American Samoa Model Checks

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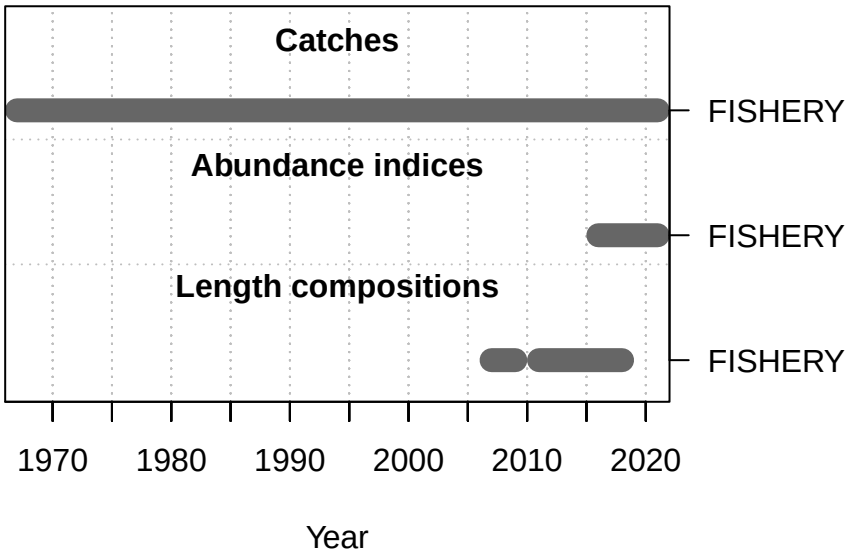
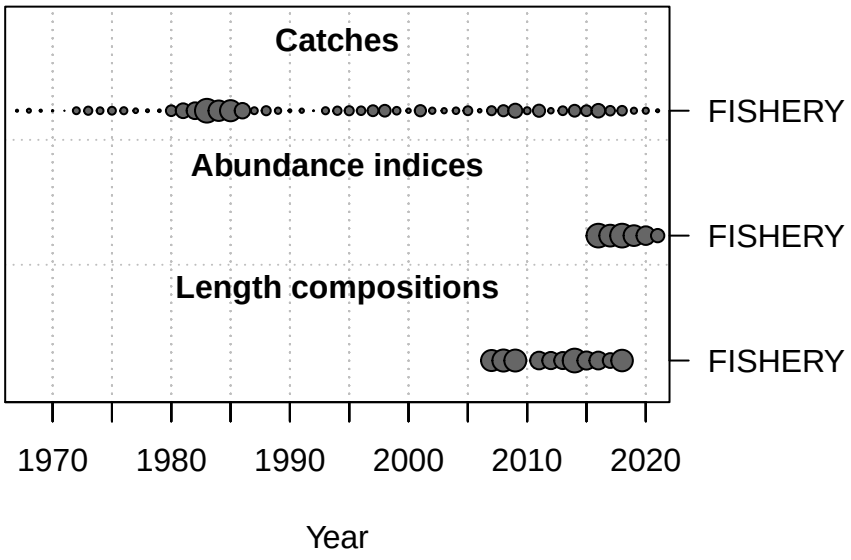
This is a summary report for the ETCO base model run.

Model Output

Input Data





Convergence Check

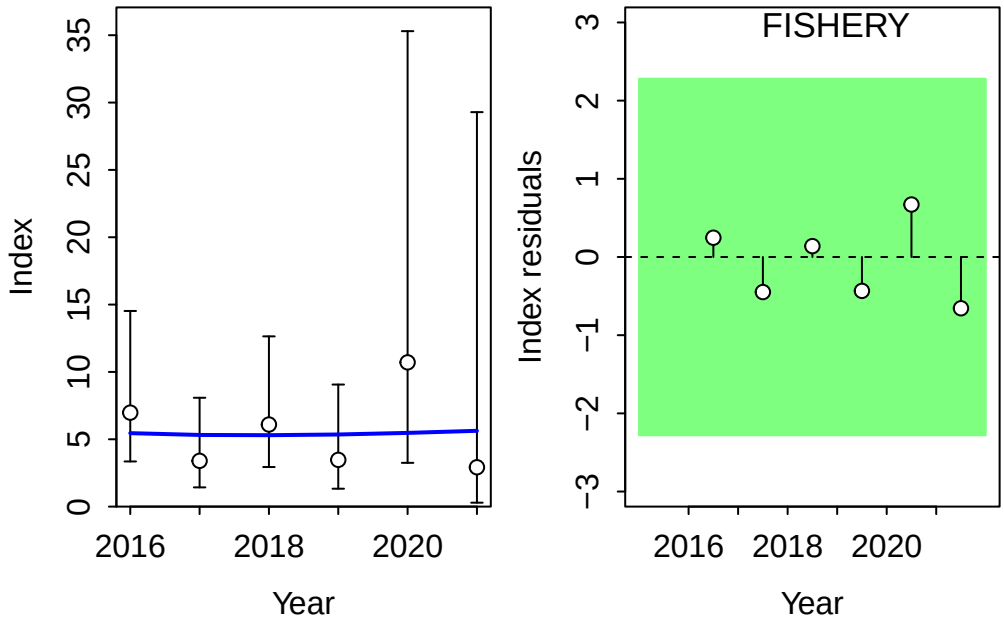
```
  Converged     MaxGrad
1      TRUE 2.52587e-05
```

```
[1] "1 NOTE:  Max data length bin: 90  < max pop len bins: 100; so will accumulate larger po
[2] "N warnings: 1"
```

