

# Jan Wohland

## Academic positions

### 2021 - present **Senior Scientist**

Influence of climate change on wind energy site assessment  
CLIMATE SERVICE CENTER GERMANY

- Climate risk quantification for the energy sector using high-resolution climate models
- Evaluation of the climate modeling chain in wind energy contexts
- Stakeholder engagement

### 2019 - 2021 **ETH Postdoctoral Fellow**

European multidecadal renewable generation variability  
ETH ZURICH  
DEPARTMENT FOR ENVIRONMENTAL SYSTEMS SCIENCE, CLIMATE POLICY GROUP

- Long-term resource assessment of solar photovoltaics and wind power
- Representation of dimming and brightening
- Uncertainty quantification in centennial reanalyses

## Education

### 2016 - 2019 **PhD in Physics (summa cum laude)**

Topic: Impacts of climate variability and climate change on renewable power generation  
UNIVERSITY OF COLOGNE & FORSCHUNGSZENTRUM JÜLICH  
with JProf. Dr. Dirk Witthaut

- Climate change impacts on European power balancing
- Congestion management in the German transmission grid
- Long-term variability of wind power generation

2018 Research visit in Norway (3 months)

GEOPHYSICAL INSTITUTE, UNIVERSITY OF BERGEN  
with Prof. Dr. Noel Keenlyside

### 2013 - 2016 **Master in Physics focusing on Climate Physics (with distinction)**

Thesis: Modeling characteristics of surface elevation profiles of Siple Coast ice streams  
UNIVERSITY OF POTSDAM & POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH  
with Prof. Dr. Anders Levermann

2016 Research visit in South Africa (3 months)

CLIMATE SYSTEM ANALYSIS GROUP, UNIVERSITY OF CAPE TOWN  
with Chris Jack, PhD

### 2010 - 2013 **Bachelor in Physics and Mathematics**

Thesis: Sensitivity of climate network results under different resolutions  
HUMBOLDT-UNIVERSITY BERLIN & POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH  
with Prof. Dr. Dr. h.c. Jürgen Kurths

## Peer-reviewed publications (ORCID: 0000-0001-8336-0009)

- under review N. Brazzola, A. Patt, **J. Wohland**  
Definitions and implications of climate-neutral aviation  
under review
- submitted D. Mühlemann, D. Folini, S. Pfenninger, M. Wild, **J. Wohland**  
Meteorologically-informed spatial planning of European PV deployment to reduce multi-day  
generation variability  
submitted
- published **J. Wohland**, D. Folini, B. Pickering  
Wind speed stilling and its recovery due to internal climate variability  
Earth System Dynamics 12, 1239-1251, 2021
- R. McKenna, S. Pfenninger, H. Heinrichs, ..., **J. Wohland**  
Reviewing methods and assumptions for high-resolution large-scale onshore wind energy po-  
tential assessments  
Renewable Energy 182, 659-684, 2022
- X. Hou, M. Wild, D. Folini, S. Kazadzis, and **J. Wohland**  
Climate change impacts on solar power generation and its spatial variability in Europe based  
on CMIP6  
Earth System Dynamics 12, 1099-1113, 2021
- J. Wohland**, D. Brayshaw, S. Pfenninger  
Mitigating a century of European renewable variability with transmission and informed siting  
Environmental Research Letters, 16, 064026, 2021
- N. Brazzola, **J. Wohland**, A. Patt  
Offsetting future agricultural methane emission pathways with CO<sub>2</sub> removal  
PLoS ONE 18(3):, e0247887, 2021
- C. Neubacher, D. Witthaut, **J. Wohland**  
Multi-decadal offshore wind power variability can be mitigated through optimized European  
allocation  
Advances in Geosciences, 54, 205-215, 2021
- J. Wohland**, D. Brayshaw, H. Bloomfield, M. Wild  
European multidecadal solar variability badly captured in all centennial reanalyses except  
CERA20C  
Environmental Research Letters 15, 104021, 2020
- H.C. Bloomfield, P.L.M. Gonzalez, J.K. Lundquist, L.P. Stoop, J. Browell, R. Dargaville, M. De  
Felice, K. Gruber, A. Hilbers, A. Kies, M. Panteli, H.E. Thornton, **J. Wohland**, M. Zeyringer,  
D.J. Brayshaw  
The importance of weather and climate to energy systems: A workshop on Next Generation  
Challenges in Energy-Climate Modelling  
Bulletin of the American Meteorological Society 1–23, 2020
- J. Wohland**, N.E. Omrani, N.S. Keenlyside, D. Witthaut  
Significant multi-decadal variability in German wind energy yields  
Wind Energy Science, 4, 515–526, 2019
- J. Wohland**, N.E. Omrani, D. Witthaut, N.S. Keenlyside  
Inconsistent wind speed trends in current twentieth century reanalyses  
Journal of Geophysical Research – Atmospheres 124, 2019
- J. Wohland**, D. Witthaut, C. F. Schleussner  
Negative emission potential of Direct Air Capture powered by renewable excess electricity in  
Europe  
Earth's Future 6, 1-5, 2018
- J. Weber, **J. Wohland**, M. Meyers, J. Moemken, C. Hoppe, J. G. Pinto, and D. Witthaut  
Impact of climate change on backup energy and storage needs in wind-dominated power systems

