American Samoa Model Checks

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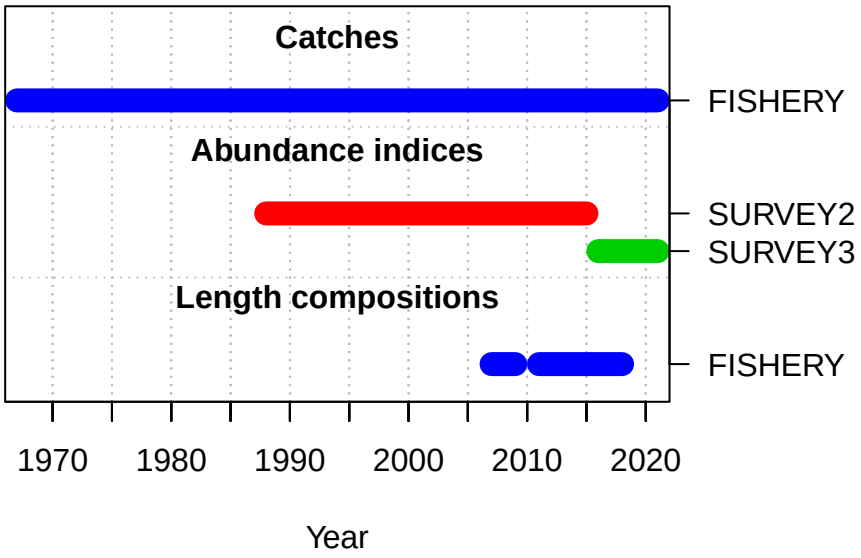
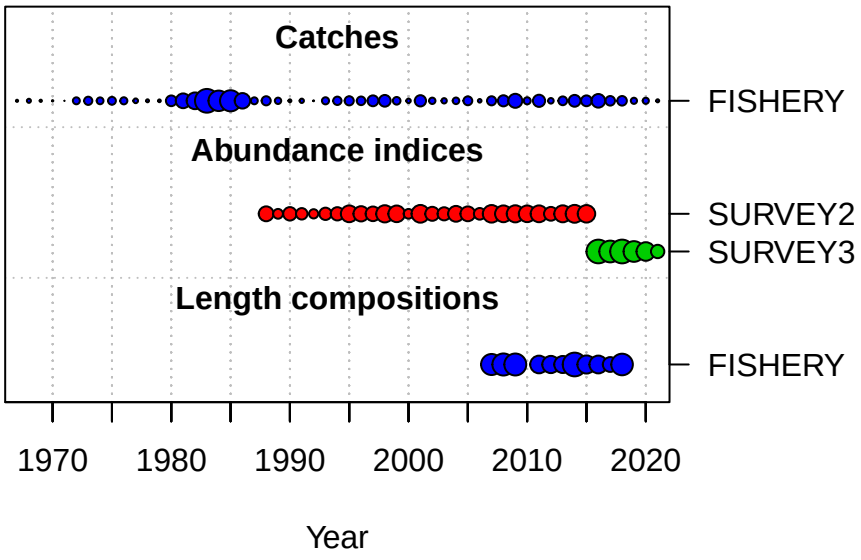
This is a summary report for the ETCO base model run.

Model Output

Input Data





Convergence Check

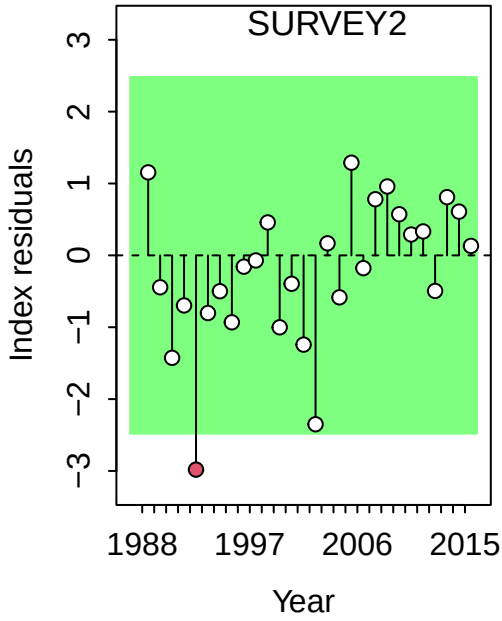
```
  Converged     MaxGrad
1      TRUE 2.66436e-05
```

