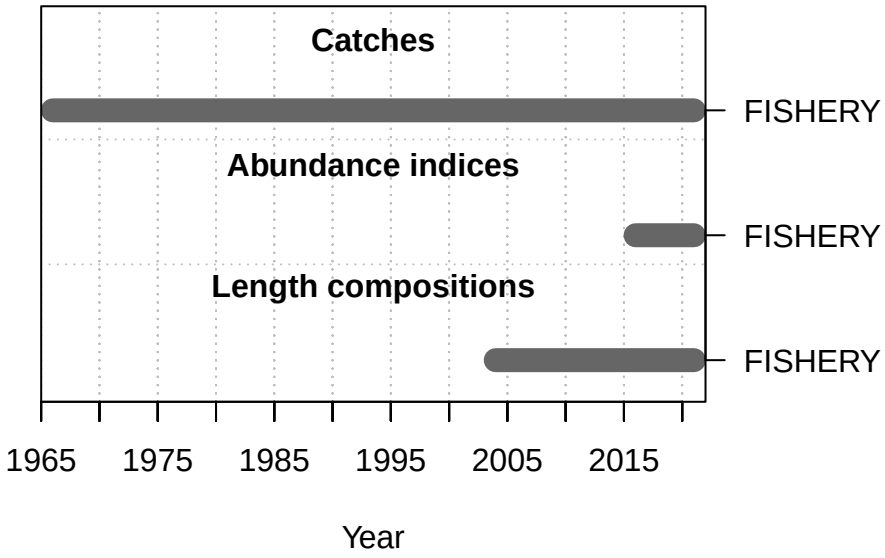
# American Samoa Model Checks

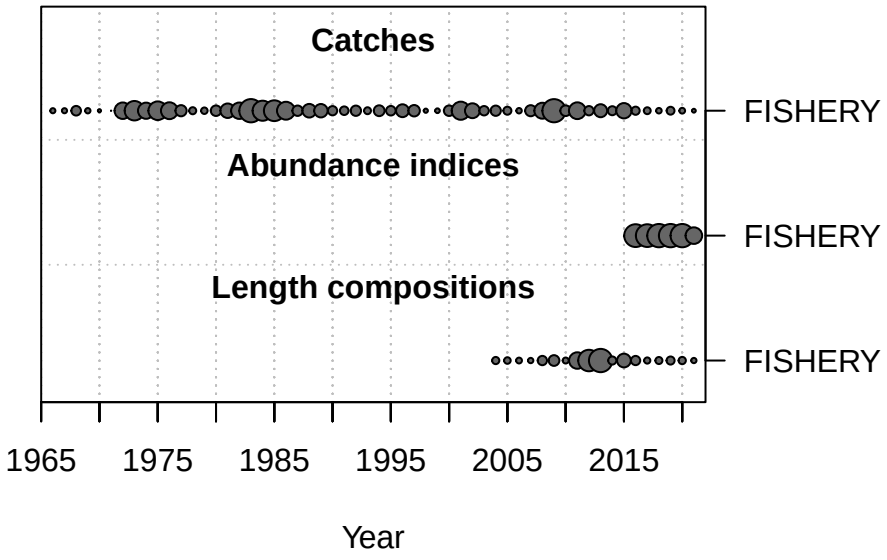
2022-08-30

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

## Model Output

### Input Data






### Convergence Check

```
  Converged     MaxGrad
1      TRUE 1.80646e-05
```

```
[1] "1 NOTE:  Max data length bin: 38.5  < max pop len bins: 43; so will accumulate larger p
[2] "N warnings: 1"
```

