Robert C. Jnglin Wills

Assistant Professor of Climate Dynamics
Institute for Atmospheric and Climate Science, ETH Zurich
Universitätstrasse 16, 8092 Zürich, Switzerland
Email: r.jnglinwills@usys.ethz.ch
Website: https://iacweb.ethz.ch/staff/rjnglin/

RESEARCH INTERESTS

Climate dynamics, climate variability and prediction, climate feedbacks and climate change, climate model analysis, high-resolution earth system modeling, idealized modeling, large-scale circulation of the atmosphere and oceans, atmosphere-ocean interactions, weather-climate interactions, spatiotemporal data analysis, hydrological cycle, climate extremes

EDUCATION

Ph.D., California Institute of Technology, Environmental Science and Engineering 2016
- Thesis: *Stationary eddies and zonal variations of the global hydrological cycle in a changing climate*, advised by Prof. Tapio Schneider

M.S., California Institute of Technology, Environmental Science and Engineering 2013

B.S., University of California Berkeley, Engineering Physics, Highest Honors 2011

ACADEMIC APPOINTMENTS

ETH Zurich, Zurich, Switzerland
- Assistant Professor, Institute for Atmospheric and Climate Science 04.2023 – present

National Center for Atmospheric Research, Boulder, CO
- Affiliate Scientist, Climate Analysis Section 02.2022 – present

University of Washington, Seattle, WA
- Research Scientist, Department of Atmospheric Sciences 01.2021 – 03.2023
- Data Science Postdoctoral Fellow, eScience Institute 10.2019 – 01.2021
- Postdoctoral Researcher, Department of Atmospheric Sciences 01.2017 – 01.2021

ETH Zurich, Zurich, Switzerland
- Postdoctoral Researcher, Department of Earth Sciences 02.2016 – 07.2016
- Visiting Graduate Student, Department of Earth Sciences 07.2013 – 01.2016

California Institute of Technology, Pasadena, CA
- Graduate Research Assistant, Department of Environmental Science & Engineering 09.2012 – 01.2016
- Graduate Research Assistant, Applied Physics 09.2011 – 09.2012

GRANTS

Forced Component Estimation Statistical Methods Intercomparison Project (ForceSMIP) Hackathon, Swiss National Science Foundation (SNSF) Scientific Exchanges
- PI: Robert Jnglin Wills; Award: CHF 14,980; 07.2023 – 09.2023

Constraining Future Changes in the Large-Scale Atmospheric Circulation to Improve Projections of Regional Climate Impacts, SNSF Eccellenza Professorial Fellowship
- PI: Robert Jnglin Wills; Award: CHF 1,890,400; 04.2023 – 03.2028

Identifying Climate Model Biases in the Pattern of Ocean Warming and their Influence on Regional Climate Change

- U.S. National Science Foundation, Climate & Large-Scale Dynamics AGS-2203543
- PI: Robert Jnglin Wills (I stepped down in 03.2023 upon moving to Switzerland); Co-PIs: David Battisti, Kyle Armour; Award: $479,132, 08.2022 – 07.2025

Variable Resolution Modeling of the Large-Scale Atmospheric Circulation Response to North Atlantic SST Anomalies

- U.S. National Science Foundation, Climate & Large-Scale Dynamics AGS-2128409
- PI: Robert Jnglin Wills (I stepped down in 03.2023 upon moving to Switzerland); Co-PI: David Battisti; Award: $341,245; 11.2021 – 10.2024

Variability in the Rate and Pattern of Global Warming: Forced and Unforced Components

- U.S. National Science Foundation, Climate & Large-Scale Dynamics AGS-1929775
- PI: David Battisti; Award: $282,370; 09.2019 – 08.2022
- I wrote the proposal but was ineligible to be a PI at the time of submission to NSF.

