American Samoa Model Checks

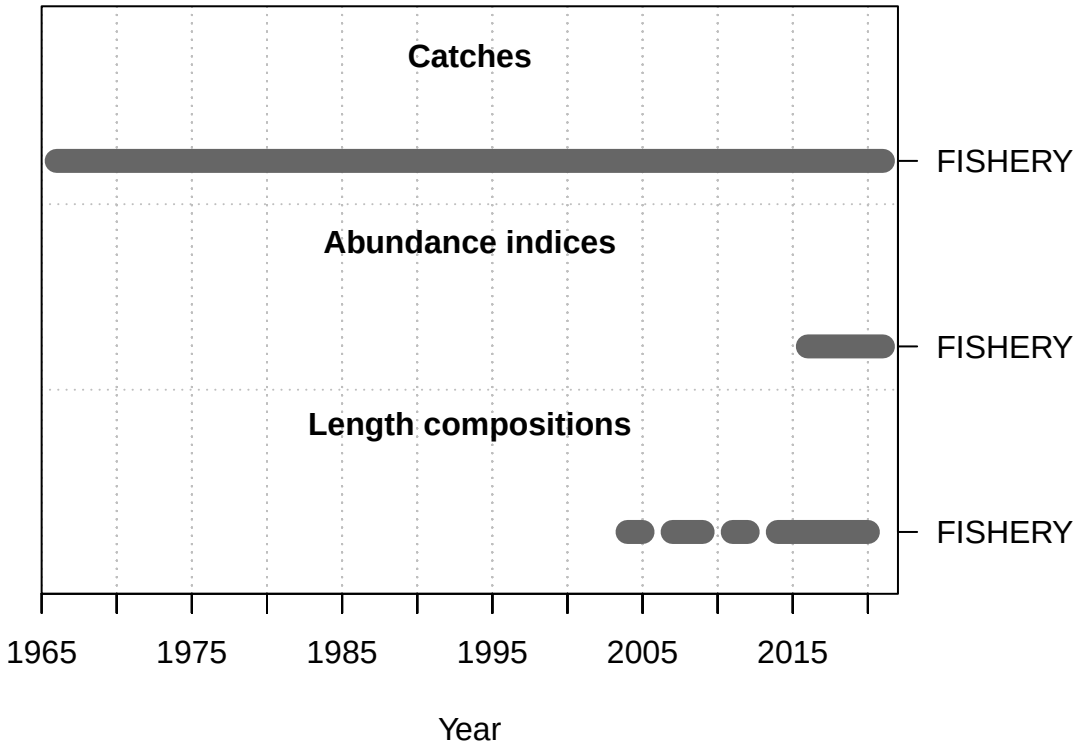
Meg Oshima

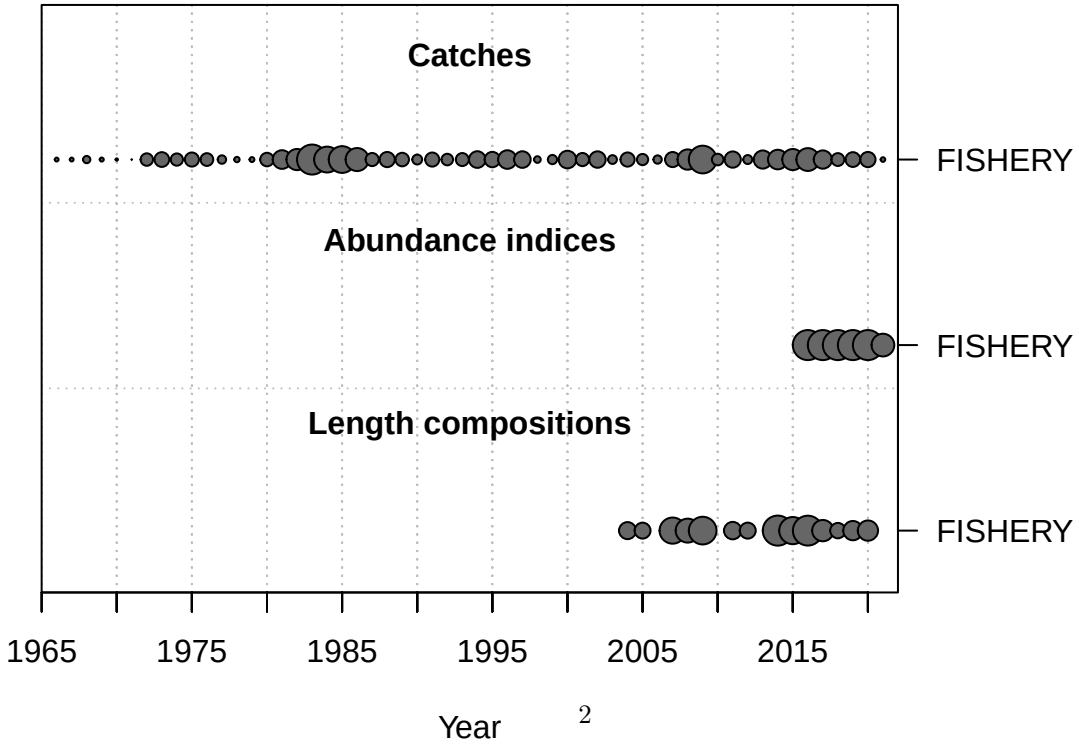
2022-08-11

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

Model Output

Input Data





Convergence Check

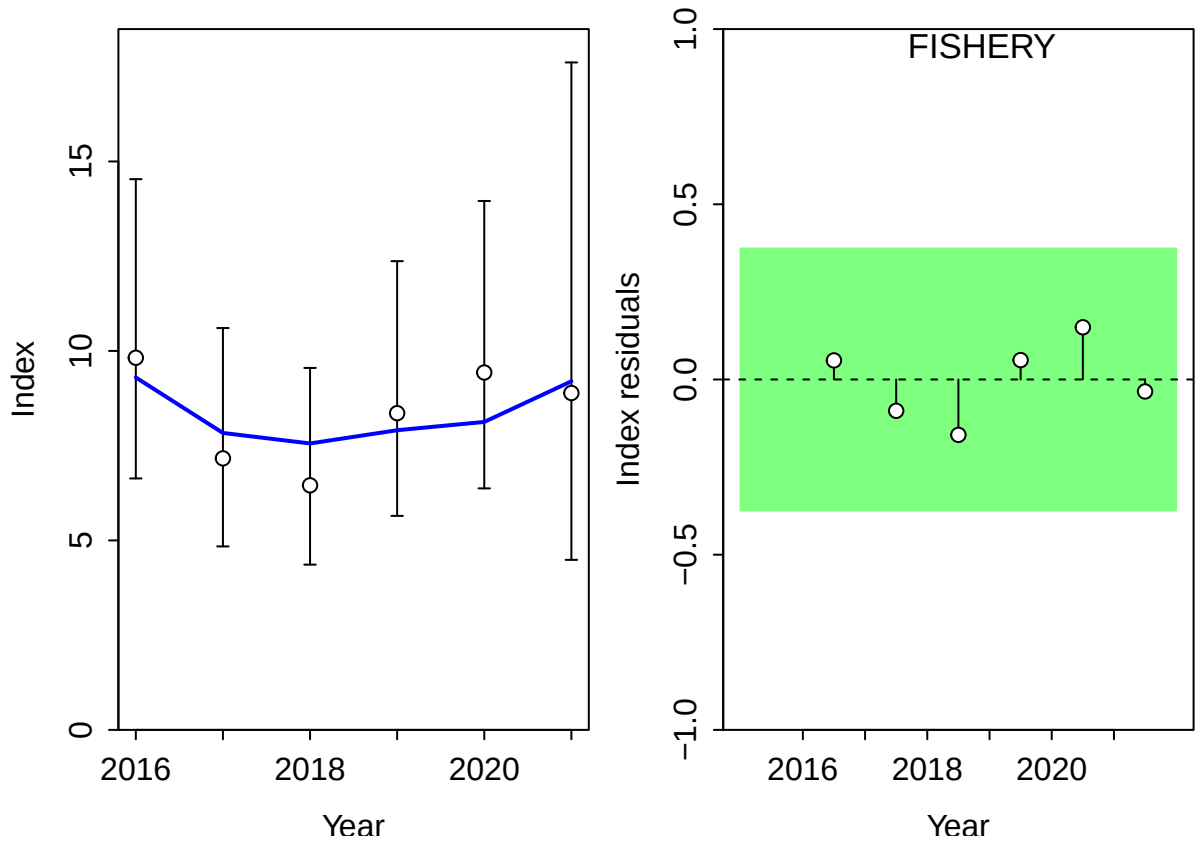
```
##   Converged     MaxGrad
## 1      TRUE 8.47926e-05
```

```
## [1] "1 NOTE:  Max data length bin: 85  < max pop len bins: 94; so will accumulate larger pop len bins
## [2] "2 warning: poor convergence in Fmsy, final dy/dy2= -0.00646212"
## [3] " N parameters are on or within 1% of min-max bound: 2; check results, variance may be suspect"
## [4] "N warnings: 2"
```

