# American Samoa Model Checks

Meg Oshima

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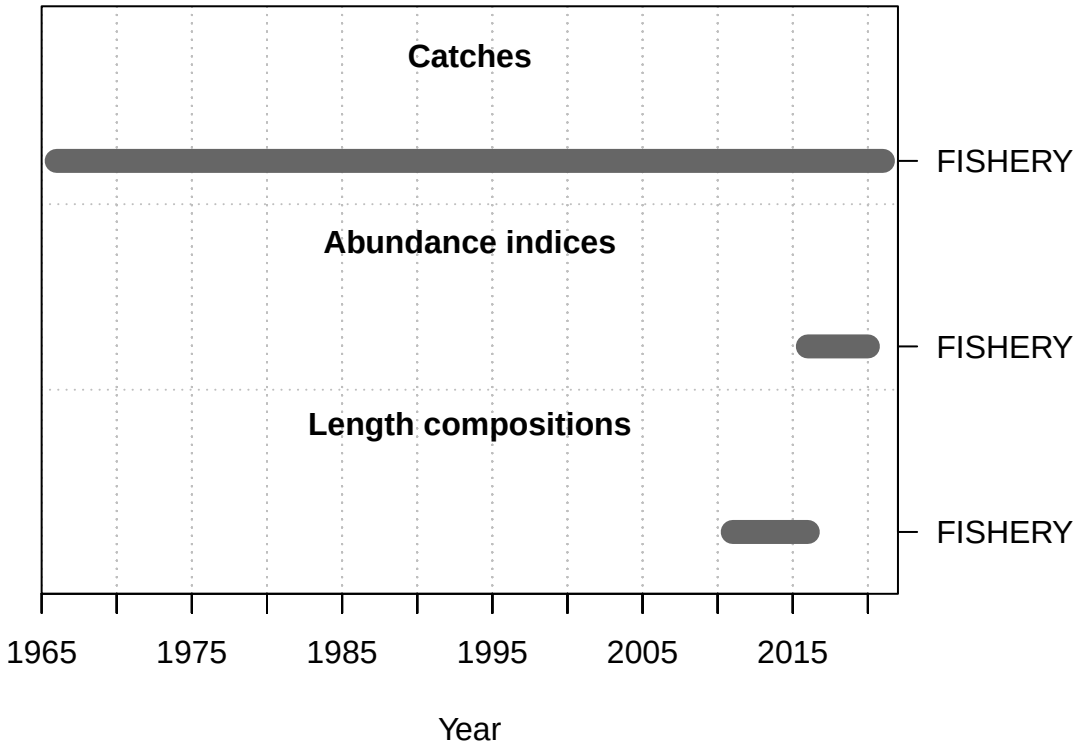
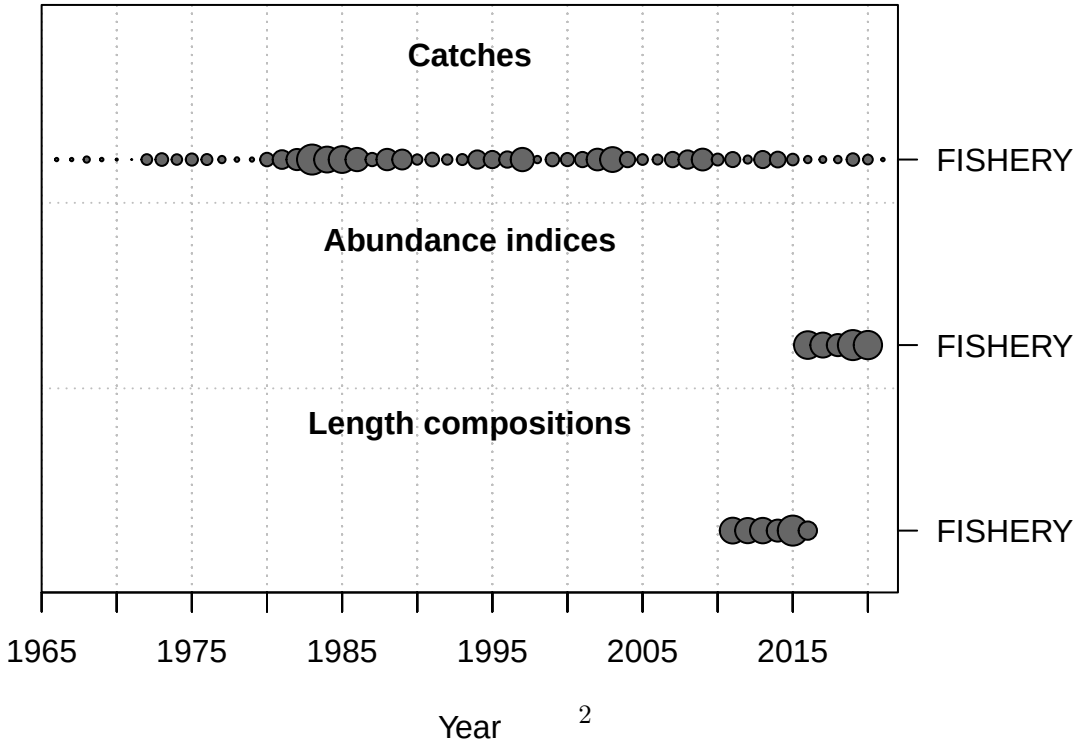
**This is a summary report for the VALO base model run.**

# Model Output

## Input Data



## Convergence Check

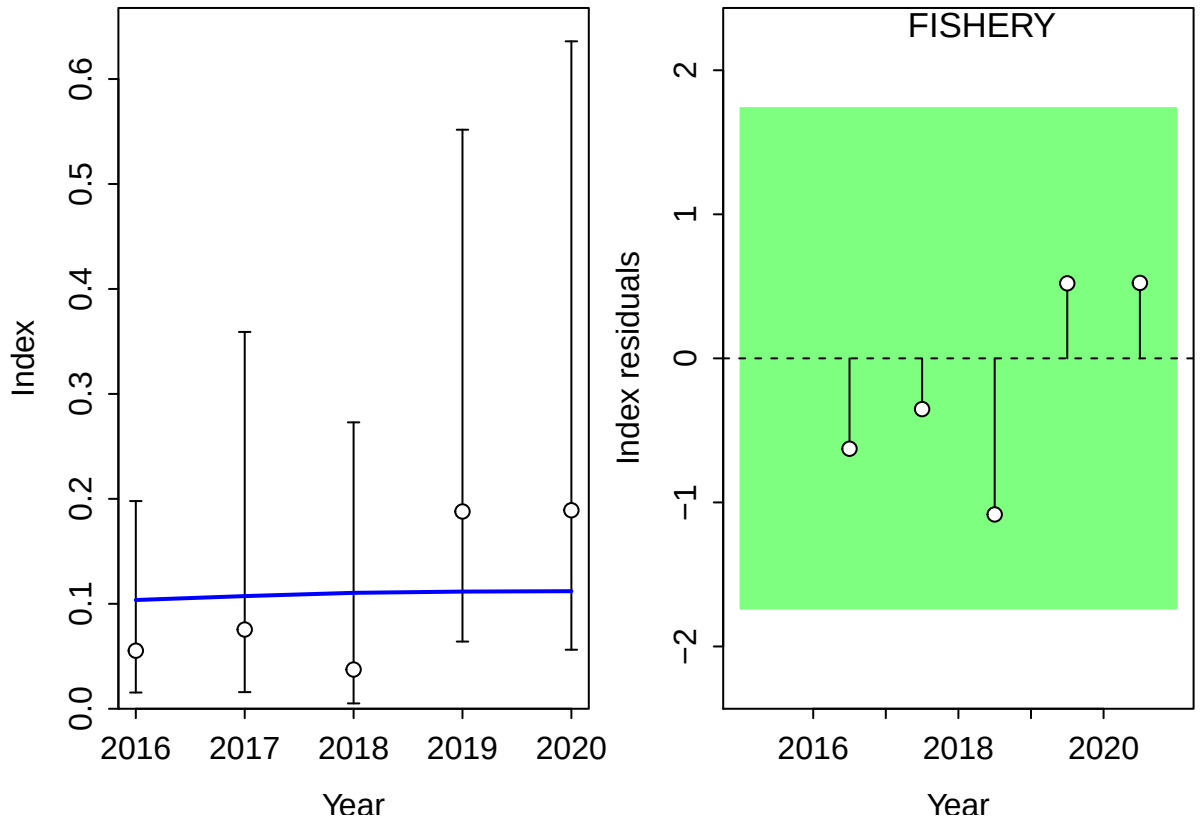
```
##   Converged     MaxGrad
## 1      TRUE 4.05322e-05
```

```
## [1] "1 NOTE:  Max data length bin: 51  < max pop len bins: 57; so will accumulate larger pop len bins
## [2] "2 parameter init value is greater than parameter max 1 > 0.99999 for parm: 25 ; search for <now
## [3] "3 warning: poor convergence in Fmsy, final dy/dy2= -0.00705854"
## [4] " N parameters are on or within 1% of min-max bound: 2; check results, variance may be suspect"
## [5] "N warnings: 3"
```