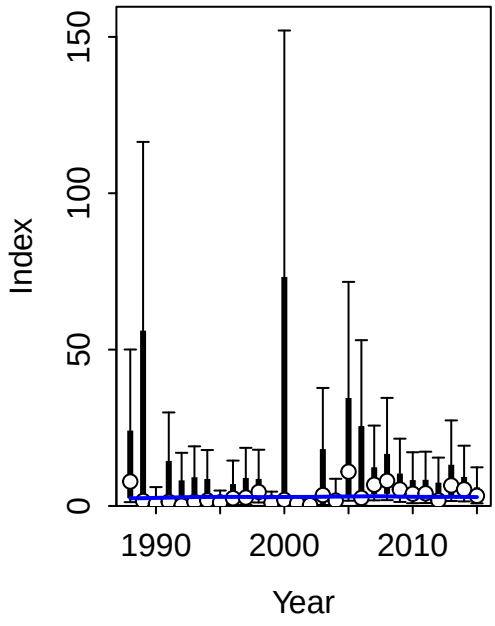
```
[1] "1 NOTE:  Max data length bin: 90  < max pop len bins: 100; so will accumulate larger po
[2] " N parameters are on or within 1% of min-max bound: 1; check results, variance may be s
[3] "N warnings: 1"
```

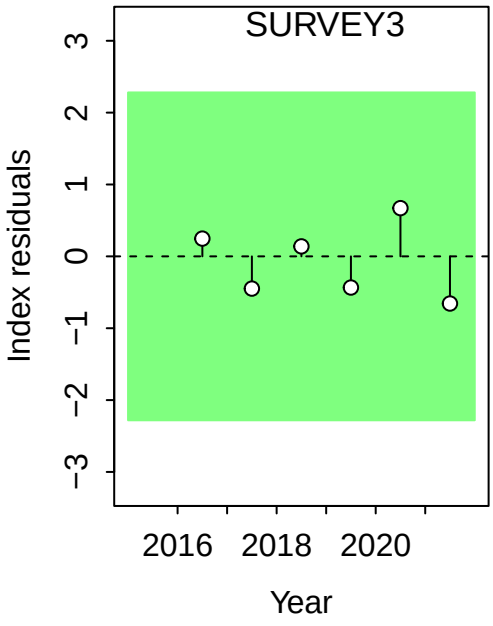
Fit to Model

CPUE

Fleet	RMSE.perc	Nobs
SURVEY2	101.0	28
SURVEY3	47.4	6
Combined	93.8	34


SURVEY2
Index residuals
3
2
1
0
−1
−2
−3
1988
1997
2006
2015
Year

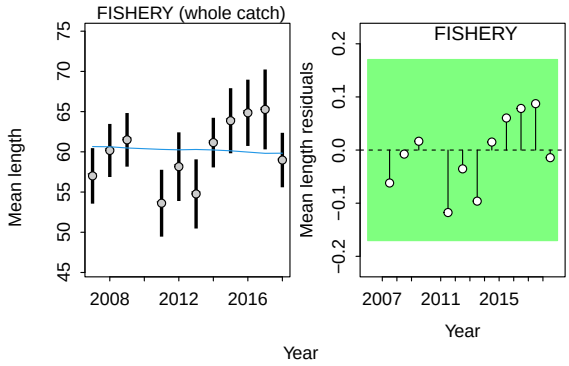

Index
150
100
50
0
1990
2000
2010
Year

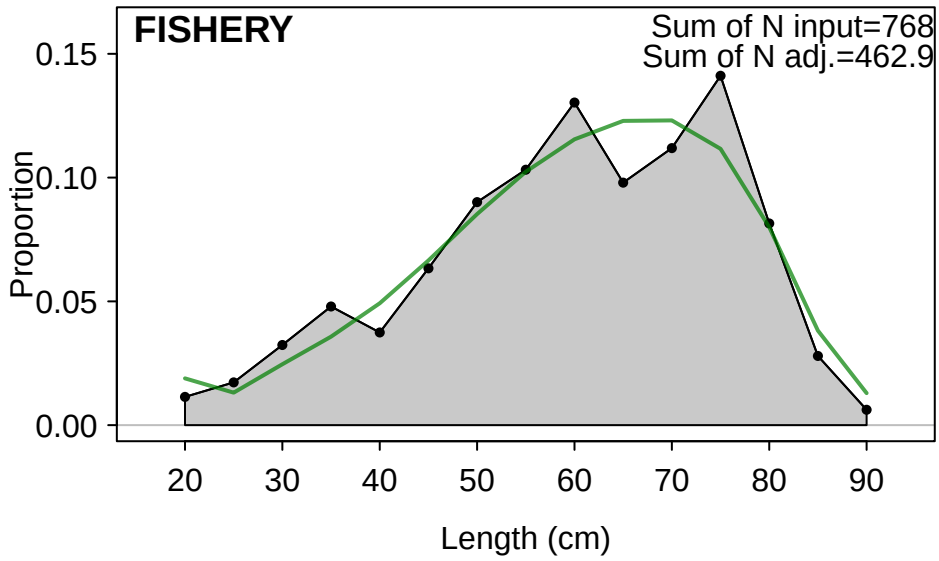

SURVEY3
Index residuals
3
2
1
0
−1
−2
−3
2016
2018
2020
Year

Length Comp

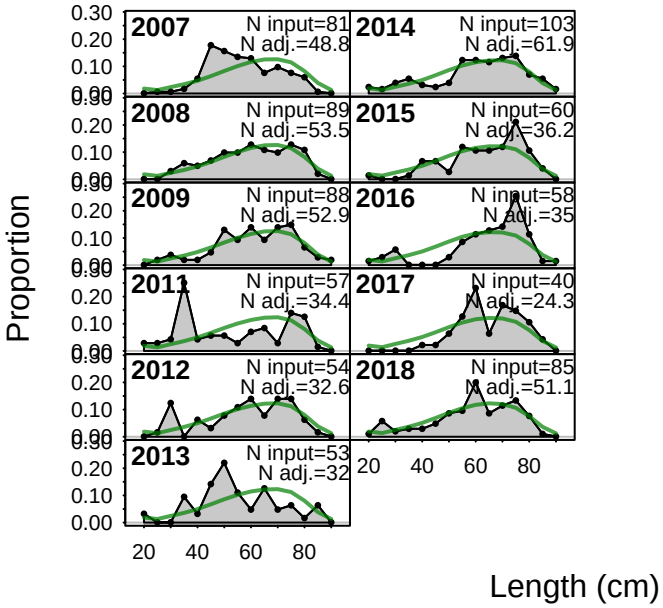
Fleet	RMSE.perc	Nobs
FISHERY	6.5	11
Combined	6.5	11

```
