American Samoa Model Checks

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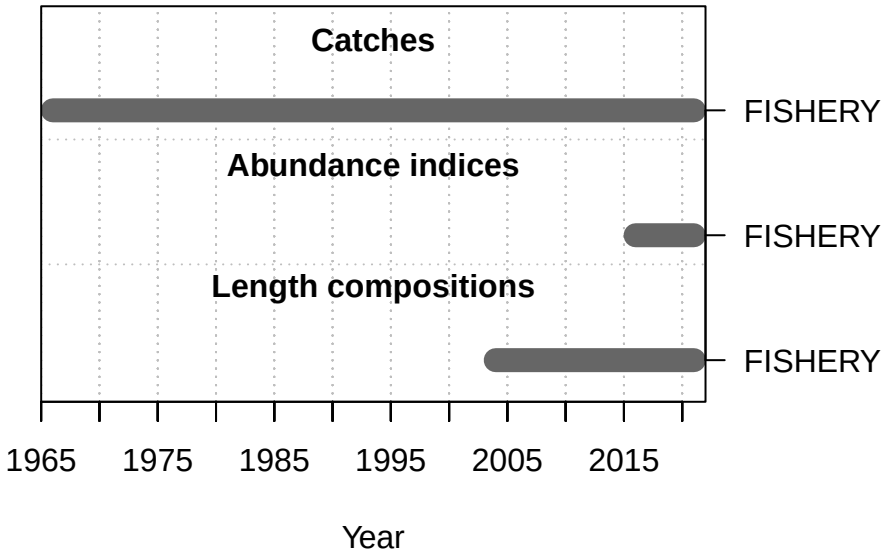
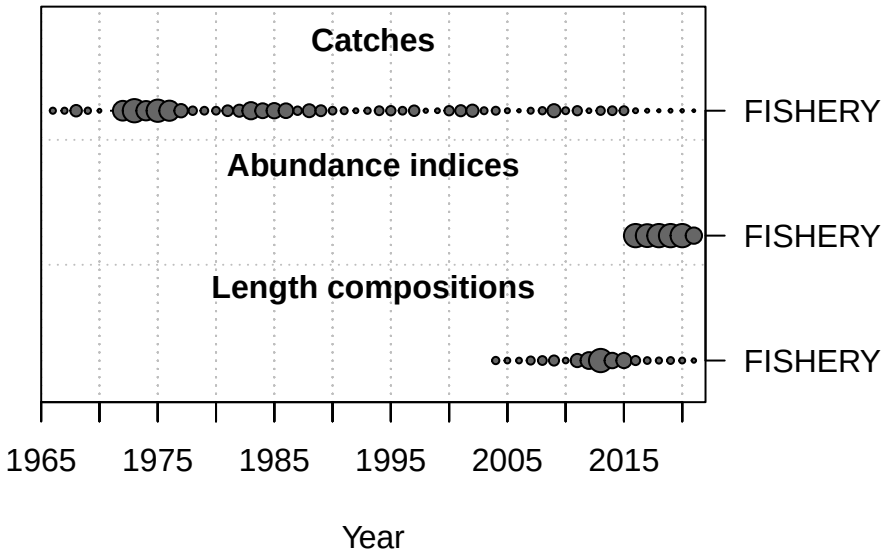
This is a summary report for the LUKA base model run.

Model Output

Input Data





Convergence Check

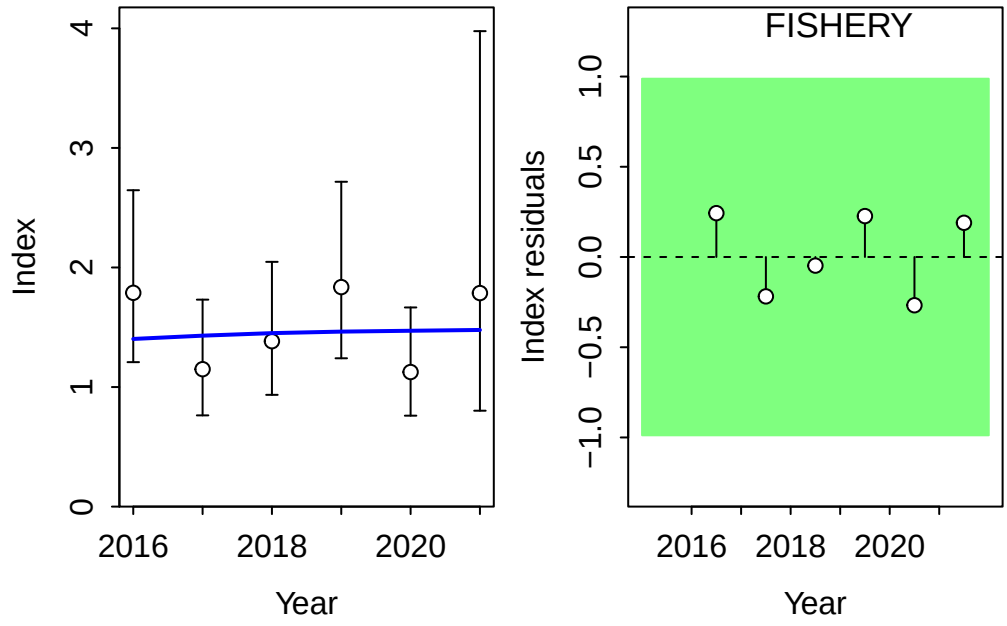
```
  Converged     MaxGrad
1      TRUE 1.69466e-05
```

```
[1] "1 NOTE:  Max data length bin: 28  < max pop len bins: 31; so will accumulate larger pop
[2] "2 Forecast F capped by max possible F from control file: 2.9"
[3] "3 Forecast F capped by max possible F from control file: 2.9"
[4] "N warnings: 3"
```