Fit to Model

CPUE

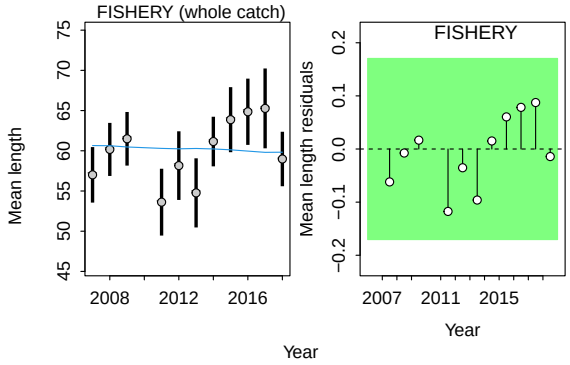
Fleet	RMSE.perc	Nobs
FISHERY	47.4	6
Combined	47.4	6

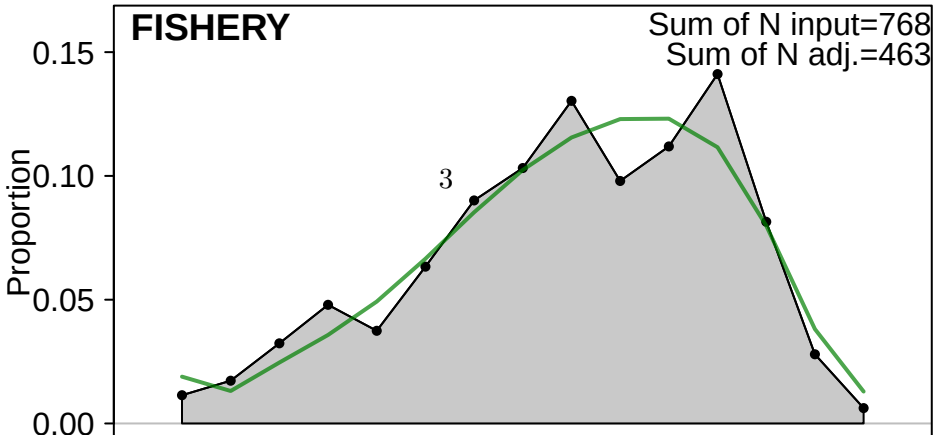


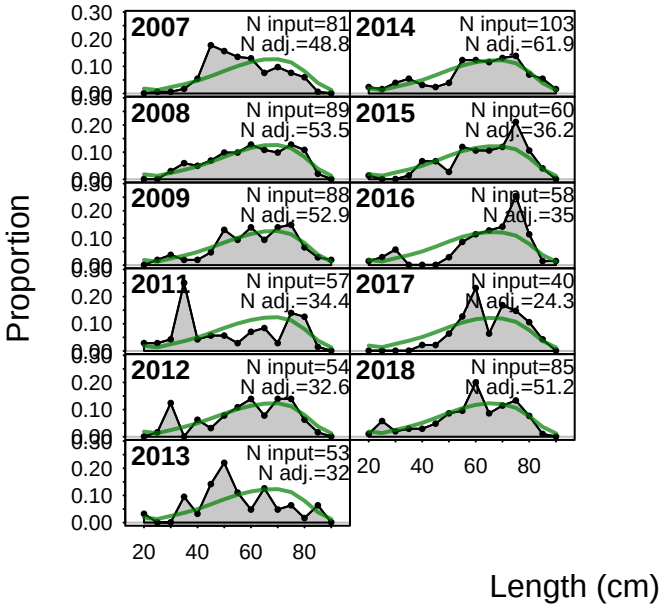
Length Comp

Fleet	RMSE.perc	Nobs
FISHERY	6.5	11
Combined	6.5	11

```
          w         lo         hi              Index runs.p   test  sigma3.lo sigma3.hi type
0.2704271 0.1865759 0.6774377         1 FISHERY  0.175 Passed -0.1704781 0.1704781  len
```

