American Samoa Model Checks

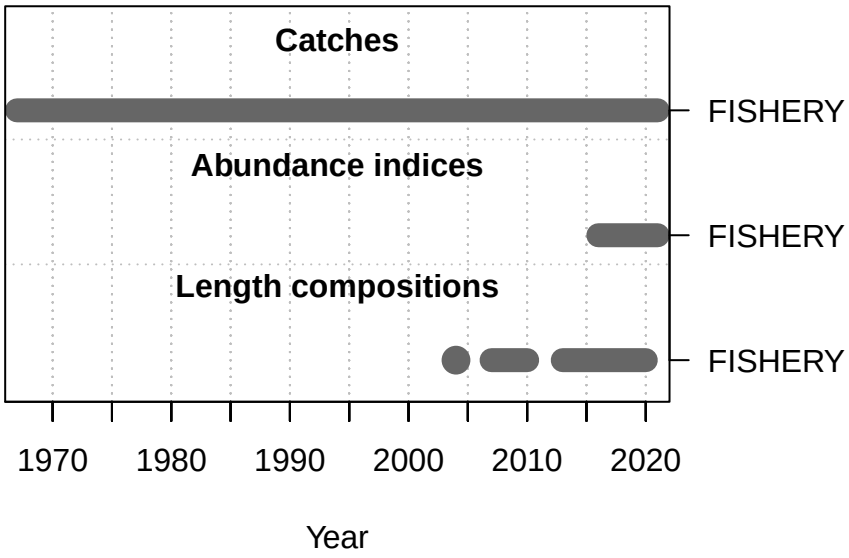
Marc Nadon and Meg Oshima

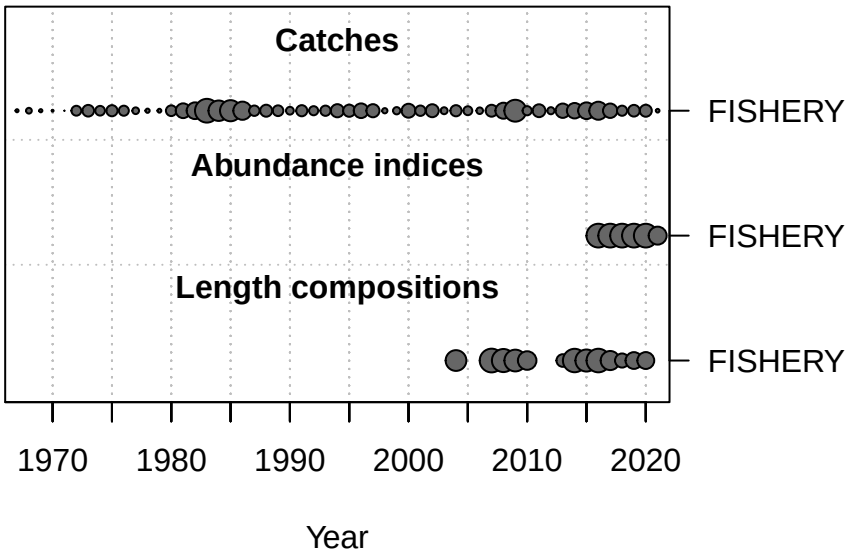
2023-02-05

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

Model Output

Input Data





Convergence Check

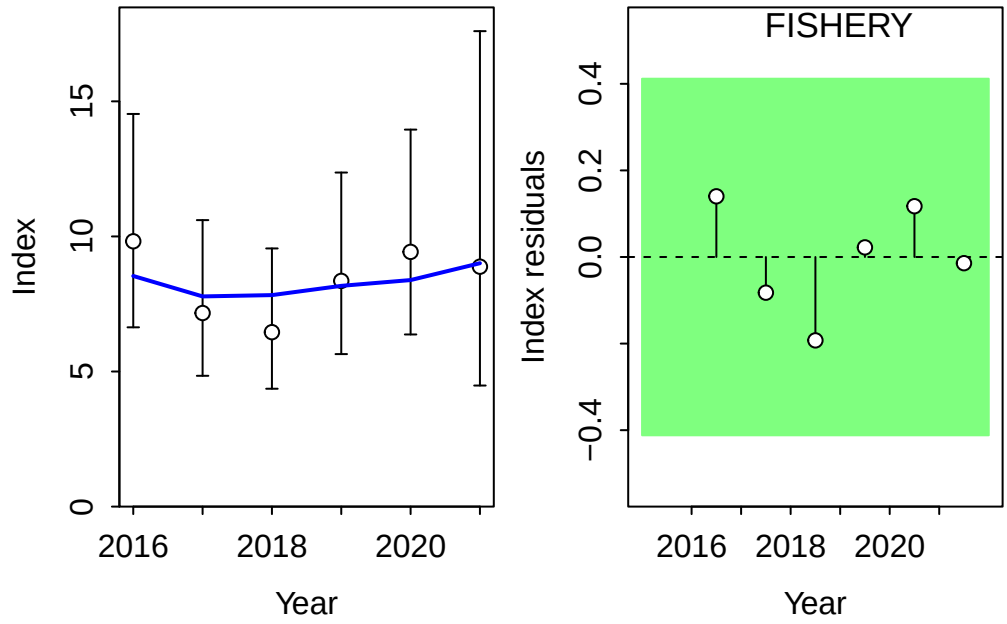
```
  Converged    MaxGrad
1      TRUE 0.00011659
```

```
[1] "1 NOTE:  Max data length bin: 85  < max pop len bins: 94; so will accumulate larger pop
[2] "2 Final gradient: 0.00011659 is larger than final_conv: 0.0001"
[3] "N warnings: 2"
```