HONORS AND AWARDS

AGU 2022 Outstanding Reviewer Citation, *Geophysical Research Letters*, 2023

AGU 2021 Outstanding Reviewer Citation, *Paleoceanography and Paleoclimatology*, 2022

Swiss National Science Foundation Eccellenza Professorial Fellowship (see Grants), 2021

Data Science Postdoctoral Fellowship, UW eScience Institute ($2,000), 2019

Travel Award, CLIVAR Large Ensembles Workshop, 2019

UW College of the Environment Travel Fund Award ($750), 2019

Travel Award, Advanced Climate Dynamics Course 10-Year Anniversary Conference (NOK 5000), 2019

Science Editor's Spotlight: *Disentangling global warming, multidecadal variability, and El Niño in Pacific temperatures*, 2018

Travel Award, International Workshop on Climate Informatics ($1000), 2017

AGU Editor's Spotlight: *Thermodynamic and dynamic controls on changes in the zonally anomalous hydrological* cycle, 2016

Robert and Diane Lang Graduate Fellowship (1 year, 100% support), 2012

Caltech Engineering & Applied Science Division Fellowship (9 mo., 100% support), 2011

Outstanding Student Poster Award, APS Division of Plasma Physics Meeting, 2010

National Undergraduate Fellowship in Plasma Physics and Fusion Energy Sciences (3 mo., 100% support), 2010

PEER-REVIEWED PUBLICATIONS

ORCID: 0000-0002-7776-2076 Google Scholar

29. Armour, K.C., C. Proistosescu, Y. Dong, L.C. Hahn, E. Blanchard-Wrigglesworth, A.G. Pauling, **R.C. Jnglin Wills**, T. Andrews, M.F. Stuecker, S. Po-Chedley, I. Mitevski, P.M. Forster, and J.M. Gregory: Sea-surface temperature pattern effects have slowed global warming and biased warming-based constraints on climate sensitivity. Proceedings of the National Academy of Science, in press. [preprint]

28. Rugenstein, M., S. Dhame, D. Olonscheck, **R. Jnglin Wills**, M. Watanabe, and R. Seager: *Connecting the SST pattern problem and the hot model problem*, 2023. Geophysical Research Letters, 50, e2023GL105488.

27. Dörr, J.S., D.B. Bonan, M. Årthun, L. Svendsen, and **R.C. Jnglin Wills**, 2023: *Forced and internal components of observed Arctic sea-ice changes*. The Cryosphere, 17, 4133–4153.

26. Gray, W.R., C. deLavergne, **R.C. Jnglin Wills**, L. Menviel, P. Spence, M. Holzer, M. Kageyama, and E. Michel. 2023, *Poleward shift in the Southern Hemisphere westerly winds synchronous with the deglacial rise in CO_2*. Paleoceanography and Paleoclimatology, 38, e2023PA004666.

25. Maher, N., **R.C. Jnglin Wills**, P. DiNezio, J. Klavans, S. Milinski, S.C. Sanchez, S. Stevenson, M.F. Stuecker, and X. Wu, 2023: *The future of the El Niño-Southern Oscillation: Using large ensembles to illuminate time-varying responses and inter-model differences*. Earth System Dynamics, 14, 413–431.

24. **Wills, R.C.J.**, Y. Dong, C. Proistosescu, K.C. Armour, and D.S. Battisti, 2022: *Systematic climate model biases in the large-scale patterns of recent sea-surface temperature and sea-level pressure change*. Geophysical Research Letters, 49, e2022GL100011.

23. Shi, H., F.-F. Jin, **R.C.J. Wills**, M.G. Jacox, B.A. Black, D.J. Amaya, R. R. Rykaczewski, S.J. Bograd, M. García-Reyes, and W.J. Sydeman, 2022, *Global decline in ocean memory over the 21st century*. Science Advances, 8, eabm4368.

22. Oldenburg, D., **R.C.J. Wills**, K.C. Armour, L. Thompson, 2022: *Resolution dependence of atmosphere-ocean interactions and water-mass transformation in the North Atlantic*. Journal of Geophysical Research: Oceans, 127, e2021JC018102.

21. **Wills, R.C.J.**, K.C. Armour, D.S. Battisti, C. Proistosescu, and L.A. Parsons, 2021: *Slow modes of global temperature variability and their impact on climate sensitivity estimates*. Journal of Climate, 34, 8717–8738.

