

Xian Wu

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Education

- Ph.D. Geological Sciences (Research area: Climate Dynamics) 2015–2020
The University of Texas at Austin
Dissertation: “Duration of El Niño and La Niña Events: Mechanisms and Multiyear Predictability”.
Advisor: Yuko Okumura
- B.S. Atmospheric Sciences (Climatology) 2011–2015
Nanjing University of Information Science and Technology (NUIST)

Academic Appointments

- Postdoctoral Research Associate, NOAA GFDL & Princeton University Mar 2023–present
Project: “Understanding Equatorial Pacific Climate Processes via Hierarchical Coupled Modeling”
Mentor: Andrew Wittenberg
- Advanced Study Program Postdoctoral Fellow, National Center for Atmospheric Research (NCAR)
Sept 2020–Mar 2023
Project: “Decadal Predictability and Prediction Skill in the Pacific Ocean”
Mentors: Stephen Yeager and Clara Deser
- Graduate Research Assistant, UT Austin Aug 2016–Aug 2020

Research Interests

Large-scale ocean-atmosphere interaction, climate variability and change, climate predictability

Fellowships and Awards

- NCAR Advanced Study Program Postdoctoral Fellowship 2020
UT Austin, Institute for Geophysics Graduate Fellowship Spring 2020
Outstanding Student Presentation Award, American Geophysical Union Fall Meeting 2019
UT Austin, Institute for Geophysics Entry Fellowship 2015 – 2016
Excellent Honor Graduate Award, NUIST 2015
First-Class Scholarship, NUIST 2011 – 2015

Publications

Published or accepted:

8. **Wu, X.**, S. G. Yeager, C. Deser, N. Rosenbloom, and G. A. Meehl, 2023: Volcanic forcing degrades multiyear-to-decadal prediction skill in the tropical Pacific, *Science Advances*, accepted.
7. Maher, N., R. C. J. Wills, P. N. DiNezio, J. Klavans, S. Milinsk, 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 Syst. Dynam. Discuss.*, <https://doi.org/10.5194/esd-2022-26>, in press.
6. Yeager, S. G., N. Rosenbloom, A. A. Glanville, **X. Wu**, I. Simpson, H. Li, M. J. Molina, K. Krumhardt, S. Mogen, K. Lindsay, D. Lombardozzi, W. Weider, W. M. Kim, J. H. Richter, M. Long, G. Danabasoglu, D. Bailey, M. Holland, N. Lovenduski, W. G. Strand, and, T. King 2022: The Seasonal-to-Multiyear Large Ensemble (SMYLE) Prediction System using the Community Earth System Model Version 2, *Geosci. Model Dev.*, 15, 6451–6493, <https://doi.org/10.5194/gmd-15-6451-2022>.
5. **Wu, X.**, Y. M. Okumura, P. N. DiNezio, S. G. Yeager, and C. Deser, 2022: The Equatorial Pacific Cold Tongue Bias in CESM1 and its Influence on ENSO Forecasts. *J. Climate*, 35, 3261–3277, <https://doi.org/10.1175/JCLI-D-21-0470.1>.
4. **Wu, X.**, Y. M. Okumura, C. Deser and P. N. DiNezio, 2021: Two-year Dynamical Predictions of ENSO Event Duration during 1954–2015. *J. Climate*. 34, 4069–4087, <https://doi.org/10.1175/JCLI-D-20-0619.1>.
3. **Wu, X.**, Y. M. Okumura, and P. N. DiNezio, 2021: Predictability of El Niño Duration Based on the Onset Timing. *J. Climate*. 34, 1351–1366, <https://doi.org/10.1175/JCLI-D-19-0963.1>.
2. **Wu, X.**, Y. M. Okumura, and P. N. DiNezio, 2019: What Controls the Duration of El Niño and La Niña Events? *J. Climate*, 32, 5941–5965, <https://doi.org/10.1175/JCLI-D-18-0681.1>.
1. Okumura, Y. M., T. Sun, and **X. Wu**, 2017: Asymmetric Modulation of El Niño and La Niña and the Linkage to Tropical Pacific Decadal Variability. *J. Climate*, 30, 4705–4733, <https://doi.org/10.1175/JCLI-D-16-0680.1>.

Under review:

DiNezio, P. N., T. Shanahan, T. Sun, C. Sun, **X. Wu**, A. Lawman, D. Lea, and M. Kageyama, U. Merkel, M. Prange, B. Otto-Bliesner, and X. Zhang, 2023: The tropical response to ocean circulation collapse.

In preparation:

Wu, X., et al., High prediction skill of tropical Pacific decadal variability and associated oceanic mechanisms.

Lawman, A. et al. including X. Wu, Tropical rainfall during Heinrich Stadial 1: Mechanisms and an integrative model-data comparison.

Media

US CLIVAR Research Highlights, “[Predicting the duration of El Niño and La Niña events with multiyear lead time](#)”, Apr 23, 2021

NOAA MAPP News, “[Scientists Explore Cutting-Edge Multi-Year ENSO Forecasts Using Climate Model](#)”, Feb 28, 2021

The Washington Post, Capital Weather Gang, “[Lingering La Niña may help forecasters spot costly weather patterns two years away](#)”, Dec 10, 2020

Presentations

Invited:

“Predicting the duration of La Niña events using the CESM multiyear forecast systems”, WCRP the second chapter of the Explaining and Predicting Earth System Change webinar series on ‘Triple La Niña’, virtual, Nov 2022.

