Nicole Feldl

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Current position

Assistant Professor, University of California, Santa Cruz

Research Interests

Climate dynamics • Polar amplification • Tropical-extratropical interactions • Climate feedbacks and climate sensitivity • Games for learning

Employment

2016-present Assistant Professor
Earth and Planetary Sciences
University of California, Santa Cruz

2015-2016 National Science Foundation Postdoctoral Research Fellow
Environmental Science and Engineering
California Institute of Technology

2013-2015 Foster and Coco Stanback Postdoctoral Scholar
Environmental Science and Engineering
California Institute of Technology
HOST: Simona Bordoni

2007-2013 Graduate Research Assistant
Atmospheric Sciences
University of Washington

2005-2007 Project Engineer
UNAVCO, a non-profit university-governed consortium,
facilitates geoscience research and education using geodesy

2002-2005 Graduate Research Assistant
Geological Sciences
University of Colorado, Boulder

Education

2013 PhD in Atmospheric Sciences
University of Washington
ADVISOR: Gerard Roe

2005 MS in Geological Sciences
University of Colorado
ADVISOR: Roger Bilham

2002 BS in Geological Sciences *summa cum laude*
University of North Carolina at Chapel Hill

Honors & Awards

2018 NSF CAREER Award.

2015 NSF Postdoctoral Research Fellowship (PRF).

2013 Foster and Coco Stanback Postdoctoral Fellowship.

2012 Washington NASA Space Grant Consortium Graduate Fellowship.

2011 Outstanding Poster Presentation, World Climate Research Programme Open Science Conference, Denver.

2007 Achievement Rewards for College Scientists (ARCS) Fellowship, Seattle Chapter.

2005 Outstanding Geoscience Student Award, Association for Women Geoscientists, Denver Chapter.

2004 Longley, Warner, and Wahlstrom Award, University of Colorado.

2002 Op White Prize in Geology, University of North Carolina at Chapel Hill.

Grants

2018-2023 PI, CAREER: The Lapse Rate Feedback and Other Mechanisms of High-Latitude Climate Change, NSF AGS-1753034.

2019-2022 Co-PI, REU: The Lamat Summer Research Program on High Performance Computing in Astrophysics, NSF AST-1852393.

2018-2021 Co-PI, MRI: Acquisition of a High Performance Computer for Computational Science at UC Santa Cruz, NSF AST-1828315.

2015-2016 PI, PRF: Coupling Between Regional Climate Feedbacks and Large-scale Circulation in a Hierarchy of Models, NSF AGS-1524569.

Publications

Journal Articles

Advisees are underlined. H-index 15, cumulative citations 1176 (Google Scholar, January 2022).

27 Santer, B. D., S. Po-Chedley, **N. Feldl**, J. C. Fyfe, Q. Fu, S. Solomon, M. England, K. B. Rodgers, M. F. Stuecker, C. Mears, C.-Z. Zou, C. J. W. Bonfils, G. Pallotta, M. D. Zelinka, N. Rosenbloom, J. Edwards (2021), Robust anthropogenic signal identified in the seasonal cycle of tropospheric temperature, submitted.

26 Merlis, T. M., **N. Feldl**, and R. Caballero (2021), Changes in poleward atmospheric energy transport

over a wide range of climates: Energetic and diffusive perspectives and a priori theories, submitted.

25 Singh, H., **N. Feldl**, J. E. Kay, and A. L. Morrison (2021), Climate sensitivity is sensitive to changes in ocean heat transport, *Journal of Climate*, , in press.

24 Kaufman, Z. S., and **N. Feldl** (2021), Causes of the Arctic's lower-tropospheric warming structure, *Journal of Climate*, doi:0.1175/JCLI-D-21-0298.1, in press.

23 Taylor, P. C., R. C. Boeke, L. N. Boisvert, **N. Feldl**, M. Henry, Y. Huang, P. L. Langen, W. Liu, F. Pithan, S. A. Sejas, and I. Tan (2022), Process drivers, inter-model spread, and the path forward: A review of amplified Arctic warming, *Frontiers in Earth Science*, 9:758361, doi:10.3389/feart.2021.758361.

22 **Feldl**, **N.**, and T. M. Merlis (2021), Polar amplification in idealized climates: The role of ice, moisture, and seasons, *Geophysical Research Letters*, 48, e2021GL094130, doi:10.1029/2021GL094130.

21 **Feldl**, **N.**, S. Po-Chedley, H. K. A Singh, S. Hay, and P. J. Kushner (2020), Sea ice and atmospheric circulation shape the high-latitude lapse rate feedback, *npj Climate and Atmospheric Science*, 3, 41 doi:10.1038/s41612-020-00146-7.