20. Bonan, D.B., T. Schneider, I. Eisenman, and **R.C.J. Wills**, 2021: *Constraining the date of a seasonally ice-free Arctic using a simple model*. Geophysical Research Letters, 48, e2021GL094309.

19. Oldenburg, D., **R.C.J. Wills**, K.C. Armour, L. Thompson, and L.C. Jackson, 2021: *Mechanisms of low-frequency variability in Atlantic northward ocean heat transport and AMOC*. Journal of Climate, 34, 4733–4755.

18. Årthun, M, **R.C.J. Wills**, H. Johnson, L. Chafik, and H.R. Langehaug, 2021: *Mechanisms of decadal North Atlantic climate variability and implications for the recent cold anomaly*. Journal of Climate, 34, 3421–3439.

17. Nilsson, J., D. Ferreira, T. Schneider, and **R.C.J. Wills**, 2021: *Is the surface salinity difference between the Atlantic and Indo-Pacific a signature of the Atlantic Meridional Overturning Circulation?* Journal of Physical Oceanography, 51, 769–787.

16. Rae, J.W.B., W.R Gray, **R.C.J. Wills**, I. Eisenman, B. Fitzhugh, E.F.M. Littley, P. Rafter, R. Rees-Owen, A. Ridgwell, B. Taylor, A. Burke, 2020: *Overturning circulation, nutrient limitation, and warming in the glacial North Pacific*. Science Advances, 6, eabd1654.

15. **Wills, R.C.J.**, D.S. Battisti, K.C. Armour, T. Schneider, and C. Deser, 2020: *Pattern recognition methods to separate forced responses from internal variability in climate model ensembles and observations*. Journal of Climate, 33, 8693–8719.

14. Parsons, L.A., M.K. Brennan, **R.C.J. Wills**, and C. Proistosescu, 2020: *Magnitudes and spatial patterns of interdecadal temperature variability in CMIP6*. Geophysical Research Letters, 47, e2019GL086588.

13. Gray, W.R., **R.C.J. Wills**, J.W.B Rae, A. Burke, R. Ivanovic, W.H.G. Roberts, D. Ferreira, and P.J. Valdes, 2020: *Wind-driven evolution of the North Pacific subpolar gyre over the last deglaciation*. Geophysical Research Letters, 47, e2019GL086328.

12. **Wills, R.C.J.**, R.H. White, and X.J. Levine, 2019: *Northern Hemisphere stationary waves in a changing climate*. Current Climate Change Reports, 5, 372–389.

11. **Wills, R.C.J.**, D.S. Battisti, C. Proistosescu, L. Thompson, D.L. Hartmann, and K.C. Armour, 2019: *Ocean circulation signatures of North Pacific decadal variability*. Geophysical Research Letters, 46, 1690–1701.

10. **Wills, R.C.J.**, K.C. Armour, D.S. Battisti, and D.L. Hartmann, 2019: *Ocean-atmosphere dynamical coupling fundamental to the Atlantic Multidecadal Oscillation*. Journal of Climate, 32, 251–272.

9. **Wills, R.C.J.** and T. Schneider, 2018: *Mechanisms setting the strength of orographic Rossby waves across a wide range of climates in a moist idealized GCM*. Journal of Climate, 31, 7679–7700.

8. Gray, W.R., J.W.B. Rae, **R.C.J. Wills**, A.E. Shevenell, G.L. Foster, C.H. Lear, and B. Taylor, 2018: *Deglacial upwelling, productivity and CO2 in the North Pacific Ocean*. Nature Geoscience, 30, 340–344.

7. Ferreira, D., P. Cessi, H. Coxall, A. de Boer, H.A. Dijkstra, S.S. Drijfhout, T. Eldevik, N. Harnik, J.F. McManus, D.P. Marshall, J. Nilsson, F. Roquet, T. Schneider, and **R.C. Wills**, 2018: *Atlantic-Pacific asymmetry in deep water formation*. Annual Reviews of Earth and Planetary Sciences, 46, 327–352.

6. **Wills, R.C.**, T. Schneider, J.M. Wallace, D.S. Battisti, and D.L. Hartmann, 2018: *Disentangling global warming, multidecadal variability, and El Niño in Pacific temperatures*. Geophysical Research Letters, 45, 2487–2496.