Fit to Model

CPUE

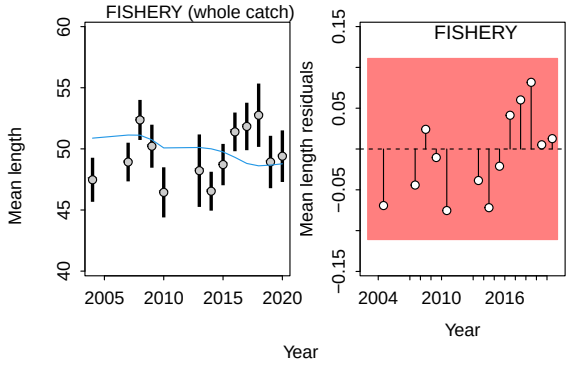
Fleet	RMSE.perc	Nobs
FISHERY	11.4	6
Combined	11.4	6

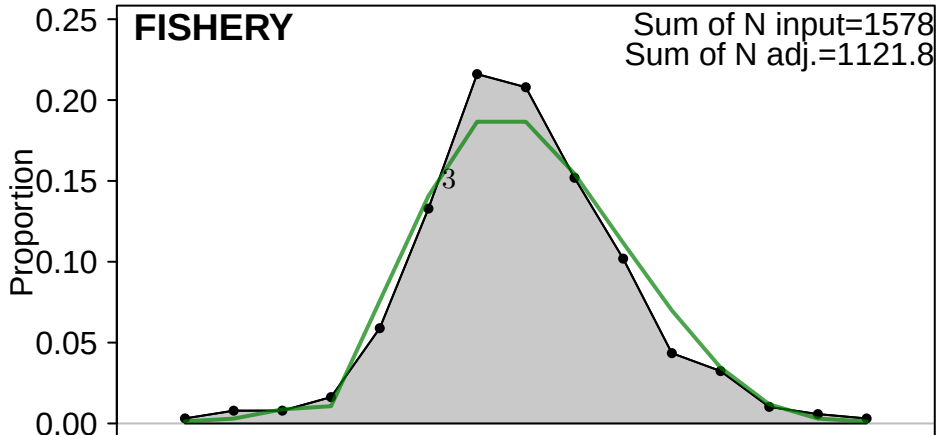


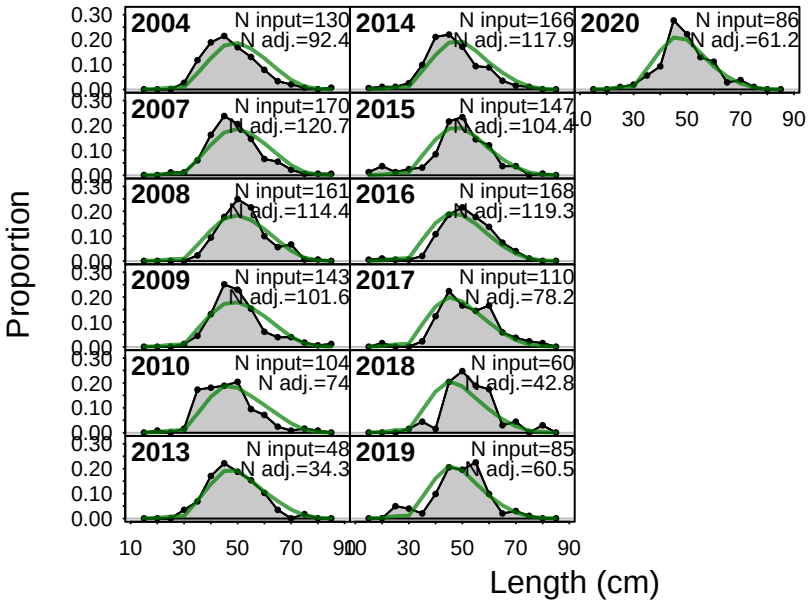
Length Comp

Fleet	RMSE.perc	Nobs
FISHERY	5	13
Combined	5	13

```
          w          lo          hi           Index runs.p   test  sigma3.lo sigma3.hi type
0.14332309 0.09985132 0.30643215       1 FISHERY  0.022 Failed -0.1109516 0.1109516  len
```

