

Karin van der Wiel

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My general research interests include atmospheric dynamics, atmosphere-land and atmosphere-ocean interactions, extreme events, and the impact of weather on society. Most of my research focuses is on how internal climate variability and climate change might impact these topics. I hope to contribute to increasing our understanding of Earth's weather and climate in a way that is useful for society.

PROFESSIONAL EXPERIENCE

Royal Netherlands Meteorological Institute || Scientist

October 2019 – present, De Bilt, Netherlands

- Climate change scenarios

Royal Netherlands Meteorological Institute || Postdoctoral scientist

October 2016 – September 2019, De Bilt, Netherlands

- High impact climate extremes

Princeton University || Postdoctoral scientist

NOAA Geophysical Fluid Dynamics Laboratory || Visiting scientist

October 2015 – September 2016, Princeton, NJ, U.S.A.

- U.S. extreme precipitation and flooding
- Mild weather

EDUCATION

University of East Anglia || PhD Environmental Science

July 2015, Norwich, United Kingdom

Thesis: Mechanisms for the existence of diagonal Southern Hemisphere convergence zones

Wageningen University || MSc Meteorology and Air Quality

November 2011, Wageningen, Netherlands

Specialisation: Meteorology and Climate • Cum Laude (GPA 8.8/10)

Wageningen University || BSc Soil, Water, Atmosphere

August 2009, Wageningen, Netherlands

Minor: Applied mathematics in hydrology • Cum Laude (GPA 8.0/10)

AWARDS AND FELLOWSHIPS

2022 | EGU Outstanding Early Career Scientist Award

2021 | EMS Young Scientist Award

2020 | UK Geographical Association 'Highly commended' educational resources

2019 | WMO Research Award for Young Scientists

2019 | ECMWF short-term secondment.

2018 | SPARC early-career conference grant

2018 | AGU Editor's Citation for Excellence in Refereeing for Water Resources Research

2017 | AGU James R. Holton Award

2014 | AGU student travel grant

2013 | Geophysical Fluid Dynamics Fellowship, Woods Hole Oceanographic Institution

2012 | University of East Anglia, Faculty of Science, fully-funded PhD studentship

PUBLICATIONS

Names with an asterisk (*) indicate a (group of) student(s) that I advised

In press

40. Y Boulagiem, J Zschleichler, E Vignotto, K van der Wiel, S Engelke: Modelling and simulating spatial extremes by combining extreme value theory with generative adversarial networks. *Environmental Data Science*. In press.
39. E Tschumi, S Lienert, K van der Wiel, F Joos, J Zscheischler: A climate database with varying drought-heat signatures for climate impact modelling. *Geoscience Data Journal*. In press.

