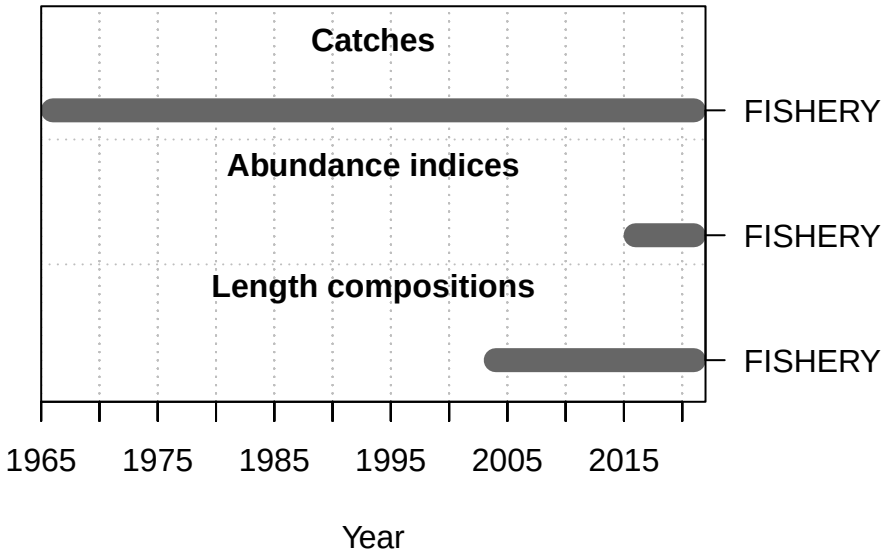
American Samoa Model Checks

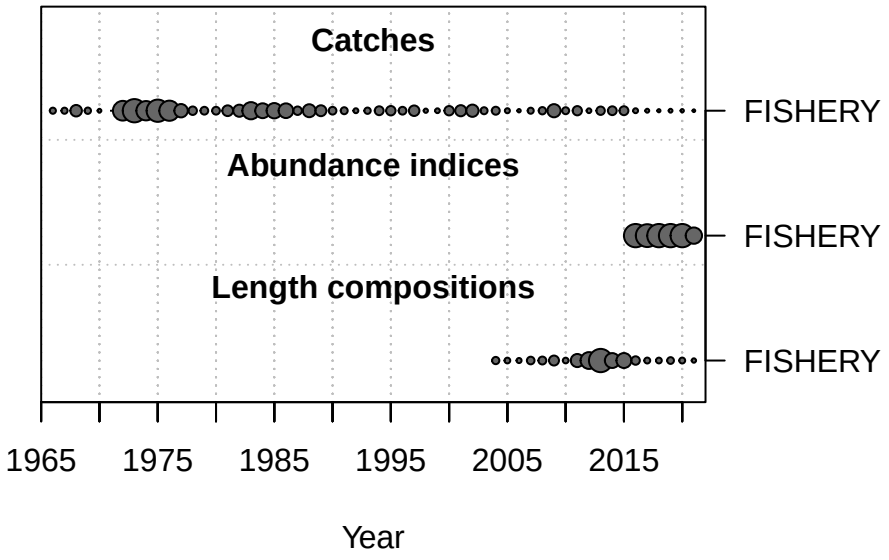
2022-09-22

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

Model Output

Input Data





Convergence Check

```
  Converged     MaxGrad
1      TRUE 4.68713e-05
```

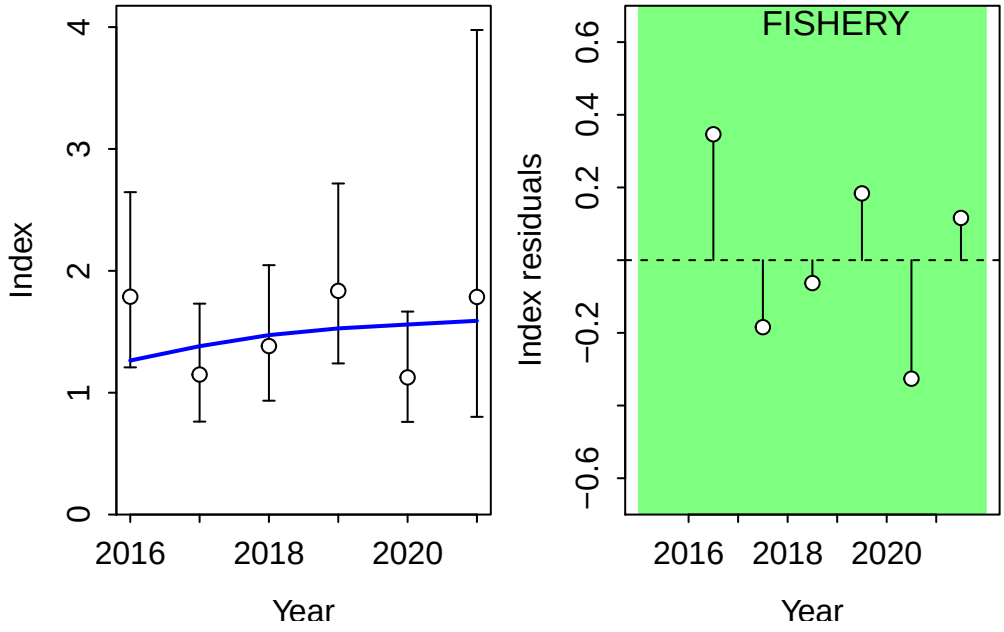
```
[1] "1 NOTE:  Max data length bin: 28  < max pop len bins: 31; so will accumulate larger pop
[2] "2 parameter init value is greater than parameter max 14.1 > 10 for parm: 2 ; search for
[3] "3 warning: poor convergence in Fmsy, final dy/dy2= -0.0118966"
[4] "4 Forecast F capped by max possible F from control file: 2.9"
[5] "5 Forecast F capped by max possible F from control file: 2.9"
[6] "N warnings: 5"
```

