American Samoa Model Checks

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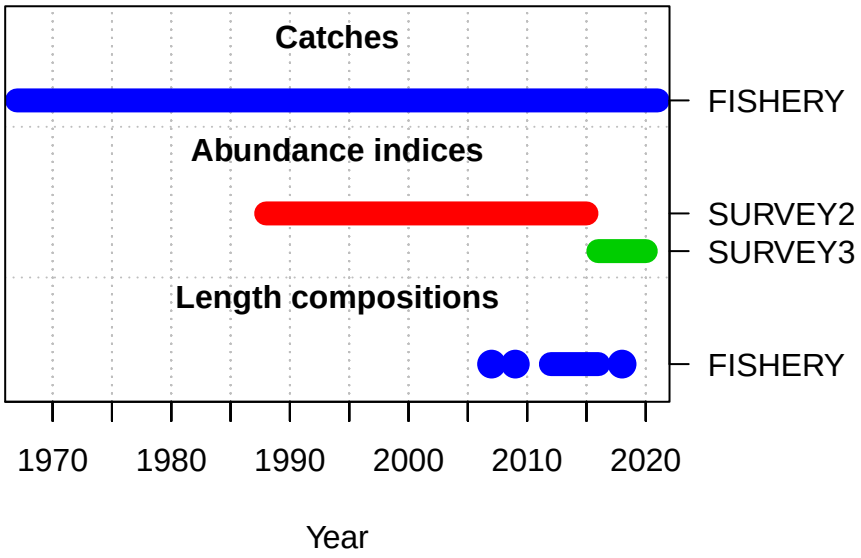
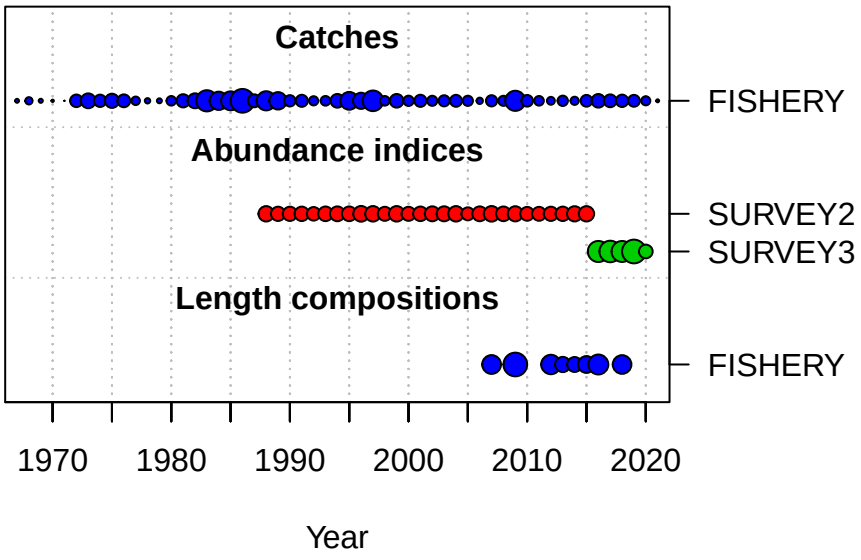
2023-02-14

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

Model Output

Input Data





Convergence Check

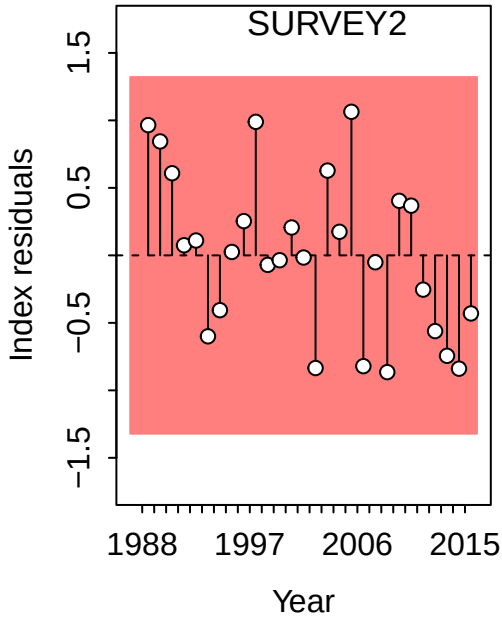
```
  Converged     MaxGrad
1      TRUE 9.89379e-05
```

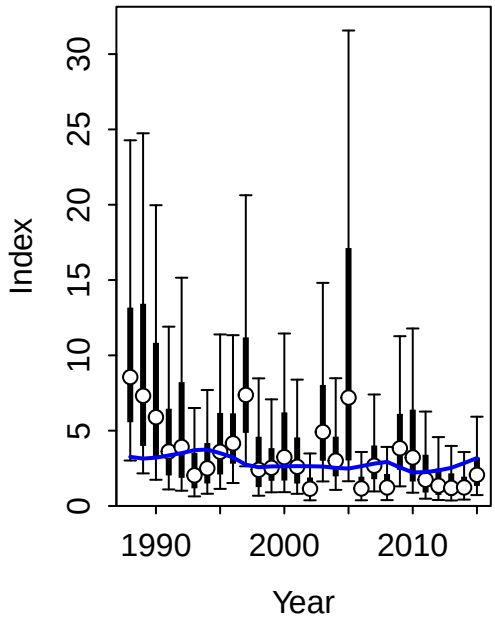
```
[1] "1 NOTE:  Max data length bin: 65  < max pop len bins: 72; so will accumulate larger pop
[2] " N parameters are on or within 1% of min-max bound: 1; check results, variance may be su
[3] "N warnings: 1"
```

