Surplus tests with MSE

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Abstract

ToDo

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1 Introduction

The MSE runs on the ple4 dataset but it can be adapted to other datasets. The OM is conditioned using the stock assessment results and distinct S/R. The MP is based on the usual MSY HCR, with a $B_{trigger}$ and a F_{target}, and an additional harvest rate limit. All is dealt in relative terms. The stock status is estimated with a biomass dynamic model. The OEM introduces variability on the abundance index and bias both on the abundance index and catches. The IEM introduces bias on the catch. The bias on catch, both on the OEM and IEM must be linked so that catches on the OM are of the same level.

```
> sessionInfo()

R version 2.15.0 (2012-03-30)
Platform: x86_64-pc-linux-gnu (64-bit)

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 [3] LC_TIME=en_US.UTF-8        LC_COLLATE=en_US.UTF-8
 [5] LC_MONETARY=en_US.UTF-8    LC_MESSAGES=en_US.UTF-8
 [7] LC_PAPER=C                 LC_NAME=C
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[11] LC_MEASUREMENT=en_US.UTF-8 LC_IDENTIFICATION=C

attached base packages:
[1] splines   grid      stats     graphics  grDevices utils     datasets
[8] methods   base

other attached packages:
 [1] Hmisc_3.9-1      survival_2.36-12 xtable_1.6-0     FLBioDym_0.1.2
 [5] FLAdvice_1.0     ggplotFL_0.1     ggplot2_0.8.9    proto_0.3-9.2
 [9] reshape_0.8.4    plyr_1.7.1       akima_0.5-7      FLash_2.5.0
[13] FLCore_2.5.0     lattice_0.20-6

loaded via a namespace (and not attached):
[1] cluster_1.14.1 stats4_2.15.0  tools_2.15.0
```

2 Methods

- Operating Model

  $N_{t+1,a+1} = N_{t,a}e^{-Z}$

  $R_{t+1} = f(S_t)\rho$ where $\rho \sim LN(0, \sigma_R^2)$ and f:segreg,b&h,b&h+AR1

  $C_{t,a} = \frac{F_{t,a}}{Z_{t,a}}(1 - e^{-Z})N_{t,a}$

  $Y_t = \sum_a C_{t,a}\bar{W}_{t,a}$

- Implementation Error Model

  $Y_t = \frac{TAC_t}{\alpha_t}$

- Management Procedure

  $TAC_t = HCR(\hat{\Theta}_t|F_{trgt}, B_{trg}, HR_{max})$

  $\hat{\Theta} = g(\hat{C}_t, \hat{I}_t)$ where g: biomass dynamic model

- Observation Error Model

  $\hat{C}_t = C_t\alpha_t$ where $\alpha \sim U(0.95cthBias, 1.05cthBias)$

  $\hat{I}_t = B_t\gamma_t$ where $\gamma \sim LN(\lambda, \sigma_I^2)$ and $\lambda \sim U(0.95srvBias, 1.05srvBias)$

3 Results

Table 1: Simulation scenarios

scn	Btrig	CV	Ftar	aLag	srvBias	cthBias
1	0.5	0.2	1	1	1.0	1.0
2	0.5	0.2	1	3	1.0	1.0
3	0.5	0.2	1	5	1.0	1.0
4	0.5	0.2	1	1	0.5	1.0
5	0.5	0.2	1	3	0.5	1.0
6	0.5	0.2	1	5	0.5	1.0
7	0.5	0.2	1	1	1.0	0.5
8	0.5	0.2	1	3	1.0	0.5
9	0.5	0.2	1	5	1.0	0.5
10	0.5	0.2	1	1	0.5	0.5
11	0.5	0.2	1	3	0.5	0.5
12	0.5	0.2	1	5	0.5	0.5

