

## ***Curriculum Vitae for Cecilia M. Bitz***

22 May 2019

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University of Washington  
Seattle, WA 98195-1640

### **Education**

1997	PhD	Atmospheric Sciences	University of Washington
		Dissertation title: A Model Study of Natural Variability in the Arctic Climate	
1990	MS	Physics	University of Washington
1988	BS	Engineering Physics	Oregon State University

### **Professional positions held**

2019 (July) –Present Chair of Department of Atmospheric Sciences, University of Washington

2017–Present Directory Program on Climate Change, University of Washington

2013–Present Professor, Atmospheric Sciences, University of Washington

2012–Present Faculty, Astrobiology Program, University of Washington

2006–Present Adjunct Physicist, Polar Science Center, University of Washington

2009–2013 Associate Professor, Atmospheric Sciences, University of Washington

2005–2009 Assistant Professor, Atmospheric Sciences, University of Washington

2001–2005 Physicist, Polar Science Center, Applied Physics Lab, University of Washington

2000 - 2001 NOAA Climate and Global Change Visiting Scholar, Polar Science Center, Applied Physics Laboratory, University of Washington

1999 Apr.-Dec. Research Associate, Quaternary Research Center, University of Washington

1997 -1999 Research Associate, School of Earth & Ocean Sciences, Univ. of Victoria, Canada.

1993-1997 Research Assistant, Department of Atmospheric Sciences, University of Washington

1988-1993 Research Assistant, Department of Physics, University of Washington

### **Awards and Honors**

Graduate Student Invited Lecture University of Reading May 2019

Frontiers of Science Lecture University of Utah February 2019

American Geophysical Union Fellow 2018

Alfred Wegener Lecture in Climate Science, March 2017

Washington State Academy of Sciences, elected member 2015

American Meteorological Society Fellow 2015

Highly Cited Researchers of 2014 list

Sears Lecture, Woods Hole, GFD and Climate summer school 2014

Francis Bretherton visitor to NCAR 2014

Fulbright Scholar Award to New Zealand 2013-2014

Rosenstiel Award in Atmospheric Science and Oceanography 2013  
American Geophysical Union Ascent Award in Atmospheric Science 2013  
Agassiz Visiting Lecturer, Harvard University 2013  
Community Climate System Model Distinguished Achievement Award 2002  
NOAA Climate and Global Change Fellowship (1999-2001)  
Shell Award, Department of Physics, University of Washington 1990  
Kerrer Award, Department of Physics, University of Washington 1989  
Tau Beta Pi (Engineering) and Sigma Pi Sigma (Physics) Honor Societies, 1986

**Refereed Publications, >100 total, *Graduate Students and Postdocs in italics***

- Wayand, N., C.M. Bitz, and E. Blanchard-Wrigglesworth, 2019: A year-round subseasonal-to-seasonal sea ice prediction portal, *Geophys. Res. Lett.*, 46. Doi:10.1029/2018GL081565.
- Randall, D.A., C.M. Bitz, G. Danabasoglu, S. Denning, P. Gent, A. Gettelman, S. Griffies, P. Lynch, H. Morrison, R. Pincus, and J. Thuburn, 2019: 100 years of Earth System Model development, *Meteorological Monographs*, 0, doi:10.1175/AMSMONOGRAPHS-D-18-0018.1.
- Meehl, G.A., J.M. Arblaster, C.T.Y. Chung, M.M. Holland, A. DuVivier, L. Thompson, D. Yang, and C.M. Bitz, 2019: Sudden recent Antarctic sea ice retreat, connections to the tropics, and upper ocean regime change around Antarctica, *Nature Communications*, 10, Doi:10.1038/s41467-018-07865-9
- Bertram, M., L. Thompson, J. Murray, C. Bretherton, and C.M. Bitz, 2019: Preparing Graduate Students for 21st Century Climate Conversations, *Eos*, 10, Doi:10.1038/s41467-018-07865-9
- Goldenson, N.*, L.R. Leung, C.M. Bitz, and E. Blanchard-Wrigglesworth, 2018: Influence of atmospheric river events on mountain snowpack in the western U.S., *J. Climate*, 31, 9921-9940, Doi:10.1175/JCLI-D-18-0268.1.
- Ordoñez, A.C.*, C.M. Bitz, and E. Blanchard-Wrigglesworth, 2018: Processes controlling Arctic and Antarctic sea ice predictability in the Community Earth System Model, *J. Climate*, 31, 9771-9786. Doi:10.1175/JCLI-D-18-0348.1.
- Stuecker, M.F.*, C.M. Bitz, K.C. Armour, C. Proistosescu, S.M. Kang, S.-P. Xie, D. Kim, S. McGregor, W. Zhang, S. Zhao, W. Cai, Y. Dong, and F.-F. Jin, 2018: Polar amplification dominated by local forcing and feedbacks, *Nature Climate Change*, 8, 1076-1081. Doi:10.1038/s41558-018-0339-y
- Oldenburg, D.*, K.C. Armour, L. Thompson, and C.M. Bitz, 2018: Distinct mechanisms of ocean heat transport into the Arctic under internal variability and climate change, *Geophys. Res. Lett.*, 45, 7692-7700, Doi:10.1029/2018GL078719.
- Proistosescu, C.*, A. Donohoe, K. Armour, G. Roe, M. Stuecker, and C.M. Bitz, 2018: Radiative feedbacks from stochastic variability in surface temperature and radiative imbalance, *Geophys. Res. Lett.* Doi:10.1029/2018GL077678, Highlighted in *Eos*.
- Deitrick, R.*, R. Barnes, C.M. Bitz, D. Fleming, B. Charnay, V. Meadows, C. Wilhelm, J. Armstrong, and T. Quinn, 2018: Exo-Milankovitch Cycles II: Climates of G-dwarf Planets in Dynamically Hot Systems, *Astronomical Journal*, 155. 266, (27pp), Doi:10.3847/1538-3881/aac214.
- Zhang, Y.-F.*, C.M. Bitz, J.L. Anderson, N. Collins, J. Hendricks, T. Hoar, K. Raeder and

