

David B. Bonan

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Education

- 2025 **Ph.D., Environmental Science and Engineering**
California Institute of Technology Pasadena, CA
- 2021 **M.S., Environmental Science and Engineering**
California Institute of Technology Pasadena, CA
- 2019 **B.S., Atmospheric Sciences | Minor, Applied Mathematics | College Honors**
University of Washington Seattle, WA

Appointments & Experience

- 2024 – now **Visiting Scientist**
Climate and Global Dynamics, NSF National Center for Atmospheric Research Boulder, CO
- 2024 – now **CICOES Postdoctoral Research Fellow**
Department of Atmospheric and Climate Science, University of Washington Seattle, WA
- 2024 **Postdoctoral Research Associate**
Environmental Science and Engineering, California Institute of Technology Pasadena, CA
- 2019 – 2024 **Graduate Research Assistant**
Environmental Science and Engineering, California Institute of Technology Pasadena, CA
- 2017 – 2019 **Mary Gates Research Fellow**
Department of Atmospheric Sciences, University of Washington Seattle, WA
- 2017 – 2018 **Undergraduate Research Assistant**
Department of Earth and Space Sciences, University of Washington Seattle, WA
- 2016 – 2019 **Undergraduate Assistant**
Program on Climate Change, University of Washington Seattle, WA
- 2014 – now **Freelance Artist**
Self Employed Boulder, CO

Honors, Awards, & Fellowships

- 2025 – 2026 Data Science Postdoctoral Fellowship, University of Washington eScience Institute
- 2024 – 2026 Cooperative Institute for Climate, Ocean, & Ecosystem Studies Postdoctoral Fellowship
- 2024 California Institute of Technology Geological and Planetary Sciences Award for Academic Excellence in Research
- 2024 Nature Reviews Earth & Environment Research Highlight for Dong et al., (2023): “Drivers of Southern Ocean cooling”
- 2023 American Geophysical Union Fall Meeting Outstanding Student Presentation Award
- 2022 The Nansen Legacy Research Fellowship
- 2022 Advanced Climate Dynamics Course Participant in Rondane, Norway
- 2022 California Geophysical Fluid Dynamics Student Presentation Award
- 2021 – 2024 National Science Fellowship Graduate Research Fellowship
- 2020 IACS-IGS Graham Cogley Award Honorable Mention
- 2019 – 2020 American Meteorological Society Graduate Fellowship
- 2019 – 2020 California Institute of Technology Graduate Fellowship
- 2019 American Geophysical Union Editors’ Highlight for Bonan et al., (2018): “Identifying Uncertainties in Climate Models”
- 2018 Mary Gates Research Scholarship
- 2018 American Meteorological Society Senior Named Scholarship
- 2018 American Alpine Club Research Grant
- 2017 Mary Gates Research Scholarship
- 2017 – 2019 Ernest F. Hollings Undergraduate Scholarship
- 2015 – 2019 CenturyLink Scholarship

Publications

<https://scholar.google.com/citations?user=SLZbVj8AAAAAJ&hl=en>

Peer-Reviewed

* indicates student advisee

Submitted

- Q. Ding, T. J. Ballinger, D. Kondrashov, G. Chen, P. Zhang, and **D. B. Bonan**: A Rossby wave-driven intraseasonal atmospheric mode regulates Arctic summer warming and moistening.
- H. F. Drake, **D. B. Bonan**, I. Keshwani, R. Liu, A. Meza, M. Poinelli, P. A. Rafter, M. Rugenstein, K. Uyeda, and K. Willcott: Collapse and recovery of abyssal circulation and ventilation under warming.
- E. R. Newsom, **D. B. Bonan**, A. F. Thompson, K. C. Armour, and L. Zanna: Controls on the timescale of Earth's climate response to greenhouse-gas forcing.
- J. Zhu, B. Otto-Bliesner, J. Tierney, E. C. Brady, I. Simpson, **D. B. Bonan**, and D. J. Lunt (2026): More equable past and future warm climates in unprecedented high-resolution simulations.
- B. G. Buchovecky, F. H. Lambert, C. M. Zarakas, M. M. Laguë, C. D. Koven, I. Fung, **D. B. Bonan**, and A. L. S. Swann: Reduced evapotranspiration decreases land precipitation despite enhanced moisture convergence: insights from perturbed parameter ensembles of Earth system models.
- **D. B. Bonan** and T. Schneider: Estimating the maximum mean precipitation in hothouse climates.