Peer-reviewed journal articles

38. H Goulart*, K van der Wiel, C Folberth, J Balkovic, B van den Hurk (2021): Weather-induced crop failure events under climate change: a storyline approach. *Earth System Dynamics*, 12, pp. 1503–1527.
37. E Bevacqua, C De Michele, C Manning, A Couasnon, AFS Ribeiro, AM Ramos, E Vignotto, A Bastos, S Blesić, F Durante, J Hillier, SC Oliveira, JG Pinto, E Ragno, P Rivoire, K Saunders, K van der Wiel, WWu, T Zhang, J Zscheischler (2021): Guidelines for studying diverse types of compound weather and climate events. *Earth's Future*. 9, pp. e2021EF002340.
36. K van der Wiel, G Lenderink, H de Vries (2021): Physical storylines of future European drought events like 2018 based on ensemble climate modelling. *Weather and Climate Extremes*. *Weather and Climate Extremes*, 33, pp. 100350.
35. R Sperna Weiland*, K van der Wiel, FM Selten, D Coumou (2021): Intransitive atmosphere dynamics leading to persistent hot-dry or cold-wet European summers. *Journal of Climate*, 34 (15), pp. 6303-6317
34. GJ van Oldenborgh, K van der Wiel, S Kew, S Philip, F Otto, R Vautard, A King, F Lott, J Arrighi, R Singh, M van Aalst (2021): Pathways and pitfalls in extreme event attribution. *Climatic Change*, 166 (13), pp. 13.
33. G van Kempen*, K van der Wiel, LA Melsen (2021): The impact of hydrological model structure on the simulation of extreme runoff events. *Natural Hazards and Earth System Sciences*, 21 (3), pp. 961-976.
32. J Vogel*, P Rivoire*, C Deidda*, L Rahimi*, CA Sauter*, E Tschumi*, K van der Wiel, T Zhang, J Zschleichler (2021): Identifying meteorological drivers of extreme impacts: an application to simulated crop yields. *Earth System Dynamics*, 12, pp. 151-172.
31. PNJ Bonekamp, N Wanders, K van der Wiel, AF Lutz, WW Immerzeel (2021): Using large ensemble modelling to derive future changes in mountain specific climate indicators in a 2 °C and 3 °C warmer world in High Mountain Asia. *International Journal of Climatology*, 41, pp. E964-E979.
30. SF Kew, SY Philip, M Hauser, M Hobbins, N Wanders, GJ van Oldenborgh, K van der Wiel, TIE Veldkamp, J Kimutai, C Funk, FEL Otto (2021): Impact of precipitation and increasing temperatures on drought in eastern Africa. *Earth System Dynamics*, 12, pp. 17-35.
29. K van der Wiel, R Bintanja (2021): Contribution of climatic changes in mean and variability to monthly temperature and precipitation extremes. *Communications Earth and Environment*, 2 (1), pp.1-11.
28. S Vijverberg, M Schmeits, K van der Wiel, D Coumou (2020): Sub-seasonal statistical forecasts of eastern United States hot temperature events. *Monthly Weather Review*, 148 (12), pp. 4799-4822.
27. SY Philip, SF Kew, GJ van Oldenborgh, F Otto, R Vautard, K van der Wiel, A King, F Lott, J Arrighi, R Singh, M van Aalst (2020): A protocol for probabilistic extreme event attribution analyses. *Advances in Statistical Climatology, Meteorology and Oceanography*, 6 (2), pp. 177-203.
26. JR Brown, M Lengaigne, BR Lintner, MJ Widlansky, K van der Wiel, C Dutheil, BK Linsley, AJ Matthews, J Renwick (2020): South Pacific Convergence Zone dynamics, variability, and impacts in a changing climate. *Nature Reviews Earth & Environment*, 1 (10), pp. 530-543.
25. SY Philip, SF Kew, K van der Wiel, N Wanders, GJ van Oldenborgh (2020): Regional differentiation in climate change induced drought trends in the Netherlands. *Environmental Research Letters*, 15 (9), pp. 094081.
24. Nanditha JS, K van der Wiel, U Bhatia, D Stone, FM Selten, V Mishra (2020): A seven-fold rise in the probability of exceeding the observed hottest summer in India in a 2 °C warmer world. *Environmental Research Letters*, 15 (4), pp. 044028.

