

Interactive comment on “Oceanic response to the consecutive Hurricanes Dorian and Humberto (2019) in the Sargasso Sea” by Dailé Avila-Alonso et al.

Anonymous Referee #2

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General Comments:

1. The study describes the response of the ocean to two consecutive hurricanes in 2019, looking at various aspects, including temperature change, heat content and chlorophyll. The paper is well written and interesting, though the results are not unexpected or especially new. It should be noted though that studies of consecutive hurricanes in this region are not new - the authors may have not been aware for example of some recent studies (that should be cited) of the impact of consecutive hurricanes on the same region, including Todd et al. (2018) on the 2017's hurricanes and Ezer (2020) who studied the same Dorian and Humberto hurricanes of this study! However,

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the aforementioned papers focused mostly on the impact of hurricanes on coastal sea level and ocean currents (and the Gulf Stream in particular), while here the additional analysis of biological impacts and chlorophyll is an interesting new kink that worth publication. With regards to ocean dynamics, it would be useful to add a little more discussion - the study area is strongly influenced by the Gulf Stream which was significantly weakened during Dorian (Ezer, 2020) and this had implications for mixing and advection, since a weakened GS could also contribute to relative cooling downstream when advection of warm tropical waters slows down. It would have been interesting also to extend the study period to see the timescale of recovery after the storm and the role that the GS plays in this recovery.

References:

Todd, R.E., T.G. Asher, J. Heiderich, J.M. Bane, R.A. Luettich (2018), Transient response of the Gulf stream to multiple hurricanes in 2017, *Geophys. Res. Lett.*, 45, doi:10.1029/2018GL079180.

Ezer, T. (2020), The long-term and far-reaching impact of hurricane Dorian (2019) on the Gulf Stream and the coast, *J. Mar. Sys.*, 208, doi:10.1016/j.jmarsys.2020.103370.

Specific Comments:

2. Abstract- Sentence starting “Overall, . . .” (line 7) and ending “. . .post-storm weeks, respectively.” (line 12) is too long, cumbersome and needs separating to shorter sentences and rephrasing.

3. Introduction- The discussion is mostly about climate change and hurricanes, and not enough on the actual topic of the study, i.e., the processes involved in the impact of storms on the upper ocean.

4. Line 35- I suggest deleting “In agreement”, its awkward to start a paragraph this way.

5. Lines 38-39- Maybe add citation to Todd et al. (2018) who studied the same men-

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tioned hurricanes, and when discussing Dorian (lines 42, 62, etc.) may cite Ezer (2020).

6. Figures 6a and 11a- It is unclear how they were done and what they represent- how can one compare a hurricane at a particular year and a particular week to past years?, and what does the clear trend represents. It seems that there is much more information in these figures than described and the interpretation is unclear.

7. Lines 305-312- When discussing the dynamics and mixing processes, may be add something about the role of the Gulf Stream, as in Ezer (2020).

8. Fig. 12c- Are those absolute geostrophic velocity? or velocity anomaly? Anomalies do not tell us much, maybe also show the absolute SSH and velocity to indicate the hurricane track relative to the mean flow of the subtropical gyre and the GS.

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