5. **Wills, R.C.**, D.S. Battisti, D.L. Hartmann, and T. Schneider, 2017: *Extracting modes of variability and change from climate model ensembles*. Proceedings of the 7th International Workshop on Climate Informatics: CI 2017, V. Lyubchich, N.C. Oza, A. Rhines, and E. Szekely, Eds., NCAR Technical Note NCAR/TN-536+PROC, 25-28.

4. **Wills, R.C.**, X.J. Levine, and T. Schneider, 2017: *Local energetic constraints on Walker circulation strength*. Journal of the Atmospheric Sciences, 74, 1907-1922.

3. **Wills, R.C.**, M.P. Byrne, and T. Schneider, 2016: *Thermodynamic and dynamic controls on changes in the zonally anomalous hydrological cycle*. Geophysical Research Letters, 43, 4640–4649.

2. **Wills, R.C.** and T. Schneider, 2016: *How stationary eddies shape changes in the hydrological cycle: Zonally asymmetric experiments in an idealized GCM*. Journal of Climate, 29, 3161–3179.

1. **Wills, R.C.** and T. Schneider, 2015: *Stationary eddies and the zonal asymmetry of net precipitation and ocean freshwater forcing*. Journal of Climate, 28, 5115–5133.

OTHER PUBLICATIONS

Wills, R.C.J., S. Sippel, and E.A. Barnes, 2020: *Separating forced and unforced components of climate change: The utility of pattern recognition methods in large ensembles and observations*. US CLIVAR Variations, 18.2, 1–10.

Wills, R.C. 2016: *Stationary eddies and zonal variations of the global hydrological cycle in a changing climate*. Ph.D. Thesis, California Institute of Technology.

Wills, R.C., M. Davis, P.P. Woskov, D.T. Garnier, J. Kesner, and M.E. Mauel, 2010. *Density Profile Measurements in LDX using Microwave Reflectometry*. APS DPP JP9.00068. MIT PSFC Research Report. PSFC/RR-10-9.

SUBMITTED MANUSCRIPTS

Wills, R.C.J., A. R. Herrington, I.R. Simpson, D.S. Battisti: Resolving weather fronts increases the large-scale circulation response to Gulf Stream SST anomalies in variable resolution CESM2 simulations. Journal of Advances in Modeling Earth Systems, submitted. [*preprint*]

Bonan, D.B., J.S. Dörr, **R.C. Jnglin Wills**, A.F. Thompson, and M. Årthun: *Sources of low-frequency variability in observed Antarctic sea ice*. The Cryosphere Discussion. [*preprint*]

MENTORING

Current Advisees

- Postdocs: Clarissa Kroll
- Ph.D. Students: Nora Fahrenbach, Zhenghe Xuan, Joas Müller

Ph.D. Theses

- (co-advisor) Dylan Oldenburg, Ph.D. 2021, Oceanography, University of Washington

M.Sc. Theses

- Maren Höver, M.Sc. 2024, Atmospheric and Climate Science, ETH Zurich

Informal Student Mentoring

- David Bonan, Ph.D. Student, California Institute of Technology, 2019 – 2022
- He Huang, Visiting Undergraduate Researcher at Univ. of Washington, 2020 – 2021

TEACHING

ETH Zürich, Zurich, Switzerland

- Instructor, 701-1258, *Global Atmospheric Circulation and Climate* 2024

University of Washington, Seattle, WA

- Instructor, ATM S 442, *Atmospheric Motions II* 2022
- Instructor, ATM S 341, *Atmospheric Radiative Transfer* 2021
- Guest lecturer, ATM S 220, *Exploring the Atmospheric Sciences* 2017, 2020, 2021
- Guest lecturer, ATM S 501, *Physics & Chemistry of the Atmosphere* 2019
- Guest lecturer, ATM S 552, *Objective Analysis* 2019
- Guest lecturer, ATM S 587, *Fundamentals of Climate Change* 2018
- Guest lecturer, OCEAN 423, *Ocean Circulation & Climate* 2018
- Guest lecturer, PCC 586, *Current Questions in Climate Research* 2018

