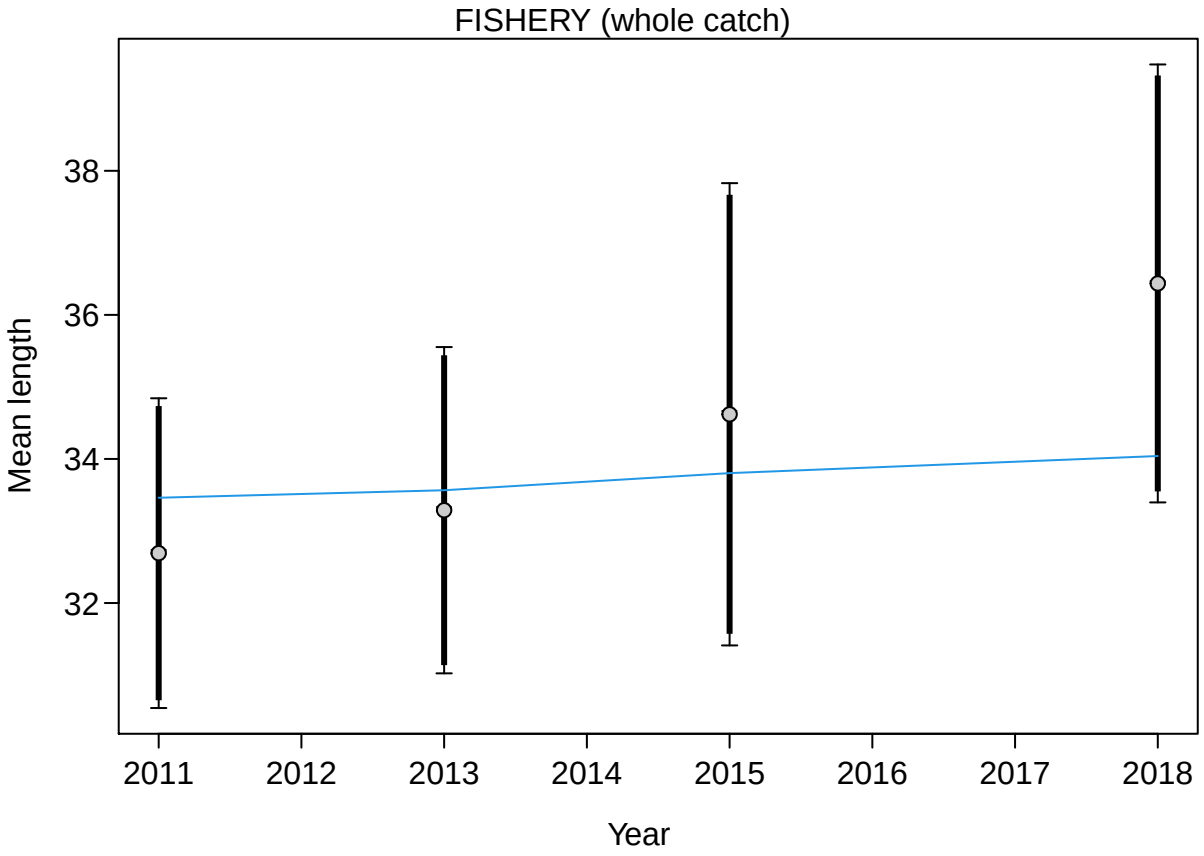
```
##
##  Running Runs Test Diagnosics for Mean length
## Plotting Residual Runs Tests
```

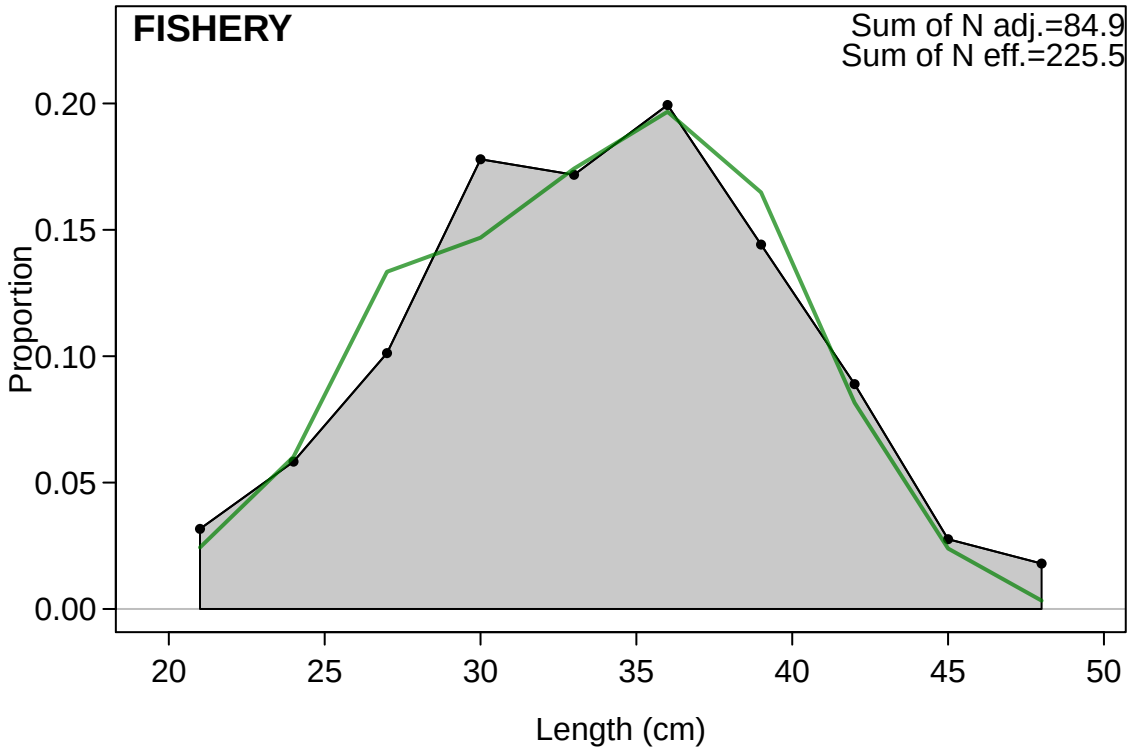
```
##
## Runs Test stats by Mean length:

##     Index runs.p   test   sigma3.lo  sigma3.hi type
## 1 FISHERY   0.11 Passed -0.08092148 0.08092148  len

## Plotting JABBA residual plot

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

## 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 ne
## 25.351
```

