American Samoa Model Checks

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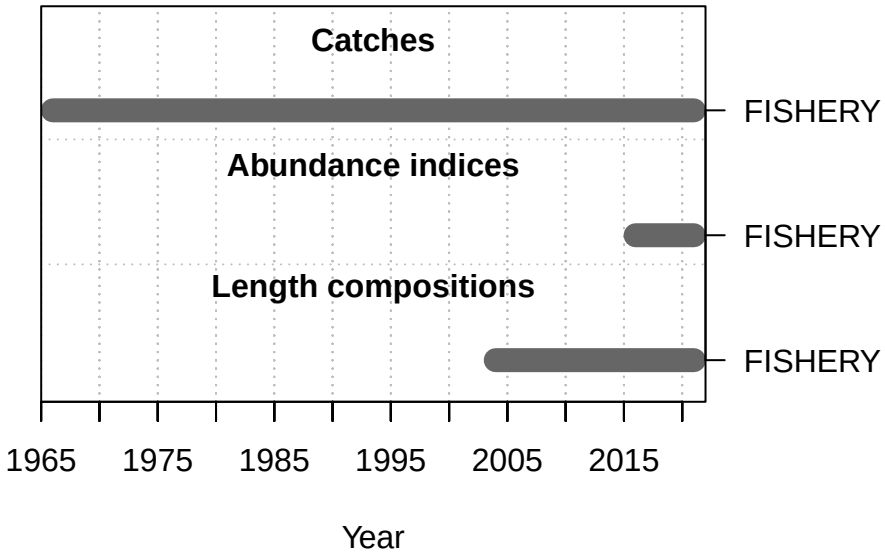
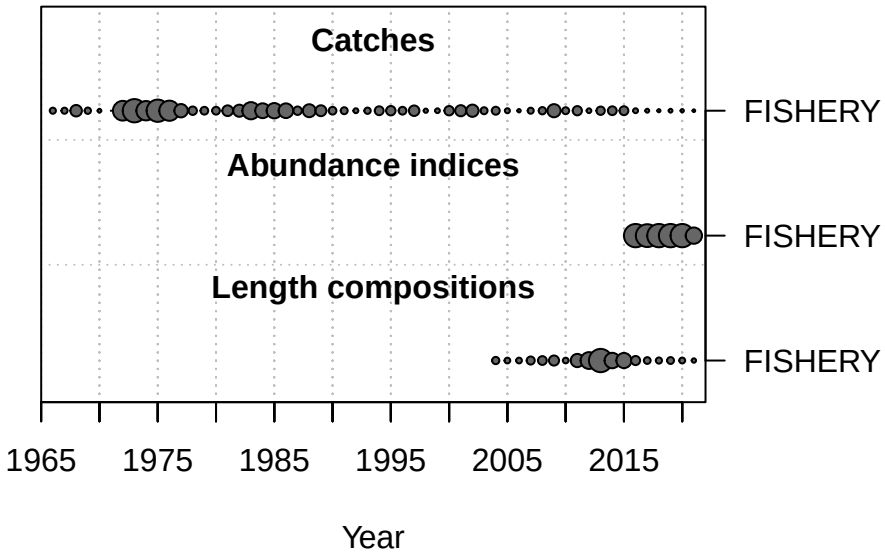
This is a summary report for the LUKA base model run.

