# American Samoa Model Checks

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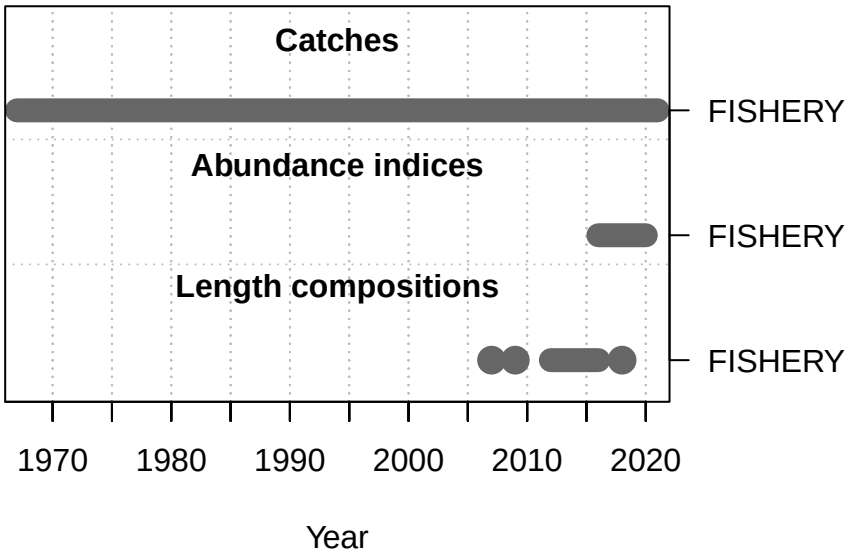
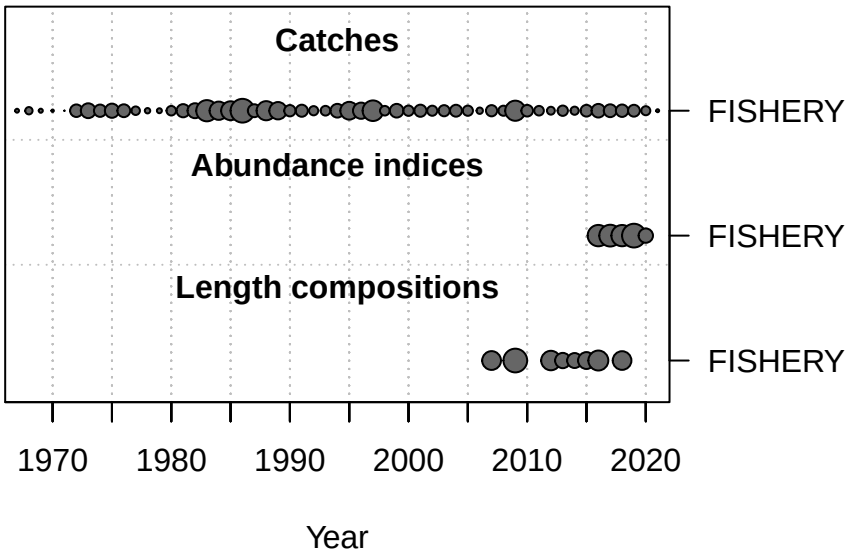
**This is a summary report for the CALU base model run.**

## Model Output

### Input Data






### Convergence Check

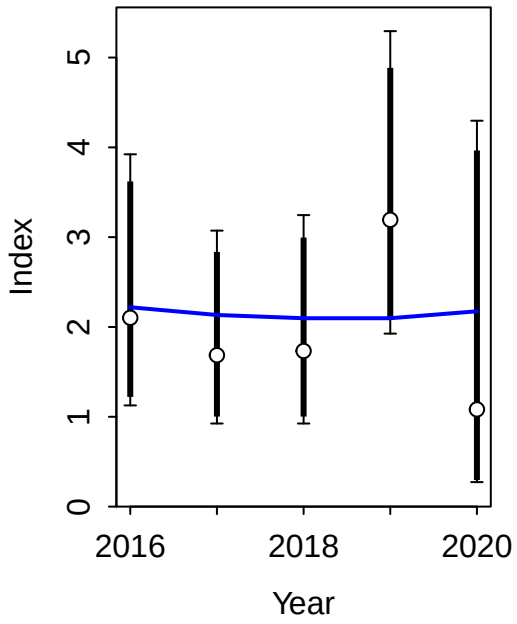
```
  Converged     MaxGrad
1      TRUE 7.83088e-05
```