- F. Massonnet*, 2018: Insights on sea ice data assimilation from perfect model observing system simulation experiments, *J. Climate*, 31, 5911-5926, Doi:10.11175/JCLI-D-17-0904.1
- Roach, L., C. Horvat, S. Dean, and C.M. Bitz*, 2018: An emergent sea ice floe size distribution in a global coupled ocean-sea ice model, *J. Geophys. Res. Oceans*, 123, 4322-4337 doi:10.1029/2017JC013692.
- Russell, J.L., I. Kamenkovich, C. Bitz, R. Ferrari, S.T. Gille, P.J. Goodman, R. Hallberg, K. Johnson, K. Khazmutdinova, I. Marinov, M. Mazloff, S. Riser, J.L. Sarmiento, K. Speer, L. D. Talley, and R. Wanninkhof*, 2018: Metrics for the Evaluation of the Southern Ocean in Coupled Climate Models and Earth System Models, *J. Geophys. Res. Oceans*, 123, 3120-3143, doi:10.1002/2017JC013461.
- Blanchard-Wrigglesworth, E., M.A. Webster, S.L. Farrell, and C.M. Bitz*, 2018: Reconstruction of Arctic snow on sea ice, *J. Geophys. Res. Oceans*, 123, 3588-3602, Doi:10.1002/2017JC013364.
- Kimmritz, M., F. Counillon, C.M. Bitz, F. Massonnet, I. Bethke, and Y. Gao*, 2018: Optimizing assimilation of sea ice concentration in a fully-coupled Earth system model with a multicategory sea ice model, *Tellus A: Dynamic Meteorology and Oceanography*, 70:1, 1435945, Doi:10.1080/1600870.2018.1435945.
- PoChedley, S., K.C. Armour, C.M. Bitz, and Q. Fu*, 2018: Sources of intermodal spread in the lapse rate and water vapor feedbacks, *J. Clim.*, 31, 3187-3206, Doi:10.1175/JCLI-D-17-0674.1.
- Goldenson, N., G. Mauger, L.R. Leung, C.M. Bitz, and A. Rhines* 2018: Effects of ensemble configuration on estimates of regional climate uncertainties, *Geophys. Res. Lett.* 45, 926-934, Doi:10.1002/2017GL076297.
- Pauling, A.G., I.J. Smith, P.J. Langhorne, and C.M. Bitz*, 2017: Time-dependent freshwater input from ice shelves: Impacts on Antarctic sea ice and the Southern Ocean in an Earth System Model, *Geophys. Res. Lett.* doi:10.1002/2017GL075017
- Singh, H.K.A., C.M. Bitz, A. Donohoe, and P. Rasch*, 2017: A source-receptor perspective on the polar hydrologic cycle: Source regions, seasonality, and Arctic-Antarctic parity in the hydrologic cycle response to CO<sub>2</sub>-doubling, *J. Clim.*, 30, 9,999-10,017. doi:10.1175/JCLI-D-16-0917.1
- Stuecker, M. F., C.M. Bitz, and K.C. Armour*, 2017: Conditions leading to the unprecedented Antarctic sea ice extent during the 2016 austral spring season, *Geophys. Res. Lett.*, doi:10.1002/2017GL074691
- Director, H.M., A.E. Raftery, and C.M. Bitz*, 2017: Improved Sea Ice Forecasting Through Spatiotemporal Bias Correction, *J. Clim.*, 30, 9,493-9,510. doi:10.1175/JCLI-D-17-0185.1.
- Rose, B.E., T.W. Cronin, and C.M. Bitz*, 2017: Ice caps and ice belts: The effects of obliquity on ice-albedo feedback, *Astrophysical Journal*, 846, 17pp. doi:10.3847/1538-4357/aa8306.
- McCusker, K.E., P.J. Kushnir, J.C. Fyfe, M. Sigmond, V.V. Kharin, and C.M. Bitz*, 2017: Remarkable Separability of Circulation Response to Sea Ice Loss and Greenhouse Gas Forcing, *Geophys. Res. Lett.*, doi: 10.1002/2017GL074327.
- Blanchard-Wrigglesworth, E., A. Barthélemy, M. Chevallier, R.I. Cullather, N. Fučkar, F. Massonnet, P Posey, W. Wang, J. Zhang, C. Ardilouze, C.M. Bitz, G.*

- Vernieres, A. Wallcraft, and M. Wang, 2017: Multi-model seasonal forecast of Arctic sea-ice forecast uncertainty at pan-Arctic and regional scales, *Climate Dynamics*, doi:10.1007/s00382-016-3388-9.
- Cheng, W., E. Blanchard-Wrigglesworth, C.M. Bitz, C. Ladd, and P. Stabeno, 2016: Diagnostic sea ice predictability in the pan-Arctic and U.S. Arctic regional seas, *Geophys. Res. Lett.*, 43, 11,688-11,696, doi: 10.1002/2016GL070735.
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- Singh, H.K.A., C.M. Bitz, J. Nusbaumer, and D. C. Noone, 2016: A Mathematical Framework for Analysis of Water Tracers: Part I, Development of Theory and Application to the Preindustrial Mean State, *J. of Advances in Modeling Earth Systems*, 8, 991-1013, doi:10.1002/2016MS000649.
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- Singh, H.K.A., A. Donohoe, C.M. Bitz, J. Nusbaumer and, D. C. Noone, 2016: Greater aerial moisture transport distances with warming amplify interbasin salinity contrasts, *Geophys. Res. Lett.*, 43, 8677-8684, doi:10.1002/2016GL069796.
- Tobin, T., C. M. Bitz, and D. Archer, 2016: Modeling climatic effects of carbon dioxide emissions from Deccan Traps Flood Volcanism around the Cretaceous-Paleogene Boundary, *Palaeogeography, Palaeoclimatology and Palaeoecology*, doi:10.1016/J.PALAEO.2016.05.028.
- Meehl, G.A., J.M. Arblaster, C.M. Bitz, C.T.Y. Chung, and H. Teng, 2016: Recent Antarctic sea ice expansion driven by tropical Pacific decadal climate variability, *Nature Geo.*, 9, doi:10.1038/NGEO2751.
- Singh, H.K.A., C.M. Bitz and D. M. W. Frierson, 2016: Climate response to lowering surface orography of Antarctica and the importance of atmosphere-ocean coupling, *J. Climate*, 29, 4137-4153, doi: 10.1175/JCLI-D-15-0442.1
- Shields, A.L., R. Barnes, E. Agol, B. Charnay, C.M. Bitz, and V. S. Meadows, 2016: The effect of orbital configuration on the possible climates and habitability of Kepler-62f, *Astrobiology*, 16, doi: 10.1089/ast.2015.1353.
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- Mashall, J., *K. Armour*, J. Scott, Y. Kostov, D. Ferreira, T.G. Shepherd, and C.M. Bitz, 2014: The ocean's role in polar climate change: Asymmetric Arctic and Antarctic responses to greenhouse gas and ozone forcing, *Phil. Trans. R. Soc.*, A372: 20130040. <http://dx.doi.org/10.1090/rsta.2013.0040>.
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- Singh, H.A.*, D.S. Battisti, C.M. Bitz, 2014: A heuristic model of Dangaard-Oeschger cycles: Description, results, and brief sensitivity studies: Part 1, *J. Climate*, 27, 4337-4358, doi: 10.1175/JCLI-D-12-00672.1.
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- Shields, A.L.*, V. S. Meadows, C.M. Bitz, R.T. Pierrehumbert, M.M. Joshi, T.D. Robinson, 2013: The effect of host star spectral energy distribution and ice-albedo

- feedback on the climate of extrasolar planets, *Astrobiology*, 13, 715-739  
doi:10.1089/ast.2012.0961.
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- Bitz, C.M., and D.S. Battisti, 1999: Interannual to decadal variability in climate and the glacier mass balance in Washington, Western Canada, and Alaska, *J. Climate*, 12, 3181-3196.
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- Battisti, D.S., C.M. Bitz and R.E. Moritz, 1997: Do general circulation models underestimate the natural variability in the Arctic climate? *J. Climate*, 10, 1909-1920.
- Bitz, C.M., D.S. Battisti, R.E. Moritz and J.A. Beesley, 1996: Low-frequency variability in the Arctic atmosphere, sea ice, and upper-ocean climate system, *J. Climate*, 9, 394-408.

### **Submitted Publications** *Graduate Students and Postdocs in italics*

- Horvat, C.* C.M. Bitz and C. Polashenski, Sea Ice Thinning and Surface Transformation Drive Solar Heating of the Arctic Ocean, in review.
- Stuecker, M.F., A. Timmermann, F.-F. Jin, C. Proistosescu, S.M. Kang, D. Kim, K.-S. Yun, E.-S. Chung, J.-E. Chu, C.M. Bitz, K.C. Armour, and M. Hayashi, Equatorial warming dominated by off-equatorial forcing, in review.
- Barnes, R., R. Luger, R. Deitrick, P. Driscoll, T. Quinn, D. Fleming, H. Smotherman, D. McDonald, C. Wilhelm, R. Garcia, P. Barth, B. Guyer, V. Meadows, C. Bitz, P. Gupta, S. Domagal-Goldman, and J. Armstrong: VPlanet: The Virtual Planet Simulator, submitted to *Publications of the Astronomical Society of the Pacific*. Article reference: PASP-100817, in review.
- Lo, F.* C.M. Bitz, D.S. Battisti, J. Hess, North American allergenic pollen seasonal characteristics: Local, regional and taxon-specific pollen calendars, accepted pending minor revisions.
- Molnár, P., C. M. Bitz, M. M. Holland, J. E. Kay, S. R. Penk, S. C. Amstrup: Fasting season length sets temporal limits for global polar bear persistence, submitted
- Zanowski, H., F.D.W. Christie,* K.C. Armour, C.M. Bitz, and E.J. Steig: West Antarctic Continental Shelf Temperature Variability in High-Resolution Coupled Climate Models, submitted.
- Pauling, A.G.* and C.M. Bitz: Geoengineering by optimally flooding the Arctic sea ice

with seawater reduces future sea ice thinning, in prep.  
*Atwood, A.R., D.S. Battisti, C.M. Bitz, and J.P. Sachs, Response of the tropical Pacific to abrupt climate change 8,200 years ago, in prep.*  
*Newsom, E.R., C.M. Bitz, and A. Thompson, Buoyancy flux constraints on the Global Overturning Circulation, in prep.*

