

Dear Editor,

This study aims to investigate the main surface and sub-surface characteristics of several mesoscale eddies observed during eight Seaglider missions in the vicinity of Perth submarine canyon.

Although the topics and the applied methodology are promising, the paper reports several unclear or incomplete reasoning (sometimes caused by English mistakes and/or confused phrasing). The results are intriguing but at times appear superficially presented, which may challenge the reader's understanding. Additionally, I have concerns regarding the methodology used for eddy tracking, especially without further clarification from the authors on their rationale for this approach.

After a careful review of the paper, it presents as an interesting scientific work; however, it lacks the necessary attention to formal writing and presentation quality. Overall, it seems that different sections of the manuscript may have been written by various authors involved in the study, leading to inconsistencies in style. Despite this, the figures and statistical analyses are impressive, and their discussion is clear and well-articulated.

Therefore, I believe that this study will likely be a significant contribution after a careful (major) revision and clarification. I also suggest the grammar and the syntax to be better checked and verified to meet the high quality standards required for publication in Ocean Science. Specific comments/suggestions are listed in the attached document. Were a revised manuscript to be sent for another round of reviews, I would take part with pleasure.

ABSTRACT

The abstract maybe promises more than you actually find in the manuscript but it works fine. The studied region and the methodology is of huge interest for the oceanographic community and the paper seems exciting. So I was disappointed finding the manuscript a bit hurried.

Lines 8-10: Check and improve sentences

INTRODUCTION

Lines 26-32: Check syntax and grammar

Lines 54-55: Please improve this sentence

Figure 1: Eddy tracks often looks very "geometric", with sharp unrealistic changes in direction. I wonder if a different, more robust tracking algorithm can be used to verify (and eventually solve, if necessary) this issue.

Table 1: In caption, I would prefer to read "Adapted from ..."

DATA AND METHODS

Lines 122-126: In the first sentence I cannot get completely the meaning of your text (the word format is a typo or a verb is missing?). In the second one, I think that L3 is repeated more time than necessary. I suggest to improve product description rephrasing both sentences without repeating L3 several times.

Lines 128-133: Please reorganize this paragraph. I suggest to avoid repetitions and check the phrasing - NASA satellites, for example, do not distribute observations, but acquire. Data are not "applied" in SeaDAS but maybe "processed" and so on.

Lines 137-139: Is this safe? Any reference or sensitivity test about this scaling?

Line 141: I suggest to replace “see below” with “see section xxxx”, and “corresponding” with “co-located”.

Line 144: you already provided the symbol, you can use it avoiding to repeat relative vorticity

Line 152: As mentioned above, I wonder if the tracking algorithm proposed by Nencioli et al. (2010) is still the best option for your purposes, also considering that it was not developed for altimetry products. Three eddy detection and tracking methods (i.e., the Okubo–Weiss, vector-geometry, and winding-angle) algorithms can be usually applied for eddy identification and tracking with different performances as showed, for example, by Xing and Yang, 2021 (DOI: 10.1175/JTECH-D-20-0020.1). Then, several advanced techniques have been presented in the last two decades, also taking advantage of deep learning. In such a context, I would like you motivate your choice about Nencioli et al. (2010).

Lines 155-156: Cannot understand. Please rephrase.

Lines 156-159: Please avoid repetitions, for example merging the two sentences.

Line 170: “fitted”, I would prefer “equipped”

Line 173: “In this study”, I suggest to go to line 174 and start here a new paragraph.

Lines 181-182: I suggest to move this up, to line 174 – “In this study, we analysed temperature, salinity, depth, and chlorophyll-a fluorescence observations collected during eight Seaglider missions carried out between October 2010 and January 2017 (Table 2), to study the vertical characteristics of mesoscale eddies”.

Table 2: "Glider mission ID and total deployment period" sounds better for column 3

RESULTS

Line 189: KE was already defined in the previous section. If this represents the same parameter you can just use the acronym

Lines 203-204: What do you mean? Should not?

Line 204: “was characterized BY ...” ?

Line 204: I suggest to avoid confusion using SSC and SCC - are they the same parameter? can you make a choice, or avoid acronym for SSC if not used anywhere than in the data section?

Figure 2: Can you improve the caption?

First sentence is very confusing and repetitive. Additionally, I cannot read the term "Prime" anywhere in the figure. For prime you mean the letter (not term) with the apostrophe?

Lines 217-218: “(For further ... (2010))” - This is not necessary here in my opinion. You clearly mentioned it in the text. Again, I am not persuaded of using this tracking algorithm.

Figure 3: Please improve caption, especially in the first two sentences.

Lines 243-246: Please check this sentence: a comma or a pronoun is missing to clearly understand its meaning.

Line 251: "maximum" or "maxima" ? Also, please go through the text to homogenize formats, deciding if units must be attached or separate from numeric values.

Lines 253-256: Please, improve style in this important paragraph.

Line 257: Can you use a better term than "encompassing" here?

Lines 263 and 266: I suggest to avoid repeating similarly if possible.

Lines 269-271: Missing verb or wrong syntax. Please, improve.

Line 272: I don't get the meaning of this sentence. Please improve!

Lines 295-296: Respect to what ????

Lines 302-303: Please, improve this sentence. Verb, comma or pronoun is missing.

Figure 7: As for previous figures, please improve caption!

Line 344: better "from 18 to 21 March 2015"

Lines 359-361: Please improve this sentence.

Lines 362-364: Please improve.

Line 373: better "from 17 to 19 Nov in 2016"

Lines 388-389: Please check this sentence

DISCUSSION

Lines 400-401: Please, use commas!

Line 410: "over the period" reads better.

Lines 431-434: Please, improve these sentences.

Lines 445-446: Please improve, for example "The expected lower chlorophyll concentrations within anti-cyclonic eddies were not observed".

Line 451: Please use "to" or "with"

Lines 486-487: I suggest to rephrase as "ranged from ... to ..., and from ... to ..."

