

# 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

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## 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

### Submitted

- **Bonan, D.B.**, A.F. Thompson, E.R. Newsom, S. Sun, and M. Rugenstein: Transient and equilibrium responses of the Atlantic overturning circulation to warming in coupled climate models: the role of temperature and salinity.

### Non-Refereed

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

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## Presentations

### Seminars & Colloquia

5. California Institute of Technology, Environmental Science, Engineering, and Society Seminar: From simple to complex: insights into the climate response using a hierarchy of models. Pasadena, CA, December, 2021.
4. Colorado State University, Large Scale Dynamics Series: Insights into the climate response from a conceptual 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

13. 2022 Ocean Sciences Meeting (OSM): Controls on ocean heat uptake in a conceptual model of the coupled ocean-atmosphere system, Honolulu, HI, February 2022.
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 conceptual 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

9. 2022 Ocean Sciences Meeting (OSM) Meeting: Partitioning and constraining uncertainty in projections of Arctic sea ice. Honolulu, HI, February, 2022. (*invited*)
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

17. 2022 Ocean Sciences Meeting (OSM). February 27-29, 2022. Virtual.
16. 2021 American Geophysical Union (AGU) Fall Meeting. December 13-17, 2021. Virtual.
15. 2021 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. 2021 European Geophysical Union (EGU) General Assembly. April 19-30, 2021. Virtual.
10. 2020 American Geophysical Union (AGU) Fall Meeting. December 7-11, 2020. Virtual.
9. 2020 Ocean Sciences Meeting (OSM). February 16-21, 2020. San Diego, CA, USA.
8. 2020 American Meteorological Society (AMS) Annual Meeting. January 12-16, 2020. Boston, MA, USA.
7. 2019 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. 2019 American Meteorological Society (AMS) Annual Meeting. January 6-10, 2019. Phoenix, AZ, USA.
4. 2018 American Geophysical Union (AGU) Fall Meeting. December 10-14, 2018. Washington, D.C., USA.
3. 2017 American Geophysical Union (AGU) Fall Meeting. December 11-15, 2017. New Orleans, LA, USA.
2. 2017 Northwest Glaciologist's Meeting. October 13-14, 2017. Vancouver, BC, Canada.
1. 2017 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: *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  
 Co-convener, The ocean's role in polar climate, 17th Conference on Polar Meteorology and Oceanography  
 Co-chair, High Latitude Variability and Change: Arctic Change, 16th Conference on Polar Meteorology and Oceanography

## 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

- 2020 – now 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.

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## 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)

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## Computer Skills

- Basic Fortran, Shell-scripting, R  
Intermediate L<sup>A</sup>T<sub>E</sub>X, Adobe Photoshop & Illustrator, Linux, Julia, GitHub  
Advanced MATLAB, Python

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## Collaborators & Colleagues

L. Zanna (NYU) · 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)