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Eutrophication counteracts ocean acidification effects on DMS emissions

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The accumulation of anthropogenic CO_2 in the ocean has altered carbonate chemistry in surface waters since pre-industrial times and is expected to continue to do so in the coming centuries (ocean acidification). Changes in carbonate chemistry can modify the rates and fates of marine primary production and calcification. Available information from manipulative experiments suggests that the emission of dimethylsulfide (DMS) would decrease in response to ocean acidification. However, in coastal environments it has been shown that carbonate chemistry in surface waters has strongly responded to eutrophication during the last 50 years. Here, we test the hypothesis that DMS emissions also strongly respond to eutrophication in addition to ocean acidification at decadal timescales. We use the MIRO-BIOGAS model setup in the strongly eutrophied Southern Bight of the North Sea characterized by intense blooms of *Phaeocystis* that are strong producers of dimethylsulfoniopropionate (DMSP), the precursor of DMS.