“Tropical Pacific decadal predictability: the role of volcanic forcing and ocean initialization”, GFLD seminar series, virtual, Oct 2022.

“Duration of El Niño and La Niña Events: Dynamics and Multiyear Predictability”, American Geophysical Union Fall Meeting, virtual, Dec 2020 (Invited Poster).

Others:

“Predictability of tropical Pacific decadal variability and associated oceanic mechanisms”, CESM Working Group Meeting 2023, Boulder, CO, Feb 2023 (Talk).

“Volcanic forcing degrades multiyear-to-decadal prediction skill in the tropical Pacific”, American Meteorological Society 103rd Annual Meeting, Denver, CO, Jan 2023 (Talk).

“Duration of El Niño and La Niña events: dynamics and multiyear predictability”, ICTP ENSO Summer School, Trieste, Italy, Aug 2022 (Talk).

“Two-year dynamical predictions of ENSO event duration during 1954-2015”, CLIVAR Societally-Relevant Multi-Year Climate Predictions Workshop, Boulder CO, Mar 2022 (Talk).

“The effect of volcanic eruptions on multiyear-to-decadal predictions in the tropical Pacific”, CESM Working Group Meeting 2022, virtual, Feb 2022 (Talk).

“High prediction skill of tropical Pacific decadal climate in a decadal prediction system without volcanic forcing”, Ocean Sciences Meeting 2022, virtual, Mar 2022 (Talk).

“High prediction skill of tropical Pacific decadal climate in a decadal prediction system without volcanic forcing”, American Geophysical Union Fall Meeting, virtual, Dec 2021 (Talk).

“The Equatorial Pacific Cold Tongue Bias in CESM1 and its Influence on ENSO Forecasts”, American Geophysical Union Fall Meeting, virtual, Dec 2021 (Poster).

“The Equatorial Pacific Cold Tongue Bias in CESM1 and its Influence on ENSO Forecasts”, CESM Working Group Meeting 2021, virtual, Feb 2021 (Talk).

“Duration of El Niño and La Niña Events during 1954-2015”, American Geophysical Union Fall Meeting, virtual, Dec 2020 (Talk).

“Two-year Predictions of ENSO event duration during 1954-2015”, CESM Workshop 2020, virtual, Jun 2020 (Talk).

“Duration of El Niño and La Niña event: mechanisms and multiyear predictability”, Water, Climate, and Environmental Seminar Series, Austin, TX, Mar 2020 (Talk).

“Two-year Predictions of ENSO event duration during 1954-2015”, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 2019 (Poster).

“Predictability of El Niño duration based on the onset timing”, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 2019 (Talk)

“Predictability of El Niño duration based on the onset timing”, UT Austin Institute for Geophysics Seminar Series, Austin, TX, Dec 2019 (Talk).

“Predictability of El Niño duration in a coupled general circulation model”, American Meteorological Society 99th Annual Meeting, Phoenix, AZ. Jan 2019 (Talk).

“What controls the duration of El Niño and La Niña events?”, American Meteorological Society 98th Annual Meeting, Austin, TX. Jan 2018 (Talk).

“Impact of Interbasin Teleconnections on the Duration of El Niño and La Niña”, American Geophysical Union Fall Meeting, San Francisco, CA, Dec 2016 (Poster)

Teaching Experience

Graduate Teaching Assistant, *GEO 302 Earth, Wind, and Fire*, UT Austin Spring 2018

Service,

NCAR ASP committee member (2020-2023): writing club, seminar series

Journal reviewer (19 manuscripts): *Advances in Climate Change Research*, *Bulletin of the American Meteorological Society*, *Climate Dynamics*, *Geophysical Research Letters*, *International Journal of Climatology*, *Journal of Climate*, *Journal of Geophysical Research: Atmospheres*, *Journal of Physical Oceanography*, *Nature*, *Nature Geoscience*, *Science Bulletin*, *Science Advances*

Summer Schools

Artificial Intelligence for Earth System Science Summer School, Boulder, CO Jun 2020

Advanced Climate Dynamics Courses (Dynamics of the Seasonal Cycle), Norway Sept 2017

Community Earth System Model Tutorial, NCAR, Boulder, CO Aug 2016

Outreach

Event Supervisor, UT Austin Science Olympiad Tournaments (Meteorology) 2018–2019

K-12 STEM Outreach, Ford Elementary, Georgetown, Texas Jan 2019
Co-organize outreach activities on the 2014 World Meteorological Day, inform the public on air pollution facts and actions to reduce air pollution, Nanjing, China Mar 2014

Computer Skills and Numerical Modeling

Programming Languages FORTRAN, NCAR Command Language, Python, Shell Script
Numerical Modeling Community Earth System Modeling
System Windows, Mac OS, Unix/Linux

Professional Memberships

American Meteorological Society
American Geophysical Union