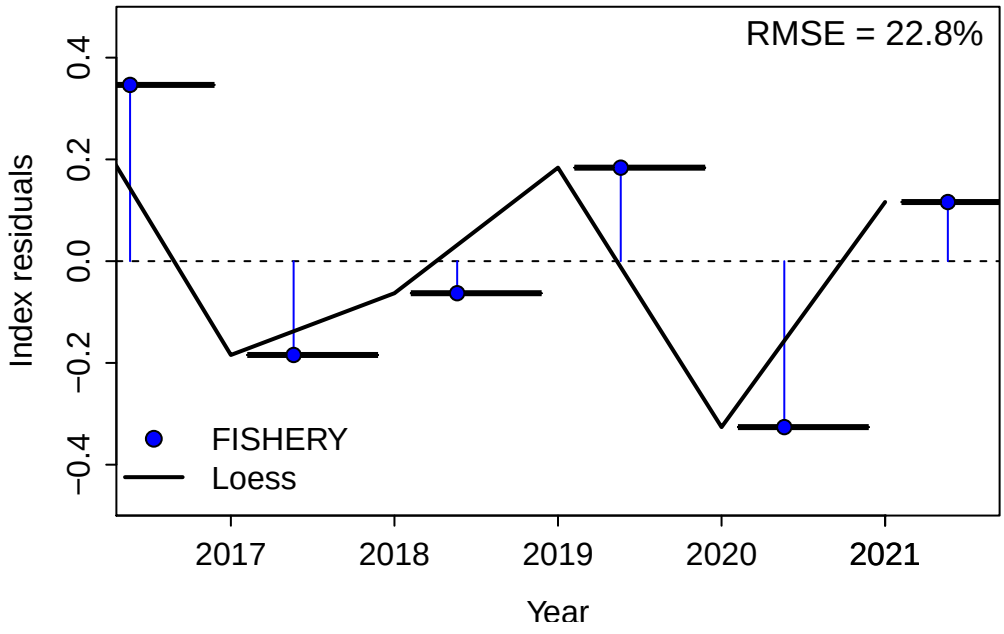
Fit to Model

CPUE

```
Residual Runs Test (/w plot) stats by Index:
```

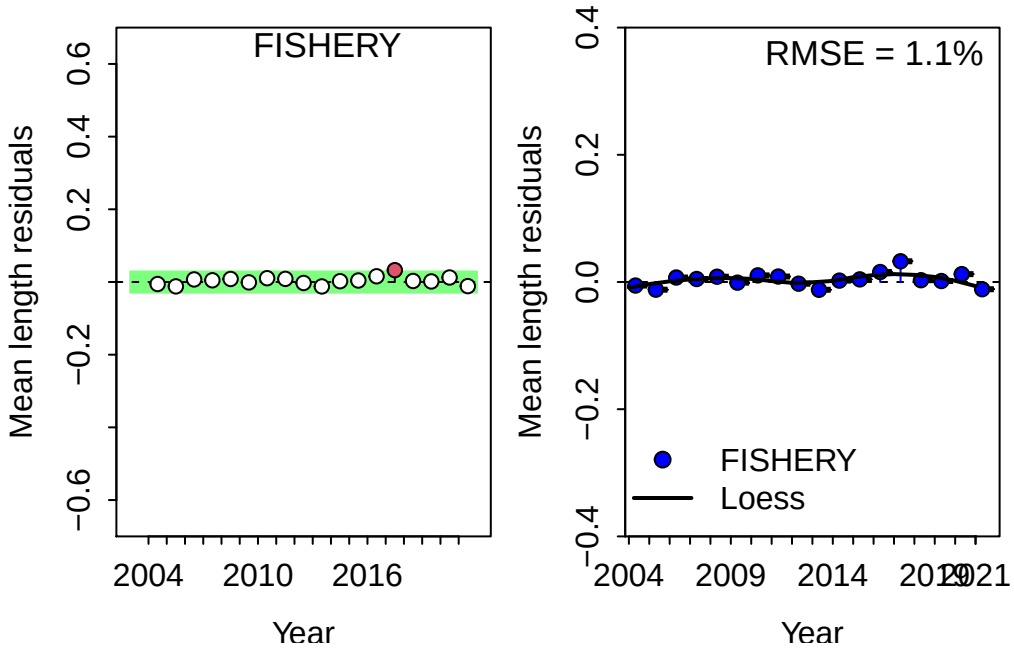
```
RMSE stats by Index:
```


Index
0
1
2
3
4
2016
2018
2020
Year
Index residuals
−0.6
−0.2
0.2
0.4
0.6
FISHERY
2016
2018
2020
Year