ETH Zürich, Zurich, Switzerland

- Teaching assistant, 651-2124, *Atmospheric General Circulation Dynamics* 2015
- Guest lecturer, 651-2124, *Atmospheric General Circulation Dynamics* 2014
- Teaching assistant, 651-4911, *Climate & Global Atmospheric Circulation* 2013

California Institute of Technology, Pasadena, CA

- Teaching assistant, CNS 107, *Writing about Scientific Research* 2013

University of California, Berkeley, CA

- Teaching assistant, Physics 7a, *Physics for Scientists and Engineers* 2010
- Pedagogical course, *Instruction Techniques in Astronomy & Physics* 2010
- Physics tutor, Student Learning Center 2009 – 2011

DEPARTMENT SEMINARS

2023 Laboratoire d'Océanographie et du Climat (LOCEAN)
Laboratoire des Sciences du Climat et de l'Environnement (LSCE)
University of Lausanne, IDYST/ISTE Seminar
ETH Zurich, Institute for Atmospheric and Climate Sciences Colloquium
NOAA Physical Sciences Laboratory
University of Washington, Atmospheric and Climate Dynamics Seminar

2022 George Mason University, Atmospheric, Oceanic, and Earth Sciences
Colorado State University, Climate Dynamics Seminar

2021 Oregon State, College of Earth, Ocean, and Atmospheric Sciences
Caltech, Climate Modeling Alliance Seminar
Durham University, Department of Earth Sciences
NYU, Courant Center for Atmosphere Ocean Science Colloquium

2020 National Center for Atmospheric Research, Climate and Global Dynamics Seminar
Duke University, Nicholas School of the Environment Seminar
Purdue University, Earth, Atmospheric, and Planetary Sciences Colloquium
University of California Irvine, Earth System Science Department Seminar
University of Oxford, Atmospheric, Oceanic and Planetary Physics Seminar (x2)
University of Reading, Meteorology Department Seminar
University of Maryland Baltimore County, Physics Colloquium
University of Washington, eScience Institute

2019 Max Plank Institute for Meteorology, Oceans in the Earth System Seminar
University of Washington, Atmospheric and Climate Dynamics Seminar
ETH Zurich, Institute for Atmospheric and Climate Science Seminar
National Center for Atmospheric Research, Climate and Global Dynamics Seminar
MIT Department of Earth, Atmospheric and Planetary Sciences, Lunch Seminar
University of Toronto, Department of Physics

2018 Cornell University, Earth and Atmospheric Sciences Seminar

2017 University of Washington, Atmospheric and Climate Dynamics Seminar
University of Washington, Department of Atmospheric Sciences Colloquium

2016 NOAA Geophysical Fluid Dynamics Laboratory (GFDL)
Stockholm University, Department of Meteorology

2015 Caltech, Environmental Science and Engineering (Dissertation Defense)
ETH Zurich, Department of Earth Sciences

2013 Scripps Institute of Oceanography, CASPO Department Seminar

Caltech, Environmental Science and Society Seminar

CONFERENCE PRESENTATIONS

2023 Joint SPARC DynVar - SNAP Meeting: The Role of Atmospheric Dynamics for Climate and Extremes (Poster): *Resolving weather fronts increases the large-scale circulation response to Gulf Stream SST anomalies*

ICTP Meeting on Atlantic Variability and Tropical Basin Interactions at Interannual to Multi-Decadal Time Scales (Invited Talk): *The Fingerprint of Ocean Processes on Atlantic Multi-decadal Variability*

Joint CFMIP-GASS Meeting on Cloud, Precipitation, Circulation, and Climate Sensitivity (Poster): *Energetic theory for Walker circulation strength and potential emergent constraints on its weakening*

EGU General Assembly (Talk): *Resolving weather fronts increases the large-scale circulation response to Gulf Stream SST anomalies*

US CLIVAR Mesoscale and Frontal-Scale Air-Sea Interactions Workshop (Poster): *Resolving weather fronts increases the large-scale circulation response to Gulf Stream SST anomalies*