## Fit to Model

### CPUE

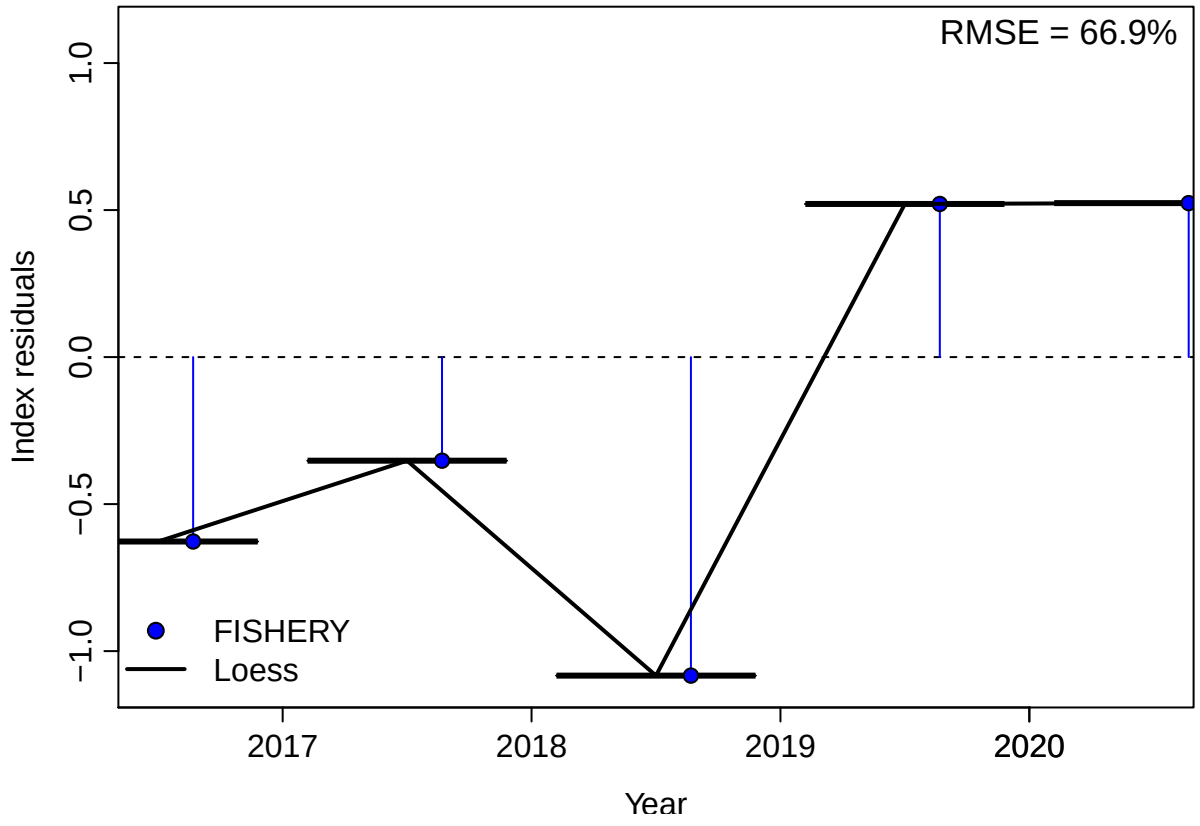
```
##
##  Running Runs Test Diagnosics for Index
## Plotting Residual Runs Tests
```




```
##
## 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 radius

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

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : There are other nea
## 4.0804
```