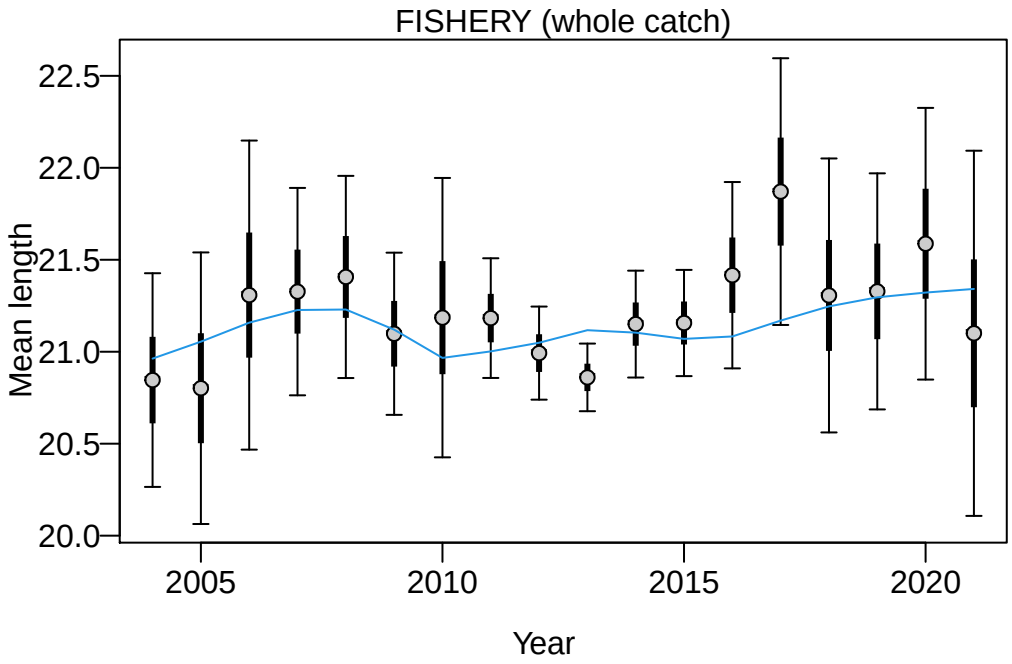

RMSE = 22.8%
Index residuals
−0.4
−0.2
0.0
0.2
0.4
FISHERY
Loess
2017
2018
2019
2020
2021
Year

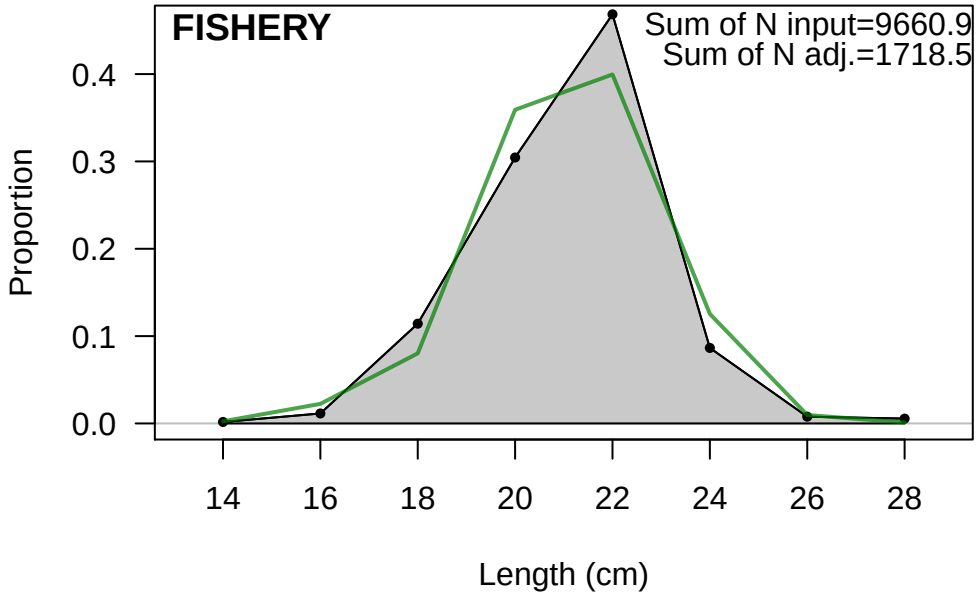
Length Comp

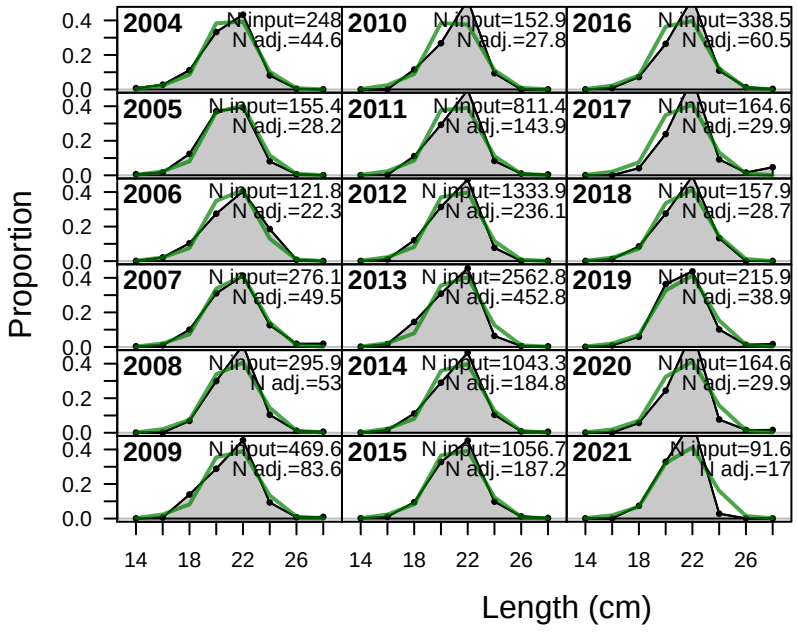
```
Residual Runs Test (/w plot) stats by Mean length:

    Index runs.p   test   sigma3.lo  sigma3.hi type
1 FISHERY  0.135 Passed -0.02903577 0.02903577  len

RMSE stats by Index:

# A tibble: 2 x 3
  Fleet    RMSE.perc  Nobs
  <chr>        <dbl> <int>
1 FISHERY        1.1    18
2 Combined       1.1    18
```



