Annual highlights

The Center for Volatile Interactions (VOLT) aims to provide fundamental insights into the production, consumption, and transformations of different volatile trace gasses in ecosystems. VOLT started operating in March 2023 and had a very successful 10 months where the Center was established in a common corridor with offices and small lunch and meeting rooms. Key people, such as the center administrator and the lab manager were immediately hired, the three first PhD students joined after the summer, and other members were hired from additional grants. We also acquired important instruments, such as quantitative PCR machines for molecular analyses and an advanced thermal desorber-GC-MS, as well as established a climate chamber facility for experiments under controlled environmental conditions.

The first annual retreat was held in November, where VOLT members had a workshop on personality types to get to know themselves and each other better so that the group dynamics for the Center could be established. In addition to discussions on the overall scientific strategy and how the different people and projects fit in, we talked about communications and social media. VOLT was also very active in terms of external collaborations, and we could see the new center drawing attention within the scientific community. Already in the first months, we hosted international visitors conducting collaborative experiments, presenting their research at the center, and participating in discussions.

In terms of science outputs, we highlight two studies central for the research scope of VOLT at micro- and macroscale, respectively:

1) A study led by VOLT-affiliated post doc, Yi Jiao, challenges the common idea that soils would be net sources of volatile organic compounds (VOCs) to the atmosphere. This work, published in Soil Biology & Biochemistry, clearly shows that when VOCs are present in the soil environment, their uptake exceeds production. It also provides the first description of the reaction kinetics and temperature dependency of microbial VOC uptake in soil.
2) A large-scale modelling study published in npj Climate and Atmospheric Science showed that climate change-induced vegetation shifts lead to considerable changes in regional VOC emissions from trees over this century. These changes are so large that they impact atmospheric chemistry and cause regional cooling or warming depending on what VOCs the dominant tree types release to the atmosphere (Fig. 1).

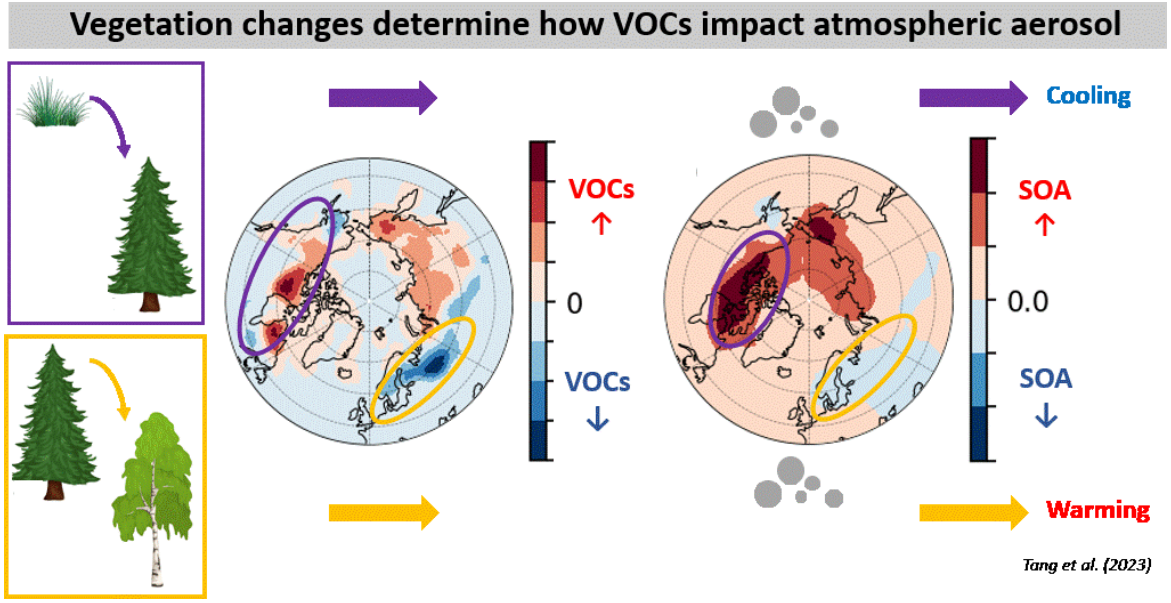

Fig. 1. Tang et al. (2023) showed that northward advancing boreal needle-leaved trees cause increased emissions of VOCs that contribute to secondary organic aerosol (SOA) formation and thereby climate cooling in the Arctic, while the temperate broad-leaved trees replacing needle-leaved trees in the boreal region cause will decrease SOA and cause climate warming.