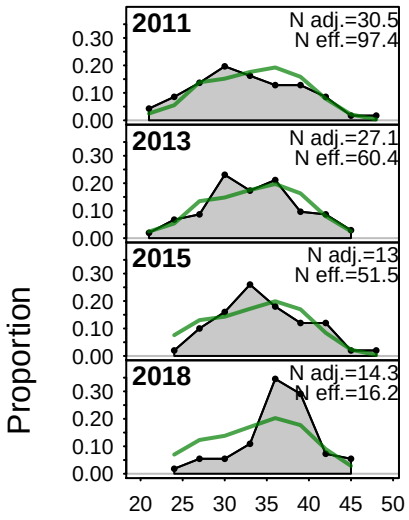



```
##
## RMSE stats by Index:
```

```
##    indices RMSE.perc nobs
## 1  FISHERY       3.8    4
## 2 Combined       3.8    4
```




FISHERY
Sum of N adj.=84.9
Sum of N eff.=225.5
Proportion
0.00
0.05
0.10
0.15
0.20
20
25
30
35
40
45
50
Length (cm)

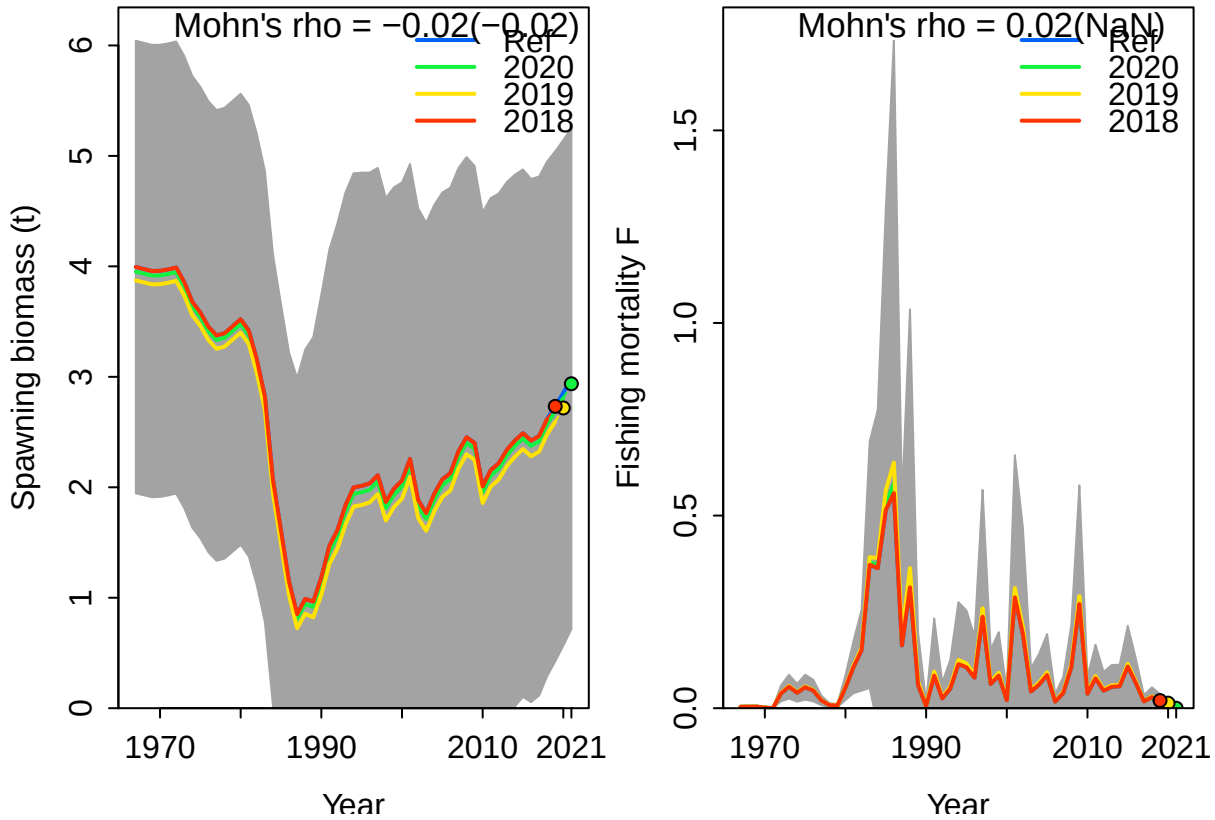


Retrospective and Hindcasting

Retrospective

```
## Plotting Retrospective pattern
```

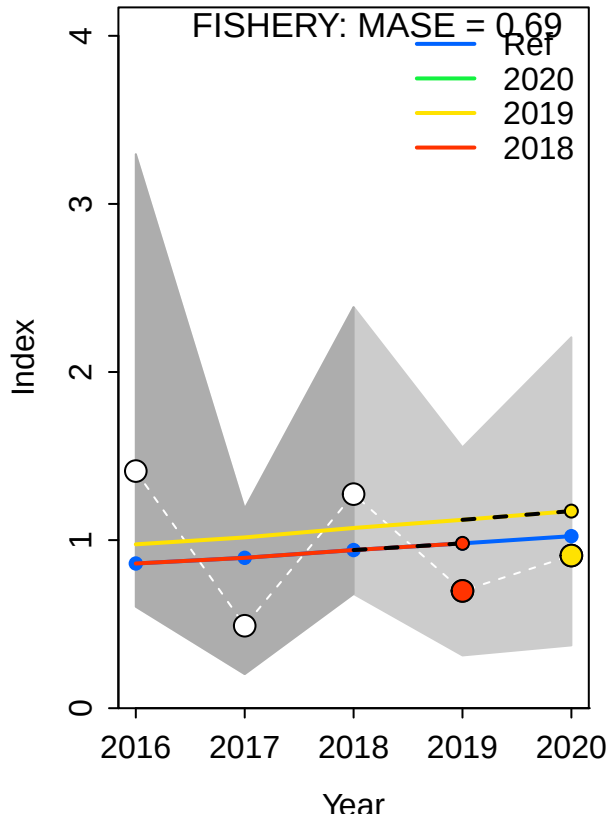
```
##
## Mohn's Rho stats, including one step ahead forecasts:
## Plotting Retrospective pattern
```




