American Samoa Model Checks

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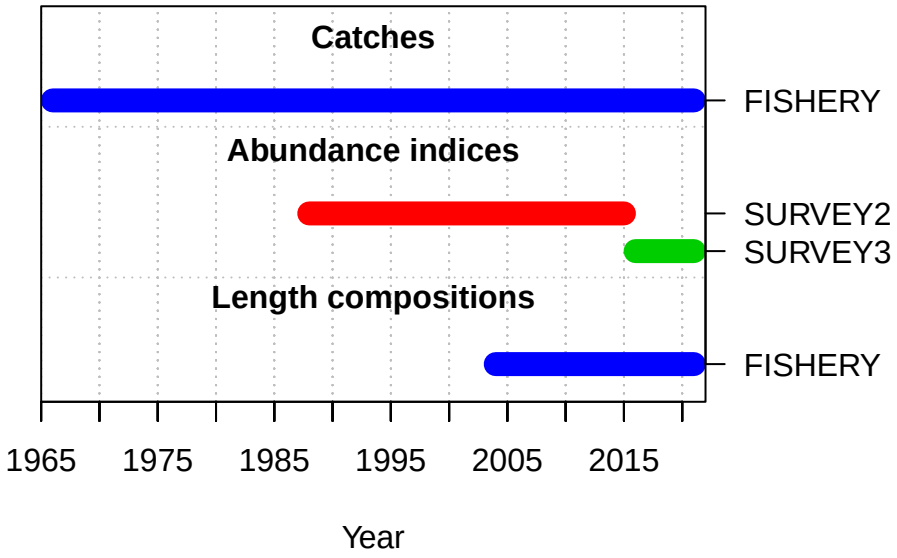
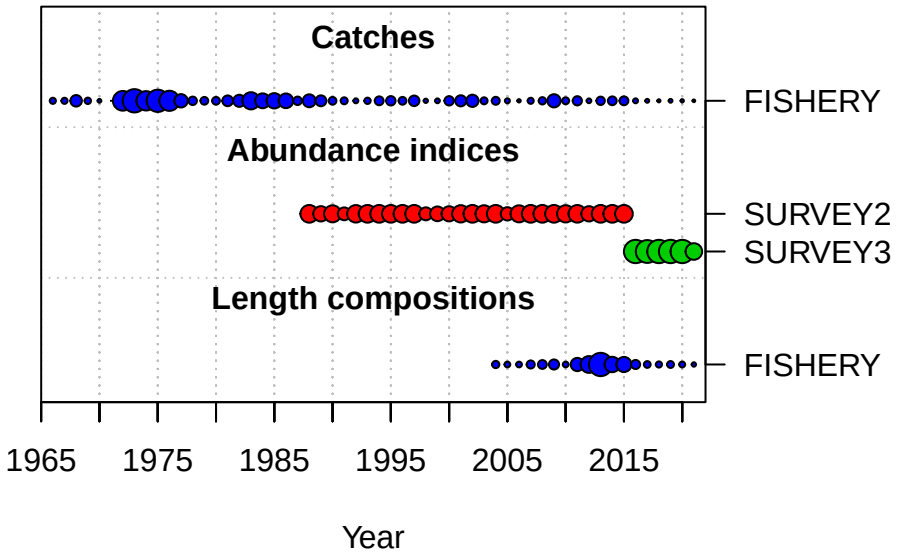
This is a summary report for the LUKA base model run.

Model Output

Input Data





Convergence Check

```
  Converged     MaxGrad
1      TRUE 7.07894e-05
```

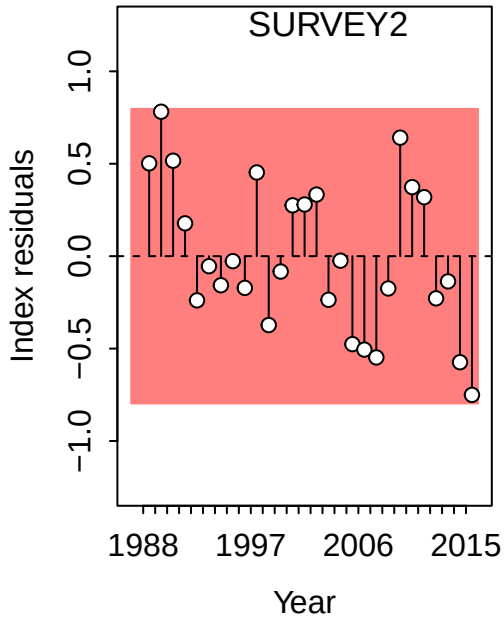
```
[1] "1 NOTE:  Max data length bin: 28  < max pop len bins: 31; so will accumulate larger pop
[2] "2  Main recdev biasadj is >2 times ratio of rmse to sigmaR"
[3] "3 Forecast F capped by max possible F from control file: 2.9"
[4] "4 Forecast F capped by max possible F from control file: 2.9"
[5] " N parameters are on or within 1% of min-max bound: 1; check results, variance may be su
[6] "N warnings: 4"
```

