

TWILA A. MOON

National Snow & Ice Data Center
Cooperative Institute for Research in Environmental Sciences
University of Colorado

www.changingice.com
twila.moon@nsidc.org

EDUCATION

- 2014 Ph.D. Earth & Space Sciences, **University of Washington**
Certificate: Climate Science, Program on Climate Change
- 2008 M.S. Earth & Space Sciences, **University of Washington**
- 2004 B.S. Geological & Environmental Sciences, **Stanford University**

PROFESSIONAL EXPERIENCE

- 2017 – present Research Scientist, National Snow & Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado – Boulder
Science Team Supervisor – role begun in 2019.
Science Communication Liaison – role begun in 2019.
- 2016 – 2017 Faculty (Lecturer, equivalent to Assistant Professor), School of Geographical Sciences, University of Bristol, UK
- 2015 – 2016 National Science Foundation Postdoctoral Research Fellow, Department of Geological Sciences, University of Oregon
- 2015 – 2017 Affiliate Scientist, National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado - Boulder
- 2014 – 2015 Postdoctoral Fellow, National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado - Boulder
- 2014 – present Affiliate Scientist, Polar Science Center, Applied Physics Lab, University of Washington
- 2012 – 2014 Research Assistant, Earth & Space Sciences, University of Washington
- 2012 Geoscience Intern, ExxonMobil Upstream Research Company
- 2010 – 2012 Research Fellow, National Science Foundation, University of Washington
- 2008 – 2010 Managing Director-Big Sky, Big Sky Institute, Montana State University
- 2007 – 2008 Research Fellow, National Science Foundation, University of Washington
- 2006 – 2007 Research Assistant, Earth & Space Sciences, University of Washington
- 2005 – 2006 Research Fellow, Program on Climate Change, University of Washington
- 2003 – 2005 Instructor, National Outdoor Leadership School

JOURNAL PUBLICATIONS

- 2019 Tedesco, M., **T. Moon**, J. K. Andersen, J. E. Box, J. Cappelen, R. S. Fausto, X. Fettweis, B. Loomis, K. D. Mankoff, T. Mote, C. J. P.P. Smeets, D. van As, and R. S. W. van de Wal (2019), Greenland Ice Sheet, *Arctic Report Card 2019*, J. Richter-Menge, M. L. Druckenmiller, M. Jeffries, Eds., <http://www.arctic.noaa.gov/Report-Card>.
- 2019 Catania, G. A., L. A. Stearns, **T. A. Moon**, E. M. Enderlin, and R. Jackson (2019), Future evolution of Greenland's marine-terminating outlet glaciers, *J Geophys Res-Earth*, 2018JF004873–76, doi:10.1029/2018JF004873.

