Andreas F. Prein

Curriculum Vitae

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Education

7/11/2013 **PhD, magna cum laude**, *Institute of Physics, Karl-Franzens-University*, Graz, Austria, Thesis: *Added Value of Convection-Permitting Climate Simulations.*

10/14/2009 **Master of Science, cum laude**, *Institute of Physics, Karl-Franzens-University*, Graz, Austria, Thesis: *Uncertainties in the Driving Data of Regional Climate Models (RCMs) in the Alpine Region.*

10/11/2006 **Bachelor of Science**, *Institute of Physics, Karl-Franzens-University*, Graz, Austria, Theses: *Conceptional Climate Models; The Potential of Wind Energy in Austria.*

Research Positions

since–11/2016 **Project Scientist 1**, *National Center for Atmospheric Research (NCAR), Boulder, USA*, Mesoscale & Microscale Meteorology Laboratory (MMM).
Research focus: 1) The importance of mesoscale processes in the climate system; 2) Organized convective storms under climate change; 3) Sub-daily precipitation extremes.

11/2014–11/2016 **Postdoctoral Scientist**, *National Center for Atmospheric Research (NCAR), Boulder, USA*, Advanced Study Program (ASP).
Research focus: 1) Representation and climate change projections of sub-daily extreme precipitation in convection-permitting climate simulations over North America; 2) weather patterns as a driver of precipitation changes in the U.S.; 3) using weather patterns as a tool for climate model evaluation and climate change assessments.

07/2013–11/2014 **Postdoctoral Scientist**, *Wegener Center for Climate and Global Change, Karl-Franzens-University, Graz, Austria*, Projects: EURO-CORDEX, NHCM-2.
Research focus: 1) Added value in convection-permitting climate simulations; 2) uncertainties in gridded observational datasets and their impacts on climate model evaluation; 3) extreme precipitation in the European Alpine region.

05/2008–07/2013 **Scientist**, *Wegener Center for Climate and Global Change, Karl-Franzens-University, Graz, Austria*, Projects: reclip:century, NHCM-1, ACQWA.
Research focus: 1) Uncertainties in European climate change projections; 2) added value of convection-permitting climate simulations

Research Visits

10/2011–02/2012 **Visiting scientist**, *Regional Climate Group, MMM, NCAR, Boulder, CO, USA.*

09/2006–12/2006 **Exchange semester**, *University of Turku, Turku, Finland.*

Research Interests

Mesoscale processes in the climate system

Process-based model evaluation methods

Uncertainties in climate projections

Statistical modeling of weather and climate extremes with extreme value theory

High impact weather and its effects on society

Grants and Fellowships

Pending

10/2018 **Nocturnal Convection and Terrestrial-feedbacks in the US (NoCTUS)**, *US National Science Foundation.*

4/2018 **The big data and climate FRONTIER: making sense of the explosive increase in climate data through smart designs and big data methods**, *Norwegian Research Council.*

Funded

9/2016 **Detecting, Interpreting, and Modeling Hydrologic Extremes to Support Flexible Water Management and Planning**, *Co-Principal Investigator*, Awarded by Bureau of Reclamation.

9/2013 **Non-Hydrostatic Climate Modeling Phase-II**, *Co-Investigator*, Awarded by Austrian Science Found (FWF).

9/2013 **High-End:Extremes**, *Co-Investigator*, Awarded by Austrian Climate Research Program (ACRP).

Fellowships

12/2014 **Advanced Study Program (ASP) sholarship**, *Awarded by the National Center for Atmospheric Research (NCAR)*, Boulder, USA.

04/2011 **Marshall Plan Scholarship holder**, *Awarded by the Austrian Marshall Plan Foundation*, Vienna.

Peer-Reviewed Publications

Prein AF (submitted) The Changing Character of the North American Monsoon and its Impacts on New Mexico's Precipitation. Journal of Climate

Prein AF, Bukovsky MS, Mearns LO, Bruyère1 C, and Done JM (submitted) Simulating North American Weather Typeswith Regional Climate Models. Frontiers

Prein AF, AG Pendergrass (submitted) Can we Constrain Uncertainty in Hydrologic Cycle Projections? Geophysical Research Letters

Prein AF, GJ Holland (2018) Global Estimates of Damaging Hail Hazard. Weather and Climate Extremes, https://doi.org/10.1016/j.wace.2018.10.004