2026

24. M. Bushuk, **D. B. Bonan**, S. M. Griffies, W. Gregory, Y. Zhang, B. Hurlin, Y.-T. Chen, T. Rackow, and H. F. Goessling (2026): Historical and projected Antarctic sea ice trends across high-resolution coupled model hierarchies. *Geophysical Research Letters*, 53 (x), e2026GL124043. doi: 10.1029/2026GL124043
23. C. Hankel and **D. B. Bonan** (2026): Transient evolution of polar amplification under different CO₂ ramping rates. *Geophysical Research Letters*, 53 (6), e2025GL120079. doi: 10.1029/2025GL120079
22. **D. B. Bonan**, M. M. Laguë, and W. R. Boos (2026): Impact of continental configuration on the climate response to greenhouse-gas forcing in an idealized GCM. *Geophysical Research Letters*, 53 (5), e2025GL120128. doi: 10.1029/2025GL120128

2025

21. **D. B. Bonan**, A. F. Thompson, T. Schneider, L. Zanna, K. C. Armour, and S. Sun (2025): Observational constraints imply limited future Atlantic meridional overturning circulation weakening. *Nature Geoscience*, 18 (6), 479-487. doi: 10.1038/S41561-025-01709-0
20. **D. B. Bonan**, J. E. Kay, N. Feldl and M. D. Zelinka (2025): Mid-latitude clouds contribute to Arctic amplification via interactions with other climate feedbacks. *Environmental Research: Climate*, 4 (1), 015001. doi: 10.1088/2752-5295/ADA84B

2024

19. R. N. Patel, **D. B. Bonan**, and T. Schneider (2024): Changes in the frequency of observed temperature extremes largely driven by a distribution shift. *Geophysical Research Letters*, 51 (24), e2024GL110707. doi: 10.1029/2024GL110707
18. **D. B. Bonan**, T. Schneider, and J. Zhu (2024): Precipitation over a wide range of climates simulated with comprehensive GCMs. *Geophysical Research Letters*, 51 (16), e2024GL109892. doi: 10.1029/2024GL109892
17. M. S. Nayak*, **D. B. Bonan**, E. R. Newsom, and A. F. Thompson (2024): Controls on the strength and structure of the Atlantic meridional overturning circulation in climate models. *Geophysical Research Letters*, 51 (11), e2024GL109055. doi: 10.1029/2024GL109055
16. **D.B. Bonan**, J. Dörr, R.C.J. Wills, A.F. Thompson, and M. Årthun (2024): Sources of low-frequency variability in observed Antarctic sea ice. *The Cryosphere*, 18 (4), 2141-2159. doi: 10.5194/TC-18-2141-2024
15. **D. B. Bonan**, N. Feldl, N. Siler, J. E. Kay, K. C. Armour, I. Eisenman, and G. H. Roe (2024): The influence of climate feedbacks on regional hydrological changes under global warming. *Geophysical Research Letters*, 51 (3), e2023GL106648. doi: 10.1029/2023GL106648

2023

14. Y. Dong, L. M. Polvani, and **D. B. Bonan** (2023): Recent multi-decadal Southern Ocean surface cooling unlikely caused by Southern Annular Mode trends. *Geophysical Research Letters*, 50 (23), e2023GL106142. doi: 10.1029/2023GL106142

