Ocean Acidification and the Effects on Marine Trace Gas Production

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UK Ocean Acidification Research Programme

NATURAL ENVIRONMENT RESEARCH COUNCIL

SOPRAN Surface Ocean Processes in the Anthropocene

UEA University of East Anglia

PML Plymouth Marine Laboratory

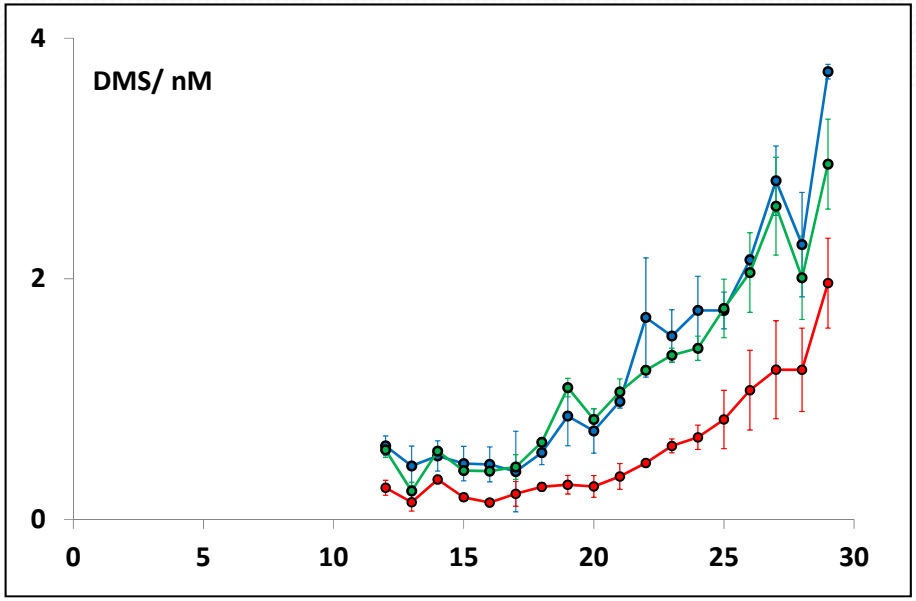
Aim of the Project

Previous field experiments on DMS and DMSP have shown significant decreases in concentration under high ρCO_2

To study the changes in seawater DMS (Dimethylsulphide) and DMSP (Dimethylsulphoniopropionate) concentrations under increasing ρCO_2 and decreasing pH

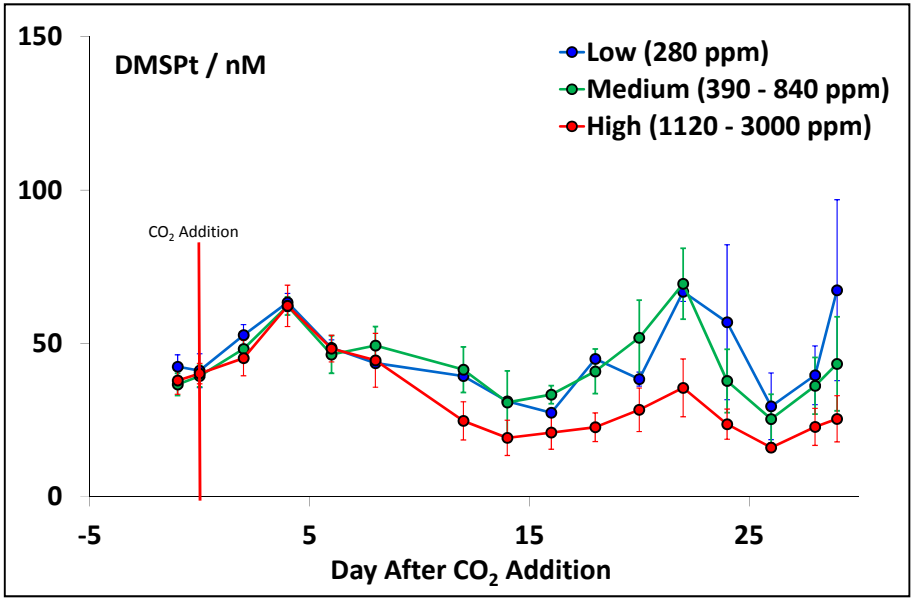
- Community studies using KOSMOS mesocosms
- Laboratory studies with individual organisms

Total DMS and DMSP in an Open Coastal Environment

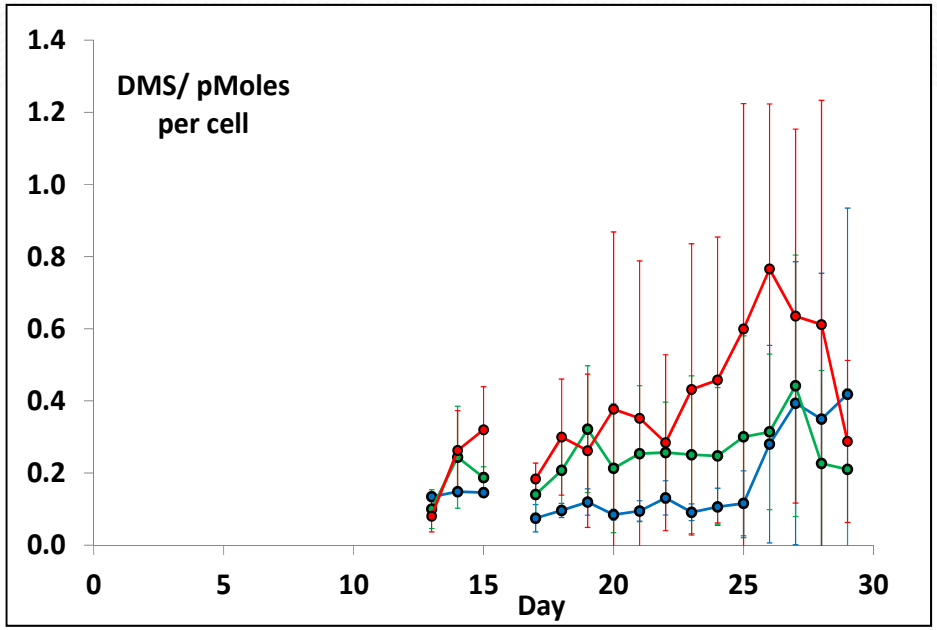


DMS showed significantly reduced concentration under increased pCO_2.