- 2019 Trevers, M., A. J. Payne, S. L. Cornford, **T. Moon**, Bouyant forces promote tidewater glacier iceberg calving through large basal stress concentrations, *The Cryosphere*.
- 2019 **Moon, T. A.**, I. Overeem, M. Druckenmiller, M. Holland, H. Huntington, G. Kling, A. L. Lovcraft, G. Miller, T. Scambos, C. Schädel, E. A. G. Schuur, E. Trochim, F. Wiese, D. Williams, G. Wong, The expanding footprint of rapid Arctic change, *Earth's Future*.
- 2019 Straneo, F. D. A. Sutherland, L. A. Stearns, G. Catania, P. Heimbach, **T. Moon**, M. R. Cape, K. L. Laidre, D. Barber, S. Rysgaard, R. Mottram, S. M. Olsen, M. J. Hopwood, L. Meire, The case for a sustained Greenland ice sheet-ocean observing system, *Frontiers in Marine Science*.
- 2019 Vijay S., S. Khan, A. Kusk, A. Solgaard, **T. Moon**, A. Bjørk, Resolving seasonal ice velocity of 45 Greenlandic glaciers with very high temporal details, *Geophys Res Lett*.
- 2018 Ran, J., M. Vizcaino, P. Ditmar, M. R. van den Broeke, **T. Moon**, C. R. Steger, E. M. Enderlin, B. Wouters, B. Noël, C. H. Reijmer, R. Klees, M. Zhong, L. Liu, and X. Fettweis, Seasonal mass variations show timing and magnitude of meltwater storage in the Greenland Ice Sheet, *The Cryosphere*, 12(9), 2981–2999, doi:10.5194/tc-12-2981-2018.
- 2018 **Moon, T.**, A. Ahlstrøm, H. Goelzer, W. Lipscomb, and S. Nowicki, Rising oceans guaranteed: Arctic land ice loss and sea level rise, *Curr Clim Change Rep*, 44(11), 11051–12, doi:10.1007/s40641-018-0107-0.
- 2018 Enderlin, E. M., C. J. Carrigan, W. H. Kochtitzky, A. Cuadros, **T. Moon**, and G. S. Hamilton (2018), Greenland iceberg melt variability from high-resolution satellite observations, *The Cryosphere*, 12(2), 565–575, doi:10.5194/tc-12-565-2018.
- 2017 Cavanagh, J. P., D. J. Lampkin, and **T. Moon** (2017), Seasonal variability in regional ice flow due to meltwater injection into the shear margins of Jakobshavn Isbrae, *J Geophys Res-Earth*, 120(3), 580–18, doi:10.1002/2016JF004187.
- 2017 **Moon, T.A.**, D.A. Sutherland, D. Carroll, D. Felikson, L. Kehrl, F. Straneo (2017), Subsurface iceberg meltkey to Greenland fjord freshwater budget, *Nature Geoscience*, doi: 10.1038/s41561-017-0018-z. (cover article)
- 2017 Bondzio, J. H., M. Morlighem, H. Seroussi, T. Kleiner, M. Rückamp, J. Mouginot, **T. Moon**, E. Y. Larour, and A. Humbert, The mechanisms behind Jakobshavn Isbrae's acceleration and mass loss: a 3D thermomechanical model study, *Geophys Res Lett*, doi:10.1002/2017GL073309.
- 2017 **Moon, T.**, Saying goodbye to glaciers, *Science*, 356(6338), 580–581, doi:10.1126/science.aam9625.
- 2016 Laidre, K. L., **T. Moon**, D. Hauser, R. McGovern, M. Heide-Jorgensen, R. Dietz, B. Hudson, Use of glacial fronts by narwhals (*Monodon monoceros*) in West Greenland. *Biology Letters*, 12, 20160457. doi: 10.1098/rsbl.2016.0457.
- 2016 Carroll, D., D. Sutherland, B. Hudson, **T. Moon**, G. Catania, E. Shroyer, J. Nash, T. Bartholomaeus, D. Felikson, L. Stearns, B. Noel, M. van den Broeke (2016), The impact of glacier geometry on meltwater plume structure and submarine melt in Greenland fjords. *Geophysical Research Letters* 43, 9739–9748 doi: 10.1002/2016GL070170.
- 2016 Joughin, I., B. Smith, I. Howat, H. Fricker, T. Scambos, **T. Moon**, A SAR record of early 21st century change in Greenland, *Journal of Glaciology*, vol. 62 (231), doi: 10.1017/jog.2016.10.