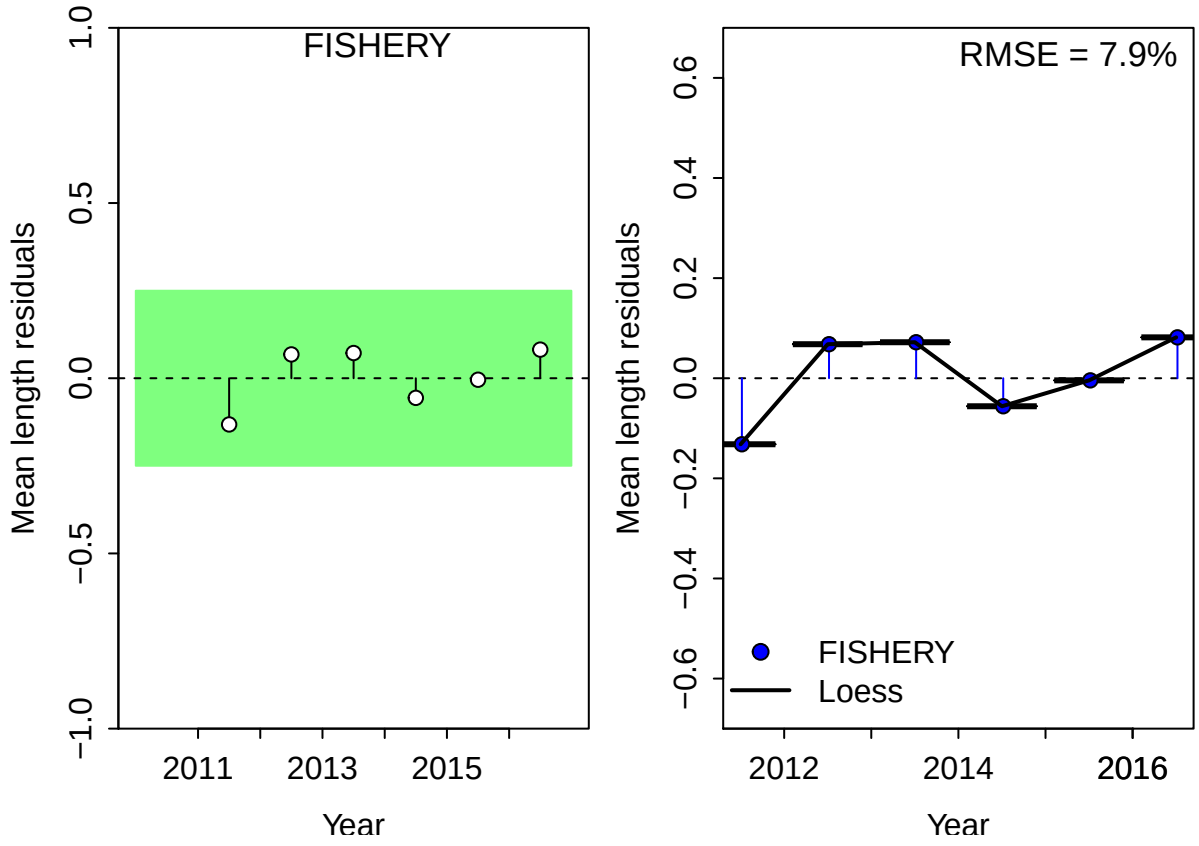

```
##
## RMSE stats by Index:
```

**Length Comp**

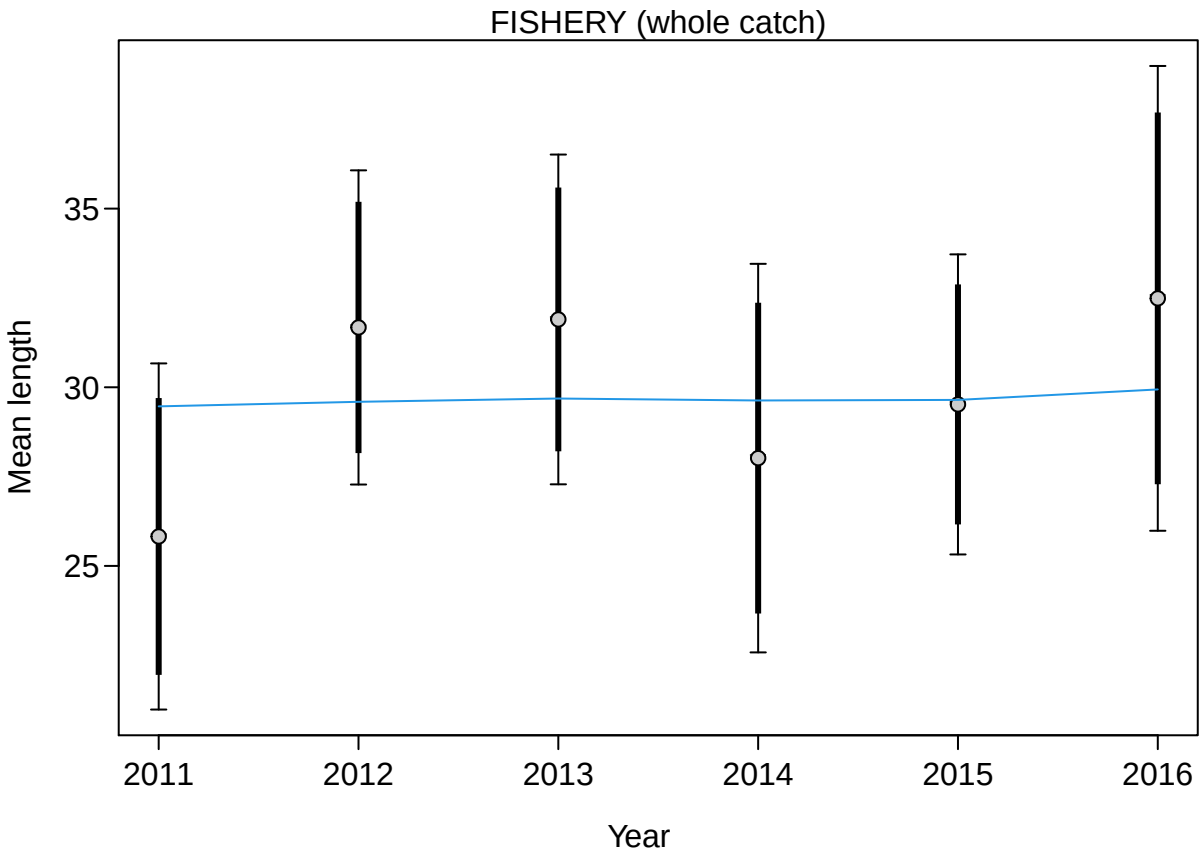
| #Factor | Fleet | New_Var_adj | Type | Name |
|---|---|---|---|---|
| 4 | 1 | 0.095953 | len | FISHERY |

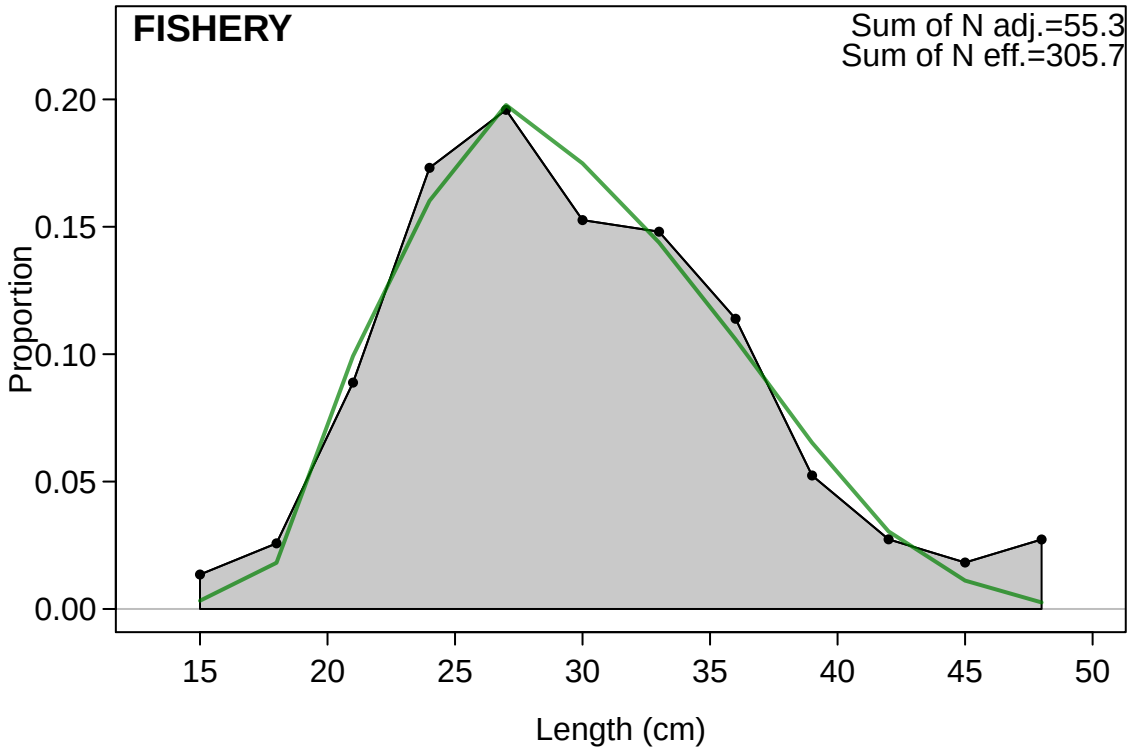
```
##
##  Running Runs Test Diagnosics for Mean length
## Plotting Residual Runs Tests

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

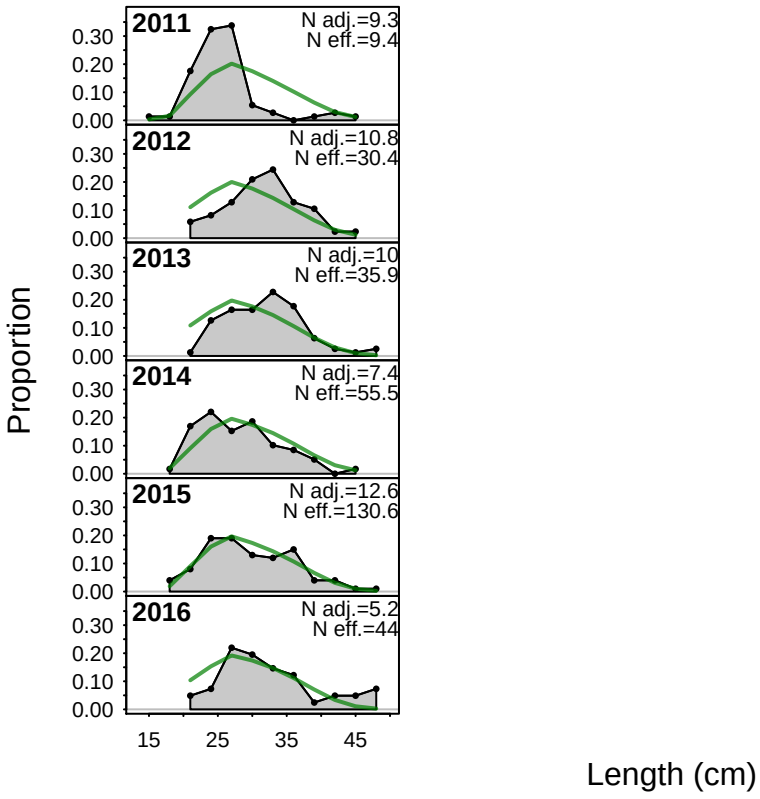
```
##     Index runs.p   test  sigma3.lo sigma3.hi type
## 1 FISHERY    0.5 Passed -0.2496898 0.2496898  len