Retrospective and Hindcasting

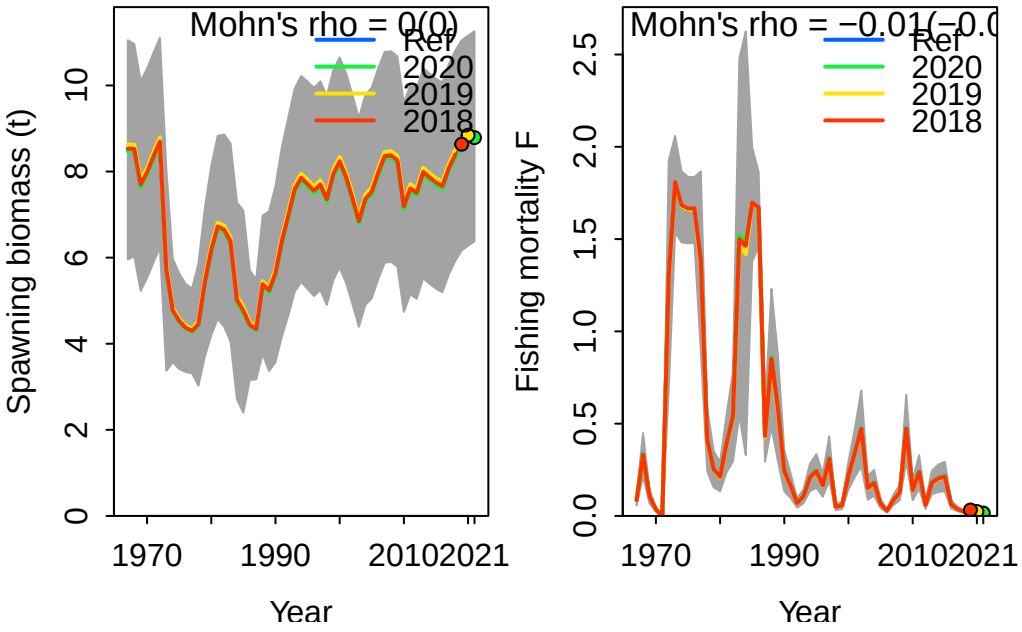

FISHERY (whole catch)
Mean length
22.5
22.0
21.5
21.0
20.5
20.0
2005
2010
2015
2020
Year


FISHERY
Sum of N input=9660.9
Sum of N adj.=1718.5
Proportion
0.4
0.3
0.2
0.1
0.0
14
16
18
20
22
24
26
28
Length (cm)



Retrospective

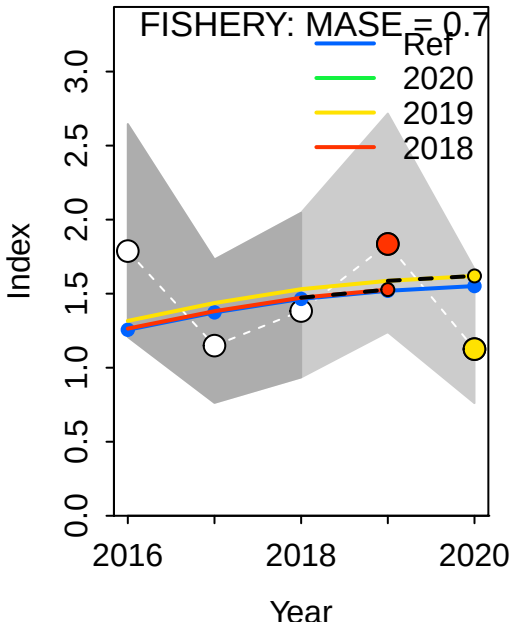
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel          Rho  ForecastRho
1    F     2020  0.003289798  0.003219886
2    F     2019 -0.016076971 -0.015766359
3    F     2018 -0.004052857 -0.003919926
4    F Combined -0.005613343 -0.005488799
```

Hindcasting

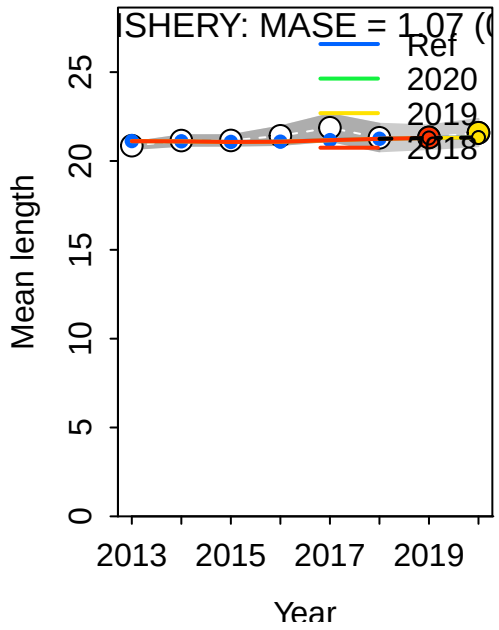
```
Plotting Hindcast Cross-Validation (one-step-ahead)