Fit to Model

CPUE

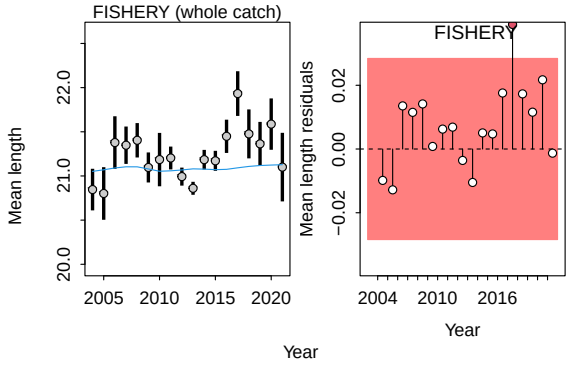
Fleet	RMSE.perc	Nobs
FISHERY	21.1	6
Combined	21.1	6

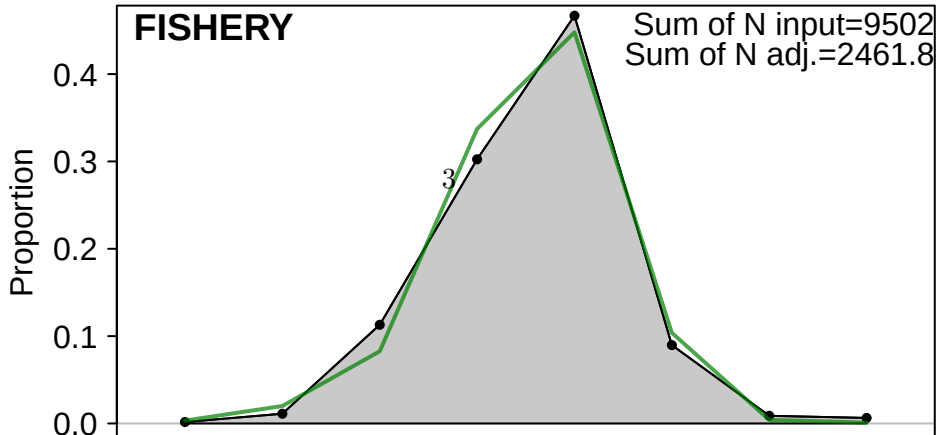


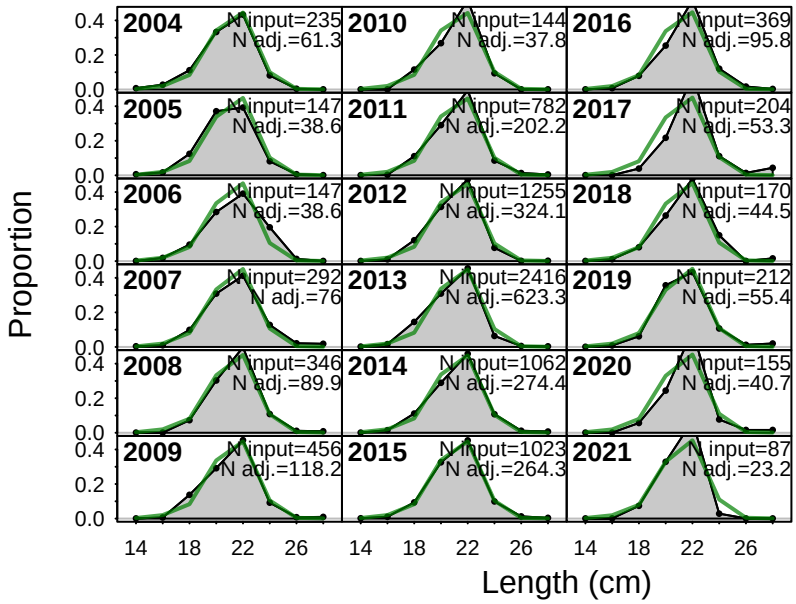
Length Comp

Fleet	RMSE.perc	Nobs
FISHERY	1.4	18
Combined	1.4	18

```
          w          lo          hi           Index runs.p   test   sigma3.lo  sigma3.hi type
0.13005330 0.07121965 0.44996221       1 FISHERY  0.024 Failed -0.02841566 0.02841566  len
```

