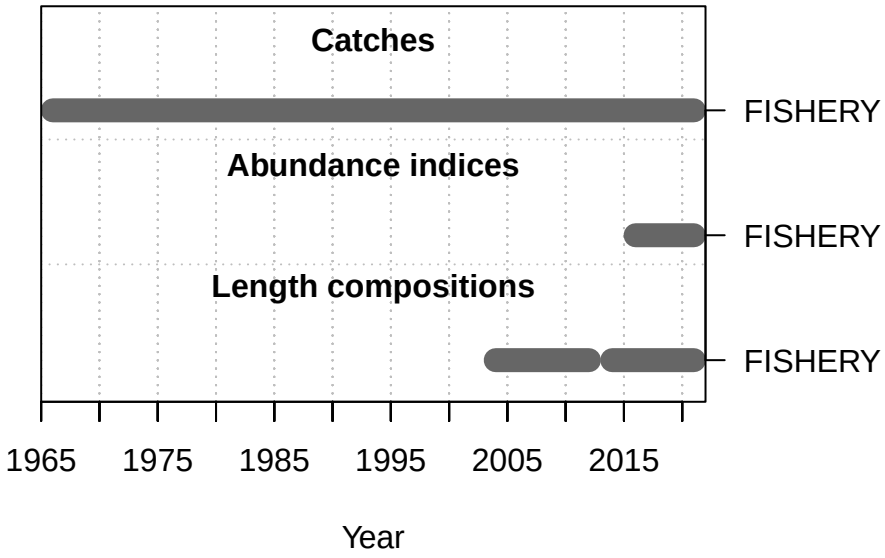
American Samoa Model Checks

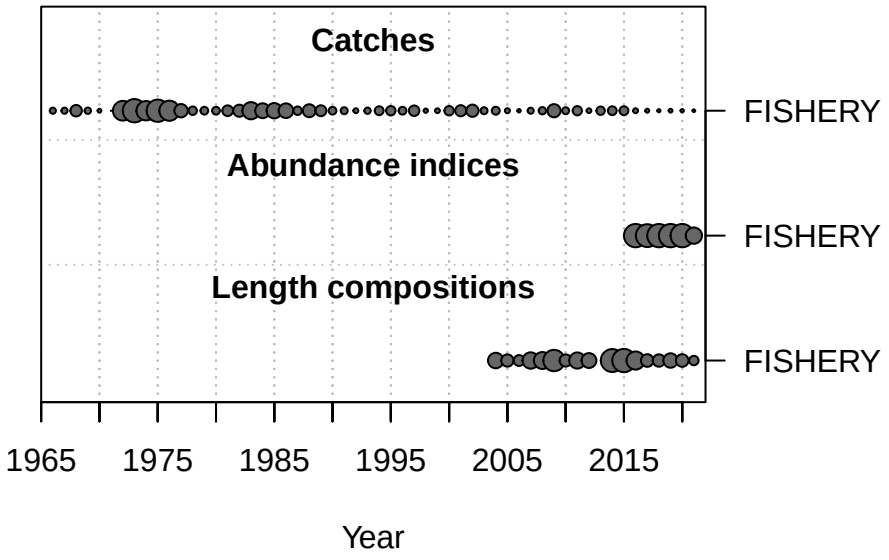
2022-08-30

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

Model Output

Input Data





Convergence Check

```
  Converged    MaxGrad
1      TRUE 5.2726e-06
```

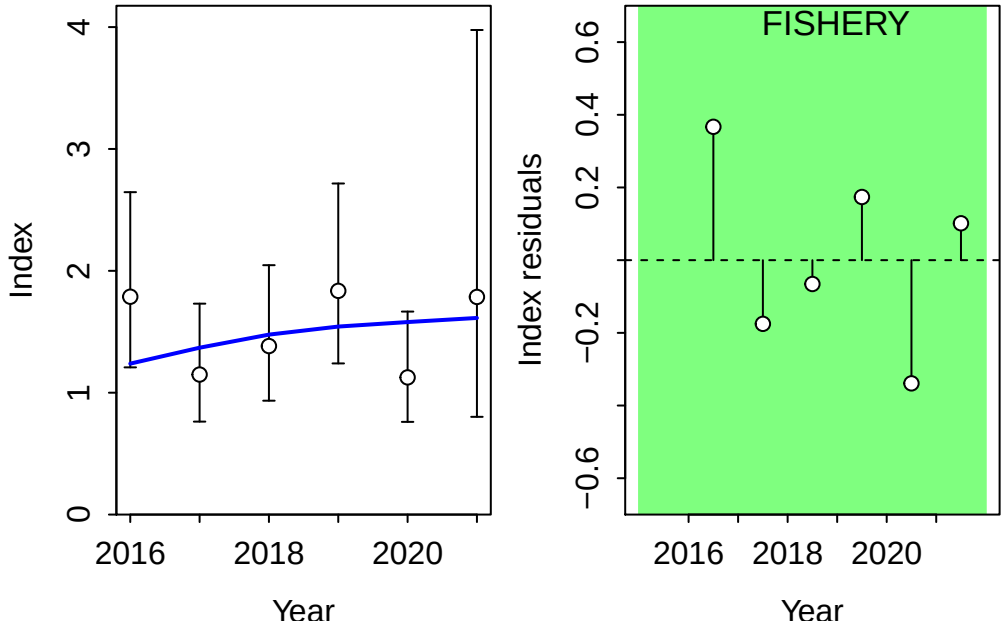
```
[1] "1 NOTE:  Max data length bin: 28  < max pop len bins: 31; so will accumulate larger pop
[2] "2 warning: poor convergence in Fspr search 0.4 0.429681"
[3] "3 warning: Fmult = 40 cannot get high enough to achieve low SPR target: 0.4; SPR achieve
[4] "4 warning: poor convergence in Btarget search 3.42811 4.09193"
[5] "5 warning: poor convergence in Fmsy, final dy/dy2= -0.0199272"
[6] "6 Forecast F capped by max possible F from control file: 2.9"
[7] "7 Forecast F capped by max possible F from control file: 2.9"
[8] "N warnings: 7"
```