## Plotting JABBA residual plot

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : Chernobyl! trL>n 6

## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : Chernobyl! trL>n 6

## Warning in sqrt(sum.squares/one.delta): NaNs produced
```




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

##    indices RMSE.perc nobs
## 1  FISHERY       7.9    6
## 2 Combined       7.9    6
```


FISHERY (whole catch)
Mean length
35
30
25
2011
2012
2013
2014
2015
2016
Year


FISHERY
Sum of N adj.=55.3
Sum of N eff.=305.7
Proportion
0.00
0.05
0.10
0.15
0.20
15
20
25
30
35
40
45
50
Length (cm)

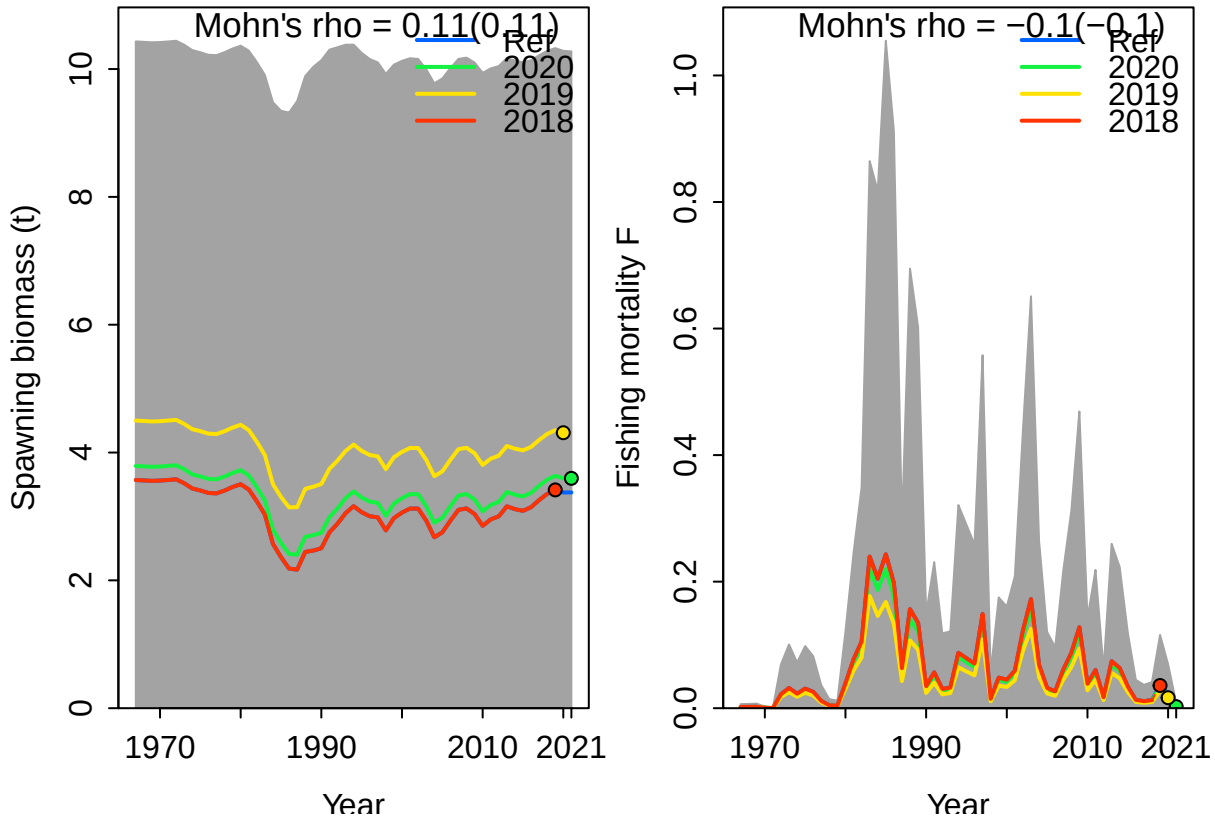



## Retrospective and Hindcasting

### Retrospective

```
## Plotting Retrospective pattern
```

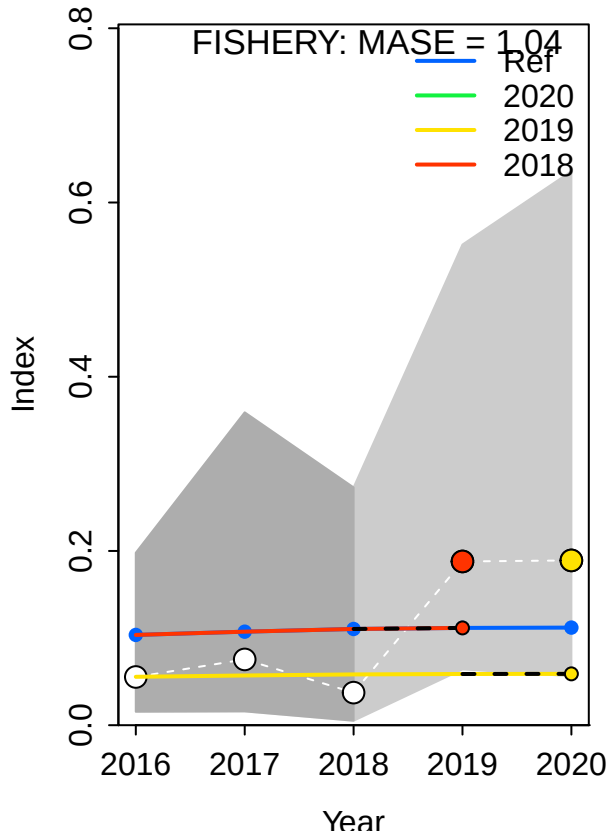
```
##
## Mohn's Rho stats, including one step ahead forecasts:
## Plotting Retrospective pattern
```




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

##   type     peel         Rho ForecastRho
## 1    F     2020 -0.06633835 -0.06525672
## 2    F     2019 -0.23121882 -0.23046217
## 3    F     2018  0.00000000  0.00000000
## 4    F Combined -0.09918572 -0.09857296
```

**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)
```