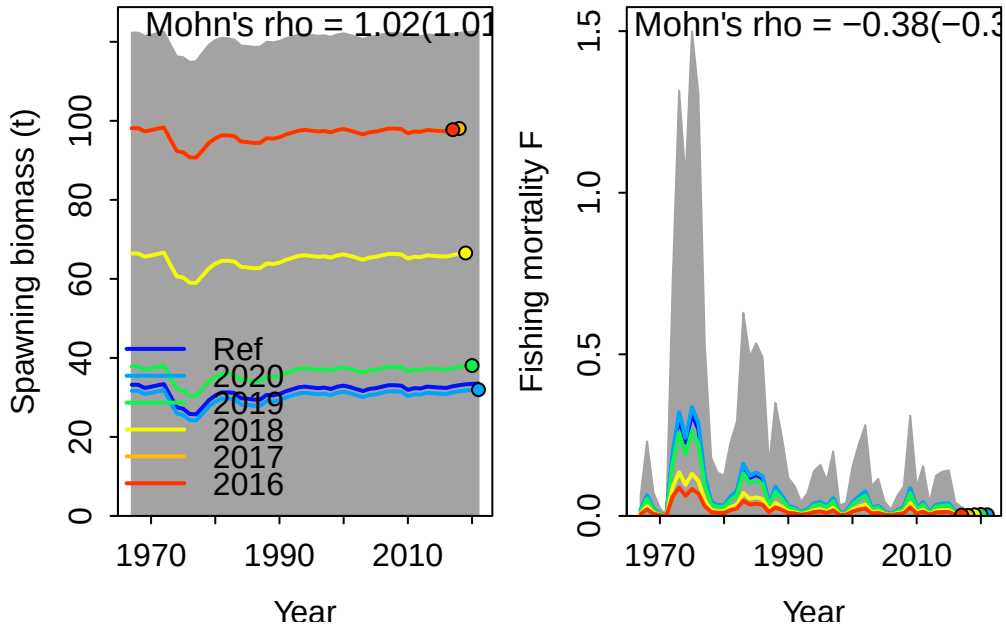






Retrospective

`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  0.04828665   0.0480543
2    F     2019 -0.12387233  -0.1233634
3    F     2018 -0.50331711  -0.5016537
4    F     2017 -0.66674655  -0.6643112
5    F     2016 -0.67018769  -0.6668410
6    F Combined -0.38316741  -0.3816230
```

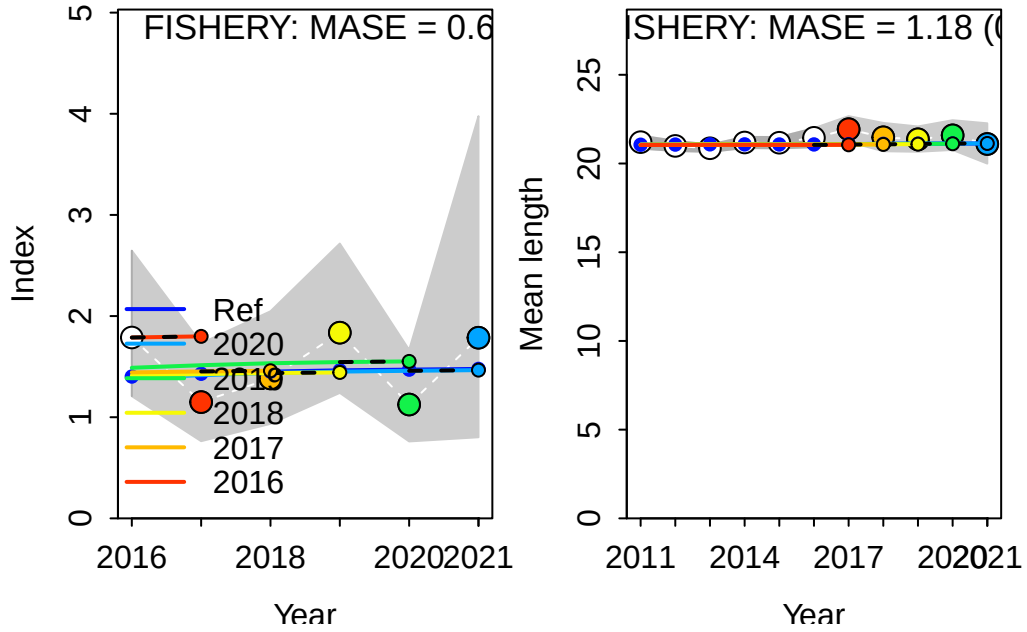
Hindcasting

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

 Computing MASE with all 5 of 5  prediction residuals for Index FISHERY


MASE stats by Index:
Plotting Hindcast Cross-Validation (one-step-ahead)

 Computing MASE with all 5 of 5  prediction residuals for Index FISHERY
```