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

##   type     peel        Rho ForecastRho
## 1    F     2020 0.01629352         NaN
## 2    F     2019 0.05241235  0.04961133
## 3    F     2018 0.00000000  0.00000000
## 4    F Combined 0.02290196         NaN
```

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

```
## Skipped SSplotrecdevs - no rec devs estimated
```

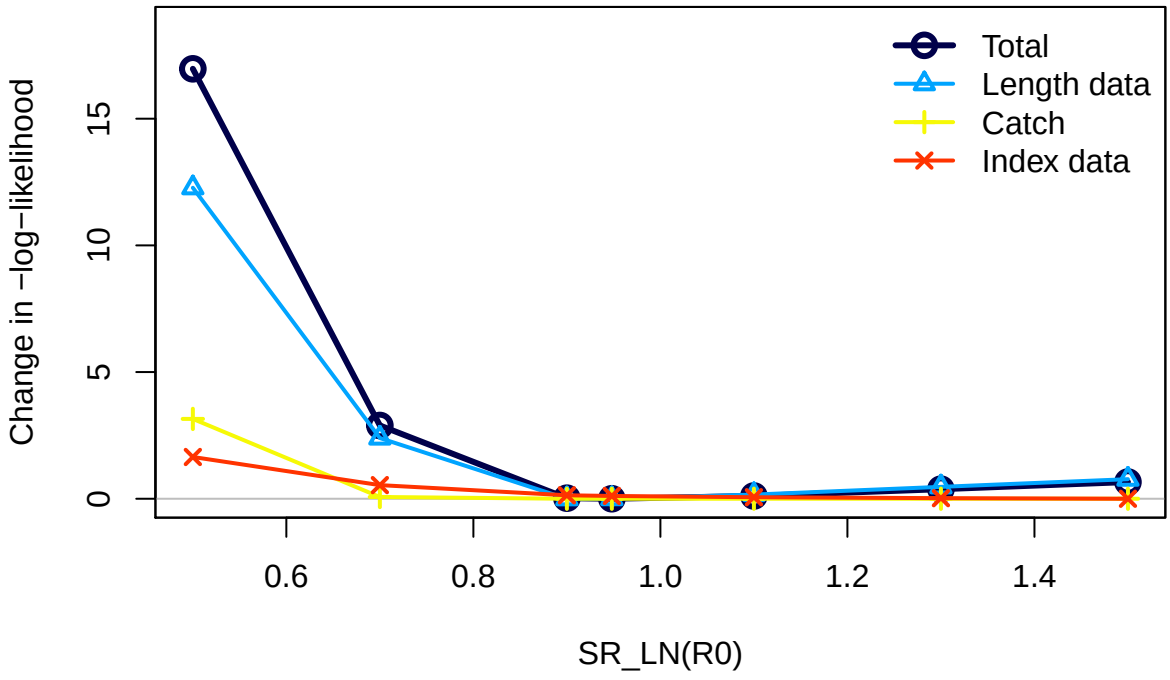
Likelihood Profile

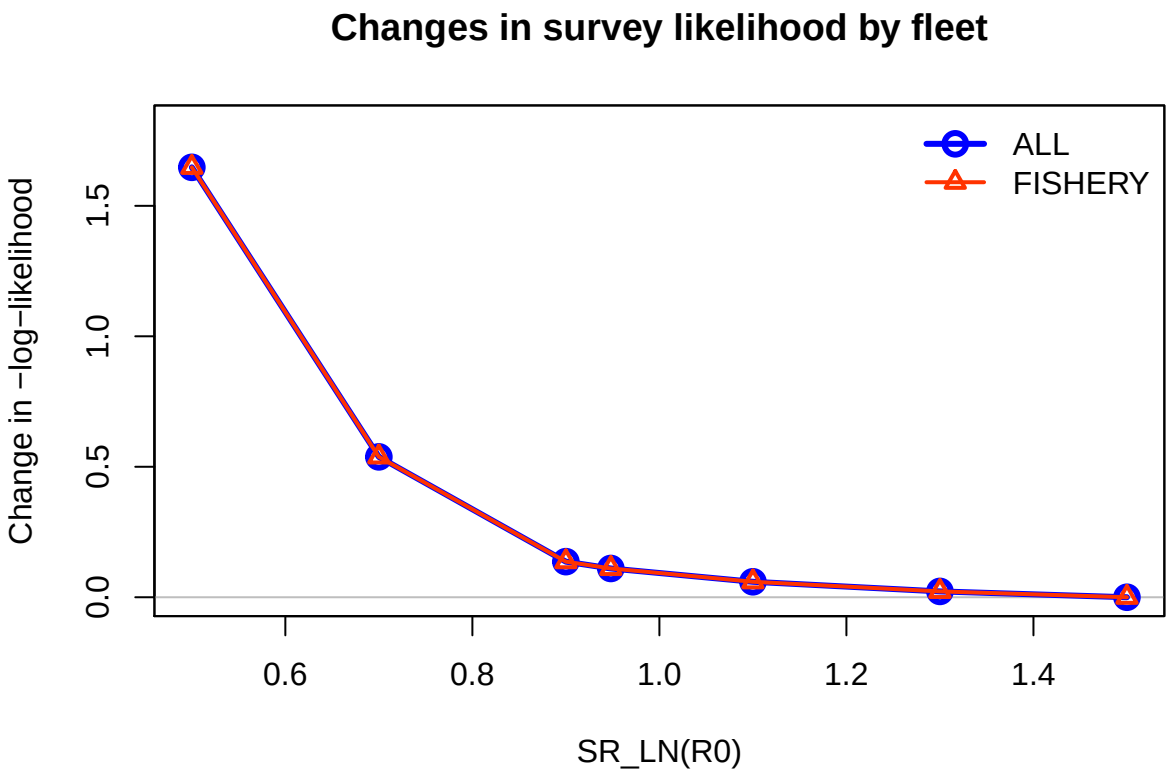
```
## [1] "SR_LN"