in Europe  
PLoS ONE 13 (8):e0201457, 2018

**J. Wohland**, M. Reyers, C. Märker and D. Witthaut  
Natural wind variability triggered drop of German redispatch volume and costs from 2015 to 2016  
PLoS ONE 13(1): e0190707, 2018

**J. Wohland**, M. Reyers, J. Weber, D. Witthaut  
More homogeneous wind conditions under strong climate change decrease the potential for inter-state balancing of electricity in Europe  
Earth System Dynamics 8, 1047–1060, 2017

B. Hewitson, K. Waagsaether, **J. Wohland**, K. Kloppers, T. Kara  
Climate information websites: an evolving landscape  
Wiley Interdisciplinary Reviews: Climate Change (2017), e470

C. F. Schleussner, T. K. Lissner, E. M. Fischer, **J. Wohland**, M. Perrette, A. Golly, J. Rogelj, K. Childers, J. Schewe, K. Frieler, M. Mengel, W. Hare, and M. Schaeffer  
Differential climate impacts for policy relevant limits to global warming: The case of 1.5° C and 2° C.  
Earth System Dynamics 7, 327-351, 2016

### Citation metrics (as of 28.09.2021)

	citations	h-index
google scholar	718	8
web of science	447	7

### Grants and awards

- 2019           ETH Postdoctoral Fellowship (230 kCHF)  
                  ETH ZURICH
- Köppen Award for an excellent doctoral dissertation  
                  CLUSTER OF EXCELLENCE CLIMATE, CLIMATIC CHANGE, AND SOCIETY  
                  UNIVERSITY OF HAMBURG
- 2018           Science communication award, FORSCHUNGSZENTRUM JÜLICH
- Travel grant by HITEC GRADUATE SCHOOL for research stay in Bergen
- 2011 - 2016   Stipend by HEINRICH BÖLL FOUNDATION
- 2016           Travel grant by HEINRICH BÖLL FOUNDATION for research stay in Cape Town
- 2014           Travel grant by HEINRICH BÖLL FOUNDATION for internship in Burkina Faso
- 2012           Language training grant by DEUTSCH-FRANZÖSISCHES JUGENDWERK for 4 week stay in Bordeaux

### Presentations

- 2021           Energy sector implications of wind stilling caused by internal climate variability  
                  AGU 2021, Renewable Energy: Wind
- Understanding and taming climate risk for the energy transition: a century of European renewable variability  
                  Energy Modeling Platform for Europe Conference, remote
- Climate dynamics for climate change mitigation: the case of long-term wind and solar generation variability  
                  University of Bonn, remote

