

November 23, 2016

Dear Dr Karstensen and co-authors,

After carefully reading the comments from both referees, as well as your detailed responses to those comments, I have come to the conclusion that major changes to your manuscript are necessary before it can be accepted for publication in Biogeosciences. The two referees from the first round of reviews have provided very constructive comments that I think will help clarify the main points of the paper. I will seek their opinions on the revised paper and your responses to their comments, provided their schedules allow them to be reassigned as referees.

In addition to the reviewers' comments, I would appreciate if you could consider the two points below.

- Given that the eddy core described by Sheen et al. (2015) is located at a much greater depth (about 2000 m) than the 125 m deep core of the anticyclonic mode-water eddy (ACME) of your study, I believe that ray tracing specifically done for your study's ACME would help better determine the critical layer depth(s). See Referee # 1, Specific comment # 5;
- Is vertical mixing really taking place mostly on the lateral edges of the eddy, as shown on your Fig. 7, rather than near the top of the eddy? Figure 4c of Sheen et al. (2015) shows enhanced mixing at the top of the eddy, at about the same depth (1500 m in their case) as where their critical layer scenario is located (their Fig. 5c).

Best regards,

Denis Gilbert, Guest editor