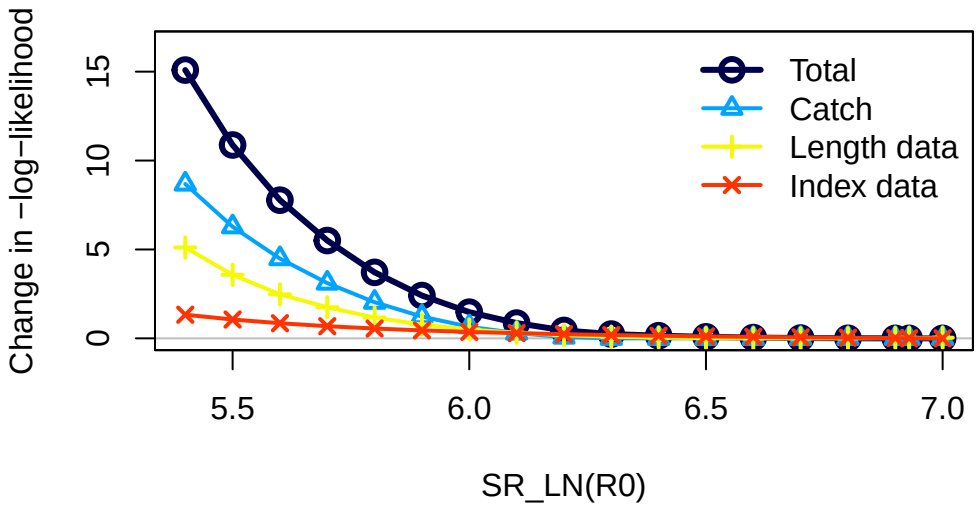
MASE stats by Index:

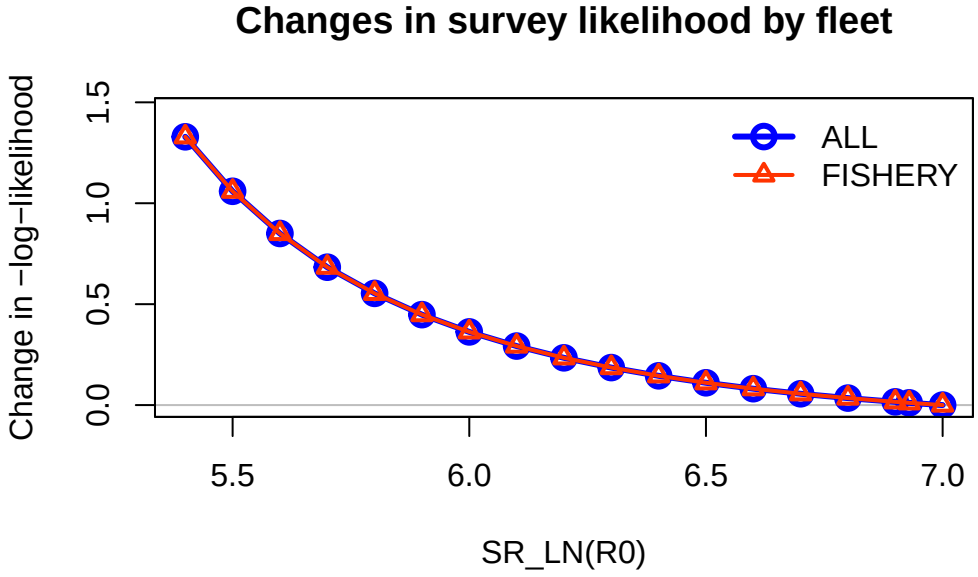
```
    Index Season    MASE     MAE.PR   MAE.base  MASE.adj n.eval
1 FISHERY      1 1.17791 0.01927912 0.01636723 0.1927912      5
```