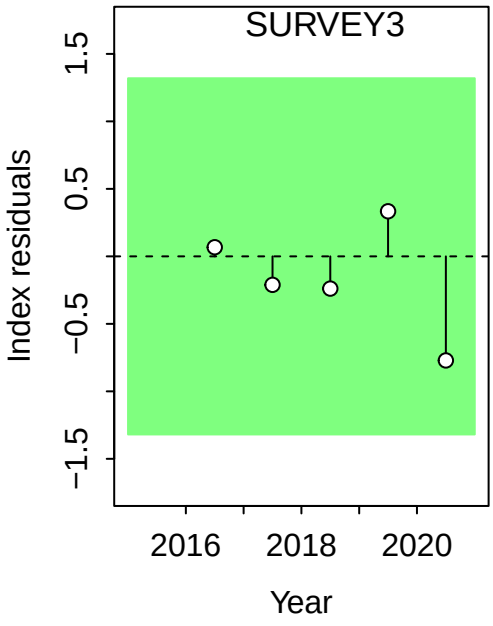
Fit to Model

CPUE

Fleet	RMSE.perc	Nobs
SURVEY2	58.1	28
SURVEY3	40.3	5
Combined	55.8	33


SURVEY2
Index residuals
1.5
0.5
−0.5
−1.5
1988
1997
2006
2015
Year

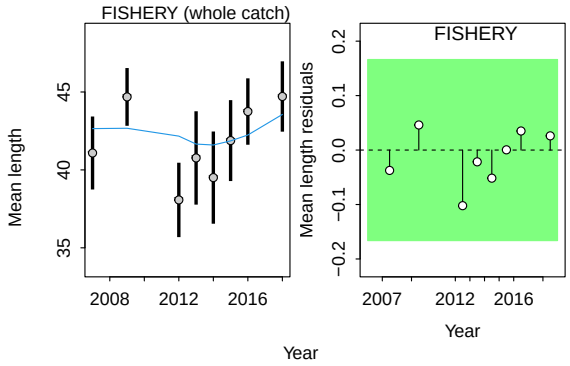

Index
0
5
10
15
20
25
30
1990
2000
2010
Year

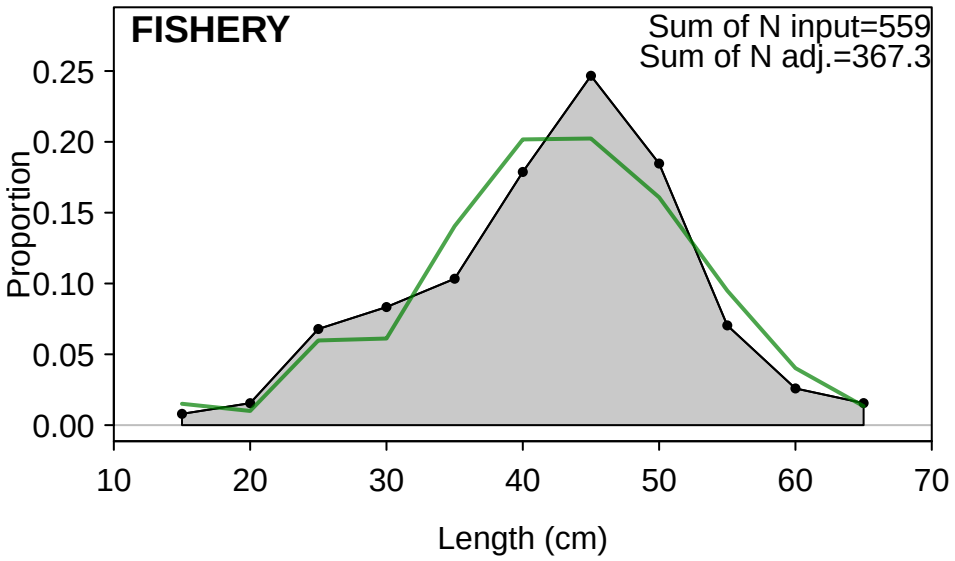

SURVEY3
Index residuals
1.5
0.5
−0.5
−1.5
2016
2018
2020
Year

Length Comp

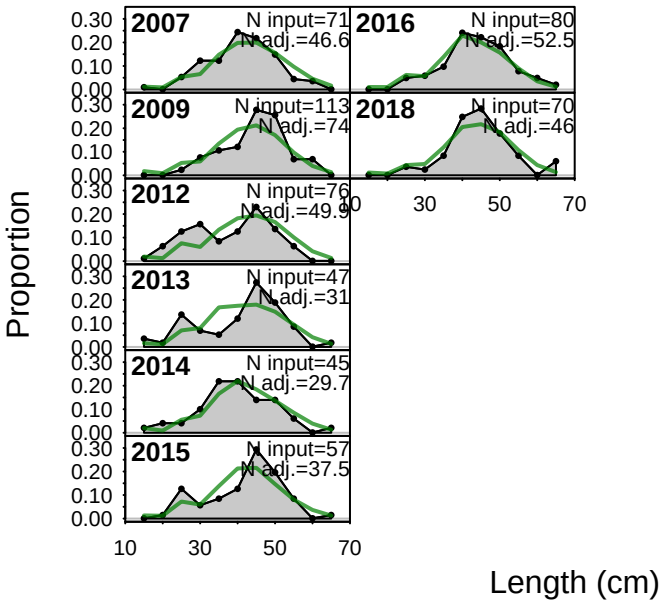
Fleet	RMSE.perc	Nobs
FISHERY	4.9	8
Combined	4.9	8

```
        w         lo         hi              Index runs.p   test sigma3.lo sigma3.hi type
0.3032874 0.1817872 1.2101304          1 FISHERY   0.223 Passed -0.166301  0.166301  len