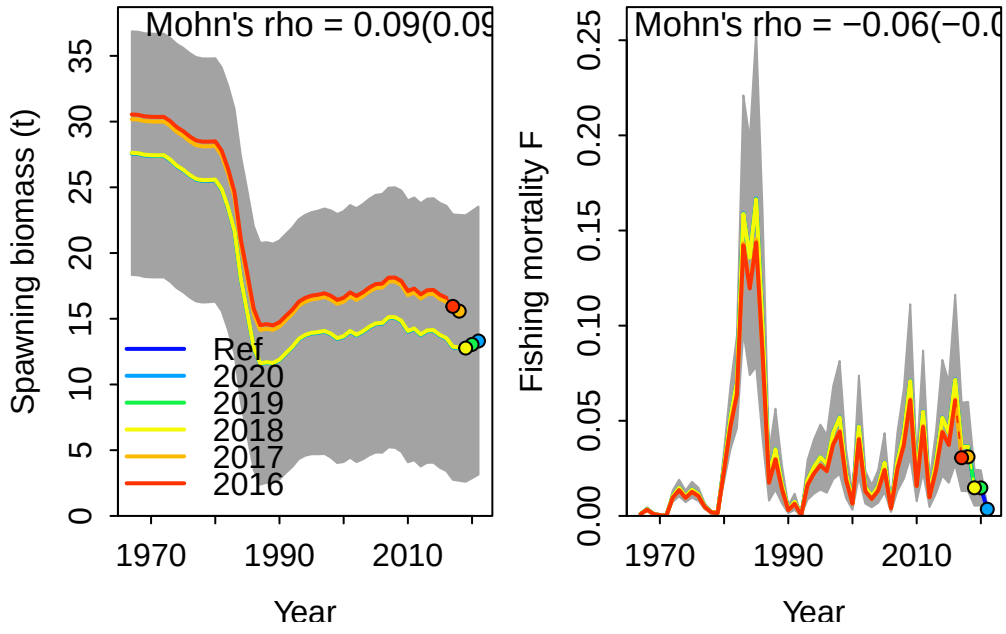






Retrospective

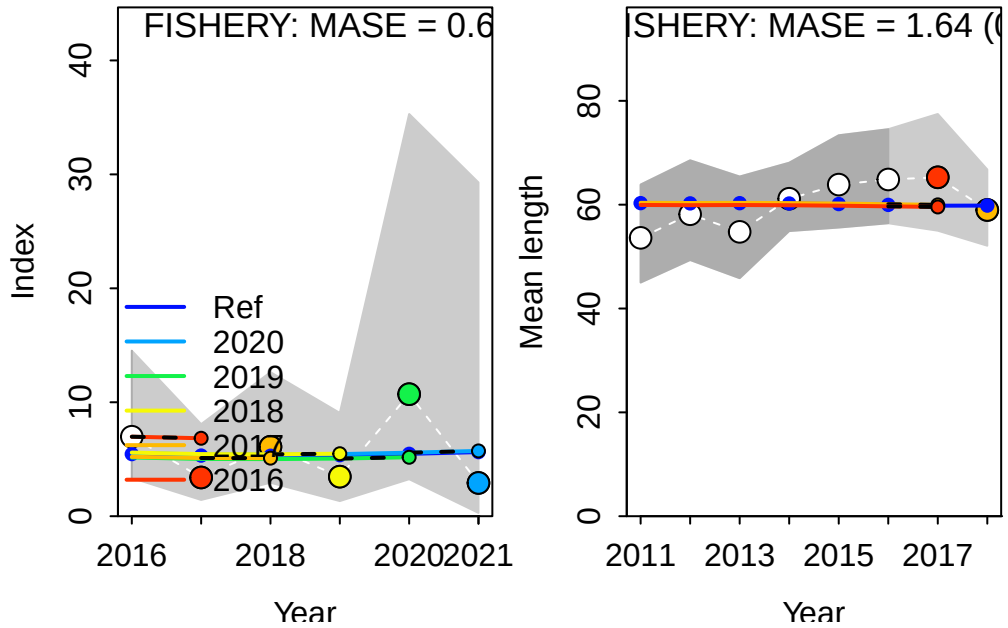
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel           Rho   ForecastRho
1    F     2020  0.0020418131  0.0019905710
2    F     2019 -0.0006746773 -0.0006647764
3    F     2018 -0.0021162397 -0.0020982465
4    F     2017 -0.1480366286 -0.1486110121
5    F     2016 -0.1532860768 -0.1567581280
6    F Combined -0.0604143619 -0.0612283184
```

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 only 2 of 5  prediction residuals for Index FISHERY

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



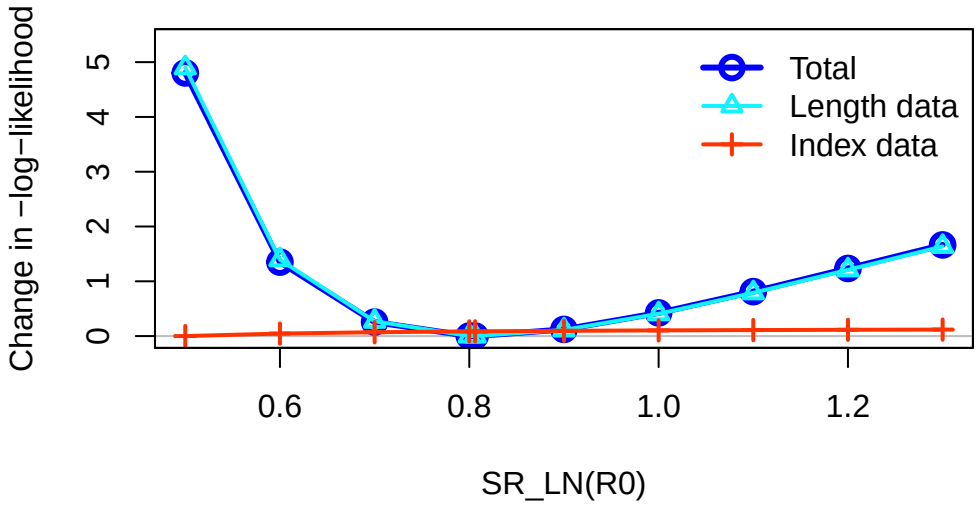

