

Indian Institute of Tropical Meteorology (IITM)

Press Release (3 June 2025)

Projections of Changes in Dimethyl Sulfide Emissions from the Global Ocean

Proceedings of the National Academy of Sciences of the United States of America (PNAS) Article #25-02077: “Climate warming increases global oceanic dimethyl sulfide emissions,” by Sankirna D. Joge et al.

A new study finds that dimethyl sulfide (DMS) emissions from the ocean may rise in the future, even while concentrations in the ocean decrease. DMS is a source of atmospheric sulfur emissions from the ocean. Its chemical byproducts contribute to aerosol formation, influencing cloud formation, albedo and hence the Earth’s radiation budget. Climate model projections of DMS emissions, however, are inconsistent. Dr. Anoop S. Mahajan and colleagues employed machine learning models trained on global observations of biological processes to model emissions of DMS, which is produced by phytoplankton. The models simulated seawater DMS concentrations from 1850 to 2100 using predictor variables from eight different climate models. The machine learning methods, the authors found, decreased the variation and improved the skill in predicting future DMS. This work reduces the large differences and biases observed in previous studies in terms of the future changes in the seawater DMS concentrations and sea-air flux estimates. This not only increases our confidence in predicting future changes in DMS emissions but also addresses the current uncertainty in climate-DMS feedback impacts in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6). Although DMS concentrations in the ocean are predicted to decrease under future warming scenarios, emissions of DMS into the atmosphere are projected to increase due to rising surface wind speeds and sea surface temperatures. This finding contradicts current IPCC climate assessments that predict a decrease in DMS emissions due to global warming. According to the authors, because anthropogenic sulfur emissions are likely to decrease due to air quality policies, the relative importance of DMS to atmospheric sulfur and to aerosol formation is likely to grow, hence offsetting a small portion of climate warming.

Read full study: [Climate warming increases global oceanic dimethyl sulfide emissions | PNAS](https://www.pnas.org/doi/10.1073/pnas.2502077122)
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Image: Press image.jpg (high resolution link: [Press IMAGE.jpg](#))

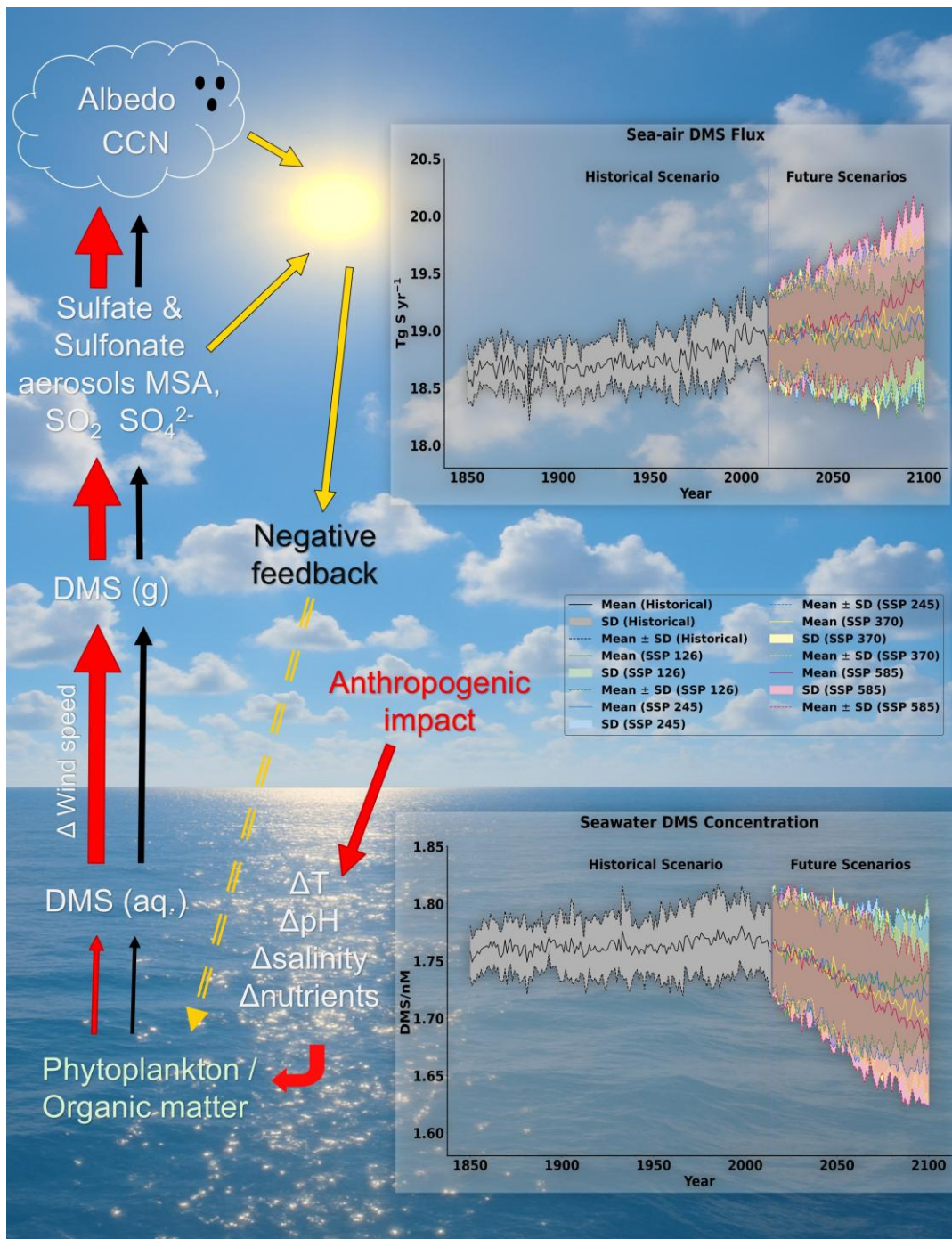


Image caption: Under the future global climate warming scenarios, DMS emissions are projected to increase, even as seawater DMS concentrations decline. This rise in emissions may contribute to climate regulation through negative feedback mechanisms, as DMS-derived oxidation products can enhance aerosols, thereby increasing cloud albedo, hence offsetting climate warming.

Image credit: Mr. Sankirna Joge and Dr. Anoop S. Mahajan