

## **Atmospheric dimethyl sulfide in the Arctic Ocean and its relation to phytoplankton productivity**

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Quantifying the relationship between oceanic emissions of dimethyl sulfide (DMS) and ocean biology presents a major challenge. We analyzed the atmospheric DMS mixing ratios in an Arctic region (Svalbard, 78.5°N, 11.8°E) during the phytoplankton growth periods in 2010, 2014, and 2015, and found regionally and temporally varying relationships between the atmospheric DMS and the strength of the DMS source in the ocean surrounding the observation site. Our analysis showed that the DMS production capacity of the Greenland Sea was approximately 5 times the capacity for the Barents Sea. By contrast, primary production in the Barents Sea was 4 times that in the Greenland Sea during the bloom periods. These results indicate a higher abundance of DMS-producing phytoplankton in the Greenland Sea than in the Barents Sea during the phytoplankton bloom period. This approach is a potentially useful tool for detecting changes in the DMS emissions associated with an ocean's changing DMS production capacities as a consequence of warming across the Arctic Ocean.