



## **Organics in the atmosphere: From air pollution to biogeochemical cycles and climate (Vilhelm Bjerknes Medal)**

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Organics are key players in the biosphere-atmosphere-climate interactions. They have also a significant anthropogenic component due to primary emissions or interactions with pollution. The organic pool in the atmosphere is a complex mixture of compounds of variable reactivity and properties, variable content in C, H, O, N and other elements depending on their origin and their history in the atmosphere. Multiphase atmospheric chemistry is known to produce organic acids with high oxygen content, like oxalic acid. This water soluble organic bi-acid is used as indicator for cloud processing and can form complexes with atmospheric Iron, affecting Iron solubility. Organics are also carriers of other nutrients like nitrogen and phosphorus. They also interact with solar radiation and with atmospheric water impacting on climate.

In line with this vision for the role of organics in the atmosphere, we present results from a global 3-dimensional chemistry-transport model on the role of gaseous and particulate organics in atmospheric chemistry, accounting for multiphase chemistry and aerosol ageing in the atmosphere as well as nutrients emissions, atmospheric transport and deposition.

Historical simulations and projections highlight the human impact on air quality and atmospheric deposition to the oceans. The results are put in the context of climate change. Uncertainties and implications of our findings for biogeochemical and climate modeling are discussed.