 Computing MASE with only 2 of 3  prediction residuals for Index FISHERY

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




```
MASE stats by Index:
Plotting Hindcast Cross-Validation (one-step-ahead)

 Computing MASE with only 2 of 3  prediction residuals for Index FISHERY
```

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

```
MASE stats by Index:
```



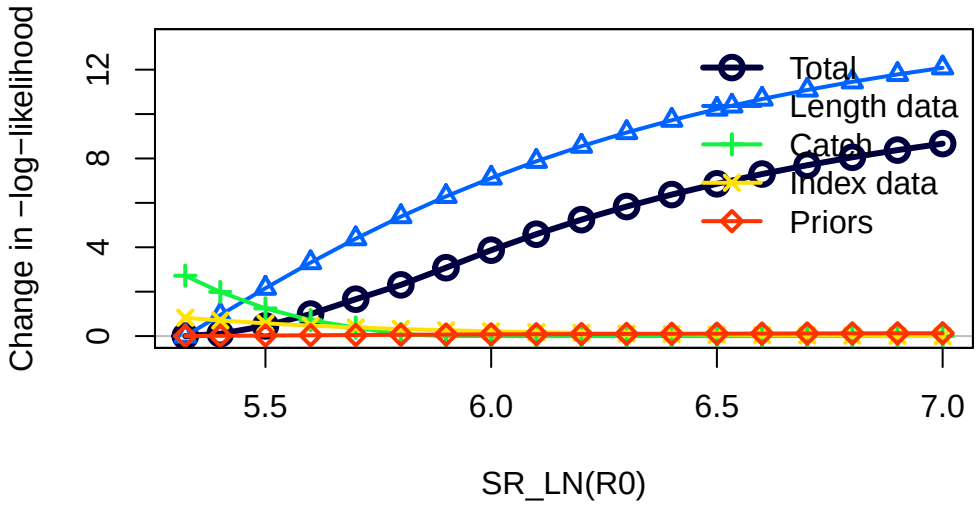
Recruitment Deviations

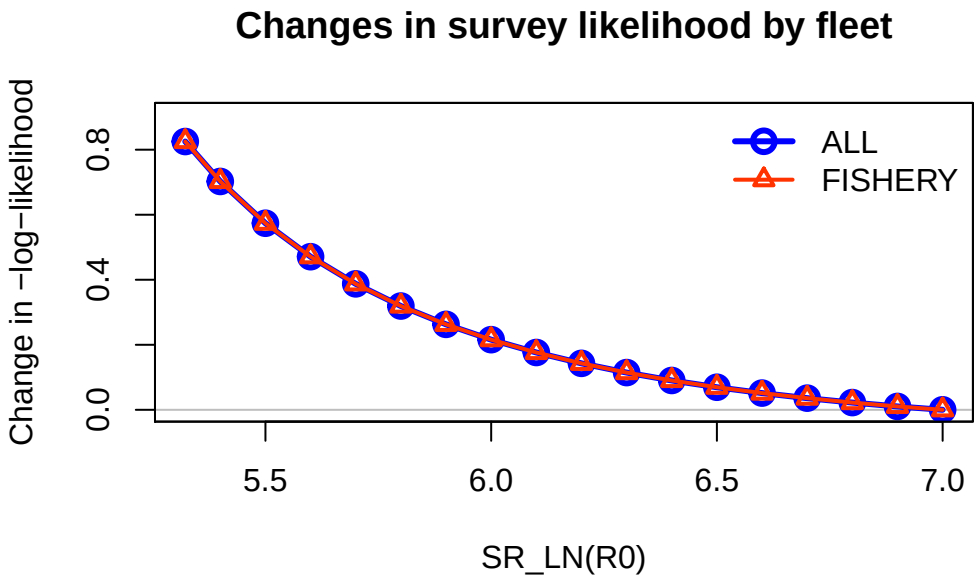
Likelihood Profile

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

	frac_change	include	label
TOTAL	1.0000	TRUE	Total
Catch	0.3136	TRUE	Catch
Equil_catch	0.0000	FALSE	Equilibrium catch
Survey	0.0952	TRUE	Index data
Length_comp	1.3939	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	0.0148	TRUE	Priors

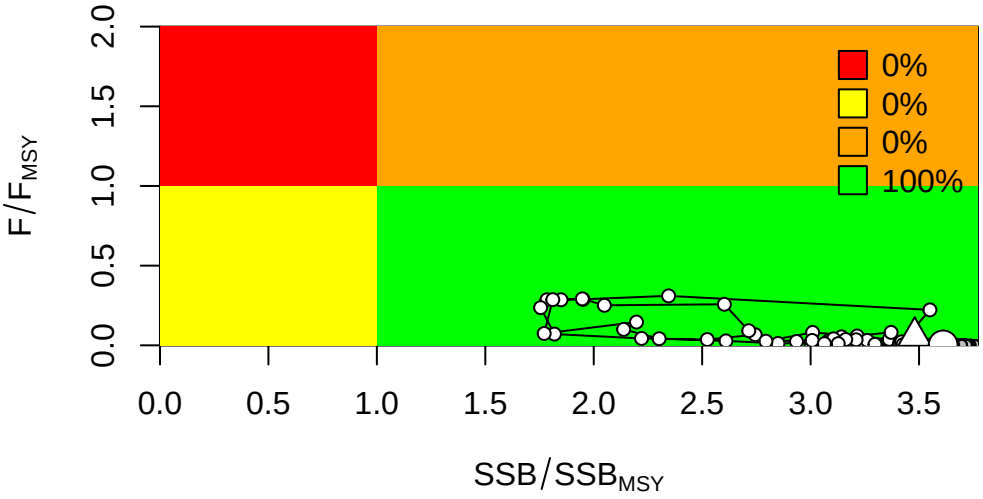
```
Parm_softbounds          0.0001   FALSE                    Soft bounds
Parm_devs                0.0000   FALSE          Parameter deviations
Crash_Pen                0.0000   FALSE                  Crash penalty
```

