

Interactive comment on “OUTPACE long duration stations: physical variability, context of biogeochemical sampling, and evaluation of sampling strategy” by Alain de Verneil et al.

Anonymous Referee #1

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General comments This is a quality paper, suitable for publication, sharply focussed on specific issue of whether a “Lagrangian” biogeochemical drift station lasting a few days is truly following the same piece of water. The methodology is sound, but focused only on the tools and environment associated with the OUTPACE program. Other environments, such as the subpolar North Atlantic during the Spring Bloom would have very much smaller scales.

The major assumption of the analysis is that temperature and salinity variability can be used as a proxy for biogeochemical variability. Clearly if there is a strong physical change, then it is more likely that they will also be different biogeochemical regimes.

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However, there can also be biogeochemical variability that is unrelated to physical variability, even variability in biogeochemical variables purely due to physical affection that is not apparent in the temperature and salinity fields. Thus the analysis presented here is closer to a necessary condition for a good Lagrangian trajectory, but is not necessarily a sufficient one.

The only true measure of biogeochemical variability around a quasi-Lagrangian trajectory is the actual variability. This will be different depending on the variable measured and the depth at which it is measured. Given the ability to make simultaneous measurements of many biogeochemical quantities from multiple drifting platforms, and the ability to autonomously survey around a platform, measuring in many places around a Lagrangian platform is becoming increasingly possible.

Specific comments Section 2.1 - How many drifters were deployed that were different from the drifting moorings? Where were they deployed relative to the moorings?

How were the SD stations placed relative to the LD stations? Was there any attempt to do a survey around the LB stations?

Figure S3 - Would be nice to additionally label the dispersion plot with units of meters and kilometers to guide the reader, i.e. 10^8 m^2 is $(10 \text{ km})^2$

Recommendations - Although the first Rossby radius appears to be a good scale here, it is certainly much too large in other, more patchy environments.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-455>, 2017.

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