### **Refereed Reports**

NRC Report, Next Generation Earth System Predictions: Strategies for Subseasonal to Seasonal Forecasts, 2016, (Committee Chaired by Raymond Ban) National Academies Press, Washington D.C., 292pp.  
NRC Report, National Security Implications of Climate Change for U.S. Naval Forces, 2011, (Committee Chaired by F. L. Bowman and A. J. Busalacchi), National Security Implications of Climate Change for U.S. Naval Forcing, National Academies Press, Washington, D.C., 172 pp.  
U.S. National Committee for the International Polar Year (Chaired by M. Albert), A vision for the International Polar Year 2007-2008, National Academies Press, Washington, D.C., 96 pp. 2004. C.M. Bitz is lead author of Chapter 3 on Understanding Change in the Polar Regions.  
Intergovernmental Panel on Climate Change, Fifth Assessment Report, Working Group 1, Contributing Author to Chapter 12 "Long-term Climate Change: Projections, Commitments and Irreversibility", 2012. Snow, Water, Ice and Permafrost in the Arctic 2011, Contributing Author to Chapter 9 "Sea Ice", 2011.  
Intergovernmental Panel on Climate Change, Fourth Assessment Report, Working Group 1, Contributing Author to Chapter 10 "Global Climate Projections", 2007.  
Intergovernmental Panel on Climate Change, Third Assessment Report, Working Group 1, Contributing Author to Chapter 8 "Model Evaluation", 2001.

### **Non-Refereed Publications**

AMS Information Statement on Climate Change, 2018, by J. Kinter, S. Nigam, C. Bitz, K. Cobb, T. Delsole, C. Deser, A. Kiefer, J.-F. Lamarque, D. Nolan, B. Stevens, and R. Zhang.  
Bitz, C., Hot Times in the Arctic, New York Times Opinion Section, 14 March 2018.  
Notz, D. and C. M. Bitz, 2017: Sea ice in Earth System Models, Chapter 12 in Sea Ice, Third Edition, ed. David Thomas, John Wiley & Sons, Ltd.  
Day, J.J., G. Svensson, I.M. Brooks, C. Bitz, L. Broman, G. Carver, M. Chevallier, H. Goessling, K. Hartung, T. Jung, J.E. Kay, E.W. Kolstad, D. Perovich, J. Screen, S. Siemen, and F. Vana, 2017: "The Abisko Polar Prediction School", Bull. Amer. Meteor. Soc. 98, p. 445-447, Doi:10.1175/BAMS-D-16-0119.1  
Armour, K.C. and Bitz, C.M., 2015: "Observed and projected trends in Antarctic sea ice", CLIVAR Variations Newsletter, Eds. Igor Kamenkovich, Joellen Russell, and Kristan Uhlenbrock, Fall Edition. P 12-19.  
Jung, T., F. Doblas-Reyes, H. Goessling, V. Guemas, C. Bitz, C. Buontemp, R. Caballero, E. Jakobsen, J. Jungclaus, M. Karcher, J. Overland, and S. Yang, Meeting summary: Polar-Low latitude linkages and their role in weather and climate prediction, 2015: Bull. Amer. Meteor. Soc. 96, p. ES197-ES200, Doi:10.1175/BAMS-D-15-00121.1

- Bitz, C.M. and J. Stroeve, 2014: "Sea Ice Predictability", CLIVAR Variations Newsletter, Eds. Judah Cohen and Kristan Uhlenbrock, Summer Edition. P 24-26.
- Golden, K. M., E. Hunke, C. Bitz, and M. Holland, 2008: "Sea ice in the Global Climate System", Essay for Mathematics Awareness Month, <http://www.mathaware.org/mam/09/essays.html>, 8 pp.
- Hutchings, J. and C. Bitz, 2005: "Sea ice mass budget of the Arctic (SIMBA) workshop: Bridging regional to global scales", report from NSF sponsored workshop held at Applied Physics Laboratory, Univ. of Washington, Seattle, WA, Feb 28-Mar 2, 2005.
- Briegleb, B.P., E.C. Hunke, C.M. Bitz, W.H. Lipscomb, M.M. Holland, J.L. Schramm, R.E. Moritz 2004: The sea ice simulation of the Community Climate System Model, version 2. Nat. Center for Atm. Res. Tech Rep no. NCAR-TN-455, Boulder, CO, 34pp.
- Collins, W.D., P.J. Rasch, B.A. Boville, J.J. Hack, J.R. McCaa, D.L. Williamson, J.T. Kiehl, B.P. Briegleb, C.M. Bitz, S.-J. Lin, M. Zhang, Y. Dai 2004, Description of the NCAR Community Atmosphere Model (CAM3). NCAR/TN-464+STR. pp. 226. <http://www.cesm.ucar.edu/models/atm-cam/docs/description/>
- Briegleb, B.P., C.M. Bitz, E.C. Hunke, W.H. Lipscomb, M.M. Holland J.L. Schramm, and R.E. Moritz 2004: Scientific Description of the Sea Ice Component in the Community Climate System Model Version Three. NCAR/TN-463+STR. pp. 70. <http://www.cesm.ucar.edu/models/ccsm2.0/csim/>
- Collins, W.D. J.J. Hack, B.A. Boville, P.J. Rasch, D.L. Williamson, J.T. Kiehl, B.P. Briegleb, J.R. McCaa, C.M. Bitz, S.-J. Lin, R.B. Rood, M. Zhang, Y. Dai 2003, Description of the NCAR Community Atmosphere Model (CAM2). pp. 189. <http://www.cesm.ucar.edu/models/atm-cam/docs/cam2.0/description/index.html>
- Briegleb, B.P., C.M. Bitz, E.C. Hunke, W.H. Lipscomb, and J.L. Schramm, 2002: Description of the Community Climate System Model Version 2 Sea Ice Model (CSIM4). pp. 60. <http://www.cesm.ucar.edu/models/ccsm2.0/csim/>
- Bitz, C.M. 2001: The relation among sea ice, surface temperature, and atmospheric circulation in simulations of future climate. Proc. International Symposium, Arctic Feedbacks to Global Change, 25--27 Oct, 2001, Rovaniemi, Finland, Arctic Centre, 20--24.
- Bitz, C.M., J.C. Fyfe, G.M. Flato, and R.E. Moritz, 2001: Sea ice response to wind forcing from AMIP models. Proc. 6th Conference on Polar Meteorology and oceanography, 14-18 May, 2001, San Diego, CA, American Meteorological Society, J5-8.
- Moritz, R.E., C.M. Bitz, and A. Rivers, 2001: Simulating Arctic ocean-atmosphere-ice interactions with a single column model version of the community climate system model. Proc. 6th Conference on Polar Meteorology and oceanography, 14-18 May, 2001, San Diego, CA, American Meteorological Society, J27-32.
- Weatherly, J.W., C.M. Bitz, and E.C. Hunke, 2001: Parallel climate model simulations with a dynamic-thermodynamic ice thickness distribution model. Proc. 6th Conference on Polar Meteorology and oceanography, 14-18 May, 2001, San Diego, CA, American Meteorological Society, 215-218.
- McPhee, M.G., G.A. Maykut, C.M. Bitz, and R.E. Moritz, 2001: Early summer heating of the upper ocean in the vicinity of SHEBA. Proc. 6th Conference on Polar

Meteorology and oceanography, 14-18 May, San Diego, CA, American Meteorological Society, 260-262.  
Weatherly, J.W. and C.M. Bitz, 2001: Natural and anthropogenic climate variations in the Arctic, Proc. 11th Symposium on Global Change Studies, 15-19 Jan 2001, Albuquerque NM, American Meteorological Society, 309-312.

