MC 131-24
1200 E. California Blvd.
Pasadena, CA 91125
(303) 565-7872
dbonan@caltech.edu
www.davebonan.com

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 interactions

Appointments & Experience

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

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

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

Non-Refereed

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

Presentations

Seminars & Colloquia

4. Colorado State University, Large Scale Dynamics Series: Insights into the climate response from a toy model of the ocean-atmosphere system. Fort Collins, CO, September 2021. (*invited*)
3. University of Washington, Ice and Climate Meeting: Explaining and constraining the spread in projections of Arctic sea ice. Virtual, April, 2021. (*invited*)
2. California Institute of Technology, Environmental Science, Engineering, and Society Seminar: Explaining the spread in projections of Arctic sea ice. Virtual, October, 2020.
1. Geophysical Fluid Dynamics Laboratory (GFDL) Seminar: Is there a spring predictability barrier for Arctic sea ice? Princeton, NJ, August 2018.

Conferences & Workshops

12. 2021 American Geophysical Union (AGU) Fall Meeting: Using observations and a simple model to constrain the date of a seasonally ice-free Arctic, Virtual, December 2021.
11. 2021 ArcticNet Annual Scientific Meeting: Explaining and constraining the spread in projections of Arctic sea ice, Virtual, December 2021.
10. 2021 California Geophysical Fluid Dynamics Meeting: A toy model of the coupled ocean-atmosphere system. Virtual, September 2021.
9. 2021 CESM Workshop: Explaining the transient and equilibrium responses of the AMOC to global warming in coupled climate models. Virtual, June 2021.
8. 16th Conference on Polar Meteorology and Oceanography: Transient and equilibrium responses of the ocean's overturning circulation to warming in coupled climate models. Virtual, June 2021.
7. 2021 European Geophysical Union (EGU) General Assembly: Transient and equilibrium responses of the Atlantic meridional overturning circulation to warming in coupled climate models. Virtual, April 2021.
6. 2021 CESM Polar Climate Working Group Meeting: Explaining and constraining the spread in projections of Arctic sea ice. Virtual, February 2021.

5. 2020 American Geophysical Union (AGU) Fall Meeting: The role of internal variability and atmospheric teleconnections in determining Arctic sea ice loss. Virtual, December 2020. (*invited*)
4. 2020 American Geophysical Union (AGU) Fall Meeting: Mechanisms for an AMOC recovery: insights from millennial-length simulations in complex coupled climate models. Virtual, December 2020.
3. US CLIVAR Working Group on Large Ensembles: Partitioning uncertainty in projections of Arctic sea ice. Virtual, October 2020. (*invited*)
2. 2020 Ocean Sciences Meeting (OSM): A spring barrier for regional predictions of summer Arctic sea ice. San Diego, CA, February 2020.
1. 15th Conference on Polar Meteorology and Oceanography: Is there a spring predictability barrier for Arctic sea ice? Boulder, CO, May 2019.

Poster

8. 2021 Cloud Feedback Model Intercomparison Project (CFMIP) Meeting: Energetic constraints on the pattern of changes to the hydrologic cycle under global warming. Virtual, September 2021.
7. 2019 American Geophysical Union (AGU) Fall Meeting: Assessing the robustness and stationarity of a Pacific Ocean teleconnection to Arctic sea ice in global climate models. San Francisco, CA, December 2019.
6. 2019 CESM Polar Modeling Workshop: Uncertainty in the pattern of warming. Boulder, CO, August 2019.
5. 2019 American Meteorological Society (AMS) Annual Meeting: A spring predictability barrier for Arctic sea ice. Phoenix, AZ, January 2019.
4. 2018 American Geophysical Union (AGU) Fall Meeting: The role of radiative feedbacks in driving uncertainty in the meridional pattern of climate change. Washington, D.C., December 2018.
3. University of Washington Program on Climate Change (PCC) Summer Institute: Sources of uncertainty in the meridional pattern of climate change. Friday Harbor, WA, September 2018.
2. University of Washington Program on Climate Change (PCC) Mini-symposium: Sources of uncertainty in the spatial pattern of climate change. Seattle, WA, February 2018.
1. 2017 American Geophysical Union (AGU) Fall Meeting: Dynamical adjustment of Scandinavian glacier mass-balance time series, New Orleans, LA, December 2017.