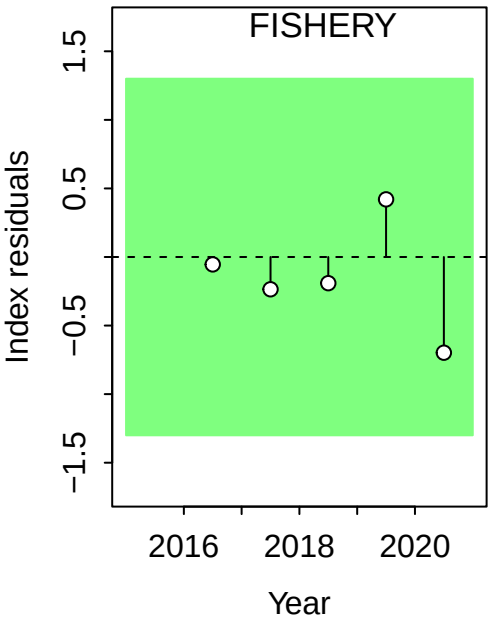
```
[1] "1 NOTE:  Max data length bin: 65  < max pop len bins: 72; so will accumulate larger pop
[2] "N warnings: 1"
```

### Fit to Model

### CPUE

| Fleet | RMSE.perc | Nobs |
|---|---|---|
| FISHERY | 38.9 | 5 |
| Combined | 38.9 | 5 |

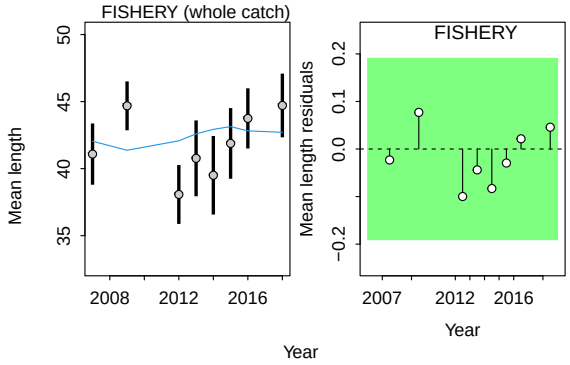


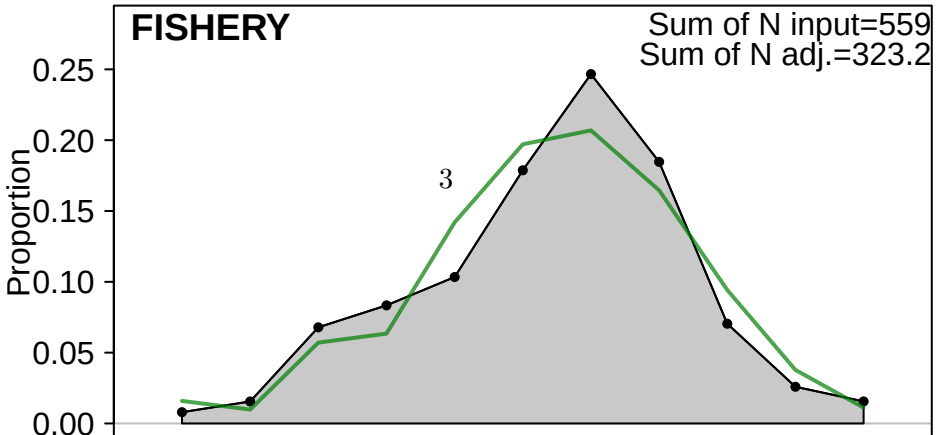



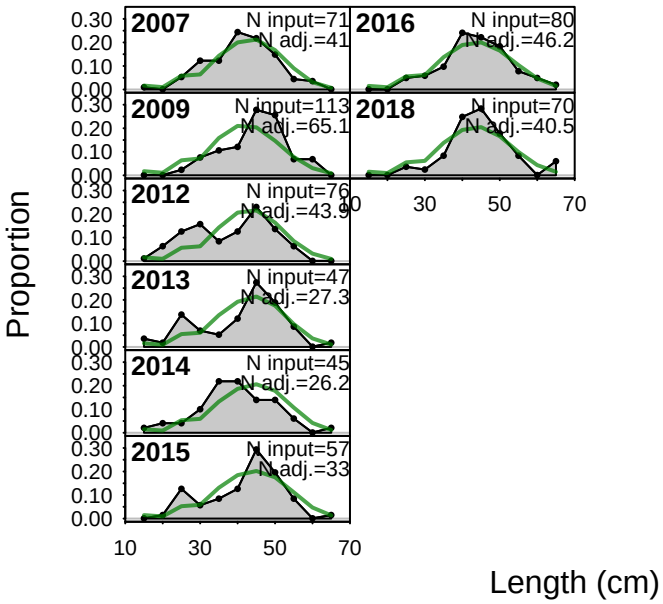

**Length Comp**

| Fleet | RMSE.perc | Nobs |
|---|---|---|
| FISHERY | 6 | 8 |
| Combined | 6 | 8 |

```
         w         lo         hi              Index runs.p   test  sigma3.lo sigma3.hi type
0.1858762 0.1119235 0.8604796          1 FISHERY  0.268 Passed -0.1904378 0.1904378  len
```

