

Sardine two stock assessment excluding survey estimates of recruitment east of Cape Agulhas

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The baseline sardine two stock assessment has been re-fit excluding the time series of survey estimates of recruitment and assuming no annual movement of recruits between the “west” and “south” stocks. In all Figures the new results are compared to the baseline model results.

The “west” stock recruitment is estimated to be lower on average; the fit to the “west” stock 1+ biomass is better, though the model is no longer able to fit the peak in recruitment in the early 2000s.

The “south” stock recruitment is estimated to be much higher on average, though even with a higher recruitment, the model underpredicts the peak in the “south” stock 1+ biomass in the early 2000s.

The model is able to fit the “south” stock 1+ biomass if the normal prior distribution on the “south” stock recruitment residuals is removed from the posterior distribution (though the latter has a non positive definite Hessian).

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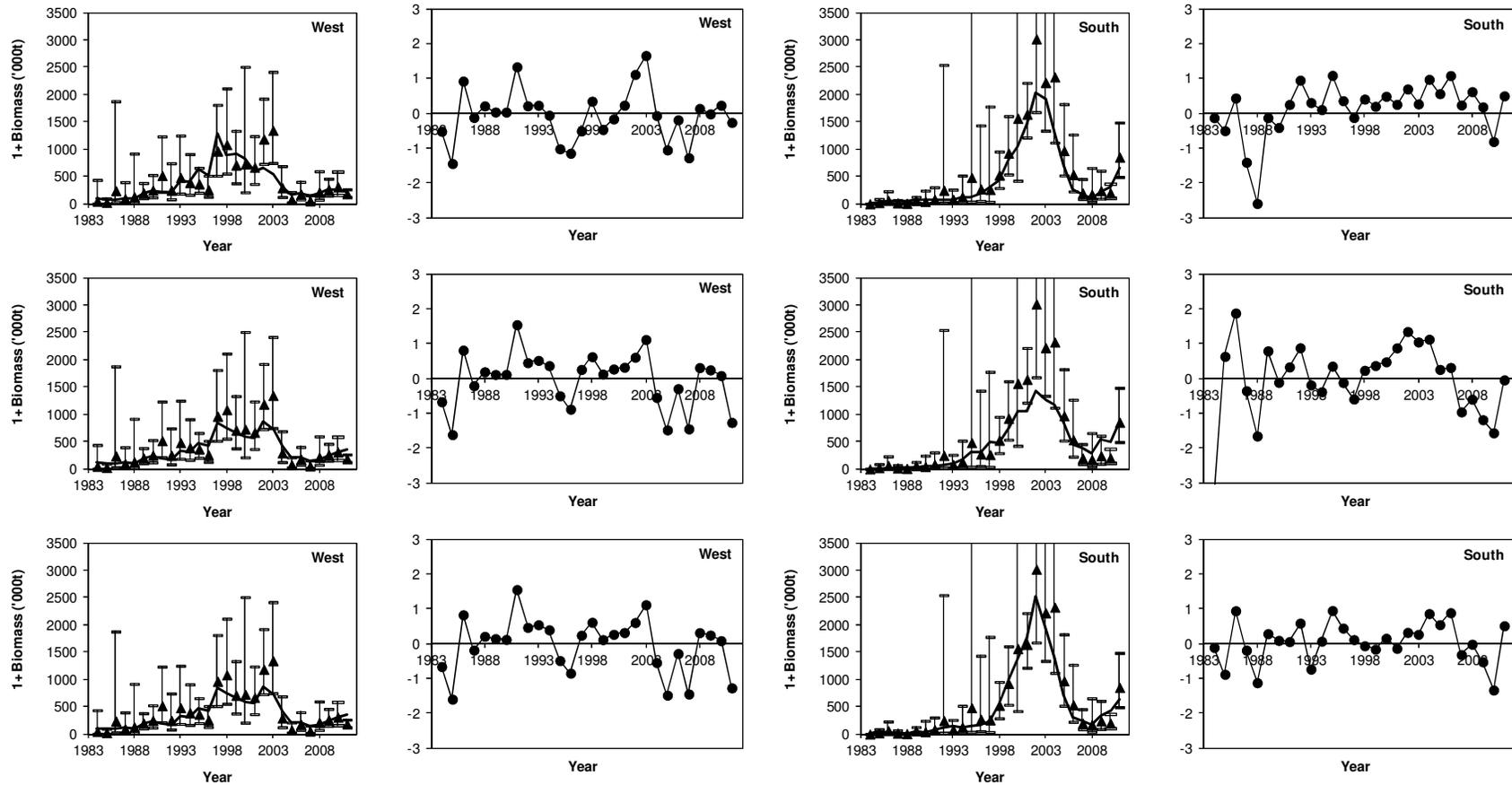


Figure 1. Acoustic survey estimated and model predicted November sardine 1+ biomass from 1984 to 2011. The survey indices are shown with 95% confidence intervals. The standardised residuals from the fits are given in the right hand plots. The top plots are from MARAM IWS/DEC13/Sardine/P1, the middle plots are from the new analysis excluding the survey estimates of recruitment east of Cape Agulhas from the likelihood, and the lower plots are a repeat of the middle plots but excluding the prior on the recruitment residuals for the “south” stock.