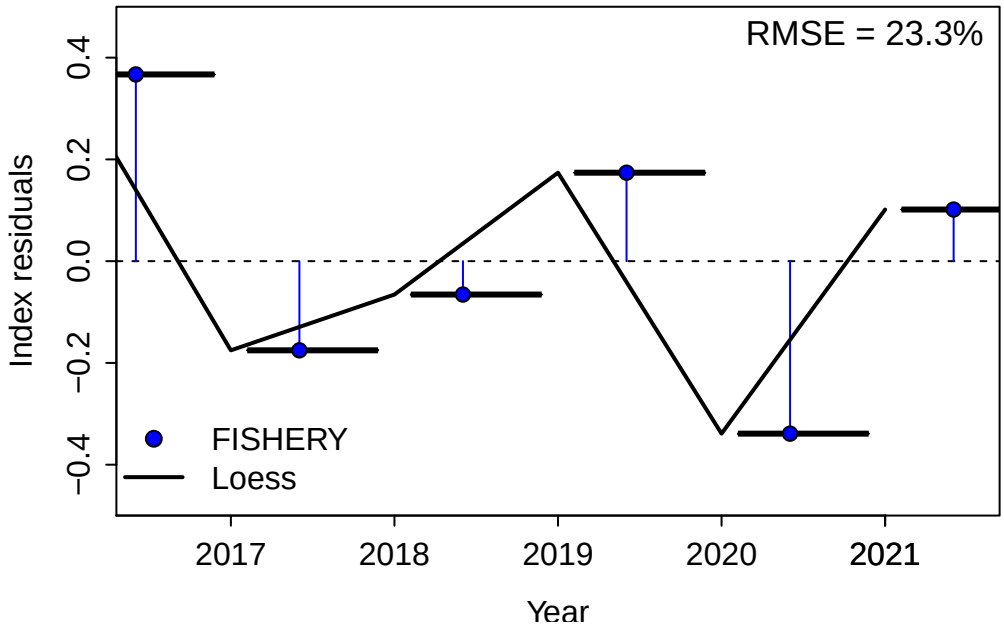
Fit to Model

CPUE

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

```
RMSE stats by Index:
```

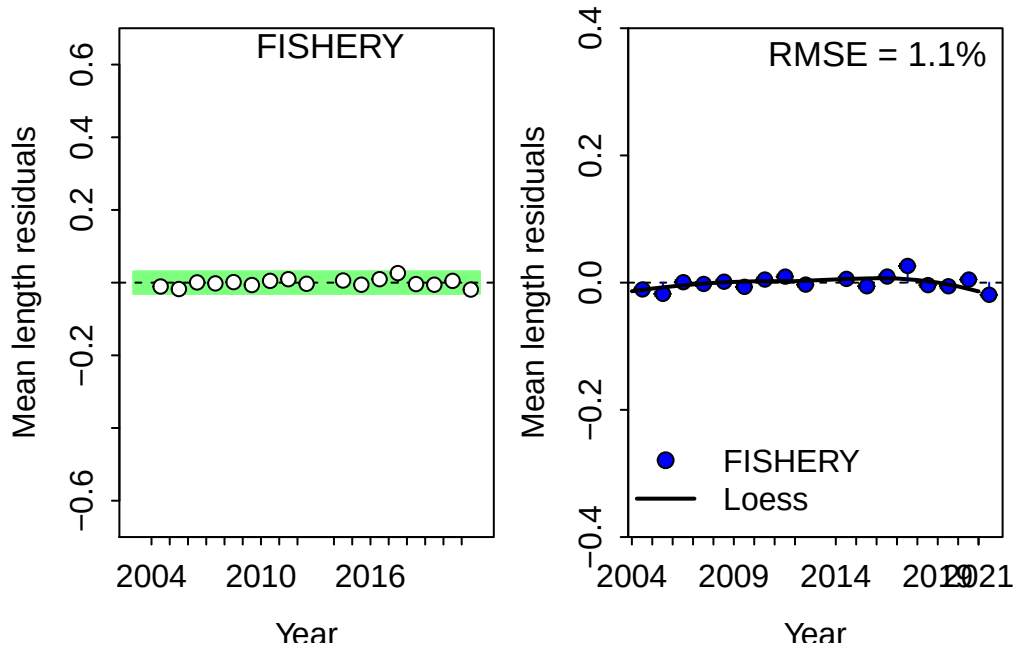

Index
0
1
2
3
4
2016
2018
2020
Year
Index residuals
−0.6
−0.2
0.2
0.4
0.6
FISHERY
2016
2018
2020
Year


RMSE = 23.3%
Index residuals
−0.4
−0.2
0.0
0.2
0.4
FISHERY
Loess
2017
2018
2019
2020
2021
Year