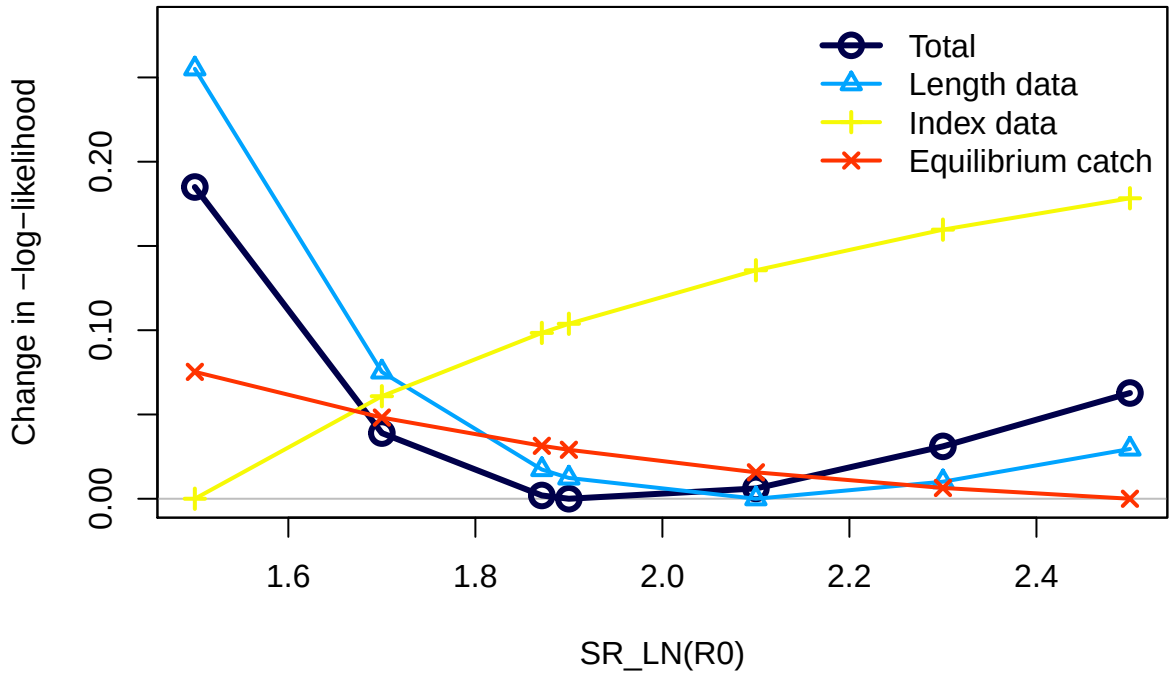
```
## Parameter values (after subsetting based on input 'models'): 1.5, 1.7, 1.9, 2.1, 2.3, 2.5, 1.87108
```

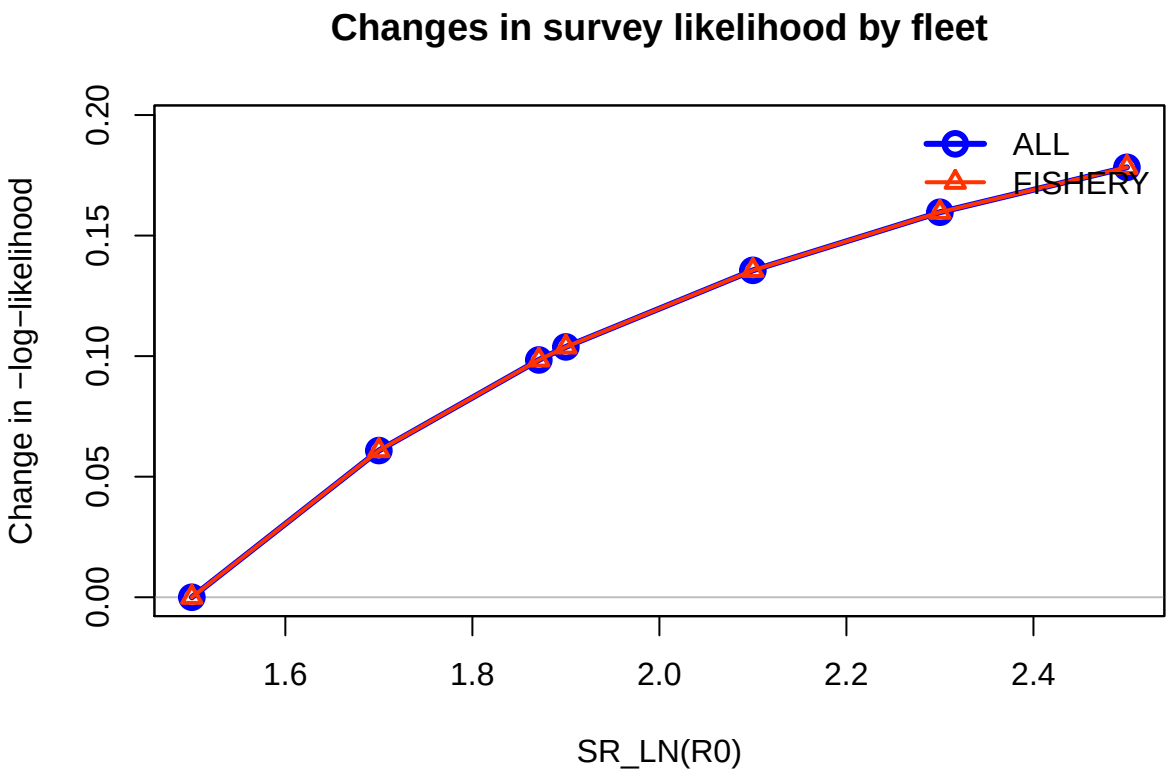
```
##
## Likelihood components showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
```

```
##                       frac_change include                           label
## TOTAL                      1.0000    TRUE                           Total
## Catch                      0.0000   FALSE                           Catch
## Equil_catch                0.4070    TRUE                 Equilibrium catch
## Survey                     0.9639    TRUE                         Index data
## Length_comp                1.3790    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            0.0018   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'): 1.5, 1.7, 1.9, 2.1, 2.3, 2.5, 1.87108,
```

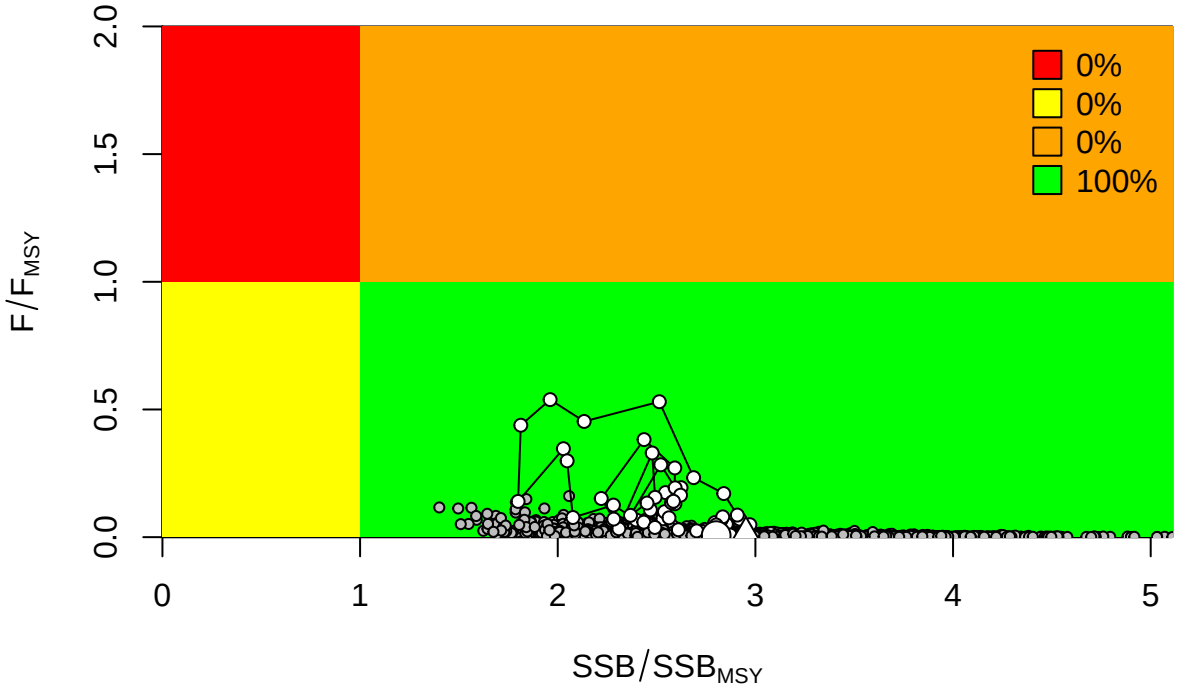
```
## Fleet-specific likelihoods showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
##                         frac_change include
## prof.table....c.1.3..             1    TRUE
```