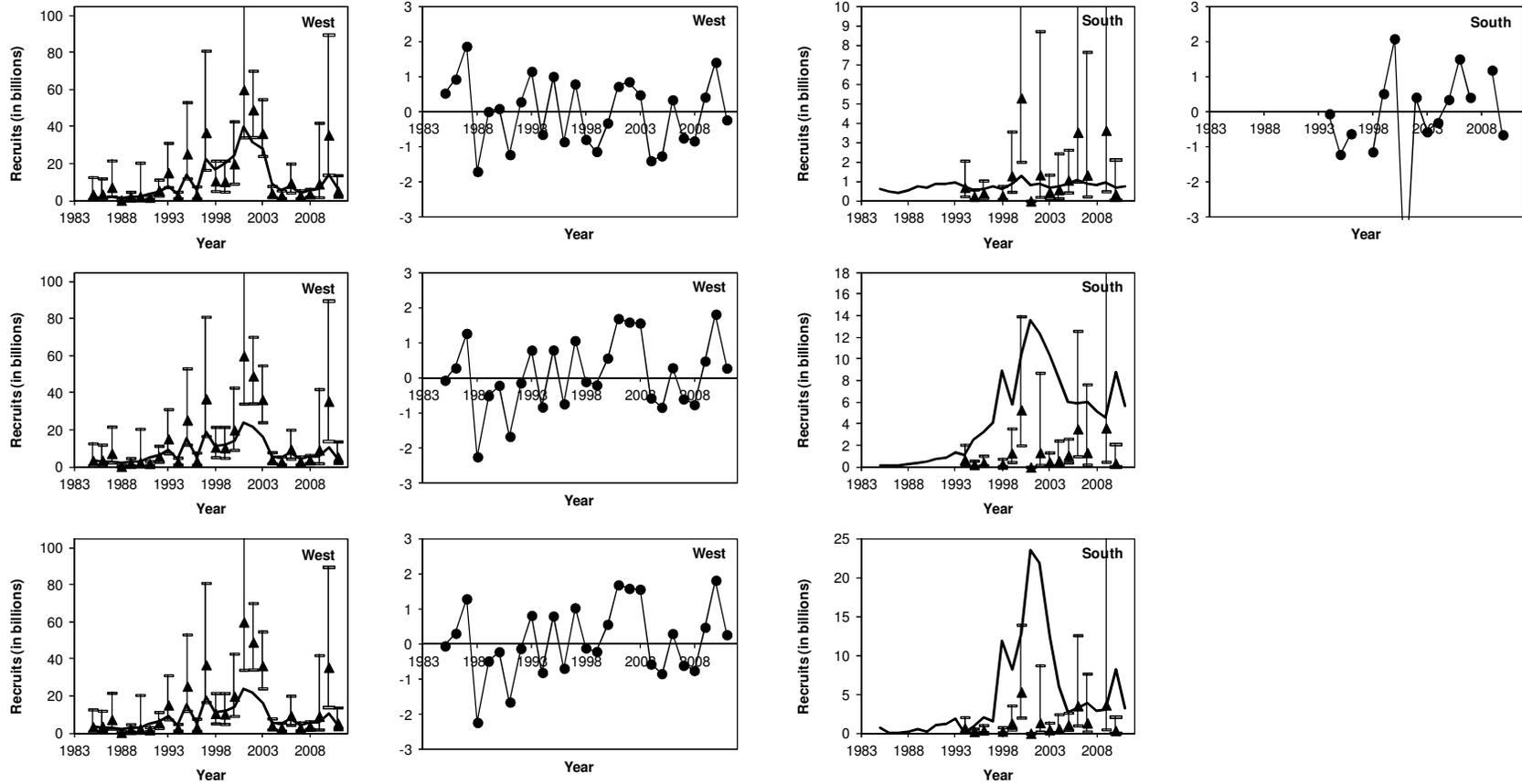


Figure 2. Acoustic survey estimated and model predicted sardine recruitment numbers from May 1985 to 2011. The survey indices are shown with 95% confidence intervals. The standardised residuals from the fits are given in the right hand plots. The top plots are from MARAM IWS/DEC13/Sardine/P1, the middle plots are from the new analysis excluding the survey estimates of recruitment east of Cape Agulhas from the likelihood, and the lower plots are a repeat of the middle plots but excluding the prior on the recruitment residuals for the “south” stock.