Fit to Model

CPUE

Fleet	RMSE.perc	Nobs
SURVEY2	39.5	28
SURVEY3	20.9	6

Combined	36.9	34



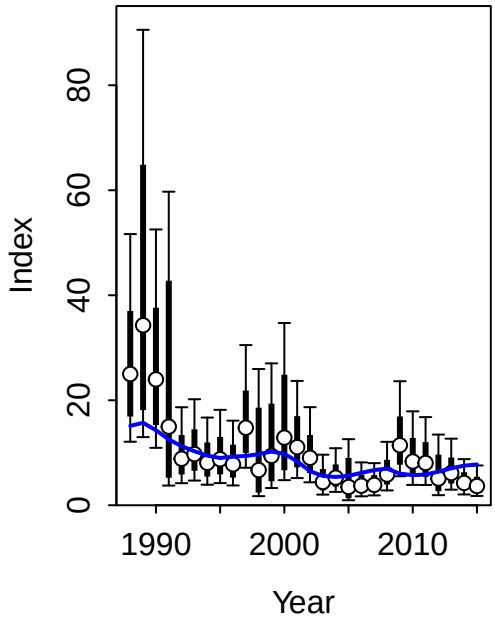
Length Comp

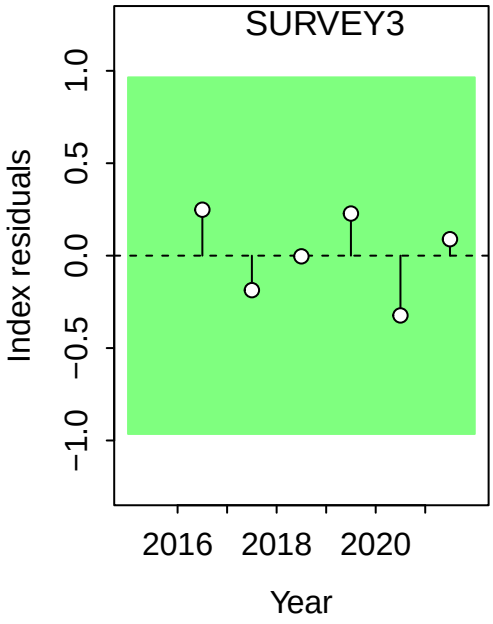
Fleet	RMSE.perc	Nobs
FISHERY	1.1	18
Combined	1.1	18