         w         lo         hi              Index runs.p   test  sigma3.lo sigma3.hi type
0.2706119 0.1887606 0.6850767          1 FISHERY  0.175 Passed -0.1704648 0.1704648  len
```



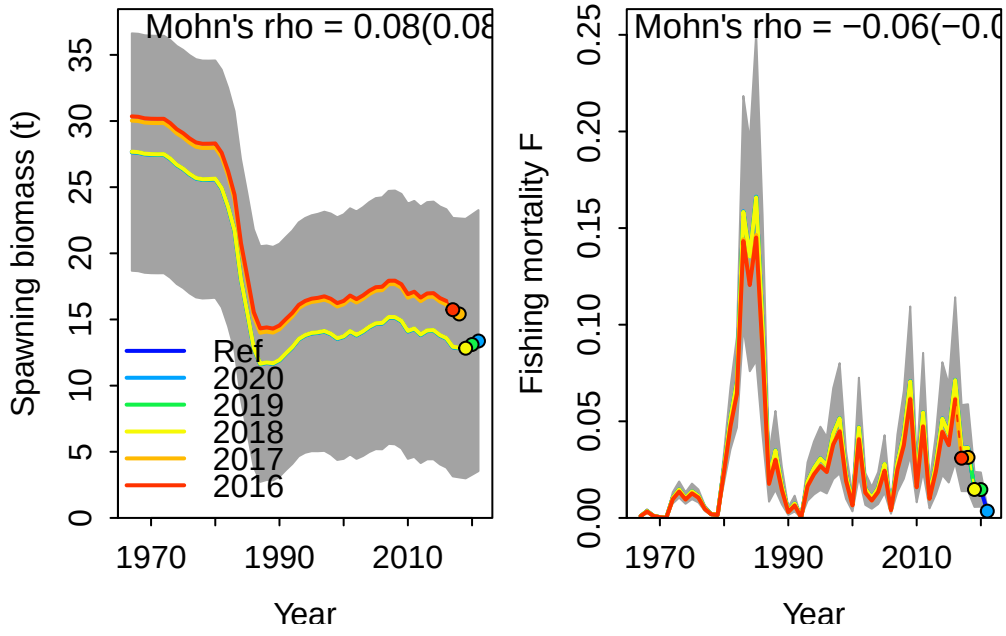


Retrospective and Hindcasting



Retrospective

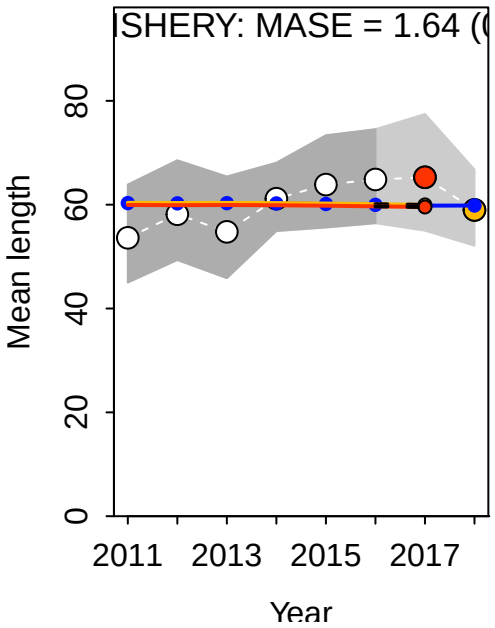
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel           Rho   ForecastRho
1    F     2020  0.0019206277  0.0018733246
2    F     2019 -0.0007045402 -0.0006878844
3    F     2018 -0.0019157879 -0.0019036135
4    F     2017 -0.1372046857 -0.1377412971
5    F     2016 -0.1410622741 -0.1443008115
6    F Combined -0.0557933321 -0.0565520564
```

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 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 1.638299 0.08832145 0.05391045 0.8832145      2
```