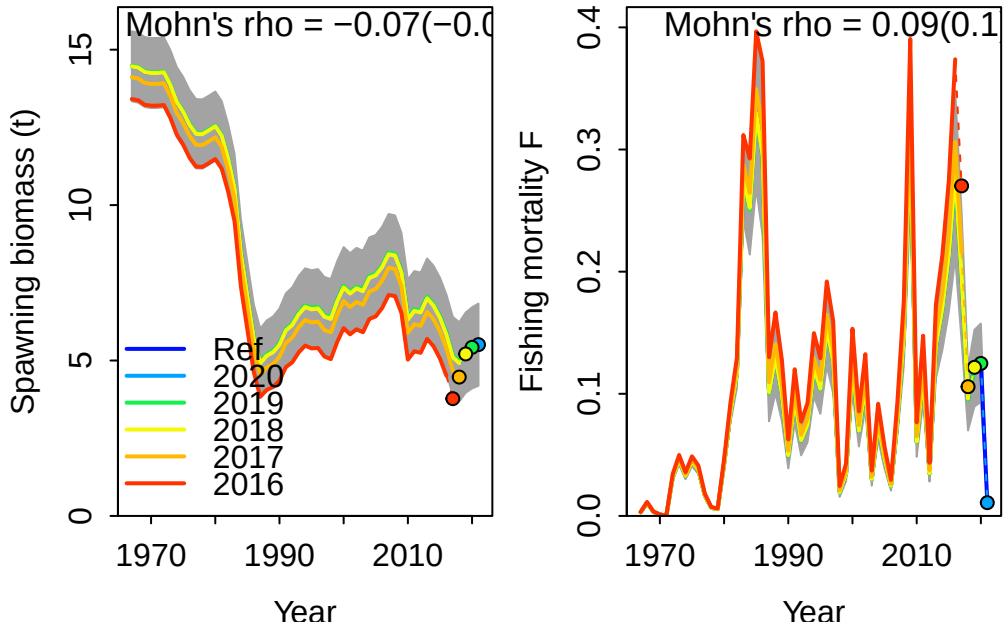






Retrospective

`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  0.000135523  0.000128993
2    F     2019 -0.004959006 -0.004823023
3    F     2018  0.005698217  0.005611941
4    F     2017  0.104322601  0.105163794
5    F     2016  0.335190443  0.382608295
6    F Combined  0.088077556  0.097738000
```

Hindcasting

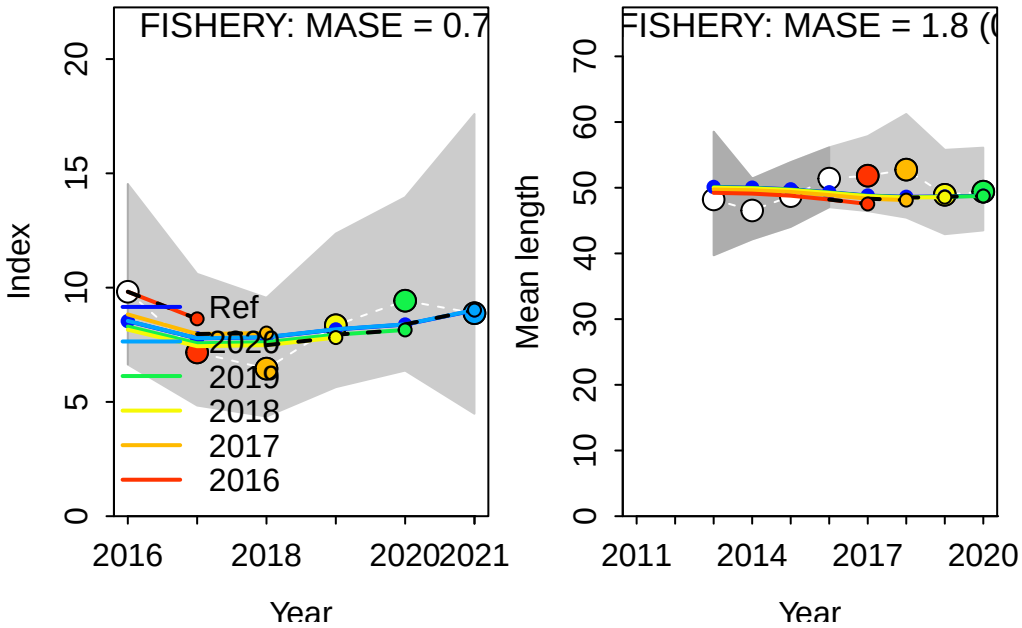
```
Plotting Hindcast Cross-Validation (one-step-ahead)

