

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

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This paper addresses a complex subject the multilevel effects of a global forcing mechanism. Stratospheric planetary wave changes are related to fishery landings through changes in surface wind stress leading to changes fishery productivity. It is certainly valuable to show that these connections can be made. This paper does a good job of establishing the necessary connections. The paper fits within the scope of this journal and should be published with consideration of a few minor revisions.

Overall: The paper is well written, but is still likely to remain challenging to some multidisciplinary audiences. To some extent this is unavoidable given the breadth topic.

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Answer: Thank you very much for your positive comments

The paper would benefit from more explicit discussion of the variations in the fishery responses to the changes in atmospheric forcing regimes. Two questions to consider could be: First, should the fisheries response lag the atmospheric regime shift? (P955 and figure 4) The linking mechanism is through habitat and food availability changes that would affect growth and reproduction in the fish species, which takes time.

Answer: Yes, you are right, it is true that the response of fish species to the atmospheric regime shifts should have some time lag. But it is very difficult to identify the lag time over the decadal time scales based on the global ocean basin. Based on articles reviewed, the response times of different fish species due to environmental change is in the range of 1 to 4 years, significantly less than the decadal periods analyzed.

Secondly, is there variation in species group responses to the forcing? For example it might be expected that the forage fish groupings (HAS(3)) may have a stronger response.

Answer: Yes, there are some different activities based on previous studies, but in the current study, the fish species grouping is according to the similar fish type and the depth of fish activity. More detailed differences will be examined in the next study.

Minor comments: Page 950 line 20. The FAO database includes landings of freshwater fish, marine fish, diadromous fish, shellfish, and mammals. However, it appears that this analysis includes only marine fish. It should be clarified that the groupings used here do not represent all aquatic species.

Answer: Yes, please check, "The nine families of FAO aquatic species are listed in Fig 1 along with a map of the 14 sub-regional data collection areas" has been changed into "The nine families of FAO marine fish species are listed in Fig 1 along with a map of the 14 sub-regional data collection oceanic areas"

Table A2: I find this table confusing because the formatting changes between pages

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975 and 976 this makes it appear to be two separate tables.

Answer: In order to avoid the confusion, the Table A2 is separated into Table A2a and Table A2b. Table A2a on Page 975 indicates the fish species over the Atlantic and Pacific Oceans. Table A2b on page 976 indicates the fish species over the Indian Ocean

Please also note the supplement to this comment:

<http://www.earth-syst-dynam-discuss.net/5/C702/2015/esdd-5-C702-2015-supplement.pdf>

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

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