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

## Parameter values (after subsetting based on input 'models'): 0.5, 0.7, 0.9, 1.1, 1.3, 1.5, 0.948059

##
## 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                      0.1857    TRUE                           Catch
## Equil_catch                0.0000   FALSE                 Equilibrium catch
## Survey                     0.0971    TRUE                        Index data
## Length_comp                0.7234    TRUE                       Length data
## Recruitment                0.0000   FALSE                       Recruitment
## InitEQ_Regime              0.0000   FALSE Initital equilibrium recruitment
## Forecast_Recruitment       0.0000   FALSE             Forecast recruitment
## Parm_priors                0.0000   FALSE                           Priors
## Parm_softbounds            0.0005   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'): 0.5, 0.7, 0.9, 1.1, 1.3, 1.5, 0.948059,
```

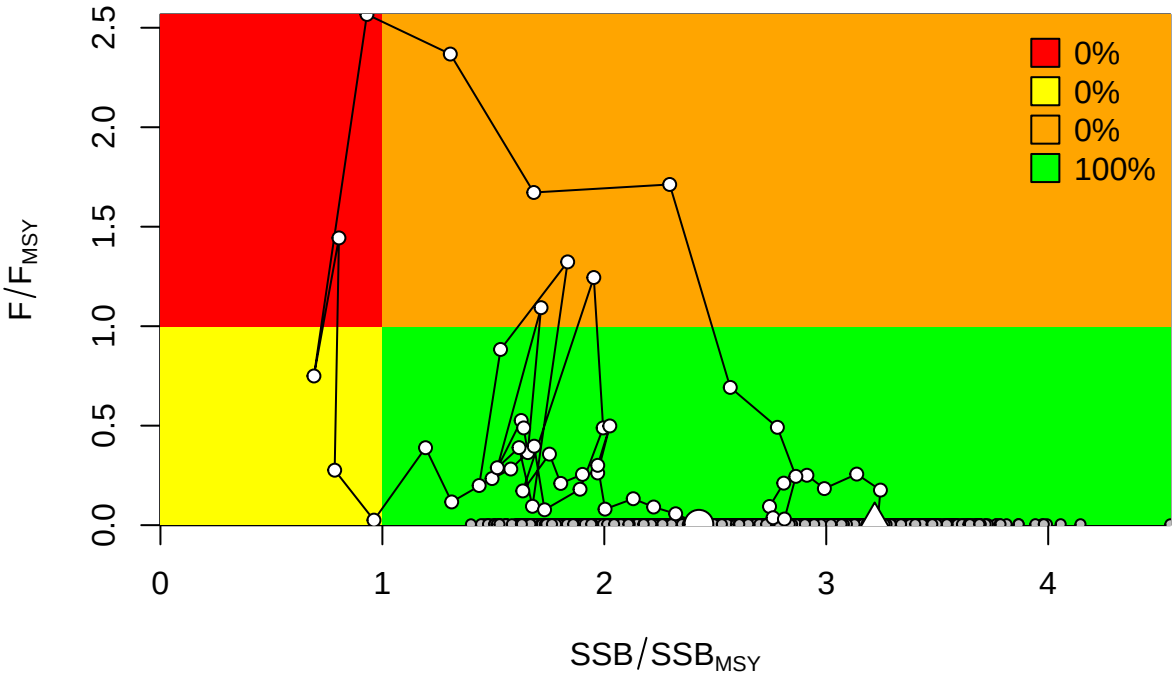
```
## Fleet-specific likelihoods showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
##                        frac_change include
## prof.table....c.1.3..            1    TRUE
```



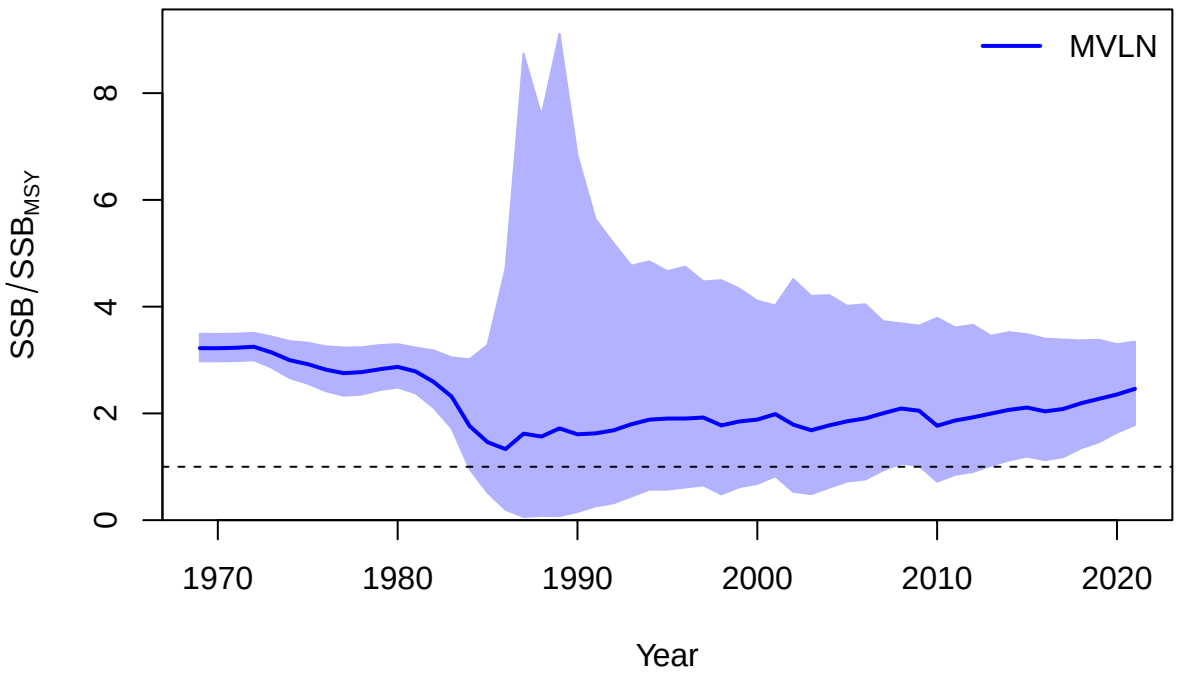


Management Quantities

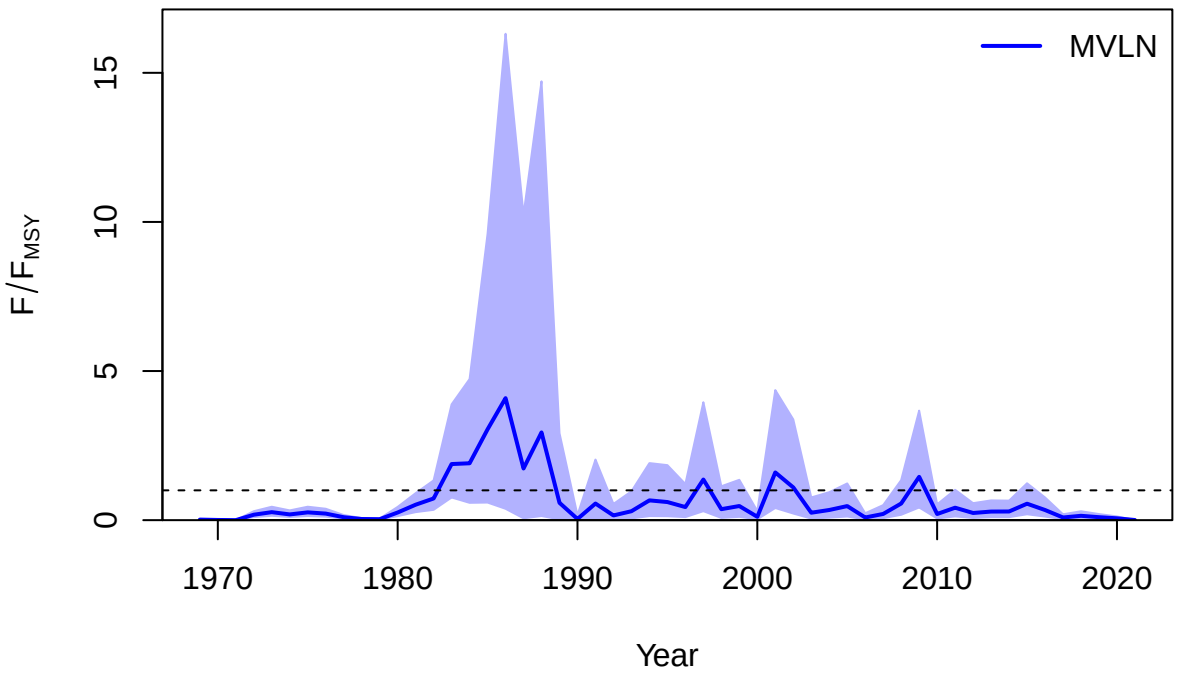
```
##
##  starter.sso with Bratio: SSB/SSBMSY and F: _abs_F
##
```



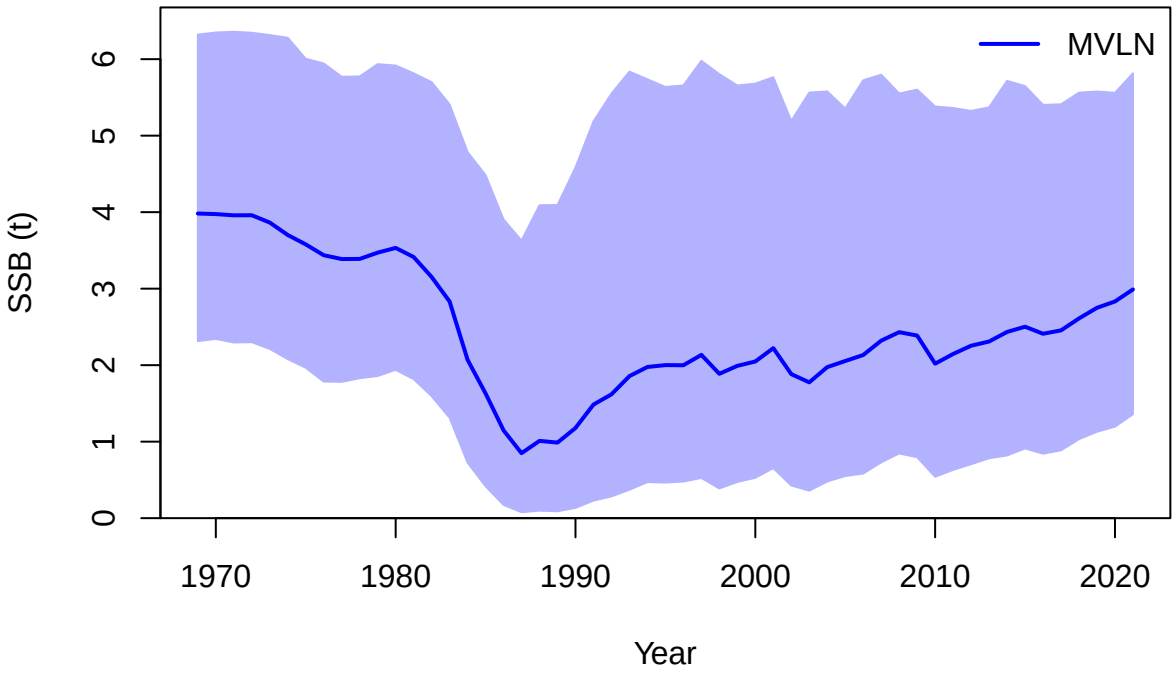