```



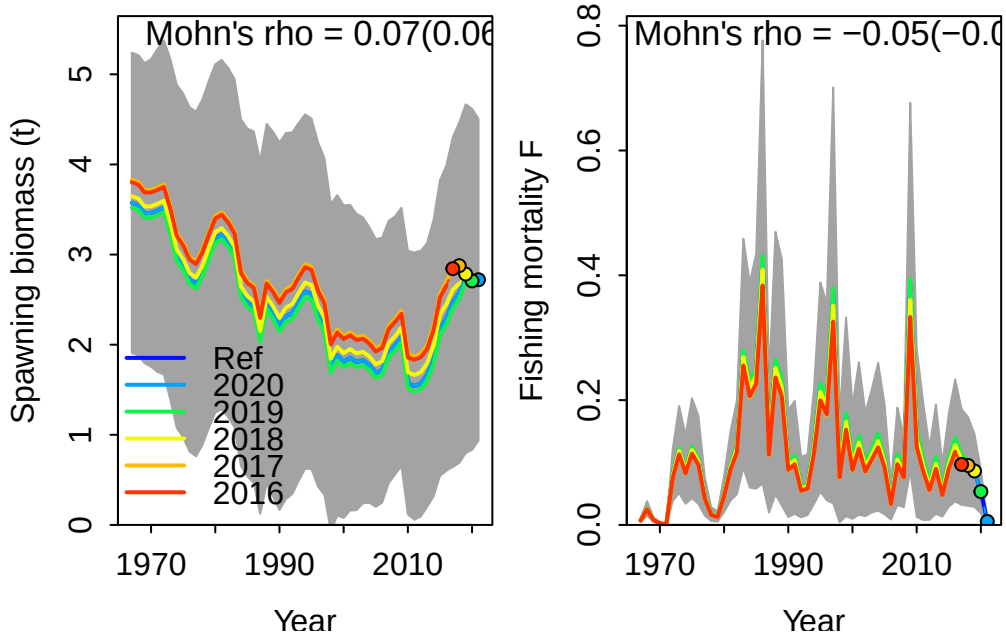


Retrospective and Hindcasting



Retrospective

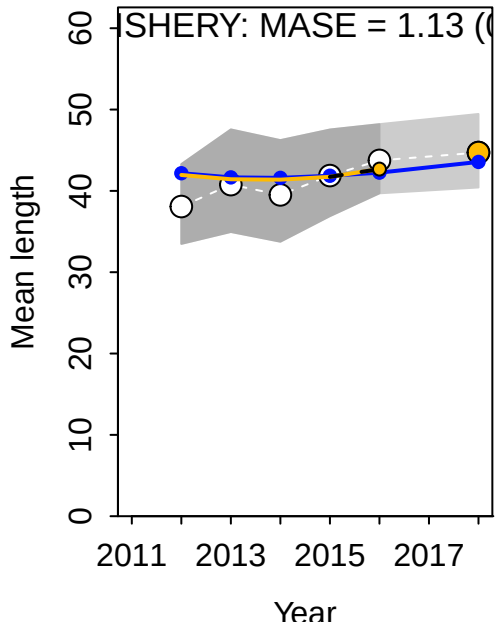
`Mohn's Rho stats, including one step ahead forecasts:`



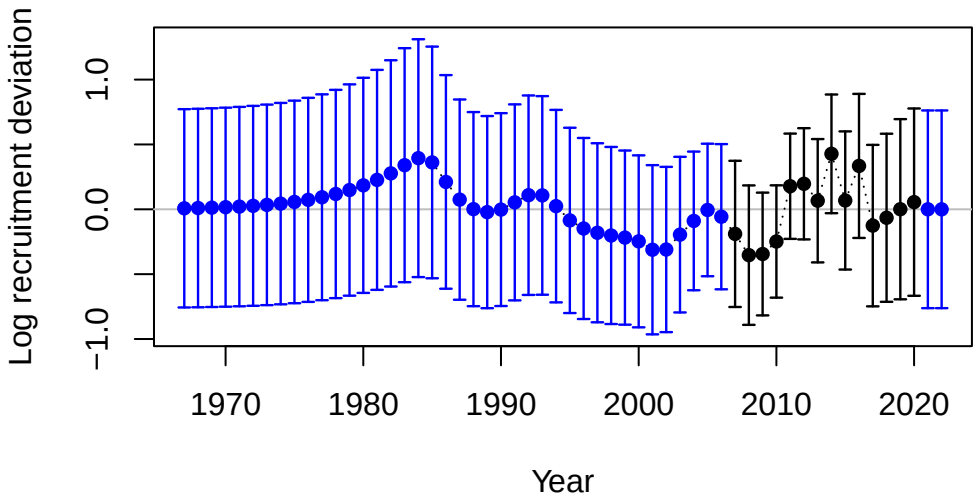
```
Mohn's Rho stats, including one step ahead forecasts:

  type     peel          Rho  ForecastRho
1    F     2020  0.000000000  0.000000000
2    F     2019  0.006666024  0.002278174
3    F     2018 -0.025837904 -0.008556184
4    F     2017 -0.113987608 -0.062889466
5    F     2016 -0.133669143 -0.108446250
6    F Combined -0.053365726 -0.035522745
```