- 2015 Fahnestock, M., T. Scambos, **T. Moon**, A. Gardner, T. Haran, M. Klinger, Rapid large-area mapping of ice flow using Landsat 8, *Remote Sensing of Environment*, doi:10.1016/j.rse.2015.11.023.
- 2015 **Moon, T.**, I. Joughin, B. Smith, Seasonal to multi-year variability of glacier surface velocity, terminus position, and sea ice/ice mélange in northwest Greenland, *Journal of Geophysical Research-Earth Surface*, vol. 120, doi:10.1002/2015JF003494.
- 2014 **Moon, T.**, I. Joughin, B. Smith, M. R. van den Broeke, W. J. van de Berg, B. Noël, M. Usher, Distinct patterns of seasonal Greenland glacier velocity, *Geophysical Research Letters*, vol. 41 (20), doi:10.1002/2014GL061836.
- 2012 **Moon, T.**, I. Joughin, B. Smith, and I. Howat, 21st century evolution of Greenland outlet glacier velocities, *Science*, vol. 336 (6081), doi:10.1126/science.1219985. (cover article)
- 2010 Joughin, I., B. Smith, I. Howat, T. Scambos and **T. Moon**, Greenland flow variability from ice-sheet-wide velocity mapping, *Journal of Glaciology*, vol. 56 (197), doi:10.3189/002214310792447734.
- 2008 **Moon, T.** and I. Joughin, Changes in ice front position on Greenland's outlet glaciers from 1992 to 2007, *Journal of Geophysical Research-Earth Surface*, vol. 13 (F2), doi: 10.1029/2007JF000927.
- 2008 Joughin, I., S. Das, M. King, B. Smith, I. Howat, **T. Moon**, Seasonal speedup along the western flank of the Greenland Ice Sheet, *Science*, vol. 320 (5877), doi: 10.1126/science.1153288.
- 2008 Joughin, I., I. Howat, R. Alley, G. Ekstrom, M. Fahnestock, **T. Moon**, M. Nettles, M. Truffer, V. Tsai, Ice-front variation and tidewater behavior on Helheim and Kangerdlugssuaq Glaciers, Greenland, *Journal of Geophysical Research-Earth Surface*, vol. 13 (F1), doi: 10.1029/2007JF000837.

ADDITIONAL PUBLICATIONS

- 2018 **Moon, T.**, W. Abdalati, J. L. Bamber, H. A. Fricker, I. Joughin, E. Rignot, T. Scambos, Geoengineering is not a quick glacier fix, *Correspondence* published in *Nature*, vol. 556(436).
- 2018 **Moon, T.**, contributor to Letters: NextGen Voices, *Science*, vol. 359(6371), p. 26-28.
- 2016 Straneo, F., **T. Moon**, D. Sutherland, P. Heimbach, G. Catania, Establishing a Greenland Ice Sheet Ocean Observing System (GrIOOS): Report from an International Workshop, https://web.who.edu/griso/wp-content/uploads/sites/27/2018/04/GrIOOS_Report_final.pdf
- 2015 **Moon, T.** and I. Joughin, Greenland Ice Sheet surface velocities: New data sets [in Arctic Report Card 2015], <http://www.arctic.noaa.gov/reportcard>.
- 2014 **Moon, T.**, Greenland outlet glacier ice-flow variability, *U.S. CLIVAR Variations Newsletter*, vol. 12 (2), p. 1-6.
- 2012 **Moon, T.** and I. Joughin, Greenland glaciers – not so fast!, *RealClimate*, blog post May 15, 2012.

PUBLISHED DATASETS

- 2019 Scambos, T., M. Fahnestock, T. Moon, A. Gardner, and M. Klinger. 2019. *Landsat 8 Ice Speed of Antarctica (LISA), Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/nxpc-e997>.
- 2016 Scambos, T., M. Fahnestock, T. Moon, A. Gardner, and M. Klinger. 2016. *Global Land Ice Velocity Extraction from Landsat 8 (GoLIVE), Version 1*. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N5ZP442B>.
- 2015 Joughin, I. and **T. Moon**, MEASUREs annual Greenland outlet glacier terminus positions from SAR Mosaics. Boulder, Colorado USA: NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: <http://dx.doi.org/10.5067/DCOMLBOCL3EL>.