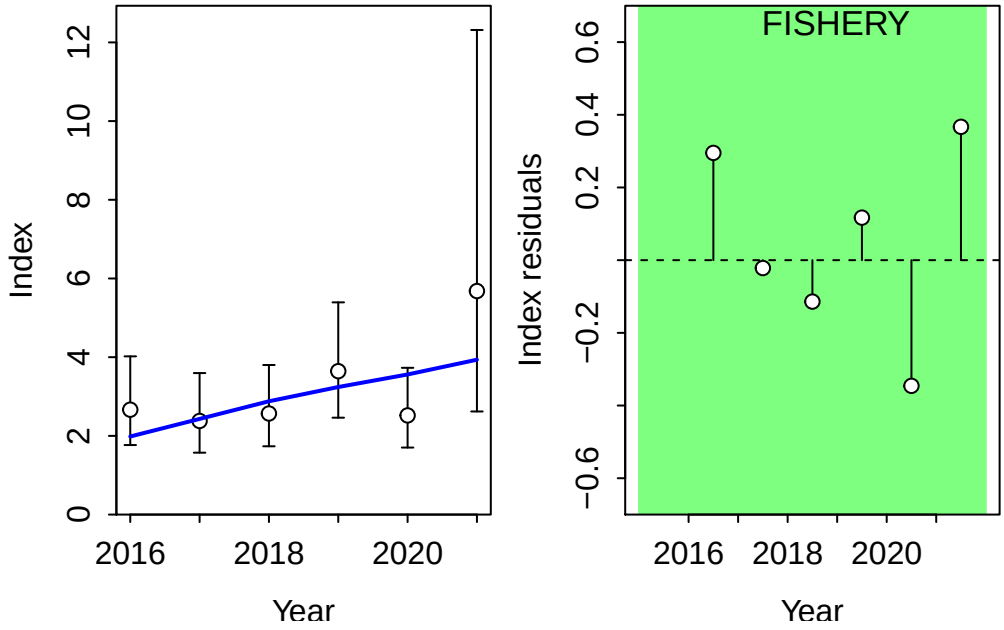
### Fit to Model

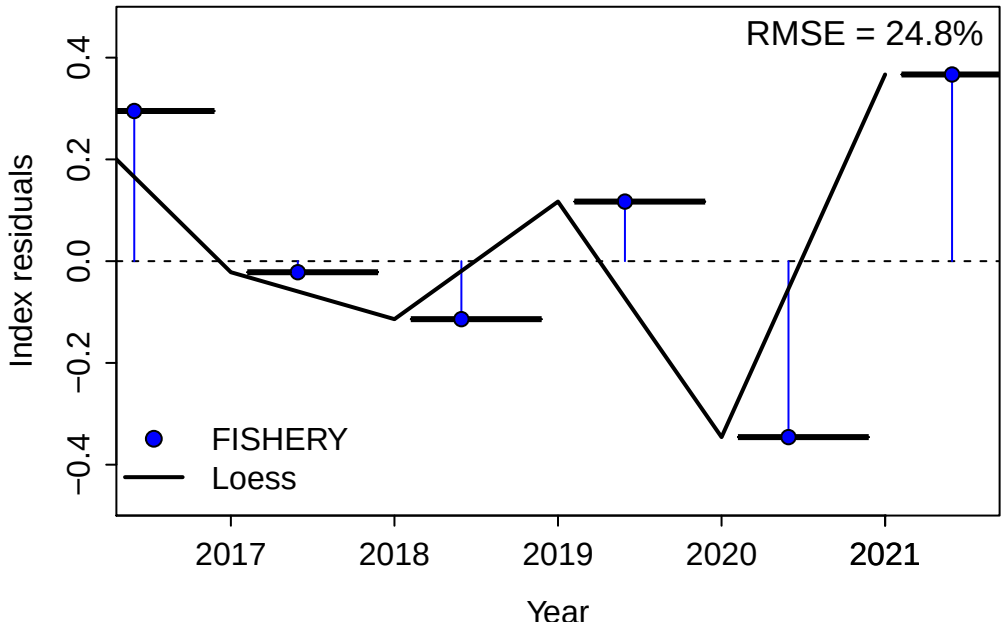
### CPUE

```
Residual Runs Test (/w plot) stats by Index:
```

```
RMSE stats by Index:
```

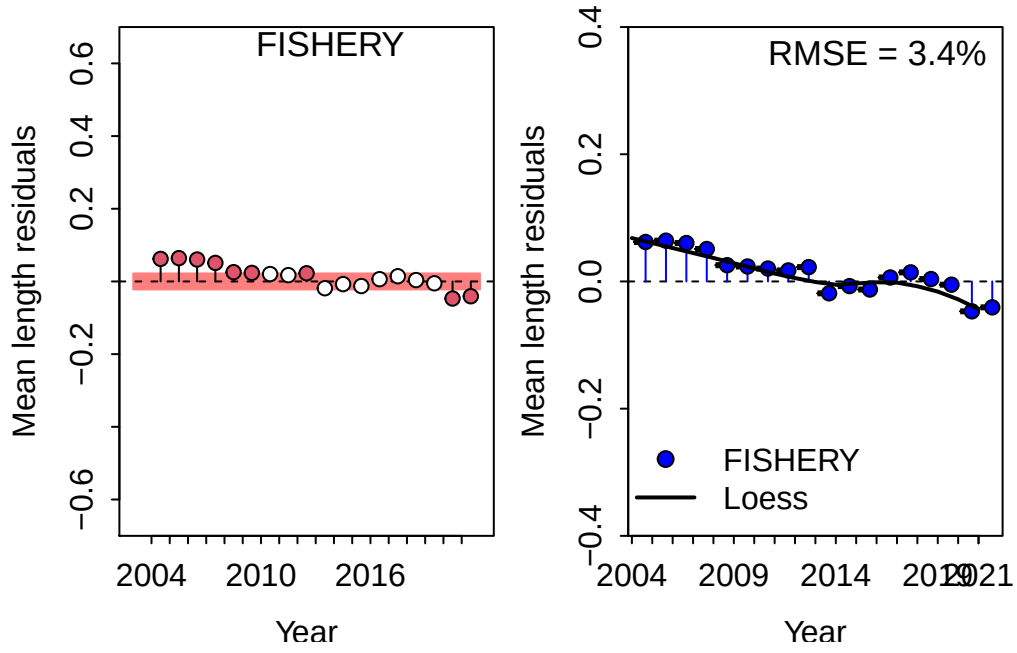
### Length Comp


Index
0
2
4
6
8
10
12
2016
2018
2020
Year
Index residuals
FISHERY
−0.6
−0.2
0.2
0.4
0.6
2016
2018
2020
Year