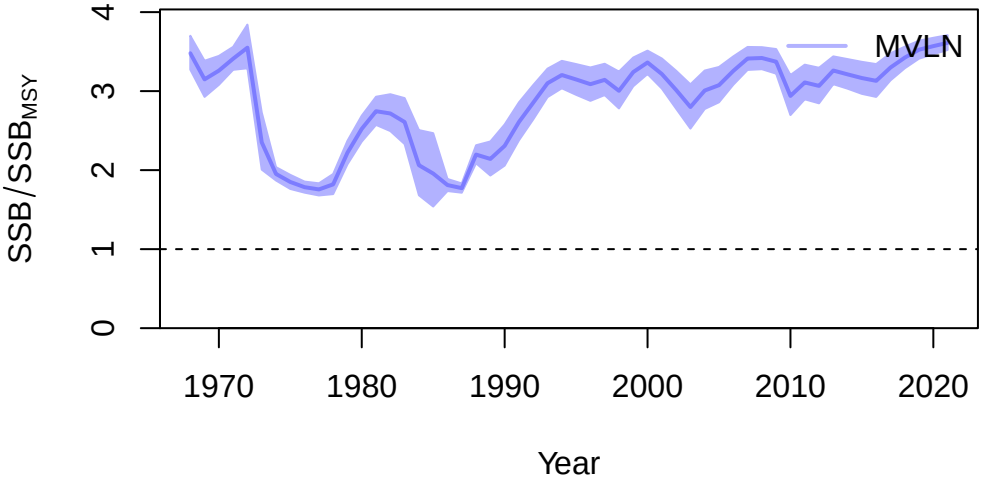


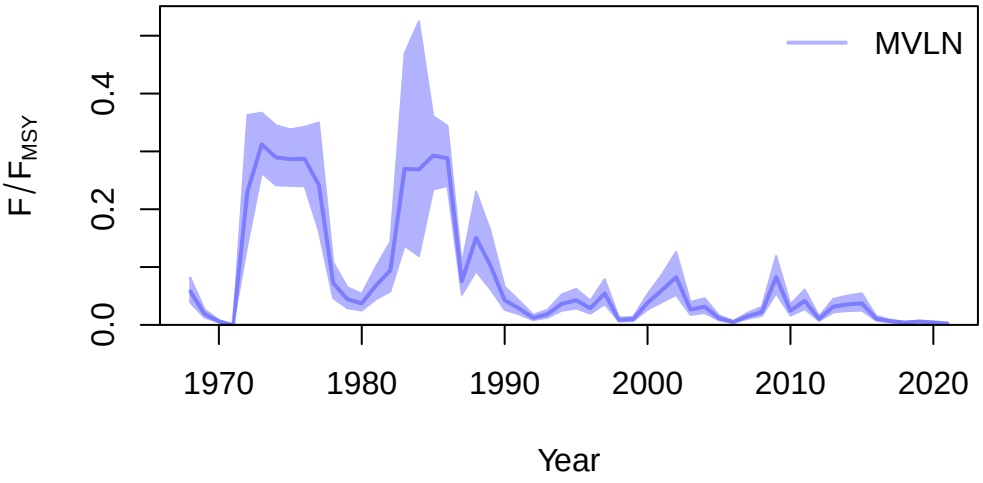


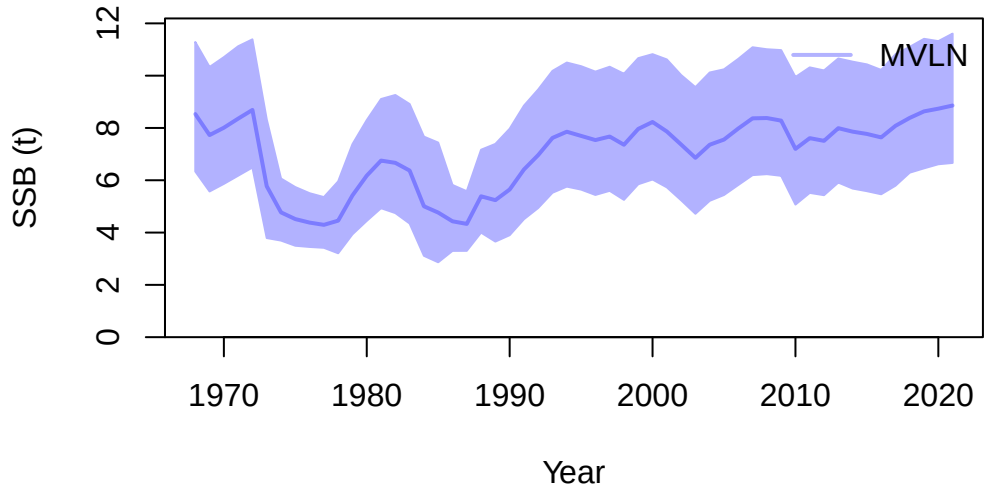
Management Quantities

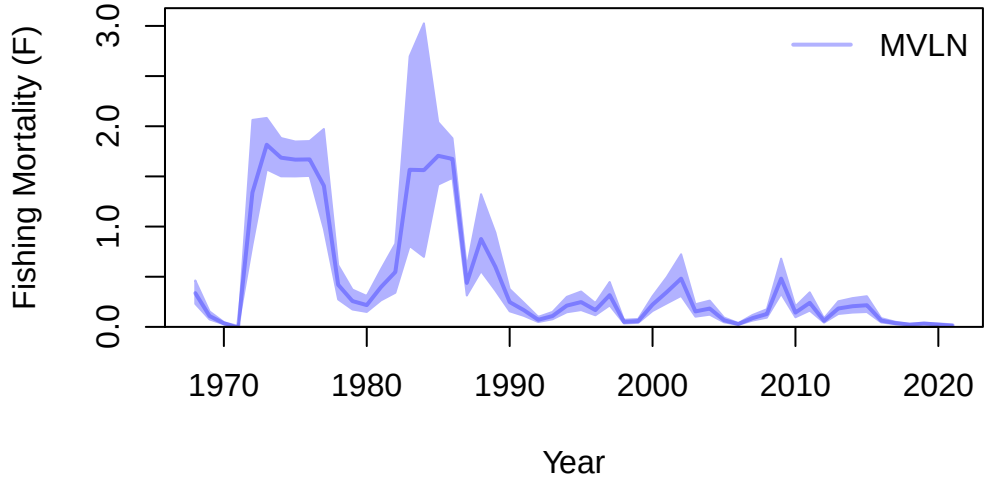
`starter.sso with Bratio: SSB/SSBMSY and F: _abs_F`