### **Professional Distinctions and Memberships**

International Science Panel to the New Zealand Antarctic Science Platform, member since 2018.

Community Modeling Committee (CMC) independent ad hoc review committee chartered by NOAA, member since June 2018.

National Science Foundation Portfolio Committee on the Arctic Division of Polar Programs, since March 2018

Committee to write the American Meteorological Society Information Statement on Climate Change, since Sep. 2017.

National Research Council, Board on Atmospheric Sciences, since Sep. 2016

President's Advisory Council on University Relations to UCAR (PACUR), 2013 - 2016

UW representative to UCAR, since Oct 2013

Co-lead of the WCRP Polar Climate Predictability Initiative, 2013-2017.

Co-lead of the Sea Ice Prediction Network and organizer of the Sea Ice Outlook, 2013-2017.

National Research Council committee on "Developing a U.S. Research Agenda to Advance Subseasonal to Seasonal Forecasting", July 2014 to March 2016.

Advisory Committee for the National Science Foundation Geosciences Directorate and Polar Division Subcommittee Chair, 2013-2014.

Advisory Committee for the National Science Foundation Office of Polar Programs, 2010-2013. Committee Chair Aug 2011 to May 2013.

Community Earth System Model, Advisory Board (2007-2014), Scientific Steering Committee (2002-2005) and member of Polar Climate Working Group since 1996.

National Academy of Sciences – Committee on "Linkages between Arctic Warming and Mid-Latitude Weather Patterns: A Workshop" since April 2013

Blue-ribbon panel to evaluate the CAREER program of the National Science Foundation, 2012.

National Research Council workshop on "Sea Ice Prediction", Panel member, May 2012

Partnership for Enhanced Engagements in Research, Oversight Committee, National Academy of Science, since Nov. 2011.

National Academy of Sciences – Committee to plan U.S.-Indo Kavli Frontiers of Science April 2011.

National Research Council workshop on "A National Strategy for Advancing Climate Modeling" attendee, April 2011.

CLIVAR Southern Ocean Panel member, since Dec. 2011.

CLIVAR Greenland Panel member, since Dec. 2010.

Senior Scientists Team for NSF Sea-Level Planning Workshop, 2010.

Scientific Organizing Committee for the WCRP Polar Predictability Workshop, 2010.

National Research Council – Committee on National Security Implications of Climate Change on U.S. Naval Forces, 2009-2011, resulting in report.

Organizing Committee for NSF workshop on “Lessons from the 2007 Arctic sea-ice minimum”, Mar. 2008.

CLIVAR Polar Fluxes Panel member, 2008-2010.

National Research Council – Climate Research Committee, 2007–2010.

UCAR Steering Committee for the NOAA Climate and Global Change Postdoctoral Fellowship Program, 2007-2010.

Planning Committee for WCRP “World Modelling Summit for Climate Prediction” 2007– 2008.

Organized session on Sea-Ice Modeling at the Ocean Climate Modeling Meeting at GFDL Oct 2009.

DOE Committee on “Biological cycling of carbon in ocean environments”, 2008.

Sea Ice Outlook Core Integration Group, 2008-2009.

Book editor for AGU Monograph published in 2008 “Arctic Sea Ice Decline: observations, projections, mechanisms, and implications”.

Session convener for Fall 2006 AGU session on “Rapid Transition From Perennial to Seasonal Arctic Sea Ice”

National Research Council planning meeting on “Changing ice conditions in the Arctic - -- Implications and opportunities”, Nov. 2006.

National Research Council – U.S. Planning Committee for the International Polar Year, (2004-2005). Resulting in report.

CLIVAR Atlantic-Sector Implementation Panel member, 2003-2005.

National Snow and Ice Data Center advisory group. (2001-2002).

American Meteorological Society, Polar Meteorology and Oceanography committee. (2001-2003).

### **Invited Lectures**

“Squaring Climate Change at the Poles”, Frontiers of Science Lecture, University of Utah, February 2019.

“Arctic Amplification: Local Versus Remote Causes and Consequences”, Department Seminar, University of Utah, February 2019.

“The effect of ENSO on Arctic Sea Ice and Its Prediction”, AGU Fall December 2018.

“Coupled Wave-Ice Interactions in the Marginal Ice Zone in Simulations with a Floe-Size Distribution”, AGU Fall December 2018.

“Climate Change in the Pacific Northwest: How would Limiting Warming to 1.5 Degrees Compare to Current Global Commitments?” UW Whole U Lecture, December 2018.

“Simulating sea ice-surface wave interactions in the changing marginal ice zones”, Caltech, Nov 2018.

“Drivers of Southern Ocean climate change in recent decades”, UCLA, October 2018.

“My experience writing an opinion piece for the New York Times”, Interagency Arctic Research Policy Committee webinar, June 2018.

“Feedback in the marginal ice zone from wave-ice interactions”, Arctic System Change Workshop, National Center for Atmospheric Research, April 2018.

“The unprecedented Antarctic sea ice extent during the 2016 austral spring season”, Geophysical Fluid Dynamics Laboratory, March 2018.

“Conditions leading to the unprecedented Antarctic sea ice extent during the 2016 austral

- spring season”, University of Otago, Dept. of Physics, February 2018.
- “Butterflies, Frogs, and Polar Bears: The First Decade of Seasonal Sea Ice Prediction”, NASA Global Modeling and Assimilation Office, November 2017.
- “Cool Opportunities with Sea Ice Data Assimilation”, University College London seminar, October 2017.
- “What sea ice physics is missing from climate models?”, Isaac Newton Institute, Cambridge University, September 2017.
- “Polar amplification processes and feedbacks in response to individual climate forcings”, Aspen Global Change Institute Polar Amplification Workshop, June 2017.
- “Why did Antarctic sea ice plummet in late 2016? April 2017. Southern Ocean Workshop, National Center for Atmospheric Research, April 2018.
- “Butterflies, Frogs, and Polar Bears: The First Decade of Seasonal Sea Ice Prediction”, Massachusetts Institute of Technology, Earth Atmosphere and Planetary Science Lecture, March 2017.
- “Butterflies, Frogs, and Polar Bears: The First Decade of Seasonal Sea Ice Prediction”, California Institute of Technology, Division of Geological and Planetary Sciences Seminar, March 2017.
- “A Decade of Sea Ice Prediction”, Alfred Wegener Lecture in Climate Science, March 2017.
- “Which observations are most important for characterizing Arctic sea ice?” AMS, January 2017.
- “Expanding Antarctic sea ice: Anthropogenic or natural variability”, AGU Fall, December 2016.
- “Which observations are most important for characterizing Arctic sea ice?” AGU Fall, December 2016.
- “Tracking the Aerial Hydrologic Cycle Through Climate Change and Variability”, ATOC Distinguished Lecture at University of Colorado, September 2016.
- “The Hydroclimate of Westerly Wind Enhancement”, at Response of Global Climate to the Antarctic Ozone Hole Symposium, June 2016.
- “A Decade of Sea Ice Prediction”, University of Oklahoma, March 2016.
- “Sources of Seasonal Sea Ice Predictability”, NOAA Next Generation GPS Sea Ice Model Workshop, Boulder, CO, February 2016.
- “Understanding Antarctic Climate Change: How Are We Led and Misled by Models”, Workshop on Antarctic Sea Ice held by the National Research Council, Boulder, CO, January 2016.
- “Modeling the Future of Sea Ice in the Polar Oceans”, at “The Polar Oceans and Global Climate Change” American Polar Society 80<sup>th</sup> Anniversary Meeting and Symposium, La Jolla, November 2015
- “The Big Picture: A Climate Scientists View on the State of the Planet and Where We May Be Heading”, Wildlife Society Conference, Winnipeg, CA, November, 2015.
- “Sea Ice Process Controls on Abyssal Southern Ocean Heat Uptake”, Conference on the Mathematics of Sea Ice, Simon Fraser University, Vancouver, CA, September, 2015
- “Arctic Sea Ice Prediction: Challenges and Opportunities”, 6th Symposium on the Impacts of an Ice-Diminished Arctic on Naval and Maritime Operations, National Ice Center and U.S. Arctic Research Commission, Washington DC, July 2015