Retrospective and Hindcasting

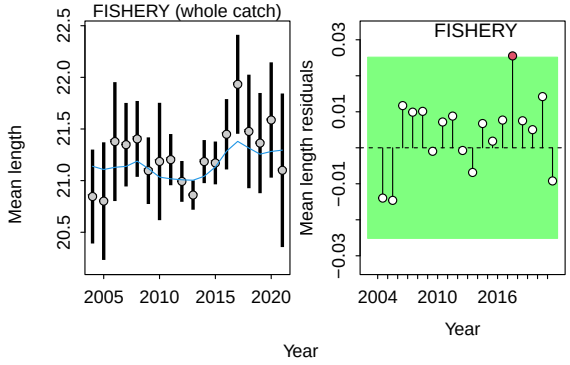
Retrospective

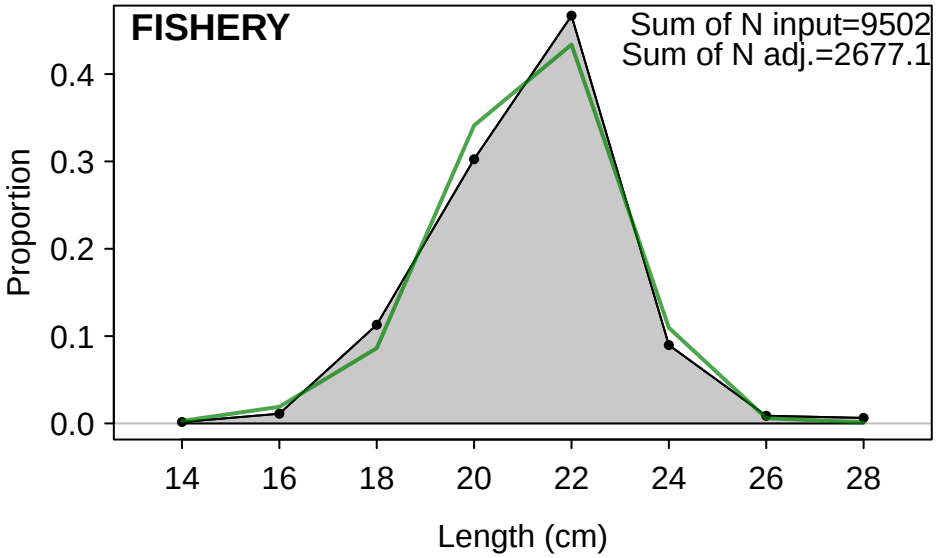
`Mohn's Rho stats, including one step ahead forecasts:`

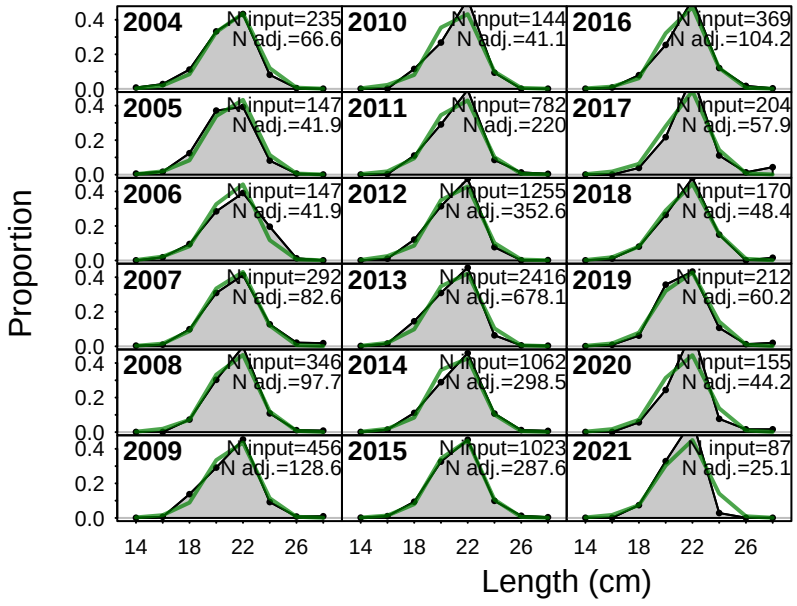


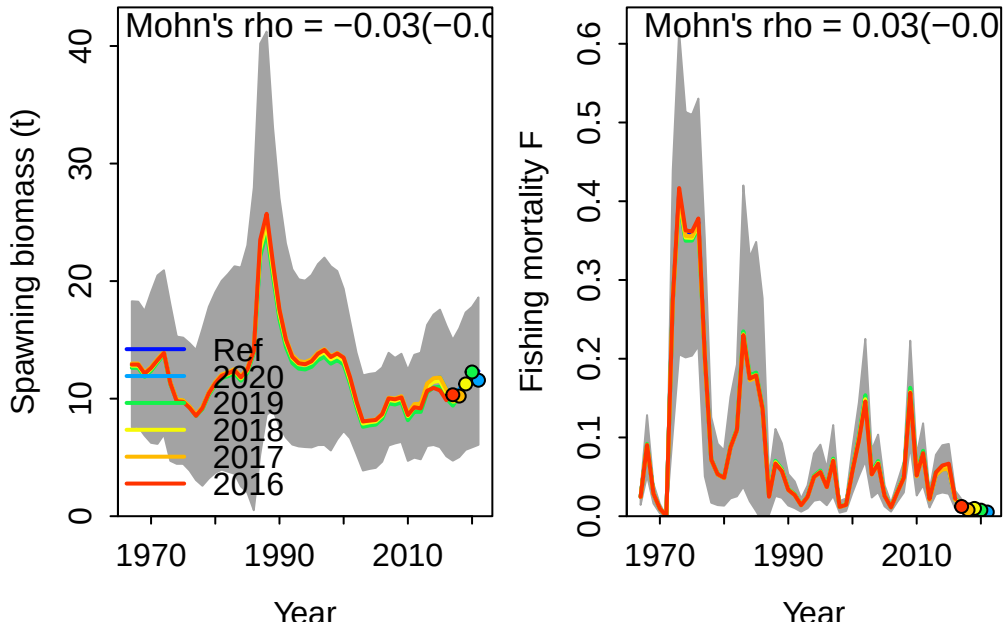



```
        w        lo        hi              Index runs.p   test   sigma3.lo  sigma3.hi type
0.8426562 0.5313078 2.2408547          1 FISHERY  0.135 Passed -0.02515343 0.02515343  len
```




