

Title: Thermocline mixing and vertical oxygen fluxes in the stratified central North Sea

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Bg 2015-185 (revised edition)

The article still needs considerable attention before consideration for publication.

As indicated by reviewers:

From the short study the article offers a contributory physical process affecting the oxygen dynamics in the North Sea during the summer stratification period. Avoid making assertive and/or dramatic statements from this snapshot study: oxygen dynamics are complex (as acknowledged in your introduction and in section 4.2), and you have studied only one aspect over a very short time period, so acknowledge this by deleting or softening several statements (some suggested below).

Be aware that reviewers comments must be thoroughly and adequately responded to.

In particular:

- The ms describes the turbulence/flux studies carried out, with microstructure measurements over a 3-day period presented, in the context of the oxygen structure during the stratification period. Ensure that this is clear in the discussion. As the study was neither designed nor carried out to examine the role of nutrients or phytoplankton relative to the oxygen dynamics, and no new data were collected on these parameters to support their speculated role in the oxygen story, please confine this aspect to a short part of the discussion only (where it fits, as interesting speculation). I suggest you take out the lengthy elaboration of the idea in the abstract (lines 16-20, or replace with a single line statement). Without data-backed results this idea is misleading to include in the abstract. Likewise shorten sections 4. 4 to propose future work (much is already said in 4.2)
- The oxygen Winkler measurements: the methodology is not necessary but insert and refer to the classical reference: however (what the reviewer is probably keen to see) provide the confidence level in CTD vs Winkler bottle measurements (e.g. from the regression) .
- Much of the language/grammar in the ms can be improved for better flow and understanding. Simplify by deleting or substituting words (some are detailed below).

ABSTRACT

Suggested necessary changes:

L 9 delete “the key” ; change “determine” to “contribute to determining ”

L 11 delete “which is”

L 12 remove “ephemeral” : its meaning is not clear

L 14 remove “throughout the stratification period”

Remove lines 16 – 20 to a discussion (section 4) topic

GENERAL

Some suggested changes:

Use of “therefore” is in most sentences not necessary, remove : e.g. Lines 19, 28, 97, 538, 545

Use of “the” is often unnecessary so remove: e.g. Lines 31, 98, 550, 551,

Use of “also” is mostly unnecessary so remove: e.g. Lines 34, 51, 62, 71, 289, 292, 385

L 29, L 386 shorten “as well as” to “and”

L 36 delete “in fact”; also in line122

L 44 insert “(fig.1)”

L 45 replace “which has” by “with”

L 46 central

L 51 remove “the occurrence of”

L52 indicate stratification period between which months

L55 remove “indeed”

L 56 remove “in the past”

L 57 remove “more recently”

L 59 change “as low as” to “to”

L 66 remove “in fact”

L 112 change “at a relatively long distance” to “relatively far”

L 119 (M_2 ?) + reference

L 120 - (refer to L52)

L 327 delete “a very”

L 361 ? in the sediment

L 371 delete “will”

L 378 correct the measurement (typo)

L 382 change “away” to “aside”

L 382 delete “in”

L391 occurring

L 412 reduced

L435 change “does” to “ do”

L 463a factor of almost 5 higher.....

L467+ delete “ephemeral”; rather describe as a short study; change “will” to “could”, temporarily

L 512 with lowest reported values reported.

L 517 replace “expected” with “argued”

L 519 clumsy: be more specific e.g.production that contributes to observed deficits....

L 524 change “will” to “could”

L496 replace “in addition to” with “and”

L 542 - 558: delete or considerably shorten (there is a lot of repetition from earlier statements). This is speculation only so does not need elaboration.

FIGURES & REFERENCES

Check that further references are included