Rachel H. White

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EDUCATION

2012 Ph.D., Space and Atmospheric Physics Group, *Imperial College London, UK*
Thesis title: New Bias Correction Methods for Simulating Precipitation and Runoff in the Weather Research and Forecasting Model
2008 M.Sci., First-class honours, Natural Sciences (Experimental and Theoretical Physics), *University of Cambridge, UK*
2007 B.A., First-class honours, Natural Sciences (Experimental and Theoretical Physics), *University of Cambridge, UK*

EMPLOYMENT

Sept 2020 -	Assistant Professor, Department of Earth, Ocean and Atmospheric Sciences, *University of British Columbia*
Nov 2018 – Aug 2020	Marie Skłodowska-Curie Fellow, Department of Earth Sciences, *Barcelona Supercomputing Center*
Jul 2018 – Sep 2018	Acting Instructor, Department of Atmospheric Sciences, *University of Washington*
Mar 2017 – Jul 2018	Post-doctoral Research Associate and Part-time Lecturer, Department of Atmospheric Sciences, *University of Washington*
Jan 2015 – Mar 2017	JISAO Post-doctoral Research Fellow, Joint Institute for the Study of the Atmosphere and Ocean, *University of Washington*
Jul 2012 – Nov 2014	Research Associate, *Imperial College London*
Mar 2014 – May 2014	Visiting Scientist, Department of Atmospheric Sciences, *University of Washington*
Jan 2010 – Dec 2010	Part-time Scientific Consultant with Imperial Consultants, *Science Museum London: Climate Science Exhibition*

PUBLICATIONS (PEER-REVIEWED)

H-index: 10; i10-index: 10; Citations: 332 (google scholar, Aug 2022)

Wang, M., Q. Fu, S. Solomon, B. Alexander, R. H. White, 2022, Stratosphere-troposphere exchanges of air mass and ozone concentration in the Last Glacial Maximum, *Journal of Geophysical Research – Atmospheres, accepted*

White, R. H., K. Kornhuber, O. Martius, and V. Wirth, 2022, From Atmospheric Waves to Heatwaves: A Waveguide Perspective for Understanding and Predicting Concurrent, Persistent and Extreme Extratropical Weather. *BAMS,* 10.1175/BAMS-D-21-0170.1

Prodhomme, C., S. Materia, C. Ardilouze, R.H.White, J. Garcia Serrano, L. Batté, V. Guemas, and G. Fragkoulidis, 2021, Seasonal prediction of European Summer Heatwaves. *Climate Dynamics* 10.1007/s00382-021-05828-3

Madonna, E., D.S. Battisti, C. Li and R.H.White, 2021, Reconstructing winter climate anomalies in the Euro-Atlantic sector using circulation regimes. *Weather and Climate Dynamics* 10.5194/wcd-2-777-2021

White, R.H., Wallace, J.M., and Battisti, D.S., 2021, Revisiting the Impact of Mountains on Atmospheric Circulation: Zonal Mean Impacts and Stationary Waves. *Journal of Atmospheric Sciences,* 10.1175/JAS-D-20-0300.1

Wang, M., Fu, Q., Solomon, S., White, R H., and Alexander, B., 2020, Stratospheric ozone in the Last Glacial Maximum. *Journal of Geophysical Research – Atmospheres,* 10.1029/2020JD032929

Fu, Q., Wang, M., White, R.H., Pahlavan, H., Alexander, B., Wallace, J.M., 2020, Quasi-biennial oscillation and sudden stratospheric warmings during the last glacial maximum. *Atmosphere,* 10.3390/atmos11090943

Fu, Q., White, R.H., Wang, M., Alexander, B., Solomon, S., Gettelman, A., Battisti, D.S. and Lin, P., 2020, The Brewer-Dobson Circulation during the Last Glacial Maximum. *GRL,* 10.1029/2019GL086271

White, R.H., 2019, Detecting Waveguides for Atmospheric Planetary waves: Connections to Extreme Weather Events. Proceedings of the 7th International Workshop on Climate Informatics: CI 2019, http://dx.doi.org/10.5065/y82j-f154