Model Output

Input Data





Convergence Check

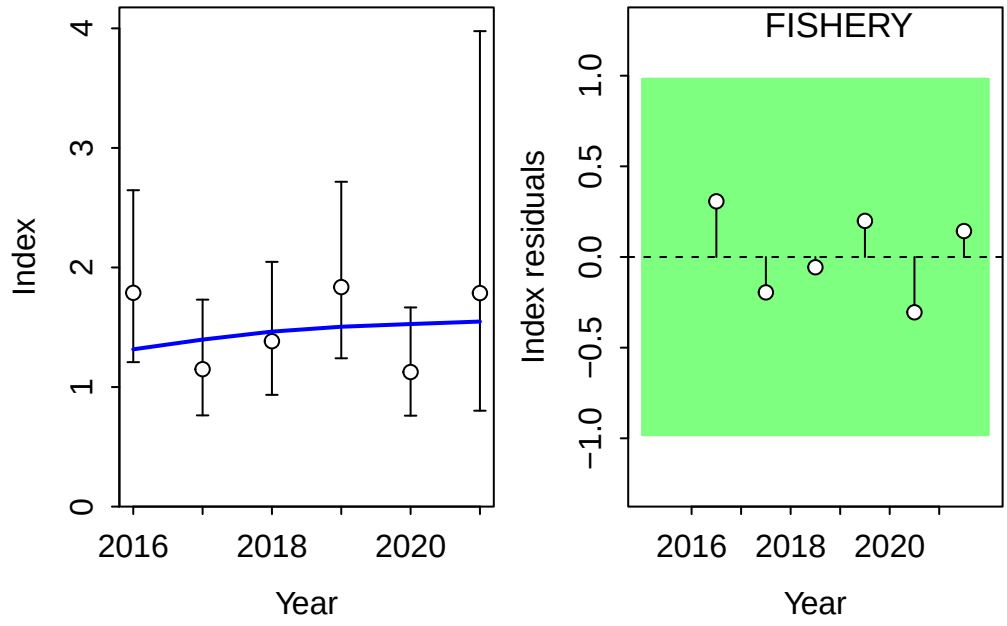
```
  Converged     MaxGrad
1      TRUE 2.53274e-05
```

```
[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

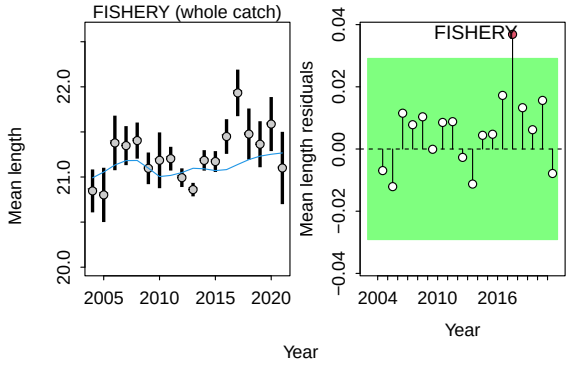
Fleet	RMSE.perc	Nobs
FISHERY	21.9	6
Combined	21.9	6

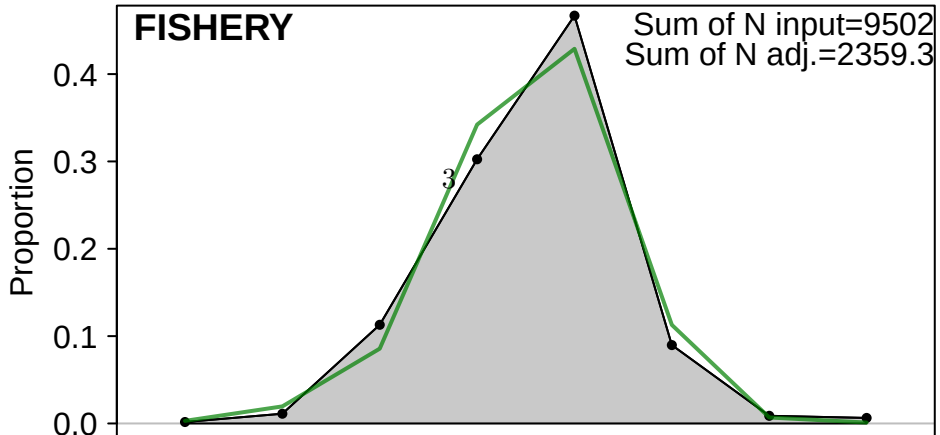


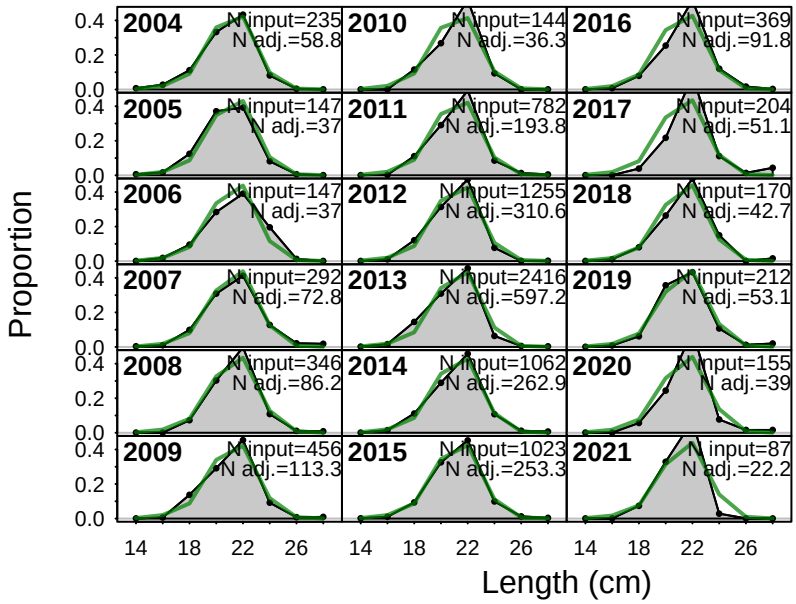
Length Comp

Fleet	RMSE.perc	Nobs
FISHERY	1.3	18
Combined	1.3	18