Recruitment Deviations

Likelihood Profile

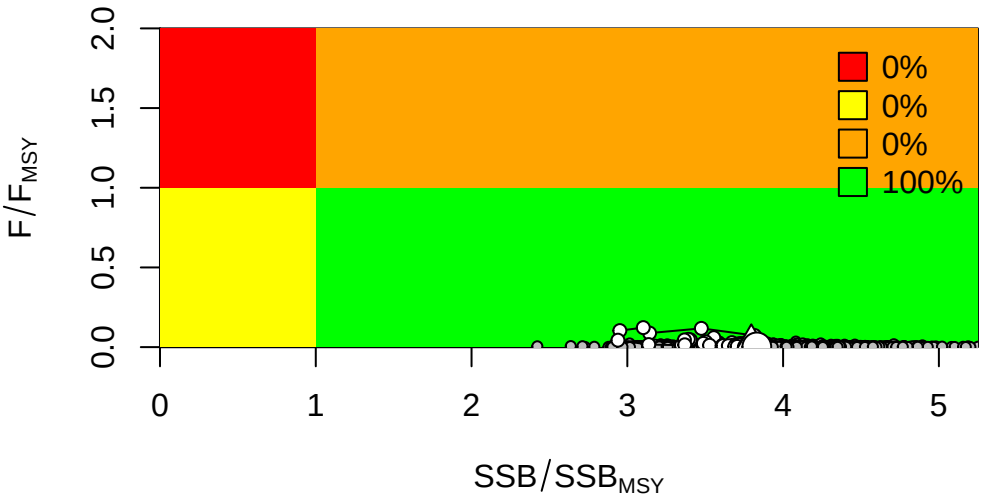
```
[1] "SR_LN"
                     frac_change include                           label
TOTAL                     1.0000    TRUE                           Total
Catch                     0.5753    TRUE                           Catch
Equil_catch               0.0000   FALSE                Equilibrium catch
Survey                    0.0881    TRUE                       Index data
Length_comp               0.3388    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               0.0005   FALSE                          Priors
Parm_softbounds           0.0000   FALSE                     Soft bounds
Parm_devs                 0.0000   FALSE            Parameter deviations
Crash_Pen                 0.0000   FALSE                   Crash penalty
```