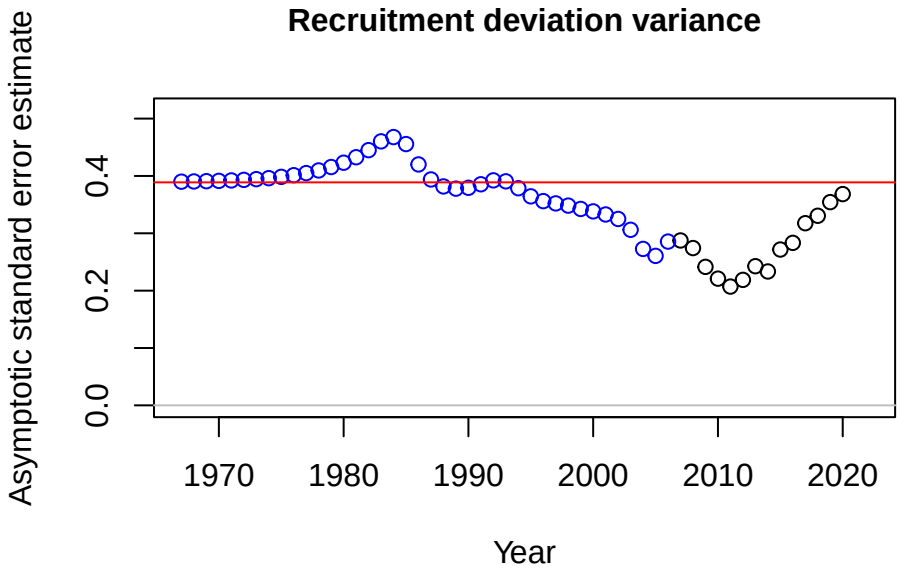
Hindcasting

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

No observations in evaluation years to compute prediction residuals for Index SURVEY2