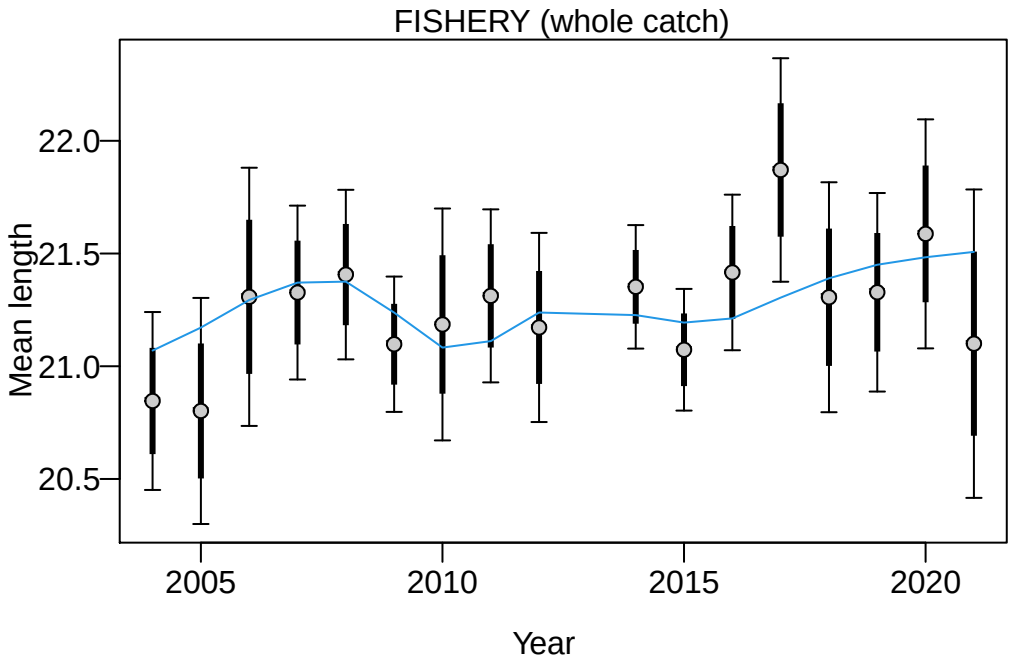
Length Comp

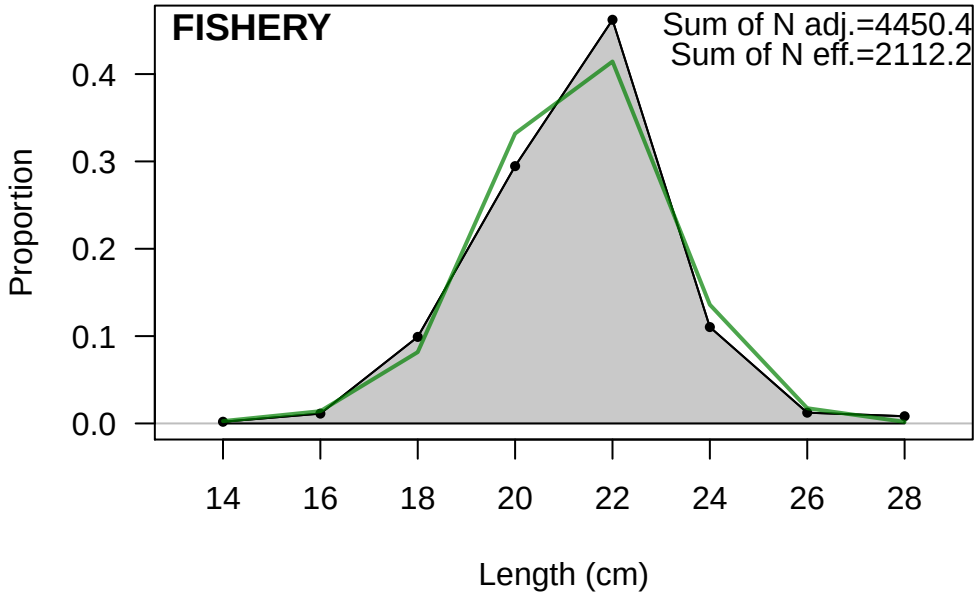
#Factor	Fleet	New_Var_adj	Type	Name
4	1	0.356469	len	FISHERY

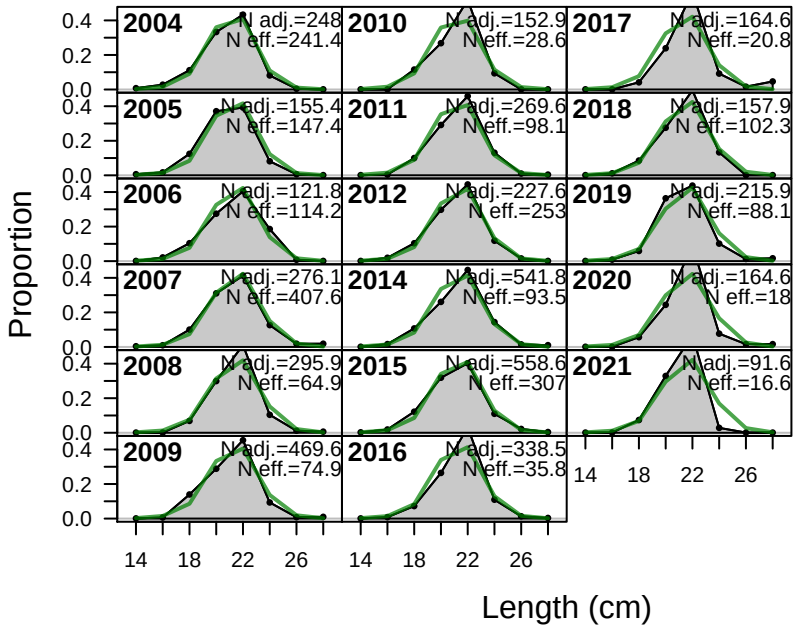
```
Residual Runs Test (/w plot) stats by Mean length:

    Index runs.p   test   sigma3.lo  sigma3.hi type
1 FISHERY  0.962 Passed -0.03111467 0.03111467  len

RMSE stats by Index:

# A tibble: 2 x 3
  Fleet    RMSE.perc  Nobs
  <chr>        <dbl> <int>
1 FISHERY        1.1    17
2 Combined       1.1    17
```