“Can Ice Shelf Melt Prevent Polar Amplification in the Antarctic?” University of Reading, Apr. 2015

“Ocean Sea Ice and Climate”, Ocean Leadership Public Policy Forum, Mar 2015

“Future of Arctic and Antarctic Sea Ice”, WHOI Annual Sear’s Public Lecture, Aug. 2014

“The Coolest Part of the Ocean”, WHOI GFD Summer School Lecture, Aug. 2014

“Polar climate response to tropical SST trends from 1980-2012 in a fully coupled climate model”, Connecting the polar regions to the tropics in a Lamont mini-conference, Jun 2014

“Polar Amplification in the 21<sup>st</sup> Century”, Royal Society, London, Dec. 2014

“Tinkering with AGCMs to investigate atmospheric behavior, AGU Fall 2014

“Antarctic Sea Ice Expansion and The Consequences of Missing Processes in Global Climate Models”, AGU Fall Meeting, San Francisco, Dec, 2014.

“Where is the Polar Amplification?” 2014 New Zealand Sea Ice Symposium, Keynote Lecture, Feb, 2014

“The Latest IPCC Report: A Climate Scientists Summary”, Climate and Energy Seminar, Dunedin, NZ, Feb, 2014.

“Fast and slow response of sea ice and the Southern Ocean to ozone depletion” SPARC general assembly, Queenstown, NZ, Jan, 2014.

“Why is the Antarctic sea ice expanding while the Arctic sea ice is retreating rapidly?”, AGU Fall Meeting, San Francisco, Dec, 2013.

“Fast and slow response of sea ice and the Southern Ocean to ozone depletion” International Glaciological Society, local chapter, Dunedin, NZ, Oct, 2013.

“Polar Amplification: Mechanisms and Consequences” at Columbia University, Oct 2013

“Sea ice loss, consequences for Arctic warming and ecosystems, Arctic Circle Conference, Reykjavik, Oct, 2013

“Polar Amplification” at White Arctic, Blue Arctic, Exploring Sea Ice Restoration Workshop held at Columbia University, Apr 24, 2013.

“Why is Antarctic sea ice expanding while the Arctic sea ice is retreating rapidly?”, University of Miami, Rosenstiel School, Rosenstiel Award Lecture, Apr. 23, 2013.

“Why is Antarctic sea ice expanding while the Arctic sea ice is retreating rapidly?”, Harvard University, Agassiz Lecture, Earth and Planetary Sciences Colloquium, Apr. 15, 2013.

“Why is Antarctic sea ice expanding while the Arctic sea ice is retreating rapidly?”, University of Wisconsin, Madison, Atmosphere and Ocean Sciences Colloquium, Mar 18, 2013.

“Predictability of Arctic Sea Ice”, ECMWF Seminar on Seasonal prediction: science and applications, Reading, England, Sep. 6 2012

“Predictability of Arctic Sea Ice”, Keynote lecture for the Bjerknes Center Tenth Anniversary Celebration, Bergen, Norway, Sep 3, 2012.

“Antarctic Climate Change Caused by Ozone Depletion in a Fine Resolution Ocean Climate Model”, Keynote lecture for the Conference of the Southern Committee on Antarctic Research, Portland, OR, Jul. 16, 2012.

“Predictability of Arctic Sea Ice”, WCRP Open Science Meeting, Denver, CO. Nov. 2011.

Southern Ocean CLIVAR Committee Workshop “Southern Hemisphere Sea Ice and Climate Change”, Nov. 2011.

Program on Climate Change Summer Institute, "Arctic Precipitation and Its Climatic and Ecological Impacts", Friday Harbor, WA, Sep 2011.

National Academy of Science Kavli Frontiers in Science Symposium, Apr, 2011.  
"Climate Response to Ozone Trends in an Eddy Resolving Ocean Climate Model" (poster presentation)

American Geophysical Union, "Can stratospheric sulfate aerosols prevent cryospheric change and sea level rise in the 21st?", Dec. 2010.

American Geophysical Union, "Sea ice-ocean interactions and their effect on mixing at very high resolution in a fully coupled climate model", Dec. 2010.

New York University Courant Institute Atmosphere Ocean Science Colloquium,  
"Seasonal to Interannual Predictability of Arctic Climate", New York, Nov, 2010.

WCRP Polar Predictability Workshop "How Early Can We Predict the Sea Ice Summer Minimum?", Bergen, Norway, Oct, 2010.

IARC-CLiC Sea Ice Workshop, "Arctic Sea Ice Projections in CCSM4", Fairbanks, Oct, 2010.

Program on Climate Change Summer Institute, "Sea Ice is Everything", Friday Harbor, WA, Sep 2010.

Institute for Pure and Applied Mathematics, "Age of Sea Ice as Tool to Understand Persistence and Sensitivity", UCLA campus, Los Angeles, Mar, 2010.

UW Civil and Environmental Engineering seminar "The Survival of Arctic Sea Ice", Mar. 2010.

AAAS Symposium on Sea Ice, "Bringing sea ice microphysics and biogeochemistry into global climate models", Feb. 2010.

Presentation to the WCRP Climate and Cryosphere Science Steering Committee "Sea Ice Modeling Present and Future", Valdivia, Chile, Feb 2010.

National Academy of Science Kavli Frontiers in Science Symposium, Speaker  
"Geoengineering: Saving the world, one entire planet at a time", Nov, 2009.

NRC Committee on National Security Implications of Climate Change on U.S. Naval Forces, "State-of-the-Science for Arctic Sea Ice Projections", Oct. 2009

University of Toronto "Is the Sea Ice Coming Back?", Oct. 2009.

Gordon Conference on Radiation and Climate, "The survival of Arctic summer sea ice in the 21st century", Jul. 2009.

Oak Ridge National Laboratory, National Center for Computational Sciences, "The survival of Arctic summer sea ice", Mar., 2009.

Los Alamos National Laboratory, Earth and Environmental Sciences, "The survival of Arctic summer sea ice", Feb., 2009.

National Science Foundation, "The survival of Arctic summer sea ice", Jan., 2009.

Massachusetts Institute of Technology, Department of Earth, Atmosphere, and Planetary Science, "The survival of Arctic summer sea ice: An investigation with simple and complex models", Dec., 2008.

American Geophysical Union, "Future projections of rapid arctic sea ice decline", Dec. 2008.

California Institute of Technology, Environmental Science and Engineering, "Predicting Arctic Ice-Climate Interactions", Oct. 2008.

University of California, Berkeley Atmospheric Sciences Center, "Predicting Arctic Ice-Climate Interactions", Oct. 2008.

Program on Climate Change Summer Institute, "The Coolest Part of the Ocean", Friday Harbor, WA, Sep 2008.

Pacific Marine Environmental Lab, Seattle, Feb. 2008, "Predicting Arctic Sea Ice Retreat".

University of Arizona, Tucson, Feb. 2008. "Predicting Arctic Sea Ice Retreat".

University of California, Los Angeles, Atmospheric and Oceanic Sciences Jan. 2008. "Predicting Arctic Sea Ice Retreat".