Fit to Model

CPUE

```
##
##  Running Runs Test Diagnosics for Index
## Plotting Residual Runs Tests
```

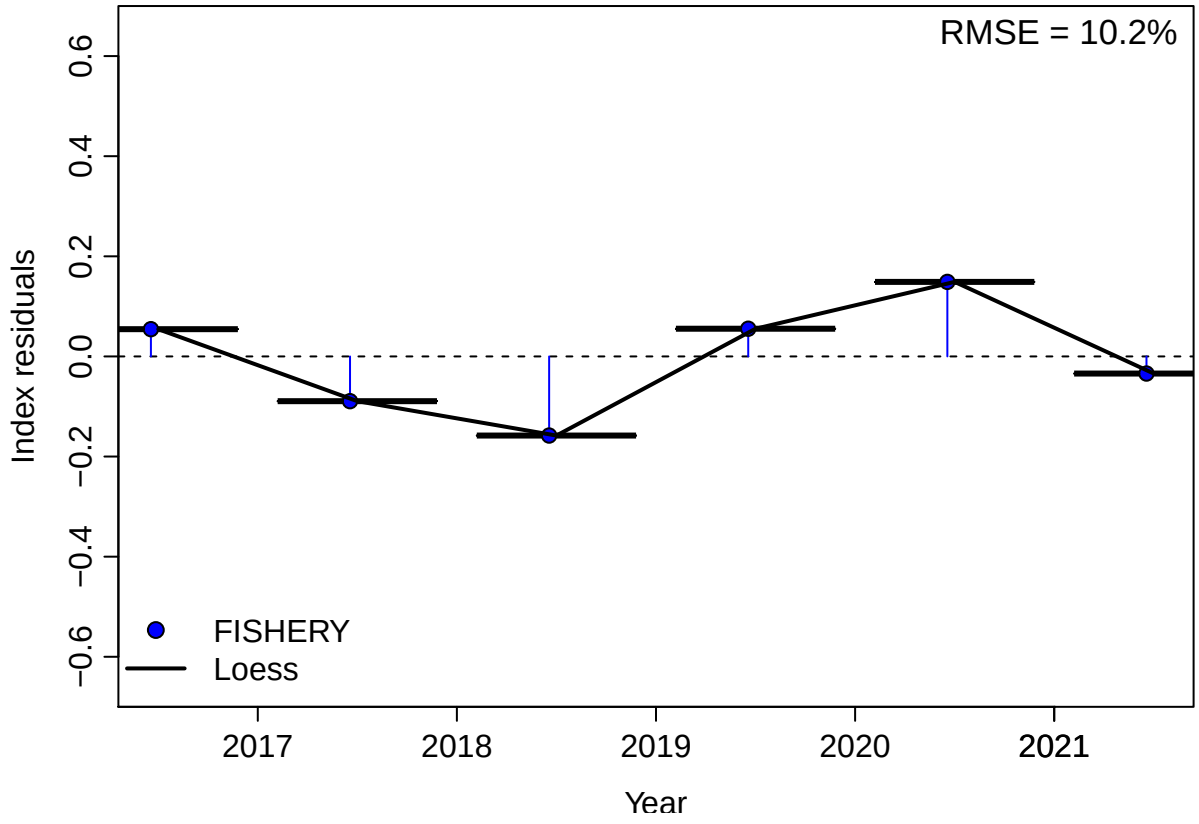



```
##
## Runs Test stats by Index:
## Plotting JABBA residual plot
```

```
## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : Chernobyl! trL>n 6
```

```
## Warning in simpleLoess(y, x, w, span, degree = degree, parametric = parametric, : Chernobyl! trL>n 6
```

```
## Warning in sqrt(sum.squares/one.delta): NaNs produced
```