```
MASE stats by Index:

    Index Season     MASE    MAE.PR   MAE.base MASE.adj n.eval
1 FISHERY      1 1.636538 0.0882265 0.05391045 0.882265      2
```

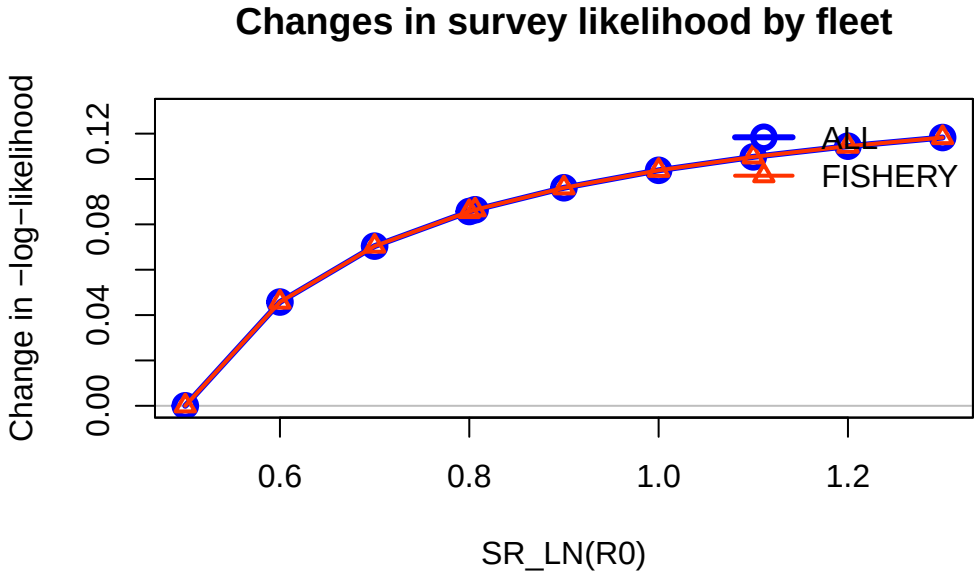
Recruitment Deviations

Likelihood Profile