 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 4 of 5  prediction residuals for Index FISHERY

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



MASE stats by Index:

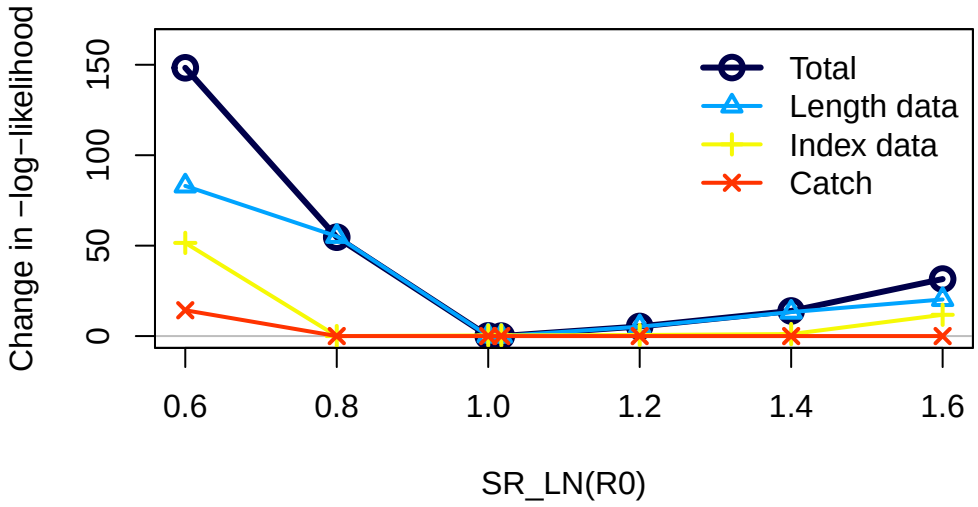
```
    Index Season     MASE     MAE.PR   MAE.base  MASE.adj n.eval
1 FISHERY      1 1.799459 0.04998565 0.02777815 0.4998565      4
```

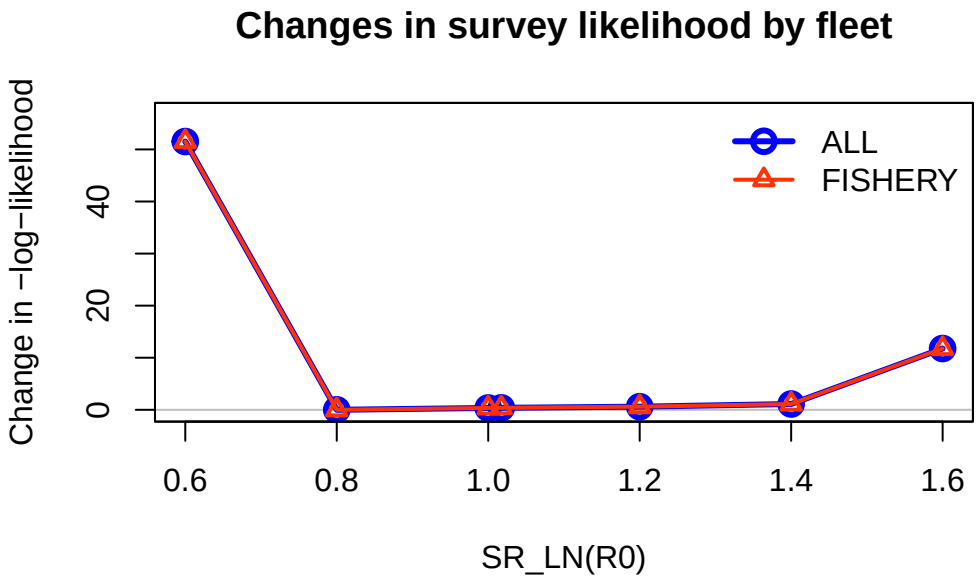
Recruitment Deviations

Likelihood Profile

```
[1] "SR_LN"
                    frac_change include                          label
TOTAL                    1.0000    TRUE                          Total
Catch                    0.0962    TRUE                          Catch
Equil_catch              0.0000   FALSE              Equilibrium catch
Survey                   0.3473    TRUE                     Index data
Length_comp              0.5598    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              0.0008   FALSE                        Priors
```