23. [K van der Wiel](#), FM Selten, R Bintanja, R Blackport, JA Screen (2020): Ensemble climate-impact modelling: extreme impacts from moderate meteorological conditions. *Environmental Research Letters*, 15 (3), pp. 034050.
22. R Bintanja, [K van der Wiel](#), EC van der Linden, J Reusen, L Bogerd, F Krikken, FM Selten (2020): Strong future increases in Arctic precipitation variability linked to poleward moisture transport. *Science Advances*, 6 (7), pp. eaax6869.
21. A Sebastian, A Gori, RB Blessing, [K van der Wiel](#) and B Bass (2019): Disentangling the impacts of human and environmental change on catchment response during Hurricane Harvey. *Environmental Research Letters*, 14 (12), pp. 124023.
20. GA Vecchi, T Delworth, H Murakami, SD Underwood, AT Wittenberg, F Zeng, W Zhang, K Bhatia, W Cooke, J He, A Rosati, [K van der Wiel](#), W Anderson, V Balaji, J Baldwin, J-H Chen, K Dixon, R Gudgel, L Harris, L Jia, NC Johnson, SB Kapnick, T Knutson, S-J Lin, M Liu, J Ng, JA Smith, G Villarini, X Yang (2019): The response of tropical-cyclone permitting coupled global climate models to CO₂ doubling: large-scale surface climate and tropical cyclone activity. *Climate Dynamics*, 53 (9), pp. 5999-6033.
19. [K van der Wiel](#), HC Bloomfield, RW Lee, LP Stoop*, R Blackport, JA Screen, FM Selten (2019): The influence of weather regimes on European renewable energy production and demand. *Environmental Research Letters*, 14 (9), pp. 094010.
18. R Blackport, JA Screen, [K van der Wiel](#), R Bintanja (2019): Minimal influence of reduced Arctic sea ice on coincident cold winters in mid-latitudes. *Nature Climate Change*, 9 (9), pp. 687-704.
17. [K van der Wiel](#), LP Stoop*, BRH van Zuijlen, R Blackport, MA van den Broek, FM Selten (2019): Meteorological conditions for extreme low renewable energy production and extreme high energy shortfall. *Renewable and Sustainable Energy Reviews*, 111, pp. 261-275.
16. [K van der Wiel](#), N Wanders, FM Selten, MFP Bierkens (2019): Added value of large ensemble simulations for assessing extreme river discharge in a 2 °C warmer world. *Geophysical Research Letters*, 46 (4), pp. 2039-2102.
15. S Philip, S Sparrow, SF Kew, [K van der Wiel](#), N Wanders, R Singh, A Hassan, K Mohammed, H Javid, K Haustein, FEL Otto, F Hirpa, RH Rimi, AKM Saiful Islam, DCH Wallom, GJ van Oldenborgh (2019): Attributing the 2017 Bangladesh floods from meteorological and hydrological perspectives. *Hydrology and Earth System Sciences*, 23 (3), pp. 1409-1429, highlighted article.
14. [K van der Wiel](#), SB Kapnick, GA Vecchi, JA Smith, PCD Milly, L Jia (2018): 100-yr Lower Mississippi floods in a global climate model: characteristics and future changes. *Journal of Hydrometeorology*, 19 (10), pp. 1547-1563.
13. L Krishnamurthy, GA Vecchi, X Yang, [K van der Wiel](#), V Balaji, SB Kapnick, L Jia, F Zeng, K Paffendorf, S Underwood (2018): Causes and probability of occurrence of extreme precipitation events like Chennai 2015. *Journal of Climate*, 31 (10), pp. 3831-3848.
12. FEL Otto, [K van der Wiel](#), GJ van Oldenborgh, S Philip, SF Kew, P Uhe, H Cullen (2018): Climate change increases the probability of heavy rains in the northern UK like those of storm Desmond – a real-time event attribution revisited. *Environmental Research Letters*, 13 (2), 024006.
11. GJ van Oldenborgh, [K van der Wiel](#), A Sebastian, R Singh, J Arrighi, FEL Otto, K Haustein, S Li, GA Vecchi, H Cullen (2017): Attribution of the extreme rainfall from Hurricane Harvey, August 2017. *Environmental Research Letters*, 12 (12), 124009, featured article.
10. [K van der Wiel](#), ST Gille, SG Llewellyn Smith, PF Linden, C Cenedese (2017): Characteristics of colliding sea breeze gravity current fronts: a laboratory study. *Quarterly Journal of the Royal Meteorological Society*, 143 (704), 1434-1441.
9. [K van der Wiel](#), SB Kapnick, GJ van Oldenborgh, K Whan, S Philip, GA Vecchi, RK Singh, J Aright, H Cullen (2017): Rapid attribution of the August 2016 flood-inducing extreme precipitation in south Louisiana to climate change. *Hydrology and Earth System Sciences*, 21 (2), 897-921, highlighted article.
8. [K van der Wiel](#), SB Kapnick, GA Vecchi (2017): Shifting patterns of mild weather in response to projected radiative forcing. *Climatic Change*, 140 (3), 649-658.
7. [K van der Wiel](#), SB Kapnick, GA Vecchi, WF Cooke, TL Delworth, L Jia, H Murakami, S Underwood, F Zeng (2016): The resolution dependence of US precipitation extremes in response to CO₂ forcing. *Journal of Climate*, 29 (22), 7991-8012.
6. MA Stiller-Reeve, C Heuzé, WT Ball, RH White, G Messori, [K van der Wiel](#), I Medhaug, A Eckes, A. O'Callaghan, MJ Newland, S Williams, M Kasoar, HE Wittmeier and V Kumer (2016): Improving together: better science writing through peer learning. *Hydrology and Earth System Sciences*, 20 (7), 2965-2973.