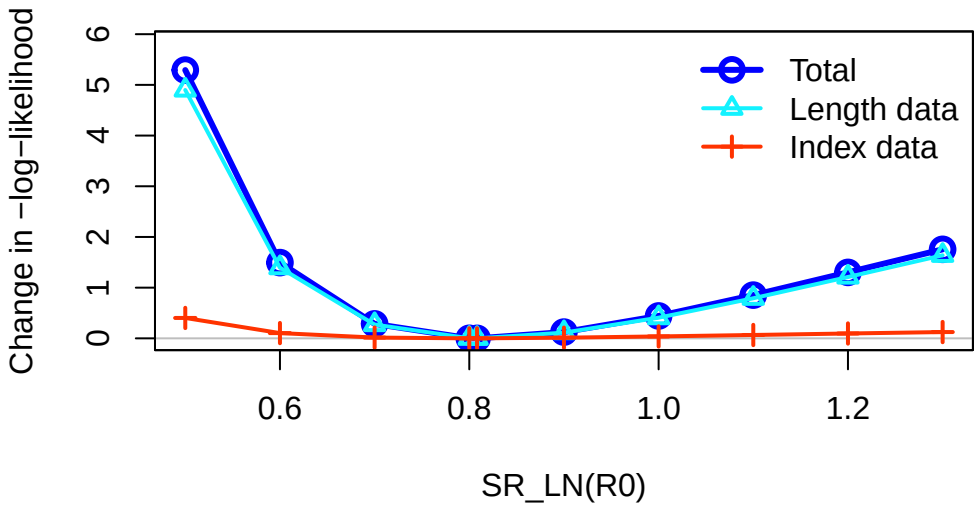


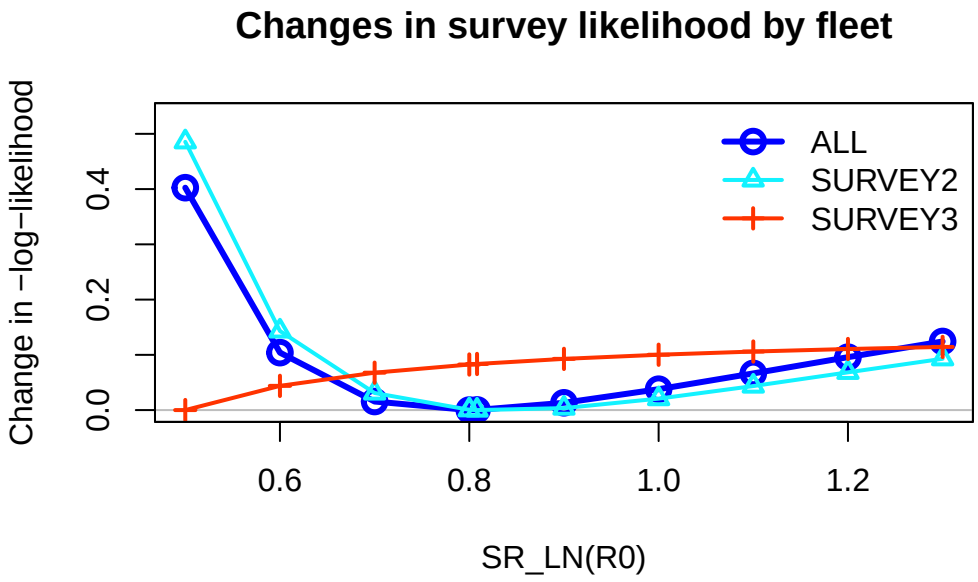
Recruitment Deviations

Likelihood Profile

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

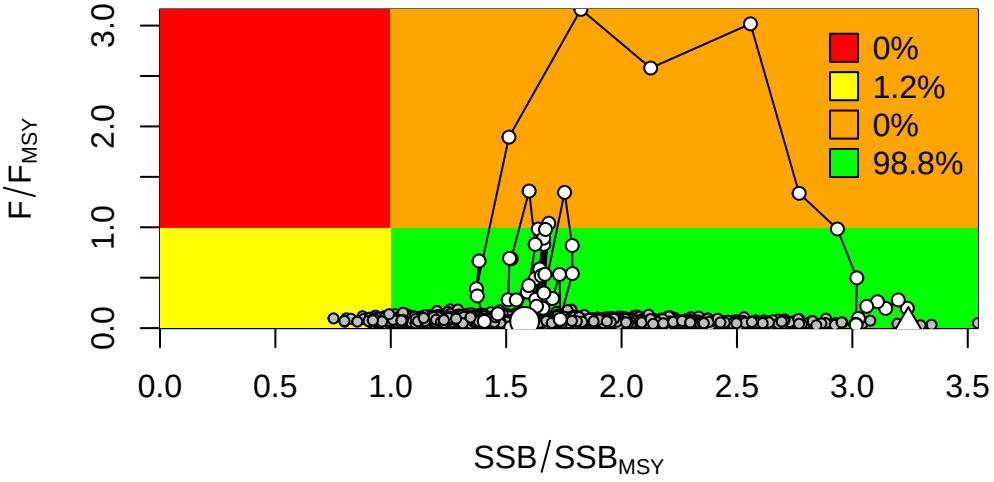
	frac_change	include	label
TOTAL	1.0000	TRUE	Total
Catch	0.0000	FALSE	Catch
Equil_catch	0.0000	FALSE	Equilibrium catch
Survey	0.0761	TRUE	Index data
Length_comp	0.9257	TRUE	Length data
Recruitment	0.0000	FALSE	Recruitment
InitEQ_Regime	0.0000	FALSE	Initital equilibrium recruitment
Forecast_Recruitment	0.0000	FALSE	Forecast recruitment
Parm_priors	0.0017	FALSE	Priors
Parm_softbounds	0.0001	FALSE	Soft bounds
Parm_devs	0.0000	FALSE	Parameter deviations
Crash_Pen	0.0000	FALSE	Crash penalty