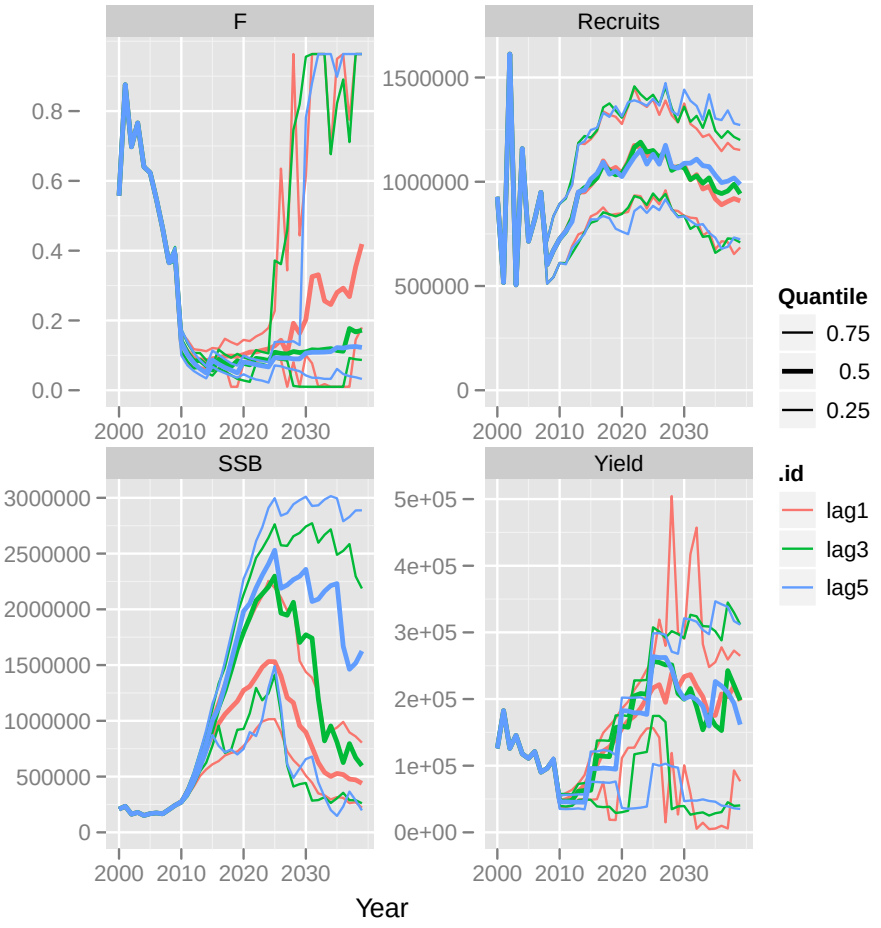

Figure 1: Projections with assessment lags of 1,3 and 5 years

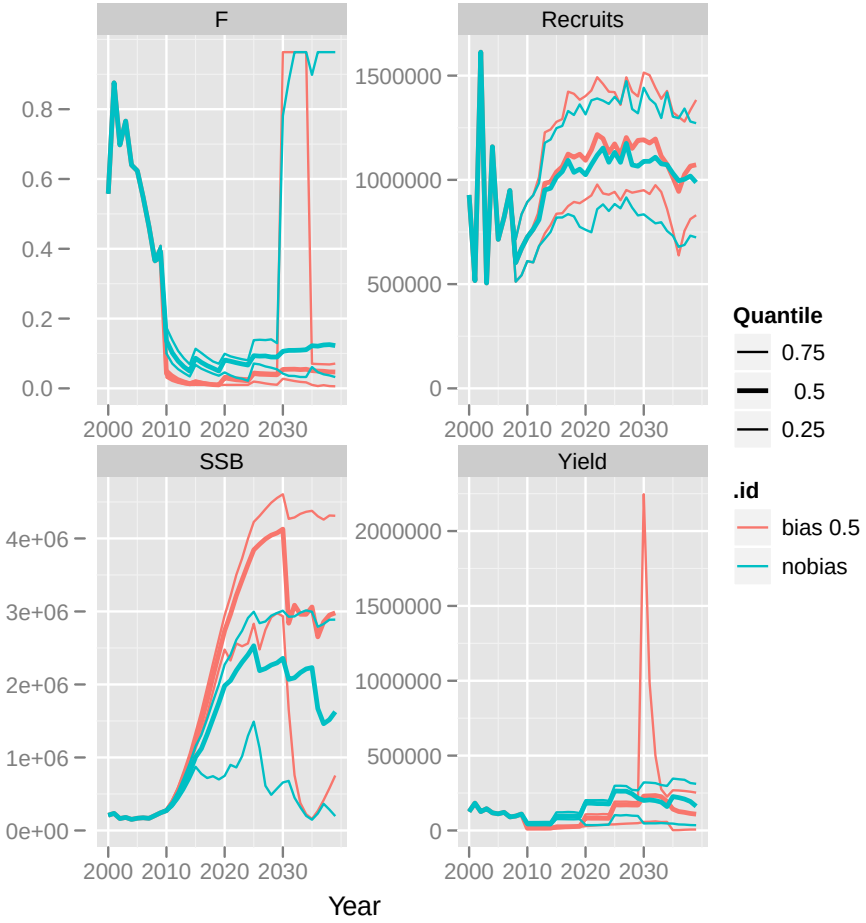

Figure 2: Projections with bias on the index of abundance