```
##
## Plot Comparison of stock
```



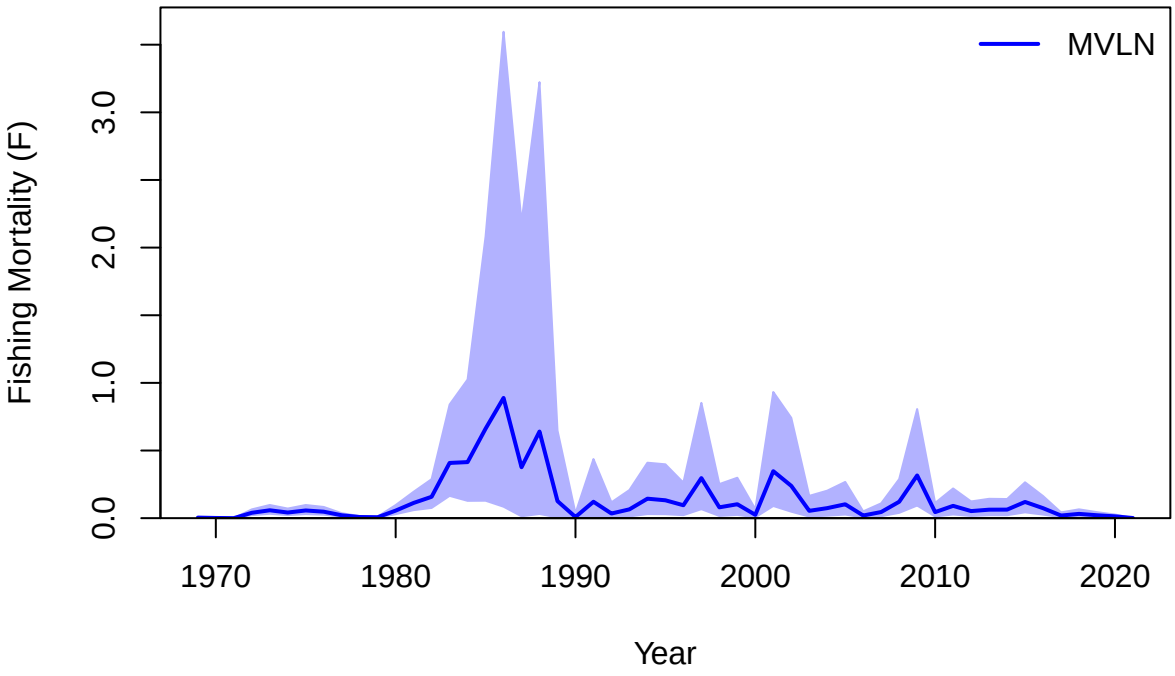