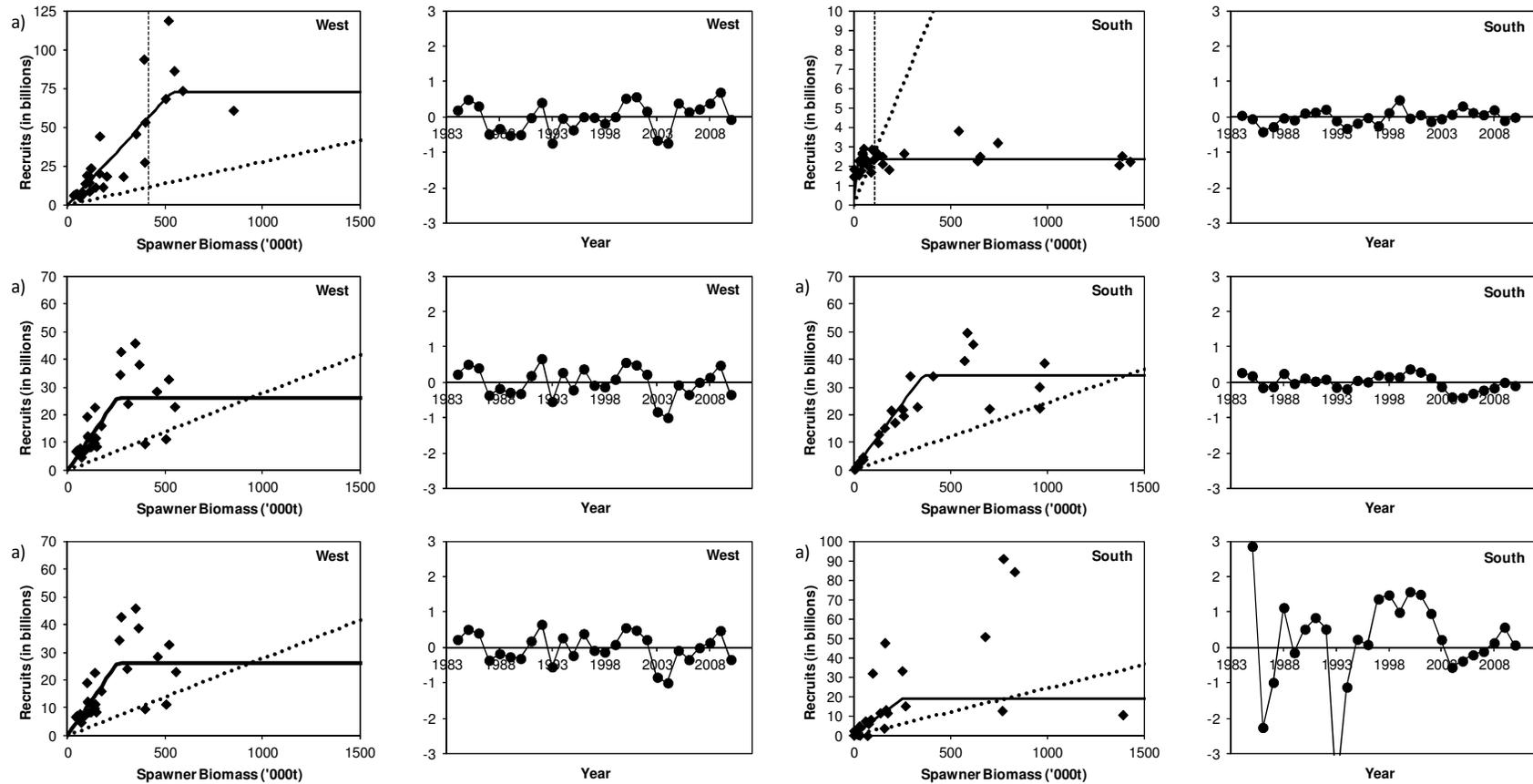


Figure 3. Model predicted sardine recruitment (in November) plotted against spawner biomass from November 1984 to November 2010 with the estimated Hockey stick stock recruitment relationship. The dotted line indicates the replacement line. The standardised residuals from the fit are given in the right hand plots. The top plots are from MARAM IWS/DEC13/Sardine/P1, the middle plots are from the new analysis excluding the survey estimates of recruitment east of Cape Agulhas from the likelihood, and the lower plots are a repeat of the middle plots but excluding the prior on the recruitment residuals for the “south” stock.