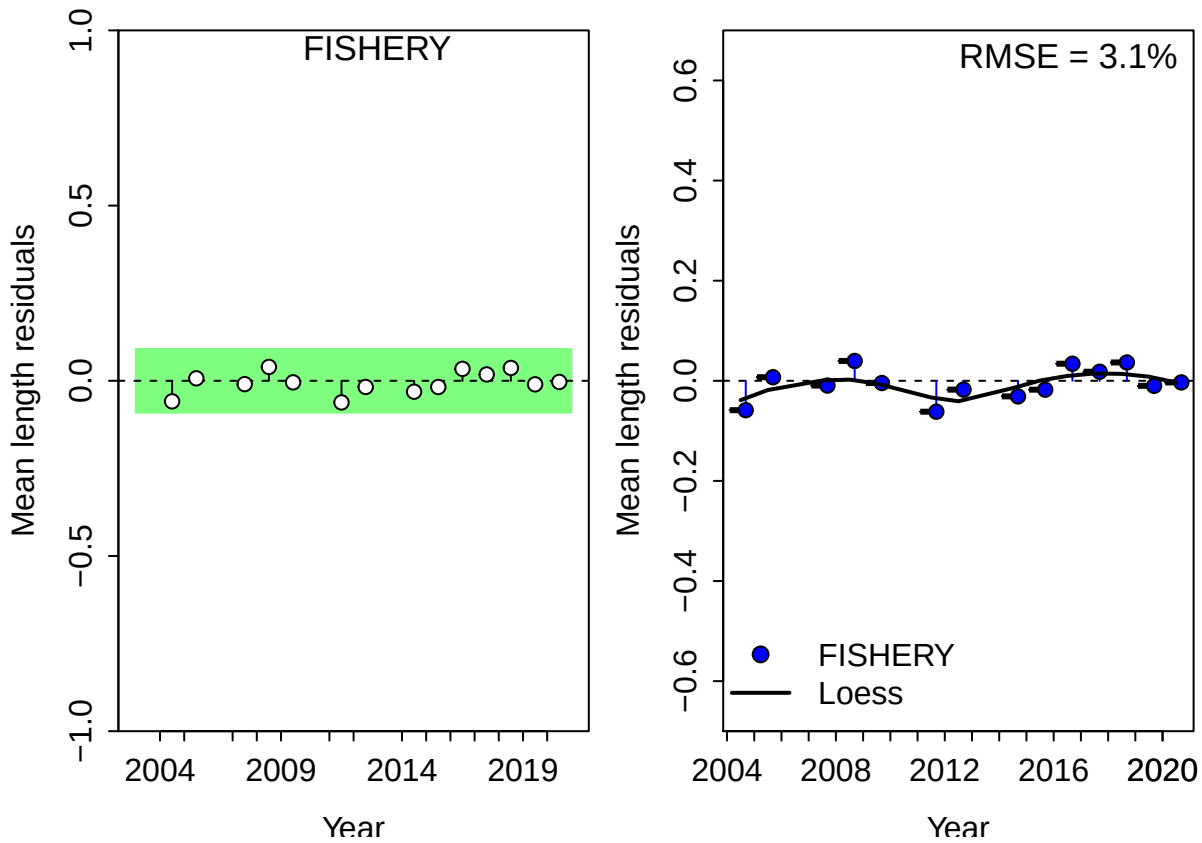



```
##
## RMSE stats by Index:
```

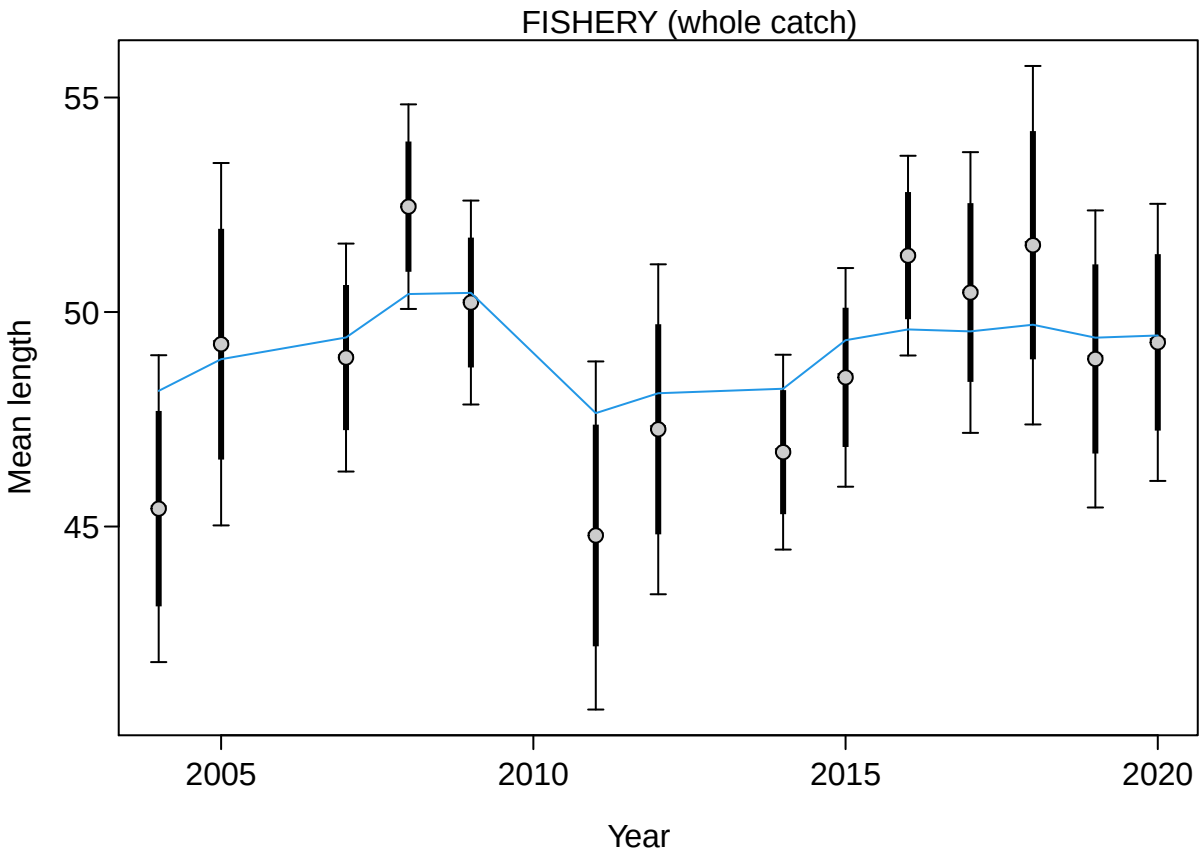
Length Comp

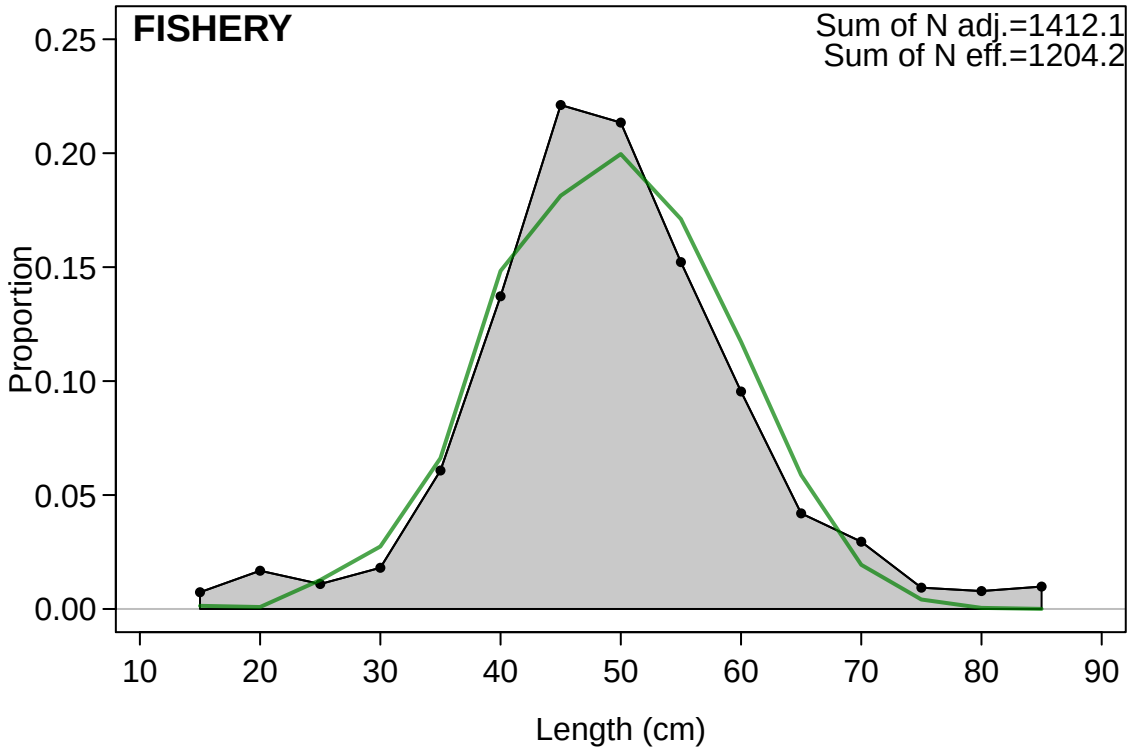
#Factor	Fleet	New_Var_adj	Type	Name
4	1	0.405467	len	FISHERY

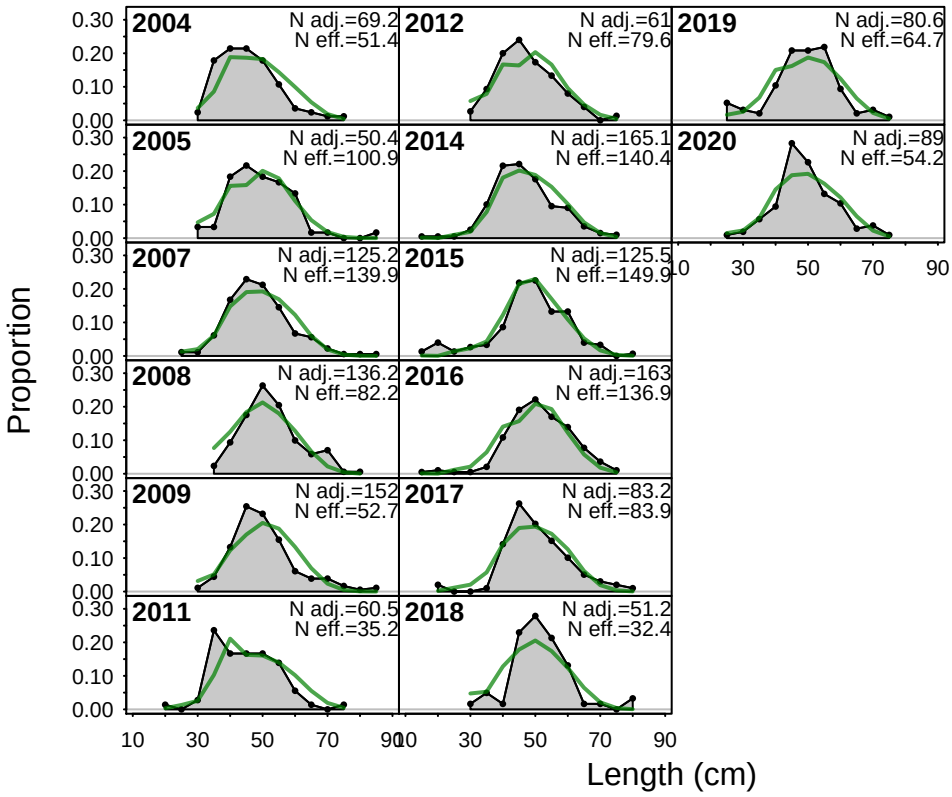
```
##
##  Running Runs Test Diagnosics for Mean length
## Plotting Residual Runs Tests

##
## Runs Test stats by Mean length:

##     Index runs.p   test   sigma3.lo  sigma3.hi type
## 1 FISHERY  0.397 Passed -0.09078386 0.09078386  len

## Plotting JABBA residual plot
```




```
##
## RMSE stats by Index:

##    indices RMSE.perc nobs
## 1  FISHERY       3.1   14
## 2 Combined       3.1   14
```


FISHERY (whole catch)
Mean length
55
50
45
2005
2010
2015
2020
Year


FISHERY
Sum of N adj.=1412.1
Sum of N eff.=1204.2
Proportion
0.25
0.20
0.15
0.10
0.05
0.00
10
20
30
40
50
60
70
80
90
Length (cm)