FISHERY
Sum of N input=9502
Sum of N adj.=2677.1
Proportion
0.0
0.1
0.2
0.3
0.4
14
16
18
20
22
24
26
28
Length (cm)


Proportion
2004 N input=235 N adj.=66.6
2010 N input=144 N adj.=41.1
2016 N input=369 N adj.=104.2
2005 N input=147 N adj.=41.9
2011 N input=782 N adj.=220
2017 N input=204 N adj.=57.9
2006 N input=147 N adj.=41.9
2012 N input=1255 N adj.=352.6
2018 N input=170 N adj.=48.4
2007 N input=292 N adj.=82.6
2013 N input=2416 N adj.=678.1
2019 N input=212 N adj.=60.2
2008 N input=346 N adj.=97.7
2014 N input=1062 N adj.=298.5
2020 N input=155 N adj.=44.2
2009 N input=456 N adj.=128.6
2015 N input=1023 N adj.=287.6
2021 N input=87 N adj.=25.1
0.0
0.2
0.4
14
18
22
26
Length (cm)




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

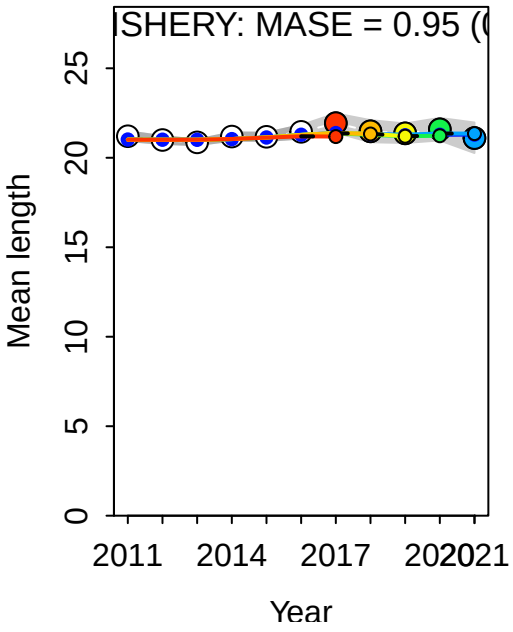
	type	peel	Rho	ForecastRho
1	F	2020	0.04688002	0.067164314
2	F	2019	-0.02022793	-0.038245712
3	F	2018	0.09628331	-0.021014120
4	F	2017	-0.03362025	0.059668697
5	F	2016	0.05564608	-0.105695640
6	F	Combined	0.02899225	-0.007624492

Hindcasting

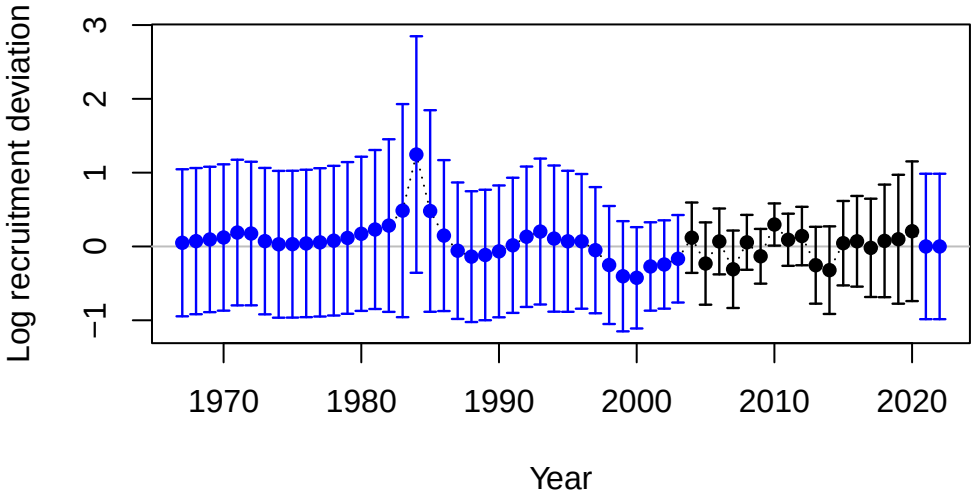
```
Plotting Hindcast Cross-Validation (one-step-ahead)

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 all 5 of 5  prediction residuals for Index FISHERY
```