CESM Climate Variability and Change Working Group Meeting (Talk): *Resolving weather fronts increases the large-scale circulation response to Gulf Stream SST anomalies*

AMS Annual Meeting (Talk): *Enhanced large-scale atmospheric circulation response to Gulf Stream SST anomalies in CAM6 simulations with 1/8-degree regional grid refinement*

2022 WCRP Workshop on Modelling the Climate System at Ultra-High-Resolution (Talk): *Enhanced large-scale atmospheric circulation response to Gulf Stream SST anomalies in CAM6 simulations with 1/8-degree regional grid refinement*

CLIVAR Climate Dynamics Panel annual workshop: External versus internal variability on decadal and longer time scales (Talk): *Anomalous SST trends 1979-present: Internal variability or systematic climate model forced response bias?*

Cloud Feedback Model Intercomparison Project Meeting (Talk): *Understanding the diversity of tropical Pacific SST gradient changes in climate models*

SMILE Webinar Series on Large Ensembles (Invited Talk): *Large ensembles reveal systematic climate model biases in the large-scale pattern of recent sea-surface temperature and sea-level pressure change*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Talk): *Mesoscale processes enhance large-scale atmospheric circulation response to Gulf Stream SST anomalies in CAM6 simulations with 1/8-degree regional grid refinement*

US CLIVAR Workshop on the Pattern Effect (Poster): *Systematic climate model biases in the pattern of recent sea-surface temperature and sea-level pressure change*

ECS & Cloud Feedback Virtual Symposium (Talk): *Slow modes of global temperature variability and their impact on climate sensitivity estimates*

US CLIVAR Workshop on Societally Relevant Multi-Year Climate Predictions (Talk): *Insights into multi-year and multi-decadal predictability from ocean initial conditions in the CESM2 Large Ensemble*

American Geophysical Union (AGU) Ocean Sciences Meeting (Talk): *The role of Labrador Sea water-mass transformation in low-frequency AMOC variability in high- and low-resolution models*

2021 AGU Fall Meeting (Talk): *Enhanced atmospheric response to Gulf Stream SST anomalies in CAM6 simulations with 1/8-degree regional grid refinement over the North Atlantic*

WCRP Workshop on Attribution of Multi-Annual to Decadal Changes in the Climate System (Talk): *Large ensembles unable to simulate observed multi-decadal trends in SST & SLP*

Cloud Feedback Model Intercomparison Project Meeting (Poster): *Slow modes of global temperature variability and their impact on climate sensitivity estimates*

Max Planck Research Group Selection Symposium, Chemistry, Physics, and Technology Section (Invited Talk): *Novel data science and modeling approaches to improve process understanding and prediction of a noisy climate system*

WCRP-CLIVAR Workshop on Climate Interactions Among the Tropical Basins (Invited Poster): *Pattern recognition methods to separate forced and unforced components of SST pattern changes*

2020 AGU Fall Meeting (Invited Talk): *Mechanisms of stationary Rossby wave change in comprehensive and idealized GCMs*

AGU Fall Meeting (Talk): *Decadal variability of Earth's energy balance in CMIP6*

Cloud Feedback Model Intercomparison Project Meeting (Poster): *Decadal variability of Earth's energy balance in CMIP6*

University of Washington Program on Climate Change Summer Institute (Lightning Talk): *How regional differences in precipitation minus evaporation shape the ocean circulation*

US CLIVAR Variations Webinar (Invited Talk): *Separating forced & unforced components of climate change: The utility of pattern recognition methods in large ensembles and observations*

European Geophysical Union (EGU) General Assembly (Invited Talk): *Separating climate variability and climate change with fewer ensemble members using pattern recognition*

AGU Ocean Sciences Meeting (Talk): *Atlantic SST variance changes in warmer climates: Atmospheric and oceanic mechanisms*

2019 AGU Fall Meeting (Poster): *Slow modes of global temperature variability in regions of weak radiative feedbacks*

Climate and Wave Dynamics Workshop, Eilat, Israel (Invited Talk): *Reduced midlatitude SST variability in warmer climates: Atmospheric and oceanic mechanisms*