- A century of European wind and solar power generation variability  
EGU 2021
- 2020 Climate risk and power system modeling  
Perspective talk, Workshop on Next Generation Challenges in Energy-Climate Modelling, remote  
Understanding multidecadal variability for energy system studies: can current 20th century reanalyses do the job?  
EGU 2020, Sharing Geoscience Online  
Renewables and multi-decadal climate variability  
Group seminar, Energy Meteorology Group, University of Reading
- 2019 How long is enough? Multi-decadal assessment of wind generation variability and associated pitfalls  
Wind Energy Science Conference, Cork  
Widening the view – the relevance of multi-decadal wind generation variability  
General Assembly of the European Geoscience Union, Vienna
- 2018 Wind energy: variability, vulnerability and integration  
Group seminar, Energy Meteorology Group, University of Reading  
Save the world: renewables, negative emissions and rural Africa  
Joint group seminar, Climate Policy, Renewable Energy Policy and Weather and Climate Risk groups, ETH Zürich  
Renewables and climate – a love story?  
Science Communication Symposium of Forschungszentrum Jülich  
Renewable energy and the climate sciences  
Bergen Energy Lab, University of Bergen, Bergen  
Natural wind variability triggered drop in German redispatch volume and costs from 2015 to 2016  
Strommarkttreffen, Hertie School of Governance, Berlin
- 2017 Impact of climate variability and change on highly to fully renewable power systems  
Energy Research Center, University of Cape Town  
Networking and Benchmarks  
Conference of the Helmholtz Initiative Energy System 2050, Berlin

## Academic teaching and supervision

- 2021 Risk Analysis and Management  
3rd year Bachelor course at the Institute for Environmental Decisions at ETH  
20% own contribution. Co-taught with Prof. Anthony Patt and Prof. David Bresch  
Supervision of master thesis by Niklas Stolz  
Incentive schemes for the system friendly allocation of renewables
  - Thesis results currently in preparation for journal submission
- 2020 Risk Analysis and Management  
3rd year Bachelor course at the Institute for Environmental Decisions at ETH  
20% own contribution. Co-taught with Prof. Anthony Patt and Prof. David Bresch  
Please note attached student feedback  
Co-supervision of PhD project by Nicoletta Brazzola  
Entering negative territories: economic outcomes and political feasibility of strategies to enable carbon removal  
ETH (with Prof. Anthony Patt)  
Supervision of master thesis by Dirk Mühlemann  
Title: Distribution of Photovoltaic Systems in Europe to Reduce Its Power Output Variability  
ETH (with Dr. Stefan Pfenninger)

- Thesis results currently under review

Supervision of master thesis by Xinyuan Hou

Title: Projecting future solar power production under climate scenarios

ETH (with Prof. Martin Wild)

- Thesis results accepted for publication in EARTH SYSTEM DYNAMICS

Supervision of master summer project by Shuchang-Liu

ETH (REMOTE, WITH DR. BRYN PICKERING)

2018/19

Advisor of master thesis by Charlotte Neubauer

Title: Low Frequency Variability in offshore Wind Power Generation Time Series

Institute for Theoretical Physics at UNI COLOGNE (with JProf. Dirk Witthaut)

- Thesis results published in ADVANCES IN GEOSCIENCES

## Pedagogical training

2020 Foundations of teaching and learning (3 day training for postdocs and senior scientists)  
ETH

2010 Grundkurs Seminarleitung (how to structure, run and evaluate group workshops - 6 day training)  
DGB Bezirk NRW

## Scientific engagement

2020 - 2024 **Fellow of the Interdisciplinary Network Junges ZiF**  
UNIVERSITY OF BIELEFELD  
INSTITUTE FOR ADVANCED STUDY, CENTER FOR INTERDISCIPLINARY RESEARCH (ZENTRUM FÜR INTERDISZIPLINÄRE FORSCHUNG - ZIF)

ongoing Review activity for Climate Dynamics, Geophysical Research Letters, Environmental Research Letters, Earth's Future, Joule, Advances in Science and Research, IEEE Transactions on Sustainable Energy, Nature Communications

Expert reviewer

IPCC Assessment Report 6, working group III Mitigation of Climate Change

Member of the expert database

SCIENCE MEDIA CENTER GERMANY

2021 Scilogs blog article about my PhD research  
Energiewende und das Klima: Wie schaffen wir ein stabiles Stromsystem aus schwankenden Quellen?