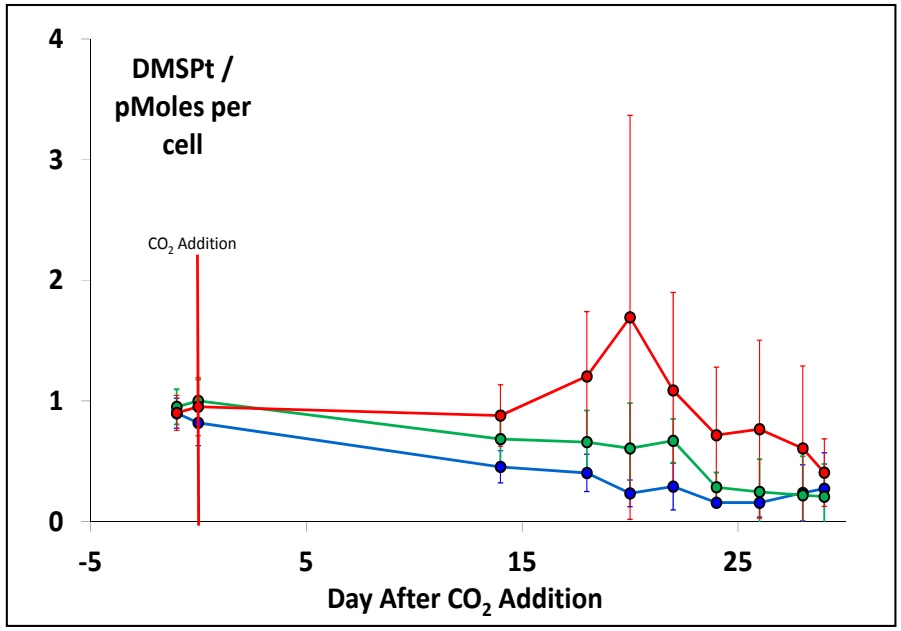
DMSP showed significantly lower concentrations in the high pCO_2 mesocosms



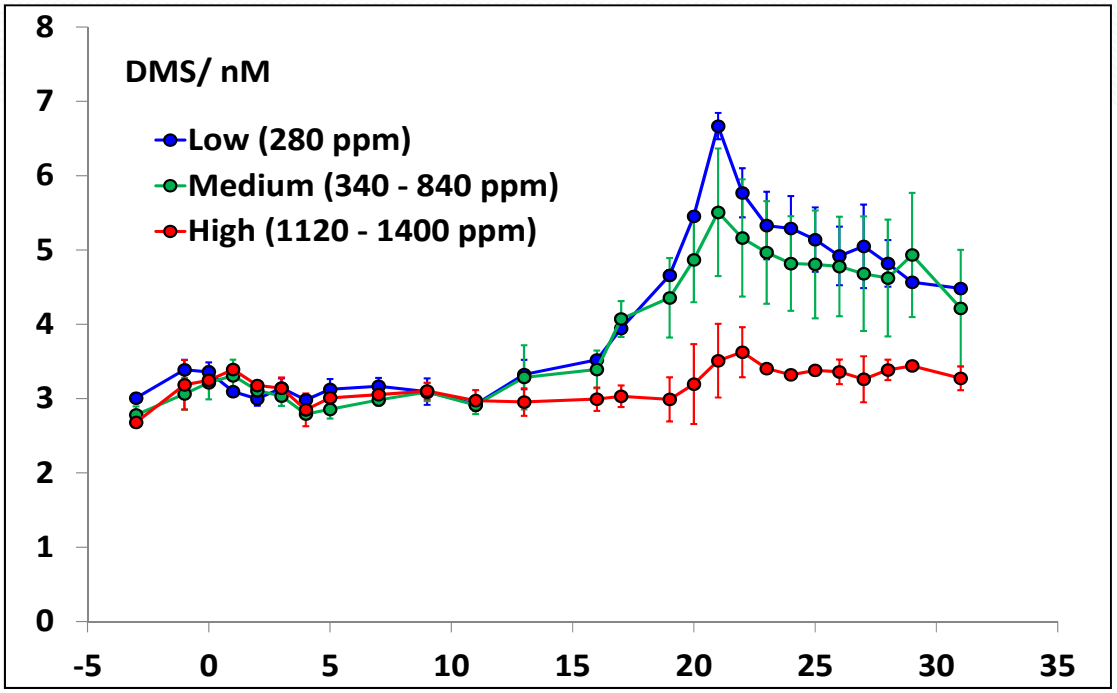
But…



Normalised to *E.huxleyi* cell count, DMS and DMSP show opposite trends



Total DMS: Baltic Sea



No DMSP data!

DMS has very low correlations with the cell groups counted on the flow cytometer: no way to calculate DMS on a per cell basis.

In Conclusion

CO_2 has no impact on DMS or DMSP *production* in the lab or in the field during these experiments, but appears to be impacting the growth of *E.huxleyi.*

In lab experiments it has no effect on *E.huxleyi* growth (strain RCC1229).

What is causing the decrease in growth in the field, and why are there many studies showing a reduction in DMS/ DMSP under high CO_2?

Acknowledgements

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