

***Interactive comment on* “Towards understanding hydroclimatic change in Victoria, Australia – why was the last decade so dry?” by A. S. Kiem and D. C. Verdon-Kidd**

Anonymous Referee #2

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Review “Towards understanding hydroclimatic change in Victoria, Australia-why was the last decade is dry?” by A.S. Kiem and D.C. Verdon-Kidd

In this study the authors investigate the characteristics of the most recent changes in Victorian rainfall and stream flow.

Although some interesting results are presented the article fails to provide a substantial contribution towards the understanding why the last decade was so dry. Some of the conclusions are not really new and others are not supported by the data. In addition the paper is not very well focused and the different topics are not investigated in depth.

I will discuss these issues more in detail below. My conclusion is that it cannot be published in its present form.

Detailed comments

1. They argue that the recent reduction in the mid 1990's in Victorian rainfall is not unusual and has happened before. However, according their table 2 only during the mid 1990's there was a significant step towards drying for all sites. For the other dry periods there was much more variation among the different sites. This is not discussed. In addition they argue that SAM index is one of the drivers of the rainfall fluctuations. Fig. 6 shows a large trend of the SAM from 1950 towards the end, being the main signal. This is not discussed. Thus although the authors claim that the 1990's are not unusual, their own analysis point towards a different direction. Any possible connection with the recent global warming is ignored. This hypothesis should be tested much better before it can be rejected. It might well be that the trend in the SAM is related to global warming.

2. The connection between the change in circulation patterns and the three large-scale indices is presented in table 3. I found this table hard to interpret. I would urge the authors to present the results in a more graphical way in which the connection can be better grasped. In this way the connection between the circulation patterns and these indices is rather vague. This is realized by the authors when they state that: "It seems that both SAM and ENSO play a role in modulating synoptic patterns and therefore rainfall during autumn". The connection between SAM and ENSO and rainfall in south east Australia is not new. This connection should be explored more in detail to be valuable.

3. They argue that the drying since the 1990's is due to a combination of El-Nino and SAM. This is based on hand-waving arguments. There is no quantification given how much ENSO and SAM have affected the rainfall in south east Australia since 1990's.

4. They criticize the arguments of Cai and Cowan for explaining the reduction in stream

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flow, without putting forward new hypothesis. Figure 7 presents interesting results but is only a starting point. Therefore the whole topic of changes in stream flow is not investigated in depth and gives hardly any new information.

The most interesting aspect of this article is the connection to the change in circulation patterns (fig. 5). I would suggest the authors to focus on this aspect.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6181, 2009.

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