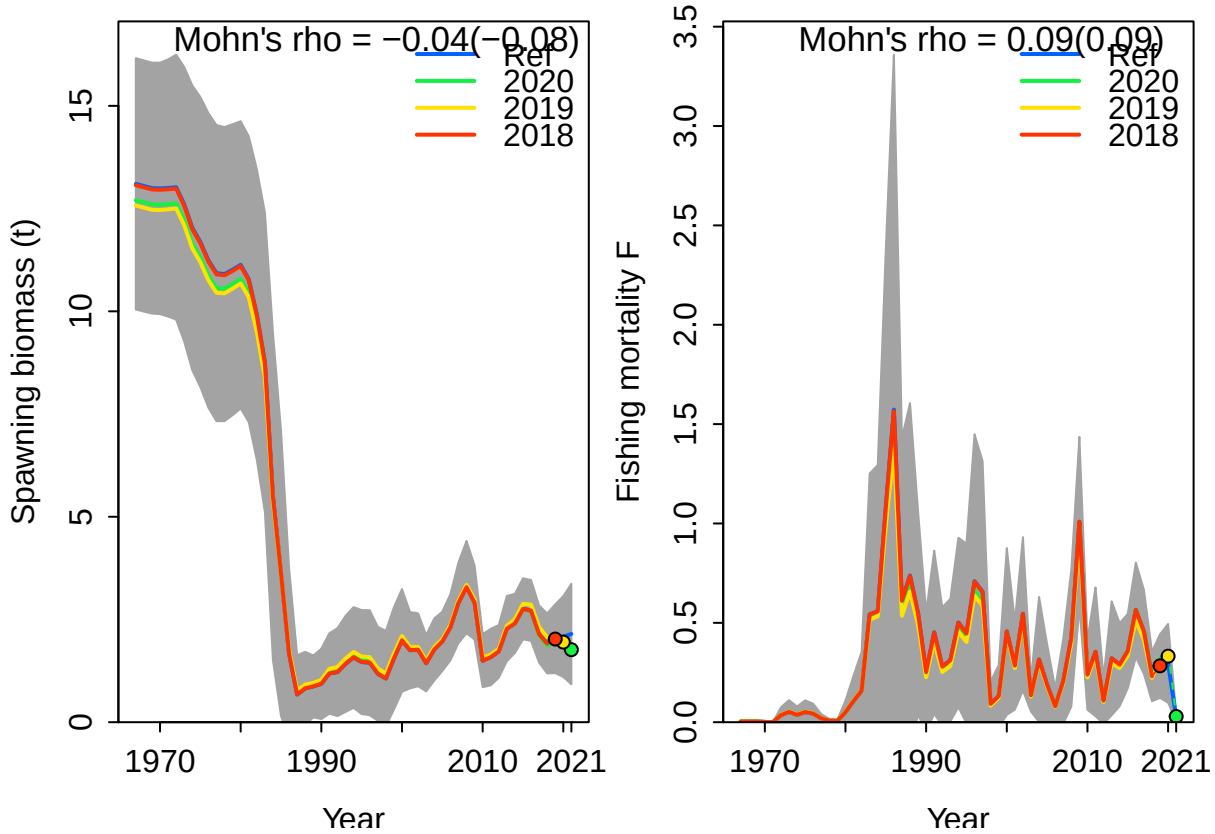


Retrospective and Hindcasting

Retrospective

```
## Plotting Retrospective pattern
```

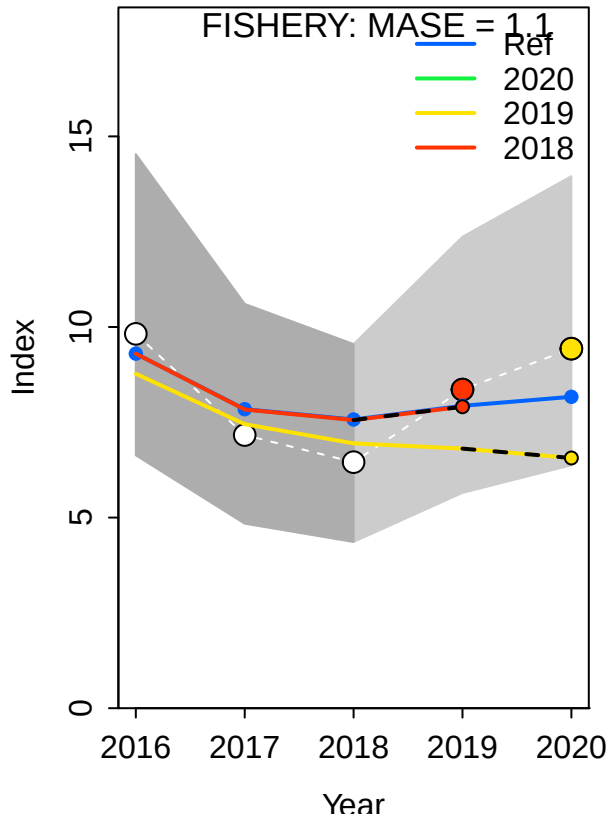
```
##
## Mohn's Rho stats, including one step ahead forecasts:
## Plotting Retrospective pattern
```



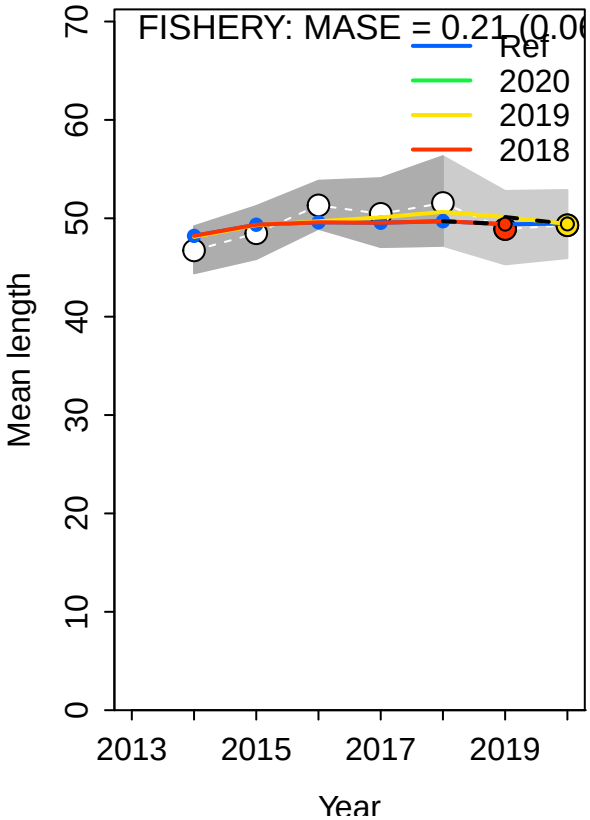

```
##
## Mohn's Rho stats, including one step ahead forecasts:

##   type     peel        Rho ForecastRho
## 1    F     2020 0.20337244  0.15376804
## 2    F     2019 0.06681363  0.12140999
## 3    F     2018 0.00350351  0.00537642
## 4    F Combined 0.09122986  0.09351815
```

Hindcasting

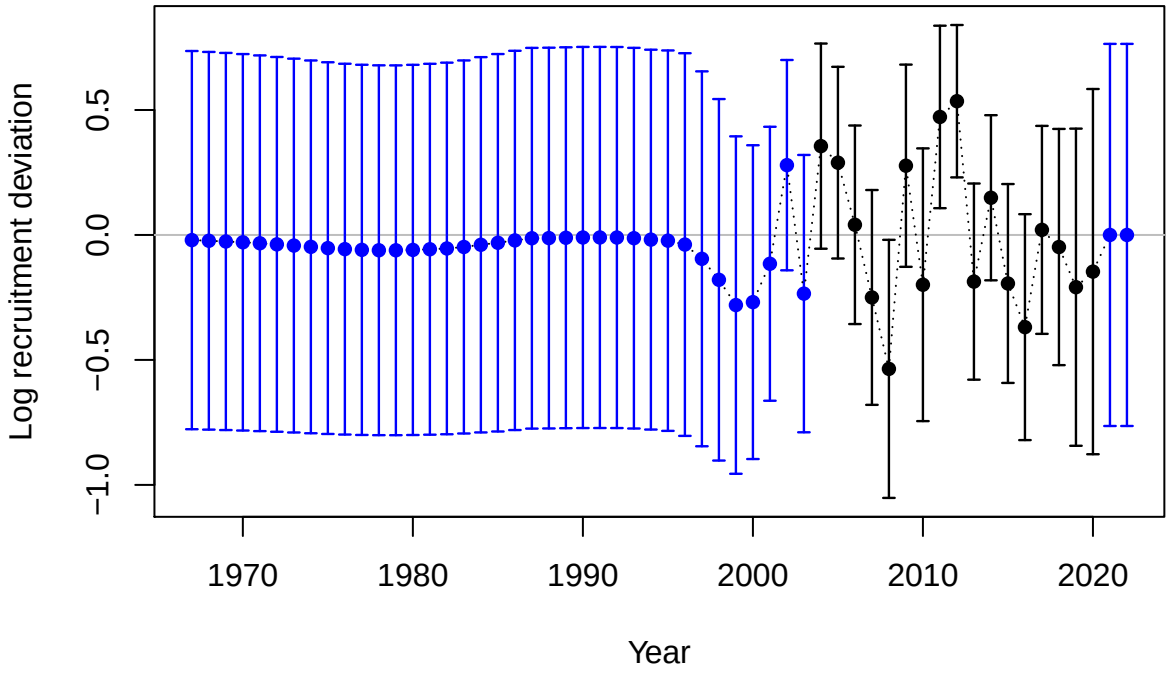
```
## Plotting Hindcast Cross-Validation (one-step-ahead)
##
##  Computing MASE with only 2 of 3  prediction residuals for Index FISHERY
##
##  Warning:  Unequal spacing of naive predictions residuals may influence the interpretation of MASE
```

