SIMONA MEILER

Stanford University
School of Engineering & Doerr School of Sustainability
Department of Civil and Environmental Engineering

PROFESSIONAL APPOINTMENTS

08/2024 – present	**Postdoctoral Scholar, Department of Civil and Environmental Engineering, Stanford University** Supervision: Prof. Jack W. Baker
12/2023 – 08/2024	**Postdoctoral Scholar, Weather and Climate Risks Group, ETH Zurich** Supervision: Prof. David N. Bresch
01/2024 – 06/2024	**Consultant UNU-EHS/IDMC, Global Displacement Risk Model** Supervision: Dr. Maxime Souvignet (UNU-EHS), Sylvain Ponserre (IDMC)
04/2020 – 09/2020	**Research assistant, ETH Zurich** Research assistant in the Weather and Climate Risk group at ETH Zurich

EDUCATION

09/2020 – 11/2023	**PhD Student, Weather and Climate Risks Group, ETH Zurich** Supervision: Prof. David N. Bresch Co-supervision: Prof. Kerry Emanuel (MIT) PhD thesis: *Unraveling unknowns in tropical cyclone risk assessment*
10/2019 – 03/2020	**MIT Boston, USA, Internship** Research internship in Mick Follows' group at the Department of Earth, Atmosphere and Planetary Sciences (EAPS)
09/2017 – 03/2020	**ETH Zurich, Master's degree in Environmental Sciences** Major: Biogeochemistry and Pollutant Dynamics Master's thesis: *Ocean oxygen extreme events in the eastern tropical Pacific*
09/2010 – 02/2016	**ETH Zurich, Bachelor's degree in Environmental Sciences** Specialization: Biogeochemistry and Pollutant Dynamics Bachelor's thesis: *Investigating the importance of iron reservation through siderophore secretion in competition*
08/2002 - 07/2008	**Bündner Kantonsschule Chur, Matura** Core subjects: Spanish, Geography

GRANTS AND FELLOWSHIPS

12/2025	**Stanford Doerr Discovery Grant** - *Mapping the dimensional structure of climate risk uncertainties.* 75'000.- USD for 1 year.
07/2025	**Innosuisse Innovation Project (IP-SBM) 127.978** – *Quantifying socio-economic risks of North Atlantic hurricanes in a changing climate*. PI: Prof. Ulrike Lohmann (ETH Zurich). Role: Co-applicant; PhD co-supervisor (J. Liu). Industry partner: Schroders. Dates: 09/2025-03/2029
12/2023	**SNSF Postdoc.Mobility Fellowship (P500PN_222189)** – *Probabilistic climate risk modelling and robust decision-making under uncertainty.* 138'000.- CHF awarded for the period 09/01/2024 – 08/31/2026

AWARDS AND HONORS

12/2025	Prix Schläfli Geosciences, Swiss Academy of Sciences, 2025
11/2024	ETH Medal for outstanding doctoral theses 2024
10/2024	SCOR Switzerland Actuarial Award 2024

LIST OF PUBLICATIONS

PhD Thesis

Meiler, S. (2023). *Unraveling Unknowns in Tropical Cyclone Risk Assessment* [Doctoral dissertation, ETH Zurich]. https://doi.org/10.3929/ethz-b-000645395

Peer-reviewed publications

Liu, J., Steinmann, C. B., Bresch, D. N., **Meiler, S.**, Lohmann, U., & Hohermuth, B. (2026). Recalibrating Risk: A simplified model for North Atlantic hurricanes in a warming climate. *Journal of Catastrophe Risk and Resilience*, 04(03). https://doi.org/10.63024/zd46-e3zf

Meiler, S., Lee, C.-Y., Camargo, S. J., & Sobel, A. H. (2026). Global coastal wind hazard maps from the CHAZ tropical cyclone model. *Scientific Data*. https://doi.org/10.1038/s41597-025-06452-0

Meiler, S., Mühlhofer, E., Lüthi, S., Bresch, D. N., Ottonelli, D., Ghizzoni, T., Trasfaroni, E., Rudari, R., Rossi, L., Kasmalkar, I., Mohammadiamanab, N., Daou, D., Nguyen, T. L., Gyawali, D. R., Peter, M., Oakes, R., Souvignet, M., & Ponserre, S. (2025). A natural hazard risk modelling approach to human displacement—Frontiers & challenges. *Environmental Research: Climate.* https://doi.org/10.1088/2752-5295/ae014c

Wattin Håkansson, V., **Meiler, S.**, Hülsen, S., Villiger, L., Bossut, M., McCaughey, J. W., Kropf, C. M., & Bresch, D. N. (2025). Beyond single company climate risk disclosure: Event-based physical risk reporting. *Environmental Research: Climate*, 4(3), 035014. https://doi.org/10.1088/2752-5295/adf912