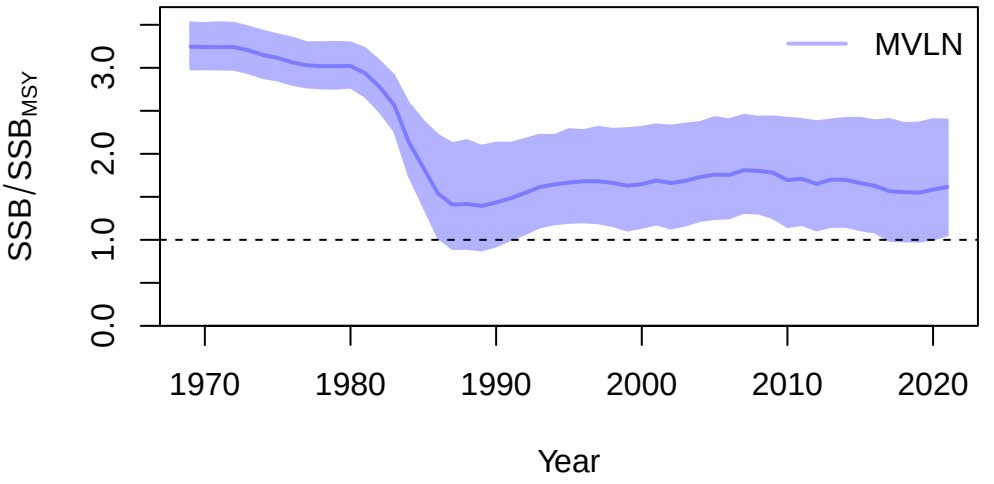


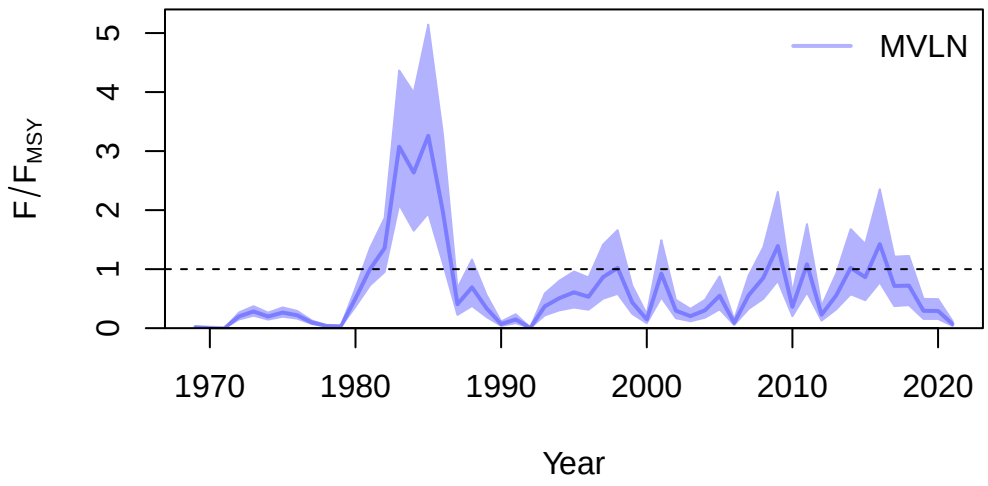


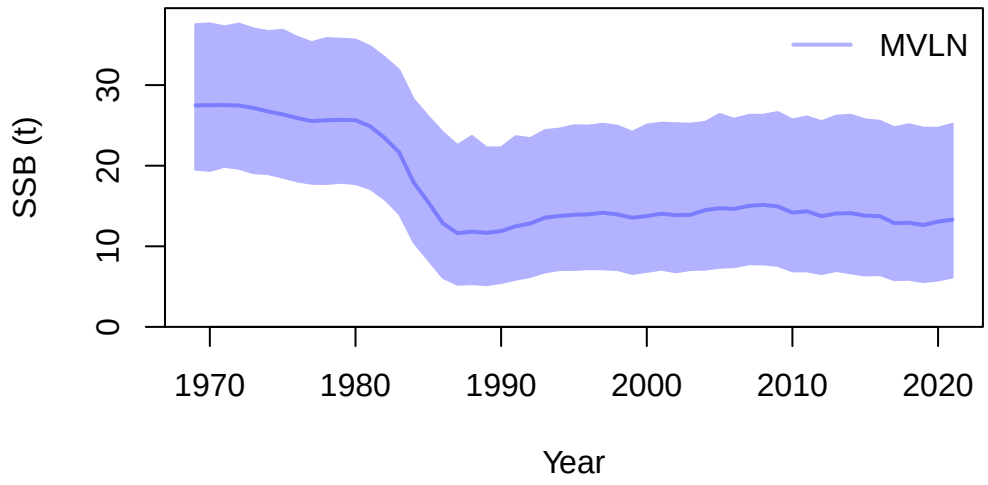