CLIVAR Large Ensembles Workshop (Talk): *Separating climate variability and climate change: How many ensemble members are needed?*

American Meteorological Society (AMS) Conference on Atmosphere and Ocean Fluid Dynamics (Talk): *Coupled atmosphere-ocean dynamics of North Pacific decadal variability*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Poster): *Mechanisms of stationary Rossby wave change in comprehensive and idealized GCMs*

Advanced Climate Dynamics Course 10-Year Anniversary Conference (Talk): *Preferred patterns of ocean variability and change: From decadal to centennial timescales and beyond*

PAGES Climate Variability Across Scales Workshop (Talk): *Characterizing low-frequency variability in climate models: Towards better attribution of observed climatic changes*

2018 AGU Fall Meeting (Poster): *Characterizing unforced low-frequency variability of global temperature and global energy imbalance in climate models*

US CLIVAR International AMOC Meeting (Talk): *Ocean-atmosphere dynamical coupling fundamental to the Atlantic Multidecadal Oscillation*

AGU Ocean Sciences Meeting (Talk): *The role of the ocean in low-frequency internal variability of global temperature and energy imbalance*

2017 AGU Fall Meeting (Talk): *The oceanic contribution to Atlantic multi-decadal variability*

7th International Workshop on Climate Informatics (Talk): *Extracting modes of variability and change from climate model ensembles*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Poster): *Isolating the decadal component of the Pacific Decadal Oscillation*

AMS Annual Meeting (Talk): *Stationary-eddy influence on changes in the hydrological cycle*

2016 GEWEX Hydro-Climate Sensitivity Workshop (Invited Talk): *The sensitivity of the zonally anomalous hydrological cycle: Dynamic and thermodynamic mechanisms*

EGU General Assembly (Poster): *Thermodynamic and dynamic controls on the amplitude of the zonally anomalous hydrological cycle*

2015 AGU Fall Meeting (Poster): *The response of idealized stationary-eddy circulations to climate change*

SPARC Workshop on Storm Tracks (Talk): *Orographically forced stationary eddies and the localization of storm tracks across a wide range of climates*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Talk): *Zonal hydrological-cycle variations in idealized model experiments*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Poster): *Mechanisms of changing orographic stationary Rossby wave forcing*

2014 AGU Fall Meeting (Talk): *Mechanisms of stationary Rossby wave change in a changing climate*

GEWEX 7th International Conference on the Global Water and Energy Cycle (Poster): *Circulation-dominated zonal precipitation variations*

Latsis Symposium on Atmosphere and Climate Dynamics (Poster): *Circulation-dominated zonal precipitation variations*

2013 AGU Fall Meeting (Poster): *Triggering deglaciations – a potential mechanism based on ice sheet induced freshwater forcing changes and North Pacific deep-water formation*

AGU Fall Meeting (Poster): *Climatic control of large-scale relief – a case study in the Andes from the ITCZ to Patagonia*

Davos Atmosphere and Cryosphere Assembly (Poster): *The influence of orographic stationary Rossby waves on large-scale precipitation and erosion climatology*

AMS Conference on Atmosphere and Ocean Fluid Dynamics (Talk): *The effect of topographic stationary Rossby waves on precipitation climatology*

EGU General Assembly (Talk): *The role of topography in local climate change*

2010 APS Division of Plasma Physics Meeting (Poster): *Density profile measurements in LDX using microwave reflectometry (**Outstanding Student Poster Award**)*

PROFESSIONAL LEADERSHIP

Scientific Organizing Committee for US CLIVAR Workshop on "Confronting Earth System Model Trends with Observations: The Good, the Bad and the Ugly", Mar. 2024

Organizer of the Forced Component Estimation Statistical Methods Intercomparison Project (ForceSMIP) Hackathon in Zurich, Switzerland and Boulder, CO, Aug. 2023

Organizer of the Workshop and Hackathon on ENSO Projections in Large Ensembles, Boulder, CO, Aug. 2021

Organizer of a University of Washington Department of Atmospheric Sciences Workshop on Active and Inclusive Learning, Aug. 2020

- Motivated by research showing active learning improves student learning outcomes, with the largest benefit for underrepresented students, I organized a workshop on the benefits of active learning and methods for incorporating active learning in the classroom.

