

## ***Interactive comment on “Wind variability in the Canary Current during the last 70 years” by Nerea Marrero Betancort et al.***

### **Anonymous Referee #1**

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“Wind variability in the Canary Current during the last 70 years”

The manuscript under review is eminently descriptive. It is focused on the changes of direction and intensity of the wind in a limited area of the Canary upwelling system. Anyway, it could be an interesting contribution to the field. At this point, the article should be upgraded in some ways to be suitable for publication. The paper presents some uncertainties and mistakes:

- Minor revisions:

1) Regarding the comparison of the databases, authors used PODAAC data which is limited from 1988 to 2011. There exists other database with similar resolution as, for example, CFSR which covers a temporal resolution from 1982 to nowadays. So author

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should explain why they chose PODAAC being able to choose other options.

2) The selection of the area under study raises some uncertainties. First, the selection of the point north of the Canary Islands in Figure 1b. It is well-known that upwelling in the area occurs mainly near the coast and that weakens away from the coast. If the study is focused in the upwelling area and on the Bakun hypothesis, perhaps it should be better to choose points closer to the coast. Second, the area under study was set between 27°N and 30°N, and 11°W to 20°W. However, the Canary upwelling system covers a larger area. In fact, Cropper et al., (2014) established 3 different areas of the Canary upwelling system. The present study was limited to the “weak permanent upwelling” area of that study. Figure 1a shows that the highest wind intensity reach 24 °N in the south, why the authors limited their study to a smaller region? Is the north of the Canary Island the best spot to conduct studies about upwelling in the area?

3) The comparison with AMO and NAO raise some questions. To what extent are such low values of  $r$  (for example 0.45 or 0.27) sufficient to assume a certain relationship between the variables (Line 126)? Moreover, those values refer to February when upwelling is weaker or inexistent. To what extent these results affect upwelling in the area? Is there any explanation to establish a lag of 10 years (even closer to 20 years according to figure 10) or is it totally arbitrary?

4) It would be interesting to add a figure with a compass rose to show the seasonal behavior of the wind in a much more intuitive way.

- Minor comments:

1) Line 29: “Currently, the research about the response of the EBCS and the associated impact under a global climate change scenario have motivated numerous studies over different time periods” This statement should be supported by some references

2) The terminology “decrease or increase” of wind direction is controversial and more appropriated to wind intensity (for example in Line 94) . I recommend the authors to

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use other expressions as “change”

3) Line 12: Delete “of the oceans”

4) Line 13: Change “word” to “world”

5) Lines 14-15: Change “Nearly 30 years ago, Bakun raised a hypothesis contending that coastal upwelling in eastern boundary upwelling systems (EBUS) might be intensified as the effect of global warming due to the enhancement of the Trade Winds as the effect of increasing pressure differences between the ocean and the continent” to “Nearly 30 years ago, Bakun raised a hypothesis contending that coastal upwelling in eastern boundary upwelling systems (EBUS) might be intensified by global warming due to the enhancement of the Trade Winds increasing pressure differences between the ocean and the continent”.

6) Line 17: Change “theses” to “these”

7) Line 26: Delete “of the world ocean”

8) Figure 5, 8 and 9: Change “times” to “time”

9) References: - Some references are overlapped - Debernard and Roed, 2008 does not appear in the text - Hurrell (both references) are wrong in the text (Lines 153-154)

Please also note the supplement to this comment:

<https://www.ocean-sci-discuss.net/os-2020-18/os-2020-18-RC1-supplement.pdf>

Interactive comment on Ocean Sci. Discuss., <https://doi.org/10.5194/os-2020-18>, 2020.

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