Management Quantities

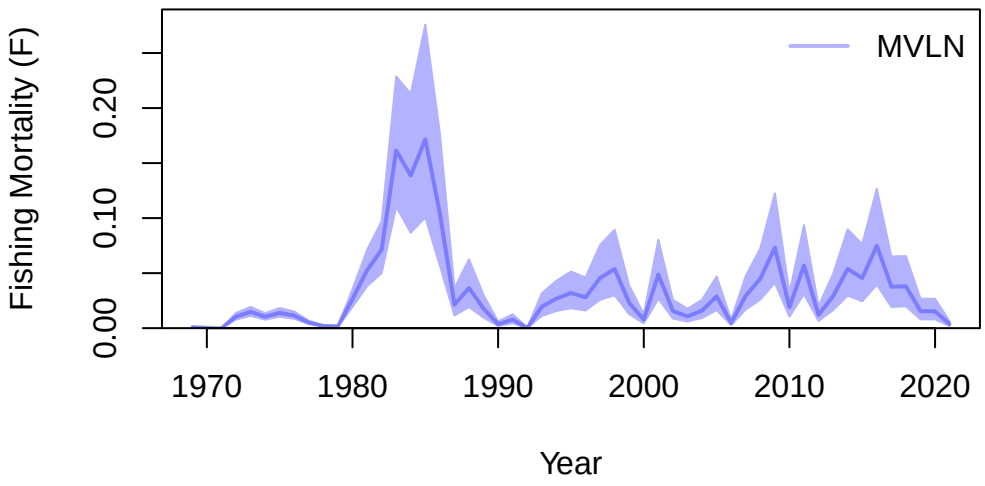
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F