National Academy of Science Climate Research Committee Forum on Extreme Events in a Changing Climate, Nov. 2007.

University of Toronto, Physics Department Colloquium, Oct. 2007. "Predicting Arctic Sea Ice Retreat".

University of Washington, Program on Climate Change seminar, Nov. 2007, "Abrupt Climate Change: Basic State Dependence, Meridional Heat Transport, and Teleconnections".

University of Michigan, Department of Geological Science's colloquium (Smith Lecture), Nov. 2007. "Future thermohaline collapse unlike the past".

American Meteorological Society and Canadian Meteorological and Oceanographic Society joint meeting, May 2007. "Sea Ice and the Present Polar Warming Asymmetry".

Mathematical Sciences Institute on Climate Change, Berkeley, Apr. 2007. "Sea ice cover in a changing climate".

Atlantic Science Week, hosted by the Norwegian Embassy and the Carnegie Institute, Washington, DC. Oct 2006. "Understanding sea ice change in nature and climate models".

University of Wisconsin, Atmospheric Sciences Colloquium, Apr. 2006. "Predicting Sea Ice-Climate Interactions"

University of Washington, Applied Math Colloquium, Jan 2006. "Sea Ice Cover in a Changing Climate"

Lamont Doherty Colloquium, Nov 2005. "The influence of sea ice on ocean heat uptake in response to increasing CO<sub>2</sub>"

National Academy of Science Frontiers in Science Symposium, Nov 2005. "Transient Polar Amplification in Climate Observations and Simulations" (poster presentation)

Institut d'Astronomie et de Géophysique G. Lemaître, Université Catholique de Louvain, Visiting Professor, Apr. 2005. "Sea ice and Climate" and "Increased Heat Transport into the Arctic Ocean in a Climate Model of the 21st Century"

American Geophysical Union, San Francisco, Dec. 2004 "Increased Heat Transport into the Arctic Ocean in a Climate Model of the 21st Century"

European Geophysical Union, Nice, Fr, Apr. 2004 "A Mechanism for the High Rate of Sea-Ice Thinning in the Arctic Ocean"

GFDL, Princeton, Jan., 2004. "A Mechanism for the High Rate of Sea-Ice Thinning in the Arctic Ocean"

Final ACSYS Conference, St Petersburg, Russia, Nov. 2003. "Modeling the Arctic climate with global coupled models"

Search Open Science Meeting, Seattle, Oct. 2003. "Atmospheric heat transport and surface feedbacks in the Arctic climate system"

Oregon State University, Physical Oceanography Seminar, Mar. 2003. "The maintenance

of sea ice extent in the climate system"

University of Alaska, Fairbanks, Chapman Lecturer, Feb. 2003. ``Sea ice in climate models - Basic structure" and ``Sea ice in climate models - Survey of different models in use"

Massachusetts Institute of Technology, Physical Oceanography Seminar, Feb. 2003. ``The maintenance of sea ice extent in the climate system"

University of Washington, Department of Atmospheric Sciences Colloquium, Oct. 2002. ``A Physical Explanation for the High Rate of Sea-Ice Thinning in the Arctic Ocean"

Community Climate System Model Annual Meeting, plenary session, Breckenridge, CO, Jun. 2002. ``Sea Ice, Climate Sensitivity, and Polar Amplification"

University of Chicago, Department of the Geophysical Sciences Colloquium, May 2002. ``Do We Understand the Role of Sea Ice in Modern Climate?"

Modeling of the Arctic Atmosphere Workshop, Madison, WI, May 2002. ``Towards Improving the Wintertime Arctic Atmospheric Circulation Simulated by GCMs with High Resolution"

European Geophysical Society, Nice, Fr, Apr. 2002. ``A Physical Explanation for the High Rate of Sea-Ice Thinning in the Arctic Ocean"

Workshop on Sea- Ice Extent and the Global Climate System, Toulouse, Fr, Apr. 2002. ``Are Modern Sea-Ice Models Adequate for Studying Climate?"

International Symposium, Arctic Feedbacks to Global Change, Rovaniemi, Finland, Oct. 2001. ``The relation among sea ice, surface temperature, and atmospheric circulation in simulations of future climate"

Gordon Conference on Polar Marine Sciences, Mar. 2001. ``Modeling Natural and Anthropogenic Arctic Climate Variations"

## Teaching

Courses taught at University of Washington

Fundamentals of Physics and Chemistry of the Atmosphere ATMS 501, Fall 2011, 2014, 2015, 2016, 2017

Climate Modeling ATMS/ESS/OCEAN 559, Spring 2008, 2010, 2012, 2015, 2017

Weather and Climate Prediction ATMS 380, Winter 2011, 2013

Ice and Climate ATMS 514/ESS 535, Spring 2009, 2011, 2013

Climate Dynamics Seminar on Kuril Island Biocomplexity ATMS 524, Spring 2006

Ice and Climate Modeling ATMS 514, Winter 2001

Atmospheric Motions I ATMS 441/503, Fall 2005, 2006, 2007, 2008, 2009, and 2011

Atmospheric Motions II ATMS 442/504, Winter 2015, 2016, 2017

Climate and Climate Change ATMS 211, Fall 2004 and Winter 2006

Global Warming: Understanding the Science ATMS 111, Summer 2008, Winter 2010 and 2012

Teaching External to UW (e.g., Summer Schools)

Week-long session at the Institute for Applied Math at UCLA for Women in Math and Public Policy.

Advanced Climate Dynamics Course on hemispheric asymmetries, Finse Norway, Sep. 2018.

CESM Polar Climate Tutorial, Aug. 2018.  
Abisko Polar Prediction School, Apr. 2016.  
Woods Hole GFD and Climate Summer School, Aug. 2014.  
Air-Ice-Sea Interaction II, The Univ. Center in Svalbard, Norway. Sep 2012.  
Advanced Climate Dynamics Course on Arctic-North Atlantic Interactions, Bergen, Norway, Jun 2009.  
Arctic Climate Modeling University of Alaska, Fairbanks, AK. Jun 2008.  
Sea Ice: The International Polar Year, University Centre, Svalbard, Norway, Jul 2007.  
Advanced Climate Dynamics Course on Climate Variability, Finse, Norway, Sep 2006.  
The Art of Climate Modeling, NCAR Advanced Study Prog. Boulder, CO, Jun 2006.  
Arctic Climate Modeling University of Alaska, Fairbanks, AK. Jul 2003.

Student supervisory as chair or co-chair of committees:

Clark Kirkman, PhD Dec. 2011, now employed in industry  
Kyle Armour, PhD Jun. 2012, now Assistant Prof. at UW  
Paul Hezel, PhD Aug. 2012, now Postdoc at Univ of Hamburg  
Eduardo Blanchard-Wrigglesworth, PhD Aug. 2013, now Research Prof. at UW  
Kelly McCusker, PhD Aug. 2013, now Climate Scientist at Rhodium Group  
Hansi Singh, PhD Aug. 2015, now Assistant Prof. at University of Victoria  
Naomi Goldenson, PhD Dec. 2017, now Postdoc at UCLA  
Emily Newsom, PhD Dec. 2016, now Postdoc at CalTech  
Brandon Ray, MS Jun. 2016, now graduate student in science policy  
Judy Twedt, MS Jun. 2016, now graduate student in iPhD program  
Ana Ordoñez, MS Jun. 2016, now working as scientists in industry  
Robin Clancy, graduate advisor since 2016  
Andrew Pauling, graduate advisor since 2017

Student supervisory as committee member:

