

## DR. STEFANIE E. FALK

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### PROFESSIONAL DEVELOPMENT

<b>Since 01/2021</b>	<b>Guest Scientist</b> , Department of Meteorology and Oceanography, Institute for Geology, University of Oslo, Oslo, Norway
<b>01/2018-01/2021</b>	<b>Postdoctoral Research Scientist, Scientific Programmer Assistant</b> , Department of Meteorology and Oceanography, Institute for Geology, University of Oslo, Oslo, Norway
<b>07/2015-06/2017</b>	<b>Postdoctoral Research Scientist</b> , Atmospheric Trace Gases and Remote Sensing, Institute of Meteorology and Climate Research, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
<b>2014</b>	<b>PhD</b> , Institute of Nuclear Physics, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany
<b>03/2010-12/2014</b>	<b>Doctoral Research Assistant</b> , Institute of Nuclear Physics, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

### MAIN AREAS OF RESEARCH AND SHORT STATEMENT OF RESULTS ACHIEVED TO DATE

As a physicist by training, research is more than a simple profession, for me, it is a way to approach the complexity of our world. My curiosity about the complex and important role of ozone in the atmosphere lead me from studying its chemical depletion in the stratosphere and polar boundary layer to its formation and removal processes by land biosphere. Inter-disciplinary work has been a cornerstone for me to improve the understanding and push the develop of current numerical models of the Earth system forward. In particular have I been working on chemistry-climate modeling (CCM) using the EMAC (ECHAM/MESSy Atmospheric Chemistry) model. My work was related to future trends of stratospheric ozone, biogenic brominated very short-lived substances (VSLs), and the influence of sulfur aerosols. I have also implemented a bromine release mechanism from snow and studied ozone depletion in the Arctic boundary layer. As I identified dry deposition as a key issue for both future air quality as well as climate I committed my recent studies to effects of ozone on vegetation. I first focused on global and regional scale dry deposition and uptake by vegetation and later dived into process-based impact modeling at the leaf level and improvements of subarctic biomes. These research activities led to scientific and code contributions to the Community Earth System Model (CESM) and an involvement in the ICP Vegetation task force. Results were presented in scientific publications and on conferences both nationally and internationally. In addition, I gladly participated in public outreach, e.g. public lectures and popular science blogs.

## SELECTED PUBLICATIONS

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### Quality assured

- Falk, S. and A. Søvde Haslerud. “Update and evaluation of the ozone dry deposition in Oslo CTM3 v1.0”. In: *Geosci. Model Dev.* 12.11 (Nov. 2019), pp. 4705–4728. doi: 10.5194/gmd-12-4705-2019.
- Falk, S. and B.-M. Sinnhuber. “Polar boundary layer bromine explosion and ozone depletion events in the chemistry-climate model EMAC v2.52: implementation and evaluation of AirSnow algorithm”. In: *Geosci. Model Dev.* 11.3 (MAR 28 2018), 1115–1131. issn: 1991-959X. doi: 10.5194/gmd-11-1115-2018.
- Falk, S., B.-M. Sinnhuber, G. Krysztofiak, P. Jöckel, P. Graf, and S. T. Lennartz. “Brominated VSLs and their influence on ozone under a changing climate”. In: *Atmos. Chem. Phys.* 17.18 (2017), pp. 11313–11329. doi: 10.5194/acp-17-11313-2017.

### Non-quality assured

- Karlsson, P. E., H. Pleijel, C. Andersson, R. Bergström, M. Engardt, A. Eriksen, S. Falk, J. Klingberg, J. Langner, S. Manninen, F. Stordal, H. Tømmervik, A.V. Vollsnes. “The vulnerability of northern European vegetation to ozone damage in a changing climate - An assessment based on current knowledge”. In: IVL Swedish Environmental Research Institute, report C586 , 60 (2021). url: <https://www.ivl.se/publikationer/publikation.html?id=6220>.

### In preparation

- Falk, S., D. Lombardozzi, S. Indrehus, B. Sacks, A. V. Vollsnes, F. Stordal, and T. K. Berntsen . “Ozone impact on Leaf Utilization of Nitrogen for Assimilation (OzoneLUNA v1.0) in CLM5.0”. In: *Geosci. Model Dev.* (2021) – in preparation
- Falk, S., A. V. Vollsnes, L. Emberson, C. O'Neill, A. Eriksen, F. Stordal, T. K. Berntsen. “Characterizing subarctic biomes for land surface modeling of pollution and climate risk”. In: *Biogeosciences* (2021) – to be submitted

## ADDITIONAL SCIENTIFIC ACHIEVEMENTS

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- Falk, S. “OzoneLUNA: Ozone damage in CLM revisited”. In: 34. CESM Land Model & Biogeochemistry Working Group Meeting. presentation, 23-25 Feb 2021 2021. url: <https://www.cesm.ucar.edu/events/wg-meetings/2021/files/land/Falk.pdf>.
- Falk, S., A. V. Vollsnes, L. Emberson, C. O'Neill, A. E. Berglen Eriksen, F. Stordal, and T. Koren Berntsen. “Characterizing subarctic biomes for land surface modeling of pollution and climate risk”. In: 34. ICP Vegetation - Taskforce Meeting. poster, 22-25 Feb 2021. url: <https://icpvegetation.ceh.ac.uk/34th-icp-vegetation-task-force-meeting>.
- “The 2018 heatwave and its implications on ozone induced damage on vegetation in a subarctic climate”. In: EGU21-15000. EGU General Assembly 2021. vPICO, 19-30 Apr 2021 2021. doi: 10.5194/egusphere-egu21-15000.

- Falk, S., A.V. Vollsnes. "Skogplanting og framtidas by". In: forskning.no, Søkelys på skogplanting, blog (MAR 19 2021). url: <https://blogg.forskning.no/blogg-sokelys-pa-skogplanting/skogplanting-og-framtidas-by/1830569>.
- Falk, S., A.V. Vollsnes, F. Stordal, A. Eriksen, and T. Koren Berntsen. "Surface Ozone in Northern Scandinavia and Implications on Local Vegetation – A Case Study". In: 33. ICP Vegetation - Taskforce Meeting. talk, 27-30 Jan 2020. url: <https://icpvegetation.ceh.ac.uk/33rd-icp-vegetation-task-force-meeting>.