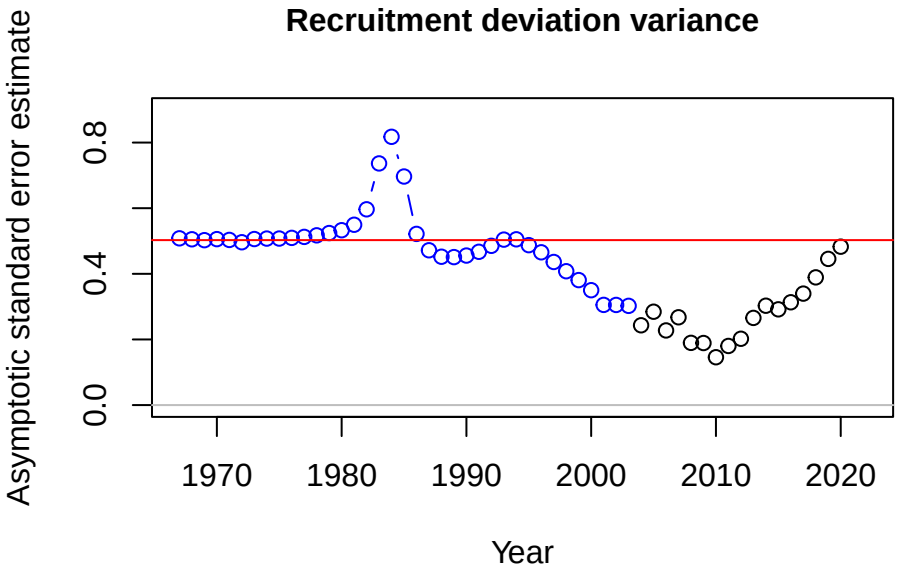
MASE stats by Index:

```
    Index Season      MASE    MAE.PR   MAE.base MASE.adj n.eval
1 FISHERY      1 0.9512055 0.0155686 0.01636723 0.155686      5
```