<https://scilogs.spektrum.de/klartext/energiewende-und-das-klima/>

Workshop on Options to Consider Climate Change in Resource Adequacy Assessment  
Panelist

Guidehouse, r2b and compass Lexecon in collab with the pentilateral forum

Workshop on Next Generation Challenges in Energy-Climate Modelling

member of organizing committee & lead of climate uncertainty and power system planning  
Breakout Discussion

2020 Workshop on Next Generation Challenges in Energy-Climate Modelling  
member of organizing committee

2019 Public presentation

Was wissen wir über den Klimawandel? (What do we know about climate change?)  
in cooperation with the trade union IGBAU

Guest post: Combining renewables with direct air capture for 'net negative' emissions  
CARBON BRIEF

Organisation of scientific event  
Mitigation of Climate change – how to achieve the Paris goals? And why?  
HITEC graduate school

## Further education

- 2021            Project Management for Research - for postdocs and senior researchers (2.5 day training for postdocs and senior scientists)  
ETH  
KlarText Workshop Science Communication (2 day event)  
KLAUS TSCHIRA STIFTUNG
- 2020            Foundations of teaching and learning (3 day training for postdocs and senior scientists)  
ETH
- 2019            Third-party funding (1 day training)  
Forschungszentrum Jülich
- 2016 - 2019    Scientific presentation, scientific writing, team communication and project management (transferable skill trainings)  
Hitec Graduate School, Forschungszentrum Jülich
- 2016            Stability of Electricity Grids (Summer school)  
Jacobs University, Bremen
- 2014            Physics of the Ocean (Summer school)  
Physikzentrum (DPG), Bad Honnef

## Poster contributions

- 2018            **J. Wohland**  
Natural wind variability triggers German redispatch volume and costs  
General Assembly of the European Geoscience Union, Vienna  
**J. Wohland, J. Weber, D. Witthaut**  
More homogeneous European wind conditions under strong climate change  
Symposium of the John von Neumann Institute for Computing, Jülich
- 2017            **J. Wohland, D. Witthaut**  
The Impact of Strong Climate Change on Inter-state Balancing in a Fully-renewable Simplified European Electricity System  
General Assembly of the European Geoscience Union, Vienna  
J. Weber, **J. Wohland, D. Witthaut**  
Impact of strong climate change on balancing and storage needs in a fully renewable energy system  
General Assembly of the European Geoscience Union, Vienna  
**J. Wohland, D. Witthaut**  
Impact of Strong Climate Change on Backup Energy Needs in a Fully-renewable European Electricity System  
Future Electric Power Systems and the Energy Transition, Champéry
- 2015            **J. Wohland, C. F. Schleussner, T. Lissner, E.M. Fischer, and K. Frieler**  
Assessing regional and warming level dependent differences in climate impacts  
General Assembly of the European Geoscience Union, Vienna

## Internships and part-time jobs

- 10.14 - 03.15    Research Assistant  
CLIMATE ANALYTICS

04.14 - 08.14 Internship in Burkina Faso  
SOLAR ENERGY FOR WESTERN AFRICA

03.13 - 06.13 Student Assistant  
Sustainability and Energy Management Unit  
FREIE UNIVERSITY BERLIN

2009 - 2010 Civil Service  
NEXUS - INSTITUTE FOR COOPERATION MANAGMENT AND INTERDISCIPLINARY RESEARCH  
in Berlin