Jacob D, et al. (submitted) Regional climate downscaling over Europe: perspectives from the EURO-CORDEX community. BAMS

Scaff L, **Prein AF**, Li Y, Liu C, Rasmussen R, and Ikeda K (submitted) Simulating the diurnal cycle of convective precipitation in North America's current and future climate with a convection-permitting model. Climate Dynamics

Musselman KN, Lehner F, Ikeda K, Clark M, **Prein AF**, Liu C, Barlage M, and Rasmussen R (2018) Projected increases and regime shifts in rain-on-snow flood potential over western North America. Nature Climate Change

Blenkinsop S, Fowler HJ, Barbero R, Chan SC, Guerreiro SB, Kendon E, Lenderink G, Lewis E, Li X, Westra S, Alexander L, Allan RP, Berg P, Dunn RJD, Ekström M, Evans JP, Holland G, Jones R, Kjellström E, Klein-Tank A, Lettenmaier D, Mishra V, **Prein AF**, Sheffield J, Tye MR (2018) The INTENSE project: using observations and models to understand the past, present and future of sub-daily rainfall extremes. Advances in Science and Research

KL Rasmussen, **AF Prein**, RM Rasmussen, K Ikeda, C Liu (2017) Changes in the convective population and thermodynamic environments in convection-permitting regional climate simulations over the United States. Climate Dynamics

Prein AF, C Liu, K Ikeda, S Trier, RM Rasmussen, GJ Holland, MP Clark (2017) Increasing rainfall volume from future severe convective storms. Nature Climate Change. doi:10.1038/s41558-017-0007-7

Prein AF, C Liu, K Ikeda, R Bullock, RM Rasmussen, GJ Holland, M Clark (2017) Simulating North American Mesoscale Convective Systems with a Convection-Permitting Climate Model. Climate Dynamics. doi:10.1007/s00382-017-3947-8

Aiguo D, RM Rasmussen, C Liu , K Ikeda , **AF Prein** (2017) Changes in Precipitation Characteristics over North America by the Late 21^{st} Century Simulated by a Convection-Permitting Model. Climate Dynamics

Púčik T, P Groenemeijer, AT Rädler, L Tijssen, G Nikulin, **AF Prein**, E van Meijgaard, R Fealy, C Teichmann, D Jacob (2017) Future changes in European severe convection environments in a regional climate model ensemble. Journal of Climate

PA Mooney, DC Broderick, CL Bruyere, FJ Mulligan, **AF Prein** (2017) The role of regional climate model physics in simulating the summertime diurnal cycle of precipitation over the contiguous United States. Journal of Climate

Prein AF, RM Rasmussen, G Stephens (2017) Challenges and Advances in Convection-Permitting Climate Modeling. BAMS; doi:10.1175/BAMS-D-16-0263.1

Prein AF, A Gobiet (2017) Impacts of uncertainties in European gridded precipitation observations on regional climate analysis. Int. J. Climatol., 37: 305–327. doi:10.1002/joc.4706

Prein AF, RM Rasmussen, K Ikeda, C Liu, M Clark, GJ Holland (2017) The future intensification of hourly precipitation extremes. Nature Climate Change; 7(1):48–52; doi:10.1038/nclimate3168

Liu C, K Ikeda, RM Rasmussen, M Barlage, AJ Newman, **AF Prein** et al. (2016), Continental-scale convection-permitting modeling of the current and future climate of North America. Climate Dynamics, doi:10.1007/s00382-016-3327-9

Prein AF, GJ Holland, RM Rasmussen, MP Clark, MR Tye (2016) Running dry: The US Southwest's drift into a drier climate state. Geophysical Research Letters, 43 (3), 1272-1279

Prein AF, et al. (2016) Precipitation in the EURO-CORDEX 0.11° and 0.44° simulations: high resolution, high benefits? Climate Dynamics, 46 (1-2), 383-412

Tobin I, Jerez S, Vautard R, Thais F, Van Meijgaard E, **Prein A**, Déqué M, Kotlarski S, Maule CF, Nikulin G, Noël T. (2016) Climate change impacts on the power generation potential of a European mid-century wind farms scenario. Environmental Research Letters. 2016 Mar 4;11(3):034013.

