Reviewer #4: I read the sections "i) Global ocean phytoplankton", "j) Global carbon cycle", and sidebars 3.1 "BioGeoChemical Argo" and 3.2 "OceanObs'19".
I have only few comments mainly pertaining to language, presentation or clarifications.

*We thank you very much for this assessment, and for your review. Our responses to your suggestions and questions are noted below.*

i) Global ocean phytoplankton

In general, the chapter is well written and informative, in line with previous issues of the State of the Climate report. Below, I've listed a few suggestions and questions.
Before, I'd have a general comment on the use of the MODIS sensor on-board Aqua. This sensor has been ageing for a few years already and I had understood that the use of its data for climate studies had become questionable. Co-authors of the section are from NASA so they should know better but it is still a point that should be clarified. Actually, they cite the PACE future mission at the end of the section (which is fine for its planned capabilities) but never mention that there are 'younger' sensors in orbit.

l.1062: acronyms of missions
Citing SeaWiFS and MODIS is fully relevant but the sentence might be a heritage of past State of the Climate reports. It might be fairer to say that a suite of "spaceborne radiometers allow … ", which would encompass MERIS, 2 VIIRS, 2 OLCI's …

l.1066: "however": for me it would mean an opposition that does not seem the message here.

*“however” deleted.*

l.1080: "was used to assess and correct…": is there a reference for this step?

l.1098: "nutrient replete conditions": does the sentence mean that phytoplankton is considered nutrient-replete in these conditions? Nutrients is actually scarce in the considered regions…

l.1119: "September": or October?

l.1150: "colored": isn't "chromophoric" the preferred term?

Fig.3.24: I don't see any lettering in the figure.

*This will be fixed during typesetting at BAMS.*

l.2266: "SeaWiFS"

*Fixed*.

j) Global carbon cycle

The Chapter gives an appropriate picture of the topic. I would however recommend revising a few sentences to make it clearer and I have questions on Fig. 3.27.

l.1186-1187: the use of the minus sign is a bit odd here since the sentence indicates a contribution from river systems to ocean.

l.1195: isn't it rather that Canth fluxes are due to air-sea pCO2 imbalance ?

l.1198: I'd write "then Canth"

*Done.*

l.1208: this sentence could be improved; I understand that SST and SSS are for 2019; what about Chla and atmospheric CO2 ? I'd suggest something like: "observed 2019 values for SST and SSS, and climatological values for MLD, satellite Chla and atmospheric CO2", or variations on that pattern.

l.1211: "The Canth fluxes": is it obvious that the CO2 fluxes derived from delta\_pCO2 are integrally anthropogenic?

l.1230: "the North Pacific is a significant source of CO2": really ? it means that the pattern of efflux seen in the western Bering Sea more than compensates the rest of the Pacific north of 30N?

l.1234: isn't it Fig.3.27c ?

*Correct; fixed*

l.1237: PgC yr-1 decade-1? Is it really mol m^2 ?

l.1245: "in the NW Pacific": does this refer to the western Bering Sea?

l.1247: isn't it Fig.3.27c ?

*Correct; fixed.*

l.1248: isn't it Fig.3.27b ? or are the titles in Fig. 3.27 inverted?

*3.27b is correct; fixed.*

l.1250: "from to" ?

*Fixed – deleted “to”.*

l.1252: "associated"

*Fixed*

Fig. 3.27: I don't see any letter a/b/c in the figure.

*Thank you. These will be added as the figures are formatted for publication.*

Sidebar 3.1: BioGeoChemical Argo

I have no specific comment on this section that I found clear and illustrative of the BioArgo system.

Sidebar 3.2: OceanObs'19

Only one comment:

l.1477: "such as those": ?

*Fixed.*