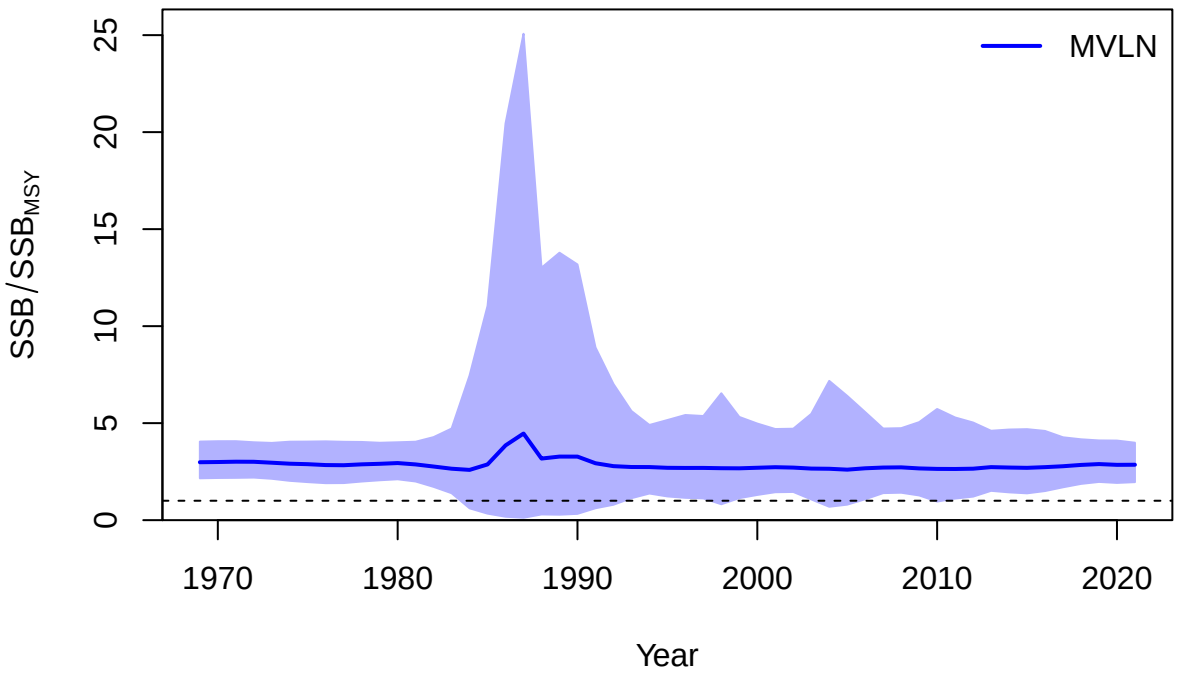



### Management Quantities

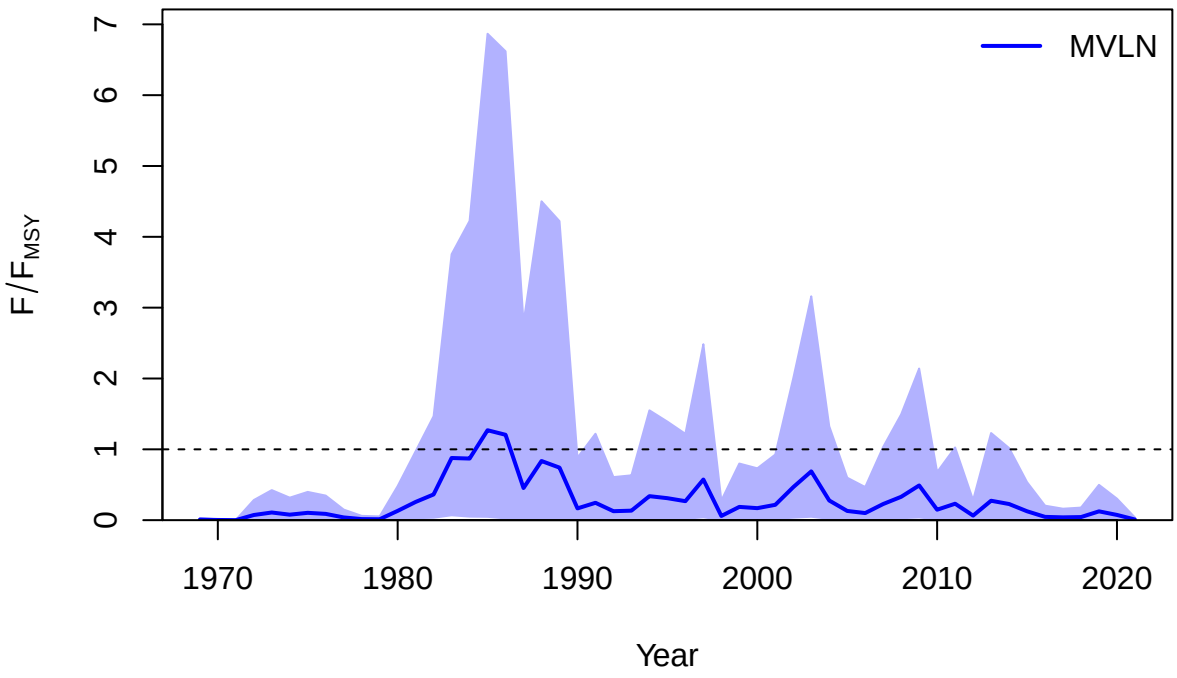
```
##
##  starter.sso with Bratio: SSB/SSBMSY and F: _abs_F
##
```