13. N. Siler, **D. B. Bonan**, and A. Donohoe (2023): Diagnosing mechanisms of hydrologic change under global warming in the CESM1 Large Ensemble. *Journal of Climate*, 36 (23), 8243-8257. doi: 10.1175/JCLI-D-23-0086.1
12. J. Dörr, **D. B. Bonan**, M. Årthun, L. Svendsen, and R. C. J. Wills (2023): Forced and internal components of observed Arctic sea-ice changes. *The Cryosphere*, 17 (9), 4133-4153. doi: 10.5194/TC-17-4133-2023
11. E. A. Wilson, **D. B. Bonan**, A. F. Thompson, N. Armstrong, and S. C. Riser (2023): Mechanisms for abrupt summertime circumpolar surface warming in the Southern Ocean. *Journal of Climate*, 36 (20), 7025-7039. doi: 10.1175/JCLI-D-22-0501.1
10. **D. B. Bonan**, N. Feldl, M. D. Zelinka, and L. C. Hahn (2023): Contributions to regional precipitation change and its polar-amplified pattern under warming. *Environmental Research: Climate*, 2 (3), 035010. doi: 10.1088/2752-5295/ACE27A
9. **D. B. Bonan**, N. Siler, G. H. Roe, and K. C. Armour (2023): Energetic constraints on the pattern of changes to the hydrological cycle under global warming. *Journal of Climate*, 36 (10), 3499-3522. doi: 10.1175/JCLI-D-22-0337.1

2022

8. **D. B. Bonan**, A. F. Thompson, E. R. Newsom, S. Sun, and M. Rugenstein (2022): Transient and equilibrium responses of the Atlantic overturning circulation to warming in coupled climate models: the role of temperature and salinity. *Journal of Climate*, 35 (15), 5173-5193. doi: 10.1175/JCLI-D-21-0912.1

2021

7. **D. B. Bonan**, 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 (18), e2021GL094309. doi: 10.1029/2021GL094309
6. **D. B. Bonan**, F. Lehner, and M. M. Holland (2021): Partitioning uncertainty in projections of Arctic sea ice. *Environmental Research Letters*, 16 (4), 044002. doi: 10.1088/1748-9326/ABE0EC

2020

5. M. Bushuk, M. Winton, **D. B. Bonan**, E. Blanchard-Wrigglesworth, and T. Delworth (2020): A mechanism for the Arctic sea ice spring predictability barrier. *Geophysical Research Letters*, 47 (13), e2020GL088335. doi: 10.1029/2020GL088335
4. **D. B. Bonan** and E. Blanchard-Wrigglesworth (2020): Nonstationary teleconnection between the Pacific Ocean and Arctic sea ice. *Geophysical Research Letters*, 47 (2), e2019GL085666. doi: 10.1029/2019GL085666

2019

3. **D. B. Bonan**, J. E. Christian, and K. Christianson (2019): Influence of North Atlantic climate variability on glacier mass balance in Norway, Sweden and Svalbard. *Journal of Glaciology*, 65 (252), 580-594. doi: 10.1017/JOG.2019.35
2. **D. B. Bonan**, M. Bushuk, and M. Winton (2019): A spring barrier for regional predictions of summer Arctic sea ice. *Geophysical Research Letters*, 46 (11), 5937-5947. doi: 10.1029/2019GL082947

2018

1. **D. B. Bonan**, 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 (17), 9131-9140. doi: 10.1029/2018GL079429

Non-Refereed

- **D.B. Bonan** (2025): Explications of a changing climate. Ph.D. Dissertation. California Institute of Technology.
- **D.B. Bonan** (2019): Disaggregating uncertainty in the regional climate response. Undergraduate Honors Thesis. University of Washington.

Grants

Computer

- 2024 NSF NCAR HPC Exploratory Allocation (1,000,000 core-hours): Impact of model resolution on climate processes in an idealized GCM.
- 2023 NSF NCAR HPC Exploratory Allocation (450,000 core-hours): Effects of continental land distribution on the climate response to greenhouse gas forcing.
- 2020 NSF NCAR HPC Exploratory Allocation (105,000 core-hours): Using a model hierarchy to identify mechanisms of sea ice loss.

Presentations

Invited Seminars & Colloquia

- 2026 University of Washington, Atmospheric and Climate Dynamics Seminar; Colorado State University, Department of Atmospheric Science Colloquium

- 2025 University of Washington, Physical Oceanography Seminar; National Center for Atmospheric Research, Climate and Global Dynamics Seminar; California Institute of Technology, Division of Geological and Planetary Sciences Seminar; University of California, Berkeley, Earth & Planetary Science Seminar; University of Washington, Atmospheric and Climate Science Seminar
- 2024 Oregon State University, College of Earth, Ocean, and Atmospheric Sciences Seminar
- 2023 University of Washington, Atmospheric and Climate Dynamics Seminar; National Center for Atmospheric Research, Paleo and Polar Climate Section; National Center for Atmospheric Research, Climate Analysis Section
- 2022 University of Bergen, Bjerknes Centre for Climate Research Seminar; University of Bergen, Physical Oceanography Seminar; Oregon State University, Physics of Oceans and Atmospheres Seminar
- 2021 California Institute of Technology, Environmental Science, Engineering, and Society Seminar; Colorado State University, Large Scale Dynamics Series
- 2020 California Institute of Technology, Environmental Science, Engineering, and Society Seminar