White, R.H., Hilgenbrink, C., and Sheshadri, A., 2019, The Importance of Greenland in setting the Northern Preferred Position of the North Atlantic Eddy-driven Jet. *GRL,* 10.1029/2019GL084780

Liu, X., Battisti, D.S., White, R.H., and Baker, P.A., 2019, South American Climate during the Early Eocene: Impact of a Narrower Atlantic and Higher Atmospheric CO2. *J. Climate,* 10.1175/JCLI-D-19-0170.1

Wills, R. C. J., White, R.H. and Levine, X. J., 2019, Midlatitude Stationary Waves in a Changing Climate. *Current Climate Change Reports,* 10.1007/s40641-019-00147-6

White, R.H., McFarlane, A.A., Frierson, D.M.W., Kang, S. M., Shin, Y., Friedman, M., 2018, Tropical Precipitation and Cross-Equatorial Heat Transport in Response to Localized Heating: Basin and Hemisphere Dependence, *GRL,* 10.1029/2018GL078781

White, R.H., Battisti, D.S., Sheshadri, A., 2018, Orographic impacts on boreal winter stratospheric circulation: Mongolian mountains matter most, *GRL,* 10.1002/2018GL077098

White, R.H., Battisti, D.S., and Skok, G., 2017, Global precipitation events tracked in time and space in gridded observational data, *GRL,* 10.1002/2017GL074011

White, R.H, Battisti, D.S., and Roe, G.H., 2017, Mongolian Mountains Matter Most: impacts of the latitude and height of Asian orography on the Winter Pacific Jet Stream, *J. Clim,* 10.1175/JCLI-D-16-0401.1

Stiller-Reeve, M.A., Heuze, C., Ball, W.T., White, R.H. et al., 2016 Improving together: better science writing through peer learning, *Hydrology and Earth System Sciences,* 10.5194/hess-20-2965-2016

White, R.H., 2015, Using multiple passive tracers to identify the importance of the North Brazil undercurrent for Atlantic Cold Tongue variability, *QJRMS*, 10.1002/qj.2536

White, R.H. and Toumi, R., 2014: River Flow and Ocean Temperatures: The Congo River, *JGR Oceans*, 119, 2501–2517, 10.1002/2014JC009836

White, R.H. and Toumi, R., 2013: The limitations of bias correcting regional climate model inputs, *GRL*, 10.1002/grl.50612

White, R. and Toumi, R., 2012: A Tightly Bound Soil-Water scheme within an atmosphere-land-surface model, Journal of Hydrology, *Journal of Hydrology 452/453*, 51-63, 10.1016/j.jhydrol.2012.05.028

<u>Under Review/In preparation</u>

White, R.H. et al., The Unprecedented Pacific Northwest Heatwave of June 2021, *under review, Nature Communications*

Fei, C., R.H. White, Recurrent Rossby waves in the CESM2: features, precursors and model biases in Northern hemisphere winter, *under review, Journal of the Atmospheric Sciences*

White, R.H., Guemas, V., Fragkoulidis, G., Prodhomme, C., Sub-seasonal predictability of tropospheric jets and waveguides, and implications for summer heatwave predictability, *In preparation, Climate Dynamics*

White, R.H., Baldwin, J., Frierson, D.M.W., Battisti, D. S., and Bonan, D., The unexpected role of Asian orography on North Atlantic and European climate. *In preparation, Journal of Climate*

BOOK CONTRIBUTIONS

Climate Change: Observed Impacts on Planet Earth, 3rd edition, edited by Trevor Letcher, published 2021, *Elsevier*. Contributing author to Chapter 21: The Jet Stream, by Stendel, M., Francis, J., White, R. H., Williams, P. D., and Woollings, T.