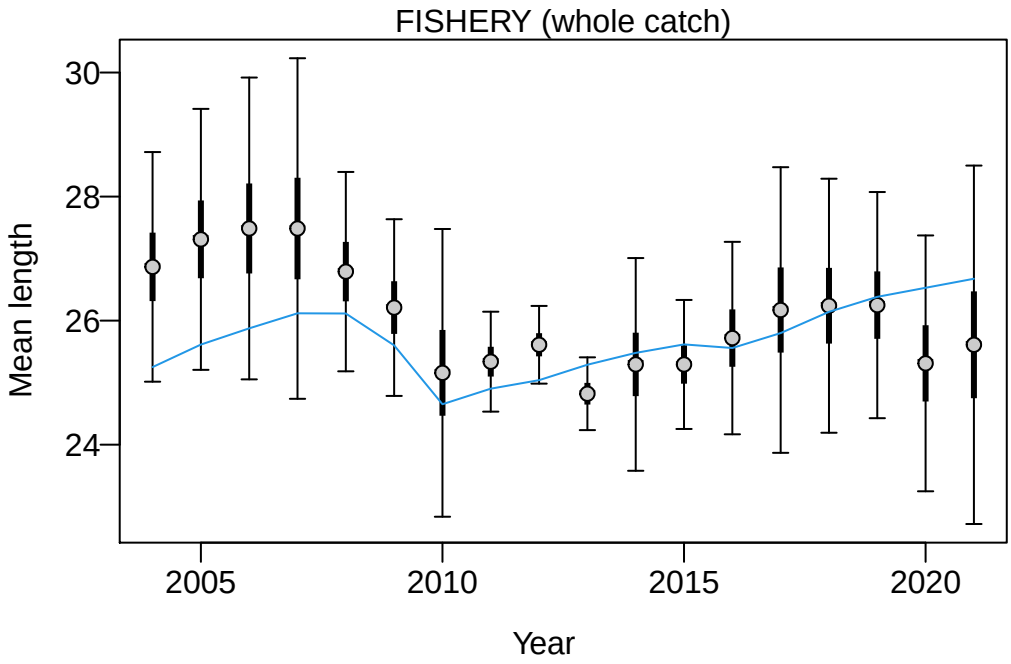

RMSE = 24.8%
Index residuals
−0.4
−0.2
0.0
0.2
0.4
FISHERY
Loess
2017
2018
2019
2020
2021
Year

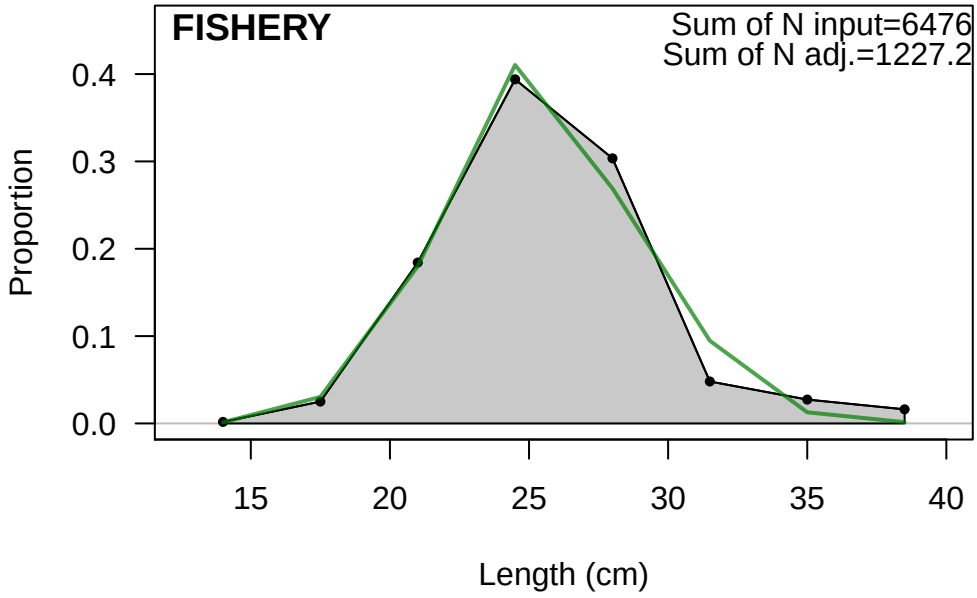
| #Factor | Fleet | New_Var_adj | Type | Name |
|---|---|---|---|---|
| 4 | 1 | 0.088892 | len | FISHERY |

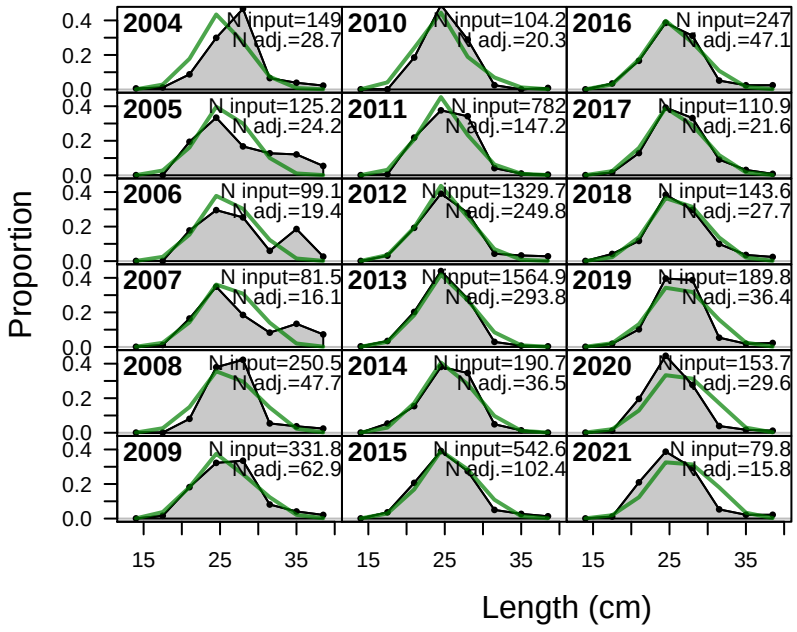
```
Residual Runs Test (/w plot) stats by Mean length:

    Index runs.p   test    sigma3.lo  sigma3.hi type
1 FISHERY  0.003 Failed -0.02189642 0.02189642  len

RMSE stats by Index:

# A tibble: 2 x 3
  Fleet    RMSE.perc  Nobs
  <chr>        <dbl> <int>
1 FISHERY        3.4    18
2 Combined       3.4    18
```




