American Samoa Model Checks

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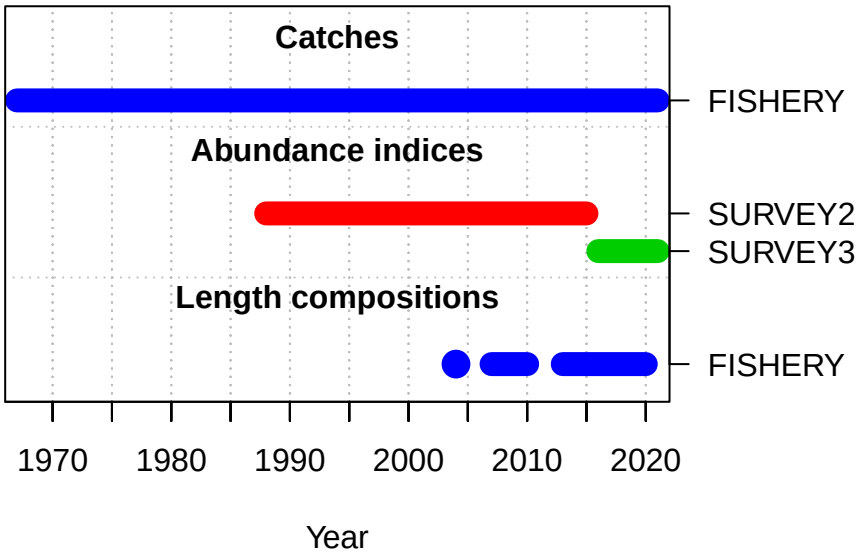
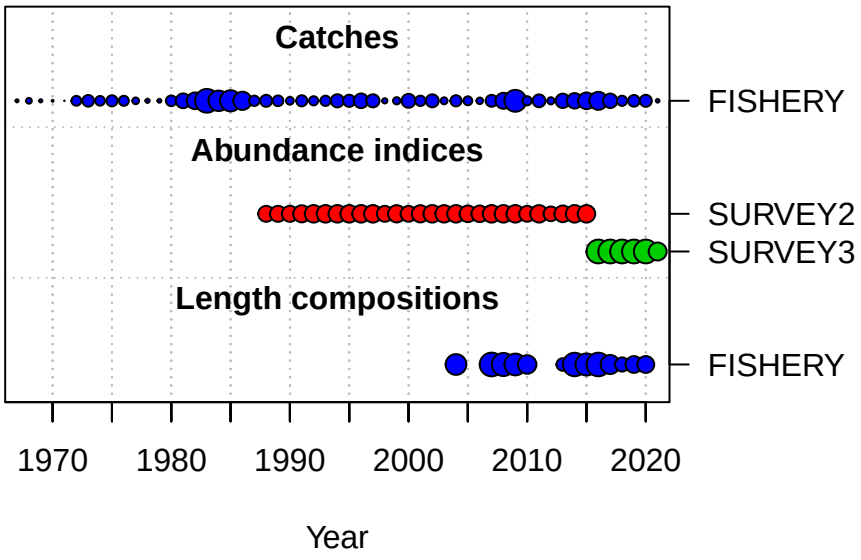
This is a summary report for the APVI base model run.

Model Output

Input Data





Convergence Check

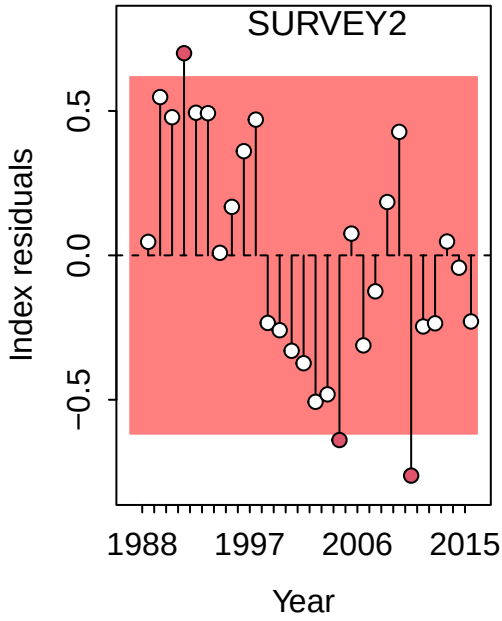
```
  Converged     MaxGrad
1      TRUE 1.06269e-05
```