```
          w          lo          hi           Index runs.p   test   sigma3.lo  sigma3.hi type
0.14420929 0.07623857 0.49276346       1 FISHERY  0.135 Passed -0.02912284 0.02912284  len
```

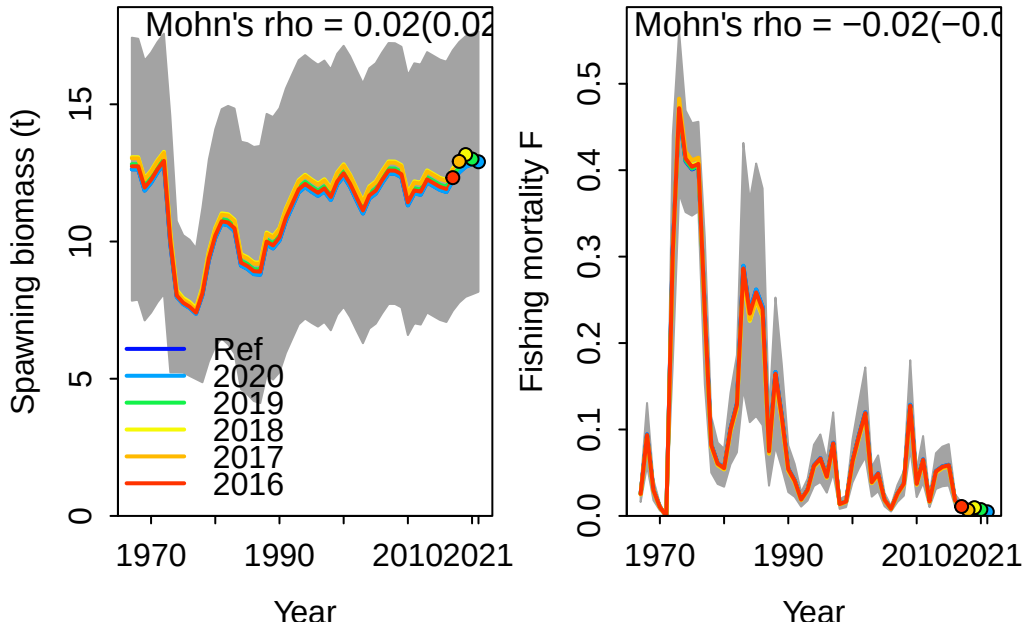






Retrospective

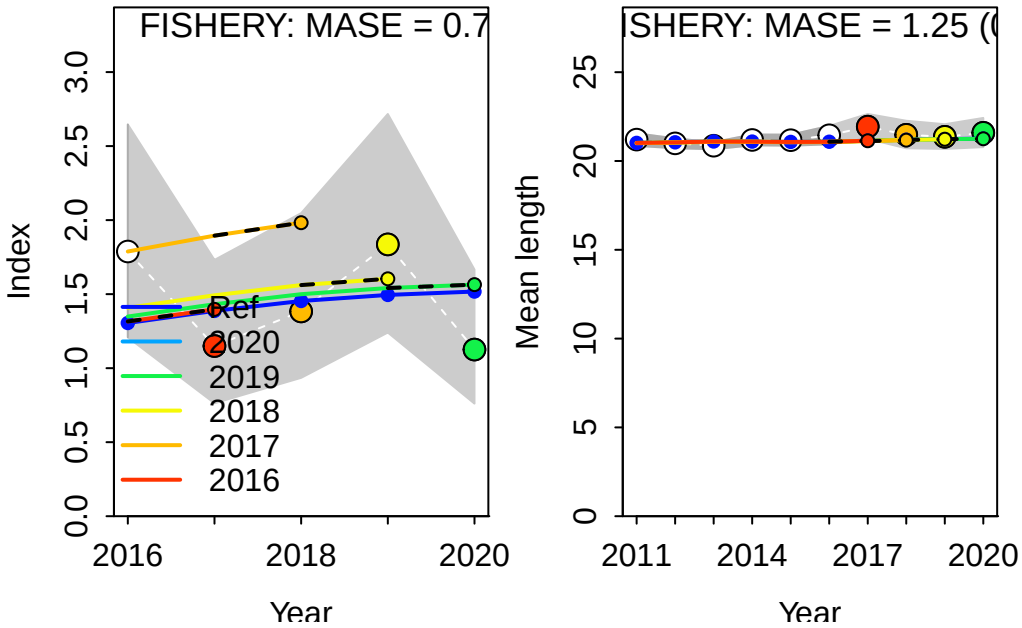
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel          Rho  ForecastRho
1    F     2020  0.001090502  0.001085840
2    F     2019 -0.013996490 -0.013750219
3    F     2018 -0.032368650 -0.031540687
4    F     2017 -0.027841637 -0.026640244
5    F     2016 -0.007909789 -0.007532871
6    F Combined -0.016205213 -0.015675636
```