Cologna, V., **Meiler, S**., Kropf, C.M. et al. (2025). Extreme weather event attribution predicts climate policy support across the world. *Nature Climate Change*. *15*, 725–735. https://doi.org/10.1038/s41558-025-02372-4

Meiler, S., Kropf, C. M., McCaughey, J. W., Lee, C.-Y., Camargo, S. J., Sobel, A. H., Bloemendaal, N., Emanuel, K., & Bresch, D. N. (2025). Navigating and attributing uncertainty in future tropical cyclone risk estimates. *Science Advances*, *11*(16), eadn4607. https://doi.org/10.1126/sciadv.adn4607

Hülsen, S., Dee, L. E., Kropf, C. M., **Meiler, S.,** & Bresch, D. N. (2025). Mangroves and their services are at risk from tropical cyclones and sea level rise under climate change. *Communications Earth & Environment*, *6*(1), 1–9. https://doi.org/10.1038/s43247-025-02242-z

Stalhandske, Z., Steinmann, C. B., **Meiler, S**., Sauer, I. J., Vogt, T., Bresch, D. N., & Kropf, C. M. (2024). Global multi-hazard risk assessment in a changing climate. *Scientific Reports*, 14(1), 5875. https://doi.org/10.1038/s41598-024-55775-2

Meiler, S., Ciullo, A., Bresch, D. N., Kropf, C. M. (2023). Uncertainty and sensitivity analysis for probabilistic, global modelling of future tropical cyclone risk. In *Proceedings of the 14th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP14)*. https://doi.org/10.25546/103244

Meiler, S., Ciullo, A., Kropf, C. M., Emanuel, K., & Bresch, D. N. (2023). Uncertainties and sensitivities in the quantification of future tropical cyclone risk. *Communications Earth & Environment*, *4*(1), Article 1. https://doi.org/10.1038/s43247-023-00998-w

Meiler, S., Britten, G. L., Dutkiewicz, S., Moisander, P. H., & Follows, M. J. (2023). Challenges and opportunities in connecting gene count observations with ocean biogeochemical models: Reply to Zehr and Riemann (2023). *Limnology and Oceanography*, *68*(6), 1413–1416. https://doi.org/10.1002/lno.12363

Ciullo, A., Strobl, E., **Meiler, S.**, Martius, O., Bresch, D. N. (2023). Increasing countries' financial resilience through global catastrophe risk pooling. *Nature Communications 14*, 922. https://doi.org/10.1038/s41467-023-36539-4

Meiler, S., Vogt, T., Bloemendaal, N., Ciullo, A., Lee, C.-Y., Camargo, S. J., Emanuel, K., Bresch, D. N. (2022). Intercomparison of regional loss estimates from global synthetic tropical cyclone models, *Nature Communications*, *13*, 6156. https://doi.org/10.1038/s41467-022-33918-1

Kropf, C. M., Ciullo, A., Otth, L., **Meiler, S.**, Rana, A., Schmid, E., McCaughey, J. W., Bresch, D. N. (2022). Uncertainty and sensitivity analysis for probabilistic weather and climate-risk modelling: an implementation in CLIMADA v.3.1.0. *Geoscientific Model Development*, *15*, 7177–7201. https://doi.org/10.5194/gmd-15-7177-2022

Meiler, S., Britten, G. L., Dutkiewicz, S., Gradoville, M. R., Moisander, P. H., Jahn, O., Follows, M. J. (2022). Constraining uncertainties of diazotroph biogeography from nifH gene abundance. *Limnology and Oceanography*. https://doi.org/10.1002/lno.12036

Manuscripts in review

Meiler, S., Blagojevic, N., Lochhead, M., Gori, A., & Baker, J. W. (2026). Probabilistic assessment of tropical cyclone recovery burden across US Atlantic and Gulf Coast counties. https://doi.org/10.31223/X5ZV3V

Meiler, S., Jackson, S. I., Emanuel, K., Diffenbaugh, N. S., & Baker, J. W. (2026). Stress testing insurance market stability under climate risk. https://doi.org/10.31223/X59X9X

Colombi, N., Emanuel, K., Burger, F. A., **Meiler, S.**, Kropf, C. M., Frölicher, T. L., Gebhart, V., & Bresch, D. N. (2026). AMOC Collapse Reshapes Global Tropical Cyclone Activity. Research Square. https://doi.org/10.21203/rs.3.rs-10213660/v1

Bloemendaal, N., **Meiler, S**., & Camargo, S. J. (under review). Tropical cyclone risks. Oxford Research Encyclopedia: Natural Hazard Science.

Zimmermann, S., **Meiler, S.,** Kam, P. M., Riedel, L., Ottonelli, D., Mühlhofer, E., Kropf, C. M., Trasforini, T., Rossi, L., Ghizzoni, T., Rudari, R., Ponserre, S., Bresch, D. N., Schewe, J. (under review). Predicting Flood-Induced Human Displacement: A Multi-Model Assessment for the Horn of Africa.