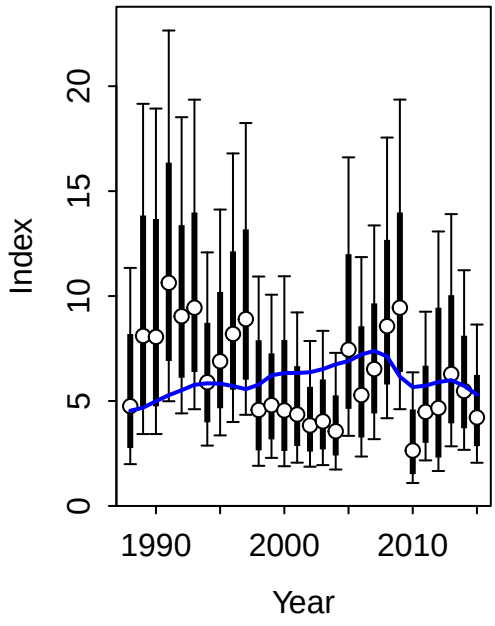
```
[1] "1 NOTE:  Max data length bin: 85  < max pop len bins: 94; so will accumulate larger pop
[2] "N warnings: 1"
```

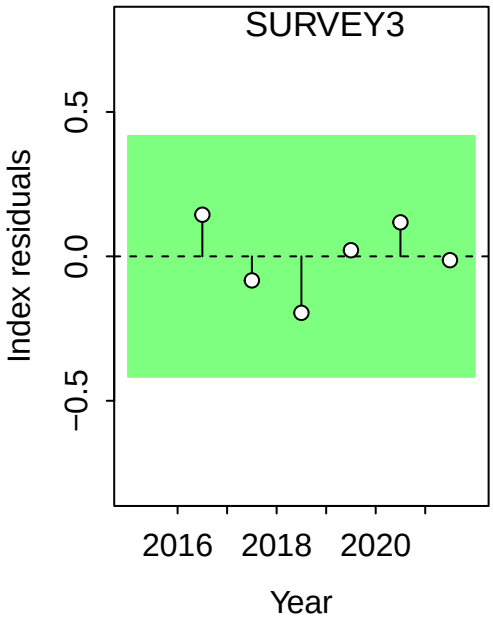
Fit to Model

CPUE

Fleet	RMSE.perc	Nobs
SURVEY2	38.9	28
SURVEY3	11.6	6
Combined	35.7	34


SURVEY2
Index residuals
0.5
0.0
−0.5
1988
1997
2006
2015
Year

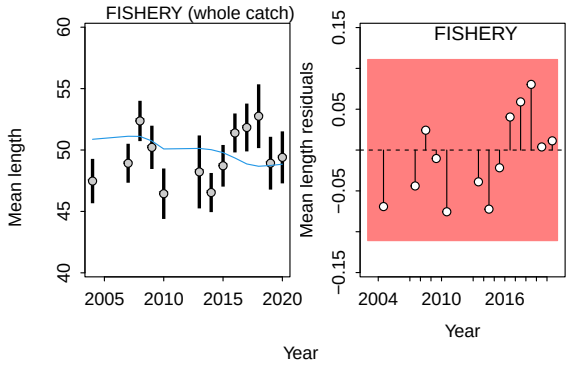

Index
0
5
10
15
20