20 Kaufman, Z. S., **N. Feldl**, W. Weijer, and M. Veneziani (2020), Causal interactions between Southern Ocean polynyas and high-latitude atmosphere-ocean variability, *Journal of Climate*, 33, 4891–4905, doi:10.1175/JCLI-D-19-0525.1.

19 Siler, N., G. H. Roe, K. C. Armour, and **N. Feldl** (2019), Revisiting the surface-energy-flux perspective on the sensitivity of global precipitation to climate change, *Climate Dynamics*, 52, doi:10.1007/s00382-018-4359-0.

18 Bonan, D. B., K. C. Armour, G. H. Roe, N. Siler, and **N. Feldl** (2018), Sources of uncertainty in the meridional pattern of climate change, *Geophysical Research Letters*, 45, doi:10.1029/2018GL079429.

17 Kim, D., S. M. Kang, Y. Shin, and **N. Feldl** (2018), Sensitivity of polar amplification to varying insolation conditions, *Journal of Climate*, 31, 4933–4947, doi:10.1175/JCLI-D-17-0627.1.

16 Anderson, B. T., **N. Feldl**, and B. R. Lintner (2018), Emergent behavior of Arctic precipitation in response to enhanced Arctic warming, *Journal of Geophysical Research: Atmospheres*, 123, doi:10.1002/2017JD026799.

15 **Feldl**, **N.**, B. T. Anderson, and S. Bordoni (2017), Atmospheric eddies mediate lapse rate feedback and Arctic amplification, *Journal of Climate*, 30, 9213–9224, doi:10.1175/JCLI-D-16-0706.1.

14 **Feldl**, **N.**, S. Bordoni, and T. M. Merlis (2017), Coupled high-latitude climate feedbacks and their impact on atmospheric heat transport, *Journal of Climate*, 30, 189–201, doi:10.1175/JCLI-D-16-0324.1.

13 Yang, J., J. Leconte, E. T. Wolf, C. Goldblatt, **N. Feldl**, T. Merlis, Y. Wang, D. D. B. Koll, F. Ding, F. Forget, and D. S. Abbot (2016), Differences in water vapor radiative transfer among 1D models can significantly affect the inner edge of the habitable zone, *The Astrophysical Journal*, 826, doi:10.3847/0004-637X/826/2/222.

12 **Feldl**, **N.**, and S. Bordoni (2016), Characterizing the Hadley Circulation response through regional climate feedbacks, *Journal of Climate*, 29, 613–622, doi:10.1175/JCLI-D-15-0424.1.

11 Roe, G. H., **N. Feldl**, K. C. Armour, Y.-T. Hwang, and D. M. W. Frierson (2015), The remote impacts of climate feedbacks on regional climate predictability, *Nature Geoscience*, 8, 135–139, doi:10.1038/ngeo2346.

10 Feldl, N., D. M. W. Frierson, and G. H. Roe (2014), The influence of regional feedbacks on circulation sensitivity, *Geophysical Research Letters*, 41, 2212–2220.

9 Rose, B. E. J., K. C. Armour, D. S. Battisti, **N. Feldl**, and D. D. B. Koll (2014), The dependence of transient climate sensitivity and radiative feedbacks on the spatial pattern of ocean heat uptake, *Geophysical Research Letters*, 41, doi:10.1002/2013GL058955.

8 **Feldl**, **N**., and G. H. Roe (2013), Four perspectives on climate feedbacks, *Geophysical Research Letters*, 40, doi:10.1002/grl.50711.

7 **Feldl**, **N**., and G. H. Roe (2013), The nonlinear and nonlocal nature of climate feedbacks, *Journal of Climate*, 26, 8289–8304, doi:10.1175/JCLI-D-12-00631.1.

6 **Feldl**, **N**., and G. H. Roe (2011), Climate variability and the shape of daily precipitation: A case study of ENSO and the American West, *Journal of Climate*, 24, 2483–2499.

5 **Feldl**, **N**., and G. H. Roe (2010), Synoptic weather patterns associated with intense ENSO rainfall in the southwest United States, *Geophysical Research Letters*, 37.

4 **Feldl**, **N**., and R. Bilham (2006), Great Himalayan earthquakes and the Tibetan Plateau, *Nature*, 444, 165-170.

3 Bilham, R., E. R. Engdahl, **N. Feldl**, and S. P. Satyabala (2005), Partial and complete rupture of the Indo-Andaman plate boundary 1847-2004, *Seismological Research Letters*, 76, 299-311.

2 Hough, S. E., R. Bilham, N. Ambraseys, and **N. Feldl** (2005), The 1905 Kangra and Dehra Dun earthquakes, *Geological Survey of India Special Publications*, 85, 15-22.