RESEARCH GRANTS

- 2019 NSF EarthCube (9/1/19-8/31/22), QGreenland: Enabling science through GIS, \$1,030,243. (*PI*)
- 2018 NASA Cryospheric Science and Biodiversity (8/1/18-7/31/21), Variability of glaciers and fjord ice in southeast Greenland with application to ice sheet dynamics and resident polar bears, \$75,049 (CU only), Co-PIs: Kristin Laidre (UWashington), Harry Stern (UWashington), Ian Joughin (UWashington). (*Institutional PI*)
- 2018 NSF UCAR (11/02/17-9/30/18), Workshops to Enhance the Integration of Modeling and Observing Approaches to Understand a Changing Arctic, \$7,677 (CU only), PI: Marika Holland (NCAR). (*Subaward*)
- 2016 NSF EarthCube RCN (10/01/15-9/30/17), Collaborative Research: Engaging the Greenland Ice Sheet Ocean (GRISO) Science Network, \$299,396, Co-PIs: Fiamma Straneo (WHOI), David Sutherland (UOregon). (*Institutional PI*)
- 2016 NASA Cryospheric Science (1/1/16-12/31/18), Global Land Ice Velocity Extraction from Landsat (GoLIVE): A robust, comprehensive, and near-real-time record of global glacier flow, \$993,320, PIs: Ted Scambos (NSIDC), Mark Fahnestock (UAlaska), Alex Gardner (JPL). (*Scientist*)

FELLOWSHIPS & AWARDS

- 2014 Ocean Sciences Postdoctoral Research Fellowship, National Science Foundation
- 2014 Postdoctoral Visiting Fellowship, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado – Boulder
- 2014 Postdoctoral Fellowship, NOAA Climate and Global Change (*declined*)
- 2011 GIS Day Student Poster Award, University of Washington
- 2010 Best Surface Processes Oral Presentation, University of Washington
- 2007 Graduate Research Fellowship, National Science Foundation
- 2005 Earth and Space Sciences Student Recognition Grant, University of Washington
- 2005 Program on Climate Change Graduate Fellowship, University of Washington

- 2003 Geological and Environmental Sciences Department Summer Research Fellowship, Stanford University
- 2002 Undergraduate Research Opportunities Major Grant, Stanford University

INVITED ACADEMIC TALKS

- 2020 Program on Climate Change, University of Washington
- 2019 CESM Annual Meeting, National Center for Atmospheric Research
- 2019 NASA Jet Propulsion Lab
- 2018 Workshop on Greenland Freshwater Flux, Washington D.C.
- 2017 Lamont-Doherty Earth Observatory, Columbia University
- 2017 Chevron Corporation (Climate Team, Fellows, Advanced Energy & Greenhouse Gas Tech)
- 2017 University of Edinburgh, School of Geosciences
- 2017 Newcastle University, Department of Geography
- 2016 Cambridge University, Scott Polar Research Center
- 2016 Helmholtz Remote Sensing and Earth System Dynamics Alliance Week
- 2016 Delft University of Technology, Geosciences and Remote Sensing
- 2016 Montana State University, Department of Earth Sciences
- 2015 Stanford University, Department of Geophysics Seminar
- 2015 University of Maryland, Atmospheric and Oceanic Sciences Seminar
- 2015 Teton Science School, Graduate Program Seminar
- 2015 University of Oregon, Geology Department Seminar
- 2014 University of Colorado, CIRES Cryosphere and Polar Processes Seminar
- 2014 Northern Arizona University, School of Earth Sciences and Environmental Sustainability Seminar
- 2013 University of Colorado, CIRES Seminar
- 2009 Montana State University, Annual Earth Sciences Colloquium Keynote Lecture

INVITED CONFERENCE ABSTRACTS

- 2019 Moon, T., A. Gardner, A. Aschwanden, H. Seroussi, Improved understanding of Arctic land ice loss by integrating observations and models, Abstract C21C-06, 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
- 2019 Moon, T., Perspectives from the next generation of cryosphere scientists, Abstract C44A-02, 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
- 2018 Moon, T., D. A. Sutherland, K. L. Laidre, Greenland freshwater production and the iceberg environment, Abstract C13A-01, 2018 Fall Meeting, AGU, Washington D. C., 10-14 Dec.