Prein AF, et al. (2015) A review on regional convection-permitting climate modeling: demonstrations, prospects, and challenges. Reviews of Geophysics, 53, 323–361

Jury MW, **Prein AF**, Truhetz H., Gobiet A. (2015) Evaluation of CMIP5 Models in the Context of Dynamical Downscaling over Europe. Journal of Climate, 28, 5575–5582

Prein AF, A Gobiet, M Suklitsch, H Truhetz, NK Awan, K Keuler, G Georgievski (2013) Added Value of Convection Permitting Seasonal Simulations. Climate Dynamics, 41(9–10), 2655–2677.

Prein AF, GJ Holland, RM Rasmussen, J Done, K Ikeda, MP Clark, CH Liu (2013) Importance of Regional Climate Model Grid Spacing for the Simulation of Heavy Precipitation in the Colorado Headwaters. Journal of Climate, 26, 4848–4857.

Prein AF, A Gobiet and H Truhetz (2011) Analysis of Uncertainty in Large Scale Climate Change Projections Over Europe. Meteorologische Zeitschrift, 20(4), 383–395.

Invited Talks

Prein AF; Severe Convection In Climate Models. North American Hail Workshop. August 14, 2018, Boulder, CO.

Prein AF; North American Mesoscale Convective Systems Under Climate Change. AOGS annual meeting. June 4, 2018, Honolulu, Hawaii.

Prein AF et al.; North American Mesoscale Convective Systems Under Climate Change. University of Michigan, March. 8, 2018, Ann Arbor, Michigan.

Prein AF et al.; Mesoscale Convective Systems Under Climate Change: Results from North American Scale Convection-Permitting Climate Simulations. AGU Fall meeting, Dec. 11, 2017, New Orleans, Louisiana.

Prein AF; North American Scale Convection-Permitting Climate Modeling: Mesoscale Convective Systems Under Climate Change. AMS 17th Conference on Mesoscale Processes, July 27, 2017, San Diego, California.

Prein AF; North American Extreme Rainfall Events Under Climate Change. CNRCWP annual science meeting, May 3, 2017, Montreal, Canada.

Prein AF et al.; Changing Characteristics of Convective Systems: Results from a Continental-Scale Convection-Permitting Climate Simulations. American Geophysical Union, Fall Meeting 2016, December 12, 2016, San Francisco, USA.

Prein AF et al.; Climate simulations on the impact-scale. Newcastle University, May 22, 2016, Newcastle, U.K.

Prein AF et al.; Regional Convection-Permitting Climate Modeling: Demonstrations, Prospects, and Challenges. International ICRC-CORDEX Conference, May 18, 2016, Stockholm, Sweden.

Prein AF et al.; A Review on Regional Convection-Permitting Climate Modeling: Demonstrations, Prospects, and Challenges. American Geophysical Union, Fall Meeting 2015, December 16, 2015, San Francisco, USA.

Prein AF, R Rasmussen, M. Clark, K, Ikeda, C. Liu; Continental-Scale Convection-Permitting Regional Climate Modeling. American Geophysical Union, Fall Meeting 2015, December 16, 2015, San Francisco, USA.

Prein AF et al.; Precipitation in the EURO-CORDEX 0.11° and 0.44° simulations: high resolution, high benefits? American Geophysical Union, Fall Meeting 2014, December 17, 2014, San Francisco, USA.

Prein AF; The EURO-CORDEX Initiative: A new generation of regional climate scenarios for Europe. Seventh ICTP Workshop on the Theory and Use of Regional Climate Models, May 13, 2014. ICTP, Trieste, Italy.

Prein AF; Added Value of Convection Permitting Climate Simulations (CRCSs). Institut f. Atmosphäre und Klima, May 21, 2013, Zürich, Switzerland.

Honors, Awards, and Accomplishments

07/2018 **Highlighted as promising future leader in climate science by the World Climate Research Program (WCRP)**, https://www.wcrp-climate.org/future-science-leadership/spotlight-on-early-career-researchers.

06/2018 **Early Career Researcher Kamide Lecturer**, 15th AOGS annual meeting, Honolulu, HI.

06/2018 **Wiley top downloaded article in 2016-2017**, Prein and Gobiet 2017, Impacts of uncertainties in European gridded precipitation observations on regional climate analysis, Int. J. Climatol., 37: 305–327. doi:10.1002/joc.4706, 1380 downloads within the first 12 months of online publication.

05/2018 **Early Career Researcher presentation award**, 8th GEWEX Open Science Conference 2018, Canmore, CA.