CONFERENCE PRESENTATIONS AND INVITED SEMINARS (LEAD/PRESENTING AUTHOR)

2022 Large-scale Controls on the Climatological Mid-latitude Storm-tracks, *Midlatitude Stormtracks Workshop, France*

2022 Climate Change and Extreme Events: What climate models can, and can't, tell us, *Property and Casualty Insurance Compensation Corporation Emerging Risks Seminar, Canada (online)*

2022 How Unprecedented was the June 2021 Heatwave? (Keynote), *Ecological impacts of the 2021 Heat Dome Symposium (University of British Columbia)*

2021 Revisiting the Role of Mountains in the Northern Hemisphere Winter Atmospheric Circulation, *AGU (online)*

2021 How are Climate Dynamics changing? *UBC Climate Change Research Symposium (online)*

2021 Propagation of Atmospheric Rossby waves - connection to predictability of climate extremes, *MCSA Cluster Event on the European Green Deal (online)*

2020 Heatwaves and Predictability-the Role of Rossby Waves and Atmospheric Waveguides, *EGU (online)*

2020 Understanding European Heatwaves: the role of Atmospheric Waves, *DMI Copenhagen*

2020 Understanding European Heatwaves: the role of Atmospheric Waves, *Uppsala University*

2020 Heatwaves and Atmospheric Dynamics: A Role for Atmospheric Waveguides? *University of Stockholm*

2020 Orography and Climate: New insights into a classical problem, *AWI Bremerhaven*

2020 Orography and Climate: New insights into a classical problem, *MPI Hamburg*

2019 Understanding Heatwaves: a role for Atmospheric Waveguides, *ETH Zurich*

2019 Understanding Heatwaves: a role for Atmospheric Waveguides, *Waves to Weather Rossby Wave Workshop, University of Mainz, invited presentation*

2019 Understanding Heatwaves: a role for Atmospheric Waveguides, *KNMI, Utrecht*

2019 Atmospheric waveguides in re-analysis data and CMIP6 simulations, *DynVarMip, Madrid*

2019 Atmospheric waves and heatwaves: the role of Rossby waveguides, *University of British Columbia*

2019 Understanding Heatwaves: a role for Atmospheric Waveguides. *CCCma, Victoria*

2019 A Tale of Two Mountain Ranges: The Remarkable Dominance of Asian Orography over North American on the Atlantic Meridional Overturning Circulation. *AMS 22nd AOFD Conference*

2019 Revisiting the Impact of Mountains on Stationary Waves: The Importance of the Zonal Mean Response. *AMS 22nd AOFD Conference*

2019 Heatwaves and Atmospheric Waveguides, *Workshop on Correlated Extreme Events*

2019 The Nature of the Preferred Positions in the North Atlantic Eddy-driven jet: the Importance of Greenland, *EGU General Assembly*

2019 The influence of mountains on large-scale atmospheric and oceanic flow: surprises from revisiting a 'solved' problem. *Advanced Climate Dynamics Course (ACDC) Conference, Norway*
2018 The Forcing of Preferred Positions in the North Atlantic Eddy-Driven Jet from Above, Below, and from the Future. *AGU Fall Meeting, invited presentation*
2018 The Varied Response of Tropical Precipitation to Localized Forcing in Different Hemispheres and Basins. *AGU*
2018 ClimateConversations: a web-based app for fostering discussion about climate based events. *AGU*
2018 The forcing of preferred positions in the North Atlantic eddy-driven jet. *Stormtracks 2018 workshop, Sweden*
2018 Is it the mountain you think it is? Impacts of individual mountain ranges on circulation, from the ocean to the stratosphere. *Department of Atmospheric & Oceanic Sciences, McGill University*
2017 Mountains, Stationary Waves, and Rossby Wave Refraction. *AGU Fall Meeting*
2017 Talking About Climate: a simple tool for everyday climate conversations. *AGU Fall Meeting*
2017 Orography and SSWs: Which Mountains Matter Most? *AMS 19th Conference on Middle Atmosphere*
2017 Mongolian Mountains Matter Most: The Impacts of Asian Orography on Downstream Atmospheric Circulation and Variability, *AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics*
2016 How ocean circulation connects extra-tropical mountains to tropical weather, *University of Otago, New Zealand*
2015 The impact of latitude on mountain-jet-stream interactions, *University of Reading, UK*
2015 The impact of mountain latitude and geometry on the Pacific Jet stream and storm track, *Imperial College London, UK*
2015 Topographic impacts on jet streams and storm tracks: Mongolian mountains matter, *EGU General Assembly*
2015 A new method for studying water mass origins on basin scales: using multiple passive tracers to study Atlantic Cold Tongue variability, *EGU General Assembly*
2014 Storm Tracks and Orography: interaction of responses from different mountain ranges, *Latsis Symposium, ETH Zurich*
2014 Improving WRF Regional Climate Simulations; Precipitation and Runoff, *University of Washington*
2013 Modelling runoff in semi-arid climate: the importance of a tightly-bound-water scheme, *Africa Climate Conference, Arusha, Tanzania*
2013 Freshwater river plumes and Ocean Temperatures, *NOC, Liverpool, UK*
2013 Freshwater river plumes and ocean temperatures, *Challenger Society for Marine Science Ocean Modelling Group Meeting, Imperial College London*
2013 The extent of the Congo River influence, *IC3, Barcelona, Spain*
2013 The influence of Congo Basin Precipitation on Atlantic SSTs, *NOC, Southampton, UK*
2012 The impact of the Congo plume, *Challenger Society for Marine Science Ocean Modelling Group Meeting, University of East Anglia*
2012 A tightly bound water soil physics scheme for the NOAH land surface model, *Sixth ICTP Workshop on the Theory and Use of Regional Climate Models, Trieste, Italy*
2011 The impact of soil moisture on the regional climate of the Olifants basin in South Africa, *EGU G.A.*

