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Interactive comment on "A NEMO-based model of *Sargassum* distribution in the Tropical Atlantic: description of the model and sensitivity analysis (NEMO-Sarg1.0)" *by* Julien Jouanno et al.

Anonymous Referee #2

Received and published: 1 March 2021

This is a very useful and valuable paper that will help contribute to the understanding of Sargassum. I recommend it for publication following the authors' consideration of the below points.

First sentence abstract: Consider altering tense "The Tropical Atlantic has been facing. . .."

Second sentence abstract: Consider being more specific about what kind of "Sargassum modelling" you mean. Transport? Growth? Population dynamics? Life-cycle? Food-web? You mention specifically what you do shortly thereafter, but I think some clarifying what type of model is needed for seasonal forecasts would be helpful.

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Discussion paper

First sentence introduction: Consider rewording to ". . . in the Northern Tropical Atlantic Ocean from 2011 to present causes annual. . ."

Line 37: consider a different word from "evolution." Many of your readers are biologists and will think that you are referring to genetic change through time (e.g., via natural selection) and I don't think that is how you intend the word to be used.

Line 71: what do you mean by "wind, wave or any event" ? Do you mean any weather event?

Line 99: I am not an expert on ocean circulation models, but it has been shown in some cases that 1/4 degree resolution models can "average out" sometime important aspects of ocean circulation. How does this relatively coarse grid resolution bias our view of the importance of wind/waves? Are these results model configuration specific? See: Putman, N.F. and He, R., 2013. Tracking the long-distance dispersal of marine organisms: sensitivity to ocean model resolution. Journal of the Royal Society Interface, 10(81), p.20120979.

Line 113: Daily fields are used for the PICES model, what did you use for the NEMO-based ocean circulation model? Also daily?

General Methods: can you clarify details on the wind/wave models(data?) used for testing the influence of windage and Stokes drift?

Line 288: Is this an ocean model resolution issue? Perhaps the energetic eddy fields are not well resolved and the simulated Sargassum moves more linearly into the Caribbean?

Table 1: I am a little confused on the Parameter range for Windage. The Putman et al. paper cited tracked Sargassum mats with GPS devices and compared movements to predictions in the operational hindcast HYCOM model and used winds from NOAA's Blended Sea Winds. Their simulations that best matched the actual Sargassum mats used Windage values of 1% or 3%. They noted that the particular value was likely

dependent upon the ocean and wind models. I am not asking you to conduct new simulations, but can you explain why you chose not to consider stronger values of windage in your simulations? Figure 8: This is a very interesting Figure. There is certainly good agreement on the Sargassum beaching locations in Africa and the Caribbean. However, I also find it interesting how much beaching is predicted in the Gulf of Mexico. My understanding is that there has been very little stranding in the western Gulf of Mexico over the past several years (I believe including 2017). Can you explain this discrepancy if it is a “false positive”?

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