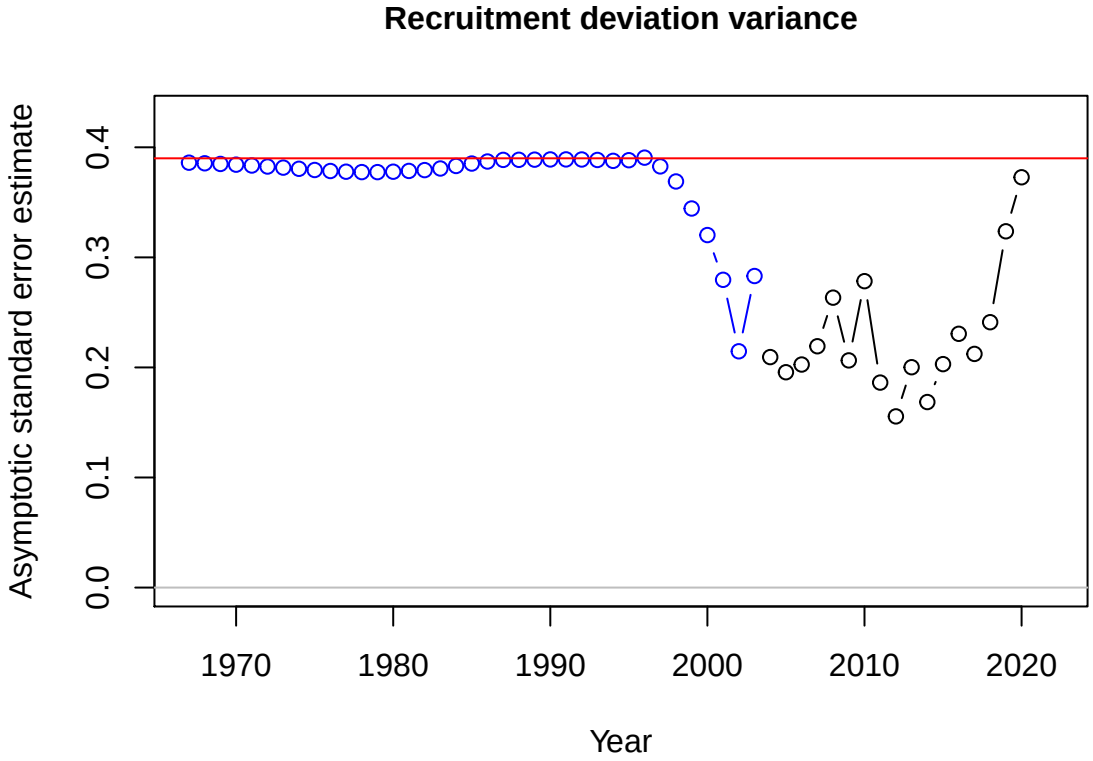



```
##
## MASE stats by Index:
## Plotting Hindcast Cross-Validation (one-step-ahead)
##
##  Computing MASE with only 2 of 3  prediction residuals for Index FISHERY
##
##  Warning:  Unequal spacing of naive predictions residuals may influence the interpretation of MASE

##
## MASE stats by Index:
```


FISHERY: MASE = 0.21 (0.0
Ref
2020
2019
2018
Mean length
0
10
20
30
40
50
60
70
2013
2015
2017
2019
Year

Recruitment Deviations





Likelihood Profile

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

```
## Parameter matching profile.string=SR_LN: SR_LN(R0)
```

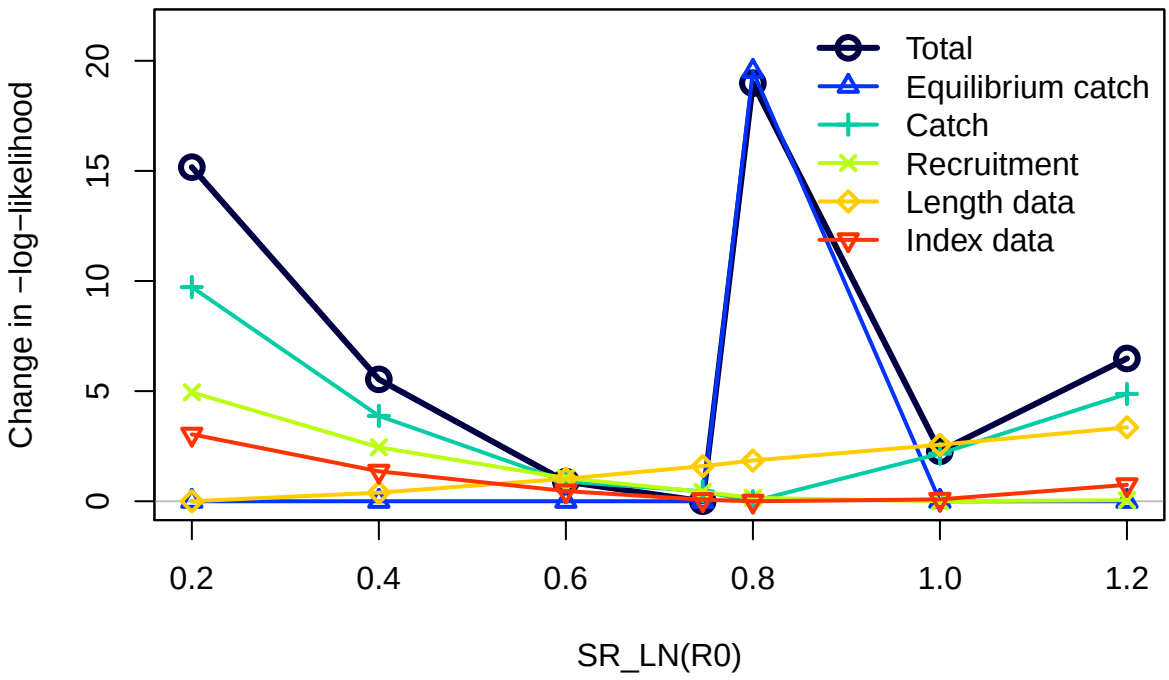
```
## Parameter values (after subsetting based on input 'models'): 0.2, 0.4, 0.6, 0.8, 1, 1.2, 0.746331
```

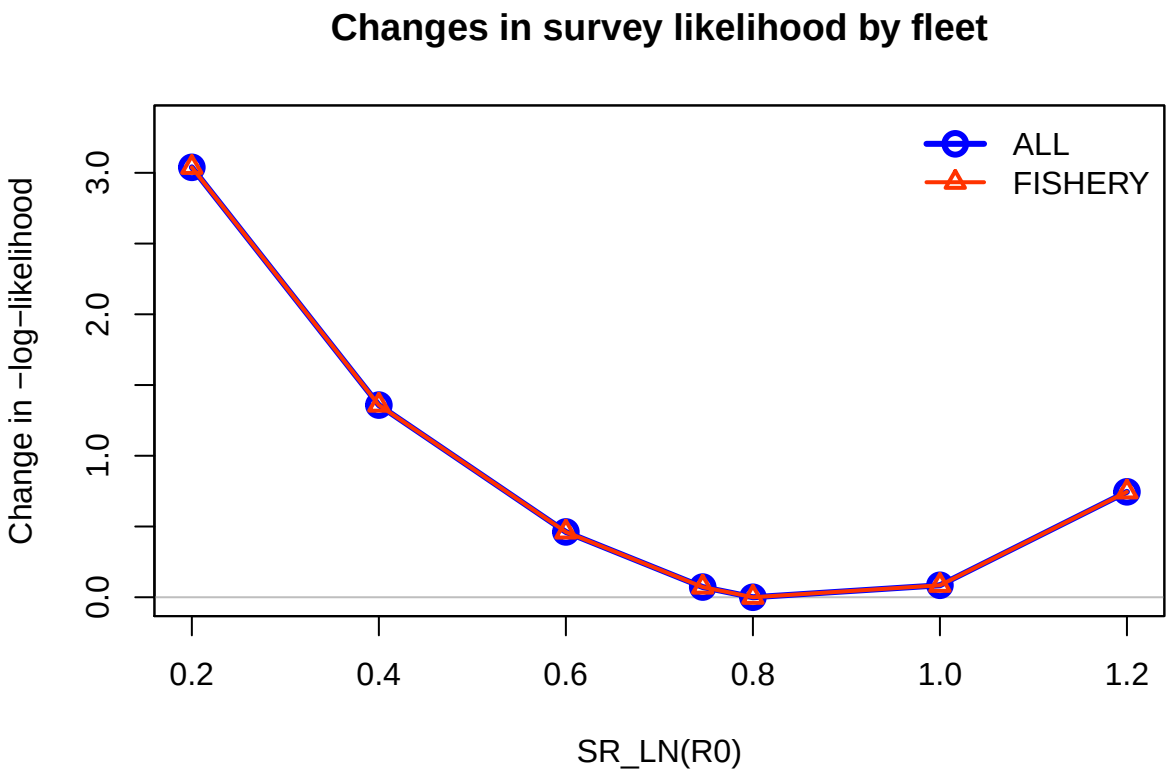
```
##
## Likelihood components showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
```

```
##                       frac_change include                            label
## TOTAL                      1.0000    TRUE                            Total
## Catch                      0.5123    TRUE                            Catch
## Equil_catch                1.0283    TRUE                Equilibrium catch
## Survey                     0.1601    TRUE                       Index data
## Length_comp                0.1767    TRUE                      Length data
## Recruitment                0.2605    TRUE                      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
```

```
## Parameter matching profile.string = 'SR_LN': 'SR_LN(R0)
## Parameter values (after subsetting based on input 'models'): 0.2, 0.4, 0.6, 0.8, 1, 1.2, 0.746331,
```