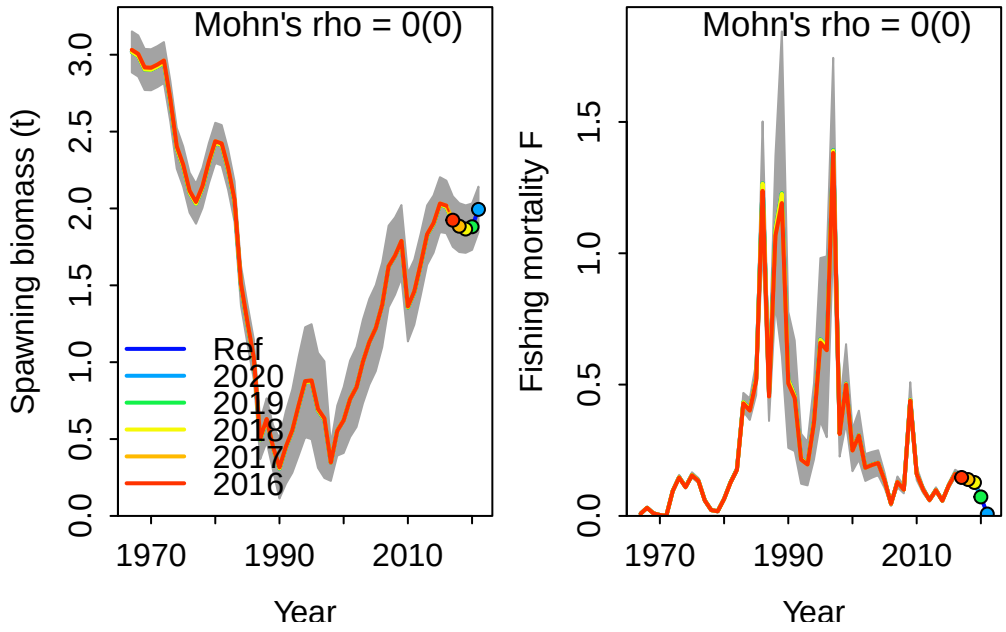





**Retrospective**

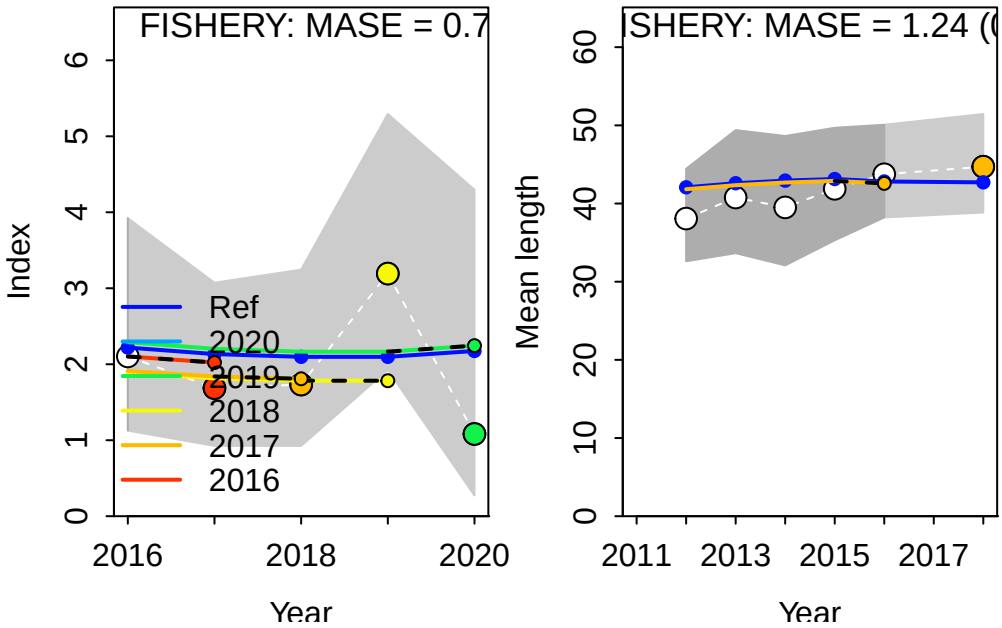
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel           Rho   ForecastRho
1    F     2020  0.0000000000  0.0000000000
2    F     2019  0.0002512701  0.0002362547
3    F     2018 -0.0003359615 -0.0003219398
4    F     2017 -0.0087129008 -0.0088493677
5    F     2016 -0.0082750315 -0.0087061308
6    F Combined -0.0034145247 -0.0035282367
```

### Hindcasting

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