5. K van der Wiel, AJ Matthews, MM Joshi and DP Stevens (2016): The influence of diabatic heating in the South Pacific Convergence Zone on Rossby wave propagation and the mean flow. Quarterly Journal of the Royal Meteorological Society, 142 (695), 901-910.
4. K van der Wiel, AJ Matthews, MM Joshi and DP Stevens (2016): Why the South Pacific Convergence Zone is diagonal. Climate Dynamics, 46 (5), 1683-1698.
3. K van der Wiel, AJ Matthews, DP Stevens and MM Joshi (2015): A dynamical framework for the origin of the diagonal South Pacific and South Atlantic Convergence Zones. Quarterly Journal of the Royal Meteorological Society, 141 (691), 1997-2010, featured article.
2. MM Joshi, M Stringer, K van der Wiel, A O'Callaghan, S Fueglistaler (2015): IGCM4: A fast, parallel and flexible intermediate climate model. Geoscientific Model Development, 8 (4), 1157-1167.
1. W Hazeleger, X Wang, C Severijns, S Stefanescu, R Bintanja, A Sterl, K Wyser, T Semmler, S Yang, B van den Hurk, T van Noije, E van der Linden and K van der Wiel (2012): EC-Earth V2.2: description and validation of a new seamless earth system prediction model. Climate Dynamics, 39 (11), 2611-2629.

Presentations (presenting author only)

2022 | EGU general assembly (planned) • KNMI (planned) • Nederlandse Natuurkundige Vereniging (planned)

2021 | Japan international workshop on storylines • Dutch Earth Sciences Conference (keynote speaker) • University of Houston • EGU general assembly • SMILE webinar series • Platform WOW webinar series • VDI Association of German Engineers • EMS Annual Meeting • Large ensembles for compound events workshop

2020 | EUCP project general assembly • Wageningen University • SMILE webinar series • Springtij festival • Dutch National Delta Conference

2019 | University of Reading • EGU general assembly • Storyline approach workshop • Wageningen University • KNMI • NVBM autumn symposium • Eindhoven physics symposium

2018 | EGU general assembly • University of Exeter • SPARC General Assembly • University of Gothenburg

2017 | Wageningen University • Compound extremes workshop • EGU general assembly • University of East Anglia • IIT Gandhinagar • IIT Delhi • AGU fall meeting

2016 | DCMIP workshop • Rutgers University • Columbia University • Massachusetts Institute of Technology • Princeton University • GLP open science meeting • Chinese Academy of Sciences

2015 | University of East Anglia • UK MetOffice

2014 | AGU fall meeting

2013 | Woods Hole Oceanographic Institute • University of Cambridge • University of East Anglia

2011 | Wageningen University

FUNDED RESEARCH PROPOSALS

2020 | KNMI Multi-year Strategic Research 'Probing future changes in climate variability and extremes using perturbed-physics large-ensemble model simulations.'

2020 | EU COST short term scientific mission 'Persistence of concurrent compound events for energy security' (visit to Laboratoire de Météorologie Dynamique, Paris, cancelled due to COVID-19).

2019 | ECMWF special project: 'European energy transition: energy security in a highly-renewable system.'

FURTHER ACTIVITIES

2021 – present | NVBM board member.

2017 – present | Core-team member for KNMI's 'klimaatbericht' service, contributed 25+ messages.

2019 – present | Chairperson of the evaluation committee weather alarms for the KNMI operational services.

2021 | Lead author of chapter on drought in the KNMI Klimaatsignaal report.

2021 | Large ensemble simulations for compound event research workshop, Ecole Normale Supérieure Paris, France.

2019 | Co-developed free only geography lesson plan 'Climate and Energy' with EncouterEdu, <https://encounteredu.com>.

2019 | Statistical modelling compound events summer school, postdoc project supervisor, Como, Italy.