**Retrospective and Hindcasting**

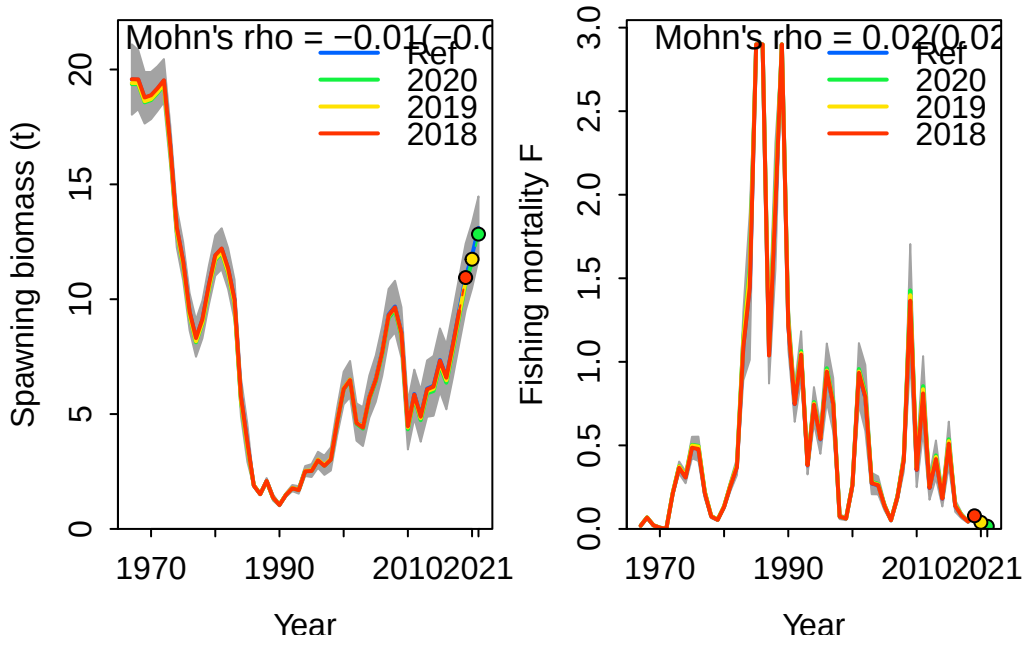

FISHERY (whole catch)
Mean length
30
28
26
24
2005
2010
2015
2020
Year


FISHERY
Sum of N input=6476
Sum of N adj.=1227.2
Proportion
0.4
0.3
0.2
0.1
0.0
15
20
25
30
35
40
Length (cm)




**Retrospective**

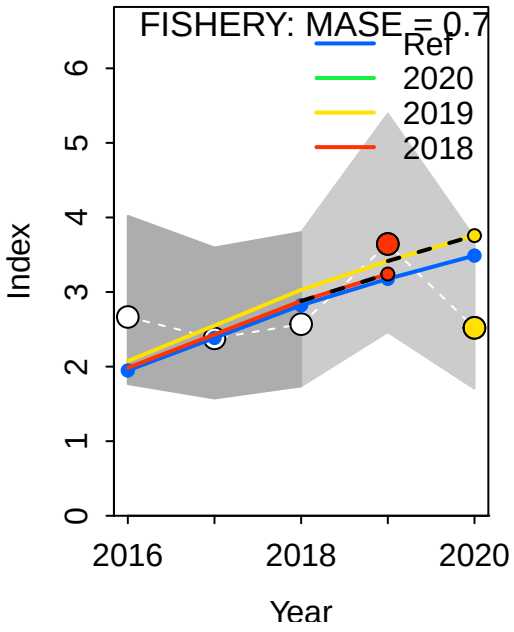
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel          Rho  ForecastRho
1    F     2020 0.0341821190 0.0309781789
2    F     2019 0.0240928182 0.0225287691
3    F     2018 0.0009708098 0.0005070433
4    F Combined 0.0197485823 0.0180046638
```

### Hindcasting

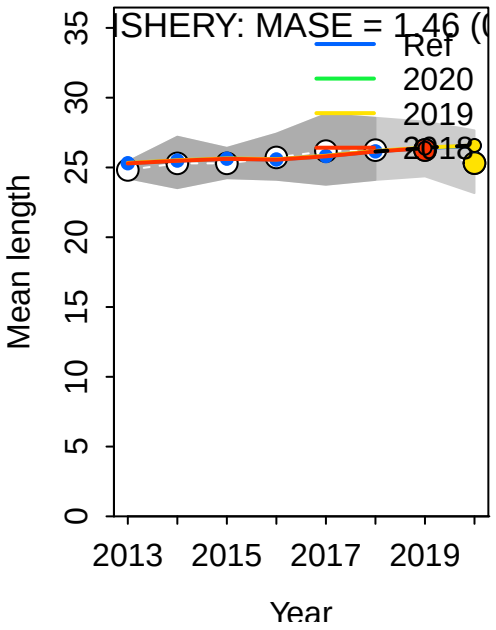
```
Plotting Hindcast Cross-Validation (one-step-ahead)

