

Seminar “Physics and Chemistry of the Atmosphere”,
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Modelling nitrogen nutrient depositions in the Arctic Ocean and its influence over phytoplankton using ICON model

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This study investigates the role of atmospheric nitrogen deposition in influencing phytoplankton dynamics in the Arctic Ocean, a region where nutrient limitations significantly affect primary productivity. Using the ICON atmospheric model coupled with ART (Aerosol and Reactive Tracer), we simulate the transport and deposition of key nitrogen species, specifically nitrate and ammonium, across the Arctic Ocean, considering both anthropogenic and natural sources.

Our analysis aims to assess how atmospheric nitrogen input, especially during periods of low biological activity, may affect nutrient availability and subsequently influence phytoplankton growth during the productive summer months. Given the Arctic's unique stratification, limited vertical mixing, and expanding ice-free areas, atmospheric deposition emerges as a potentially critical nutrient pathway.

This presentation offers a conceptual understanding of nutrient delivery mechanisms in the Arctic Ocean and underscores the importance of atmospheric deposition in supporting ongoing efforts to model and predict marine ecosystem responses under changing climate conditions.