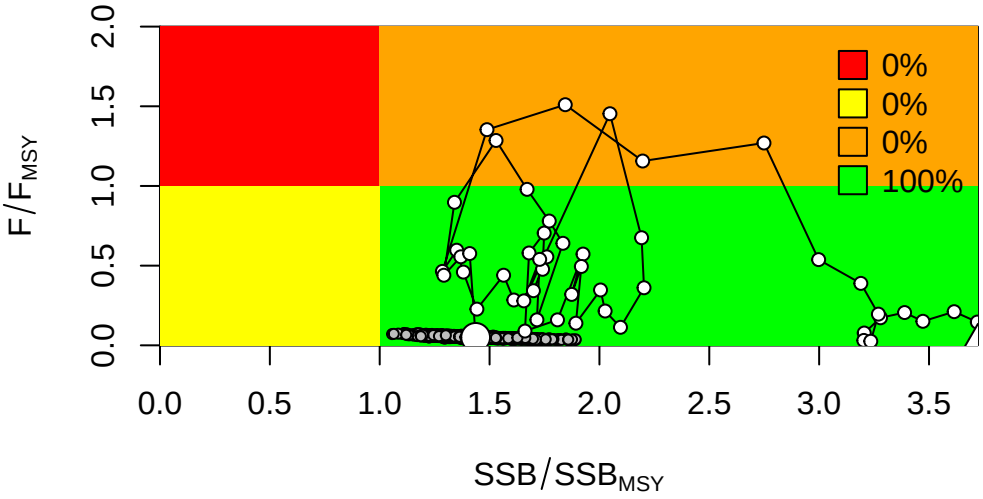
```
Parm_softbounds          0.0001   FALSE                 Soft bounds
Parm_devs                0.0000   FALSE           Parameter deviations
Crash_Pen                0.0000   FALSE                   Crash penalty
```