- 2018 Moon, T., M. Fahnestock, A. Gardner, Multi-decadal reconfiguration of Greenland Ice Sheet motion and ice edge, IGS Timescales, Processes, and Glacier Dynamics, Buffalo, NY, 3-8 June.
- 2018 Moon, T., Freshwater in Greenland fjords, Community Earth System Model Land Ice Working Group Meeting, Boulder, CO, 10-11 Jan.
- 2017 Moon, T., Redefining glacial pace: Progress and results from a velocity data revolution, IGS Polar Ice, Polar Climate, Polar Change, Boulder, CO, 14-19 Aug.
- 2017 Moon, T., M. Fahnestock, A. Gardner, T. Scambos, M. Klinger, Insights and opportunities with near-real-time global land ice velocities from GoLIVE, Abstract EGU2017-9491, European Geophysical Union General Assembly, Vienna, Austria, 23-28 Apr.
- 2015 Moon, T., M. Fahnestock, T. Scambos, I. Joughin, M. van den Broeke, M. Klinger, Seasonal ice flow patterns as indicators of subglacial hydrology on the Greenland Ice Sheet, Abstract C43E-08, 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- 2014 Moon, T., I. Joughin, B. Smith, Seasonal and interannual glacier terminus fluctuations in northwest Greenland and links to sea ice and velocity trends during the 21st century, Abstract C11E-06, 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
- 2013 Moon, T., Patterns of glacier variability in Greenland, U.S. CLIVAR International Workshop on Greenland Ice-Ocean Interaction, Beverly, Mass., 4-7 June.
- 2012 Moon, T., I. Joughin, B. Smith, and I. Howat, 21st-century Greenland outlet glacier velocities on multiple timescales, Abstract C41E-04, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

CONTRIBUTED ABSTRACTS (presenting author only)

- 2019 Moon, T., and SEARCH Land Ice Action Team, Connecting scientists and stakeholders around land ice loss and sea level rise: Lessons from a multi-year effort, Abstract PA54C-17, 2019 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
- 2019 Moon, T., D. Sutherland, E. Enderlin, D. Carroll, D. Felikson, L. Kehrl, and F. Straneo, Resolving Greenland freshwater flux in space and time, Advance Climate Dynamics Course 10-year Anniversary Alumni Conference, Rondane, Norway, 25-28 Mar.
- 2018 Moon, T., Tutorial talk: Science of a rapidly changing Arctic system, Abstract TT32A, 2018 Fall Meeting, AGU, Washington, D. C., 10-14 Dec.
- 2017 Moon, T., D. Sutherland, D. Carroll, D. Felikson, L. Kehrl, F. Straneo, Spatiotemporally resolved fjord freshwater budget including iceberg melt, IGS Polar Ice, Polar Climate, Polar Change, Boulder, CO, 14-19 Aug.
- 2017 Straneo, F., D. Sutherland, T. Moon, G. Catania, P. Heimbach, D. Felikson, Greenland ice sheet and ocean: Connecting data, science, and scientists, EarthCube All Hands Meeting, Seattle, WA, 7-9 June.
- 2017 Moon, T., D. Sutherland, D. Carroll, L. Kehrl, F. Straneo, D. Felikson, Complete spatiotemporal freshwater flux budget for a major Greenland glacier-fjord system, Abstract EGU2017-3748, European Geophysical Union General Assembly, Vienna, Austria, 23-28 Apr.
- 2016 Moon, T., M. Fahnestock, T. Scambos, I. Joughin, Complex patterns of 21st century Greenland outlet glacier change, Abstract C13C-0845, 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.

