

## ***Interactive comment on “On the potential causes of the recent Pelagic Sargassum blooms events in the tropical North Atlantic Ocean” by Sandrine Djakouré et al.***

### **Anonymous Referee #2**

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This paper reports about the relationship of Sargassum biomass with changes in temperature and nutrient levels, trying to elucidate the cause of sargassum blooming in tropical North Atlantic Ocean by analyzing the interannual variability of oceanic and atmospheric state-variables. The conclusion presented here that the combined effect of warmer SSTs and the increase of nitrate and phosphate continental inputs from the Amazon River leads to the pelagic Sargassum blooms. The data have been analyzed technically and the deduction looks convincing, however, there are several parts where the manuscript should be improved significantly, including the overall grammar of the text.

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## General and specific comments

1. Method: it is necessary to add a map showing studied area, water depth and hydrodynamic features; The geographic boundary of model must be given in the method.
2. According to satellite images (Hu et al, 2016; Wang and Hu, 2017), Sargassum bloom drifted from Gulf Mexico to Atlantic Ocean then to northeast offshore of Brazil. Thus, nutrient sources should be identified at meso-scale, from coastal waters or offshore? maybe the nutrient contribution of Amazon River to sargassum growth is much lower than equatorial upwell.
3. the analysis between sargassum biomass, climate signal and nutrients is a bit of simple; bloom is a seasonal phenomenon, thus, the variability link between seasonal biomass, nutrient and temperature are more practical and a statistical analysis is necessary.
4. Species names should be italic, please check it throughout the manuscript.
5. The materials and methods section only show the source of datasets, but little information about the significance of these data has been introduced to readers. More details should be added on this section.
6. The results section should be rewritten to avoid using references.
7. Page 9 line 3-10 "This warming of the SST could have been in favor of Sargassum blooms. . .which has been found to be affected by light and nutrient conditions", it is confused here and the relationship between optimum growth temperature and nutrient conditions should be clarified.
8. Page 9 line 15-22, I could not understand how does the climate indices influence the blooms? Franks et al. suggested that the repetitive and unprecedented peaks in NAO, AMM, AMO have generated blooms, but this manuscript conclude that major climate variations in the tropical Atlantic cannot directly explain blooms, why?

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7. Page 10 line 19-21, “the subsurface intake of nutrients in the equatorial upwelling region could also have contributed in the blooms and the mass strandings of the Sargassum blooms (Fig. 5b) in the Atlantic Ocean”, I could not find any proof in this manuscript to support this statement, please explain it clearly. In addition, the discussion usually does not contain (Fig...).

8. Throughout the discussion, little explanation has been made to the combined effect of warmer SSTs and the nutrients, however, the authors concluded that the combined warmer SSTs and the increase of nitrate and phosphate continental inputs of the Amazon River induces the Sargassum blooms in the tropical Atlantic Ocean. It is inappropriate.

9 Too much conj./adv. (such as: however, thus, moreover, etc) have been used in discussion.

10. Refereces: Need to double check the references. Such as that at lines from 31-34, the authors' names are not right, should be K. Gao and K.R McKinley 1994.....

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