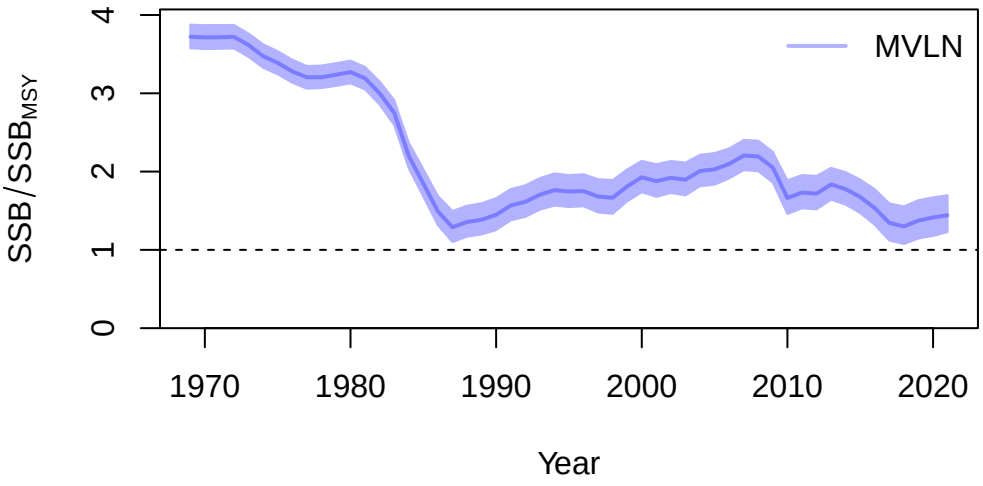


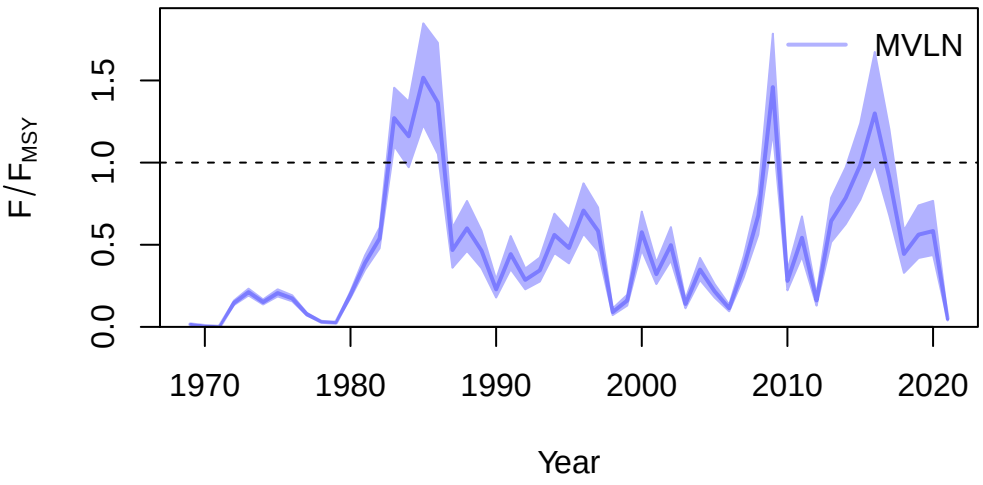


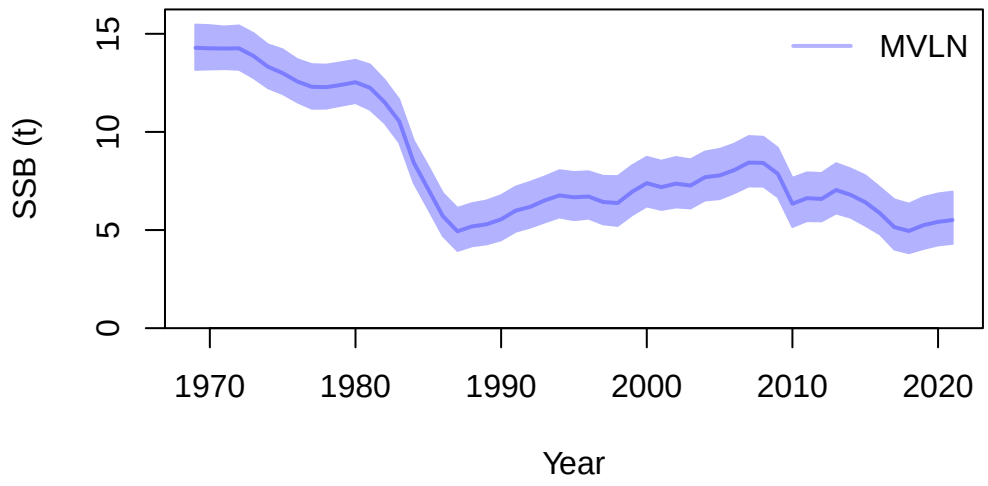
Management Quantities

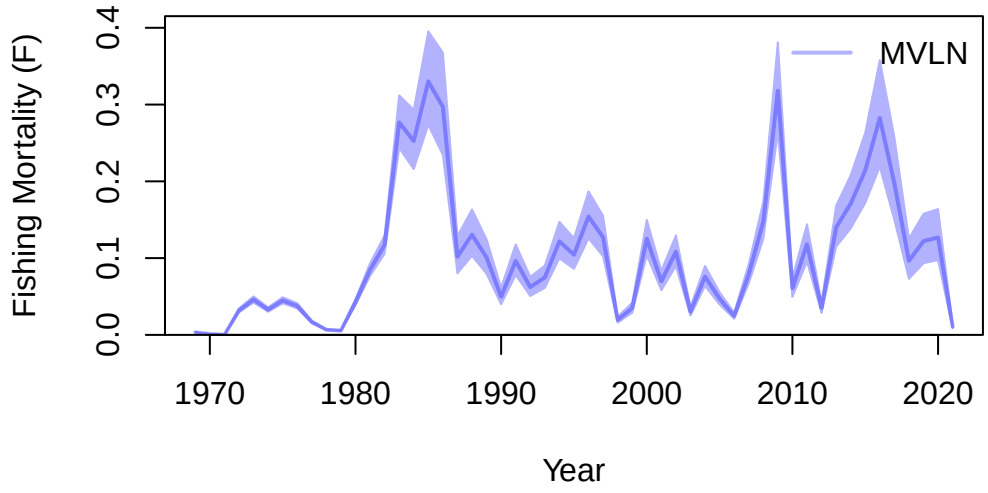
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F