Manuscripts in preparation (available upon request)

Juhel, S., **Meiler, S.,** Bossut, M., Hülsen, S., McCaughey, J. W., Kropf, C. M., & Bresch, D. N. (in preparation). Integrating Multi-Criteria Decision Analysis and Uncertainty Quantification for Climate Adaptation.

Choi, J., **Meiler, S.,** Burke, M., Diffenbaugh, N. S. (in preparation). El Niño Southern Oscillation and Sovereign Debt Projections.

Datasets

Meiler, S., Lee, C. Y., Camargo, S., & Sobel, A. H. (2025). Global coastal wind hazard maps from the CHAZ tropical cyclone model (No. 10.5061/dryad.qfttdz0vz) [Dataset]. Dryad. https://doi.org/10.5061/dryad.qfttdz0vz

Research Software and Code

CLIMADA Core Python Package (Version 6.0.1) [Research software]. Zenodo. https://doi.org/10.5281/zenodo.15020318

Contribution: Contributor to the CLIMADA codebase and co-developer of the UNSEQUA module for global uncertainty and sensitivity analysis of climate-risk and adaptation assessments (Kropf et al., 2022). Source code: https://github.com/CLIMADA-project/climada_python.

SELECTED SCIENTIFIC PRESENTATIONS (*invited or solicited)

05/2026 *__Meiler, S.:__ *Who bears the risk? Stress-testing insurance system stability under evolving risks*. Solicited presentation, ITS4.36/NH13.11, Advances in Physical Climate Risk Assessment for the Financial and Insurance Sectors, EGU General Assembly 2026, Vienna, AUT

05/2026	*__Meiler, S.__, Blagojevic, N., Lochhead, M., & Baker, J. W.: *Extending tropical cyclone risk assessment through recovery simulations*. Solicited highlight presentation, HS7.5, Hydro-meteorological Extremes and Hazards: Vulnerability, Risk, Impacts and Mitigation, EGU General Assembly 2026, Vienna, AUT
12/2025	**Meiler, S** *Uncertainty, Recovery, and Systemic Risk Modeling in Climate Risk Assessment,* Prix Schläfli lecture tour, University of Bern, Lausanne, Zürich, CHE
06/2025	*__Meiler, S__ *Hurricane recovery potential,* Symposium for Tropical Cyclone Risk in a Changing Climate, Tampa, FL, USA
01/2025	*__Meiler, S__ *Tropical Cyclones, Displacement, and Policy: Advancing Climate Risk Assessments,* JPL Center for Climate Sciences (CCS) Friday Seminar, webinar
05/2024	*__Meiler, S__ *Unraveling the unknowns of global tropical cyclone risk in the future,* Symposium on Hurricane Risk in a Changing Climate, Honolulu, HI, USA
04/2024	**Meiler, S.,** Kropf, C.M., Emanuel, K., Bresch, D. N. *Choose Your Model Wisely: Navigating Uncertainties in Future Global Tropical Cyclone Risks,* EGU General Assembly 2024, Vienna, AUT
05/2022	**Meiler, S.,** Sarhadi, A., Emanuel, K., Bresch, D. N. *Advancing compound modelling of tropical cyclone wind, surge and rain impacts – now and in a changing climate*, EGU General Assembly 2022, Vienna, AUT

SELECTED OUTREACH AND RESEARCH TRANSLATION

04/2025	**Speaker and panelist,** *From Climate Anxiety to Community Action*, SF Climate Week event at Swissnex, San Francisco; connected climate risk research with community and climate-technology audiences.
04/2025	**Invited practitioner webinar,** *Tropical Cyclones, Displacement, and Policy: Advancing Climate Risk Assessments*, Institut des Actuaires, France; presented research on tropical cyclone uncertainty, displacement, and risk perception to an actuarial audience.
05/2024	**Invited speaker,** *Unraveling the Unknowns of Global Tropical Cyclone Risk in the Future,* Oasis Insight Conference, London; translated research on future tropical cyclone uncertainty for insurance and catastrophe modeling practitioners.