 Computing MASE with only 2 of 3  prediction residuals for Index FISHERY

 Warning:  Unequal spacing of naive predictions residuals may influence the interpretation o
```




```
MASE stats by Index:
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 o
```

```
MASE stats by Index:
```



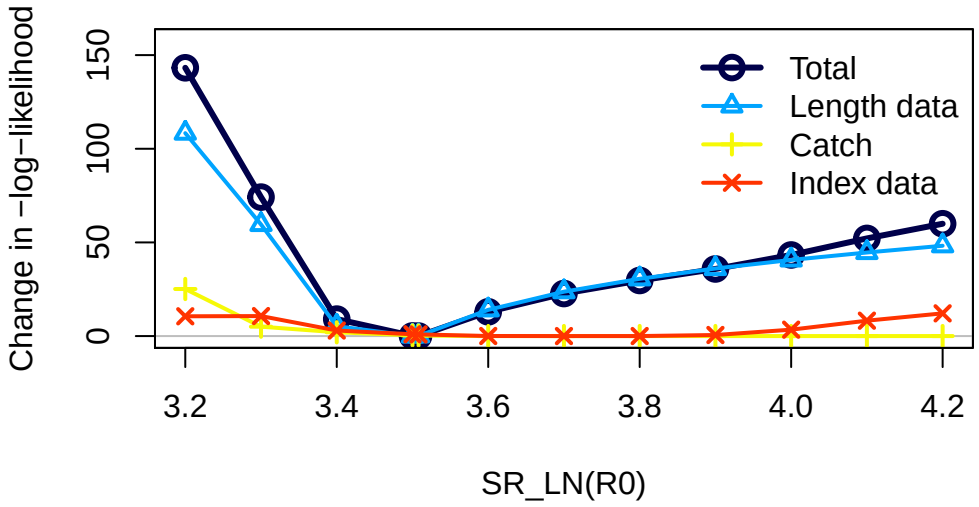

**Recruitment Deviations**

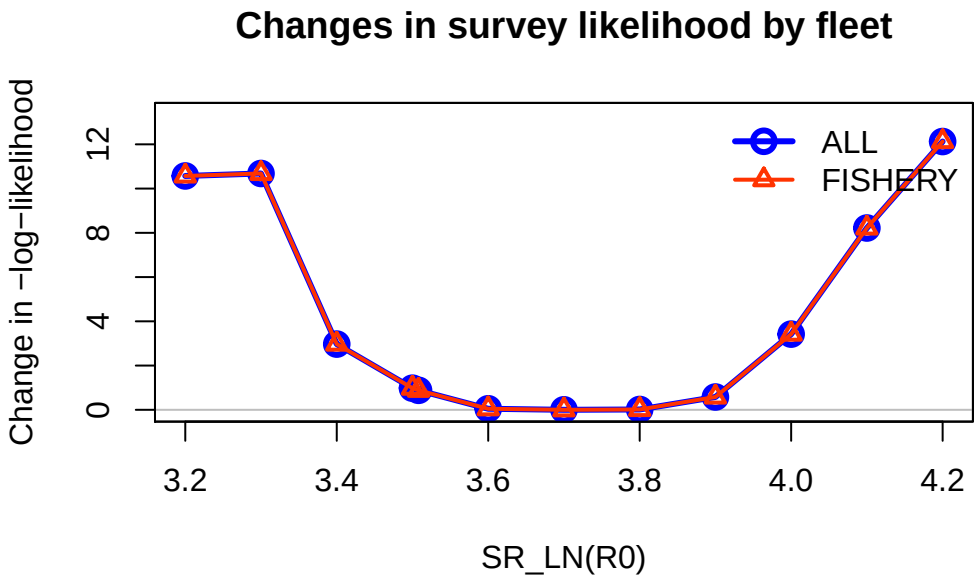
**Likelihood Profile**

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