Retrospective and Hindcasting

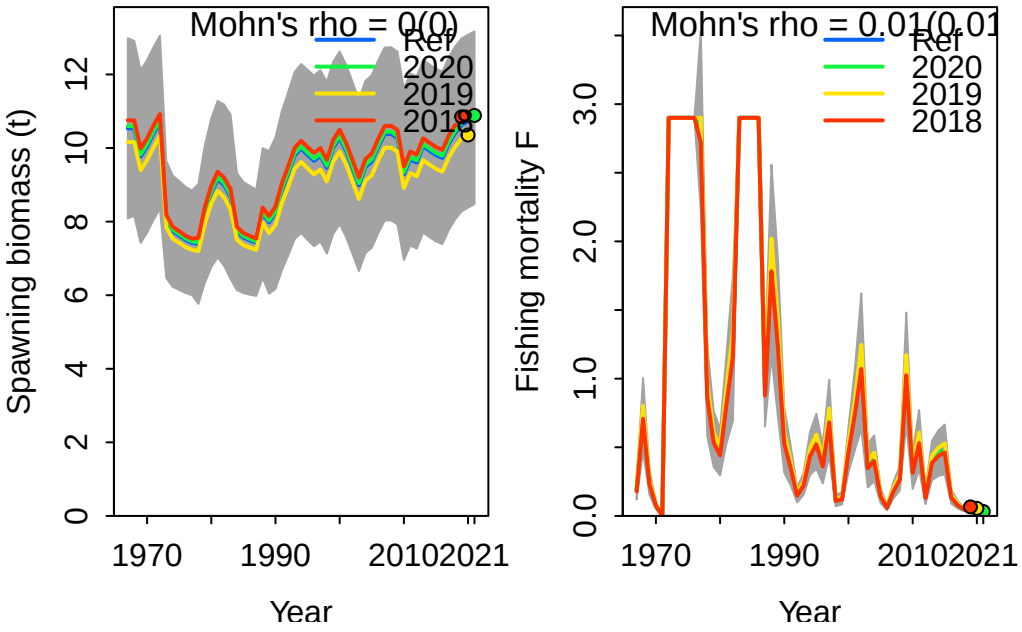

FISHERY (whole catch)
Mean length
22.0
21.5
21.0
20.5
2005
2010
2015
2020
Year


FISHERY
Sum of N adj.=4450.4
Sum of N eff.=2112.2
Proportion
0.4
0.3
0.2
0.1
0.0
14
16
18
20
22
24
26
28
Length (cm)



Retrospective

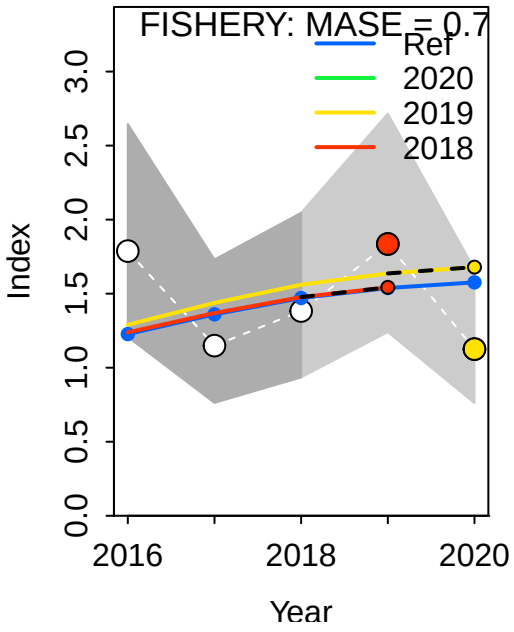
`Mohn's Rho stats, including one step ahead forecasts:`



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

  type     peel          Rho ForecastRho
1    F     2020 -0.002573696 -0.00245616
2    F     2019  0.075687247  0.07421995
3    F     2018 -0.038265730 -0.03701778
4    F Combined  0.011615940  0.01158200
```

Hindcasting

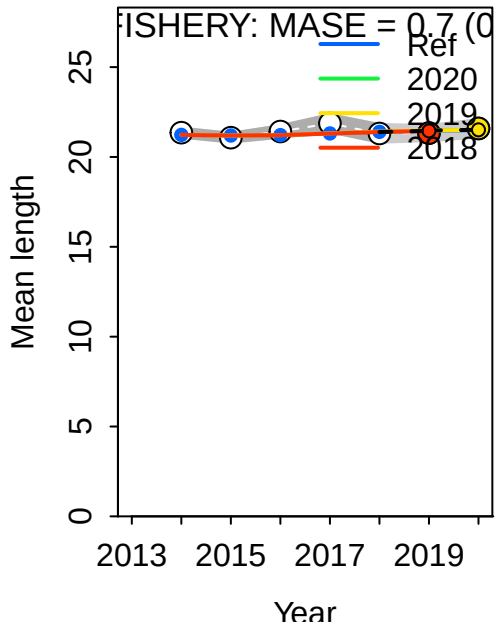
```
Plotting Hindcast Cross-Validation (one-step-ahead)