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 4 of 5  prediction residuals for Index FISHERY

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



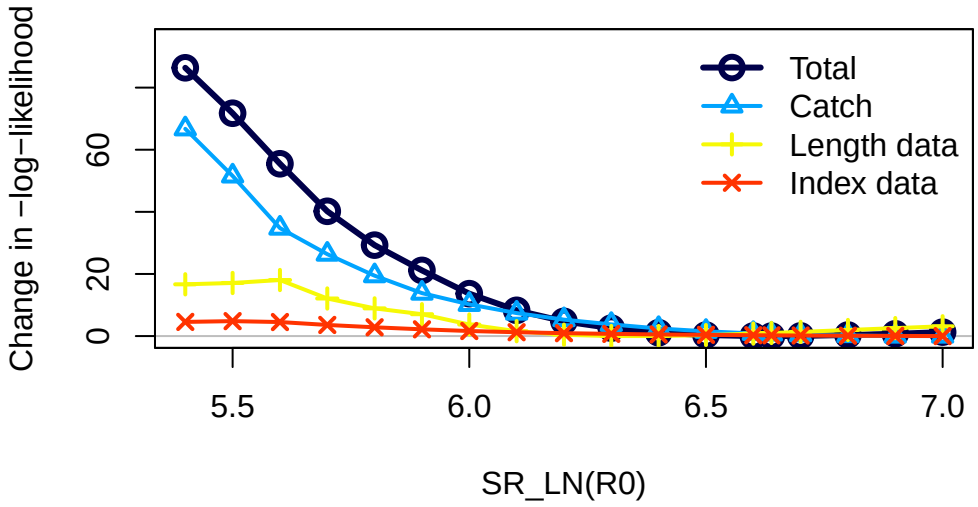

```
MASE stats by Index:

    Index Season     MASE     MAE.PR   MAE.base  MASE.adj n.eval
1 FISHERY      1 1.245141 0.01837111 0.01475424 0.1837111      4
```

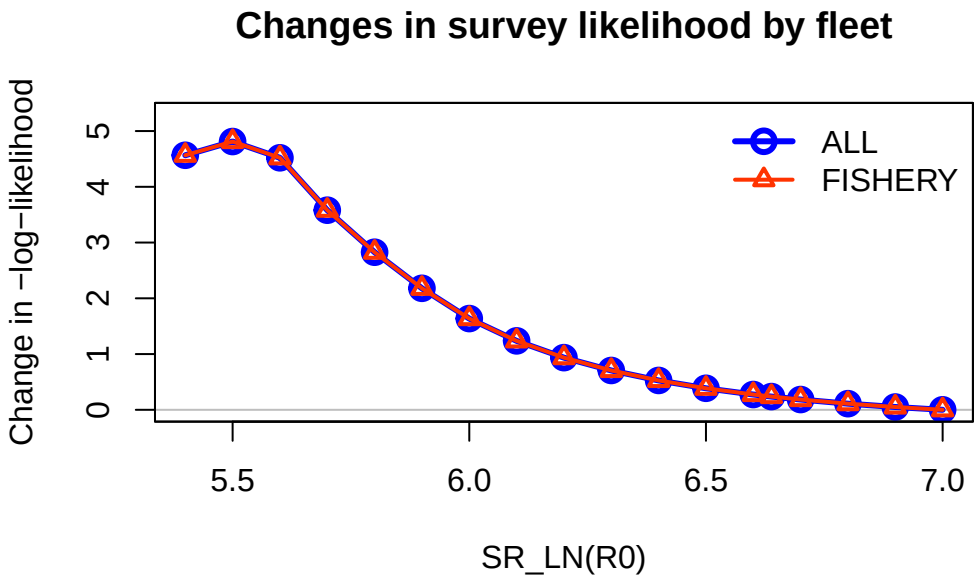
Recruitment Deviations

Likelihood Profile

```
[1] "SR_LN"
                     frac_change include                            label
TOTAL                     1.0000    TRUE                            Total
Catch                     0.7725    TRUE                            Catch
Equil_catch               0.0034   FALSE                 Equilibrium catch
Survey                    0.0557    TRUE                        Index data
Length_comp               0.2089    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
```