 Computing MASE with only 4 of 5  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 1 of 5  prediction residuals for Index FISHERY

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




MASE stats by Index:

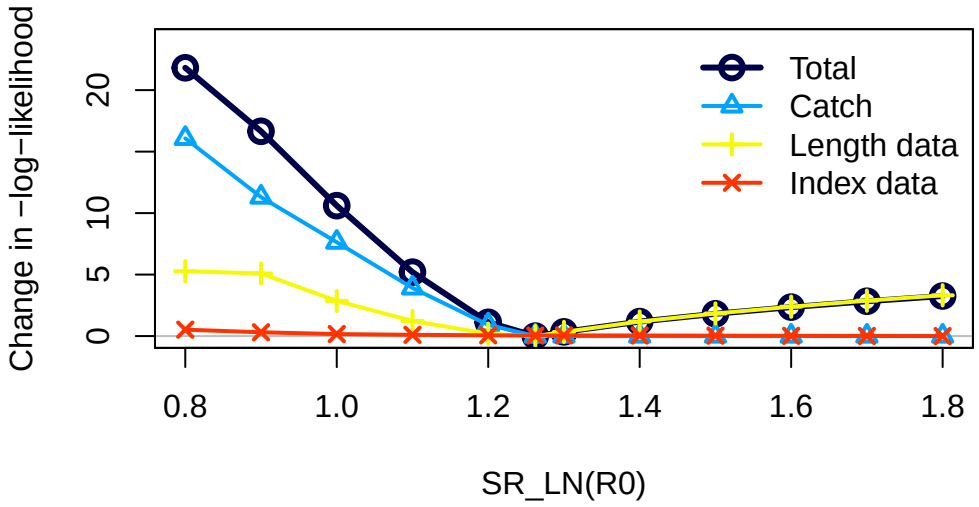
```
    Index Season     MASE     MAE.PR   MAE.base  MASE.adj n.eval
1 FISHERY      1 1.241835 0.02709344 0.02181726 0.2709344      1
```

**Recruitment Deviations**

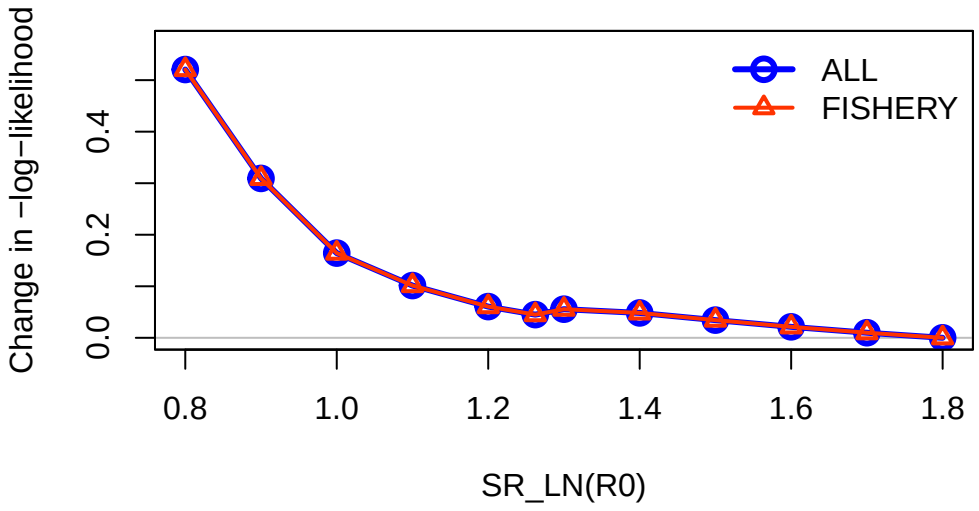
**Likelihood Profile**