```
##
## Plot Comparison of harvest
```




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

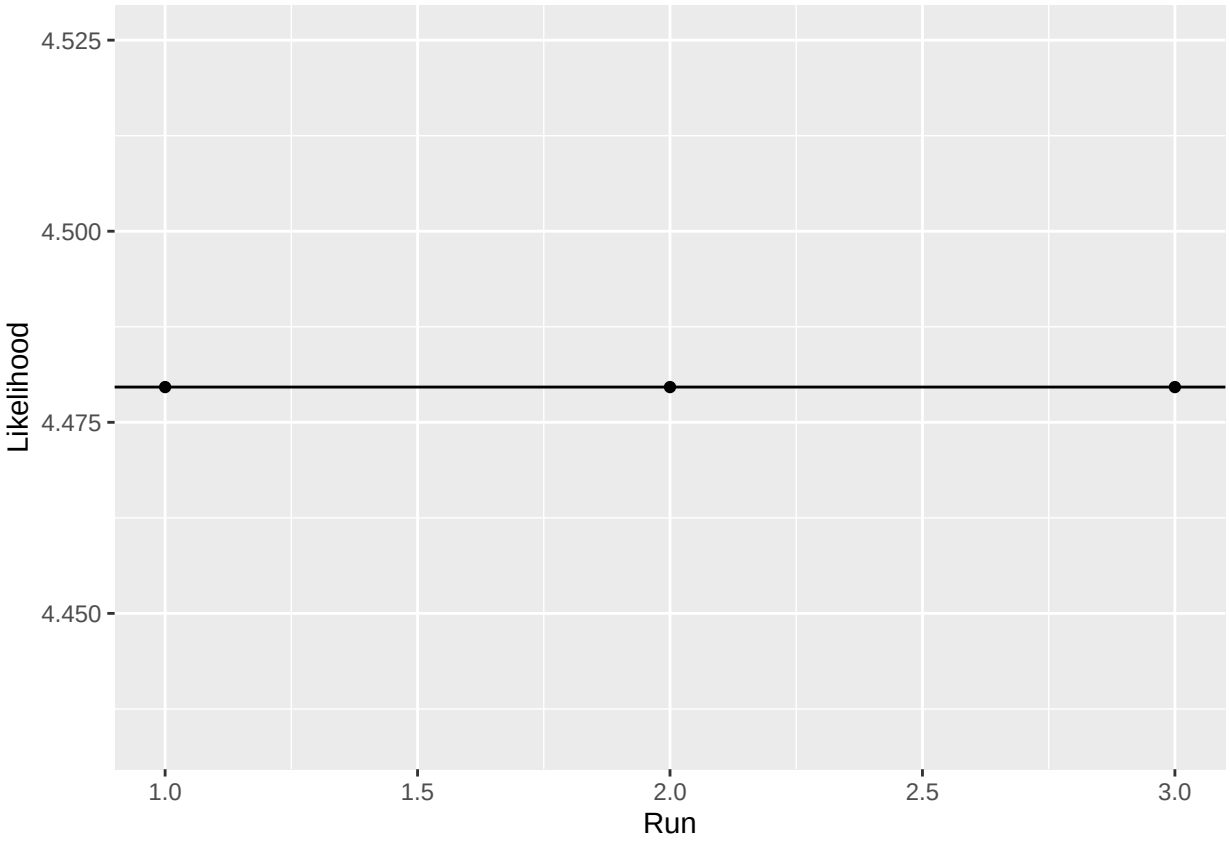


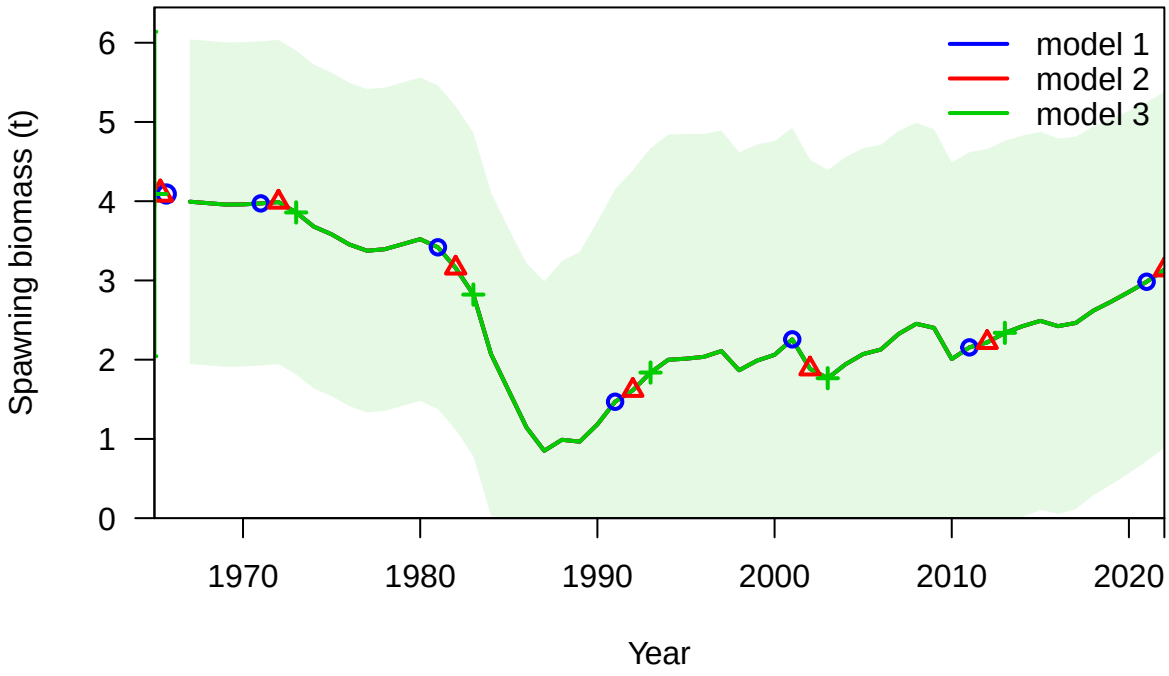