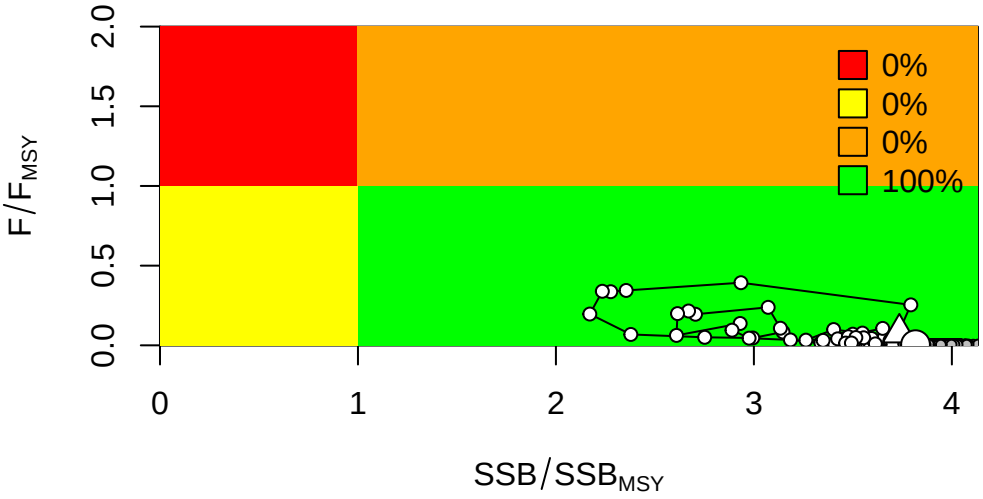
Parm_softbounds	0.0000	FALSE	Soft bounds
Parm_devs	0.0000	FALSE	Parameter deviations
Crash_Pen	0.0000	FALSE	Crash penalty