Lead organizer of the University of Washington node of the CMIP6 Python Hackathon, planned in conjunction with the National Center for Atmospheric Research and Lamont-Doherty Earth Observatory, Oct. 2019

Organizer of a University of Washington Program on Climate Change Mini-Symposium: *Using past observations to constrain future climate variability and change*, Feb. 2018

Postdoc liaison, U. Washington Department of Atmospheric Sciences, 2019 – 2021

- Represented postdoc interests at faculty meetings, provided new postdocs with the resources needed to navigate their new environment, postdoc community building

Colloquium committee member, University of Washington Department of Atmospheric Sciences, 2020

Primary convener for sessions at the AGU Fall Meeting:

- *Large-scale atmosphere-ocean dynamics of climate variability and climate change*, 2020
- *Mechanisms of low-frequency ocean-atmosphere variability and implications for Earth's energy budget*, 2018
- *Atmospheric circulations and their role in the hydrological cycle: Monsoons, storm tracks, and the ITCZ*, 2015

Primary convener for session at the EGU General Assembly: *Disentangling internal variability and forced response: Changes, Methods, Mechanisms and Impacts*, 2023

Primary convener for session at the AMS Annual Meeting: *Large-scale atmospheric dynamics and climate: Jet streams, storm tracks, stationary waves, and monsoons*, 2023

Primary convener for session at the AGU Ocean Sciences Meeting: *The role of ocean-atmosphere dynamics in global climate*, 2022

Convener for session at the AGU Fall Meeting: *Decadal to Multi-Decadal Climate Variability – Mechanisms, Predictability, and Impacts*, 2019

PROFESSIONAL SERVICE

Editor for Journal of Climate, 2022 – present

Member of the International CLIVAR Climate Dynamics Panel, 2023 – present

Member of the CLIVAR-CFMIP Tropical Pacific SST Warming Patterns (TROPICS) Working Group, 2023 – present

Committee member for AGU Honors Spilhaus Award, 2015 – 2017

Proposal reviewer for the US National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA), and Israel Ministry of Science, Technology and Space

Reviewer for Journal of Climate, Geophysical Research Letters, Nature, Nature Geoscience, Weather & Climate Dynamics, Climate Dynamics, Journal of the Atmospheric Sciences, Science Advances, Journal of Geophysical Research: Atmospheres, Journal of Geophysical Research: Oceans, Quarterly Journal of the Royal Meteorological Society, Paleoceanography and Paleoclimatology, Journal of Advances in Modeling Earth Systems, Climate of the Past, Tellus A: Dynamic Meteorology and Oceanography, Nature Communications, Scientific Reports, and Progress in Oceanography

Volunteer judge for AGU Outstanding Student Presentation Awards, 2017 – 2020

PROFESSIONAL TRAINING

2024 ETH Zurich pedagogical course, *Teaching at ETH*

2020 Workshop on Active and Inclusive Learning, University of Washington Department of Atmospheric Sciences ***(Organizer)***

2019 Science Communications Training, University of Washington College of Environment

2014 WCRP Summer School on Detection and Attribution of Extreme Events, International Centre for Theoretical Physics, Trieste, Italy

2012 Advanced Climate Dynamics Course: *Landscapes and Climate*. Snøheim, Norway
(Including outreach event on weather and climate for Norwegian high school students)

2010 UC Berkely Pedagogical course, *Instruction Techniques in Astronomy & Physics*

COMPUTATIONAL SKILLS

Dynamical Models:

- Community Earth System Model (CESM): Significant experience running on national supercomputers (e.g., Cheyenne, Derecho), including development of new model grids and input datasets
- Geophysical Fluid Dynamics Laboratory (GFDL) Flexible Modeling System (FMS): Significant experience running the atmospheric model in idealized configurations on university supercomputers, including extensive modification of source code, input parameters, and output variables

Programming and Data Processing: MATLAB, Python, Fortran, CDO, NCO, bash

Other: LaTeX, Adobe Illustrator, Open Broadcaster Software