1 Hough, S. E., R. Bilham, N. Ambraseys, and **N. Feldl** (2005), Revisiting the 1897 Shillong and 1905 Kangra earthquakes in northern India: Site response, Moho reflections and a triggered earthquake, *Current Science*, 88, 1632-1638.

Conference Presentations

Icy, moist, and seasonal: Polar amplification in idealized climates, AGU Fall Meeting, New Orleans, December 2021.

Arctic feedbacks: The interconnected roles of sea ice, atmospheric energy transport, and lapse rate changes, AGU Fall Meeting, New Orleans, December 2021. Invited.

Interdisciplinary research mentorship in serious play, co-presented with Elizabeth Swensen, Serious Play Conference, virtual due to COVID-19 pandemic, June 2021.

Sea ice and atmospheric circulation shape the high-latitude lapse rate feedback, CalGFD Meeting, virtual due to COVID-19 pandemic, August 2020.

A physical basis for the high-latitude lapse rate feedback, AGU Fall Meeting, San Francisco, December 2019.

The role of atmospheric eddies on the lapse rate feedback and Arctic amplification, AGU Fall Meeting, Washington, DC, December 2018. Invited.

Atmospheric eddies mediate lapse rate feedback and Arctic amplification, CFMIP Meeting on Clouds, Precipitation, Circulation, and Climate Sensitivity, Boulder, October 2018.

Energetic perspectives on the changing tropical circulation: Hemispheric asymmetries and subtropical drying, AMS Annual Meeting, Conference on Climate Variability and Change, Austin, January 2018. Invited.

Atmospheric eddies mediate lapse rate feedback and Arctic amplification, AMS Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, OR, June 2017.

Impact of coupled high-latitude climate feedbacks on tropical circulations, AGU Fall Meeting, San Francisco, December 2016.

Coupled high-latitude climate feedbacks and their impact on atmospheric heat transport, CFMIP/WCRP Conference on Cloud Processes, Circulation and Climate Sensitivity, ICTP, Trieste, Italy, July 2016.

Characterizing the Hadley circulation response through regional climate feedbacks, Monsoons & ITCZ: The annual cycle in the Holocene and the future, Columbia University, New York, September 2015.

Coupling between climate feedbacks and large-scale circulation, AGU Fall Meeting, San Francisco, December 2014. Invited.

The influence of regional feedbacks on circulation sensitivity, Latsis Symposium on Atmosphere and Climate Dynamics, ETH, Zurich, Switzerland, June 2014.

The influence of regional feedbacks on circulation sensitivity, AMS Conference on Hurricanes and Tropical Meteorology, San Diego, April 2014.

Nonlinear and nonlocal feedbacks in an aquaplanet, AGU Fall Meeting, San Francisco, December 2012.

Graduate Climate Conference, Pack Forest, WA, October 2012.

Regional predictability and the linearity of climate feedbacks, AGU Fall Meeting, San Francisco, December 2011.

Regional predictability and the linearity of climate feedbacks, World Climate Research Programme Open Science Conference, Denver, October 2011.

Graduate Climate Conference, Pack Forest, WA, October 2010.

Circulation variability and intense precipitation: A case study of ENSO and the American West, Pacific Northwest Weather Workshop, NOAA, Seattle, March 2010.

Intense precipitation events during La Niña in the southwestern United States, AGU Fall Meeting, San Francisco, December 2009.

Graduate Climate Conference, Pack Forest, WA, April 2009.

Professional Activities

Memberships

2004-present American Geophysical Union

2014-present American Meteorological Society

Editor & Reviewer

Journal reviewer

Nature Geoscience, Nature Communications, npj Climate and Atmospheric Science, Earth's Future, Geophysical Research Letters, Journal of Climate, Journal of Geophysical Research: Atmospheres, Climate Dynamics.

Proposal reviewer

National Science Foundation (ad hoc and panel), National Oceanic and Atmospheric Administration.

Invited Seminars & Colloquia

2022 Stormtracks 2022 Workshop, Olèron Island, France, forthcoming..

2022 University of Trento, Italy, Weather and Climate: From Fundamentals to Applications Seminar, forthcoming.

2021 PAMIP (Polar Amplification Model Intercomparison Project) Webinar, December 2021.

2021 ECS and Cloud Feedback Virtual Symposium, July 2021.

2021 DOE RGMA program, High-Latitude Processes and Feedbacks Webinar, June 2021.

2021 University of California, Irvine, Earth System Science Seminar, May 2021.

2021 University of Chicago, Geophysical Sciences Seminar, May 2021.

2021 George Mason University, Climate Dynamics Seminar, April 2021.

2021 Leipzig University, Leipzig Graduate School for Clouds, Aerosols and Radiation, Advanced Training Module: The Lapse-rate feedback in the Arctic, March 2021.