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

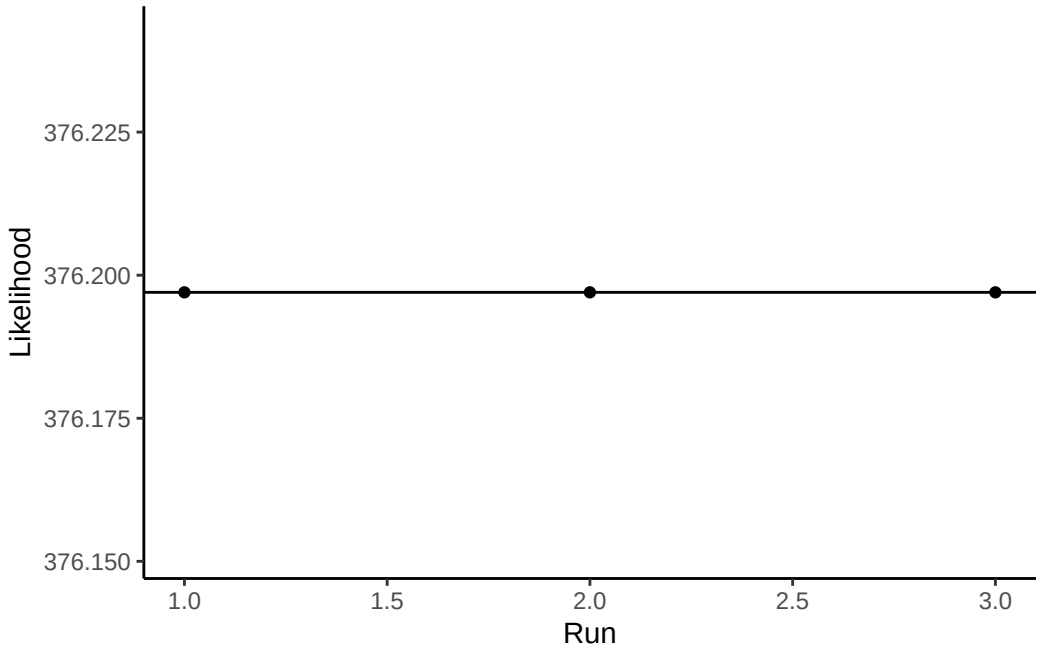

F/F$_{MSY}$
0.0
0.5
1.0
1.5
MVLN
1970
1980
1990
2000
2010
2020
Year

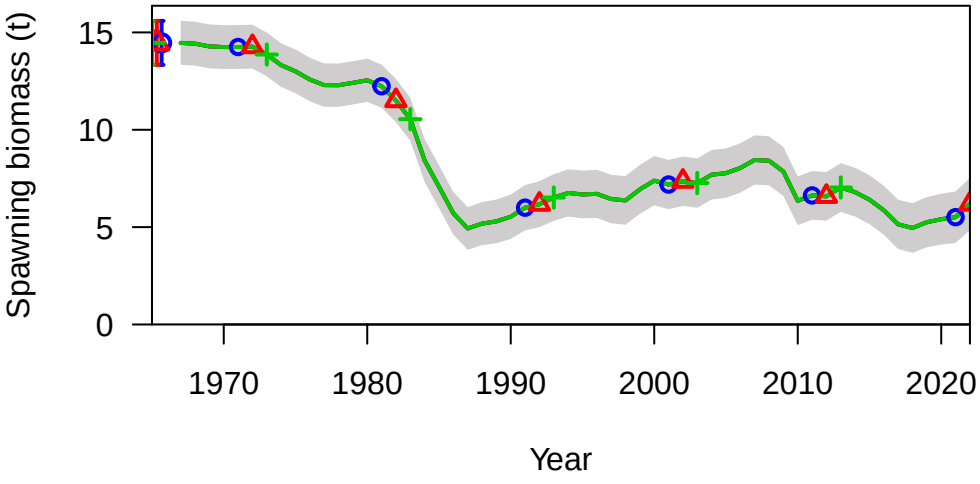


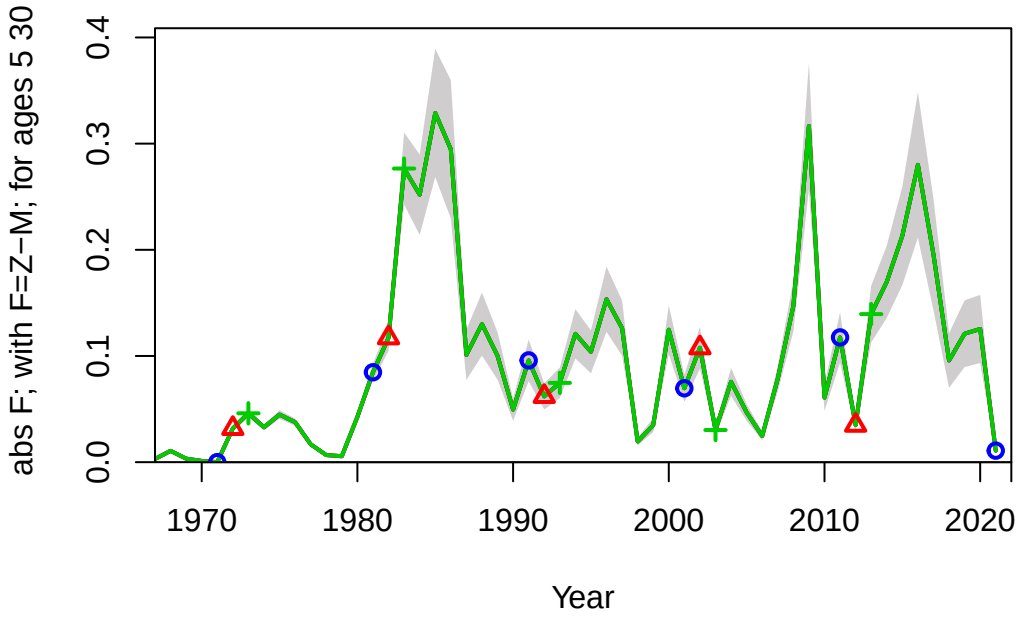


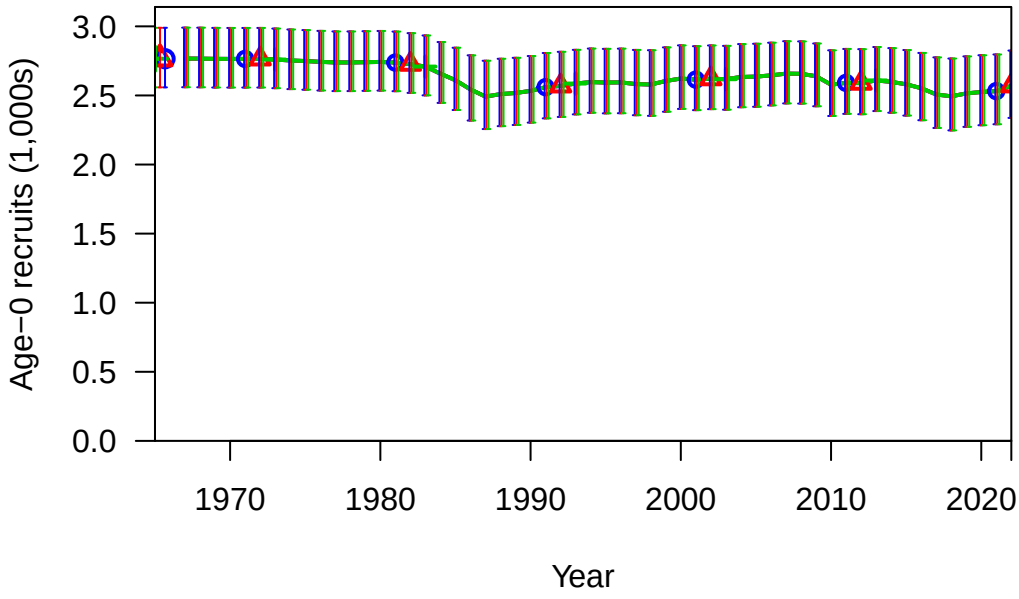

```
null device
          1
```

Jitter

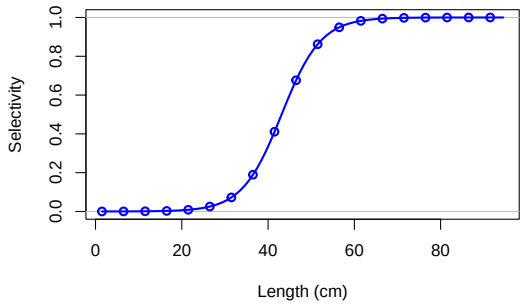

376.225
376.200
376.175
376.150
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