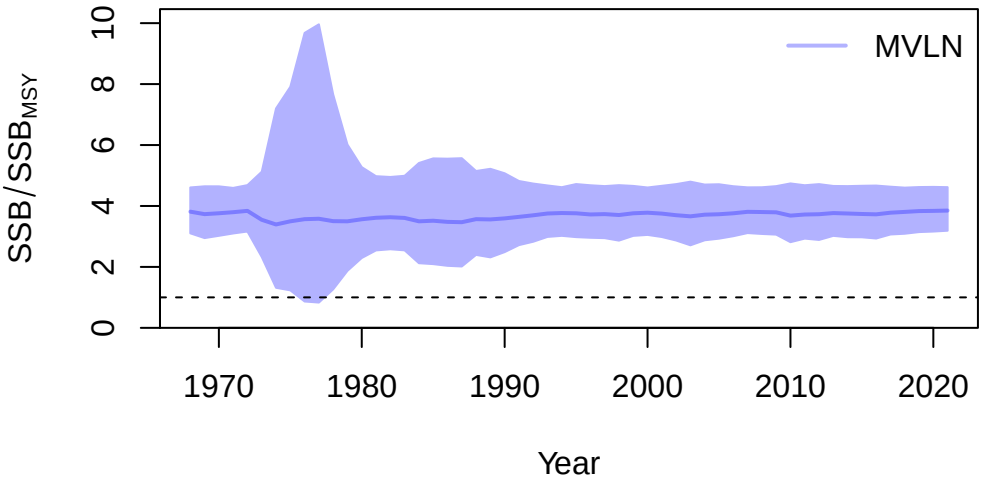


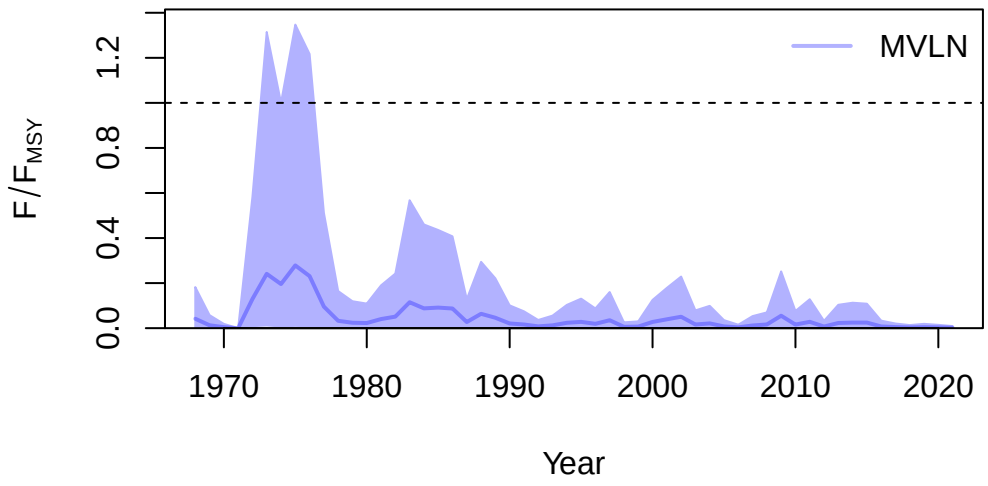


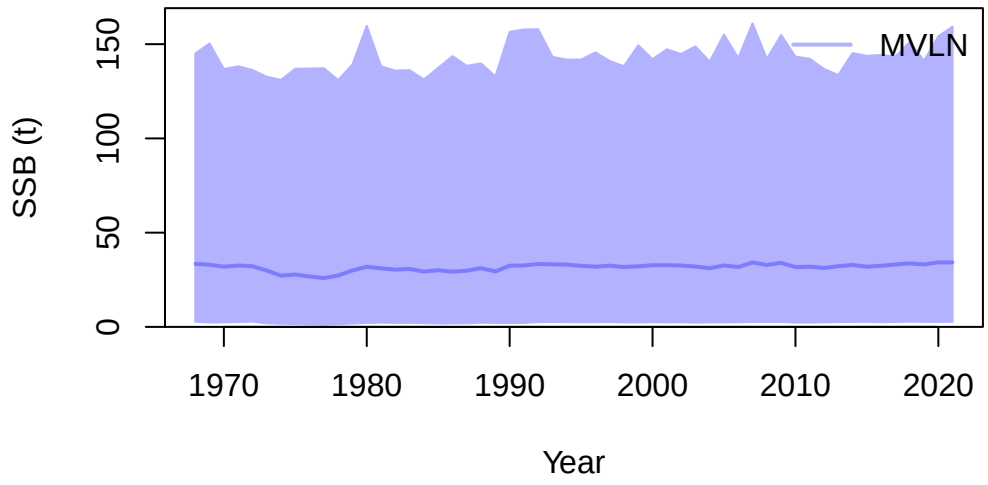
Management Quantities

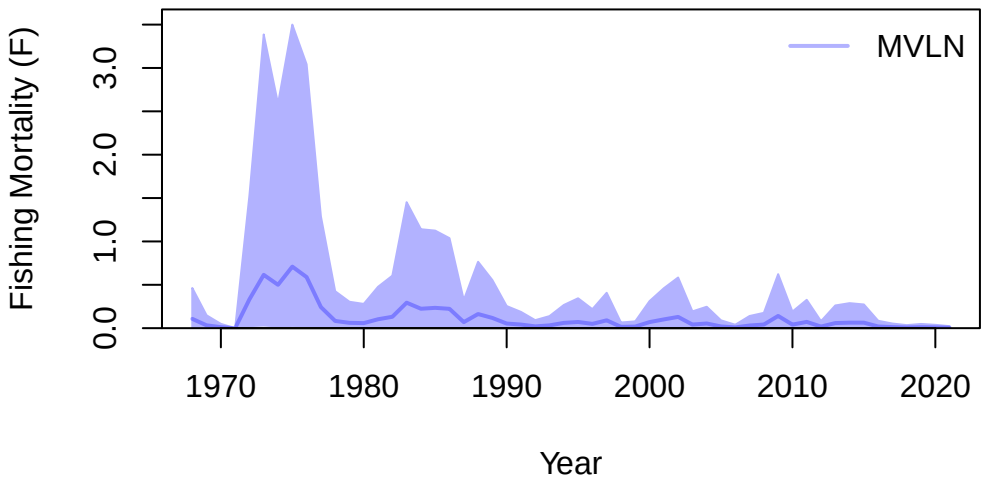
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F