2021 McGill University, Atmospheric and Oceanic Sciences Seminar, February 2021.

2021 University of California, Riverside, Hewett Club Lecture, February 2021.

2021 University of California, Los Angeles, Atmospheric Dynamics Seminar, January 2021.

2020 Stanford University, Atmosphere, Ocean, and Climate Dynamics Seminar, November 2020.

2020 Scripps Institution of Oceanography, Climate Journal Club, October 2020.

2020 National Taiwan University, Taipei, Taiwan, postponed due to COVID-19 pandemic.

2020 University of Toronto, Atmospheric Physics Noble Seminar, Toronto, Canada, March 2020.

2018 DOE RGMA program, High-Latitude Processes and Feedbacks Webinar, February 2018.

2017 Lawrence Livermore National Laboratory, Climate and Weather Seminar, November 2017.

2017 San Jose State University, Geology Club Seminar, San Jose, October 2017.

2017 UC Santa Cruz, Geophysical and Astrophysical Fluid Dynamics Seminar, Santa Cruz, May 2017.

2015 MIT, Atmospheric Science Seminar, Cambridge, November 2015.

2015 University of Rochester, Earth and Environmental Sciences Seminar, Rochester, April 2015.

2015 UC Santa Cruz, Earth and Planetary Sciences Seminar, Santa Cruz, March 2015.

2015 Boston University, Earth and Environment Department Seminar, Boston, February 2015.

2015 Colorado College, Environmental Program Seminar, Colorado Springs, January 2015.

2014 Portland State University, Geography Seminar, Portland, November 2014.

2014 UC Berkeley, Earth and Planetary Science Seminar, Berkeley, March 2014.

2014 Caltech, Environmental Science and Engineering Seminar, Pasadena, February 2014.

2013 University of Washington, Atmospheric Sciences Colloquium, Seattle, June 2013.

2013 CESM Climate Variability and Change Working Group Meeting, NCAR, Boulder, March 2013.

2010 University of Washington, Atmospheric and Climate Dynamics Seminar, Seattle, January 2010.

Advising

Postdoctoral Scholar (1)

Mark England (2021–present)

PhD Students (3)

Hayes Devaney (2021–present, co-advised with Kai Zhu), Po-Chun Chung (2021–present), Zachary Kaufman (2017–present; NSF Graduate Research Fellow)

Undergraduate Researchers (4)

Emiliia Dyrenkova (2020–2021; Lamat Fellow), Omar Rosales Cortez (2019), Ricky Calzada (2018–2019), Flor Vanessa Maciel (2018–2019; Koret Scholar)

Graduate Game Designers (1)

co-advised with Elizabeth Swensen

Devi Acharya (2021)

Undergraduate Game Designers (9)

co-advised with Elizabeth Swensen

Dallas Truong (2020), Janel Catajoy (2019–2020), Xueer Zhu (2019–2020), Amber Sargeant (2019–2020), Sean Song (2018–2020), Tiffany Phan (2018–2020), Joshua Husting (2018–2019), Alexandria McGill (2018–2019), Emily Rodriguez (2018–2019)

Teaching

University of California, Santa Cruz

2021 Hydroclimatology (EART 252; graduate), with Margaret Zimmer, Fall 2021.

2021 Modeling Earth's Climate (EART 124; upper division), Spring 2021.

2021 Introduction to Weather and Climate (EART 12; lower division), Winter 2021.

2020 The Atmosphere (EART 121; upper division), Fall 2020.

2020 Modeling Earth's Climate (EART 124; upper division), Spring 2020.

2020 Hydroclimatology (EART 252; graduate), with Margaret Zimmer, Winter 2020.

2019 Introduction to Weather and Climate (EART 12; lower division), Fall 2019.

2019 Introduction to Weather and Climate (EART 12; lower division), Winter 2019.

2018 The Atmosphere (EART 121; upper division), Fall 2018.

2018 Modeling Earth's Climate (EART 124; upper division), Spring 2018.

2018 Introduction to Weather and Climate (EART 12; lower division), Winter 2018.

2017 Atmospheric Rivers (EART 290M; graduate), with Noah Finnegan, Fall 2017.

2017 Atmospheric Dynamics (EART 290M; graduate), Spring 2017.

2016 Introduction to Weather and Climate (EART 12; lower division), Fall 2016.

University of Washington

2011 Introduction to Weather (ATMS 101; lower division), Summer 2011.

Teaching Assistantships

2010 Climate and Climate Change (ATMS 211), University of Washington, Spring 2010

2009 Earth System and Climate (ESS 201), University of Washington, Winter 2009

2003 Introduction to Geology (GEOL 1030), University of Colorado, Spring 2003.

2002 Introduction to Geology (GEOL 1030), University of Colorado, Fall 2002.