TEACHING AND SUPERVISION

2024 – present	**Co-supervisor of doctoral researchers,** with primary supervisors in parentheses: Sarah Hülsen and Nicolas Colombi (David N. Bresch), and Juner Liu (Ulrike Lohmann), ETH Zurich; Ziqian Xia (Sara Constantino), and June Choi (Noah Diffenbaugh and Marshall Burke), Stanford University
01/2025 – 04/2025	**Lecturer, graduate course CEE 308,** *Topics in Disaster & Climate Risk and Resilience Research*, Stanford University
02/2023 – 07/2023	**Bachelor's Thesis supervision**, Natalia Feringa, *Transparency in climate risk disclosure*, ETH Zurich
02/2021 – 08/2022	**Teaching assistant, MSc course 701-1252-00L**, *Climate Change Uncertainty and Risk: From Probabilistic Forecasts to Economics of Climate Adaptation,* ETH Zurich
09/2021 – 04/2022	**Master's Thesis supervision**, Anna Gevecke, *Global tropical cyclone risk in the future climate*, ETH Zurich
09/2019	**Tutor, ETH Week,** Guided an interdisciplinary team of ten students through idea development, collaborative problem-solving, project management, and evaluation

ACADEMIC LEADERSHIP AND SERVICE

2026 – 2028 **Steering committee member,** Knowledge–Action Network on Emergent Risks and Extreme Events (Risk-KAN)

2026 **Emerson Consequential Scholars Program,** Stanford Technology Ventures Program. Selected scholar; interdisciplinary programme in entrepreneurship, research translation, communication, and inclusive leadership, Stanford University.

2025 – present **Working groups and expert advising**

Co-lead of the Risk-KAN **Climate Risk Modelling for the Financial Sector** working group

Member of **US CLIVAR Working Group** on Accelerating Research on the Scientific Foundations of Regional Climate Risk Information

Unpaid catastrophe-modelling consultant to the **Property Insurance Working Group of the Federal Reserve Board's Insurance Policy Advisory Committee (IPAC)**; developed and led the analysis of potential windstorm impacts on selected insurance markets.

2024 – present **Conference and session organization**

Co-chair of the scientific programme, *Symposium for Tropical Cyclone Risk 2027*, Monte Verità, Ascona, CHE, 06/2027.

Co-convener, *Advances in Physical Climate Risk Assessment for the Financial and Insurance Sectors*, NH005, AGU Annual Meeting 2026, San Francisco, CA, USA. 12/2026.

Organising committee member, *No Place to Hide: Financial Decision-Making in an Era of Cascading Climate Risks,* Planned Risk-KAN/WCRP/S&P workshop, Hamburg, DEU, 11/2026.

Convener, *Bridging natural and social sciences to study societal responses to extreme weather events*, ITS2.8/NH13.12, EGU General Assembly 2026, Vienna, AUT, 05/2026.

Convener, *Bridging natural and social sciences to study societal responses to extreme weather events*, ITS2.9/NH13.7, EGU General Assembly 2025, Vienna AUT, 04/2025.

Co-convener, *Bridging natural and social sciences to study societal responses to extreme weather events*, ITS2.5/NH13.5, EGU General Assembly 2024, Vienna, AUT, 04/2024.

Co-convener, *Future Changes in Weather and Climate Hazards around the World*. NH11.2. EGU General Assembly 2024, Vienna, AUT, 04/2024.

2022 – present **Journal reviews**

Climate Risk Management; Communications Earth & Environment; Disasters; Earth's Future; Environmental Research Letters; Geophysical Research Letters; Journal of Advances in Modeling Earth Systems; Journal of Catastrophe Risk and Resilience; Natural Hazards; Natural Hazards and Earth System Sciences; Nature; Nature Communications; One Earth; Progress in Disaster Science; Science Advances; Scientific Reports

2021 – 2023 **Delegate of the "Mittelbau" (Junior Researchers) to Departmental Commissions D-USYS, ETH Zurich**, Departmental Conferences (2021-2023), Teaching Commission: Environmental Sciences (2022-2023)

PROFESSIONAL SPORT CAREER

2006–2018 **Professional snowboardcross athlete, Swiss Ski**
Represented Switzerland at the Winter Olympic Games in Vancouver 2010 (9th), Sochi 2014 (10th), and PyeongChang 2018 (22nd); bronze medallist at the 2015 Winter Universiade; participant in the 2007, 2009, and 2013 World Championships

ADDITIONAL PROFESSIONAL EXPERIENCE

2016–2018 **Marketing and business communication,** Kaffeezentrale and Alfredo Polti SA, Switzerland

LANGUAGE SKILLS

German	native (first language)	**Romansh**	bilingual native
English	near-native (C2)	**Italian**	basic knowledge (A2)
French	fluent (C1)	**Latin**	basic knowledge
Spanish	fluent (B2)		

SCIENTIFIC COMPUTING AND RESEARCH TOOLS

Programming and modelling: Python, MATLAB; development and application of open-source probabilistic climate-risk models, including CLIMADA

Scientific and geospatial data analysis: Jupyter, NumPy, pandas, xarray, SciPy, GeoPandas, Rasterio, NetCDF and HDF5

Open-source research workflows: Git and GitHub

High-performance computing: Bash and Unix command line; SLURM- and LSF-managed computing clusters

Scientific writing and digital communication: LaTeX, Microsoft Office, WordPress