1990
2000
2010
Year

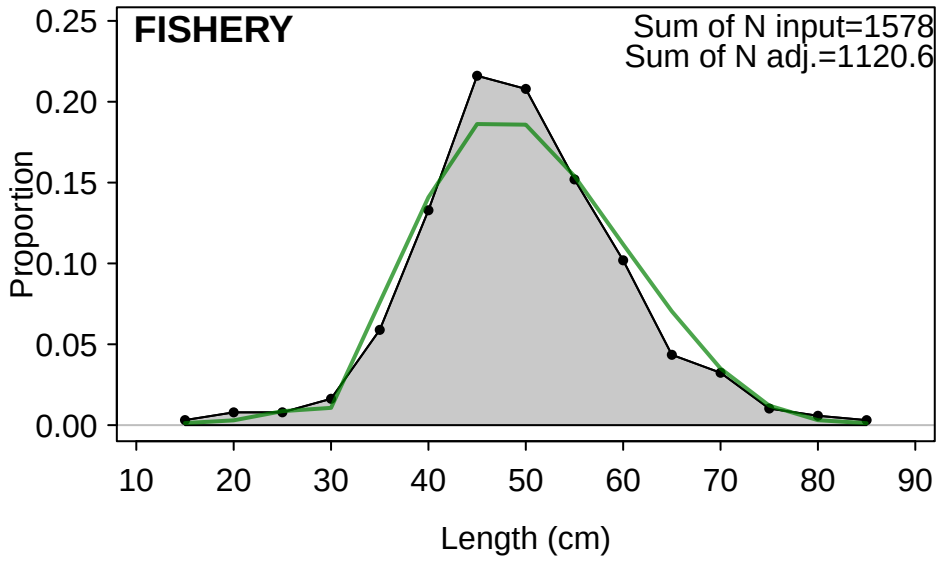

SURVEY3
Index residuals
0.5
0.0
−0.5
2016
2018
2020
Year

Length Comp

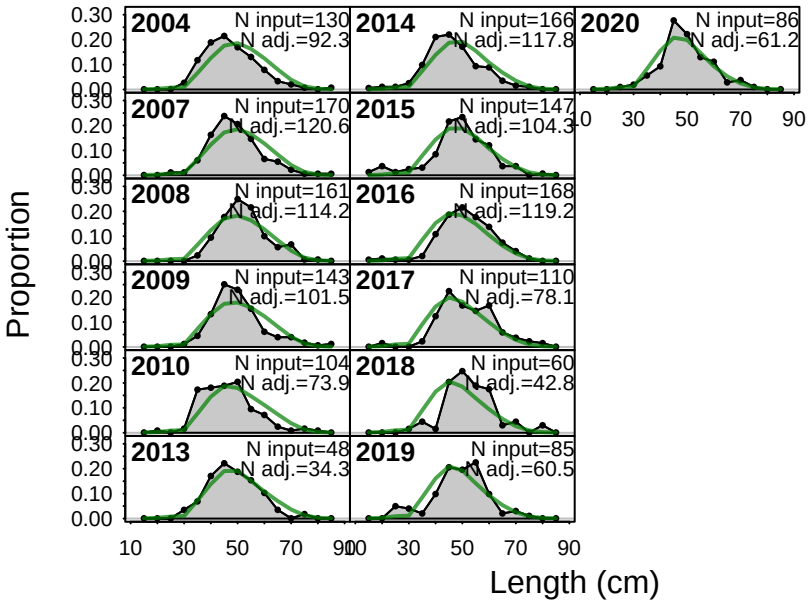
Fleet	RMSE.perc	Nobs
FISHERY	5	13
Combined	5	13

```
          w         lo         hi              Index runs.p   test  sigma3.lo sigma3.hi type
0.1458097 0.1047386 0.3400475           1 FISHERY  0.022 Failed -0.1108916 0.1108916  len
```



