

## ***Interactive comment on “Toward a classification of the Central Pacific El Niño” by M. Pascolini-Campbell et al.***

### **Anonymous Referee #1**

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This manuscript explores a number of methods that attempt to classify different types of El Niño events. It proposes a “majority statistics” using 10 methods and 5 data sets to identify a “consensus dates” on a particular type of El Niño called “Central Pacific El Niño (CP)”.

#### Comments:

- This manuscript is an interesting effort but fails to convince it is a contribution of interest to the current efforts and debate on ENSO diversity.
- First, there is little if no mention of the numerous recent studies that dispute the reality of the statistical distinction of a “new” type of El Niño (Nicholls 2008, Na et al. 2011, Lian and Chen 2012, L’Heureux et al 2012, . . .), some arguing convincingly

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that there is rather a continuum with some interesting extremes (e.g. Giese and Ray 2011). The authors put in the same bag this proposed EP/CP distinction and the older thermocline/SST mode distinction (e.g. Fedorov and Philander 2001) but it is unclear in what respect they are the same thing.

- Second, the various data sets used are not detrended, and the impact of this is not shown or discussed.

- Third, I believe the interpretation of the Takahashi et al. results given in the manuscript is wrong: they do not support the CP/EP distinction but rather distinguish extreme events from regular events which definition is not based on the longitudinal location of the SST anomaly.

- Finally, there are a number of rather weak or vague arguments as well as ad-hoc statistical methods. In particular the “majority statistics” is based on a very ad-hoc approach rather than on formal statistics.

#### References:

Fedorov, A. V., & Philander, S. G. (2001). A Stability Analysis of Tropical Ocean-Atmosphere Interactions: Bridging Measurements and Theory for El Niño. *Journal of Climate*, 14, 3086–3101.

Giese, B. S., and S. Ray (2011): El Niño variability in simple ocean data assimilation (SODA), 1871–2008, *J. Geophys. Res.*, 116, C02024

L’Heureux, M., Collins, D., & Hu, Z.-Z. (2012). Linear trends in sea surface temperature of the tropical Pacific Ocean and implications for the El Niño-Southern Oscillation. *Climate Dynamics*, 1–14. doi:10.1007/s00382-012-1331-2

Lian T., and D.Chen (2012) An Evaluation of Rotated EOF Analysis and Its Application to Tropical Pacific SST Variability. *J. Climate*. doi:10.1175/JCLI-D-11- 00663.1, in press.

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Na et al. (2011): Statistical simulations of the future 50-year statistics of cold-tongue El Niño and warm-pool El Niño. *Asia-Pacific J. Atmos. Sci.*, 47(3), 223-233

Nicholls, N., (2008): Recent trends in the seasonal and temporal behaviour of the El Niño Southern Oscillation. *Geophysical Research Letters*, 35(L19703)

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