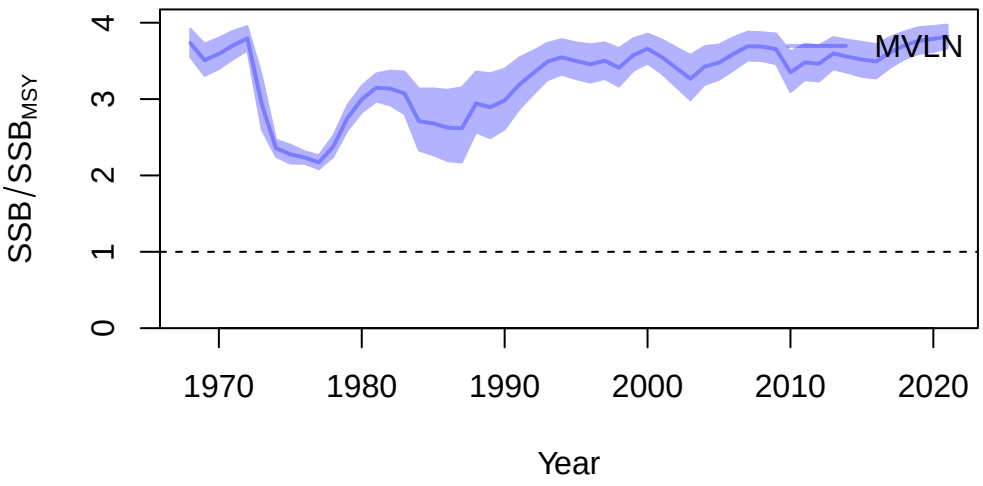


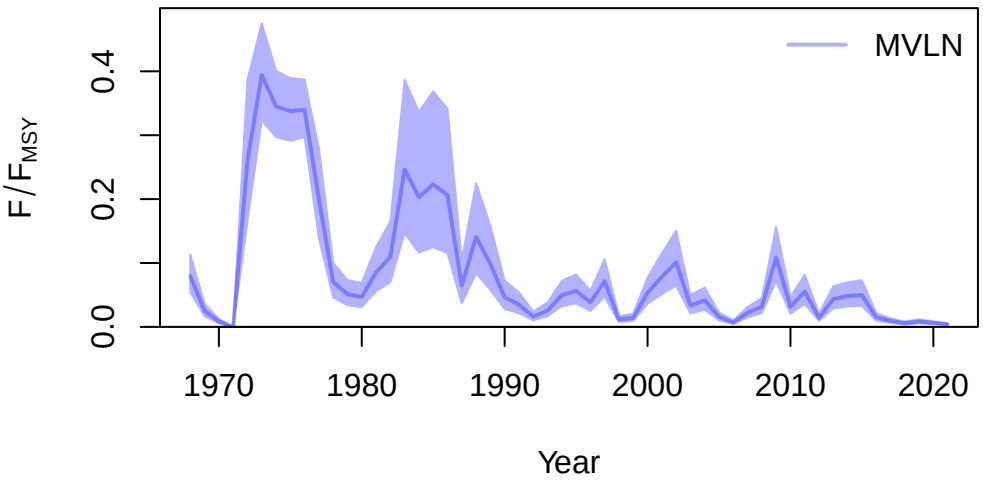


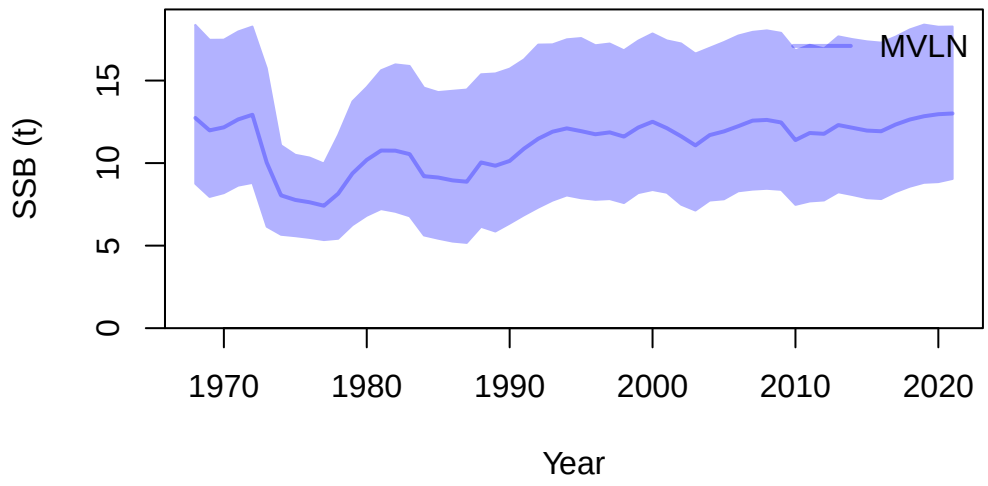
Management Quantities

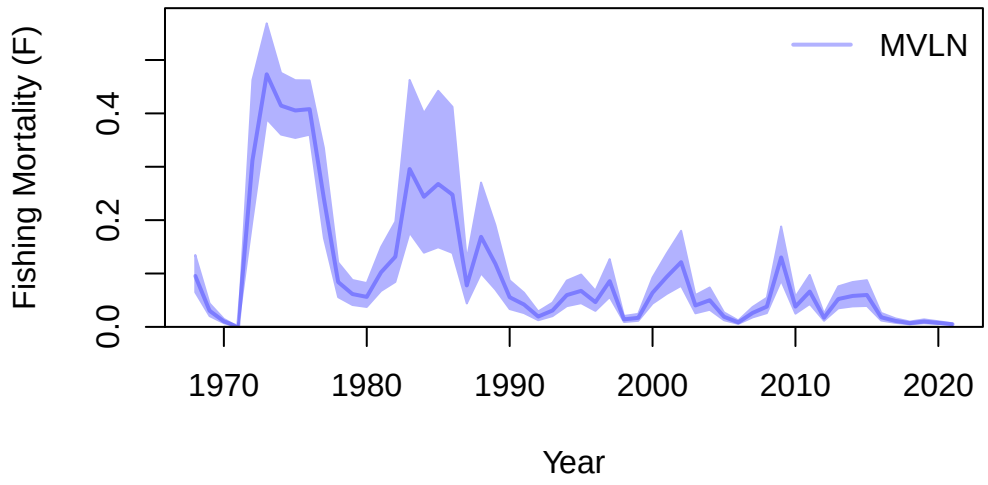
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F