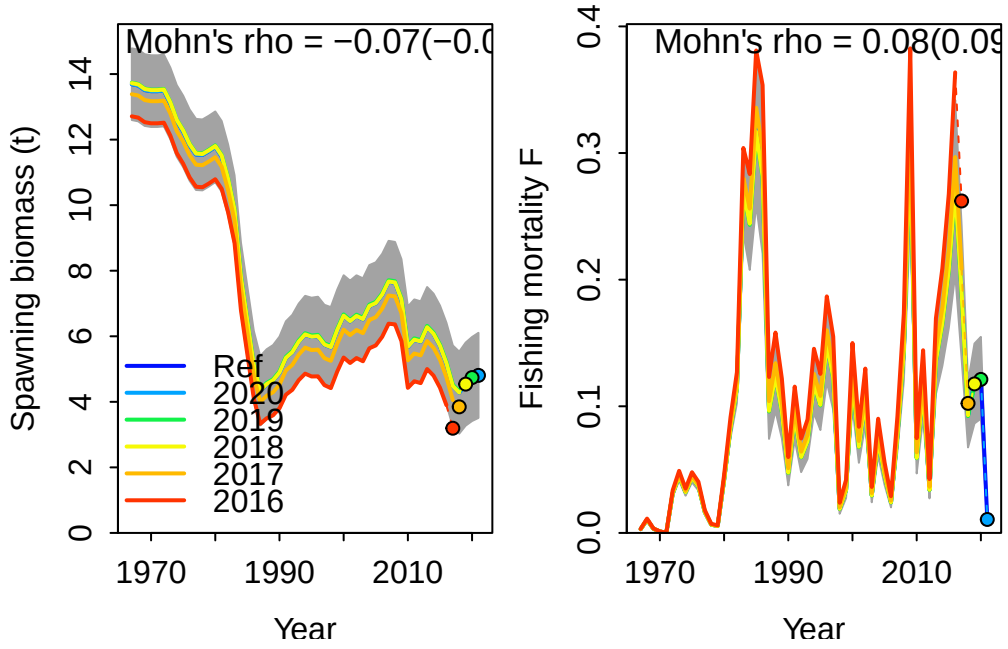


Retrospective and Hindcasting



Retrospective

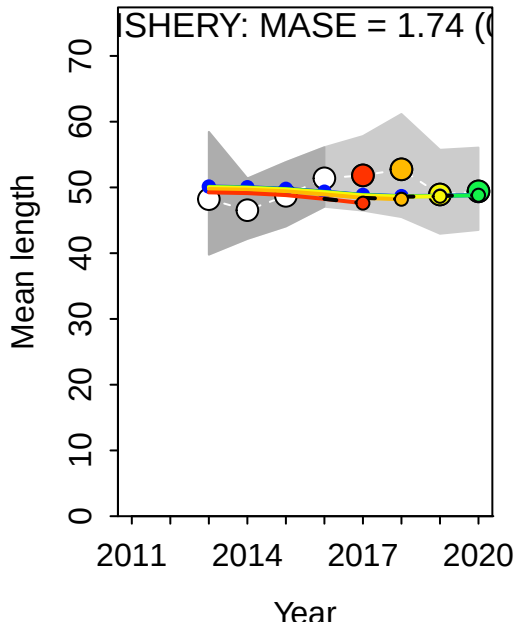
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel          Rho   ForecastRho
1    F     2020  0.000122444  0.0001223403
2    F     2019 -0.010619004 -0.0104159014
3    F     2018 -0.002853531 -0.0026695820
4    F     2017  0.096386935  0.0972420161
5    F     2016  0.331807646  0.3778475091
6    F Combined  0.082968898  0.0924252764
```

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 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 1.736573 0.04823878 0.02777815 0.4823878      4
```