Camille Li, graduated with Ph.D. 2007  
Kevin Rennert, graduated with Ph.D. 2007  
Rebecca Zanzig, graduated with MS 2007  
Ryan Eastman, graduated with MS 2009  
Yen-Ting Hwang, graduated with Ph.D. 2013.  
Elizabeth Maroon, graduated with Ph.D. 2016  
Spruce Schoenemann, graduated with PhD 2014  
Tom Tobin, graduated with PhD 2014  
Stephen PoChedley, graduated with PhD 2016  
Aomawa Shields, graduated with PhD 2014  
Adam Cambell, graduated with PhD 2015  
Brad Markle, graduated with PhD 2017  
Tsubasa Kohyama, graduated with PhD 2017  
Russell Dietrick, graduated with PhD 2017  
Marysa Laguë, current student  
Katie Brennan, current student  
Andre Perkins, current student

Andrew Geist, current student  
Hannah Director, current student  
Andrew Lincowski, current student  
Lucas Zeppetello, current student  
Dylan Oldenburg, current student  
Brittany Dygert, current student

Graduate School Representative on PhD committees:

Shannon McDaniel, graduated 2005  
Steve Price, graduated 2006  
Mathieu Fegeau, graduated 2007  
Lori Kroenig, graduated 2008  
Merriwether Wilson, graduated 2010  
Amy Nicholson graduated 2011  
Jessica Drees, graduated 2012  
Sarah Perkey, graduated 2015  
Katie Boldt, graduated 2015  
Kristin Poinar, graduated 2016  
Laura Kehrl, graduated 2018  
Paige Logan, current student  
Earle Wilson, current student  
Max Showalter, current student  
Sarah Dewey, current student  
Diana Gergel, current student  
Taryn Black, current student  
Megan Feddern, current student

Undergraduate advising:

Marta Krynytzky undergraduate student working on Arctic climate assessment for IPCC AR4 Fall 2004 - Summer 2005.  
Xiyuez Zhang undergraduate student working on Arctic climate assessment for IPCC AR5 Summer 2011 -- Winter 2012. Now graduate student at Cal Tech.  
David Yun undergraduate student working on Antarctic climate and modeling exoplanets

Postdoctoral supervisory:

Nicholas Wayand, Feb 2018 to present  
Malte Stuecker, Nov 2016 to May 2018  
Yongfei Zhang, Nov 2015 to present  
Kelly McCusker, Nov 2016 to Sep 2017, now at Rhodium Group  
Hansi Singh, Sep-Dec 2015, now at University of Victoria  
Eduardo Blanchard-Wrigglesworth Sep 2013 to Mar 2017, now Research Prof at UW  
Qiong Yang Dec 2013 – Feb 2014, now at PMEL, NOAA.  
Martin Vancoppenolle Oct. 2009 - Aug. 2010, now at CNRS, Paris

Wei Cheng, Sep 2005 to Jun 2006, now at PMEL, NOAA  
Susan Bates, Jan 2007 to Apr 2009, now at NCAR  
Kevin Rennert, Jan-Dec 2008, now congressional staff

### **National Service**

Associate editor for Journal of Advances in Modeling Earth Systems, 2018.  
Briefed the Commandant of the U.S. Coast Guard, Admiral Paul Zukunft on Arctic climate change, Jun 2016.  
Testified to the U.S. Senate Energy and Natural Resources Committee Hearing to Evaluate Opportunities for the United States to Build on Its Status as an Arctic Nation for the Betterment of the Nation and Those Who Live in the Arctic, Mar 2015.  
Congressional brief on Arctic Sea Ice Loss, organized by the American Geophysics Building, House Office Building, Washington, DC, 20 March 2013.  
Associate editor for Annals of Glaciology Volume 46, 2006.  
Associate editor for Journal of Climate 2004-2011.  
Reviewed Climate Change Science Program reports on Abrupt Climate Change and Paleoclimate History of the Arctic, 2007 and 2008.  
Developed and distribute easy-to-use MATLAB version of my energy-conserving sea ice model for research and teaching, since 2007.  
Reviewed Uncertainty in Climate Model Projections of Arctic Sea. A USGS report used for the endangered species decision for the polar bear, 2007.  
Ice Decline: An Evaluation Relevant to Polar Bears. A USGS report used for the endangered species decision for the polar bear, 2007.  
Regular reviewer for NSF, Journal of Climate, Geophysical Research Letters, Nature, Journal of Geophysical Research, and Climate Dynamics.

### **University Service**

Program on Climate Change Director, since 2017.  
Center for Health and the Global Environment (CHanGE) Advisory Board, since 2017.  
Organized the Summer Institute for the Program on Climate Change in Sep 2016.  
Joint Institute for the Study of Atmosphere and Ocean (JISAO) Advisory Board, since 2016.  
College of the Environment College Council, 2015-2017.  
College of the Environment Curriculum Committee, 2014-2015.  
College of the Environment Scholarship Committee, 2012-2014.  
Future of Ice Initiative Working Group and Advisory Board, since 2012.  
Faculty search committees 2006, 2010, 2013, 2015  
Selection Committee for the Joint Institute for the Study of Atmosphere and Ocean (JISAO) Postdoctoral Fellowship Program, 2011 and 2016.  
Committee on Graduate Studies, Atmospheric Sciences, UW, 2011-2015. Chair 2012-2015.  
Program on Climate Change, Executive Board since Oct 2009.  
Developed new course on Weather and Climate Prediction for undergraduate students.  
Prepared the application for the curriculum review in 2010. Taught the course in winter 2011, 2013.

Developed new course on Climate Modeling for graduate students in atmospheric sciences, earth and space sciences and oceanography. Prepared the application and it passed the UW curriculum review in 2007. Co-taught the course for 12 students in Spring 2008 and 2010 using a large computing allocation on the TeraGrid.

Redesigned course formally called Ice and Climate Modeling and changed the name to Ice and Climate in atmospheric sciences and earth and space sciences. Prepared the application and it passed the UW curriculum review in 2007. Taught the course in Spring 2009 and 2011.

Committee to develop new atmospheric sciences course on Global Warming, 2007.

Faculty advisor to student organized women's group in Atmospheric Sciences since 2006.

## **Outreach**

Keynote lecture at Washington Global Issues Network conference at Chief of International High School, March, 2019

Evening public lecture, University of Utah, Salt Lake City, February 2019.

Guest lecture on sea ice research and polar climate change at Westminster College, Salt Lake City, February 2019

Keynote lecture at Bellevue High School at mock international climate treaty conference, June 2018

Panel on Climate Change at the Nordic Heritage Museum Seattle, June 2017.

Lecture on "The Future of Arctic and Antarctic Ice" to the P.O.E. Seattle Chapter, May 2017.

Public lecture at Mt Baker Lodge Future of Ice Series Conversations about a Positive Future, March 2017.

Lecture to the Osher Lifelong Learning Institute on "The Future of Ice Near and Far", Seattle, WA, May 2016.

Public lecture at Mt Baker Lodge on "The Future of Ice Near and Far", Mt Baker, WA, Jan. 2016.

Guest lecture at the Art Institute of Seattle "The Future of Arctic and Antarctic Sea Ice", Seattle, WA, Feb. 2015.

Wrote guest blog for Polar Bears International "Where are the Cubs?", Nov 2014.

Public lecture at WHOI "The Future of Arctic and Antarctic Sea Ice", Woods Hole, MA, Aug. 2014.

Six evening public lectures while a Fulbright Scholar in New Zealand titled "Why is Antarctic Sea Ice Expanding While Arctic Sea Ice Is Retreating Rapidly?" from Nov 2013 to Feb 2014, Auckland, Queenstown, Christchurch, Dunedin, Wellington, and McMurdo Station Antarctica.

Wrote guest blog for AGU's Plainspoken Scientists "Give your articles a good start: Titles for the Geosciences", Aug 2013.

Wrote guest blog for Polar Bears International "The Cold Truth – Ice Cores Tell Us We Are Changing the Atmospheric Composition", Jul 2013.

Guest lecture to Bainbridge Island Men's Club on "Arctic Climate Change", Mar 2013.

Wrote guest blog for Huffington Post on the occasion of Polar Bears Week titled "Sea Ice and Climate Change", Nov 2012.