 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:



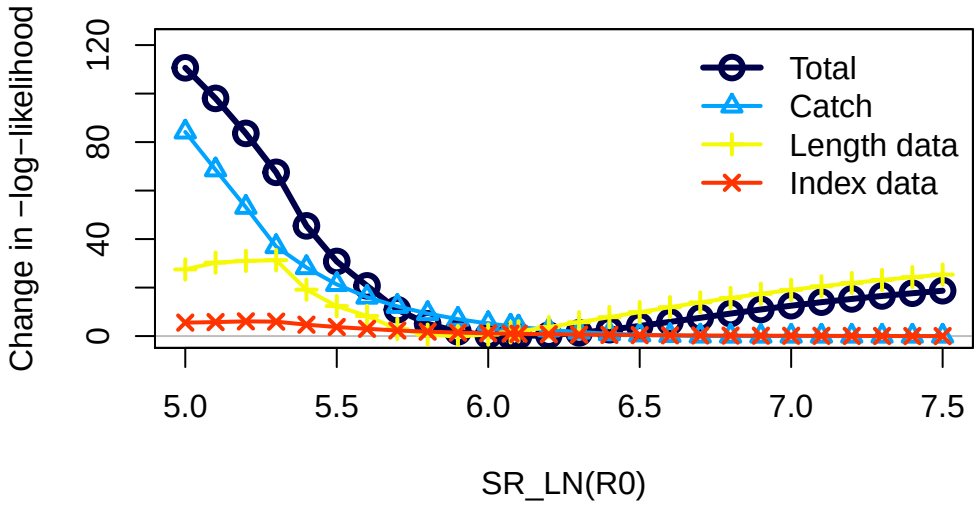
Recruitment Deviations

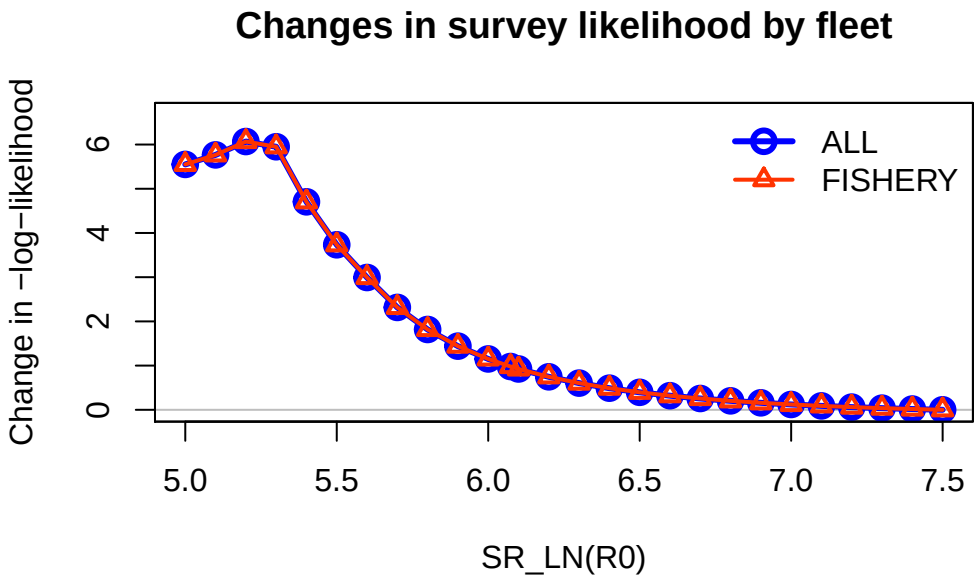
Likelihood Profile

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

	frac_change	include	label
TOTAL	1.0000	TRUE	Total
Catch	0.7609	TRUE	Catch
Equil_catch	0.0005	FALSE	Equilibrium catch
Survey	0.0549	TRUE	Index data
Length_comp	0.2829	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	0.0000	FALSE	Priors

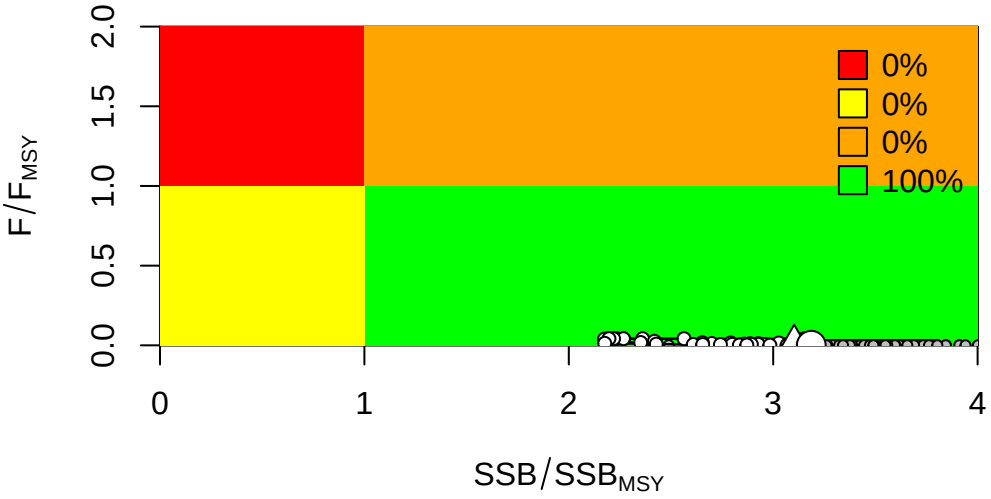
```
Parm_softbounds          0.0000   FALSE                  Soft bounds
Parm_devs                0.0000   FALSE        Parameter deviations
Crash_Pen                0.0000   FALSE                Crash penalty
```