Conferences & Workshops

- 2026 United States Climate Variability and Predictability Program Workshop
- 2025 American Geophysical Union Fall Meeting; American Geophysical Union Fall Meeting; Cooperative Institute for Climate, Ocean, and Ecosystem Studies Symposium; Kavli Institute for Theoretical Physics
- 2024 National Center for Atmospheric Research, Paleoclimate Working Group Meeting
- 2023 American Geophysical Union Fall Meeting
- 2022 American Geophysical Union Fall Meeting; Ocean Sciences Meeting
- 2021 American Geophysical Union Fall Meeting; California Geophysical Fluid Dynamics Meeting; National Center for Atmospheric Research, Community Earth System Model Workshop; Conference on Polar Meteorology and Oceanography; European Geophysical Union General Assembly; National Center for Atmospheric Research, Polar Climate Working Group Meeting
- 2020 American Geophysical Union Fall Meeting (invited); American Geophysical Union Fall Meeting; United States Climate Variability and Predictability Program, Ocean Sciences Meeting
- 2019 Conference on Polar Meteorology and Oceanography

Poster

- 2026 Advanced Research and Intervention Agency (invited)
- 2025 University of Washington, Program on Climate Change Summer Institute
- 2024 United States Climate Variability and Predictability Program Workshop
- 2023 American Geophysical Union Fall Meeting
- 2022 California Geophysical Fluid Dynamics Meeting; Conference on Polar Meteorology and Oceanography; United States Climate Variability and Predictability Program Workshop; Ocean Sciences Meeting (invited)
- 2021 Cloud Feedback Model Intercomparison Project Meeting
- 2019 American Geophysical Union Fall Meeting; National Center for Atmospheric Research, Polar Modeling Workshop; American Meteorological Society Annual Meeting
- 2018 American Geophysical Union Fall Meeting; University of Washington, Program on Climate Change Summer Institute; University of Washington, Program on Climate Change Symposium
- 2017 American Geophysical Union Fall Meeting

Virtual Seminars

- 2026 Geophysical Fluid Dynamics Laboratory Climate Sensitivity Journal Club (invited)
- 2022 ECS and Cloud Feedback Virtual Symposium (invited)
- 2020 Working Group on Large Ensembles (invited)

Workshops & Courses

Workshops

- 2026 Broadening Earth System Research Across Scales with High-Resolution Modeling. United States Climate Variability and Predictability Program Workshop. Boulder, Colorado.
- 2026 Collapse of the Atlantic Ocean circulation: Can it? Has it? Will it?. Advanced Research and Intervention Agency. London, United Kingdom.

- 2026 The Recent Pause in Arctic Climate Trends. Kavli Institute for Theoretical Physics. Santa Barbara, California.
- 2025 Paleoclimate Constraints on Future Climate. Program on Climate Change Summer Institute, University of Washington, Friday Harbor, Washington.
- 2025 The Physics of Changing Polar Climate. Kavli Institute for Theoretical Physics. Santa Barbara, California.
- 2023 Polar Amplification of Climate Change Across Hemispheres and Seasons: Causes and Constraints. United States Climate Variability and Predictability Program Workshop. Boulder, Colorado.
- 2022 The Pattern Effect: Coupling of SST Patterns, Radiative Feedbacks, and Climate Sensitivity. United States Climate Variability and Predictability Program Workshop. Boulder, Colorado.
- 2019 CESM Polar Modeling Workshop, National Center for Atmospheric Research, Boulder, Colorado.
- 2019 CESM Tutorial. National Center for Atmospheric Research, Boulder, Colorado.
- 2018 Sources of Uncertainty in Long-term Climate Projections. Program on Climate Change Summer Institute, University of Washington, Friday Harbor, Washington.
- 2018 Using Past Observations to Constrain Future Climate Variability and Change. Program on Climate Change Workshop, University of Washington, Seattle, Washington.
- 2018 Annual West Antarctic Ice sheet Workshop. University of Washington, Coupeville, Washington.
- 2016 The Climate of Antarctica and the Southern Ocean. Program on Climate Change Summer Institute, University of Washington, Friday Harbor, Washington.