Recruitment Deviations

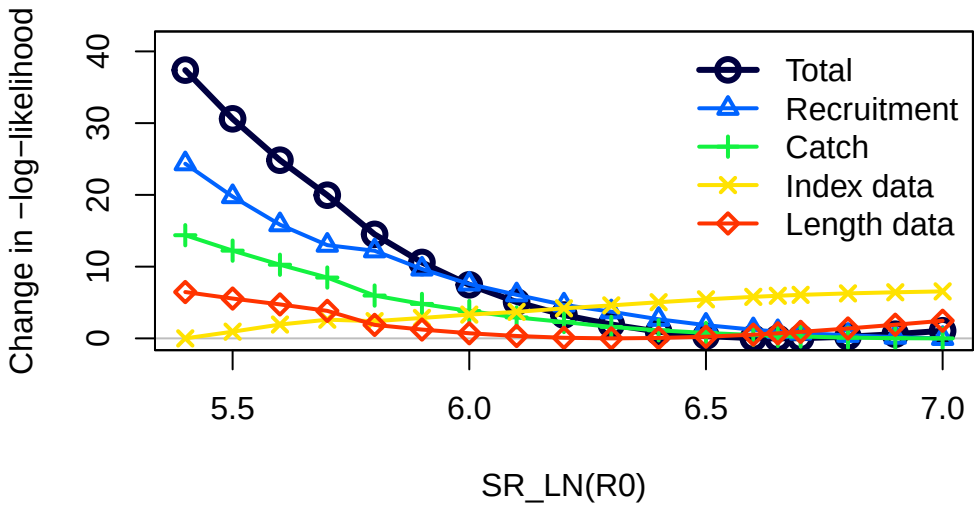


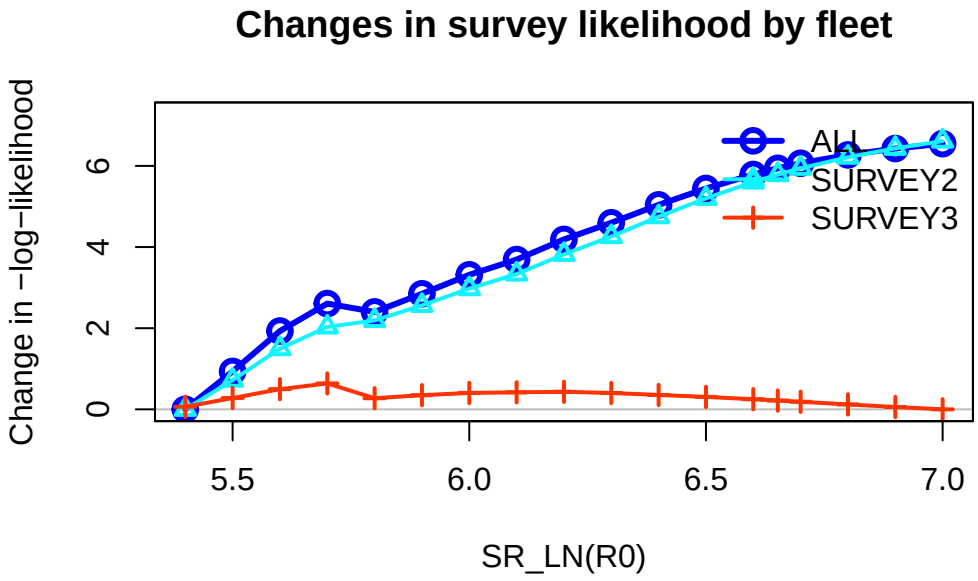


Likelihood Profile

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

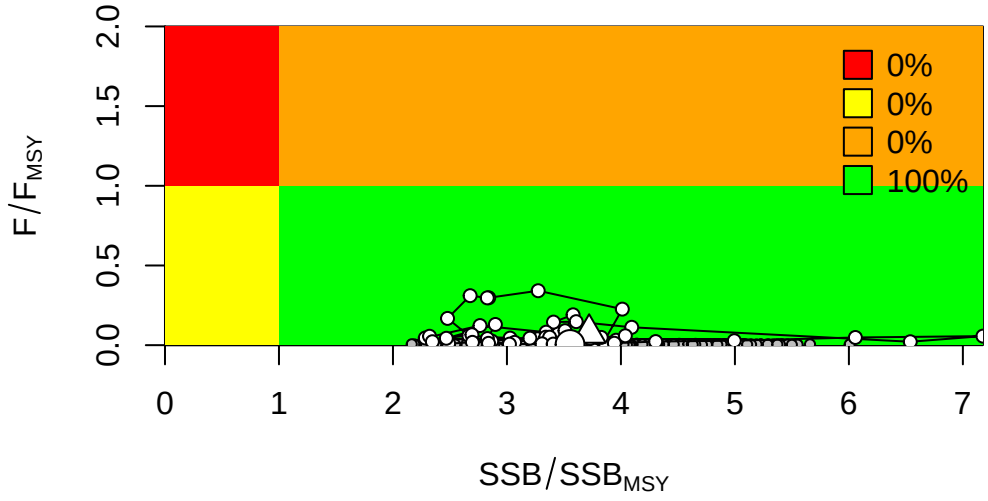
	frac_change	include	label
TOTAL	1.0000	TRUE	Total
Catch	0.3846	TRUE	Catch
Equil_catch	0.0045	FALSE	Equilibrium catch
Survey	0.1751	TRUE	Index data
Length_comp	0.1727	TRUE	Length data
Recruitment	0.6511	TRUE	Recruitment
InitEQ_Regime	0.0000	FALSE	Initital equilibrium recruitment
Forecast_Recruitment	0.0000	FALSE	Forecast recruitment
Parm_priors	0.0007	FALSE	Priors
Parm_softbounds	0.0000	FALSE	Soft bounds
Parm_devs	0.0000	FALSE	Parameter deviations
Crash_Pen	0.0000	FALSE	Crash penalty

