

Interactive comment on “Seasonal and interannual variability of water column properties along the Rottneest continental shelf, south-west Australia” by Miaoju Chen et al.

J. Kämpf (Referee)

jochen.kaempf@flinders.edu.au

Received and published: 6 November 2018

This is a well-written scientific report of the seasonal and interannual variability of water column properties along the Rottneest continental shelf, south-west Australia, based on glider data. The study includes chlorophyll fluorescence which adds relevance to carbon cycles and marine ecosystems. Here are a few comments that the authors should address in their revisions.

- 1) The abstract is tooooooo long. Can it be shortened?
- 2) Colors can be deceptive. Please add contours to figures 6,7 and 8.

C1

3) What do you mean by structure anomalies in Figures 6,7, and 8? Anomalies relative to a surface value? Relative to a seasonal average? Or an annual average? Please show absolute distributions or, at least, the reference value/profile that your anomalies are based on. Perhaps, you should also present seawater density distributions and discuss seasonal variations of the density structure.

4) Figure 9 is difficult to interpret. Is there a way to fill the data gaps using satellite SST? Why do you present this figure? Perhaps this would be better placed in the methodology section together with a discussion of data gaps?

5) It would be nice to have true chl-a values rather than just data from the BBFL2SLO optical sensor. How confident are you that your fluorescence data represent true chl-a, in particular close to the seafloor? How is this bottom chl-a maximum created? Is there any reason why you decided not to discuss CDOM?

6) In our previous study (Kämpf and Kavi, 2017), we identified seasonal chl-a maxima in the Great Australian Bight in austral autumn months. Is this feature, which is not too far away from your study region, consistent with your observations? If so, please discuss this.

7) In the last sentence of the abstract you claim that "It is concluded that the observed seasonal and inter-annual variability in chlorophyll fluorescence concentrations were related to the changes in physical forcing (wind forcing, Leeuwin Current and air-sea fluxes)." This statement is far too general and misleading given that you didn't analyze air-sea fluxes. You also don't specify what type of air-sea flux you are referring to. Dust influences? Heat fluxes? Neither did you calculate the classical upwelling index or estimate the possible influence of mesoscale eddies that could lead to dynamic uplift of nutrient-rich water across the shelf break or passing baroclinic coastally trapped waves.... Much more effort would be required to identify reasons of the observed variability of chlorophyll fluorescence concentrations.

8) In the autumn of 2014, the chlorophyll fluorescence increased ($> 1 \text{ mg m}^{-3}$). Do

C2

you know why?

Reference: Kämpf, J., and A. Kavi (2017), On the “hidden” phytoplankton blooms on Australia’s southern shelves, *Geophys. Res. Lett.*, 44, 1466–1473, doi: 10.1002/2016GL072096.

Interactive comment on *Ocean Sci. Discuss.*, <https://doi.org/10.5194/os-2018-115>, 2018.