Workshops

Participant

11. "2021 CESM Workshop". National Center for Atmospheric Research (NCAR). June 14-17, 2021. Virtual.
10. "2021 CESM Polar Climate Working Group Meeting". National Center for Atmospheric Research (NCAR). February 10, 2021. Virtual.
8. "Artificial Intelligence for Earth System Science". National Center for Atmospheric Research (NCAR). June 22-26, 2020. Virtual.
7. "2019 CESM Polar Modeling Workshop". National Center for Atmospheric Research (NCAR). August 12-16, 2019. Boulder, CO, USA.
6. "2019 CESM Tutorial". National Center for Atmospheric Research (NCAR). August 5-9, 2019. Boulder, CO, USA.
5. "Sources of Uncertainty in Long-term Climate Projections". Program on Climate Change (PCC) Summer Institute. September 12-14, 2018. Friday Harbor Labs, WA, USA.
4. "Using Past Observations to Constrain Future Climate Variability and Change". Program on Climate Change (PCC) Workshop. February 8-9, 2018. University of Washington, Seattle, WA, USA.
3. 24th Annual West Antarctic Ice sheet (WAIS) Workshop. October 8-11, 2017. Camp Casey Conference Center, Coupeville, WA, USA.
2. "The Climate of Antarctica and the Southern Ocean". Program on Climate Change (PCC) Summer Institute. September 14-16, 2016. Friday Harbor Labs, WA, USA.
1. "Terrestrial Ecosystems, Land Surface, and Climate Change". Program on Climate Change (PCC) Summer Institute. September 23-25, 2015. Friday Harbor Labs, WA, USA.

Conferences

16. American Geophysical Union (AGU) Fall Meeting. December 13-17, 2021. Virtual.
15. ArcticNet Annual Scientific Meeting. December 6-10, 2021. Virtual.

14. 2021 Cloud Feedback Model Intercomparison Project (CFMIP) Meeting. September 14-16, 2021. Virtual.
13. 2021 California Geophysical Fluid Dynamics Meeting. September 2-3, 2021. Virtual.
12. 16th Conference on Polar Meteorology and Oceanography. June 1-4, 2021. Virtual.
11. European Geophysical Union (EGU) General Assembly. April 19-30, 2021. Virtual.
10. American Geophysical Union (AGU) Fall Meeting. December 7-11, 2020. Virtual.
9. Ocean Sciences Meeting (OSM). February 16-21, 2020. San Diego, CA, USA.
8. American Meteorological Society (AMS) Annual Meeting. January 12-16, 2020. Boston, MA, USA.
7. American Geophysical Union (AGU) Fall Meeting. December 9-13, 2019. San Francisco, CA, USA.
6. 15th Conference on Polar Meteorology and Oceanography. May 19-23, 2019. Boulder, CO, USA.
5. American Meteorological Society (AMS) Annual Meeting. January 6-10, 2019. Phoenix, AZ, USA.
4. American Geophysical Union (AGU) Fall Meeting. December 10-14, 2018. Washington, D.C., USA.
3. American Geophysical Union (AGU) Fall Meeting. December 11-15, 2017. New Orleans, LA, USA.
2. Northwest Glaciologist's Meeting. October 13-14, 2017. Vancouver, BC, Canada.
1. American Meteorological Society (AMS) Annual Meeting. January 22-26, 2017. Seattle, WA, USA.

Teaching, Mentoring, & Advising

Teaching

Fall 2021 Teaching Assistant, ESE 102: Earth's Oceans, California Institute of Technology

Fall 2020 Teaching Assistant, ESE 101: Earth's Atmosphere, California Institute of Technology

Service, Leadership, & Synergistic Activities

Service

Peer Reviewer: *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

Co-Chair, "High Latitude Variability and Change: Arctic Change", 16th Conference on Polar Meteorology and Oceanography

Leadership

2020 – now President and Founder, Caltech Fermentation Club

Synergistic Activities

Volunteering, Outreach, & Writing

Volunteering

Eliot Arts Magnet Academy Middle School Science, Technology, Engineering, Environment and Health Night, January 24, 2020, Altadena, CA, USA.

Climate Science Workshops for High School Science Teachers: "Does a few degrees of global warming matter?" May 18, 2019, Seattle, WA, USA.

University of Washington, College of the Environment Student Visit Day. August 18, 2017, Seattle, WA, USA.

Outreach

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

Writing

09/2021 "The Future of Arctic sea ice". Polar Bears International.

03/2017 "Making the esoteric pertinent: a talk with Inez Fung. Program on Climate Change, University of Washington

09/2016 "An emerging scientist explores the intersection of climate activism and science". Program on Climate Change, University of Washington.

Professional Memberships

2021 – now European Geophysical Union (EGU)

2018 – now International Glaciology Society (IGS)

2017 – now American Geophysical Union (AGU)
2016 – now American Meteorological Society (AMS)

Computer Skills

Basic Fortran, Shell-scripting, R
Intermediate LaTeX, Adobe Photoshop & Illustrator, Linux, Julia, GitHub
Advanced Matlab, Python

Collaborators & Colleagues

D. Notz (MPI) · J. Dörr (UiB) · M. Årthun (UiB) · Z. Shen (Caltech) · Sally Zhang (JPU) · B. Markle (CU) · 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)