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 1.130617 0.02466696 0.02181726 0.2466696      1
```



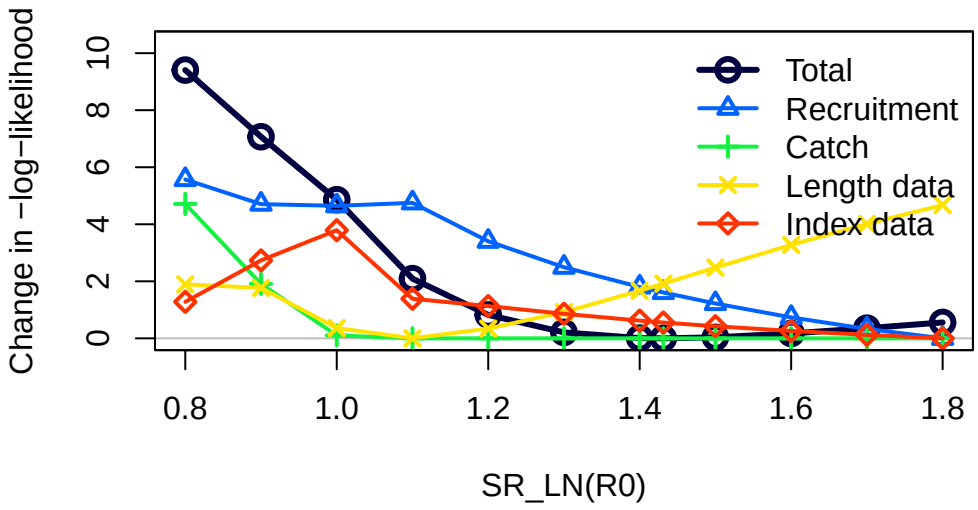
Recruitment Deviations

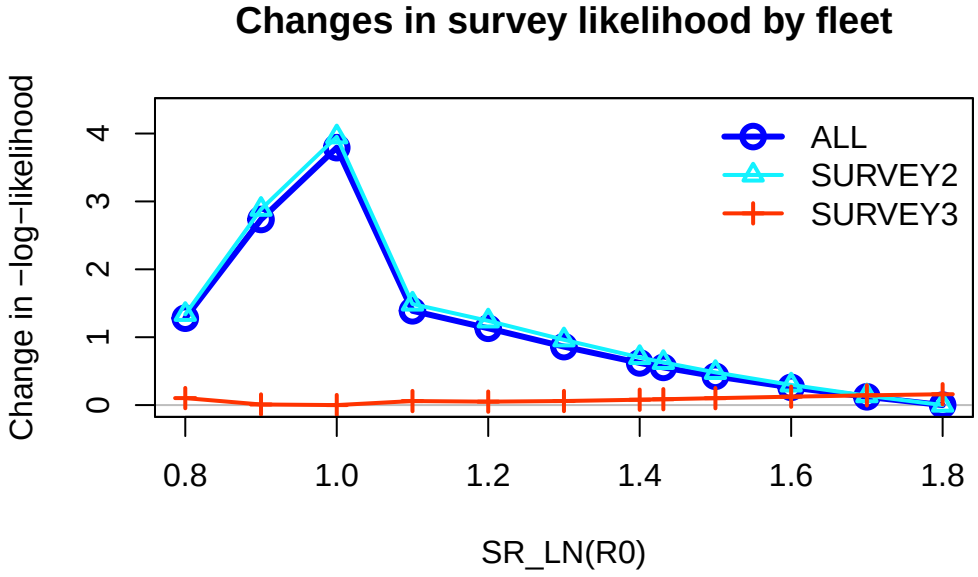




Likelihood Profile

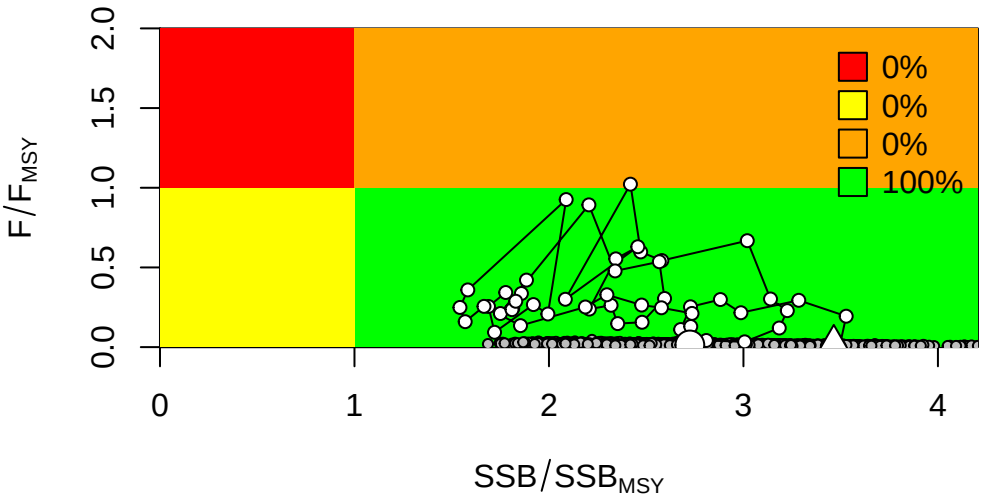
```
[1] "SR_LN"
                     frac_change include                          label
TOTAL                     1.0000    TRUE                          Total
Catch                     0.5011    TRUE                          Catch
Equil_catch               0.0000   FALSE              Equilibrium catch