```
[1] "SR_LN"
                     frac_change include                            label
TOTAL                     1.0000    TRUE                            Total
Catch                     0.0000   FALSE                            Catch
Equil_catch               0.0000   FALSE                  Equilibrium catch
Survey                    0.0246    TRUE                          Index data
Length_comp               1.0196    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               0.0018   FALSE                             Priors
```

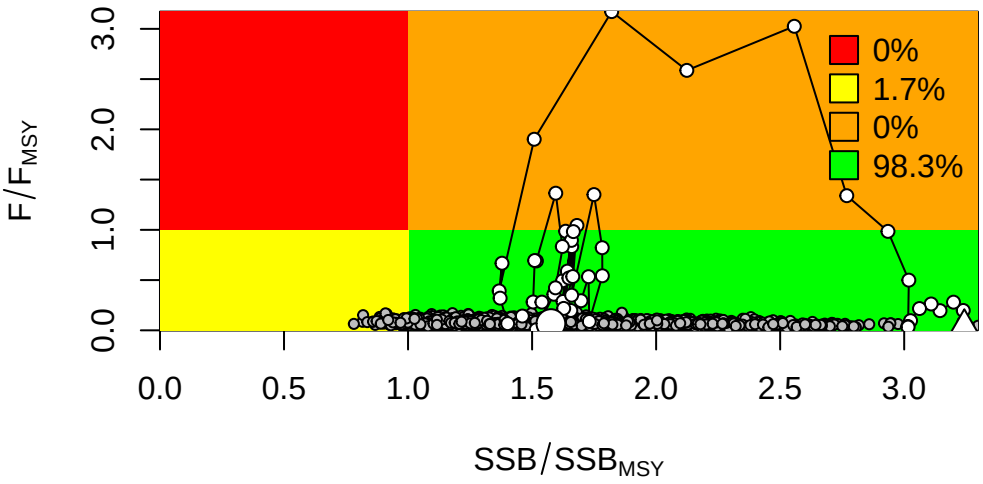
Parm_softbounds	0.0001	FALSE	Soft bounds
Parm_devs	0.0000	FALSE	Parameter deviations
Crash_Pen	0.0000	FALSE	Crash penalty

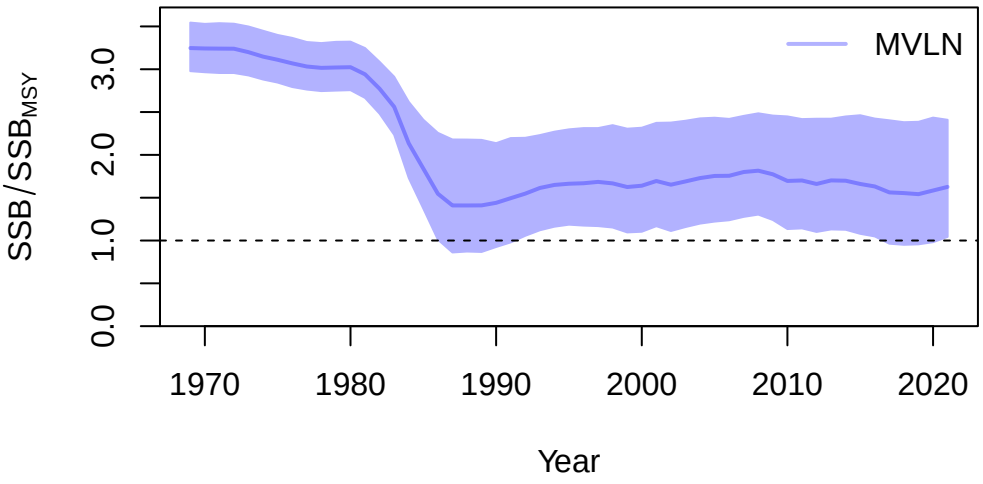


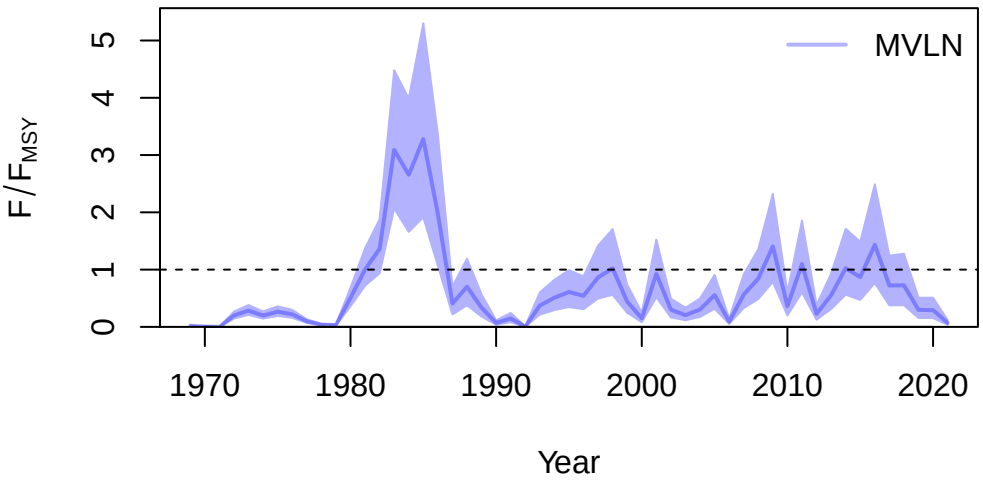


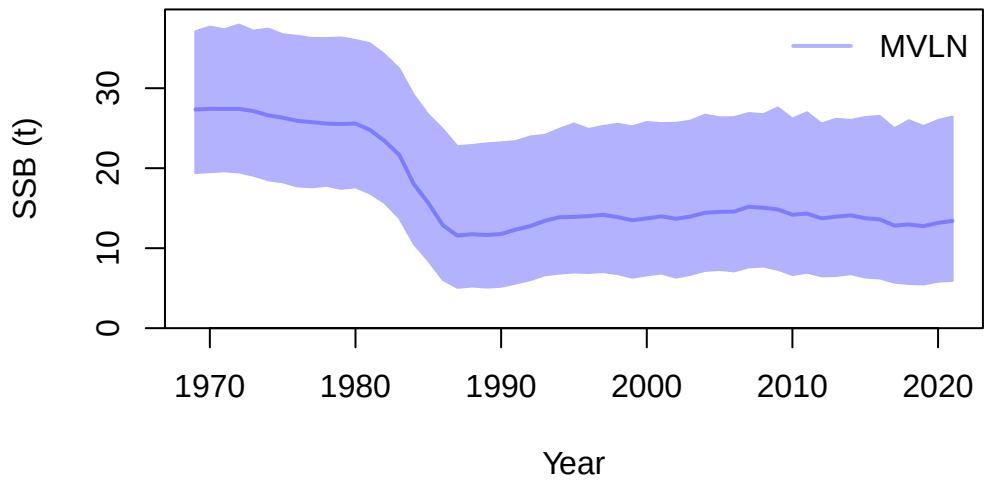