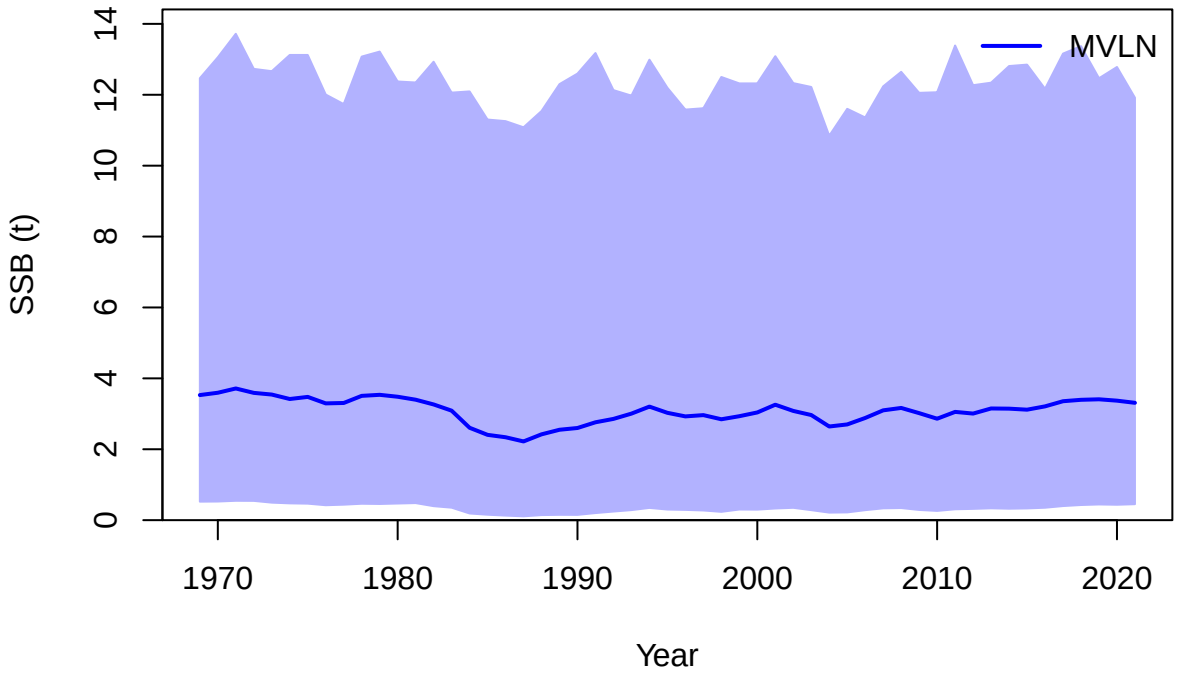

```
##
## Plot Comparison of stock
```



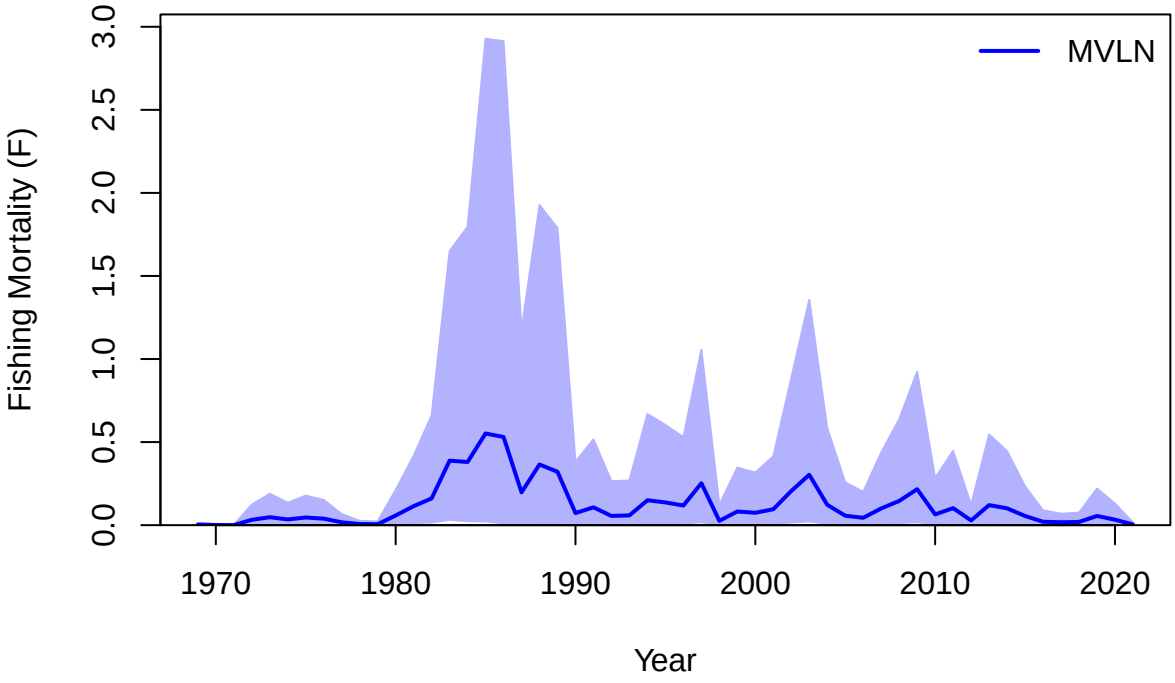

```
##
## Plot Comparison of harvest
```