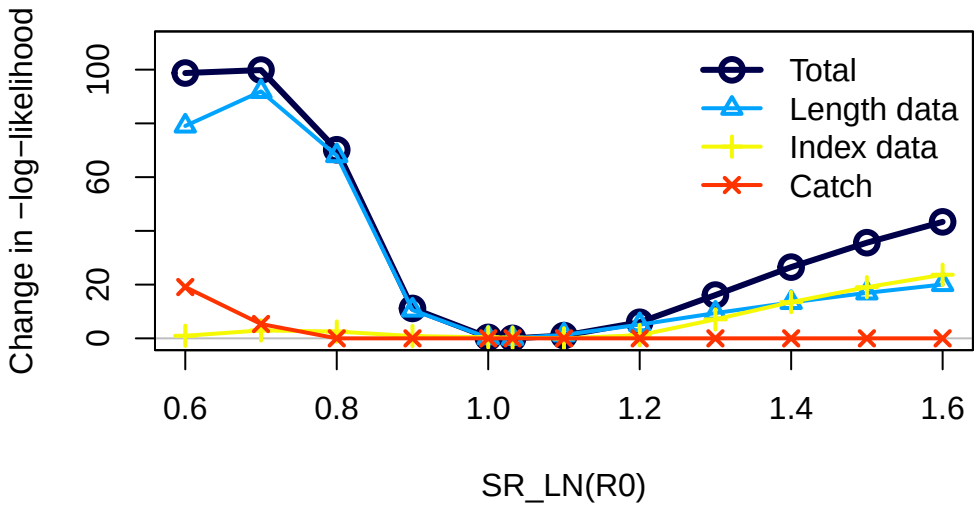


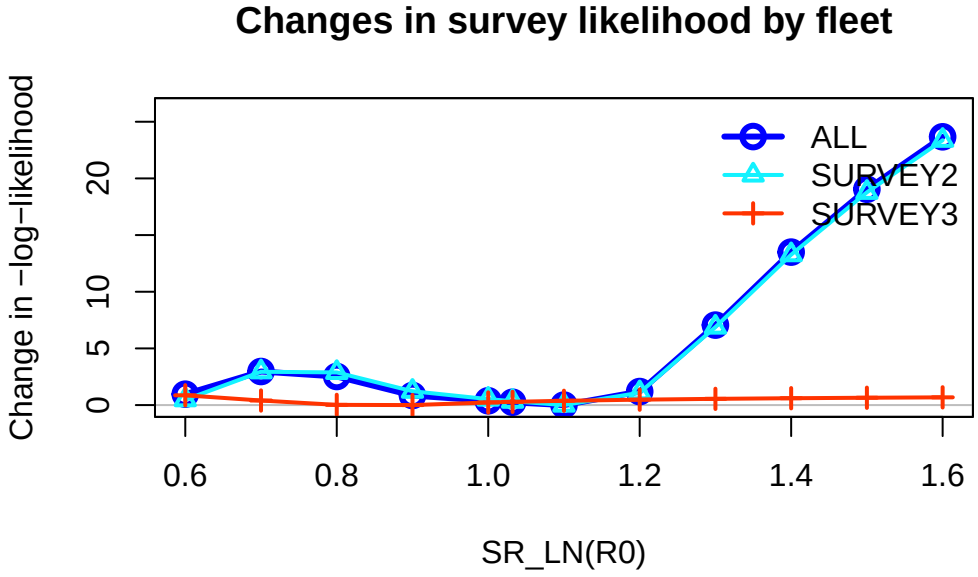
Recruitment Deviations

Likelihood Profile

```
[1] "SR_LN"
```

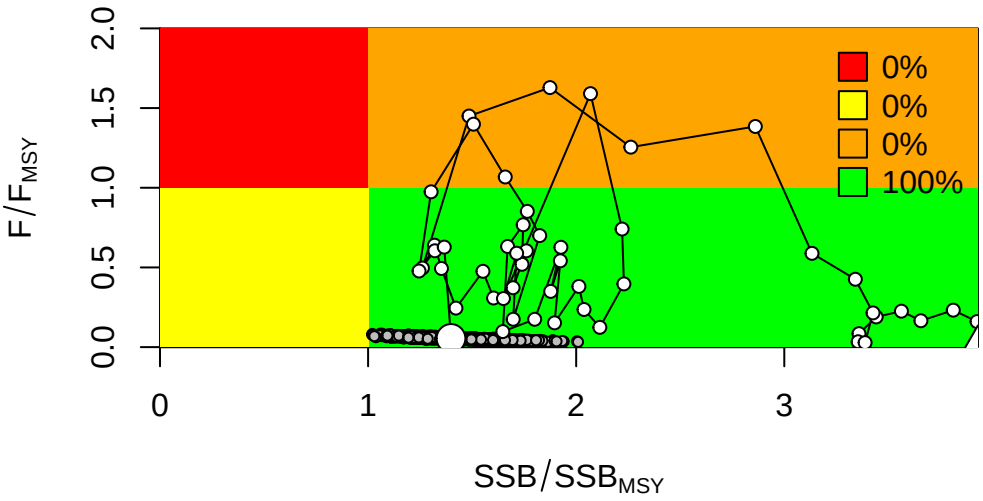
	frac_change	include	label
TOTAL	1.0000	TRUE	Total
Catch	0.1913	TRUE	Catch
Equil_catch	0.0000	FALSE	Equilibrium catch
Survey	0.2371	TRUE	Index data
Length_comp	0.9204	TRUE	Length data
Recruitment	0.0000	FALSE	Recruitment
InitEQ_Regime	0.0000	FALSE	Initital equilibrium recruitment
Forecast_Recruitment	0.0000	FALSE	Forecast recruitment
Parm_priors	0.0013	FALSE	Priors
Parm_softbounds	0.0001	FALSE	Soft bounds
Parm_devs	0.0000	FALSE	Parameter deviations
Crash_Pen	0.0000	FALSE	Crash penalty

