

Earth Syst. Dynam. Discuss., community comment CC2  
<https://doi.org/10.5194/esd-2021-104-CC2>, 2022  
© Author(s) 2022. This work is distributed under  
the Creative Commons Attribution 4.0 License.

## **Growth Cycles realistic for Area 1 and 2 of NPP peak?**

Marius Wiggert

---

Community comment on "Carbon dioxide removal via macroalgae open-ocean mariculture and sinking: an Earth system modeling study" by Jiajun Wu et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2021-104-CC2>, 2022

---

Dear Jiajun,

Thanks a lot for sharing this very interesting paper with the community. I found it very insightful and calibrated how the intervention is modelled and how you explain the results.

I'm a bit confused by the outcomes from the seaweed growth model that you show in Figure 2 and 3.

The NPP peak of Area 3 in the southern hemispheric summer (Jan/Feb/March) makes sense to me. But I don't understand why NPP of Area 1 would peak in the northern hemispheric autumn/winter (November/December). Shouldn't it peak in northern hemisphere summer Juli/August when sunlight is abundant? Or is the growth nutrient limited at that time?

Similarly, I don't understand the NPP curve for Area 2 in August/September: In the tropics there's ample sunlight all year round so the only explanation for the NPP peak would be nutrient limitation in other times of the year, which I haven't seen in any of the other papers looking at nutrient distributions throughout the year.

Is this potentially an artifact of the macro-algae species you chose? I would appreciate some more references/details on this. Thank you,

Marius Wiggert