Earth Syst. Dynam. Discuss., 5, C406–C407, 2014
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Earth System Dynamics
Discussions

Interactive comment on "Decadal regime shift linkage between global marine fish landings and atmospheric planetary wave forcing" *by* A. M. Powell Jr. and J. Xu

Anonymous Referee #1

Received and published: 29 August 2014

This work investigated a global forcing mechanism for decadal regime shifts of climate and their subsequent impacts. They argued that the global atmospheric planetary waves that can lead to changes in the global surface air–sea conditions and subsequently fishery changes. This is a very challenging topic. Manuscript is written well and fit the scope of this journal. I recommend to accept this paper after some minor revisions.

(1) The Connection of troposphere and stratosphere: The connection between troposphere and stratosphere is a controversy topic in the community. From my experience, the impact of stratosphere on troposphere exists, but it is weak and also the impact is only present in some specified regions (such as polar and tropical ocean regions) (see

the following references). This should be discussed in the paper. Huang, B., Z.-Z. Hu, J. L. Kinter III, Z. Wu, and A. Kumar, 2012: Connection of stratospheric QBO with global atmospheric general circulation and tropical SST. Part I: Methodology and composite life cycle. Clim. Dyn., 38 (1-2), 1-23. DOI: 10.1007/s00382-011-1250-7. Baldwin, M.P., L.J. Gray, T.J. Dunkerton, K. Hamilton, P.H. Haynes, W.J. Randel, J.R. Holton, M.J. Alexander, I. Hirota, T. Horinouchi, D.B.A. Jones, J.S. Kinnersley, C. Marquardt, K. Sato, and M. Takahashi, 2001: The Quasi-Biennial Oscillation. Rev. Geophys., 39, 179-229. Liess, S., and M. A. Geller, 2012: On the relationship between QBO and distribution of tropical deep convection. J. Geophys. Res., 117, D03108. DOI: 10.1029/2011JD016317.

(2) Significance of the results: From Fig. 2, it seems that determination of the shifts are not objective, how to judge the rationality? For example, on page 10, it is necessary to make the significant test for the five regime shifts. Some regime shifts may not be able to pass the significant t-test. Also, how significance of these reconstructed fields and are they significance fields (for example based on Monte-Carlo test; Livezey and Chen 1983)? These questions at least should be discussed. Livezey, R. E., and W. Y. Chen, 1983: Statistical field significance and its determination by Monte Carlo techniques. Mon. Wea. Rev., 111, 46–59.

(3) Others: In section 2, the fish catch data are used to represent the variation of marine ecosystem, better give more evidence to verify the reliability of the data? Fig. 5 is similar to the previous publication of Powell and Xu (2012), may remove it.

Interactive comment on Earth Syst. Dynam. Discuss., 5, 945, 2014.