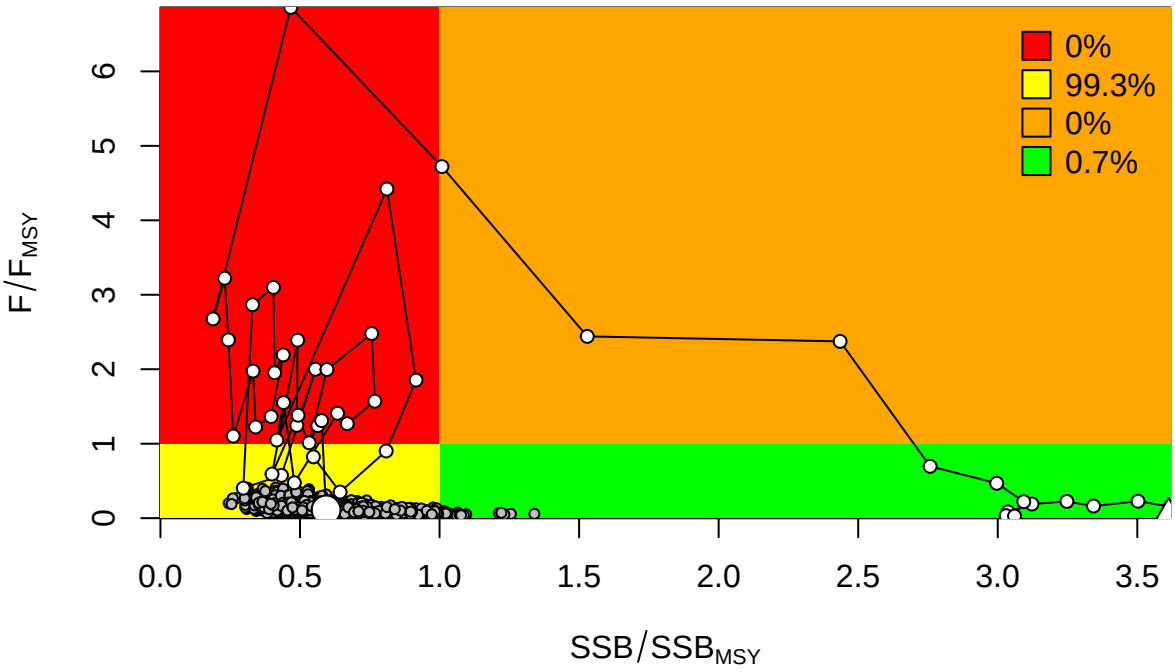
```
## Fleet-specific likelihoods showing max change as fraction of total change.
## To change which components are included, change input 'minfraction'.
##                        frac_change include
## prof.table....c.1.3..            1    TRUE
```


Change in −log−likelihood
0
5
10
15
20
0.2
0.4
0.6
0.8
1.0
1.2
SR_LN(R0)
Total
Equilibrium catch
Catch
Recruitment
Length data
Index data

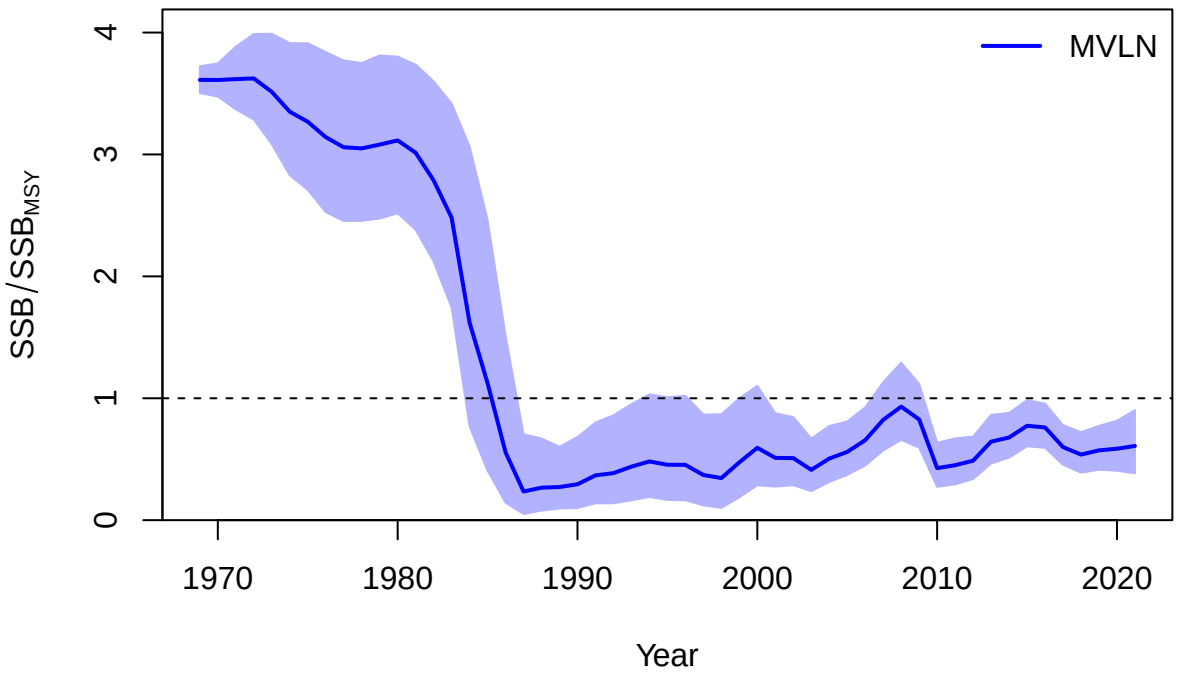


Management Quantities

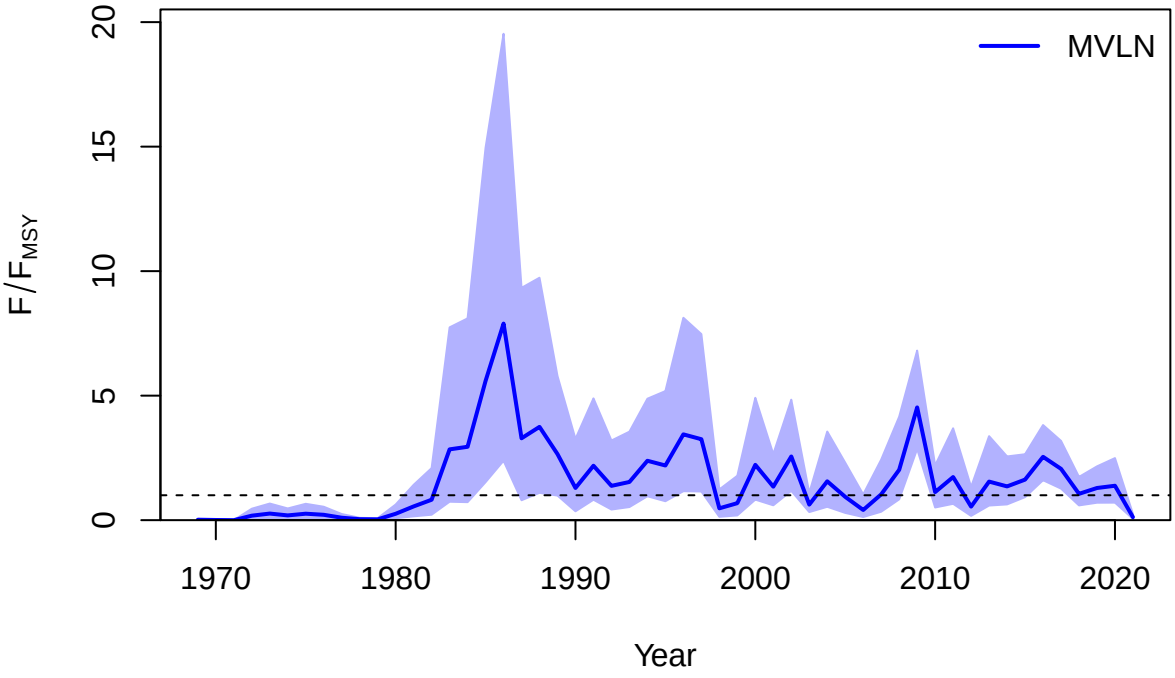
```
##
##  starter.sso with Bratio: SSB/SSBMSY and F: _abs_F
##
```



