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Professional Development

since 02/2019 **Full Professor (§98) of Meteorology and Climatology / Institute Head** Institute of Meteorology and Climatology, Department of Water, Atmosphere and Environment, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

since 12/2013 **Group Leader and Faculty Member**, Austrian Polar Research Institute

since 09/2013 **Adjunct Associate Research Scientist**, Lamont-Doherty Earth Observatory, Columbia University, New York, USA

2019 **Habilitation**, Environmental System Sciences and Meteorology, University of Graz, Austria

09/2018-01/2019 **Lecturer**, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria (part-time, transition to Full Professorship)

09/2013-01/2019 **Assistant Professor** (tenure-track), Climate Processes and Environmental Meteorology, Wegener Center for Climate and Global Change and Institute of Physics/Institute for Geophysics, Astrophysics and Meteorology, University of Graz, Austria

08/2011 – 08/2013 **Postdoctoral Research Scientist**, Lamont-Doherty Earth Observatory and Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY, USA

12/2010 – 06/2011 **Postdoctoral Research Scientist**, Institute for Atmospheric and Climate Science, ETH Zurich, Zurich, Switzerland

11/2007 – 11/2010 **Doctoral Research Assistant**, Institute for Atmospheric and Climate Science, ETH Zurich, Zurich, Switzerland

Main areas of research and short statement of results achieved to date

My research is propelled by the questions, how does anthropogenic activity alter atmospheric composition, and how changes in atmospheric composition in turn affect ambient air quality and climate. I have studied atmospheric trace gases throughout my career and my research combines numerical models with observational data sets from both ground-based networks and remote sensing platforms. I have led and contributed to studies (i) unravelling the effect of changes in climate, ambient meteorology, and anthropogenic emissions on surface pollution burdens; (ii) illustrating the role of large scale climate modes on atmospheric composition including aspects of air quality; and (iii) determining the relative contribution of ozone depletion, ozone depleting substances and well-mixed greenhouse gases to changes in surface climate and temperature at upper atmospheric levels. Throughout my career I have transferred methods from applied mathematics to atmospheric science, in particular probabilistic methods to investigate changes in extremes or improve the bias-correction of numerical models. My research has been regularly included in international assessments and I contributed to the IGAC Tropospheric Ozone Assessment Report and WMO/UNEP Ozone Assessment Reports.

Selected Publications **(full list @ https://orcid.org/0000-0003-2705-0801)**

Ivy, D. J., S. Solomon, H.E. Rieder**.** "Radiative and Dynamical Influences on Polar Stratospheric Temperature Trends". In: J. Climate, 29 (2016), pp. 4927-4938, DOI: 10.1175/JCLI-D-15-0503.1.

Lin, M., A. M. Fiore, L. W. Horowitz, A. O. Langford, S. J. Oltmans, D. Tarasick, H.E. Rieder. **"**Climate variability modulates western US ozone air quality in spring via deep stratospheric intrusions". In: Nat. Comm., 6:7105 (2015), DOI: 10.1038/ncomms8105.

Rieder, H. E., G. Chiodo, J. Fritzer, C. Wienerroither, and L. M. Polvani. "Is interactive ozone chemistry important to represent polar cap stratospheric temperature variability in Earth-System Models?". In: Environ. Res. Lett. 14.4 (2019). DOI: 10.1088/1748-9326/ab07ff

Rieder, H. E., A. M. Fiore, O. E. Clifton, G. Correa, L. W. Horowitz, and V. Naik. "Combining model projections with site-level observations to estimate changes in distributions and seasonality of ozone in surface air over the U.S.A.". In: Atmos. Environ. 193 (2018), pp. 302-315, DOI: 10.1016/j.atmosenv.2018.07.042.

Rieder, H.E., A. M. Fiore, L. W. Horowitz, V. Naik. “Projecting policy-relevant metrics for high summertime ozone pollution events over the Eastern United States due to climate and emission changes during the 21st century”. In: J. Geophys. Res. Atmos., 120 (2015), pp. 784–800, DOI: 10.1002/2014JD022303.

Rieder, H.E., L. M. Polvani, S. Solomon. “Distinguishing the impacts of ozone-depleting substances and well-mixed greenhouse gases on Arctic stratospheric ozone and temperature trends”. In: Geophys. Res. Lett., 41 (2014), pp. 2652–2660, DOI: 10.1002/2014GL059367.

Rieder, H.E. and L.M. Polvani. “Are recent Arctic ozone losses caused by increasing greenhouse gases?”. In: Geophys. Res. Lett., 40 (2013), pp. 4437–4441, DOI: 10.1002/grl.50835.

Rieder, H.E., A. M. Fiore, L. M. Polvani, J.-F. Lamarque, Y. Fang. **“**Changes in the frequency and return level of high ozone pollution events over the Eastern United States following emission controls”. In: Environ. Res. Lett., 8, 014012 (2013), DOI:. 10.1088/1748-9326/8/1/014012.

Schneidemesser, E. von, C. Driscoll, H. E. Rieder, and L. D. Schiferl. “How will air quality effects on human health, crops and ecosystems change in the future?”. In: Philos. Trans. R. Soc. A 378.2183 (2020), p. 20190330. DOI: 10.1098/rsta.2019.0330.

Young, P. J., V. Naik, A. M. Fiore, A. Gaudel, J. Guo, M. Y. Lin, J. L. Neu, D. D. Parrish, H. E. Rieder, J. L. Schnell, S. Tilmes, O. Wild, L. Zhang, J. Ziemke, J. Brandt, A. Delcloo, R. M. Doherty, C. Geels, M. I. Hegglin, L. Hu, U. Im, R. Kumar, A. Luhar, L. Murray, D. Plummer, J. Rodriguez, A. Saiz-Lopez, M. G. Schultz, M. T. Woodhouse, and G. Zeng. “Tropospheric Ozone Assessment Report: Assessment of global-scale model performance for global and regional ozone distributions, variability, and trends”. In: Elementa-Sci Anthrop. 6 (2018). DOI: 10.1525/elementa.265.

Additional scientific achievements

2012 Quadrennial Dobson Award of the International Association of Meteorology and Atmospheric Sciences – International Ozone Commission