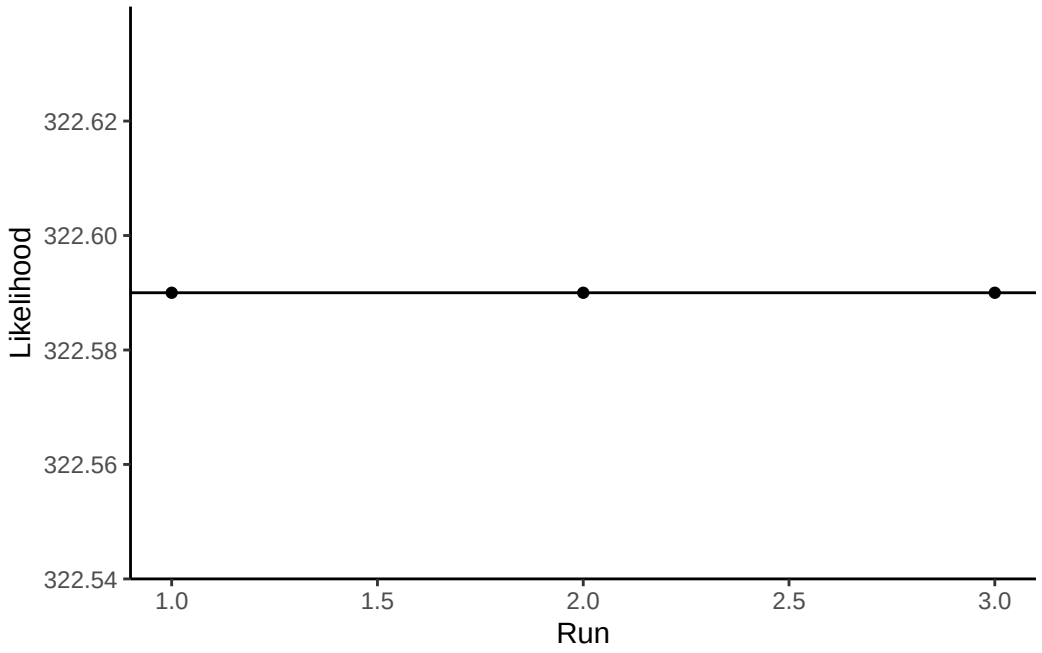

MVLN
F/F_MSY
0
1
2
3
4
5
1970
1980
1990
2000
2010
2020
Year

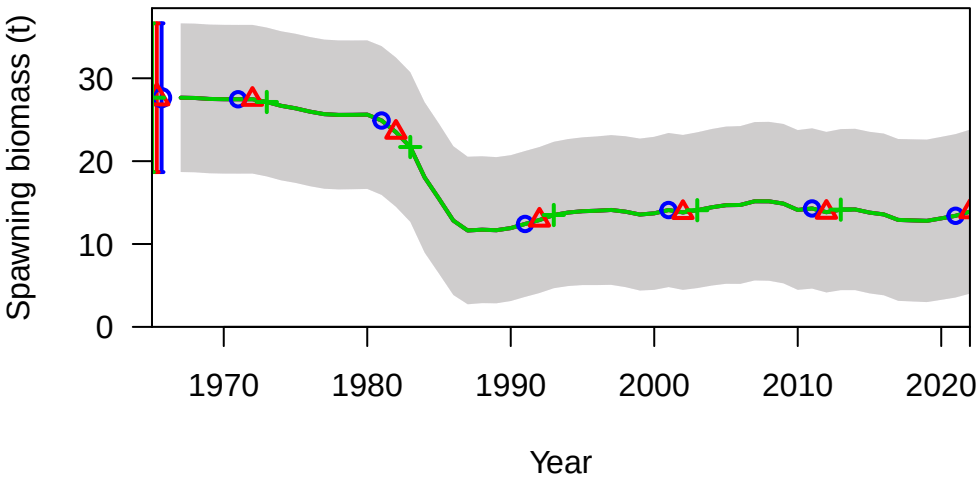

MVLN
SSB (t)
0
10
20
30
1970
1980
1990
2000
2010
2020
Year

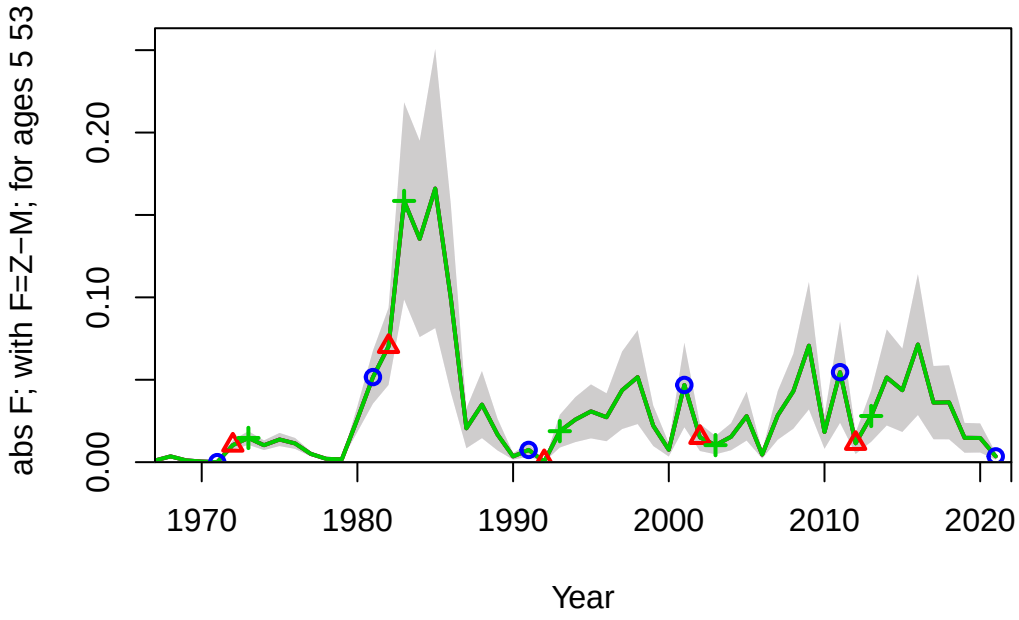


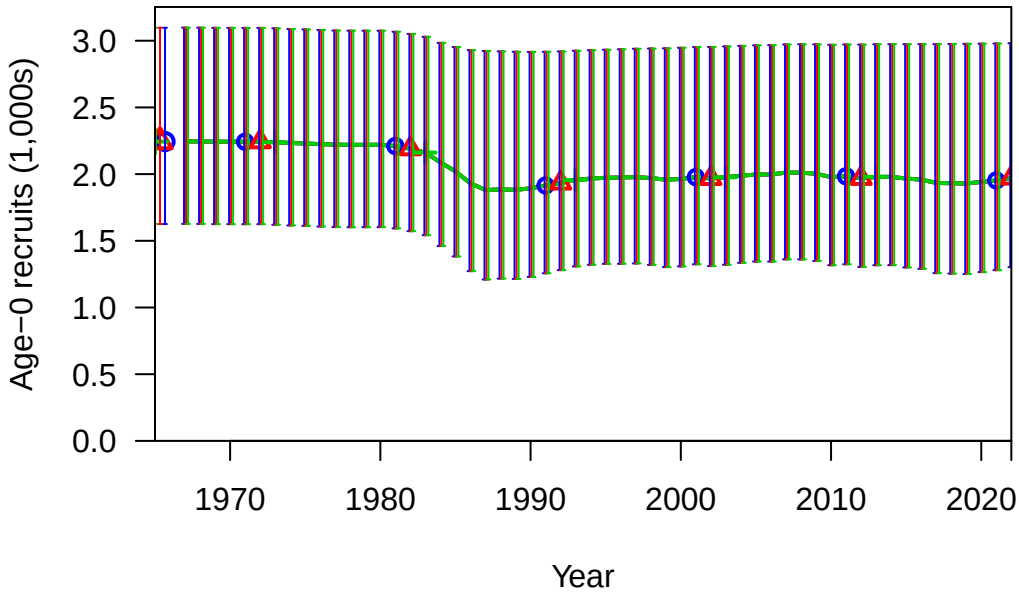

```
null device
          1
```

Jitter

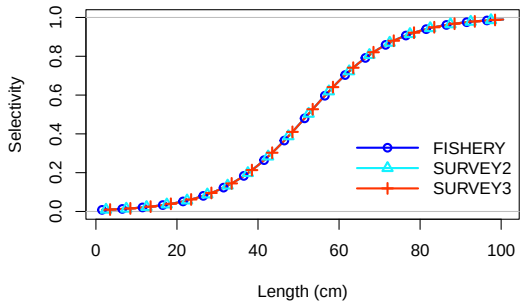

322.62
322.60
322.58
322.56
322.54
Likelihood
1.0
1.5
2.0
2.5
3.0
Run

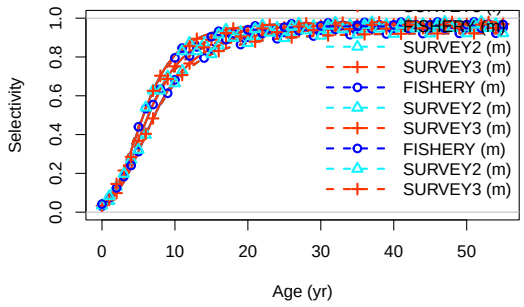

