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Modelling marine organic aerosol and its impact on clouds in the Arctic

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Marine organic aerosol is a major contributor to cloud condensation nuclei and ice nucleating particles over pristine open-ocean and coastal regions and thus has an important impact on radiation, precipitation, and atmospheric dynamics. In the Arctic, the summer-time loss of sea ice together with the rapid ice retreat are key factors for potentially increased marine aerosol emissions. In our planned studies with the aerosol-climate model ICON-HAM, we want to investigate the influence of primary marine organic aerosol on the Arctic climate and its rapid warming. Currently, the model development focuses on the implementation of a detailed, species-resolved ocean emission scheme. Here, we present the first results of an offline version following Burrows et al. (2014). The new emission scheme has been applied in ICON-HAM. This allows for including the marine organic aerosol's life cycle and interactions with mixed-phase Arctic clouds, focusing on potential ice-active species.