```
[1] "SR_LN"
                    frac_change include                            label
TOTAL                    1.0000    TRUE                            Total
Catch                    0.7369    TRUE                            Catch
Equil_catch              0.0000   FALSE                Equilibrium catch
Survey                   0.0239    TRUE                       Index data
Length_comp              0.2417    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              0.0006   FALSE                           Priors
```

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

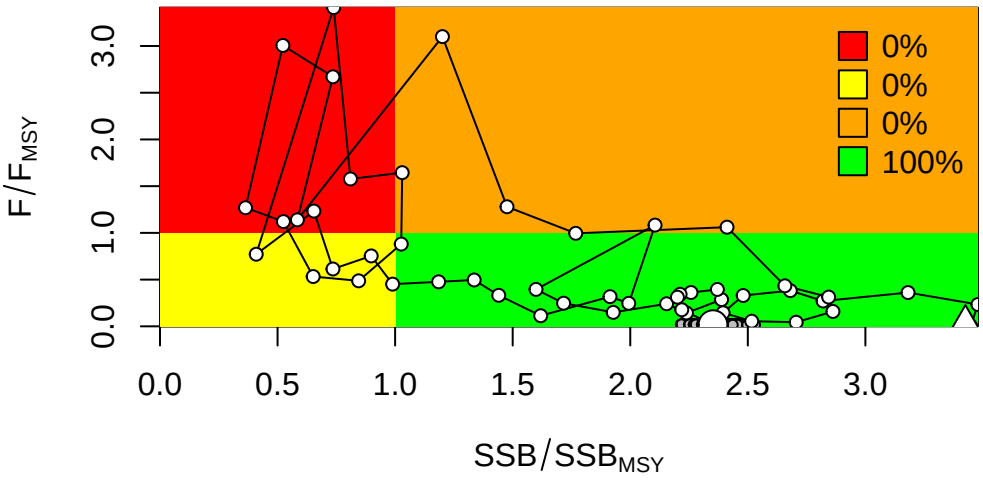


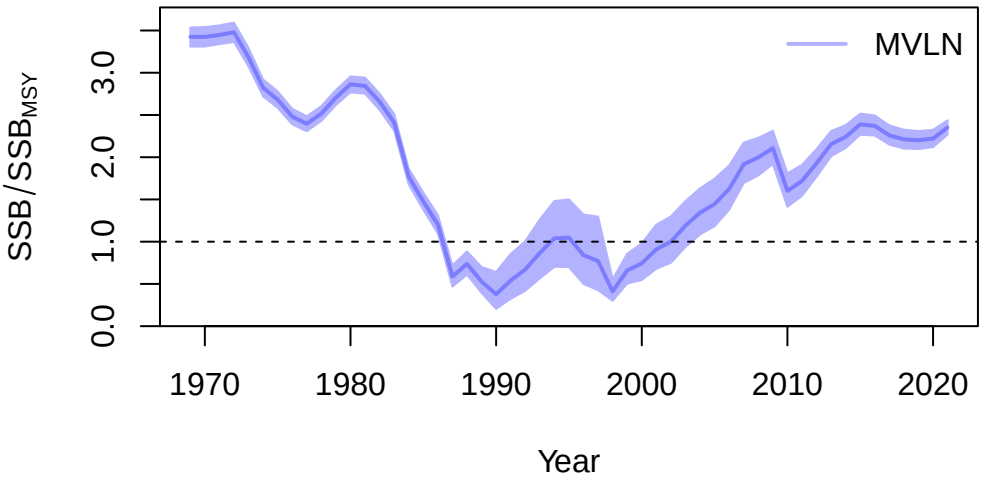

**Changes in survey likelihood by fleet**

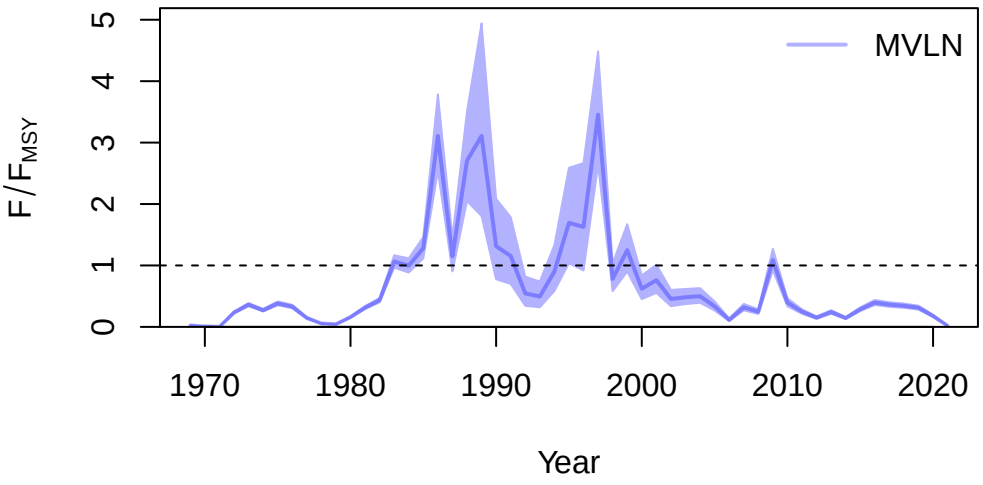


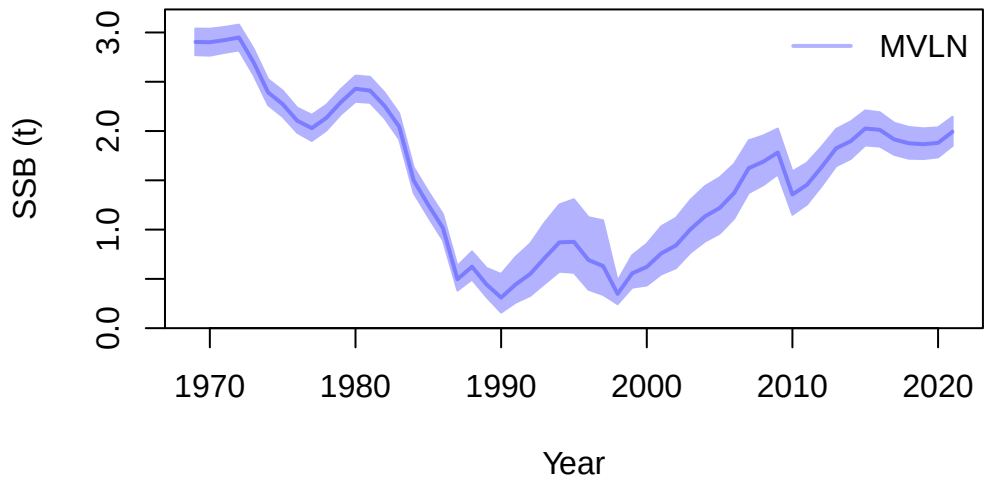