- 2015 Moon, T., M. Fahnestock, I. Joughin, T. Scambos, Greenland Ice Sheet glacier motion and ice loss: New understanding of ice sheet behavior through remote sensing, Abstract GC51A-1077, 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.
- 2015 Moon, T., M. Fahnestock, T. Scambos, M. Klinger, T. Haran, Variability of seasonal Greenland glacier velocities and implications for ice sheet sensitivity to ocean and surface meltwater changes, International Symposium on Contemporary Ice-Sheet Dynamics, Cambridge, UK, 16-21 Aug.
- 2015 Moon, T., I. Joughin, T. Scambos, M. Fahnestock, M. van den Broeke, Spatial variability of distinct seasonal glacier velocity patterns and implications for Greenland Ice Sheet sensitivity to climate change, Ilulissat Climate Days, Ilulissat, Greenland, 2-5 June.
- 2015 Moon, T., M. Fahnestock, T. Scambos, M. Klinger, and T. Haran, Comprehensive spatiotemporal glacier and ice sheet velocity measurements from Landsat 8, Abstract EGU2015-2095, European Geophysical Union General Assembly, Vienna, Austria, 13-17 Apr.
- 2015 Moon, T., Recent results and products from remote sensing of ice sheet velocities, Community Earth System Model Land Ice Working Group Meeting, Boulder, Colo., 2-3 Feb.
- 2014 Moon, T., I. Joughin, B. Smith, M. van den Broeke, M. Usher, Distinct seasonal velocity patterns based on ice-sheet—wide analysis of Greenland outlet glaciers, Abstract C12B-02, 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
- 2014 Moon, T., T. Scambos, M. Fahnestock, I. Joughin, B. Smith, T. Haran, M. Klinger, M. van den Broeke, W.J. van de Berg, and B. Noël, Observations of sea ice and ice sheet interaction in Greenland and the Antarctic Peninsula, West Antarctic Ice Sheet Workshop, Julian, Calif., 24-27 Sept.
- 2013 Moon, T., I. Joughin, and B. Smith, Sea ice/ice mélange and outlet glacier interaction in northwest Greenland, Abstract OS13D-08, 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- 2012 Moon, T., C. Bitz, and L. Thompson, Near-Greenland ocean conditions under RCP8.5 forcing, Abstract GC33C-1037, 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- 2012 Moon, T., I. Joughin, B. Smith, and I. Howat, Greenland outlet glacier velocities during 2000-2010, International Symposium on Glaciers and Ice Sheets in a Warming World, International Glaciological Society, Fairbanks, Alaska, 24-29 June.
- 2012 Moon, T., 21st century Greenland outlet glacier velocities, Earth & Space Sciences Research Gala, University of Washington.
- 2011 Moon, T., I. Joughin, B. Smith, and I. Howat, 21st century evolution of Greenland outlet glacier velocities, Abstract C11D-0702, 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011 Moon, T., I. Joughin, B. Smith, and I. Howat, 21st century evolution of Greenland outlet glacier velocities, Northwest Glaciology Meeting.
- 2011 Moon, T., Climate science explained: adventures in teaching climate science, Earth & Space Sciences Research Gala, University of Washington.
- 2010 Moon, T and I. Joughin, Understanding outlet glacier dynamics on the Greenland Ice Sheet, Northwest Glaciology Meeting.
- 2010 Moon, T. and I. Joughin, Understanding Mechanisms for Ice Loss from the Greenland Ice Sheet, Earth & Space Sciences Research Gala, University of Washington.

- 2007 Moon, T. and I. Joughin, Examining ice front variability for Greenland glaciers: 1992 – 2007, 2nd Graduate Climate Conference, University of Washington.
- 2006 Moon, T. and I. Joughin, Ice Front Changes on the Greenland Ice Sheet: 1992-2006, Eos Trans. AGU, 87(52), Fall Meet. Suppl., Abstract C13B-05.
- 2006 Moon, T. and I. Joughin, Terminus change on Greenland outlet glaciers, Graduate Climate Conference, University of Washington.

ACADEMIC PROFESSIONAL DEVELOPMENT AND WORKSHOPS

- 2018 NSF Coastlines and People Scoping Workshop (*selected participant*)
- 2018 NSF Workshop on Arctic System Science (*Organizing Committee member*)
- 2017 Metcalf Institute Science Communication Workshop
- 2017 Workshop on Ice Shelf Stability (*invited*)
- 2015 Greenland Ice Sheet Ocean Observing System (GrIOOS) Workshop (*selected participant*)
- 2015 New Generation of Polar Researchers Leadership Symposium (*selected participant*)
- 2014 Community Earth System Model Tutorial (*selected participant*)
- 2013 U.S. CLIVAR International Workshop (*invited*), *Understanding the Response of Greenland’s Marine Terminating Glaciers to Oceanic and Atmospheric Forcing*
- 2013 University of Washington Course: Science writing for general audiences
- 2012 Compass Science Communication Training course
- 2012 Program on Climate Change Summer Institute, *Topic: Ice-Ocean Interaction*
- 2010 Pacific Science Center Science Communication Fellow training
- 2010 Parallel Ice Sheet Model Workshop
- 2010 Ice Sheet – Ocean Interaction, Advanced Climate Dynamics Course (*selected participant*)
- 2010 Program on Climate Change Summer Institute, *Topic: Climate Feedbacks*
- 2006 Program on Climate Change Summer Institute, *Topic: Anthropogenic CO2 Emissions: Projections, Mitigating Technologies, and Policies*
- 2005 Program on Climate Change Summer Institute, *Topic: El Nino: Past, Present, and Future*