Courses

- 2025 Sikumiut Field School for Sea Ice Knowledge Holders. Utqiagvik, Alaska.
- 2022 Dynamics of the Global Water Cycle. Advanced Climate Dynamics Course, Rondane, Norway.

Advising, Teaching, & Mentoring

Advising

- **Undergraduate Students**
 - Sydney Vernon (2023 – 2026)
 - Manali Nayak (2022 – 2023)

Teaching

- **Guest Lectures**
 - Climate System Physics, University of Texas, Austin, Virtual, November 2025
 - Exploring the Atmospheric Sciences, University of Washington, Seattle, Washington, April 2025
 - Sikumiut Field School for Sea Ice Knowledge Holders, Utqiagvik, Alaska, April 2025
 - Ocean and Climate Dynamics, Oregon State University, Corvallis, Oregon, August 2024
- **Teaching Assistant**
 - ESE 136: Climate Models California Institute of Technology
→ Spring 2023
 - ESE 102: Earth's Oceans California Institute of Technology
→ Fall 2021
 - ESE 101: Earth's Atmosphere California Institute of Technology
→ Fall 2020

Mentoring

- 2021 – 2024 Mentor, Division of Geological and Planetary Sciences, California Institute of Technology
- 2020 – now Mentor, Graduate Student Mentorship Initiative (GSMI)

Service and Synergistic Activities & Leadership

Service and Synergistic Activities

- **Peer Reviewer**

Annals of Glaciology; Climate Dynamics; Communications Earth & Environment; Earth's Future; Environmental Research: Climate; Environmental Research Letters; Geophysical Research Letters; Journal of Advances in Modeling Earth Systems; Journal of Climate; Journal of Geophysical Research: Oceans; Nature Communications; Nature Geoscience; npj Climate and Atmospheric Science; Proceedings in the National Academy of Sciences; Science Advances; The Cryosphere

□ **Proposal Reviewer**

United States National Science Foundation

□ **Session Organizer**

- 18th Conference on Polar Meteorology and Oceanography
- 17th Conference on Polar Meteorology and Oceanography
- 16th Conference on Polar Meteorology and Oceanography

□ **Professional Memberships**

- American Geophysical Union
- American Meteorological Society
- European Geophysical Union

Leadership

- 2024 – now Committee Member, American Meteorological Society Committee on Polar Meteorology and Oceanography
- 2021 – 2024 Student Representative, American Meteorological Society Committee on Polar Meteorology and Oceanography

Volunteering and Outreach & Writing

Volunteering and Outreach

- Design for a US CLIVAR Program workshop titled "Confronting Earth System Model Trends with Observations: The Good, the Bad, and the Ugly", September 2023.
- Panelist for a Caltech Public Programming event titled "Behind The Book with Gaia Vince – Nomad Century: How Climate Migration Will Reshape Our World", November 2022.
- Design for a US CLIVAR Program workshop titled "The Pattern Effect: Coupling of SST patterns, radiative feedbacks, and climate sensitivity", May 2022.
- Volunteer for "Eliot Arts Magnet Academy Middle School Science, Technology, Engineering, Environment and Health Night", January 2020.
- Volunteer for "Climate Science Workshops for High School Science Teachers: Does a few degrees of global warming matter?", May 2019.
- Panelist for "University of Washington College of the Environment Student Visit Day", August 2017.

Writing

- The Future of Arctic sea ice. Polar Bears International. September 2021.
- Making the esoteric pertinent: a talk with Prof. Inez Fung. Program on Climate Change, University of Washington. March 2017.
- An emerging scientist explores the intersection of climate activism and science. Program on Climate Change, University of Washington. September 2016.

Computer Skills

- Basic Shell-scripting, R
- Intermediate L^AT_EX, Adobe Photoshop & Illustrator, Linux, GitHub
- Advanced MATLAB, Python, Julia, Fortran