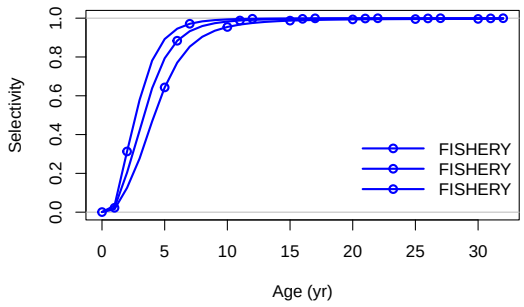

15
10
5
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year

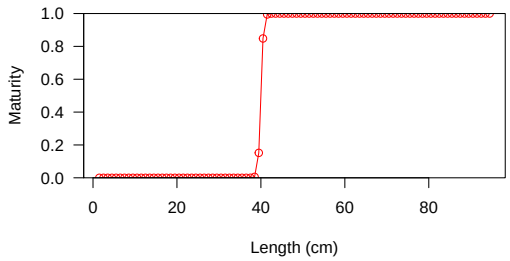


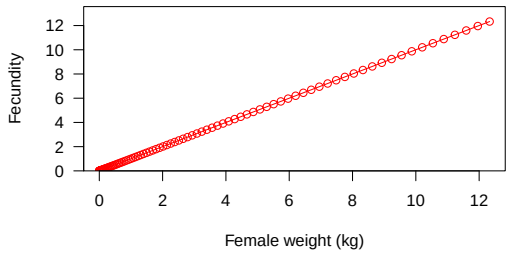


Selectivity and Maturity


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


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
20
25
30
Age (yr)
FISHERY
FISHERY
FISHERY


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


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