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

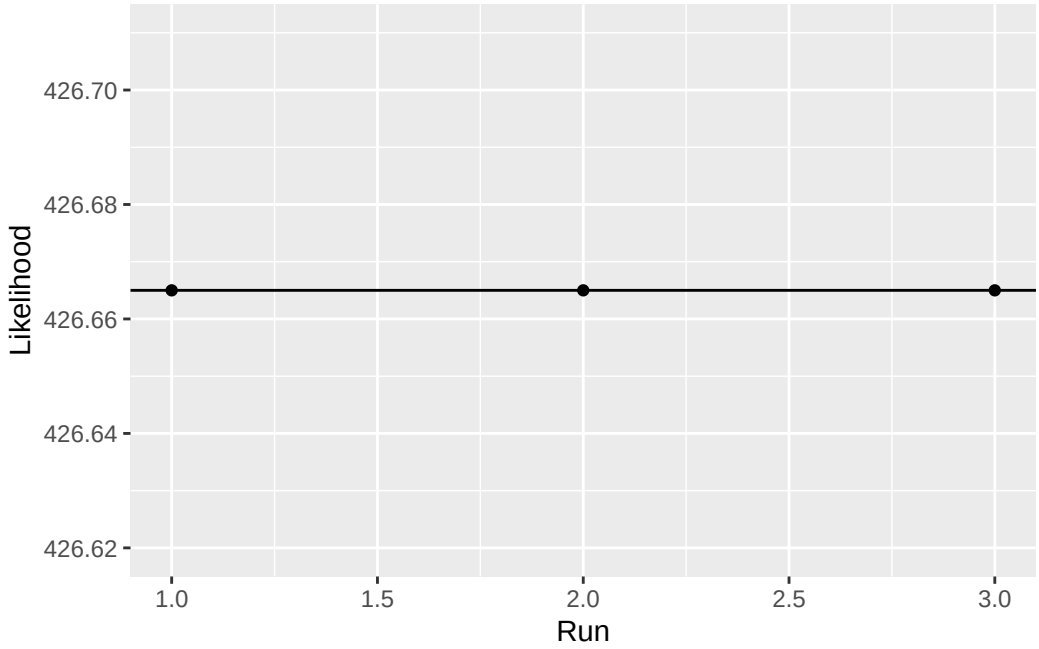

F/F$_{MSY}$
0.0
0.2
0.4
1970
1980
1990
2000
2010
2020
Year
MVLN

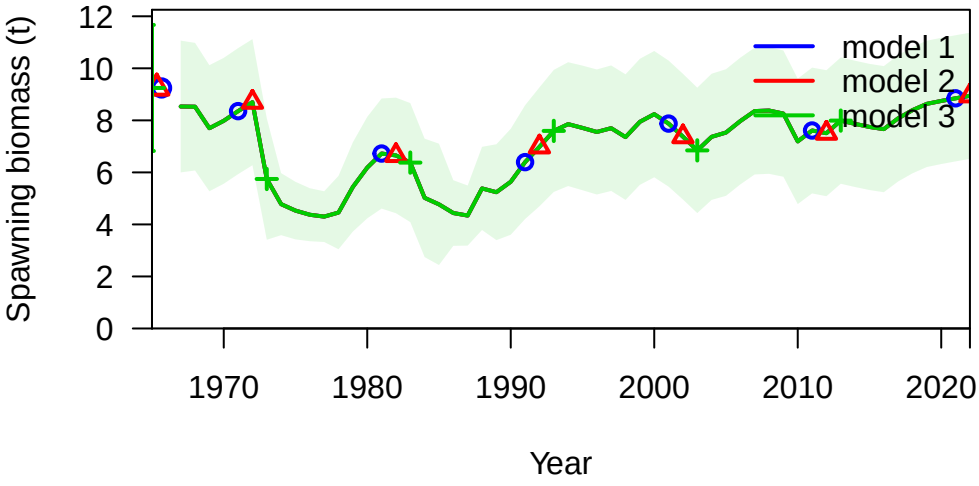


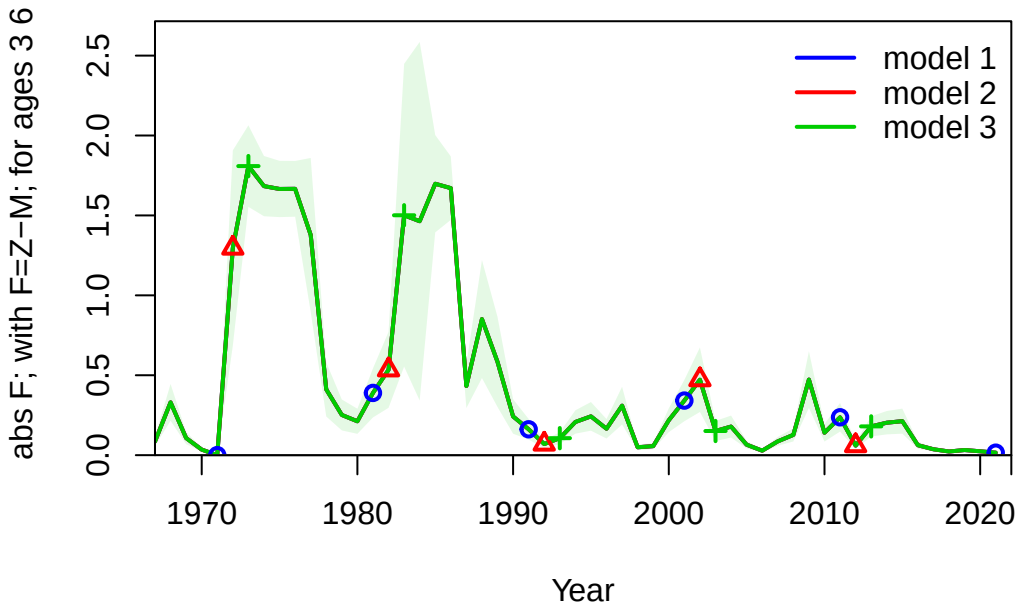


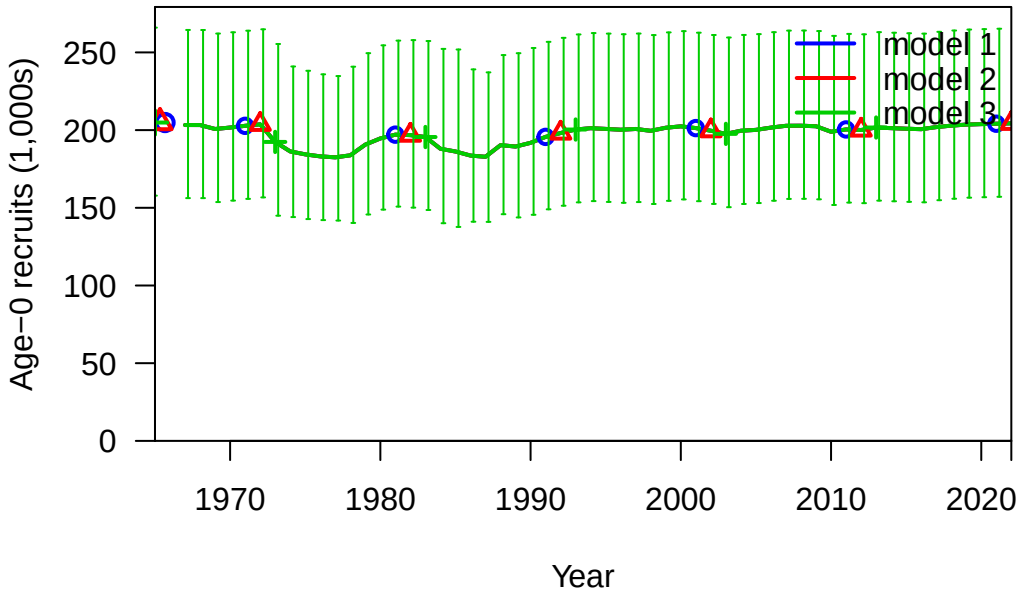

```
null device
          1
```

Jitter


426.70
426.68
426.66
426.64
426.62
Likelihood
1.0
1.5
2.0
2.5
3.0
Run


12
10
8
6
4
2
0
Spawning biomass (t)
1970
1980
1990
2000
2010
2020
Year
model 1
model 2
model 3


abs F; with F=Z−M; for ages 3 6
0.0
0.5
1.0
1.5
2.0
2.5
1970
1980
1990
2000
2010
2020
Year
model 1
model 2
model 3


Age−0 recruits (1,000s)
0
50
100
150
200
250
1970
1980
1990
2000
2010
2020
Year
model 1
model 2
model 3