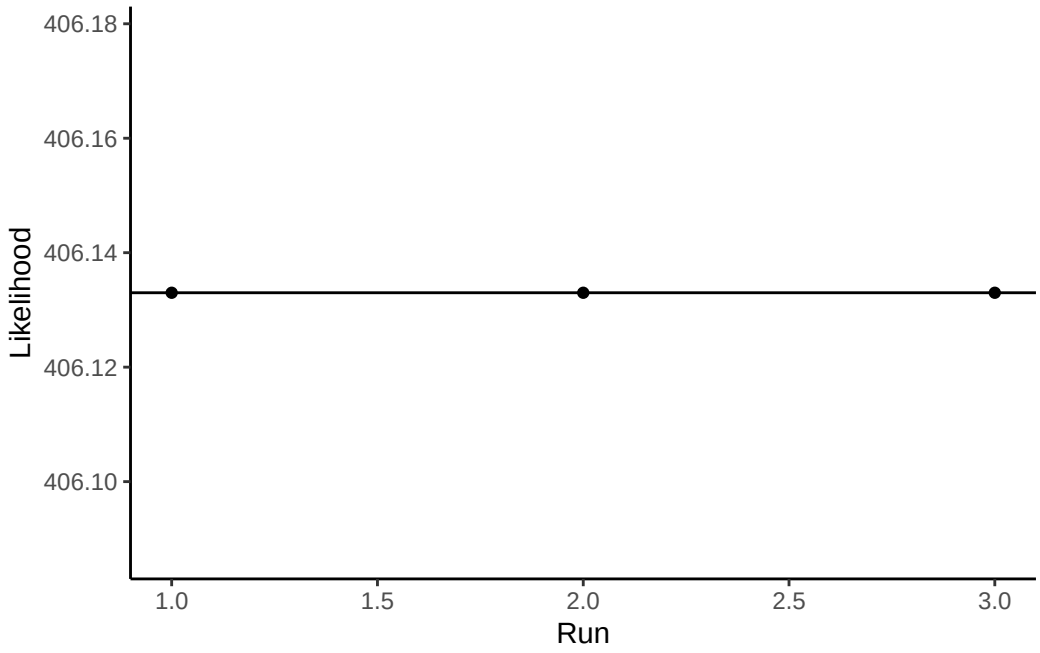

MVLN
F/F_MSY
0.0
0.4
0.8
1.2
1970
1980
1990
2000
2010
2020
Year

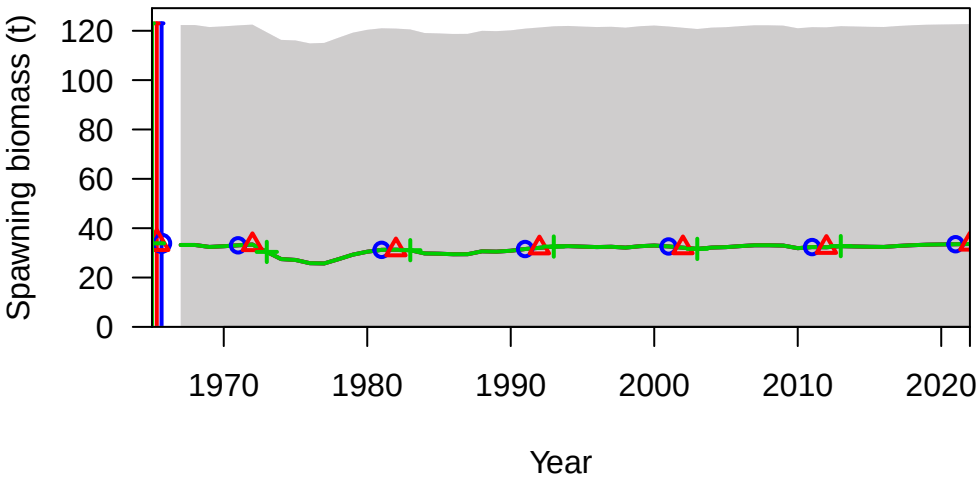

MVLN
SSB (t)
0
50
100
150
1970
1980
1990
2000
2010
2020
Year

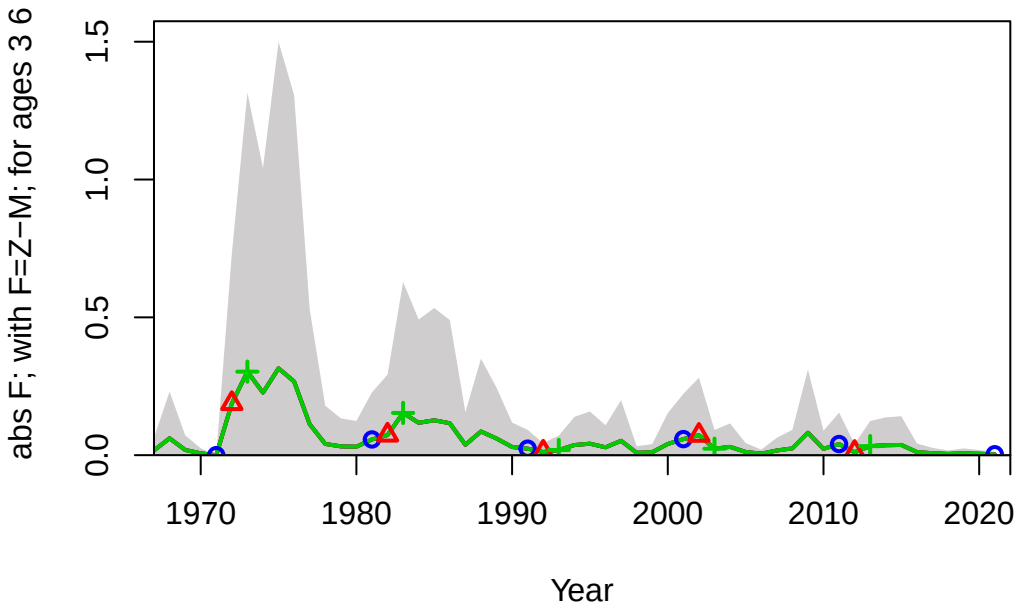


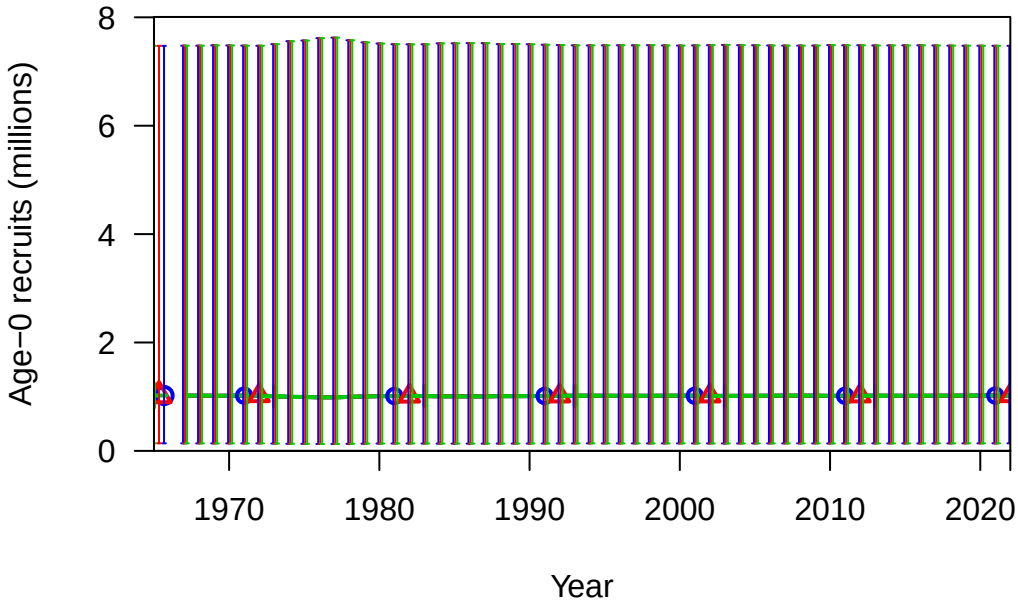

```
null device
          1
```

Jitter

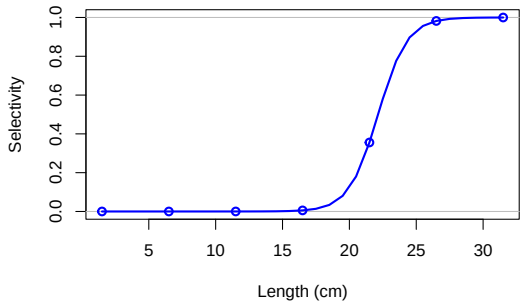

406.18
406.16
406.14
406.12
406.10
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

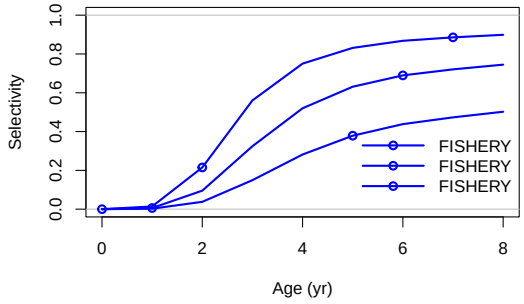

120
100
80
60
40
20
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year

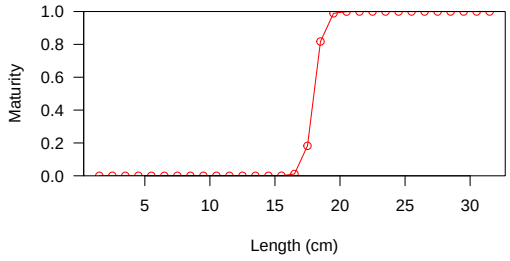


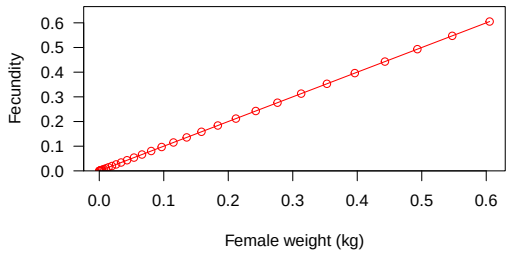


Selectivity and Maturity


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
5
10
15
20
25
30
Length (cm)


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


Maturity
0.0
0.2
0.4
0.6
0.8
1.0
5
10
15
20
25
30
Length (cm)


Fecundity
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Female weight (kg)