| | frac_change | include | label |
|---|---|---|---|
| TOTAL | 1.0000 | TRUE | Total |
| Catch | 0.1755 | TRUE | Catch |
| Equil_catch | 0.0006 | FALSE | Equilibrium catch |
| Survey | 0.0847 | TRUE | Index data |
| Length_comp | 0.7564 | 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 | 0.0062 | FALSE | Priors |

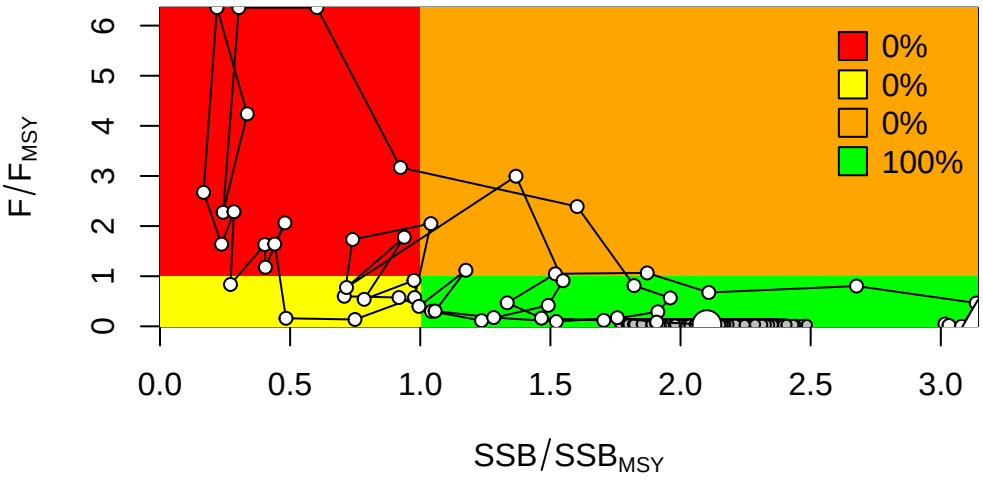
```
Parm_softbounds          0.0001   FALSE                    Soft bounds
Parm_devs                0.0000   FALSE          Parameter deviations