CONFERENCE PRESENTATIONS AND INVITED SEMINARS (CO-AUTHOR)

2022 Future Climate Simulations for the Salish Sea Using a High Resolution Ocean Model with Biogeochemistry, Ridenour et al, *Canadian Meteorological and Oceanographic Society Congress*
2022 Jet waveguides - links to persistent surface weather and sub-seasonal predictability, Romppainen-Martius et al. *EGU General Assembly*
2021 Stratospheric ozone and stratosphere-troposphere ozone exchange in the Last Glacial Maximum, Wang et al. *AGU*
2021 Towards mountains without glaciers: A regional climate assessment in western Canada and Alaska, Draeger et al. *AGU*
2021 Evaluation of high-resolution dynamical downscaling for surface energy balance modelling at mountain glaciers in Western Canada, Draeger et al. *AGU*
2020 Mechanisms of Stationary Rossby Wave Change in Comprehensive and Idealized GCMs, Jnglin-Wills et al., *AGU*
2019 Recurrent stationary waves in observations and models, Kornhuber et al. *AGU*
2019 Some Insights from the Past 20 Years of Research in Stationary Waves, Battisti and White, *AGU*

GRANTS

Project Lead

2020 - 2023 Atmospheric Waves and Regional Weather Extremes, *NSERC Accelerator Supplement;* **CAD 120,000**
2020 - 2025 Atmospheric Waves and Regional Weather Extremes, *NSERC Discovery Grant;* **CAD 187,500**
2018 – 2020 Propagation of Rossby Waves – Connection to the Predictability of Climate Extremes, *Marie Skłodowska-Curie Individual Fellowship*; **EUR 158,121**
2014 Northern Hemisphere Jets and Orography: Interactions and Threshold Behaviour, *Royal Society International Exchange Grant*; **GBP 1940**

Co-PI/Contributor

2022-2027 Optimizing Numerical Weather Prediction for Clean Energy, *MITACS Accelerate,* **CAD 3.1million**
2022 Assessment of connections between atmospheric planetary waves and extreme rainfall events (PIs Rachel White and Anna Whitford), *MITACS Globalink Exchange,* **CAD 3000**
2018 – 2021 Stratosphere-to-troposphere Ozone Flux and Surface Ultraviolet Radiation during Cold Climates and Impact on Tropospheric Oxidants (PIs Qiang Fu, Becky Alexander, and David Battisti), *U.S. National Science Foundation;* **USD 595,120**
2017 – 2020 Hemispheric energy balance and tropical precipitation shifts: the impacts of forcing location (PIs Dargan Frierson and Cecilia Bitz), *U.S. National Science Foundation;* **USD 594,498**

TEACHING

Primary Lecturer

Numerical Techniques for Ocean, Atmosphere and Earth Scientists, Spring 2022, combined graduate/undergraduate class with jupyter notebooks, 4.4/5.0 mean evaluation
Global Climate Change, Fall 2021, Fall 2022, third-year course on climate and climate change; 3.9/5.0 mean evaluation
Physical Climate Modelling; Spring 2021, a graduate course based on jupyter notebooks

Introduction to Climate Science hybrid class; Winter 2018; median student evaluation: 3.2/5.0; 33 students; University of Washington, Bothell. Converted a standard course to a hybrid online/classroom course.