**Management Quantities**

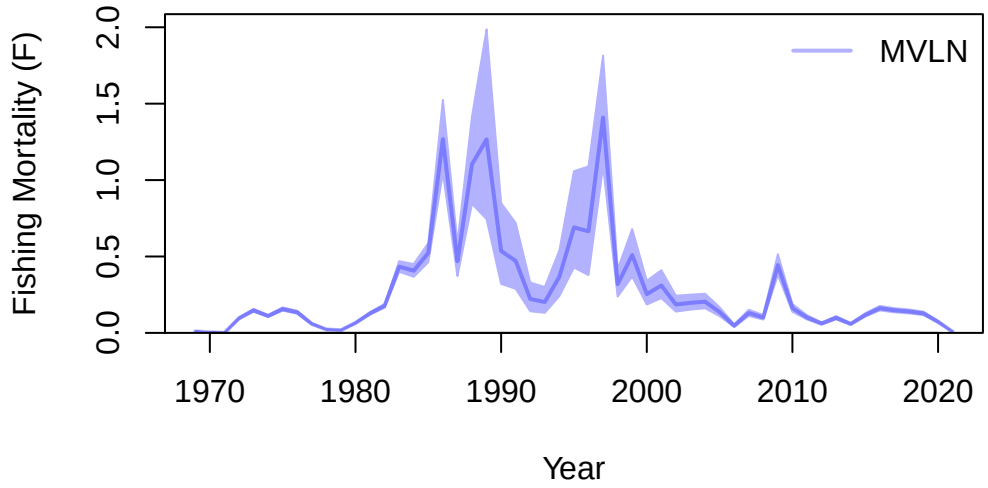
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F




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

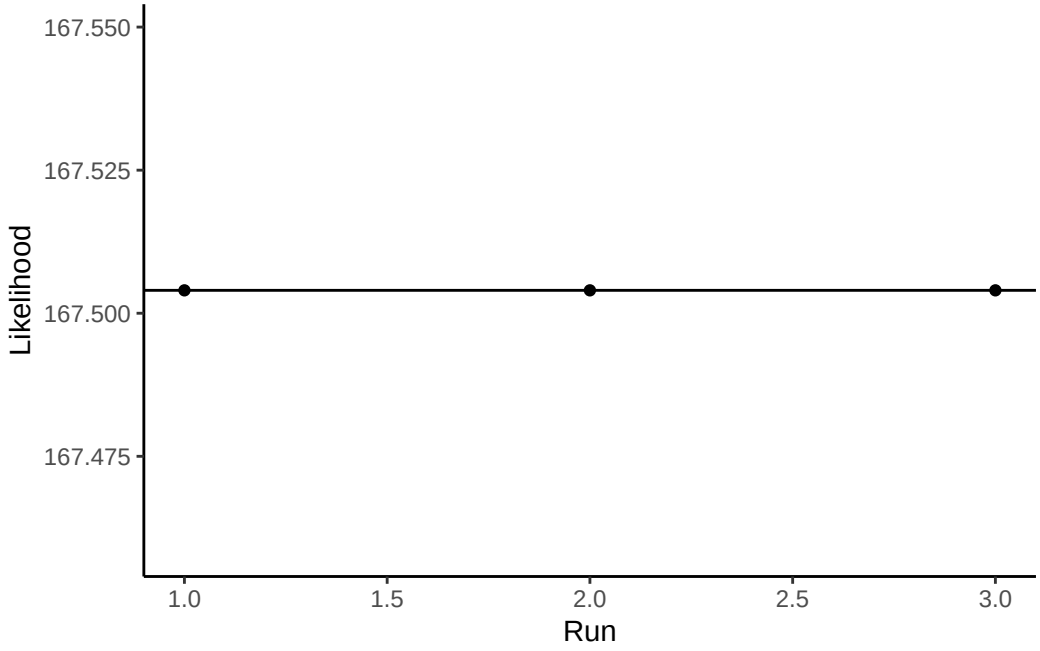

MVLN
F/F$_{MSY}$
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year

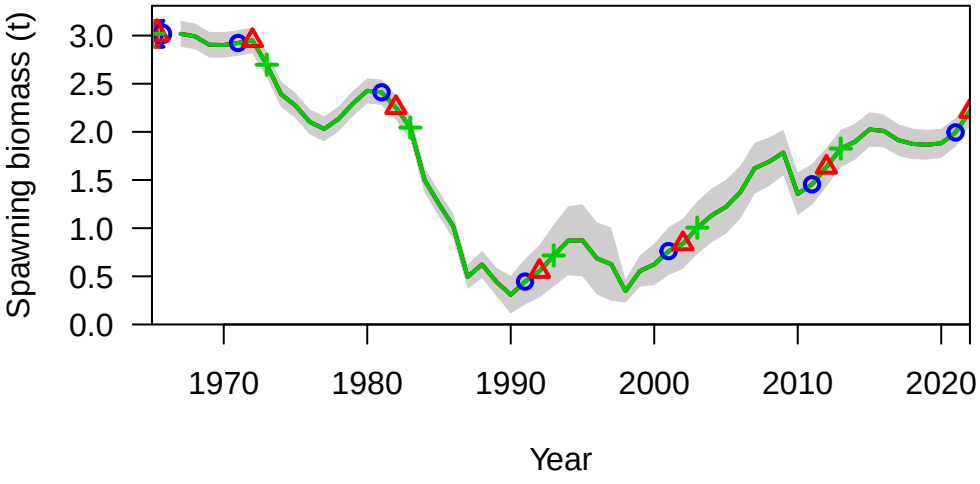


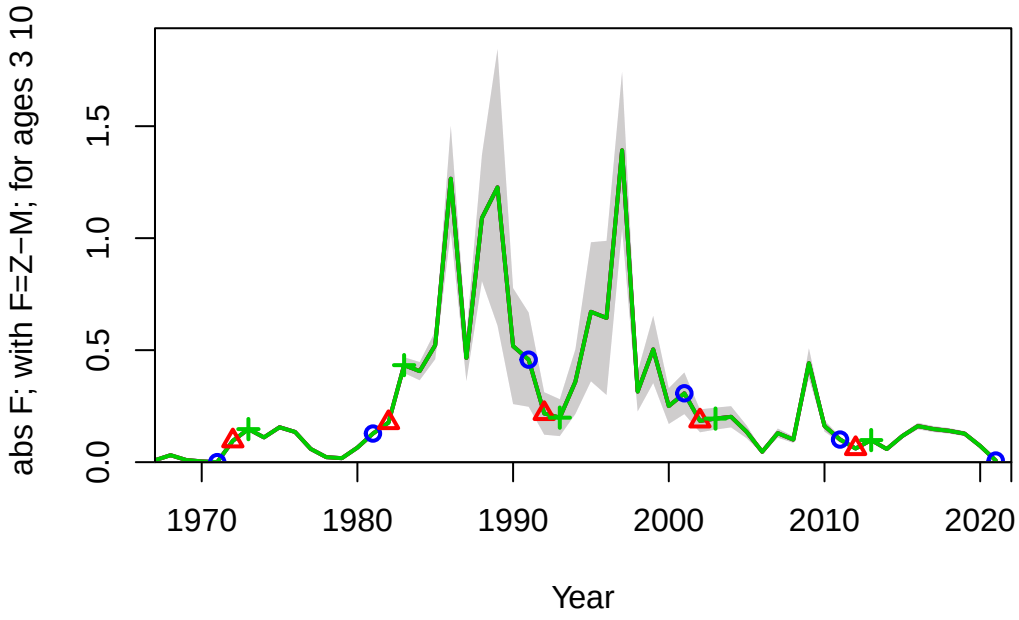



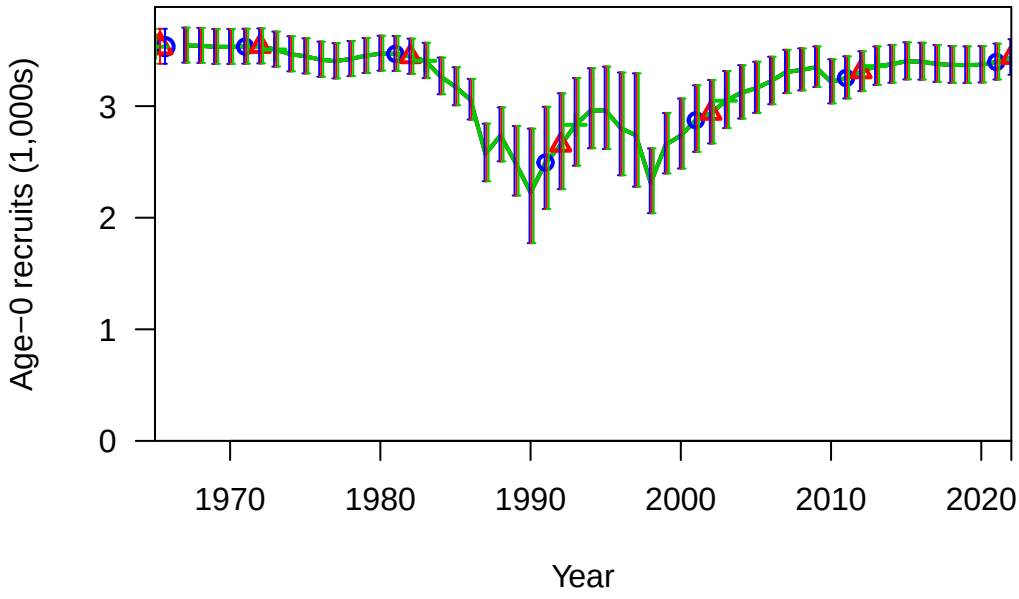