Management Quantities

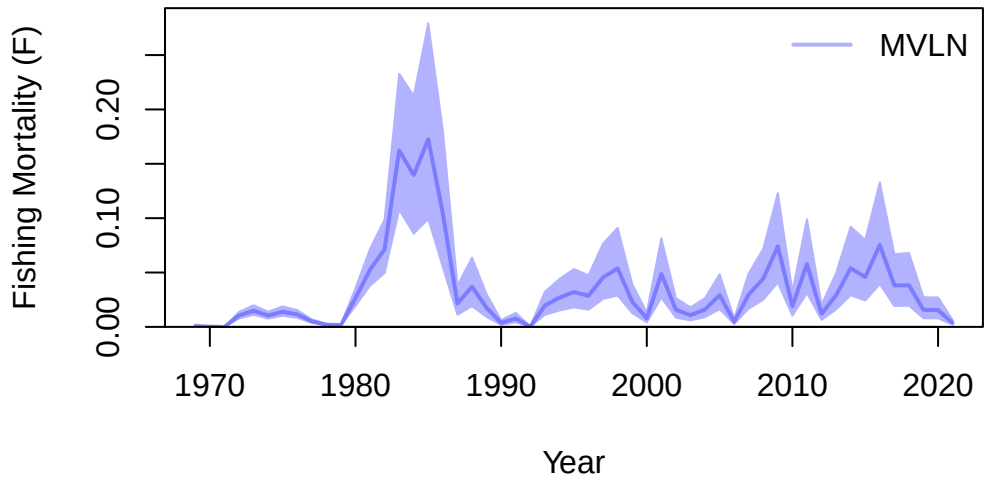
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F




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

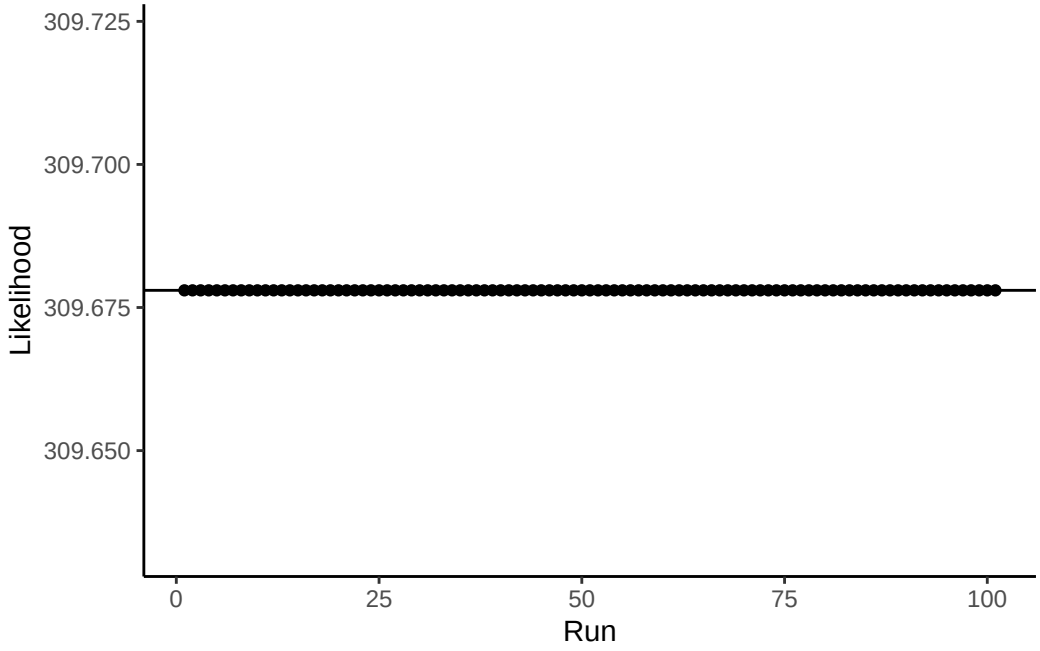

MVLN
F/F$_{MSY}$
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year

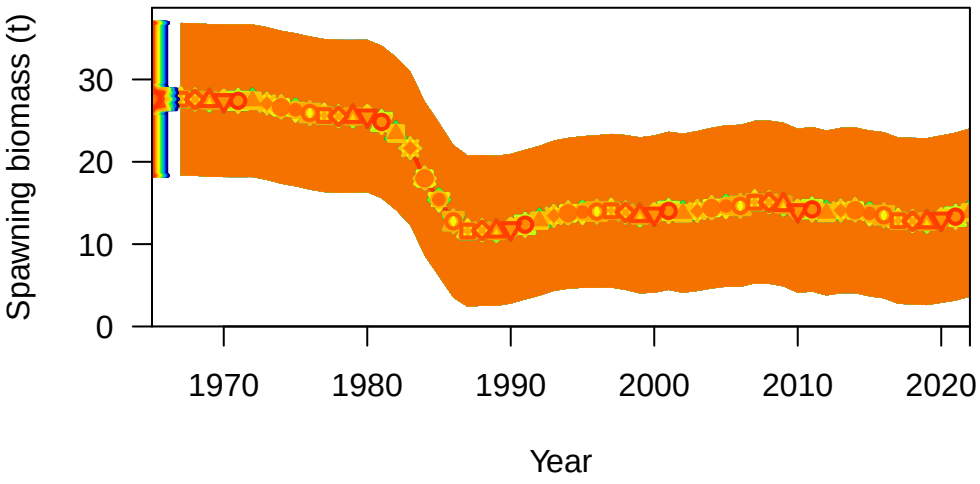


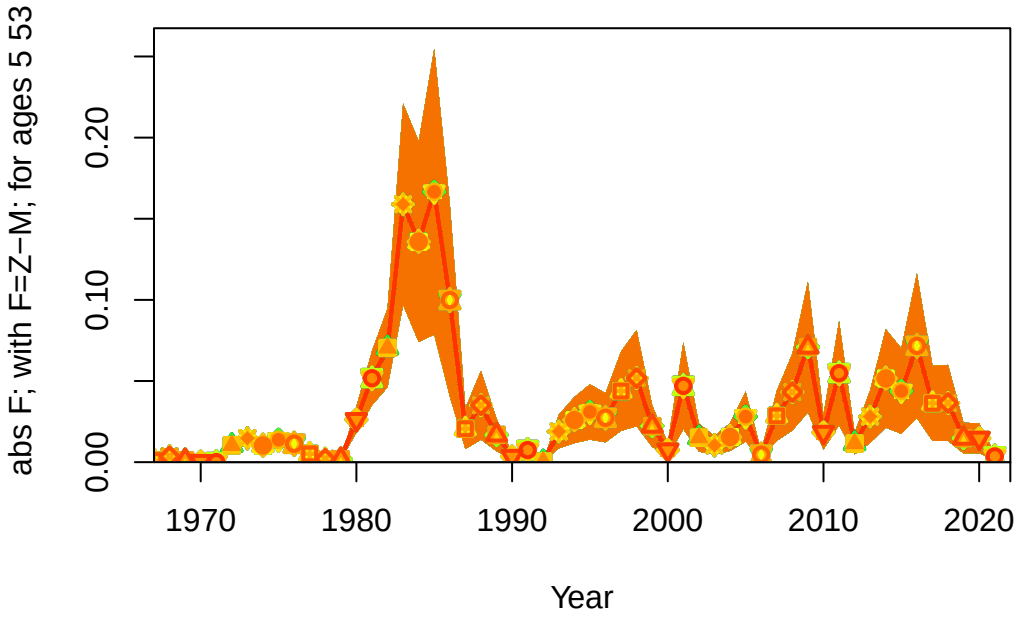


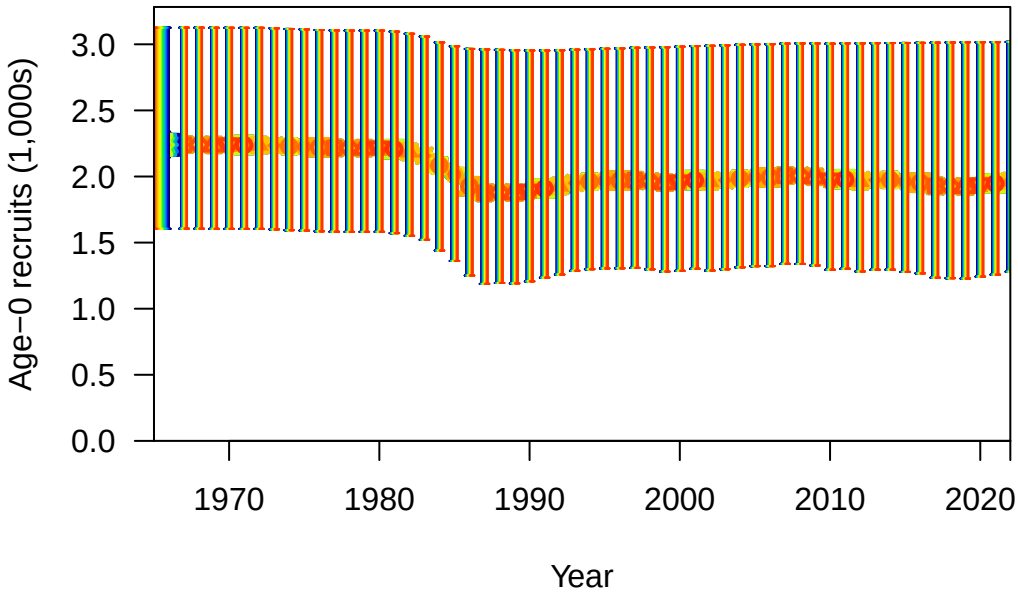