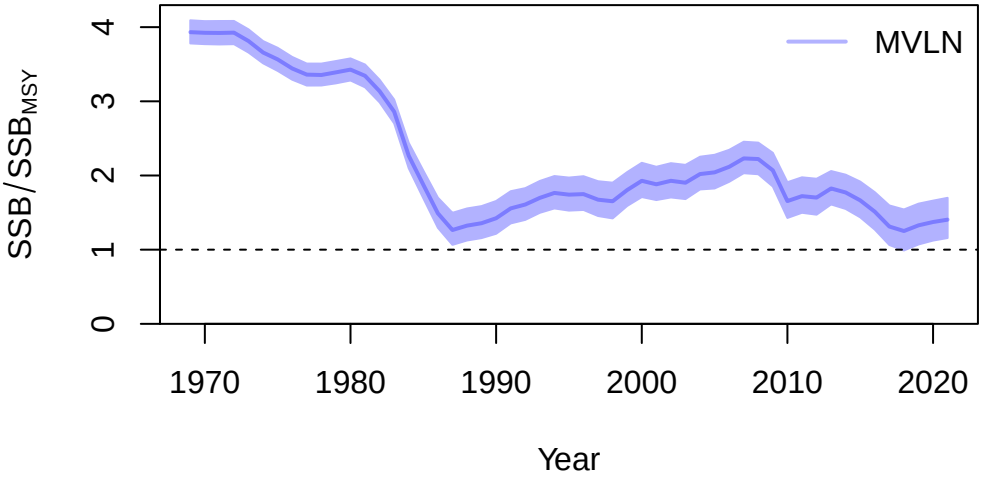


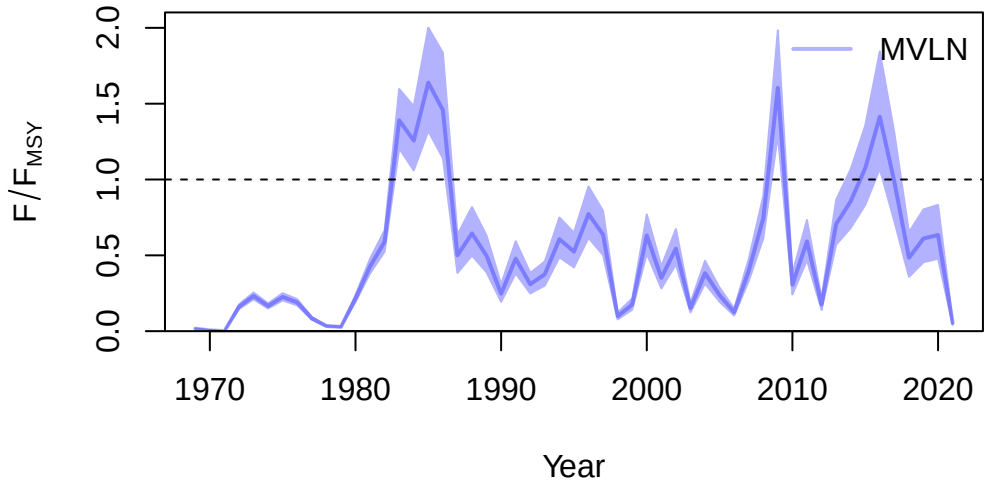


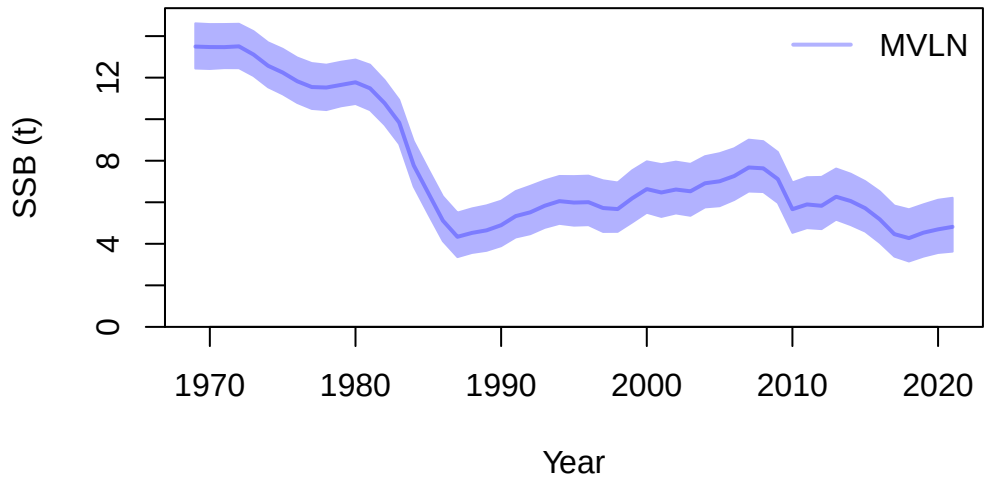
Management Quantities

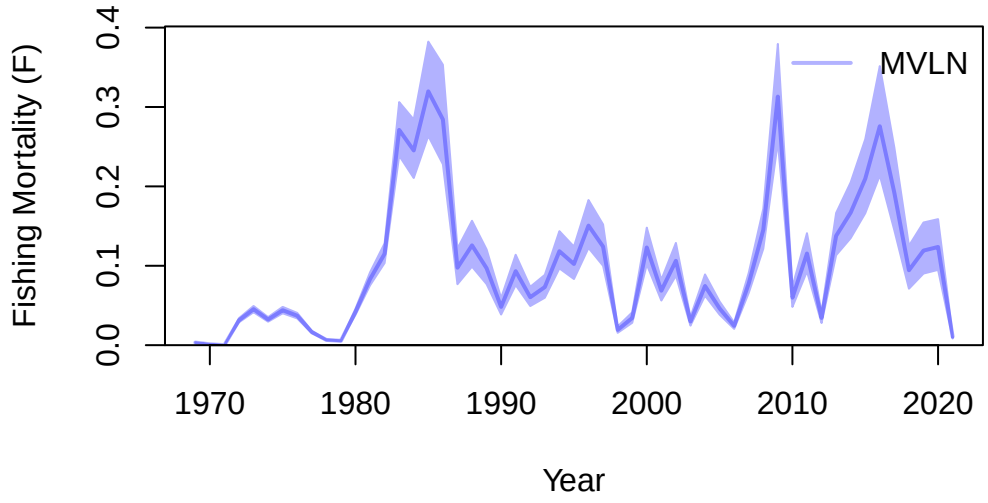
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F