Survey                    0.4031    TRUE                     Index data
Length_comp               0.4969    TRUE                   Length data
Recruitment               0.5920    TRUE                   Recruitment
InitEQ_Regime             0.0000   FALSE Initital equilibrium recruitment
Forecast_Recruitment      0.0000   FALSE          Forecast recruitment
Parm_priors               0.0078   FALSE                        Priors
Parm_softbounds           0.0001   FALSE                   Soft bounds
Parm_devs                 0.0000   FALSE          Parameter deviations
Crash_Pen                 0.0000   FALSE                 Crash penalty
```

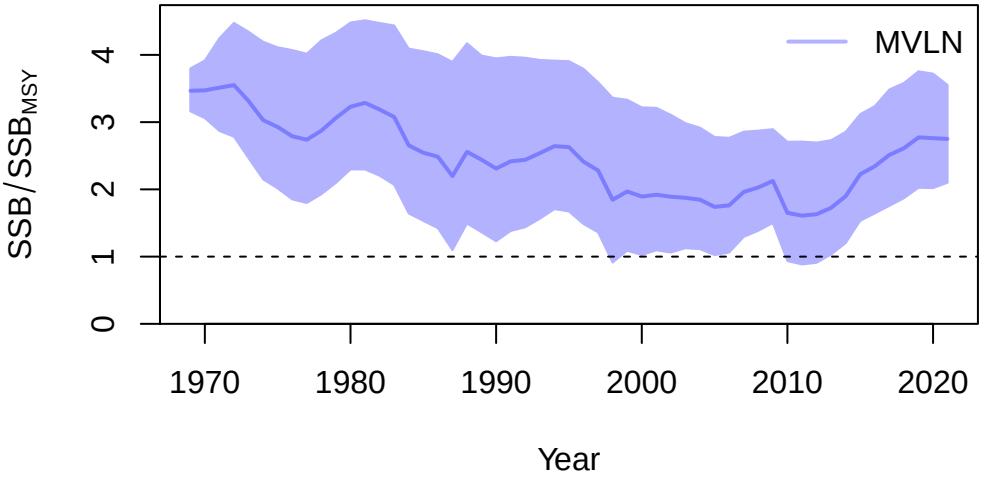


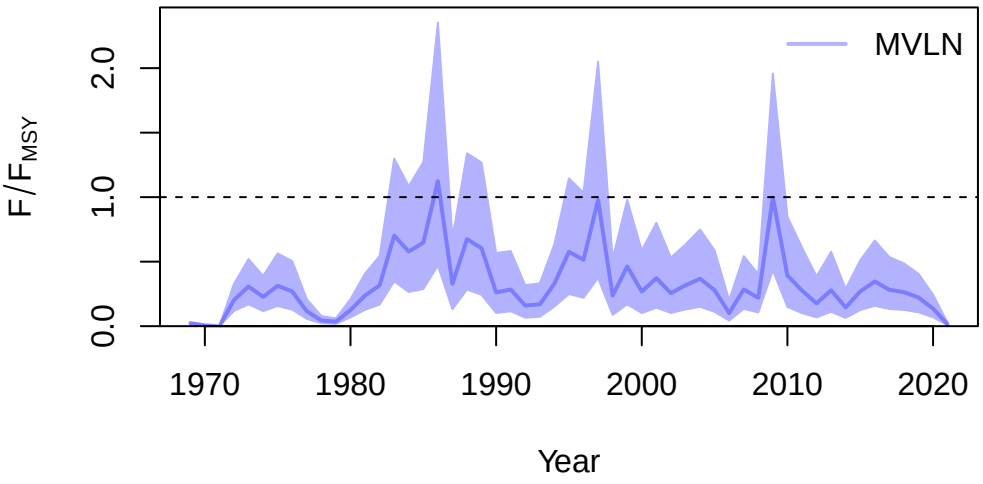


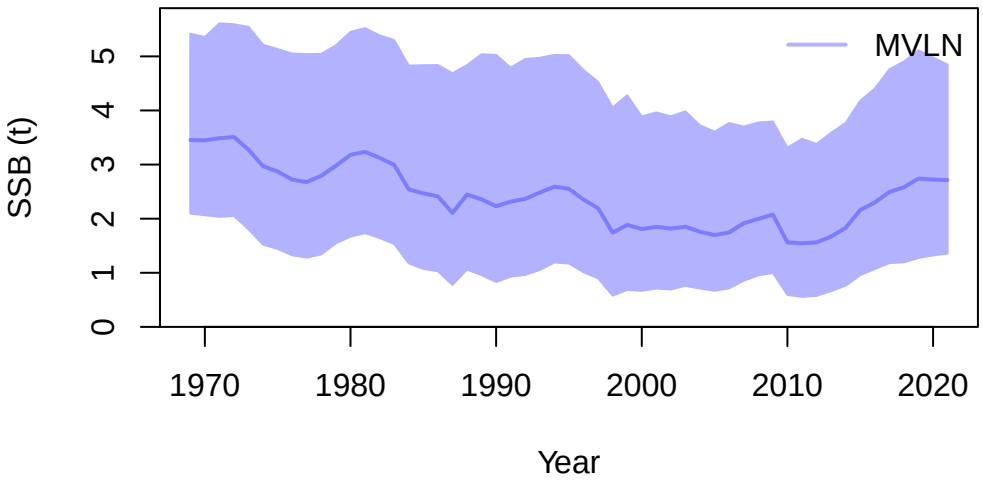
Management Quantities

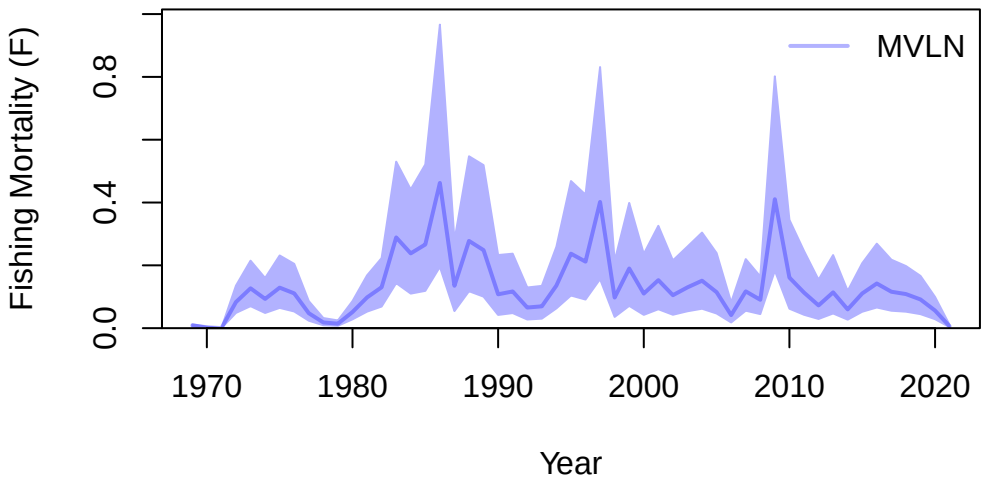
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F





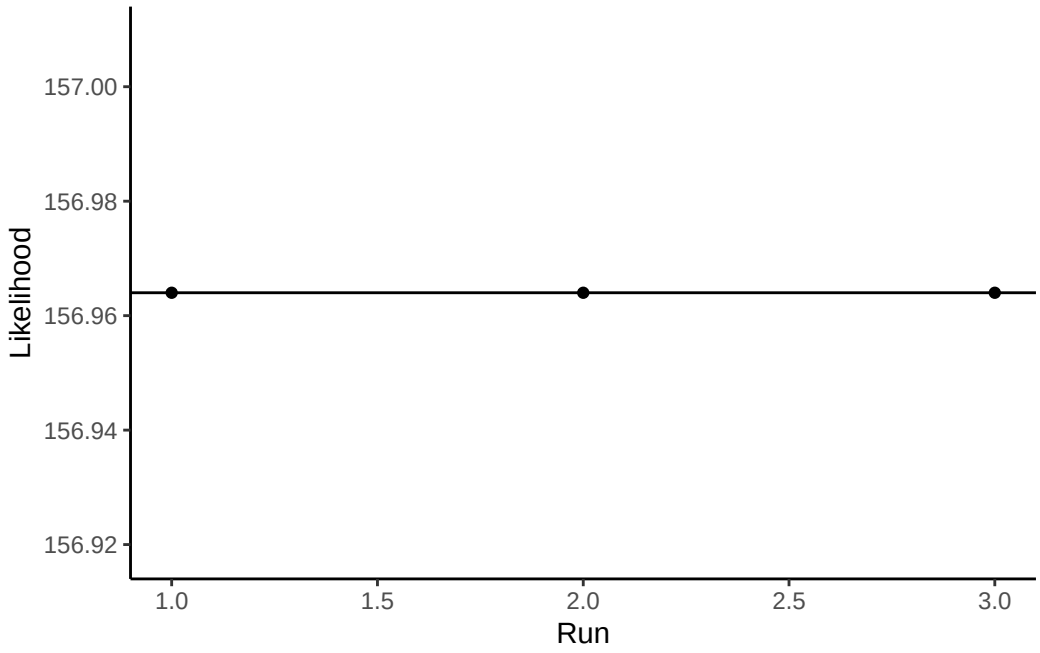

MVLN
F/F_MSY
0.0
1.0
2.0
1970
1980
1990
2000
2010
2020
Year

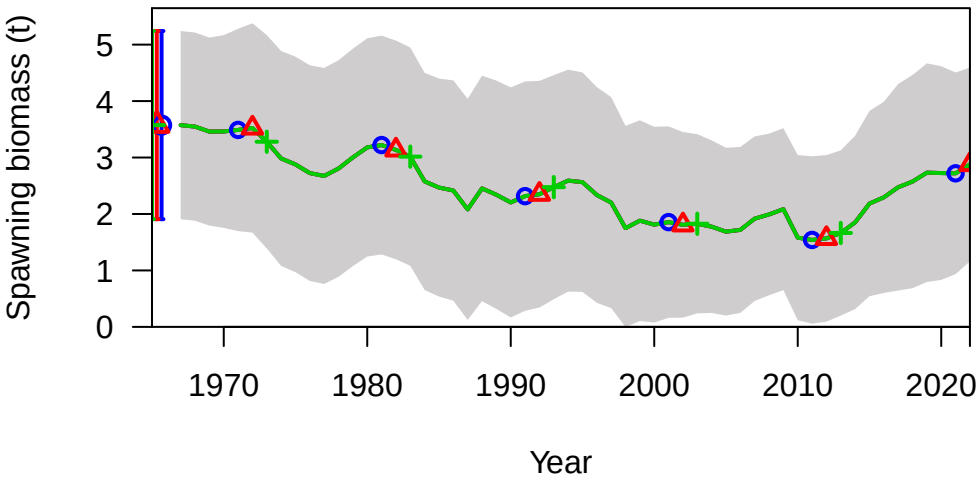

MVLN
SSB (t)
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year

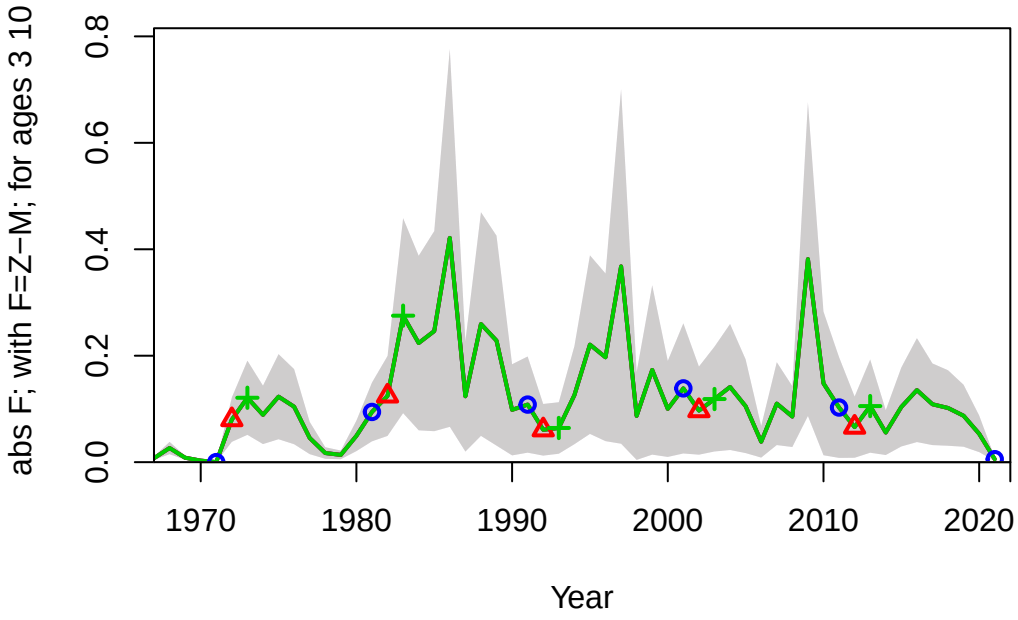


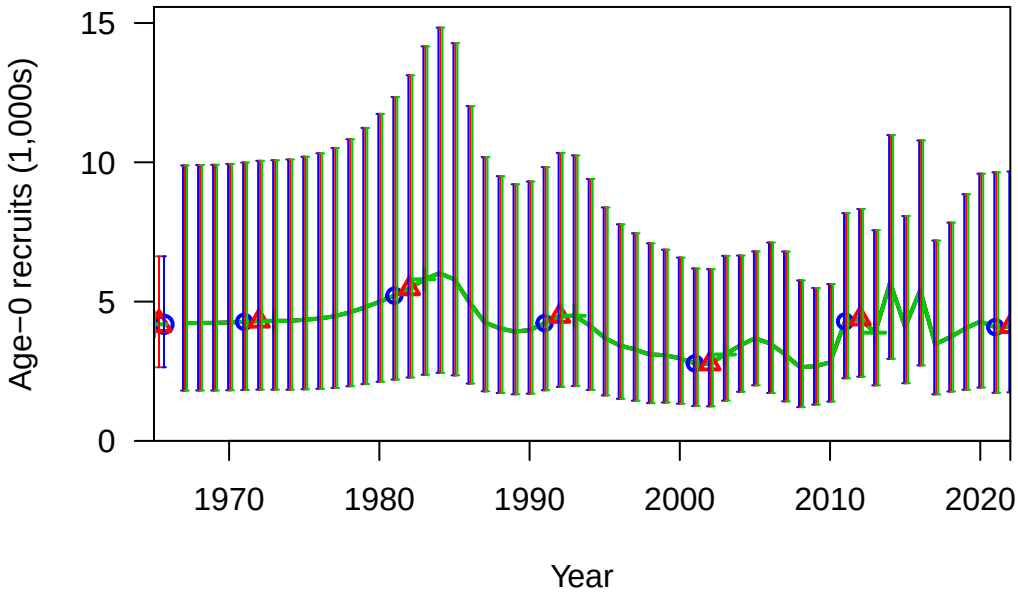

