

# ***Interactive comment on “Biogeochemical climatology for the Southern Benguela Upwelling System, constructed from *in situ* monitoring data” by Stephanie de Villiers***

## **Anonymous Referee #1**

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This paper discusses a dataset obtained from a monitoring line over a 12-year period within the southern Benguela upwelling zone. The data have been discussed previously by Hutchings et al. (2009), Lamont et al. (2015) and Ismail et al. (2015), but the data set is important because it is the first long-term, consistent monitoring line from this region since the 1960s, when the South African Sea Fisheries Research Institute carried out regular seasonal surveys of the St Helena Bay region. Since then, there have been only limited, short-term, time-series surveys of particular regions in the Benguela. The early work was described in Shannon (1985) and Chapman and Shannon (1985), and since then additional time-series studies have been carried out by Bailey and Chapman (1991) and Monteiro and van der Plas (2006). These studies

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are not mentioned in the paper, which concentrates only on monthly and annual averaged climatologies. While these are generally useful, I am not particularly convinced of their usefulness in this region, which is known to be strongly affected by short-term variability in the local wind field (see e.g., Taunton-Clark, 1979; Johnson and Nelson, 1999), and where inter annual variability is also important.

Given that this is a paper about the data set, I was annoyed that the author did not give details of the methodology used for either analyses or data calibration. This is a major omission. It is not enough to say that details are given in other papers. I want to know how you did the data reduction, what criteria were used to remove suspect data, how many comparisons of CTD oxygen and salinity samples were done, whether the nutrient samples were frozen or analyzed on board ship, and something about the ranges and standard deviations of the data. Given the 12-year time period, it may be that not all of this information is available, and the author does say this, but I certainly want to know as much about the sampling and data management as possible. A list of signal-to-noise ratios for the deepest sample taken along the line doesn't help if you don't give the actual concentrations. Note also that there is a strong movement towards giving nutrient and oxygen data in  $\mu\text{moles/kg}$ , rather than  $\mu\text{moles/dm}^{-3}$ .

As a reviewer, I was asked to check the data quality. Having registered with PANGAEA especially for this purpose, I logged in and was told I am not allowed access to the data set, which rather negates the purpose of this review. So my rating of the data quality is colored by this (I wanted to leave this blank but the system would not allow me to do so). However, from the available metadata, there are some discrepancies between the paper and the database. For example, while the paper discusses data from 12 stations, the database apparently contains data from only 10 (the two deepest stations are missing), similarly, the station positions in PANGAEA differ slightly from those listed in Table 1, although generally only in the third decimal place.

I'm sure that the data are important, and they should be announced and made available, but if nobody is going to be able to access them what is the point?

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Minor comments: 1. P3, lines 20-21 – is this really true for this part of the Benguela? The Sea Fisheries Research Institute (now part of the South African Department of Environmental Affairs) has carried out an enormous amount of research into the hydrography of the St Helena Bay region in particular since the 1950s. 2. P4, line 4 – it would help to put the sites on Fig. 1. 3. Data are plural! 4. While it is easy to make continuously shaded color figures that look pretty, in this case I think it is unnecessary and detracts from the usefulness of the figures. The contour lines are what one needs to see, and because the same color scheme is used throughout the paper, color changes and contour lines do not generally correspond, and no color scales are given. It was almost impossible to see contours in the deep blue regions of the figures, for example any temperatures  $<10^{\circ}\text{C}$ .

#### References:

Bailey, G.W. and P. Chapman (1991). Short-term variability during an anchor station study in the southern Benguela upwelling system: chemical and physical oceanography. *Prog. Oceanogr.*, 28, 9-37.

Chapman, P., and L. V. Shannon (1985), The Benguela ecosystem, Part 2. Chemistry and related processes, *Oceanogr. Mar. Biol. Ann. Rev.*, 23, 183–251.

Hutchings L, Van der Lingen CD, Shannon LJ, Crawford RJ, Verheye HMS, Bartholomae CH, van der Plas AK, et al. The Benguela Current: an ecosystem of four components. *Prog. Oceanogr.* 83: 15-32 (2009).

Ismail HE, Agenbag JJ, de Villiers S, Ximba BJ. Relation between upwelling intensity and the variability of physical and chemical parameters in the Southern Benguel Upwelling System. *Int. J. Ocean.* [Dx.doi.org/10.1155/2015/510713](https://doi.org/10.1155/2015/510713) (2015).

Johnson, A. and G. Nelson (1999). Ekman estimates of upwelling at Cape Columbine based on measurements of longshore wind from a 35 year time-series. *South Afr. J. Mar. Sci.* 21, 433-436.

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Lamont T, Hutchings L, van den Berg MA, Goschen WS, Barlow RG. Hydrographic variability in the St Helena Bay region of the southern Benguela ecosystem. *J. Geophys. Res: Oceans* 120: 2920-2944, doi:10.1002/2014JC010619 (2015).

Monteiro, P. M. S., and A. K. van der Plas (2006), Low Oxygen Water (LOW) variability in the Benguela system: Key processes and forcing scales relevant to forecasting, in *Benguela: Predicting a Large Marine Ecosystem*, Large Mar. Ecosyst. Ser., vol. 14, edited by V. Shannon et al., pp. 71–90, Elsevier, Amsterdam).

Shannon, L. V. (1985), The Benguela ecosystem, Part 1. Evolution of the Benguela, physical features and processes, *Oceanogr. Mar. Biol. Ann. Rev.*, 23, 105–182.

Taunton-Clark, J. (1979). The formation, growth and decay of upwelling tongues in response to the mesoscale wind field during summer. In: *South African Ocean Colour and Upwelling Experiment*, ed L.V. Shannon, pp 47-61, Sea Fisheries Research Institute, Cape Town.

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