Web broadcasts and public lecture educating about polar bears and climate change for Tundra Connections, Polar Bears International, one week, Nov 2012

Wrote guest blog for Polar Bears International "Sea Ice Hits New Record Low", Sep 2012.

Co-authored RealClimate.org guest blog on "Arctic Sea Ice Volume: PIOMAS, Prediction, and the Perils of Extrapolation", Apr 2012.

Web broadcasts and public lecture educating about polar bears and climate change for Tundra Connections, Polar Bears International, one week, Nov 2011

Wrote guest blog for Polar Bears International "Sea Ice and Polar Bears", Nov 2011

Featured in a children's activity book titled "Exploring Global Warming" for which I provided text and helped edit. The book is part of the afterschool explorations in science series published by the Intercultural Center for Research in Education, incre.org, 2011

Edited placards for "Exploring Climate Science" exhibit at the Science Museum in London, Spring, 2011.

Contributed collaborative art piece to "Forecast: Communicating Weather and Climate" art exhibit, Annual AMS Meeting, Seattle, Jan. 2011.

Lecture to Organization of University Women, "The Future of Arctic Sea Ice", Bellevue, Feb 2010.

Mentoring Lecture to Association for Polar Early Career Scientists "Getting Started: Work Hard, Aim High, Have Fun", Victoria, Nov. 2009.

Designed and constructed art exhibit on sea level rise at the Seattle Art Museum Olympic Sculpture Garden in Summer-Fall 2009.

Lecture to UW House Wallingford "The Future of Arctic Sea Ice", Seattle, Mar 2009.

Demonstrated climate modeling in a booth about climate and climate change at the Pacific Science Center Polar Science Weekend in 2006, 2007 and 2008.

Volunteered in booths on ocean mooring and sea ice albedo in 2009 and 2010.

Organized and operated atmospheric sciences department booth at UW for Focus the Nation, 2008.

Lecture at Burke Museum, Seattle, Aug. 2008, "Warming Up: The Future of Arctic Climate".

Panel member discussing Global Temperature Change before the world premier of David Rambo's *The Ice-Breaker* (play) at the Magic Theatre in San Francisco, Apr 2006.

Science advisory board to Cool Moms [www.coolmom.org](http://www.coolmom.org)

Designed and maintain internet climate model for education since 2006 at <http://www.atmos.washington.edu/~bitz/PSC/>

Employed and mentored high math school teacher Adam Kruger who worked on modeling sea ice during the Summers 2006 and 2007.

## Grants

2000-2003 Collaborative Research: Studies of Arctic Climate Feedbacks Using SHEBA Data and the NCAR Climate System Model, NSF (co-PI with Richard Moritz \$526,213).

2001-2002 Coupling of a State of the Art Sea Ice model to an Ocean Circulation Model: Application the Okhotsk Sea. University of Washington, Program on Climate Change Seed Grant (co-PI with LuAnne Thompson \$15,000).

2001-2003 SGER: Modeling the Atmospheric Circulation Over the Arctic, NSF (co-PI with Richard Moritz \$116,089).

- 2002-2003 Modeling the Floe-Size Distribution to Improve the Prediction of Sea Ice in the Marginal Sea, ONR (PI \$85,496).
- 2002-2003 SGER: Coupling a Slab Ocean and Sea Ice Model to the Community Atmosphere Model, NSF (PI \$44,235).
- 2003 - 2006 Understanding the Role of Rain-on-Snow events in High Latitude Climates: Soil Temperature and Ecosystem Impacts, NSF (co-PI with Jaakko Putkonen \$242,521).
- 2003 - 2007 Collaborative Research: An Investigation of Polar Amplification and High-Latitude Climate Sensitivity in Global Climate Models, NSF. (PI \$285,640).
- 2005 - 2009 The Mutual Interaction Between Ice Production and Ocean Heat Transport in a Greenhouse Warming Scenario NSF (PI \$324,406).
- 2005 - 2009: Rapid Climate Change due to Sea Ice Dynamics in the North Atlantic and Arctic Oceans NSF (PI \$354,343).
- 2005 - 2012 The Kuril Biocomplexity Project: Human Vulnerability and Resilience to Subarctic Change NSF (co-PI with Benjamin Fitzhugh \$1,650,000).
- 2005 - 2011 Ice-Ocean Interactions on the Okhotsk Sea Shelf. NSF (co-PI with LuAnne Thompson \$442,188).
- 2006 - 2008 Arctic Ice Thickness Response to Global Warming, Murdock Foundation, (PI \$14,000).
- 2007 - 2011 Deep Ocean Heat Uptake and the Influence of Sea Ice in the Southern Ocean DOE (PI \$287,410).
- 2008 - 2011 Deciphering the Antarctic MSA-sea ice link with a combined regional forecast and atmospheric chemistry model NSF (PI \$375,442).
- 2009 - 2012 How will sea ice and the Greenland ice sheet recover in a geoengineered world? Sub-contract from University of Calgary (PI \$209,624).
- 2009 - 2012 High-resolution climate modeling: The influence of weather and sea ice noise on polar climates NSF (PI \$129,213).
- 2009 - 2013 Short-term predictability of Arctic climate NSF (PI \$308,016).
- 2011 - 2013 Intercomparison of simulated Arctic snow on sea ice and estimation of snow-related feedbacks on sea ice ONR (PI \$44,950).
- 2011 - 2014 Collaborative Research: Type 1: LOI: L02170303: Arctic Climate Response to Decadal Changes in Radiative Forcing from Aerosols and Ozone NSF (PI \$418,519).
- 2013 - 2016 Early Student Support to investigate the role of sea-ice albedo feedback in sea ice predictions ONR (PI \$133,906).
- 2013 - 2017 An innovative network to improve sea ice prediction in a changing Arctic ONR (PI \$456,598).
- 2013 - 2017 The Virtual Planetary Laboratory, NASA (co-PI \$9.56M)
- 2015 - 2016 Model Prediction Across Scales applied to regional climate of the Northwestern U.S., subcontract from PNNL (PI \$113,952).
- 2016 - 2017 Arctic linkages, subcontract from University of Toronto (PI \$69,414).
- 2014 - 2018 The Hydroclimate of Antarctica, NSF (PI \$421,132).
- 2014 - 2018 Evaluating the climatology, physical processes, data errors and model biases in snow depths on Arctic sea ice in IceBridge and the CESM1, NASA (PI \$374,590).
- 2015 - present Advancing understanding of sea ice predictability with sea ice data

- assimilation in a fully-coupled model with improved region-scale metrics, NOAA (PI \$740,790).
- 2015 – present The role of improved sea ice physics on seasonal to interannual prediction ONR (PI \$275,926).
- 2016 – present Paleoclimate signatures from the climate response to Antarctic ice sheet collapse, NSF (co-PI with Eric Steig \$351,208).
- 2016 – present Climate, weather, pollen, and health: Quantifying current and future risks, NASA (co-PI with Jeremy Hess \$375,512).
- 2017 – present The role of wave-sea ice floe interactions in recent Antarctic sea ice change, NSF (PI \$415,864).
- 2017 – present Hemispheric energy balance and tropical precipitation shifts: The impacts of forcing location, NSF (co-PI with Dargan Frierson \$594,498).
- 2017 – present Year-Round, Subseasonal to Seasonal Sea Ice Prediction: An Expanded Activity of The Sea Ice Prediction Network, ONR (PI \$322,803)
- 2017 – present Advancing understanding of Arctic sea ice and weather interactions to improve forecasts on day to month timescales, ONR (PI \$483,475)
- 2018 – present The Virtual Planetary Laboratory II, NASA (co-PI with Vikki Meadows \$7M)
- 2018 – present Advancing understanding of Arctic sea ice variability and diagnostic predictability in ESMs with regional-to-global-scale process-oriented evaluation (PI \$508,420)
- 2018 – present Graduate student climate conference 2018 (PI \$30,000)

Total external as co-PI \$20.86M

Total external as PI \$7.23M