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

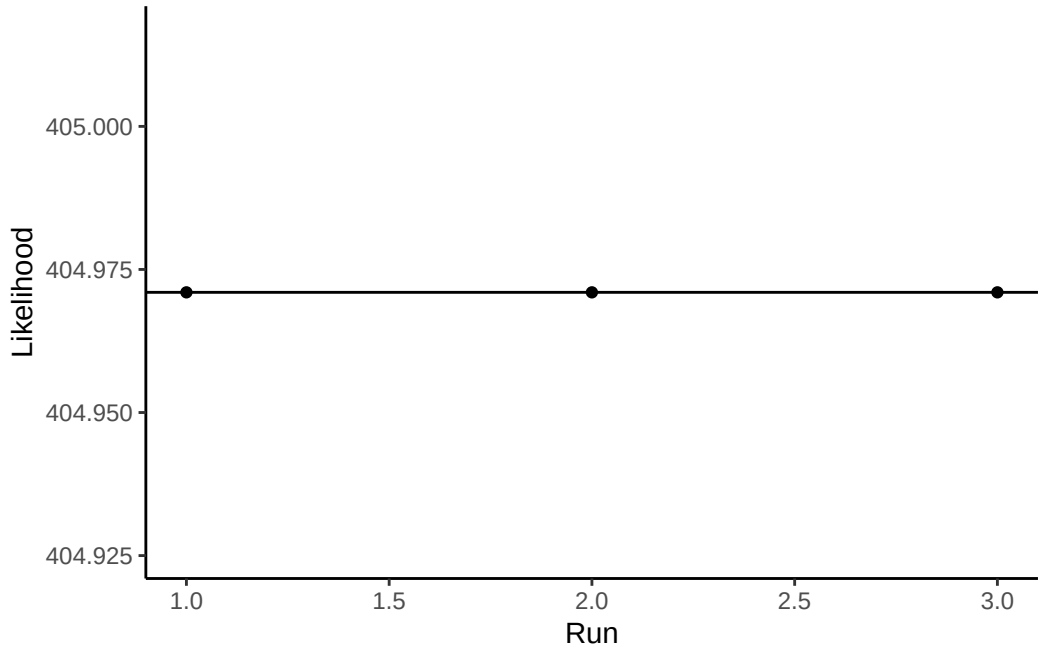

F/F$_{MSY}$
0.0
0.2
0.4
MVLN
1970
1980
1990
2000
2010
2020
Year

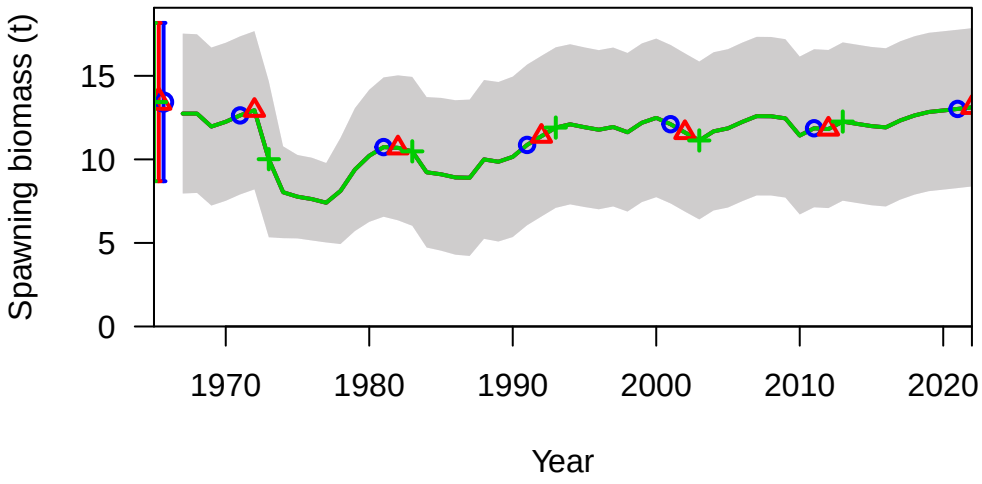


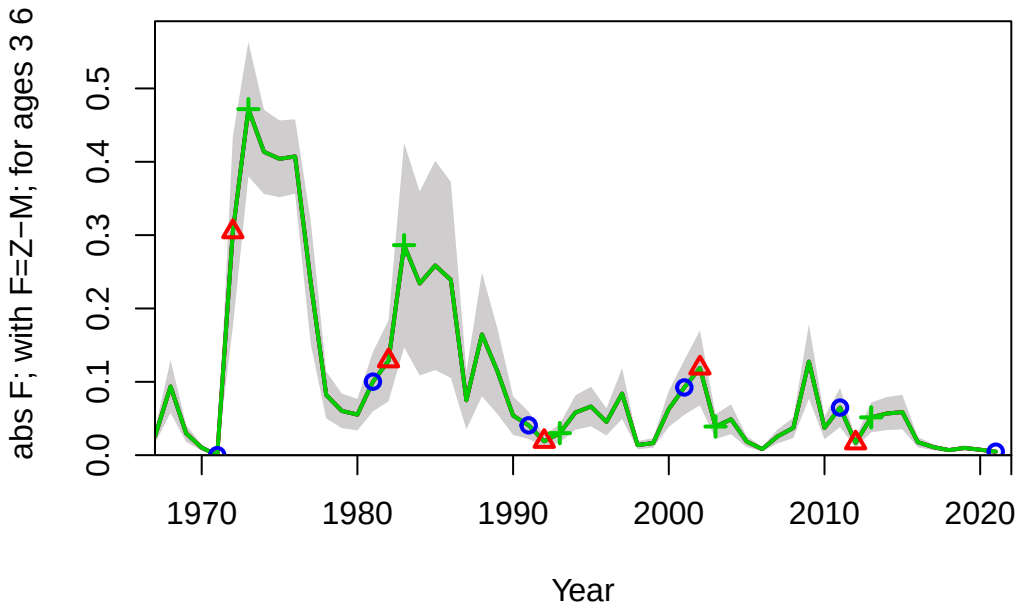


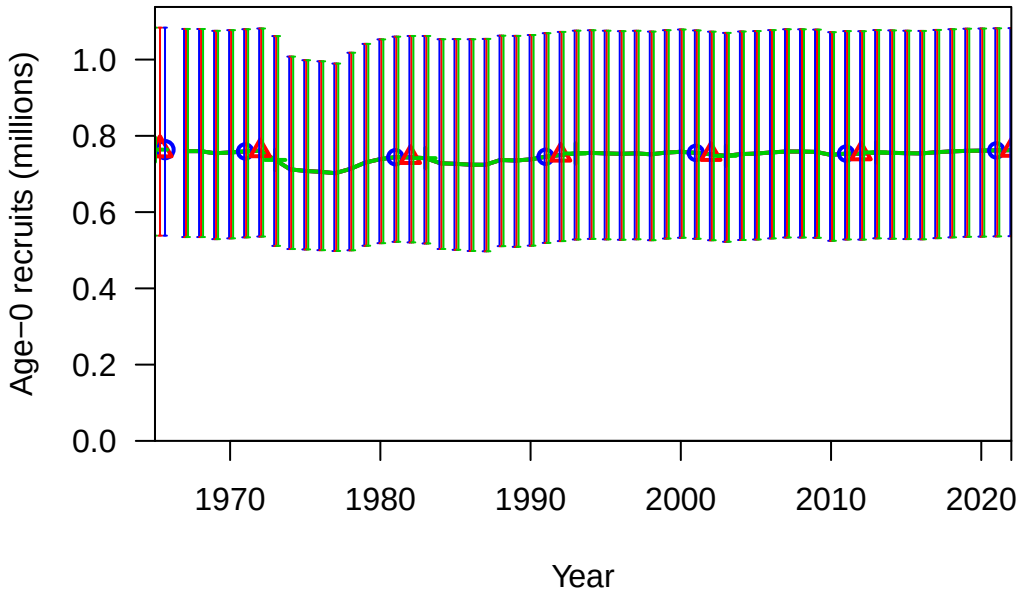

```
null device
          1
```

Jitter

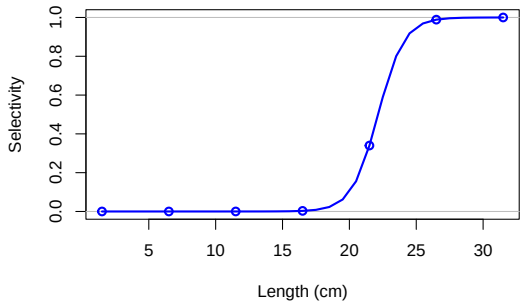

405.000
404.975
404.950
404.925