Crash_Pen                0.0000   FALSE                  Crash penalty
```

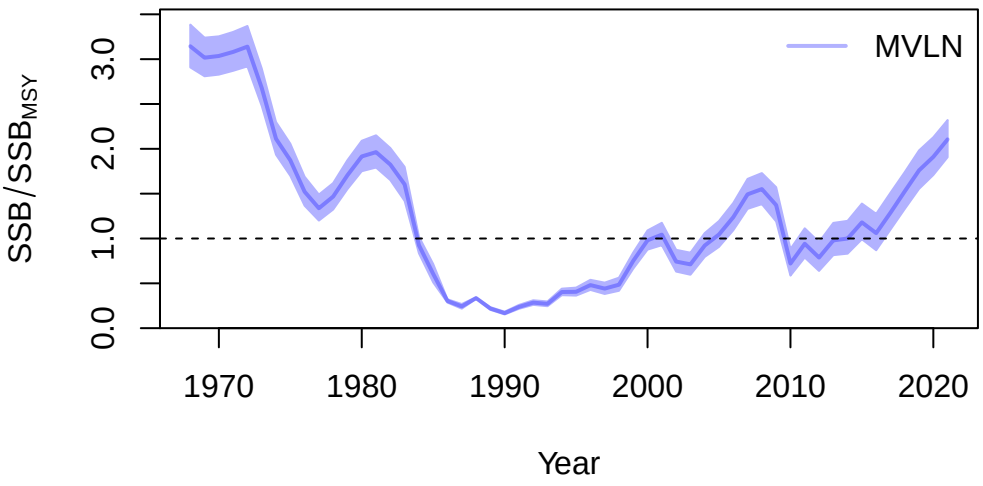


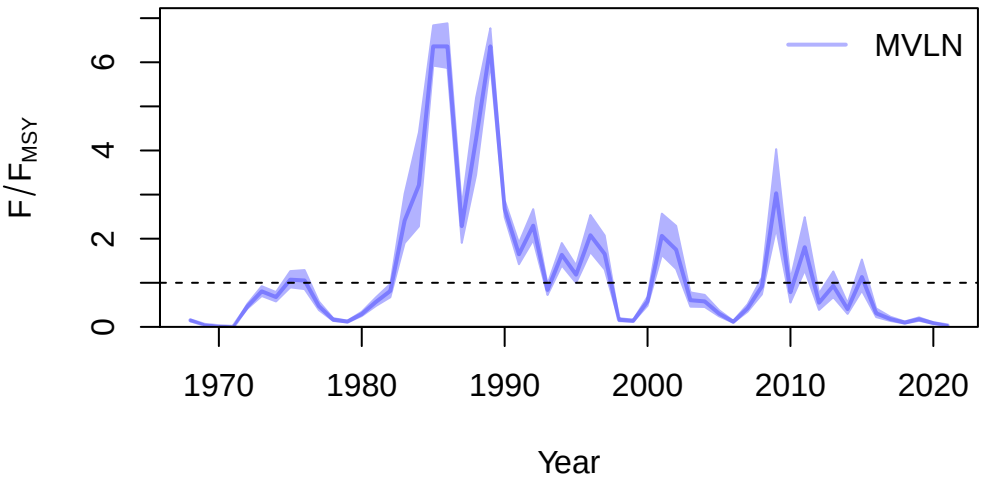



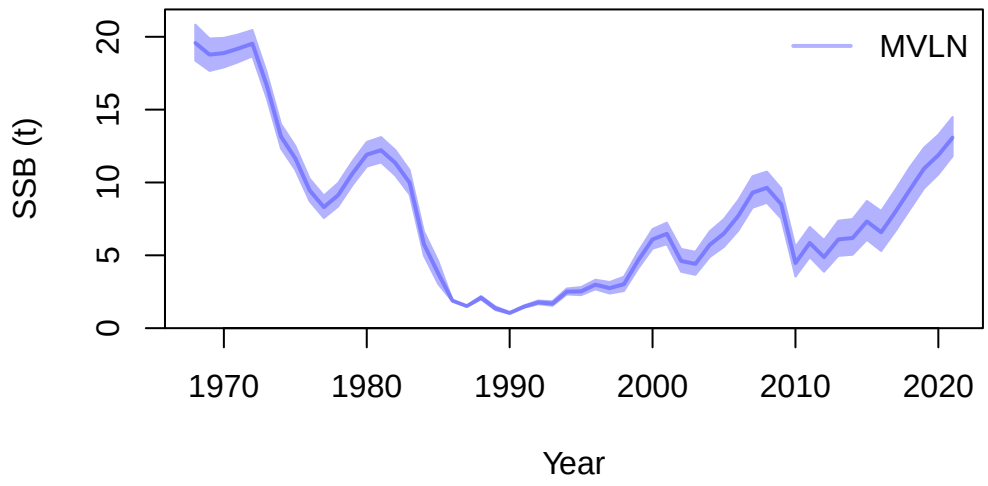
**Management Quantities**

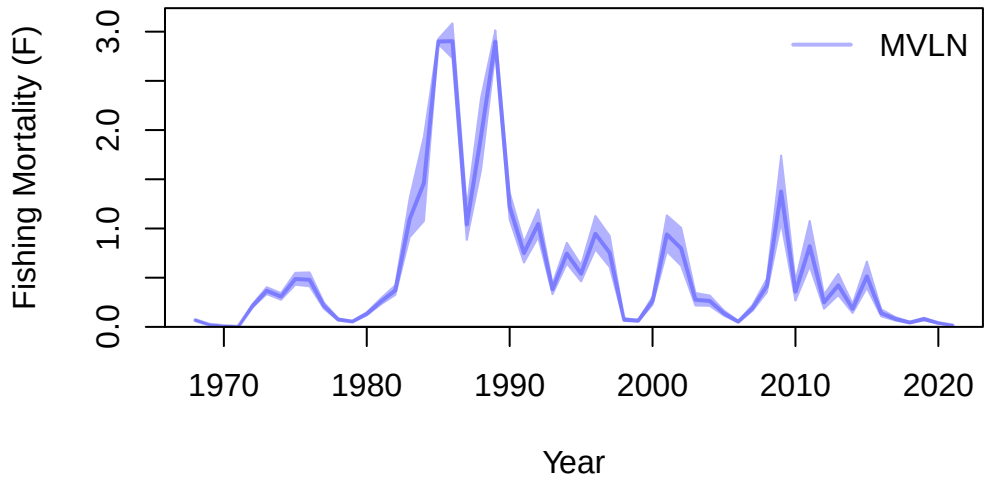
`starter.sso with Bratio: SSB/SSBMSY and F: _abs_F`




MVLN
SSB/SSB$_{MSY}$
0.0
1.0
2.0
3.0
1970
1980
1990
2000
2010
2020
Year

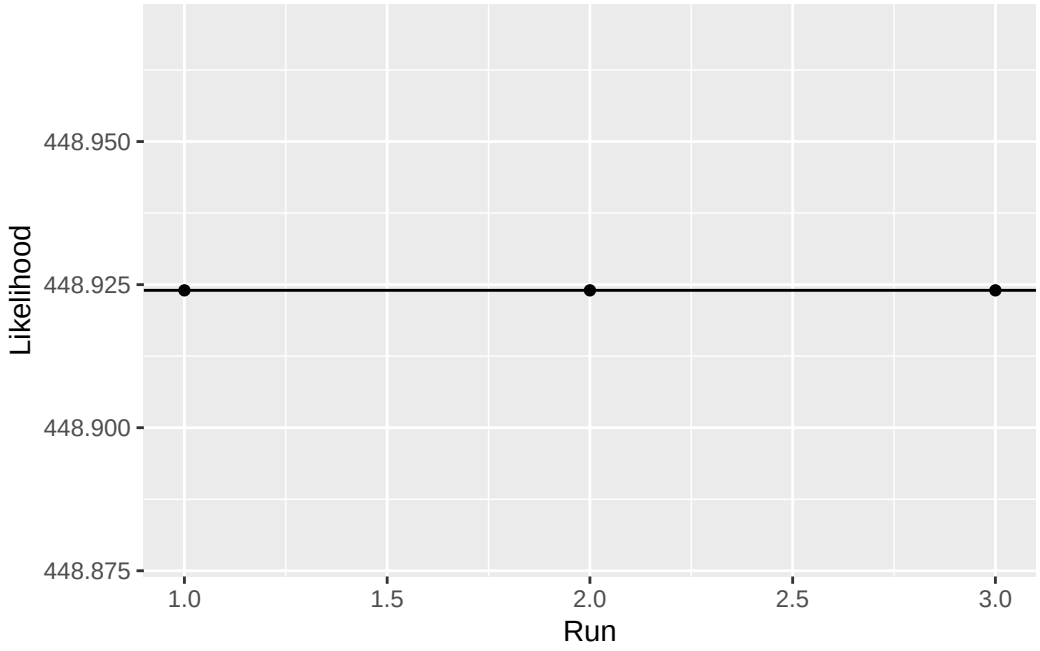

MVLN