```
null device
          1
```

**Jitter**

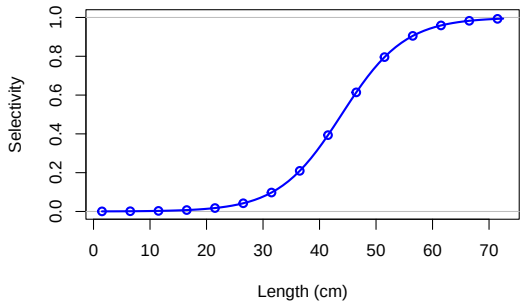

167.550
167.525
167.500
167.475
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

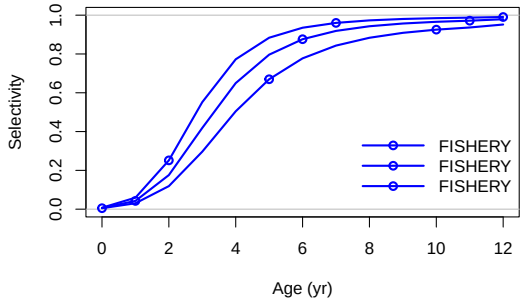

Spawning biomass (t)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1970
1980
1990
2000
2010
2020
Year

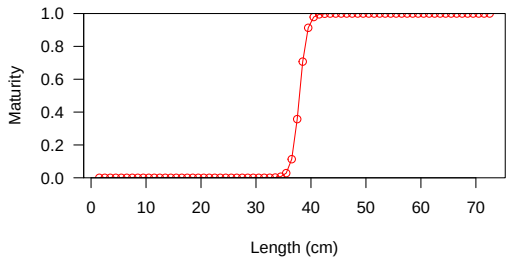


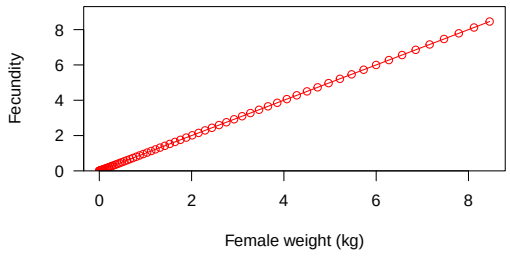




**Selectivity and Maturity**


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
10
20
30
40
50
60
70
Length (cm)


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
12
Age (yr)
FISHERY
FISHERY
FISHERY


Maturity
0.0
0.2
0.4
0.6
0.8
1.0
0
10
20
30
40
50
60
70
Length (cm)


Fecundity
0
2
4
6
8
0
2
4
6
8
Female weight (kg)