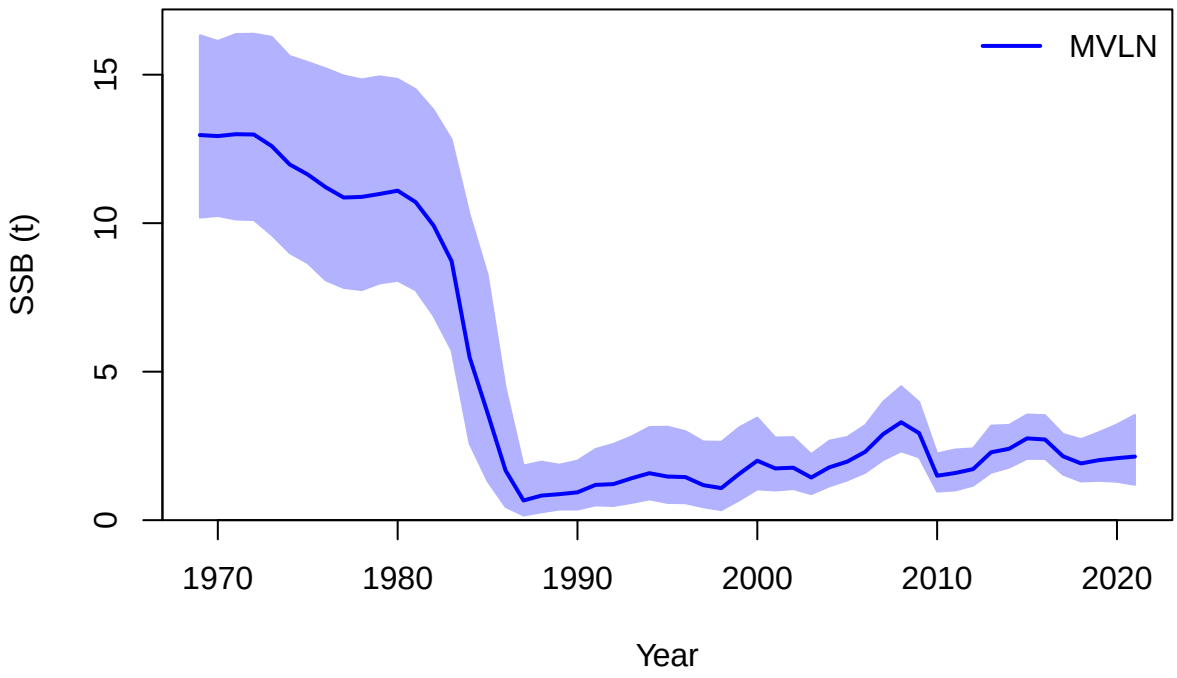

```
##
## Plot Comparison of stock
```



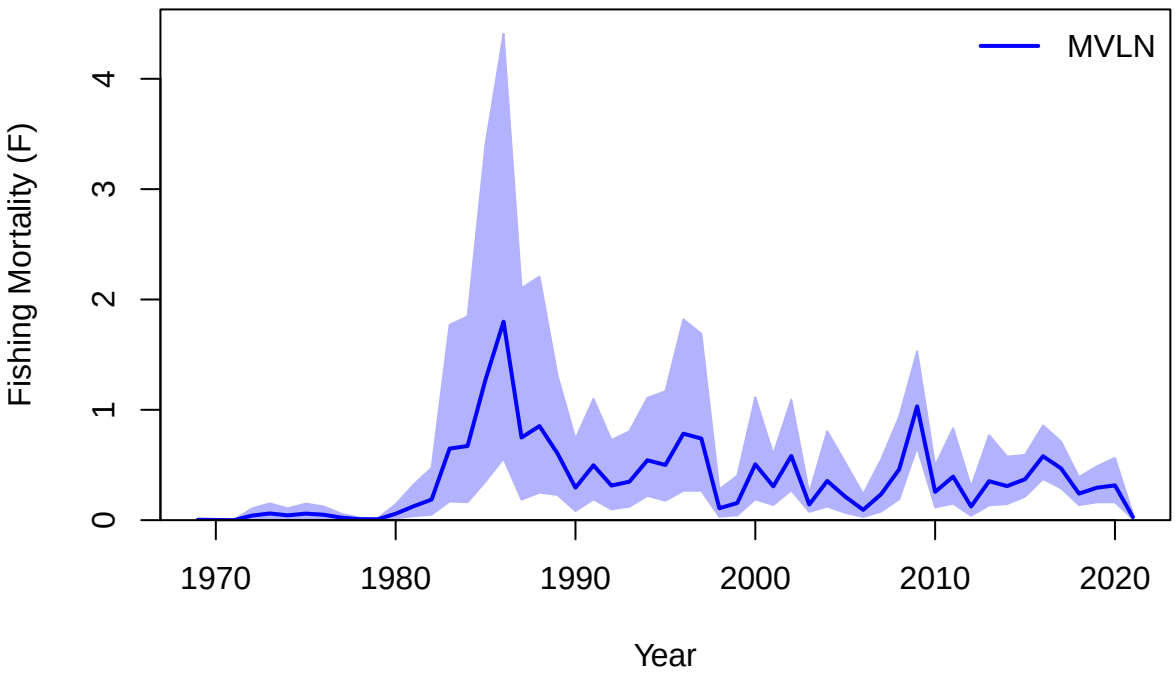

```
##
## Plot Comparison of harvest
```




```
##
## Plot Comparison of SSB
```

