Weather Clim. Dynam. Discuss., referee comment RC1
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Comment on wcd-2021-64

Anonymous Referee #1

Referee comment on "Extreme Atlantic hurricane seasons made twice as likely by ocean warming" by Peter Pfleiderer et al., Weather Clim. Dynam. Discuss., https://doi.org/10.5194/wcd-2021-64-RC1, 2021

This manuscript explores the question of whether recent extreme hurricane seasons can be attributed to changes in circulation and SST. To explore this question, the authors use a new statistical model to explore weather patterns and find that increases in Atlantic SSTs have led to an increase in the probability of extremely active hurricane seasons. While I think that this is an interesting result worthy of publication, I believe that in its current form the manuscript has two major issues:

- There are several inconsistencies throughout the manuscript (see examples below), as it pertains to the time periods and regions used for the analysis. Some additional clarity is needed and urge the authors to check the full manuscript for consistency.
- In its current form, I find the organization and utility of the supplementary information figures difficult to follow. While there are references to the figures throughout the main manuscript, the order - and need for 28 additional figures - is not clear and distracts from the main results of the manuscript. I would encourage the authors to include all necessary figures for interpreting the results in the main manuscript and use supplementary information plots to contextualize statements. In addition, all Figures should be able to stand on their own and be interpretable. I find the lack of axis markers and labels limit the effectiveness of some figures.

Once these major comments, as well as the list of minor comments below, are taken into consideration, I believe the manuscript would be suitable for publication in Weather and Climate Dynamics.

Additional Comments:

L49: Why is the 1979-2018 period used? In doing so, the authors are leaving out the

2019 and 2020 seasons, which were destructive. Does the signal become larger? If so, this would be very interesting to include.

L53: What is the original frequency that is averaged to daily?

L55: Why is the SST averaging area (20W-90W) different than the area used to classify the weather patterns (10W-90W)? Is the analysis sensitive to this approach?

L57: IBTrACKS should be IBTrACS.

L58: How is this region in Figure S3 selected? Why not all of the Atlantic? Is the results sensitive to this selection?

L60: When calculating ACE, do the authors follow Bell et. al, 2000 and only include storms while they are tropical storm strength or great? That should be clarified since the NOAA classification for above normal and extremely active seasons. Are the results sensitive to this methodology?

L93: Missing "and" before iii)

Figure 2: States SST areas is 85W-20W, 10N-20N which is different than the in-text description.

L150: How is major hurricanes defined?

Figure S1-3, S5 and S7: Should include axis (lat-lon) markers.

L152: Why is 1982-2018 used here, when it was stated earlier that 1979-2018 is used for classification of weather patterns?

L195: Why is 1900 used, if the long-term SST trend calculation starts with 1850?

L230-234: What about all years?

L240-241: What about dust impacts on these weather patterns and potential trends?