

David B. Bonan

Education

- 2021 – now **Ph.D., Environmental Science and Engineering**
California Institute of Technology Pasadena, CA
Advisors: Andrew Thompson & Tapio Schneider
- 2019 – 2021 **M.S., Environmental Science and Engineering**
California Institute of Technology Pasadena, CA
Advisors: Andrew Thompson & Tapio Schneider
- 2015 – 2019 **B.S., Atmospheric Sciences | Minor, Applied Mathematics | College Honors**
University of Washington Seattle, WA
Advisors: Kyle Armour & Gerard Roe

Research Interests

climate dynamics · sea ice · ocean circulation · ocean-atmosphere dynamics · hydrological cycle

Appointments & Experience

- 2022 **Visiting Researcher**
Bjerknes Centre for Climate Research, University of Bergen Bergen, NO
- 2019 – now **Graduate Research Assistant**
Environmental Science and Engineering, California Institute of Technology Pasadena, CA
- 2018 – 2019 **Ernest F. Hollings Scholar**
Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration Princeton, NJ
- 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 – 2018 **Undergraduate Researcher**
Department of Atmospheric Sciences, University of Washington Seattle, WA
- 2016 – 2019 **Assistant**
Program on Climate Change, University of Washington Seattle, WA
- 2016 – 2017 **Illustrator**
American Alpine Club Golden, CO
- 2014 – now **Freelance Artist**
Self Employed Boulder, CO

Honors, Awards, & Fellowships

- 2022 Advanced Climate Dynamics Course Participant in Rondane, Norway
- 2022 CalGFD Student Presentation Award
- 2021 – 2024 National Science Fellowship (NSF) Graduate Research Fellowship
- 2019 – 2020 American Meteorological Society (AMS) Graduate Fellowship
- 2019 – 2020 California Institute of Technology Graduate Fellowship
- 2019 AGU Editors' Highlight: "Sources of uncertainty in the meridional pattern of climate change"
- 2018 Mary Gates Research Scholarship
- 2018 American Meteorological Society (AMS) Senior Named Scholarship
- 2018 American Alpine Club (AAC) Research Grant
- 2017 Mary Gates Research Scholarship

2017 – 2019 NOAA Ernest F. Hollings Scholarship
2015 – 2019 CenturyLink Scholarship
2015 Premier Members Credit Union Scholarship

Publications

Peer-Reviewed

* indicates undergraduate advisee

2023

9. **Bonan, D.B.**, 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. **Bonan, D.B.**, 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. **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** (18), e2021GL094309. doi: 10.1029/2021GL094309
6. **Bonan, D.B.**, 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. Bushuk, M., 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. **Bonan, D.B.** 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. **Bonan, D.B.**, 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. **Bonan, D.B.**, 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. **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** (17), 9131-9140. doi: 10.1029/2018GL079429

Submitted

- Wilson, E.A., **D.B. Bonan**, A.F. Thompson, N. Armstrong, and S.C. Riser: Mechanisms for abrupt summertime circumpolar surface warming in the Southern Ocean. *Journal of Climate*.
- Siler, N., **D.B. Bonan**, and A. Donohoe: Diagnosing mechanisms of hydrologic change under global warming in the CESM1 Large Ensemble. *Journal of Climate*.
- Dörr, J., **D.B. Bonan**, M. Årthun, L. Svendsen, and R.C.J. Wills: Forced and internal components of observed Arctic sea-ice changes. *The Cryosphere*.
- **Bonan, D.B.**, J. Dörr, R.C.J. Wills, A.F. Thompson, and M. Årthun: Sources of low-frequency variability in observed Antarctic sea ice. *The Cryosphere*.
- **Bonan, D.B.**, N. Feldl, M.D. Zelinka, and L.C. Hahn: Contributions to regional precipitation change and its polar-amplified pattern under warming. *Environmental Research: Climate*.

Non-Refereed

Bonan, D.B. (2019): Disaggregating uncertainty in the regional climate response. Undergraduate Honors Thesis. University of Washington.

Teaching, Mentoring, & Advising

Teaching

- Spring 2023 Teaching Assistant, ESE 136: Climate Models, California Institute of Technology (Instr: Tapio Schneider, Lenka Novak)
Fall 2021 Teaching Assistant, ESE 102: Earth's Oceans, California Institute of Technology (Instr: Andrew Thompson)
Fall 2020 Teaching Assistant, ESE 101: Earth's Atmosphere, California Institute of Technology (Instr: Tapio Schneider)

Mentoring

- 2020 – 2021 Mentor, Graduate Student Mentorship Initiative (GSMI) – Científico Latino

Advising

- 2023 – now Sydney Vernon, Undergraduate Student, California Institute of Technology (co-advised with Tapio Schneider)
2022 – 2023 Manali Nayak, Undergraduate Student, Ohio State University (co-advised with Andy Thompson and Emily Newsom)

Service, Leadership, & Synergistic Activities

Service

Peer Reviewer: *Journal of Advances in Modeling Earth Systems*, *Earth's Future*, *The Cryosphere*, *Geophysical Research Letters*, *Journal of Climate*, *Annals of Glaciology*, *Journal of Geophysical Research: Oceans*, *Climate Dynamics*

- 2021 – now Student Representative, American Meteorological Society (AMS) Committee on Polar Meteorology and Oceanography

Volunteering, Outreach, & Writing

Outreach

- Behind The Book with Gaia Vince — Nomad Century: How Climate Migration Will Reshape Our World. Caltech Public Programming, Pasadena, California, November 2022.
- Eliot Arts Magnet Academy Middle School Science, Technology, Engineering, Environment and Health Night, Altadena, California, January 2020.
- Climate Science Workshops for High School Science Teachers: "Does a few degrees of global warming matter?" Seattle, Washington, May 2019.
- University of Washington, College of the Environment Student Visit Day. Seattle, Washington, 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 Fortran, Shell-scripting, R

Intermediate L^AT_EX, Adobe Photoshop & Illustrator, Linux, Julia, GitHub

Advanced MATLAB, Python

Collaborators & Colleagues

J. Kay (CU) · M. Laguë (U of U) · M. Zelinka (LLNL) · L. Hahn (UW) · A. Donohoe (UW) · E. Beer (UCSD) · E. Wilson (Stanford) · L. Zanna (NYU) · J. Dörr (UiB) · M. Årthun (UiB) · M. Holland (NCAR) · S. Sun (Caltech) · I. Eisenman (Scripps) · M. Rugenstein (CSU) · F. Lehner (Cornell) · J. Adkins (Caltech) · E. Newsom (Oxford) · R. Wills (UW) · T. Schneider (Caltech) · A. Thompson (Caltech) · E. Blanchard-Wrigglesworth (UW) · N. Siler (OSU) · N. Feldl (UCSC) · M. Bushuk (GFDL) · M. Winton (GFDL) · G. Roe (UW) · K. Armour (UW) · J. Baldwin (UCI) · D. Battisti (UW) · R. White (UBC) · J. Christian (Georgia Tech) · K. Christianson (UW) · E. Maroon (UW) · M. Bertram (UW) · E. Dawson (Stanford) · D. Frierson (UW)