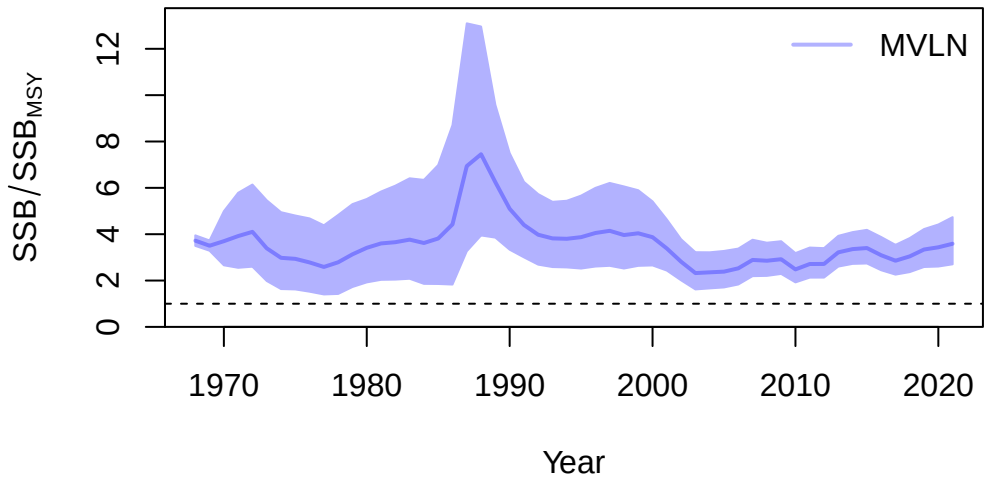


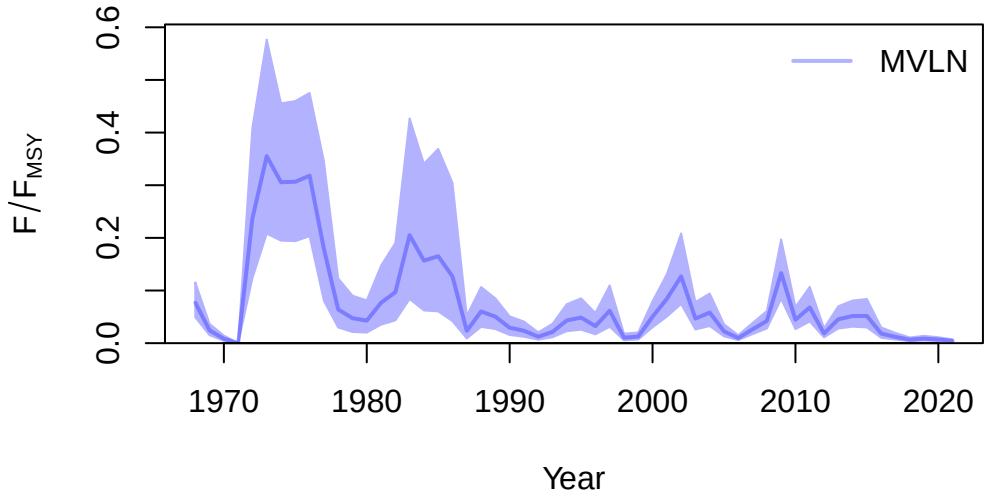


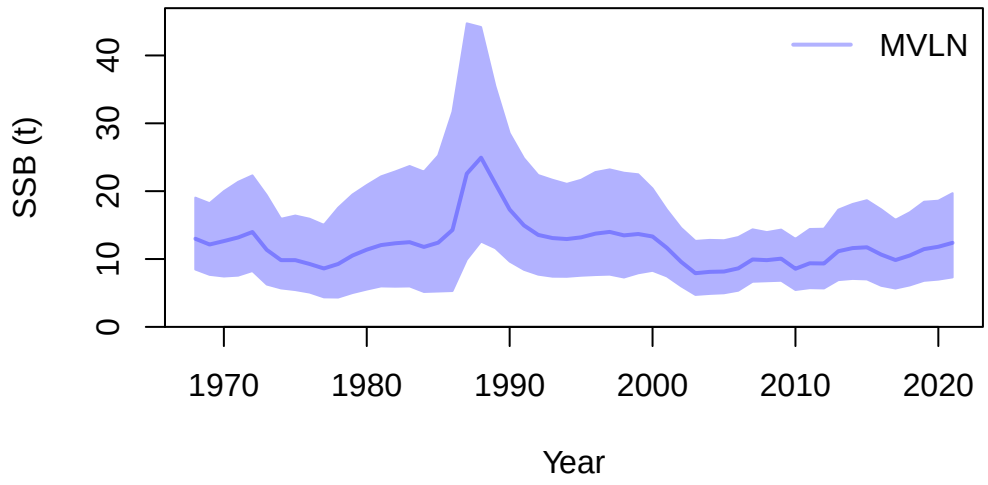
Management Quantities

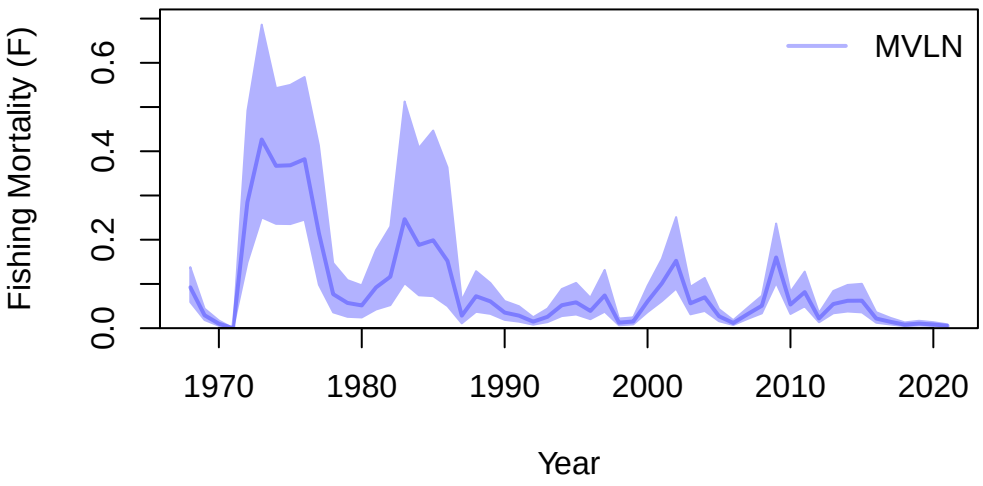
```
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F
```


0%
0%
0%
100%
F/F_MSY
SSB/SSB_MSY
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4
5
6
7


MVLN
SSB/SSB_MSY
Year
0
2
4
6
8
12
1970
1980
1990
2000
2010
2020


MVLN
F/F_MSY
0.0
0.2
0.4
0.6
1970
1980
1990
2000
2010
2020
Year


MVLN
SSB (t)
0
10
20
30
40