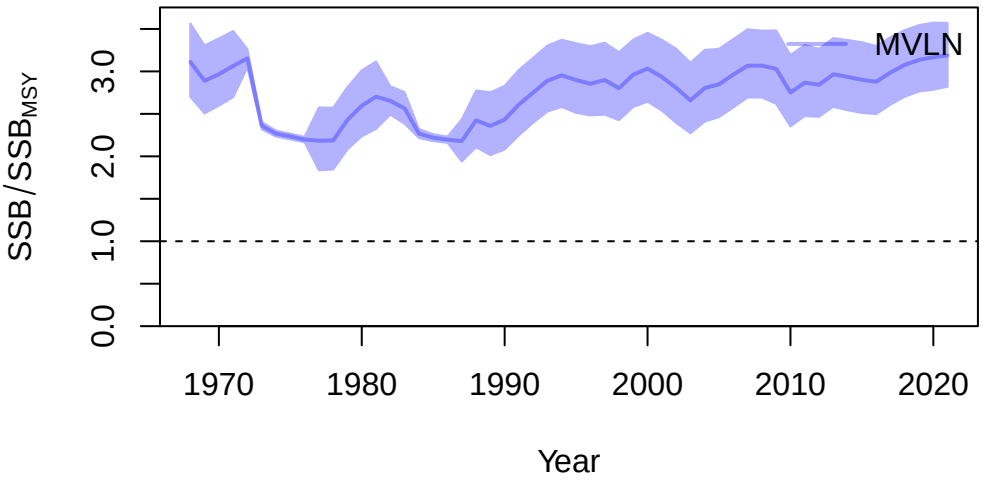


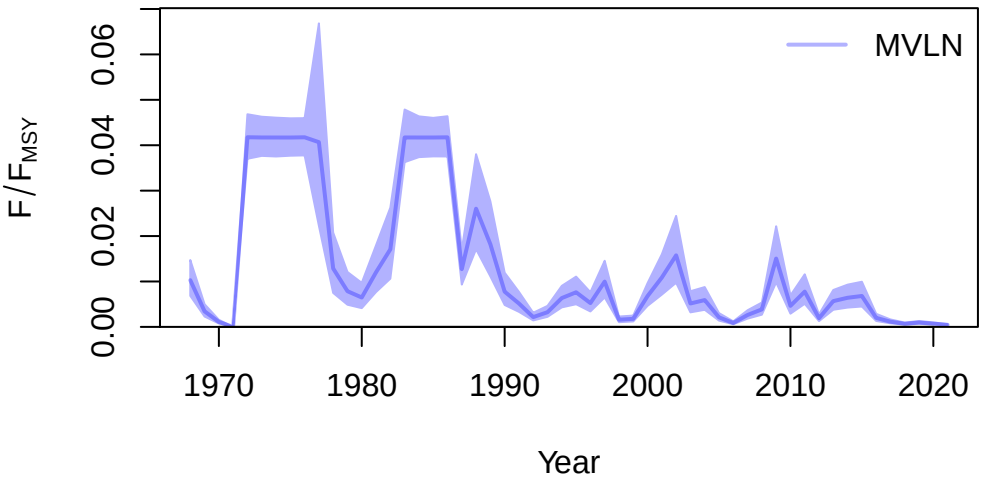


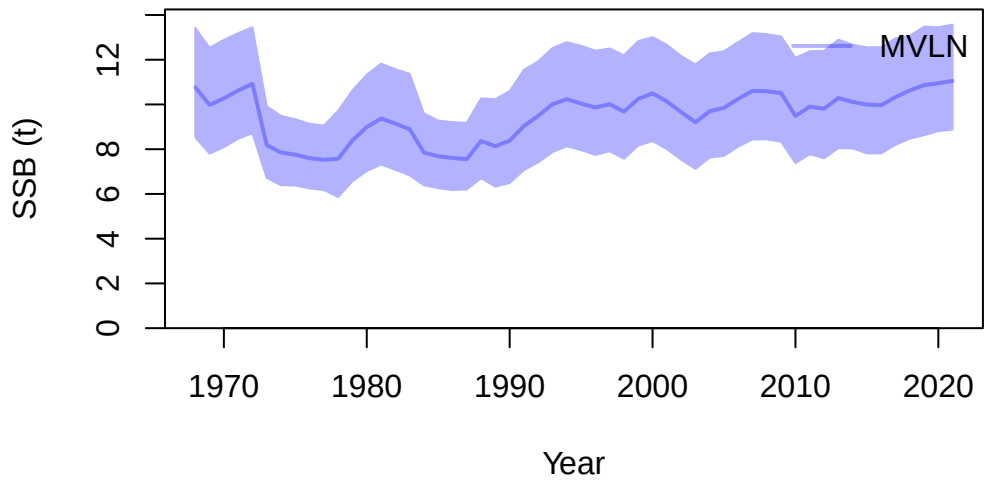
Management Quantities

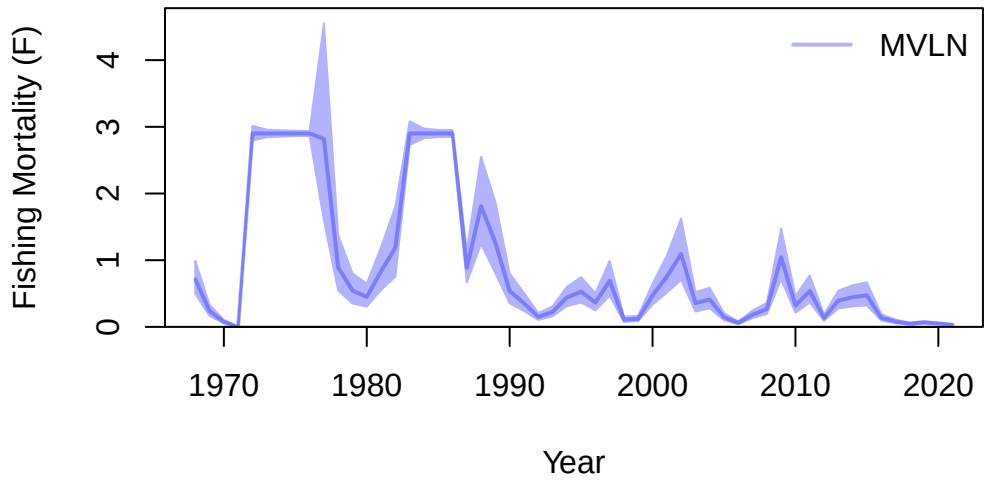
starter.sso with Bratio: SSB/SSBMSY and F: _abs_F