30
20
10
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year

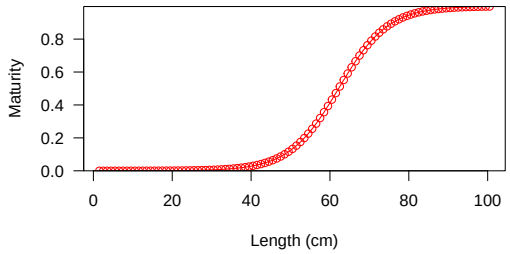


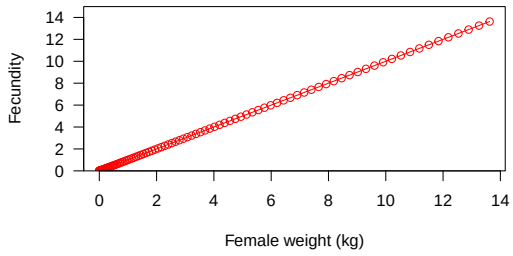


Selectivity and Maturity


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
100
Length (cm)
FISHERY
SURVEY2
SURVEY3


Selectivity
0.0
0.2
0.4
0.6
0.8
1.0
0
10
20
30
40
50
Age (yr)
SURVEY2 (m)
SURVEY3 (m)
FISHERY (m)
SURVEY2 (m)
SURVEY3 (m)
FISHERY (m)
SURVEY2 (m)
SURVEY3 (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)