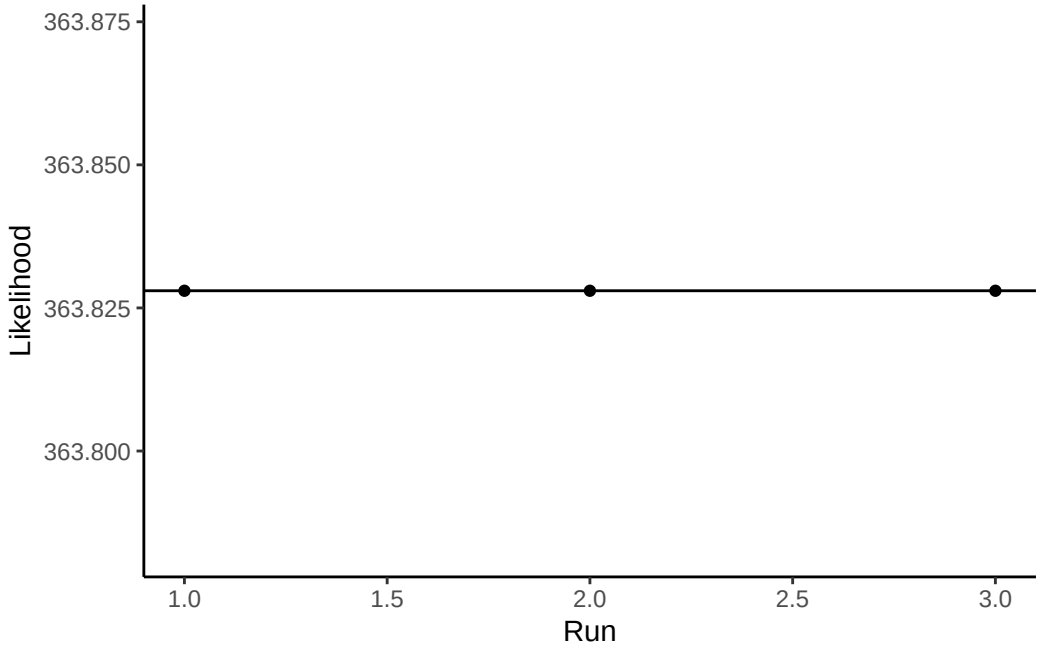

MVLN
F/F_MSY
0.0
0.5
1.0
1.5
2.0
1970
1980
1990
2000
2010
2020
Year

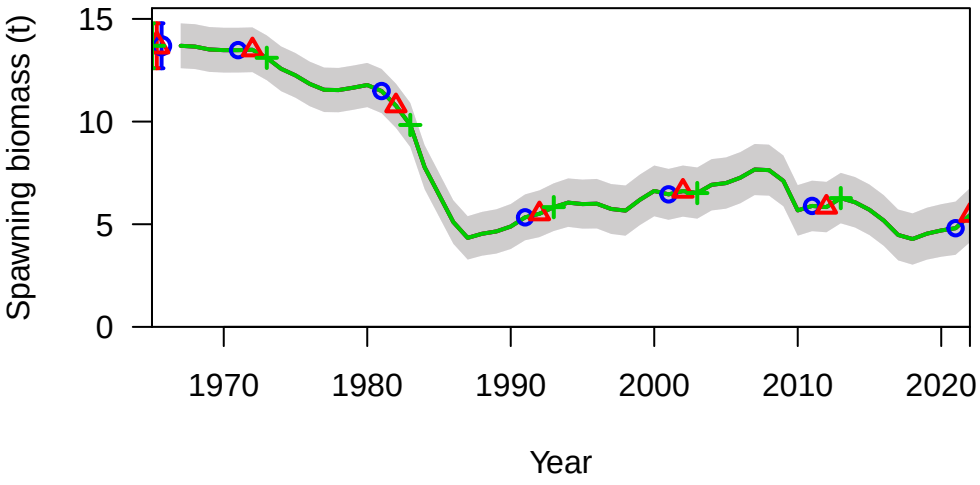

MVLN
SSB (t)
0
4
8
12
1970
1980
1990
2000
2010
2020
Year

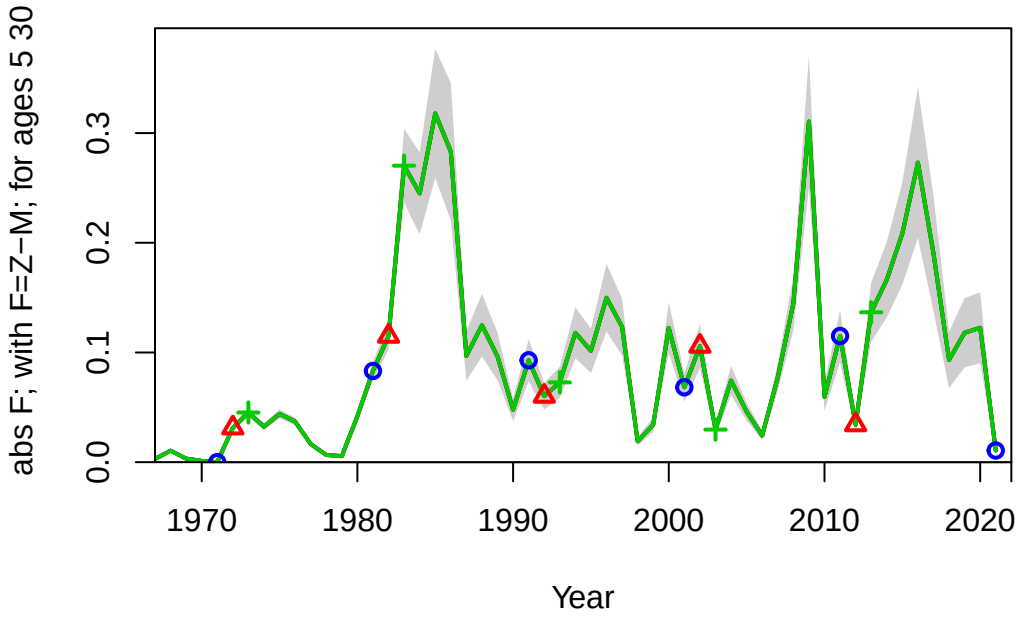


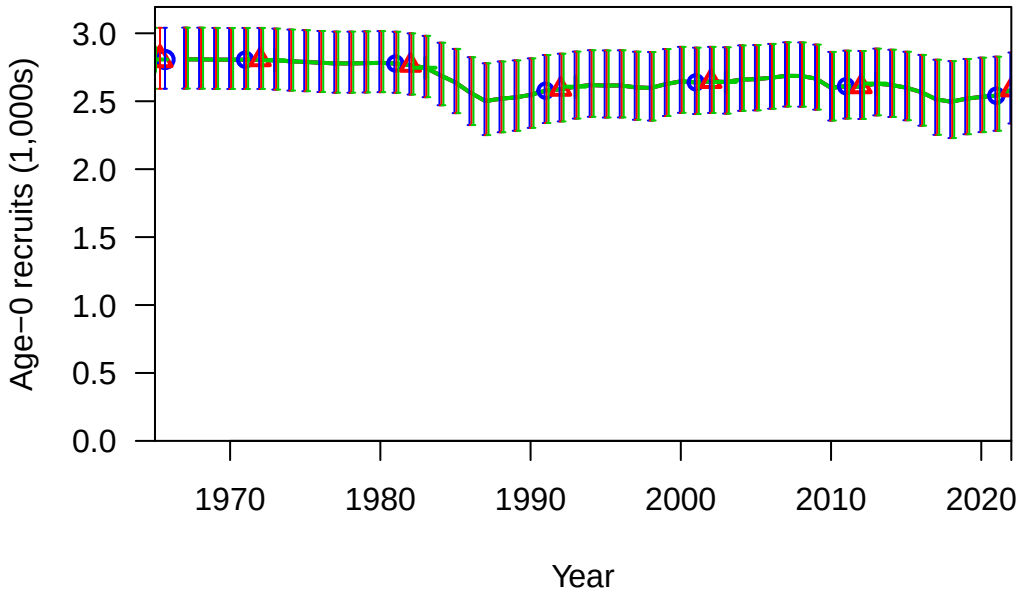

```
null device
          1
```

Jitter

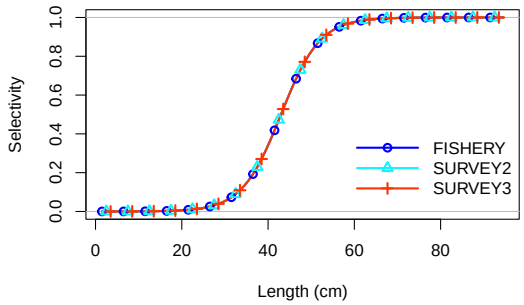

363.875
363.850
363.825
363.800
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

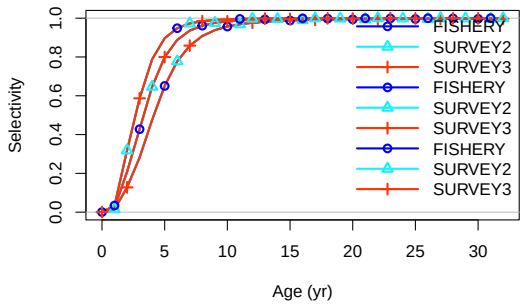

15
10
5
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year

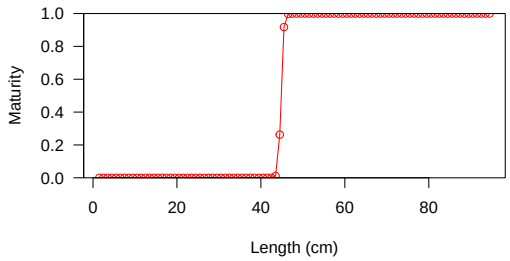


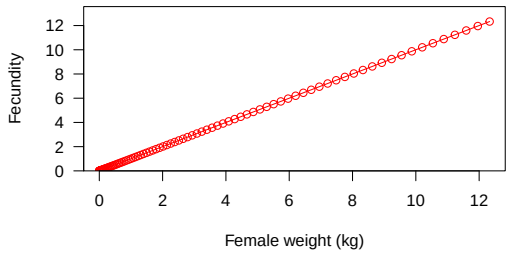


Selectivity and Maturity


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
Length (cm)
FISHERY
SURVEY2
SURVEY3


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
20
25
30
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
20
40
60
80
Length (cm)


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