

Interactive comment on “Methane emissions from the upwelling area off Mauritania (NW Africa)” by A. Kock et al.

A. Kock et al.

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Kock, Gebhardt, Bange, Methane emissions from the upwelling area off Mauritania (NW Africa)

Reply to the reviewers’ comments

We are very grateful for the valuable and very stimulating comments of the referees. We accepted most of the comments of referee #2 and have modified the ms as requested.

By modifying the ms we found a mistake in the calculation of the temperature correction for the dissolved CH₄ data. We have corrected the data; the correct concentrations and saturations are given in the ms and Figures 4-6. However, the corrections do not alter

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the results and our conclusions.

Referee #2

- Study site description, seasonality of coastal upwelling

We have re-written this section as requested. More details about the spatial extent and the seasonality etc. are described.

- Study site description, SACW, NACW

We now give the T-S ranges for NACW and SACW in the text. The reader is referred to the references in the text. SACW and NACW water mass definitions have been discussed by Tomczak in various publications and the given T-S lines are not under debate. An alternative (and very similar) definition is now cited in the text. Therefore, we did not modify Fig. 6 since we think that a detailed discussion of water mass properties is beyond the scope of the ms.

- Elevated atmospheric mixing ratios

Continental sources for CH₄ seem to be unlikely: North Africa (Sahara) has not been identified as a significant source for CH₄. Alternatively SW Europe may be an alternative continental source region, however, this seems to be unlikely at the time of cruise P348. We accept the argument by the referee and omitted the statement that CH₄ during P320/1 was decreased by atmospheric decomposition.

- Figure 5, SST vs. methane and mixing line

We have rewritten this paragraph: We accept the argument by the referee and omitted the text describing the mixing model/line and the upwelling efficiency.

- T-S lines in Fig. 6

see above

- Annual emission estimate

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We have re-worked and expanded this section considerably: (i) a new province classification is applied (Hoepffner et al.), see text and new Table 1. Hoepffner et al.'s and alternative province classifications are described in the section Study site description. (ii) The results of our estimate are now discussed in more details; for example we discuss the effect of alternative values for the duration of the upwelling season (5 vs. 9 months).

- Summary

We accept the arguments of the referee and have deleted the Summary section.

Referee # 3:

No modifications necessary.

Interactive comment on Biogeosciences Discuss., 5, 297, 2008.

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