

## Summary of Sardine Documents Provided for the MARAM International Stock Assessment Workshop

C.L. de Moor\*

Correspondence email: [carryn.demoor@uct.ac.za](mailto:carryn.demoor@uct.ac.za)

Below is a list of the primary papers provided for the sardine discussions at the December 2013 MARAM International Stock Assessment Workshop. A brief description of each document and some pointers to sections of these documents that relate to some of the key questions are given.

### Primary documents

MARAM IWS/DEC13/Sardine/P1 – The assessment model used for a single and two sardine stock hypothesis is detailed in Appendix A. This document gives the posterior mode results of a “base case” two stock model and a few selected sensitivity tests. A glossary of parameters used is provided in Appendix B. Note the discussion of west-south movement of recruits on pages 8-9 (which provided the movement hypothesis *MoveB*), and summary paragraph (pg10) that the west stock is substantially more productive than the south stock.

The baseline operating model used thus far for simulating the consequences of alternative management scenarios is based on the “base case” model of this document, except that the following changes have been made to fix rather than estimate the following parameters:

- i) Standard deviation in the residuals about the stock recruitment curve:  $\sigma_{j=1,r}^S = \sigma_{j=2,r}^S = 0.5$  ;
- ii) Multiply bias associated with the coverage of the “south” stock recruits by the recruit survey in comparison to the “west” stock recruits during the same survey:  $k_{cov E}^S = 1.0$  ; and
- iii) Standard deviation about the meanlength for age 0 of sardine:  $\vartheta_0 = 3.0$ .

MARAM IWS/DEC13/Sardine/P2 – Details an alternative “environmental switching” scenario for future movement of sardine recruits from the “west” stock to the “south” stock (*MoveE*).

MARAM IWS/DEC13/Sardine/P3 – Provides an update to the Interim OMP-13 v2 HCRs, to provide a first draft of HCRs for a two-area sardine TAC. The directed >14cm sardine HCR is detailed on top of page 8, middle of page 9, and page 12.

MARAM IWS/DEC13/Sardine/P4 – Some results from projecting the sardine and anchovy resources under a no catch scenario, a single area sardine TAC HCR (Interim OMP-13 v2), and a two area sardine TAC HCR. Results are given assuming either a single or two sardine stock operating model, with three different recruit movement scenarios for the two stock OM.

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\* MARAM (Marine Resource Assessment and Management Group), Department of Mathematics and Applied Mathematics, University of Cape Town, Rondebosch, 7701, South Africa.

## **Background documents**

Comments below attempt to indicate reasons why readers might wish to refer to each document.

MARAM IWS/DEC13/Sardine/BG1 – gives results for a single stock sardine assessment based on the same data<sup>1</sup> as used in MARAM IWS/DEC13/Sardine/P1.

MARAM IWS/DEC13/Sardine/BG2 – provides the technical details of the basis used to calculate the projection results reported in MARAM IWS/DEC13/Sardine/P4.

MARAM IWS/DEC13/Sardine/BG3 – “Proposal 3” of the document provides the details of the method used to split catch between two sardine stocks when only a single area TAC is simulated.

MARAM IWS/DEC13/Sardine/BG4 – provides the Operational Management Procedure (“Interim OMP-13 v2”) used temporarily in July 2013 to set final 2013 TAC/Bs, while further work on appropriate sardine HCRs continued. MARAM IWS/DEC13/Sardine/P3 was developed from this basis, and Interim OMP-13 v2 is used for some projections in MARAM IWS/DEC13/Sardine/P4.

MARAM IWS/DEC13/Sardine/BG5 – provides some initial results from projecting a single area sardine TAC HCR under a single or two sardine stock operating model. Some of these results were updated/repeated in MARAM IWS/DEC13/Sardine/P4.

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<sup>1</sup> Except for the time series of recruitment east of Cape Infanta.