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

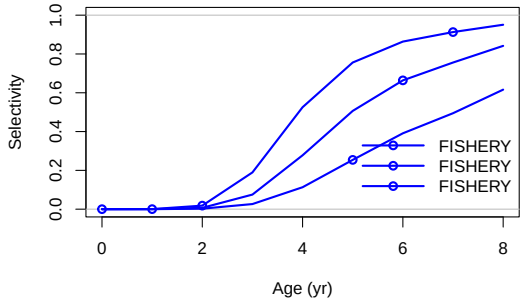

Spawning biomass (t)
15
10
5
0
1970
1980
1990
2000
2010
2020
Year

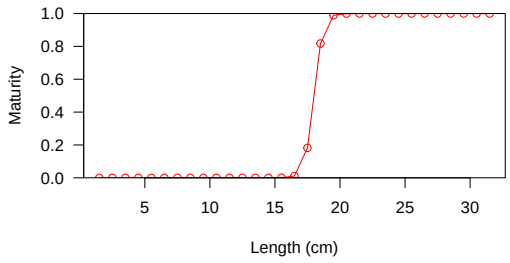


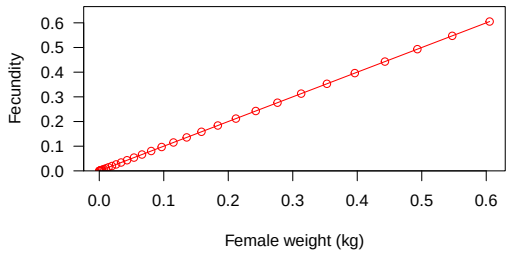


Selectivity and Maturity


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
0
2
4
6
8
Age (yr)
FISHERY
FISHERY
FISHERY


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)