```
##
## Plot Comparison of F
```

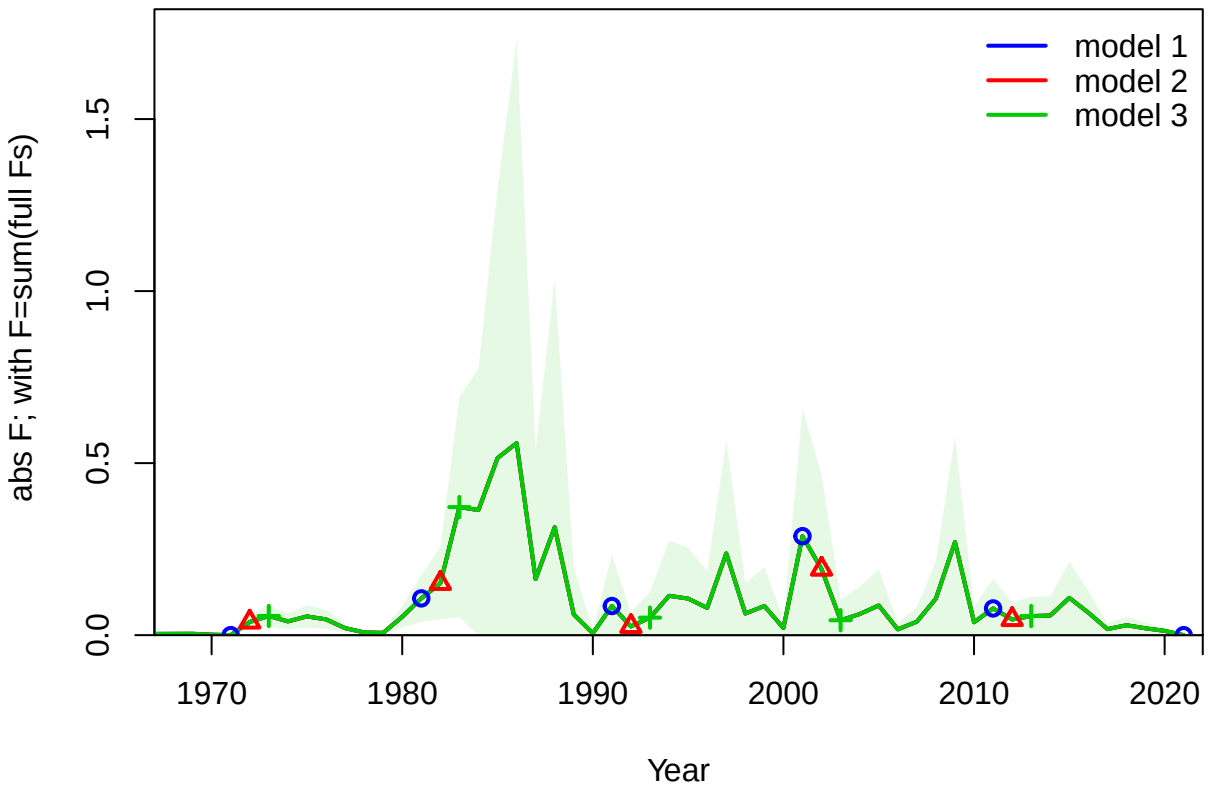

MVLN
Fishing Mortality (F)
0.0
1.0
2.0
3.0
1970
1980
1990
2000
2010
2020
Year

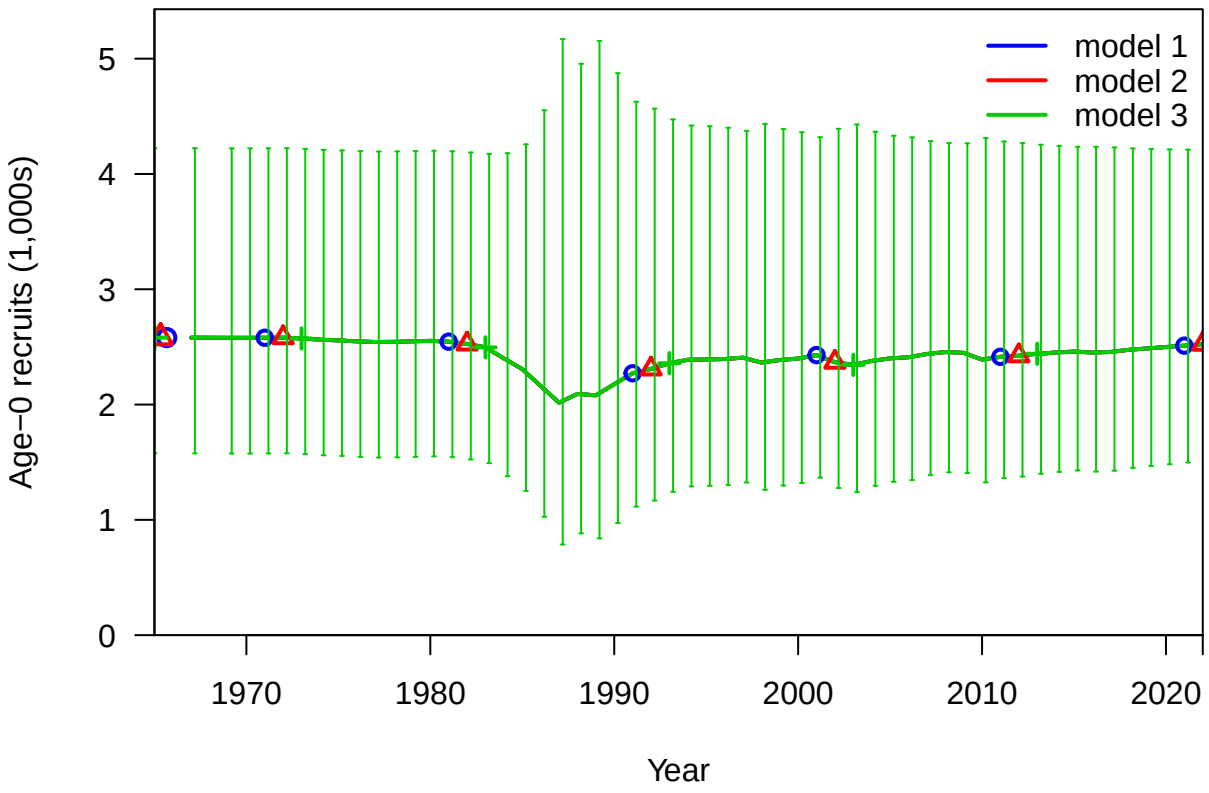
```
## RStudioGD
##         2
```

Jitter




model 1
model 2
model 3
Spawning biomass (t)
0
1
2
3
4
5
6
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)
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year