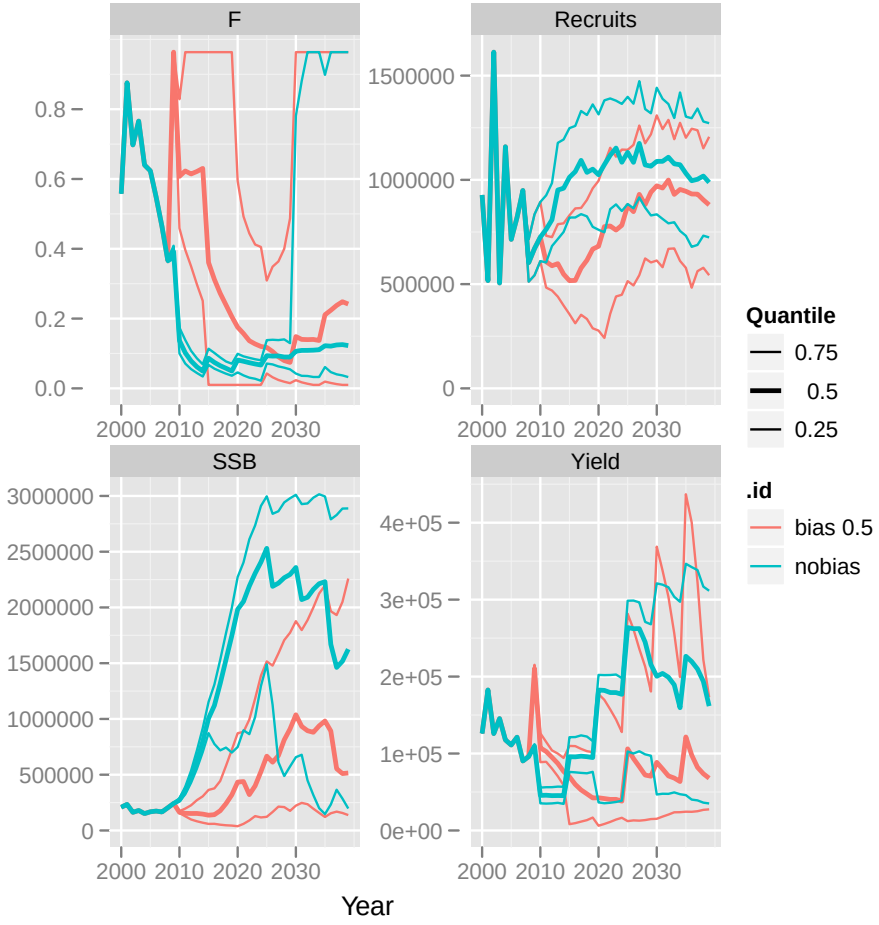

Figure 3: Projections with bias on catches

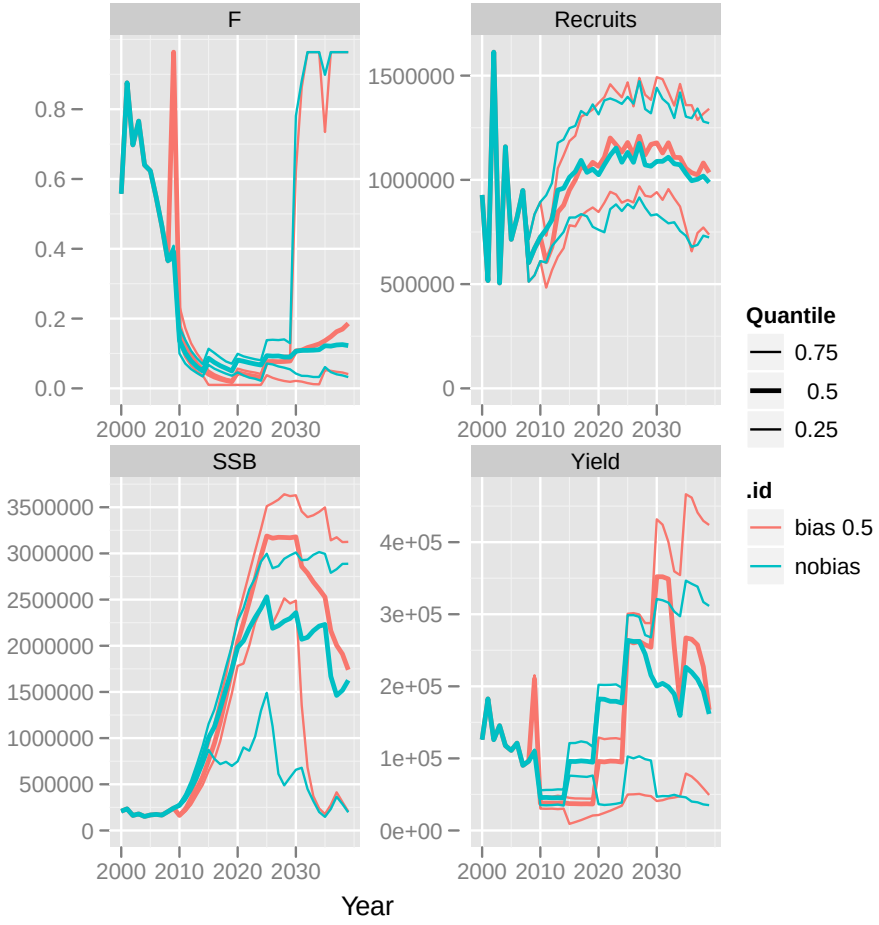

Figure 4: Projections with bias on catches and index