SSB/SSB$_{MSY}$
0.0
1.0
2.0
3.0
MVLN
1970
1980
1990
2000
2010
2020
Year

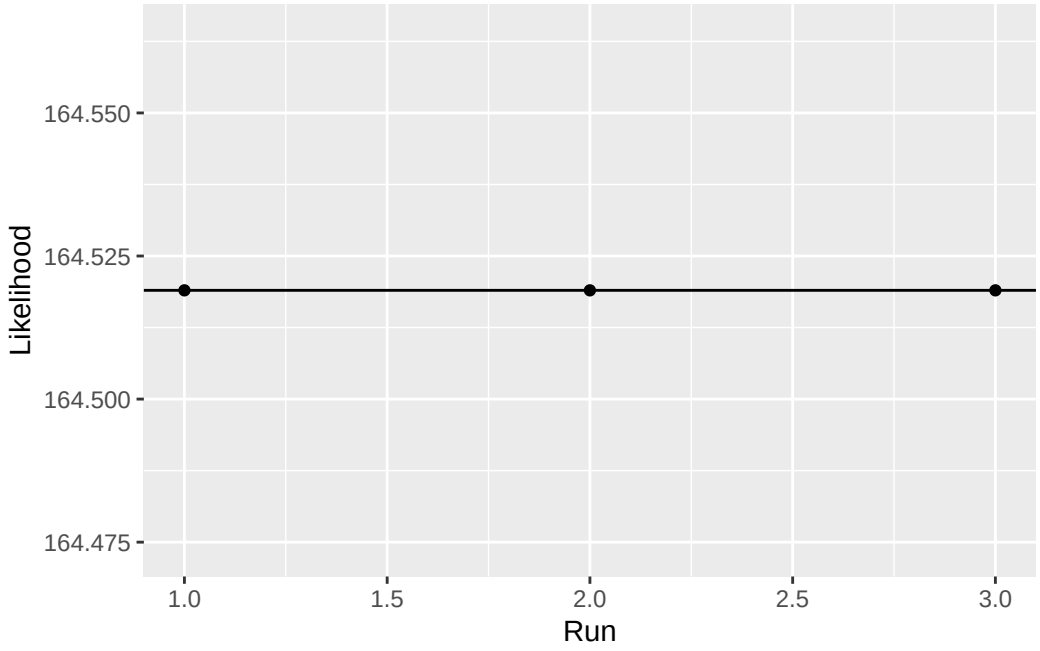

F/F$_{MSY}$
0.00
0.02
0.04
0.06
MVLN
1970
1980
1990
2000
2010
2020
Year

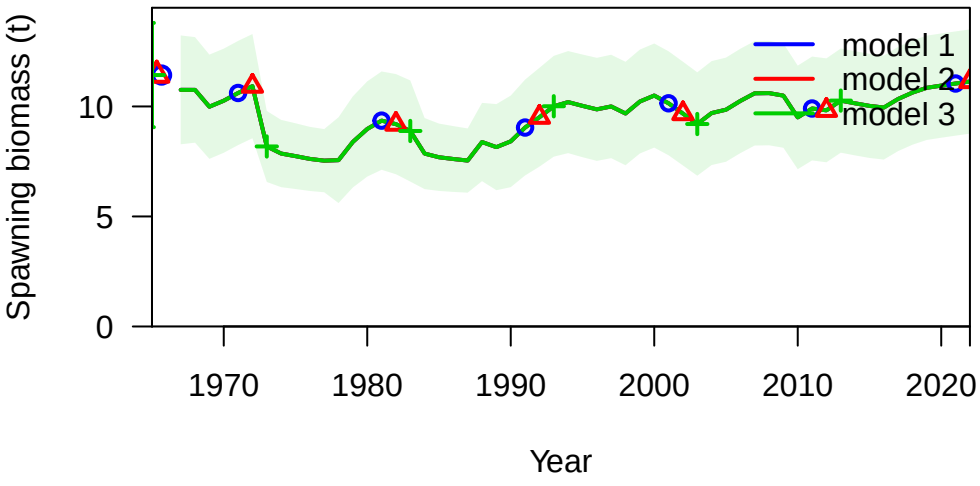


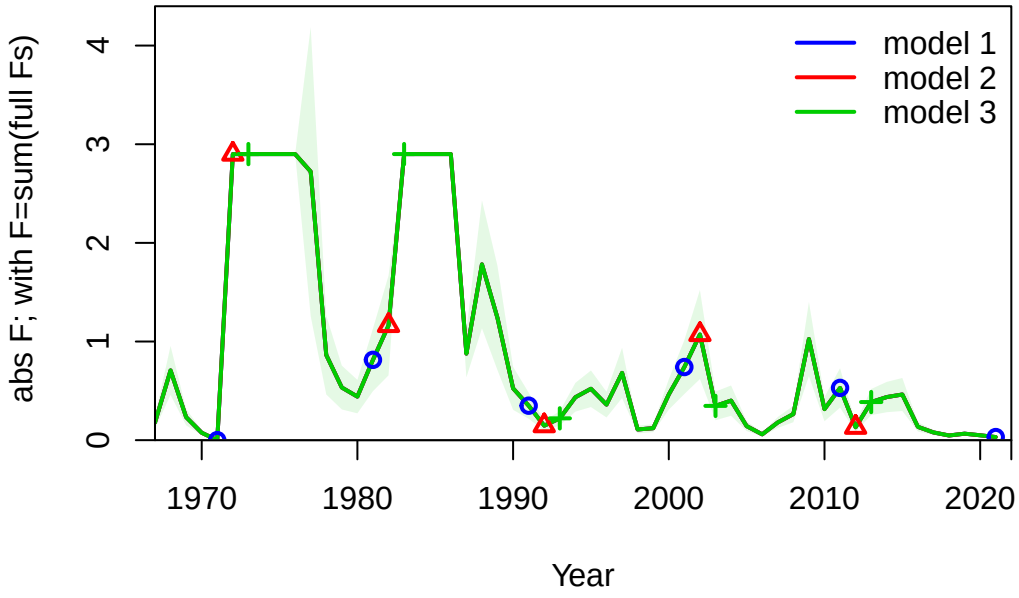


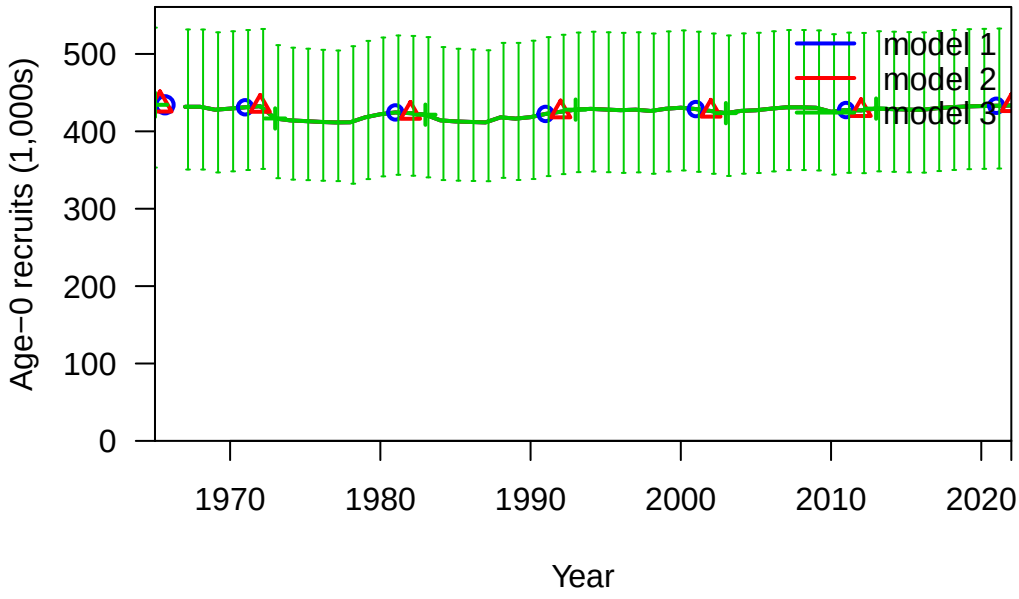

```
null device
          1
```

Jitter


164.550
164.525
164.500
164.475
Likelihood
1.0
1.5
2.0
2.5
3.0
Run


model 1
model 2
model 3
Spawning biomass (t)
0
5
10
1970
1980
1990
2000
2010
2020
Year


abs F; with F=sum(full Fs)
0
1
2
3
4
1970
1980
1990
2000
2010
2020
Year
model 1
model 2
model 3


Age−0 recruits (1,000s)
0
100
200
300
400
500
1970
1980
1990
2000
2010
2020
Year
model 1
model 2
model 3