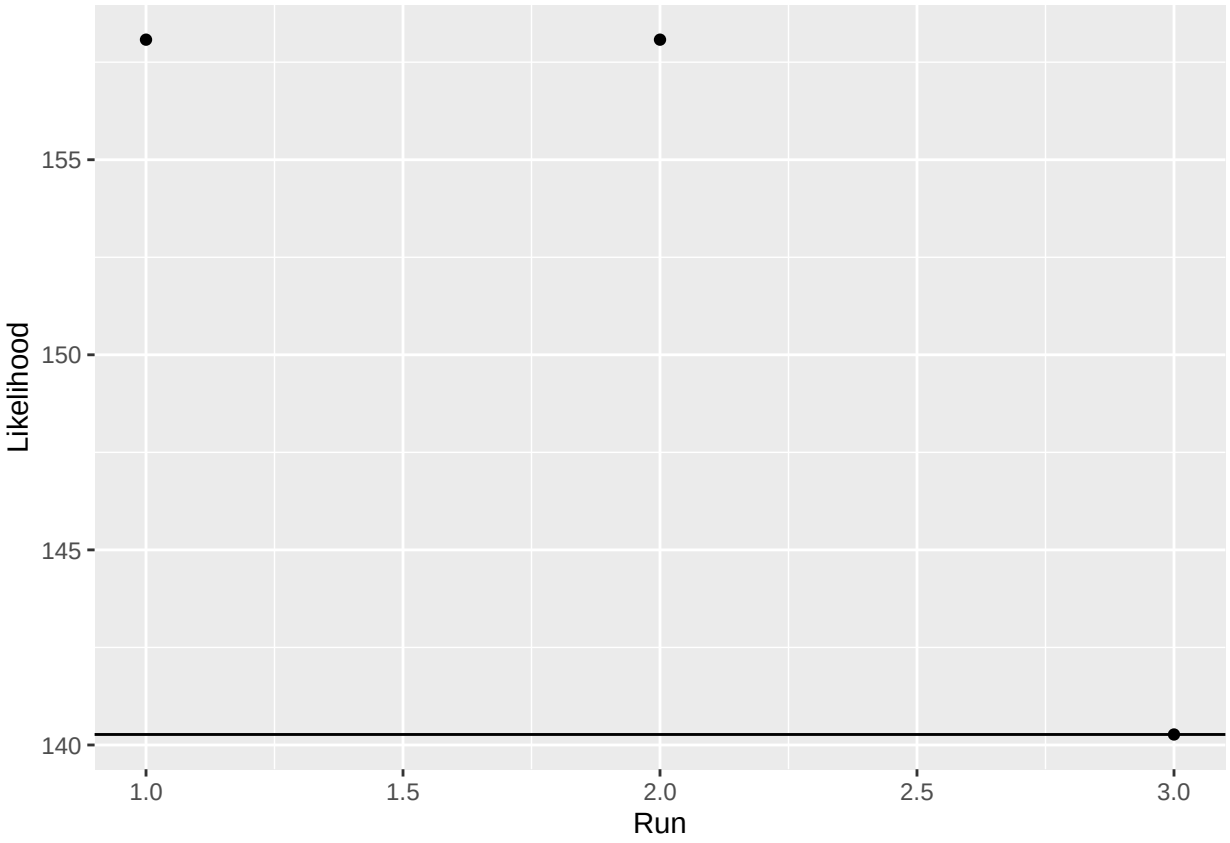


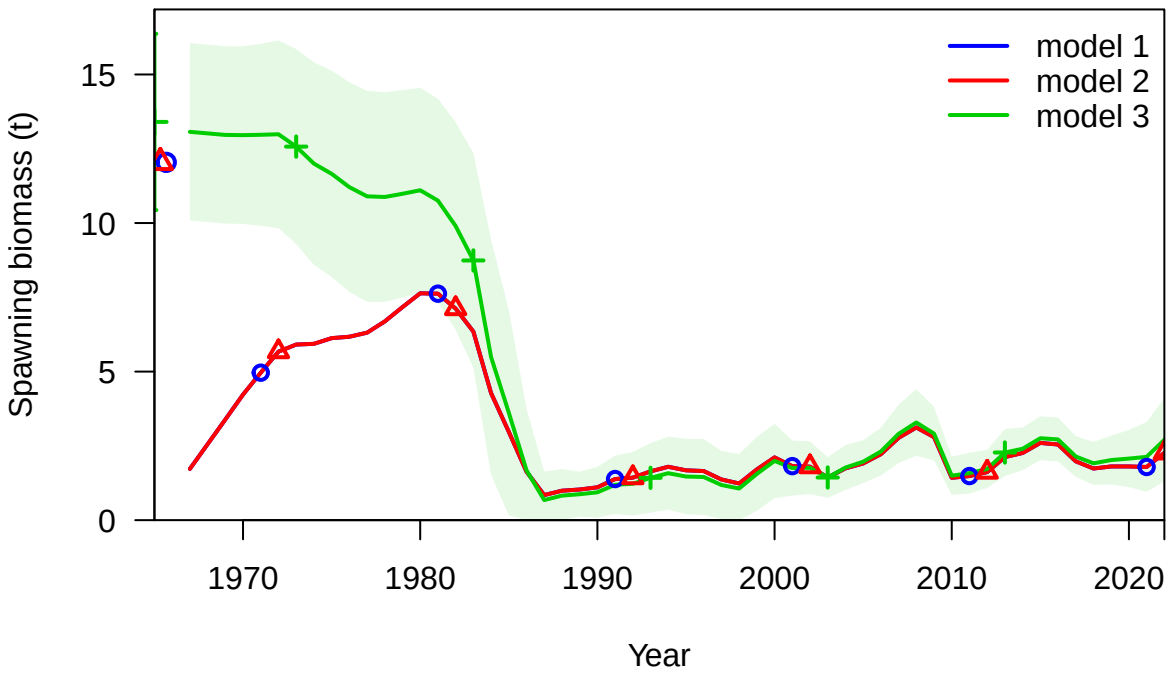

```
##
## Plot Comparison of F
```

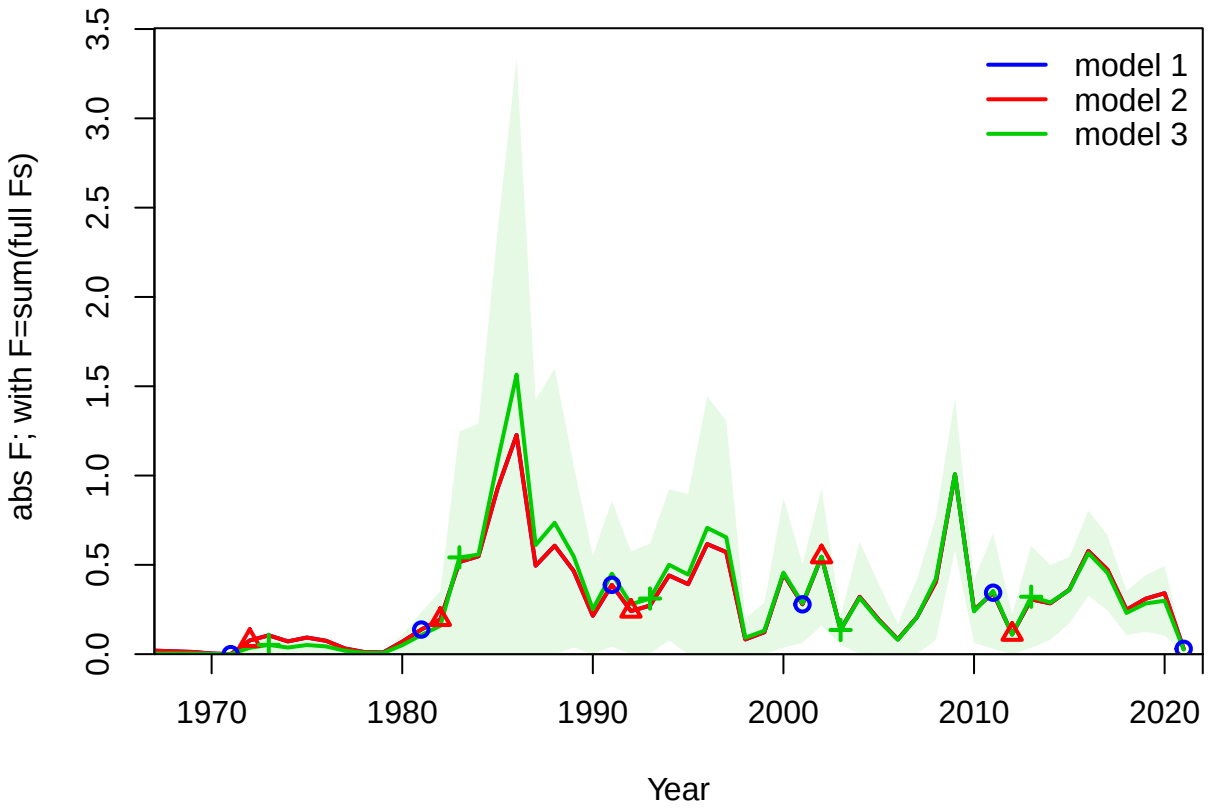

MVLN
Fishing Mortality (F)
0
1
2
3
4
1970
1980
1990
2000
2010
2020
Year

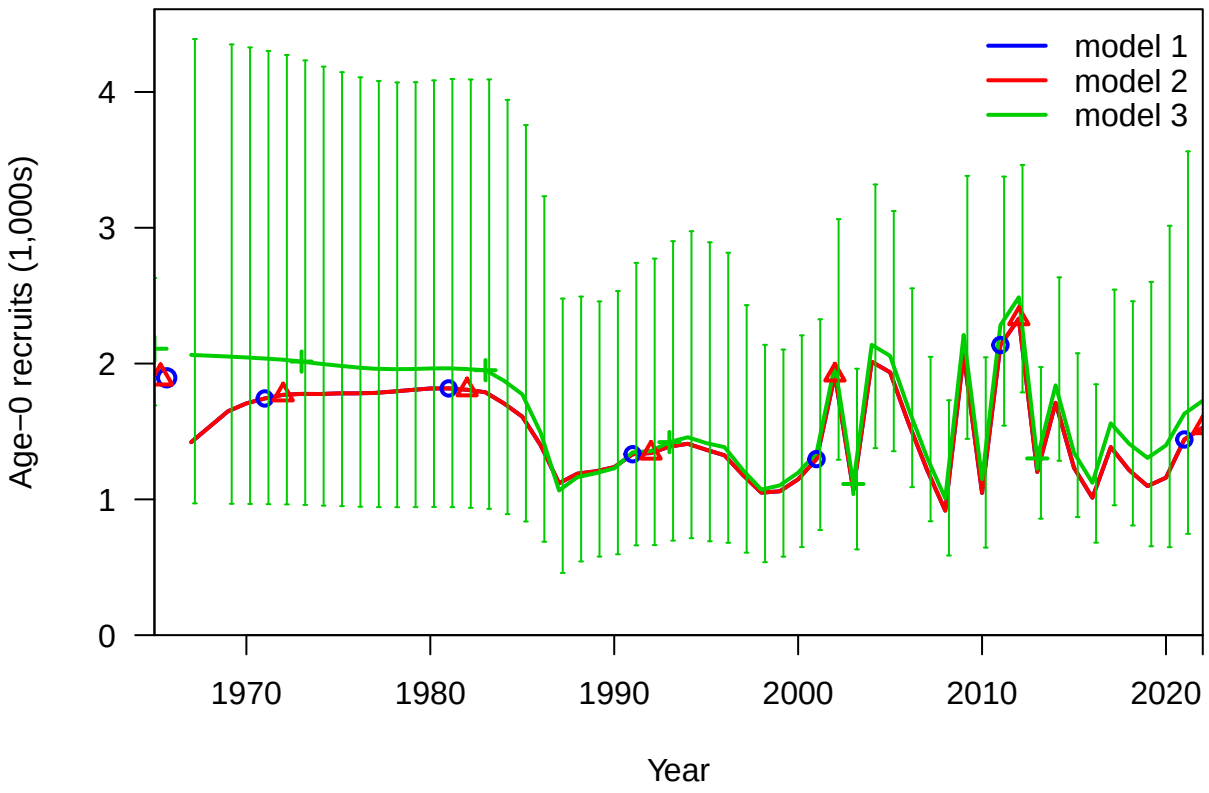
```
## RStudioGD
##         2
```

Jitter




model 1
model 2
model 3
Spawning biomass (t)
0
5
10
15
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
abs F; with F=sum(full Fs)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
1970
1980
1990
2000
2010
2020
Year


model 1
model 2
model 3
Age−0 recruits (1,000s)
0
1
2
3
4
1970
1980
1990
2000
2010
2020
Year