F/F$_{MSY}$
0
2
4
6
1970
1980
1990
2000
2010
2020
Year

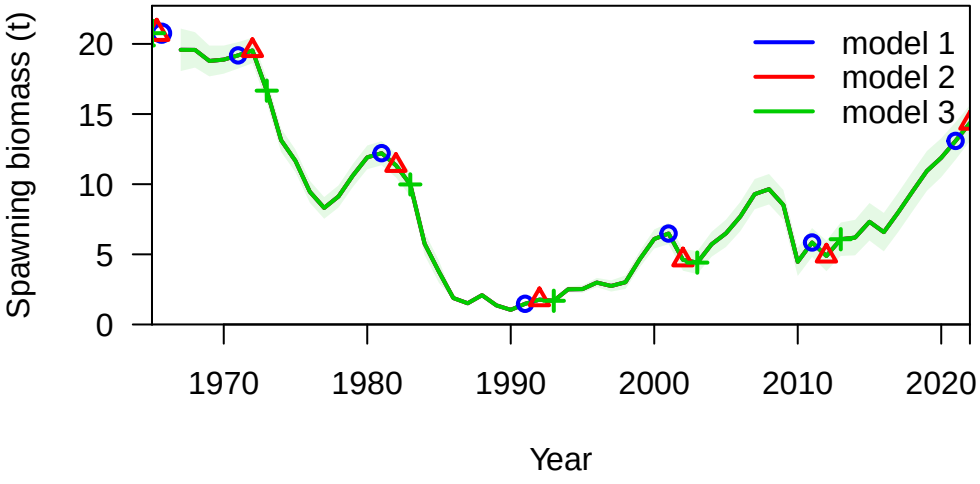


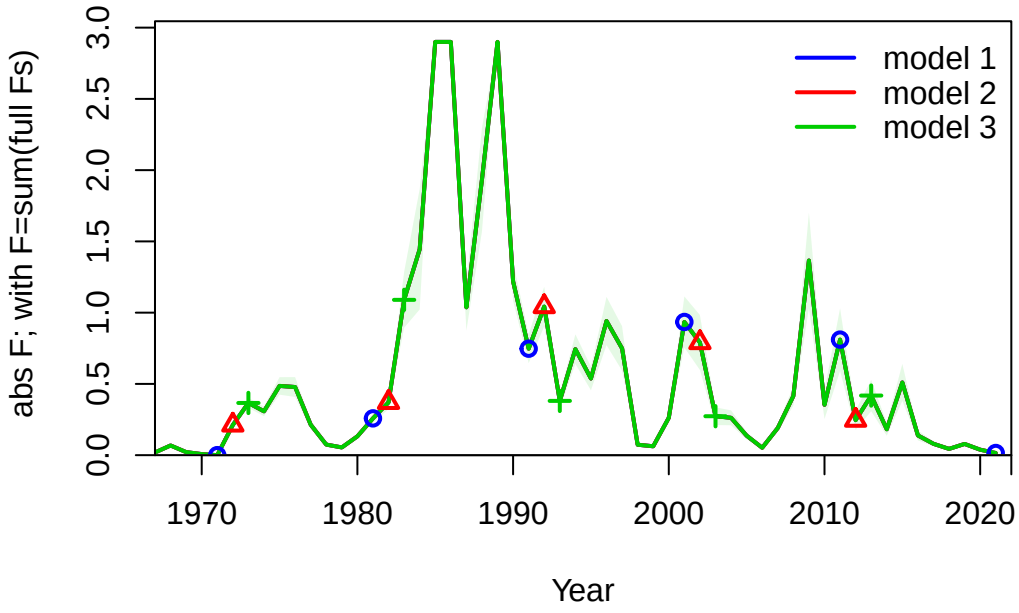



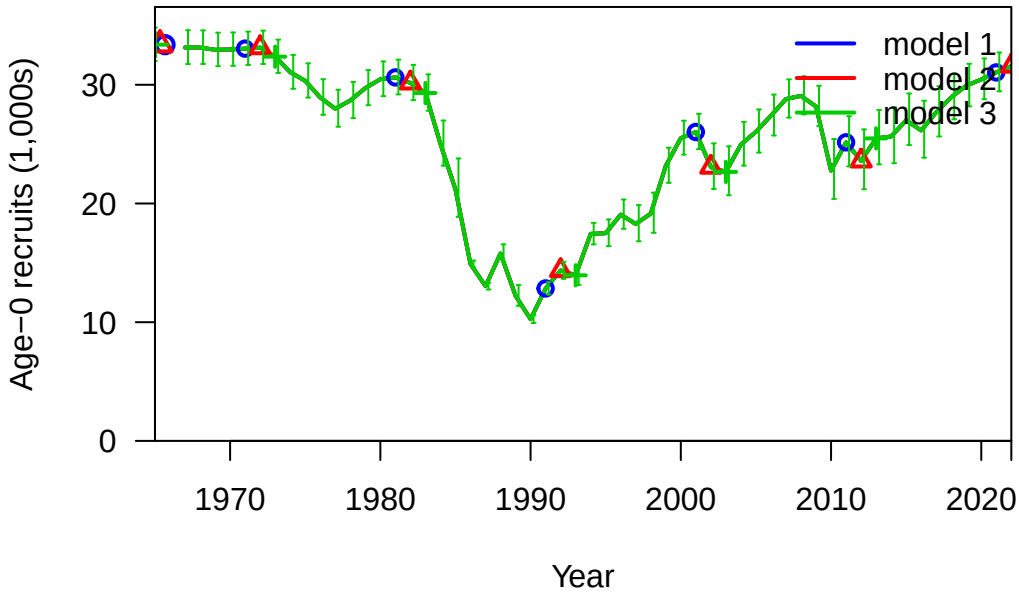

```
null device
          1
```

**Jitter**


448.950
448.925
448.900
448.875
Likelihood
1.0
1.5
2.0
2.5
3.0
Run


Spawning biomass (t)
20
15
10
5
0
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
2.0
2.5
3.0
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
model 1
model 2
model 3