```
null device
          1
```

Jitter

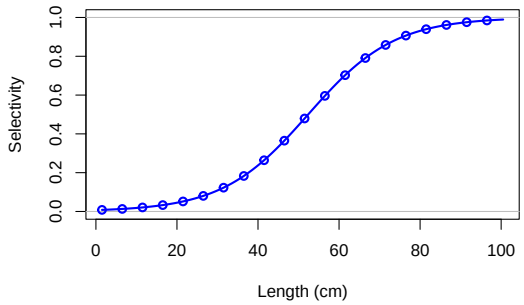

309.725
309.700
309.675
309.650
Likelihood
0
25
50
75
100
Run

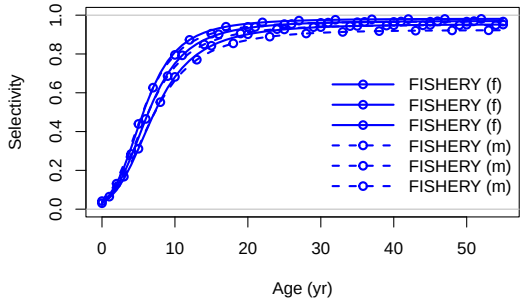

30
20
10
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year

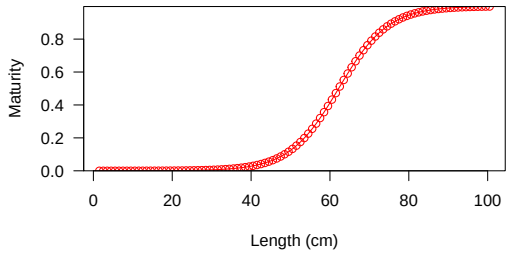


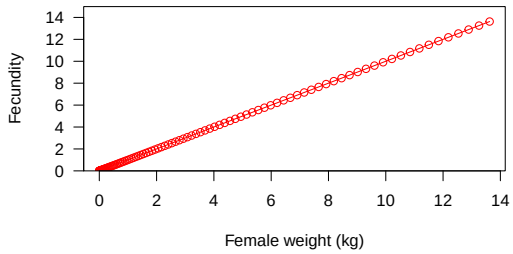


Selectivity and Maturity


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
100
Length (cm)


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
10
20
30
40
50
Age (yr)
FISHERY (f)
FISHERY (f)
FISHERY (f)
FISHERY (m)
FISHERY (m)
FISHERY (m)


Maturity
0.0
0.2
0.4
0.6
0.8
0
20
40
60
80
100
Length (cm)


Fecundity
0
2
4
6
8
10
12
14
0
2
4
6
8
10
12
14
Female weight (kg)