Global Warming: Understanding the Issues; Spring 2017; median student evaluation: 4.2/5.0; 160 students; University of Washington.

Research in Weather and Climate; Spring 2017; median student evaluation: 4.8/5.0; 7 students; University of Washington, Bothell. Designed and developed this new course-based undergraduate research experience.

Introduction to Climate Science; Fall 2016 and Winter 2017; median student evaluation: 4.7/5.0; 30 students; University of Washington, Bothell.

Physics Mechanics laboratory classes; Winter 2017; median student evaluation: 4.1/5.0; 48 students; University of Washington, Bothell.

SERVICE

Conference and Meetings

2022 Session co-convener, Jetstream Dynamics, Atmospheric Rossby Waves and Associated Extreme Weather and Climate Events, *American Geophysical Union Fall Meeting (Chicago/online)*

2022 Session co-convener, Rossby Waves and Jet Dynamics: Impacts on Weather and Climate, *EGU General Assembly (Austria/online)*

2021 Session Convener, Jetstream Dynamics, Atmospheric Rossby Waves and Associated Extreme Weather and Climate Events, *American Geophysical Union Fall Meeting (New Orleans/online)*

2021 Session co-convener, Rossby Waves and Jet Dynamics: Impacts on Weather and Climate, *vEGU General Assembly (online)*

2020 Session convener, Rossby Waves and Jet Dynamics: Impacts on Weather and Climate, *2020 EGU General Assembly (online)*

2019 Session Chair (invited), Landscapes and Climate, *Advanced Climate Dynamics Course (ACDC) Conference, Norway*

Scientific Journal Referee

Nature, Nature Climate Change, Nature Communications, Geophysical Research Letters, Journal of Atmospheric Sciences, Journal of Climate, Climate Dynamics, Journal of Geophysical Research - Atmospheres, Journal of Geophysical Research – Oceans, Quarterly Journal of the Royal Meteorological Society, Atmosphere

Public outreach lectures/Radio interviews

2022 Interviews with journalists from The Canadian Press for written articles on the June 2021 heatwave; Live radio interview (CBC On the Coast) and interview with journalist for written article (Glacier Media) on: Sounds of Earth, A Musical Exploration of our Dynamic Planet.

2021 Over 15 live and pre-recorded interviews (including: CTV, BBC Weather World, Sky News UK, Radio Times London) on climate, with topics including: atmospheric rivers, heatwaves, climate justice, the IPCC AR6, and COP26. Over 5 recorded interviews with journalists leading to a video or written article, including two New York Times articles. Two public panel discussions on climate change.

2018 Going to Extremes: Is it climate change or just bad weather? *Lagunitas, Seattle;* Climate Change 101. *Lynnwood Library, Seattle*

2017 Salmon in a time of Global Warming, *Peddler Brewing Company*; radio interview with KBCS Radio (http://kbcs.fm/2017/03/27/salmon-and-climate-change-in-the-northwest); Going to Extremes: Is it climate change or just bad weather? *Ravenna Third Place Books,*

Seattle; Going to Extremes: The Future of Weather in the Pacific Northwest*, Climate Science on Tap, Seattle*

2016 Climate Change 101, *Ada's Technical Books, Seattle;* Ask a Climate Scientist, *Seattle Central College Conversations on Social Issues;* Going to Extremes: Is it climate change or just bad weather? *Peddler Brewing Company, Seattle;* Climate Change and Us, *Washington Corrections Center for Women;* A Price on Carbon for a Warming Planet, *Climate on Tap, Seattle;* The Life of Carbon, *University House, Seattle*

Other public/student engagement

Verna J. Kirkness Education Foundation Program Mentor (2022), for Indigenous High School students

Volunteer lecturer for the U.S. Federal Emergency Management Agency, National Emergency Management Basic Academy in Washington State

Weather and climate presentations for school children of various age groups in London, Seattle, and Barcelona

USA Science Festival volunteer, Washington D.C. April 2016