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

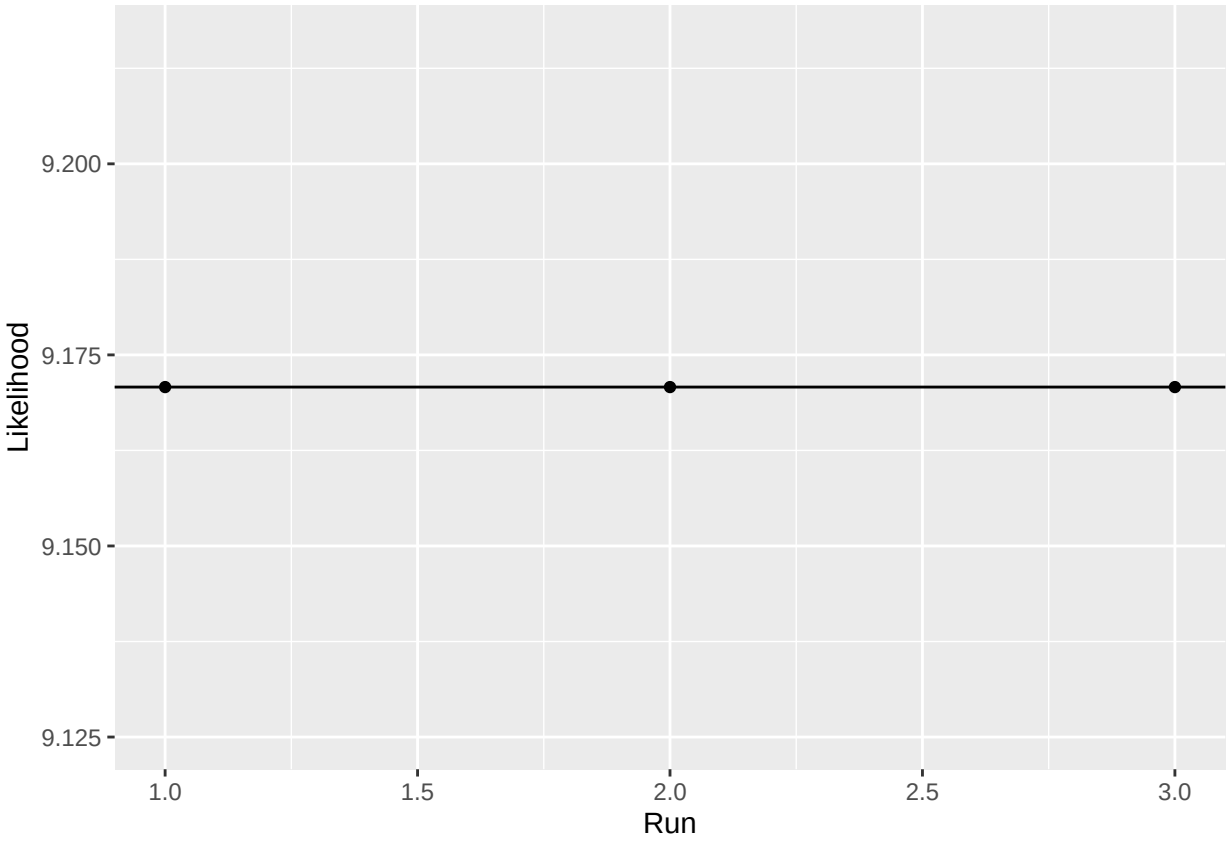


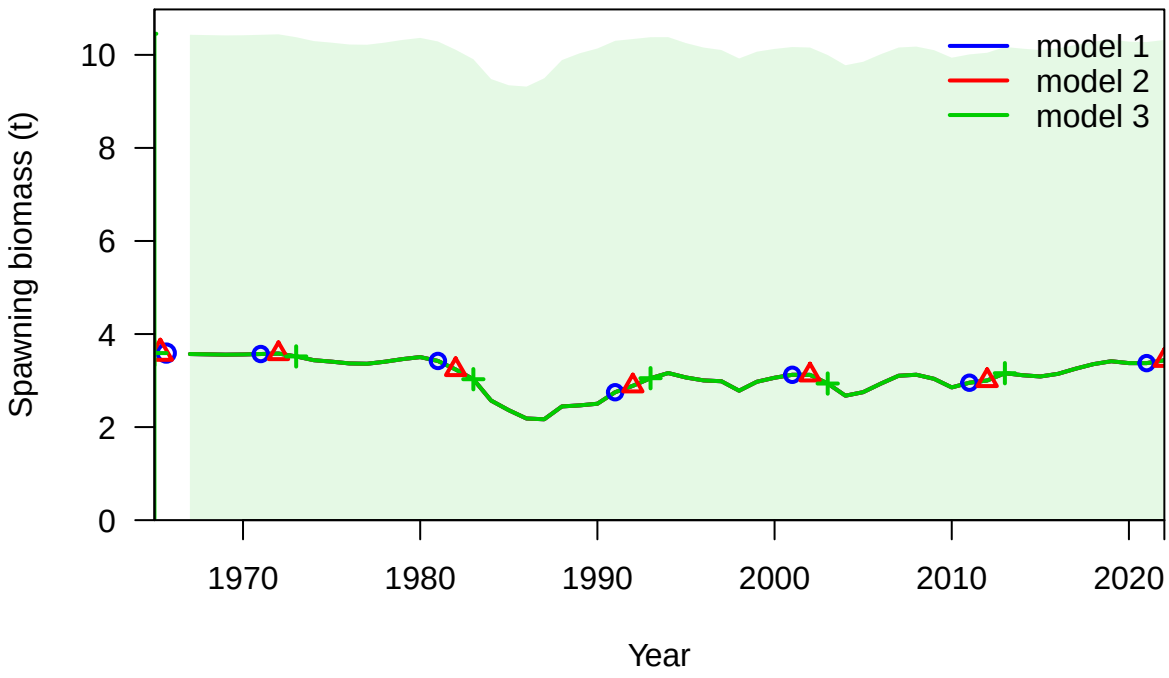

```
##
## Plot Comparison of F
```

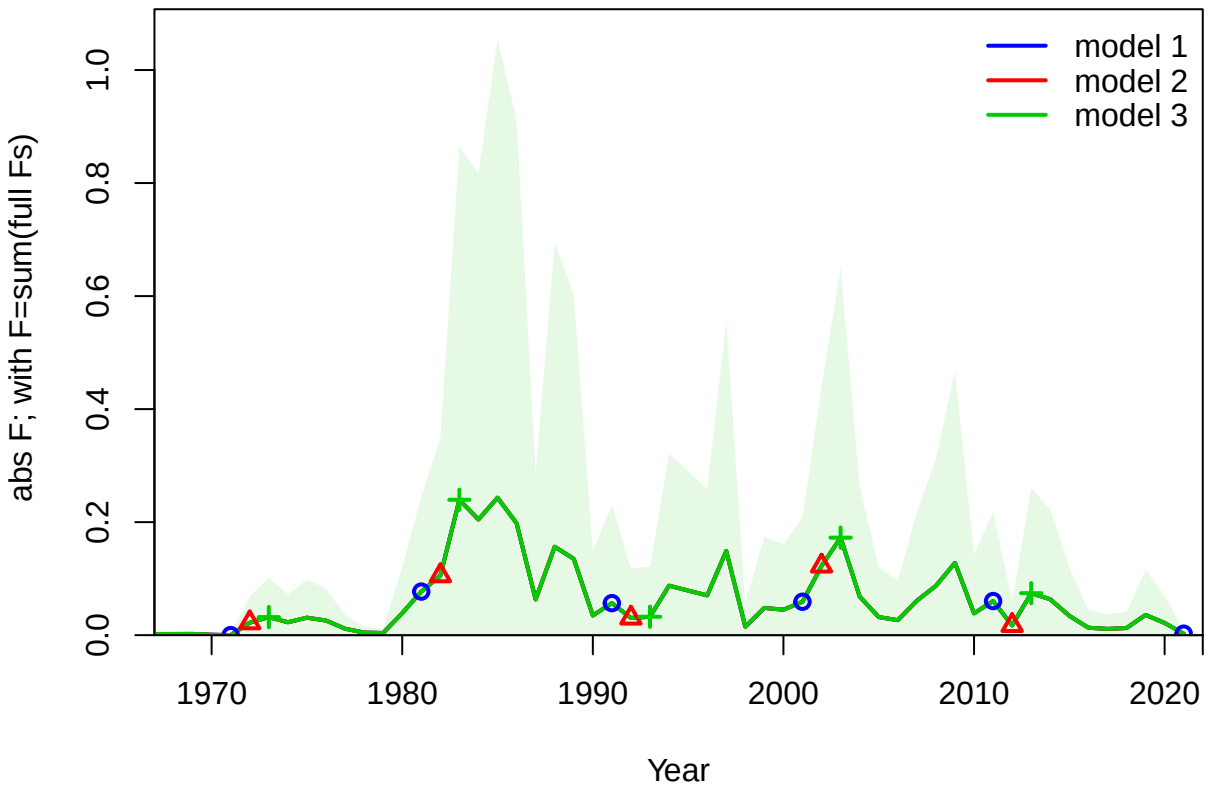

Fishing Mortality (F)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1970
1980
1990
2000
2010
2020
Year
MVLN

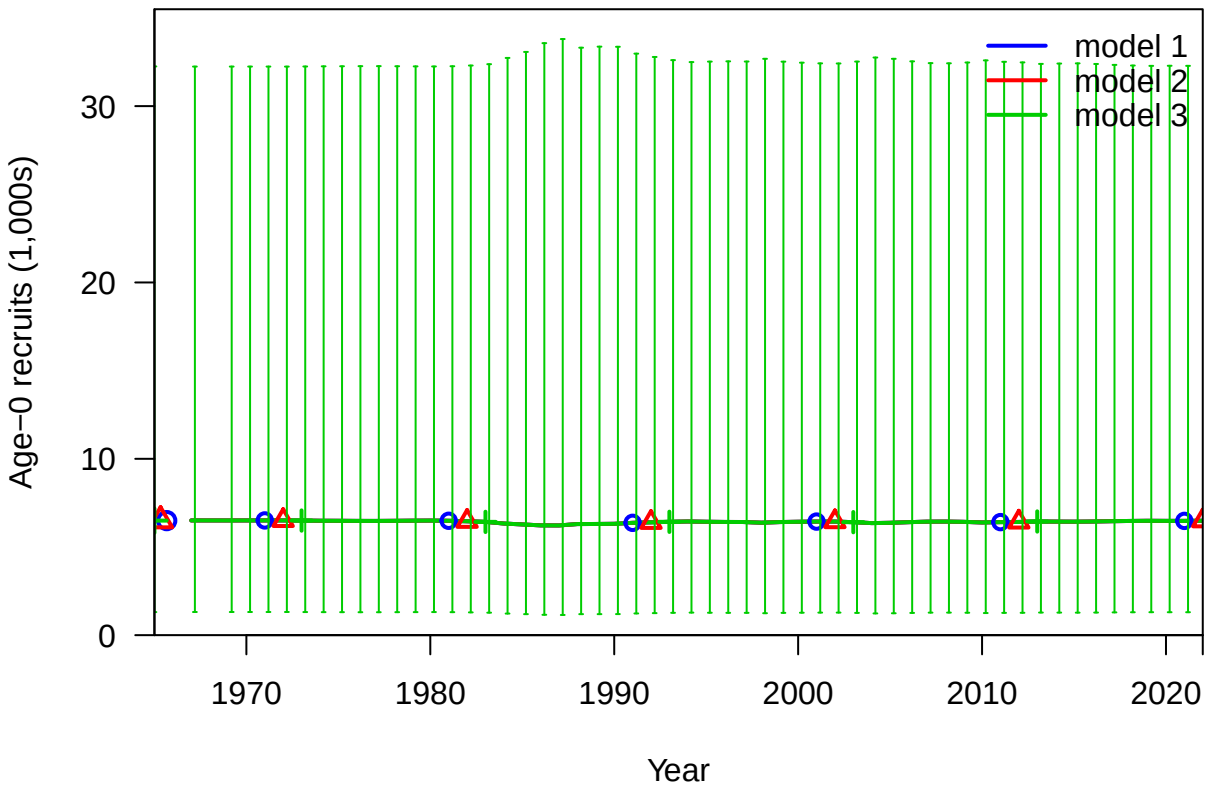
```
## RStudioGD
##         2
```

**Jitter**




model 1
model 2
model 3
Spawning biomass (t)
0
2
4
6
8
10
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
abs F; with F=sum(full Fs)
0.0
0.2
0.4
0.6
0.8
1.0
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
Age−0 recruits (1,000s)
0
10
20
30
1970
1980
1990
2000
2010
2020
Year