```
null device
          1
```

Jitter

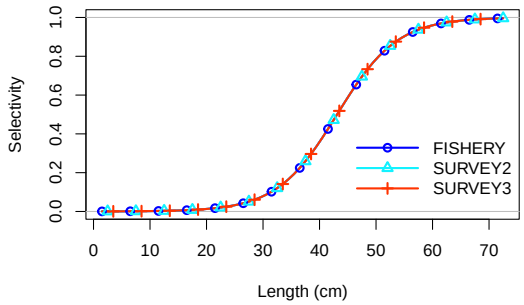

157.00
156.98
156.96
156.94
156.92
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

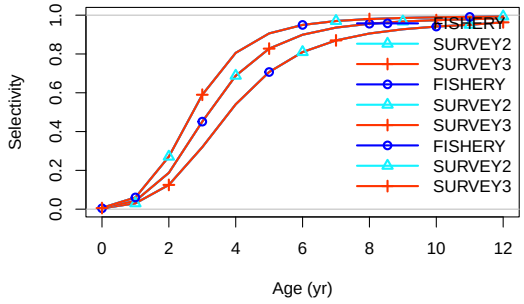

Spawning biomass (t)
5
4
3
2
1
0
1970
1980
1990
2000
2010
2020
Year

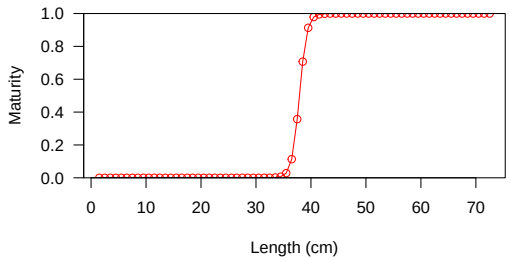


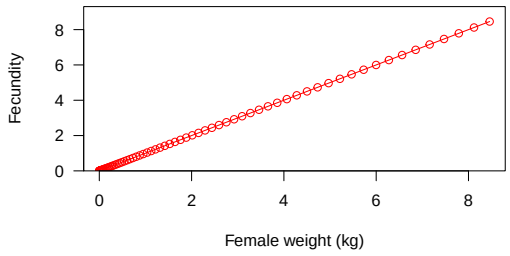


Selectivity and Maturity


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
10
20
30
40
50
60
70
Length (cm)
FISHERY
SURVEY2
SURVEY3


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
12
Age (yr)
FISHERY
SURVEY2
SURVEY3
FISHERY
SURVEY2
SURVEY3
FISHERY
SURVEY2
SURVEY3


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)