2019 | Short-term secondment, ECMWF, Reading, United Kingdom.
2019 | Physical modelling supporting a “storyline approach” workshop, CICERO, Norway.
2015 – 2019 | Volunteer scientist in the ‘Letters to a Pre-Scientist’ program, www.prescientist.org.
2017 | Global teleconnections in the Earth’s climate system summer school, Potsdam Institute for Climate Impact Research, Germany.
2017 | Addressing the challenge of compound events workshop, ETH Zurich, Switzerland.
2016 | Dynamical Core Model Intercomparison Project workshop/summer school.
2013 – 2015 | Co-founder of the UEA ClimateSnack writing group, www.scisnack.com.
2015 | Denial101x: Making Sense of Climate Science Denial, MOOC.
2013 | Fellow in the Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution.
2012 | Advanced Climate Dynamics Courses summer school: Landscapes and Climate, University of Bergen, Norway.
2008 – 2009 | President of study association Pyrus, Wageningen University.

ACADEMIC ADVISING

Postdoctoral researchers

2021 – present | Laura Muntjewerf, KNMI.

PhD students

2021 – present | Lieke van der Most, PhD co-promotor (University of Groningen)

2020 – present | Ruud Sperna Weiland, PhD co-promotor (Rabobank, Vrije Universiteit Amsterdam).

2020 – present | Henrique Goulart, PhD co-promotor (Deltares, Vrije Universiteit Amsterdam).

Research interns

2021 – present | Siem Rothengatter, MSc dissertation supervisor (Vrije Universiteit Amsterdam).

2020 – 2021 | Thomas Batelaan, MSc internship supervisor (Wageningen University).

2020 | Carlos Schyns, MSc dissertation co-supervisor (Vrije Universiteit Amsterdam).

2019 – 2020 | Ruud Sperna Weiland, MSc dissertation supervisor (University of Amsterdam).

2019 – 2020 | Gijs van Kempen, MSc dissertation co-supervisor (Wageningen University).

2019 | Onno Doensen, MSc internship co-supervisor (Wageningen University).

2017 – 2018 | Laurens Stoop, MSc dissertation supervisor (Utrecht University).

2016 | Aria Alexander, summer internship co-supervisor (Princeton University).

TEACHING EXPERIENCE

2020 | Guest lecturer, MSc course Catchment en Climate hydrology, Wageningen University

2020 | Guest lecturer, MSc course Climate Modelling, University of Groningen

2018 | Guest lecturer, MSc course Climate Modelling, University of Gothenburg

2012 - 2015 | Demonstrator, various Earth Sciences and Meteorology courses, incl. fieldwork, University of East Anglia

2007 - 2011 | Student assistent, various Mathematics and Meteorology courses, Wageningen University

OTHER SKILLS AND EXPERIENCE

Languages

Dutch (native) • English (fluent)

Manuscript review

Atmospheric Research • Atmospheric Science Letters • Bulletin of the American Meteorological Society • Climate Dynamics • Communications Earth & Environment • Earth System Dynamics • Environmental Research Letters • Geophysical Research Letters • Journal of Climate • Journal of Geophysical Research: Atmospheres • Journal of Hydrometeorology • Nature Climate Change • Nature Communications • Nature Geoscience • Scientific Reports •

Proceedings of the National Academy of Sciences • Theoretical and Applied Climatology • Quarterly Journal of the Royal Meteorological Society • Water Resources Research • Weather

Media interviews

print/online | The Advocate • Associated Press • Canadian Press • Carbon Brief • Christian Science Monitor • Climate Central • ClimateNexus • Climatewire • CNN • David Suzuki • Delta • EOS Wetenschap • The Gazette • The Guardian • HP de Tijd • Inside Climate News • Interrobang • Local Xpress Nova Scotia • Mashable • Missoulian • Mother Jones • NationSwell • New York Times • NOS op 3 • NRC • nu.nl • RTL nieuws • Ogoniok Weekly • Quest • San Diego Union-Tribune • La Tercera • The Times Picayune • USA Today • Volkskrant • Washington Post • WIRED
radio/video | 9NEWS (Denver) • CHQR (Calgary) • CKNW (Vancouver) • NPO radio 1 (Netherlands)

REFERENCES

Available upon request.