03/2017 **AGU top cited papers in 2015-2016**, Prein et al. 2015, A review on regional convection-permitting climate modeling: Demonstrations, prospects, and challenges, Reviews of Geophysics, 53, 323–361, Highlighted in Meteorology and Atmospheric Science quarterly newsletter, March 2017.

01/2017 **Cover story Nature Climate Change**, Prein et al. 2016, The future intensification of hourly precipitation extremes. Nature Climate Change, 7(1):48–52, In January 2017 issue.

05/2016 **Poster Award**, *International Conference on Regional Climate (ICRC)-CORDEX 2016*, Stockholm, Sweden.

11/2009 **Poster award**, *3. Austrian Day of Meteorology*, November 5–6, 2009, Graz, Austria.

Professional Leadership and Development

11/2016 – current **Associate Editor**, *For the international journal Climate Dynamics*, Springer, Germany.

10/2016 – current **Coordinator**, *Climate Dynamics Special Issue on "Advances in Convection Permitting Climate Modeling"*, Springer, Germany.

10/2018 **Participant**, *High Impact Communication for Scientists, October 16–17, 2018*, Boulder, CO, CI International Training.

9/2018 **Coordinator**, *2nd GEWEX Convection Permitting Climate Modeling Workshop, September 4–6, 2018*, Boulder, CO, https://ral.ucar.edu/events/2018/cpcm.

9/2016 **Coordinator**, *GEWEX Convection Permitting Climate Modeling Workshop, September 6–9, 2016*, Boulder, CO, https://ral.ucar.edu/events/2016/cpcm.

5/2016 **Coordinator**, *ICRC-CORDEX conference side event on Convection-Permitting Climate Modeling*, Stockholm, Sweden.

4/2016 4/2017 **Session Co-Chair**, *EGU Annual Meeting, Atmospheric convection and convection-permitting modelling*, Vienna, Austria.

2016– **Organizer**, *"MMM Dynamic Happy Hour"*, National Center for Atmospheric Research, Mesoscale and Microscale Meteorology Laboratory.

12/2015 **Coordinator**, *AGU Annual Meeting side event on Convection-Permitting Climate Modeling*, San Francisco, CA.

09/2015 **Participant**, *2015 Swiss Climate Summer School: Extreme events and climate*, Ascona, Switzerland.

2014–2016 **Organizer**, *"Thompson Lecture Series" seminar*, National Center for Atmospheric Research, Advanced Study Program.

02/2010–11/2014 **Co-Coordinator**, *COSMO-CLM Convection Resolving Climate Simulation (CRCS) group.*

01/2012 **Participant**, *WRF tutorial*, Boulder, CO, USA.

02/2010 **Participant**, *COSMO/CLM Spring School 2010*, Langen, Germany.

06/2009 **Participant**, *Summer School on "Climate Variability & Climate Change: Estimating and Reducing Uncertainties"*., Visegrad, Hungary.

Outreach

08/2018 **Press Conference**, *At the "1st North American Hail Workshop"*, Coverage of hail hazard in a changing climate.

05/2018 **NCAR Journalism Summit**, *Member on the panel about "Future storms, future risks"*.

11/2017 **Press Release**, *On article "Increasing rainfall volume from future severe convective storms"*, Nationwide coverage in media outlets such as The Washington Post, NPR, CBS News, and Scientific American.

12/2016 **Press Release**, *On article "The future intensification of hourly precipitation extremes"*, Triggered more than 300 nationwide news articles in newspapers such as The New York Times, The Washington Post, or Physics Today.

2/2016 **Press Release**, *On article "Running dry: The U.S. Southwest's drift into a drier climate state"*, Nationwide coverage and interviewed by reporters from multiple newspapers and radio stations.

2011– **Journal Reviewer**, Nature Climate Change, Bulletin of the American Meteorological Society (BAMS), Journal of Climate, Climate Dynamics, Journal of Geophysical Research: Atmosphere, Geophysical Research Letters, Journal of Hydrometeorology, International Journal of Climatology, Monthly Weather Review, Water Resources Research, Geoscientific Model Development, Environmental Research Letters, Tellus A, Quarterly Journal of the Royal Meteorological Society, Journal of Applied Meteorology and Climatology, Meteorologische Zeitschrift.

Languages

German **Mother tongue**

English **Fluent**

Computer Skills

Platforms Linux, Windows

Programming Python, IDL, R, MATLAB, Scripting

Editing Writing and editing of scientific documents with LaTeX