1970
1980
1990
2000
2010
2020
Year

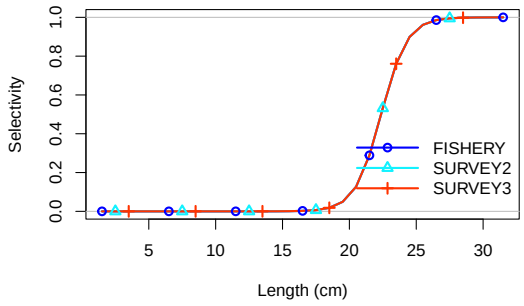


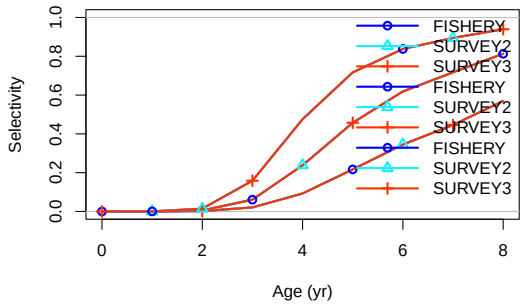

```
null device
          1
```

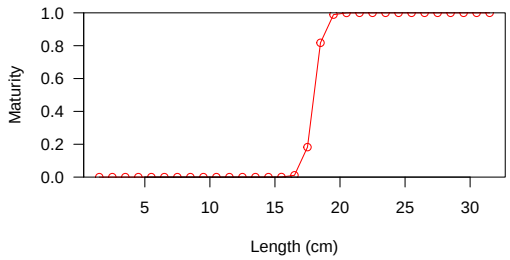
Jitter

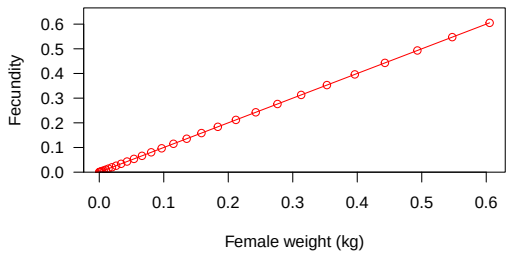
```
[1] "No jitter runs were found."
```

Selectivity and Maturity




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


Maturity
0.0
0.2
0.4
0.6
0.8
1.0
5
10
15
20
25
30
Length (cm)


Fecundity
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Female weight (kg)