SERVICE

- 2020 NASA proposal review panel
- 2019 Session chair, Ice-ocean interaction, Advance Climate Dynamics 10-year Alumni Conference
- 2018 – present Science Advisory Board Member (NSIDC representative), Greenland Icefjord Centre
- 2018 Co-Organizer, NSF Arctic System Science Workshop, NCAR, Boulder, CO
- 2017 APECS Science Communication Panel
- 2016 APECS-AGU Cryosphere Career Panel
- 2016 Session convener, Glacier-ocean interactions, mechanisms, and synthesis, AGU Fall Meeting
- 2015 Review panelist, National Science Foundation
- 2014 Session convener, Understanding ice loss in coupled glacier-ocean systems through observations, modeling, and theory, AGU Fall Meeting

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| 2014 – present | Member, Acting Committee, Greenland Ice Sheet-Ocean Interactions (GRISO) Science Network |
| 2013 – present | Ad hoc proposal reviewer, Multiple agencies |
| 2012 | Science vignette contributor, Key Concepts in Geomorphology textbook |
| 2010 – present | Paper reviewer, Multiple journals (e.g., Nature Climate Change, Nature Geoscience, Geophysical Research Letters, The Cryosphere, etc.) |
| 2010 – 2011 | Question writer, National Science Bowl |
| 2006 – 2007 | Head of Planning & Logistics, Graduate Climate Conference, University of Washington |

PUBLIC & STAKEHOLDER OUTREACH

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| 2019 | Scientific expert for Active Philanthropy Greenland Expedition |
| 2019 | Congressional Testimony, House Committee on Science, Space, and Technology |
| 2018 | TEDxBig Sky presentation |
| 2017 | Briefing for the Senate Arctic Caucus and Senate Ocean Caucus |
| 2017 – present | Skype a Scientist (speak with ~6 schools per year) |
| 2015 | Ignite@AGU speaker |
| 2015 – present | Contributing scientist, Climate Feedback (climatefeedback.org) |
| 2014 | Speaker, STEM role model event, JASON Live |
| 2014 – 2018 | Speaker, Climate Voices Science Speaker Network |
| 2013 – 2014 | Science Fair Judge, Ophir School District |
| 2011 | SciZone feature contributor, Montana State University Extended University |
| 2011 | Moderator, Avalanche Safety and the Dynamic Science of Snow, Big Sky Resort |
| 2011 | Guest lecturer, Environmental Science, Mercer Island High School |
| 2010 – 2014 | Science Communication Fellow, Pacific Science Center |
| 2005 – 2014 | Program on Climate Change Outreach Group, University of Washington |
| 2006 – 2014 | Polar Science Weekend, Pacific Science Center |
| 2010 – 2012 | Scientist Spotlight, Pacific Science Center (multiple times per year) |
| 2008 | Scientist talk, Houston Natural Science Museum |

MEDIA OUTREACH (brief examples by year)

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| Ongoing | Regularly provide comment for media, including print, online, audio, and video. |
| 2020 | <i>New York Times</i> , Interview for news article; <i>Popular Science</i> , interview for news article |
| 2019 | <i>National Public Radio All Things Considered</i> , Radio broadcast interview; <i>BBC World News</i> , Live TV interview |
| 2018 | <i>Washington Post</i> , Interview for news article; <i>Wired</i> , Interview for news article |
| 2017 | <i>CTV News (Canada)</i> , Live TV interview; <i>Nexus Media</i> , Interview for video feature |
| 2016 | <i>Climate Feedback</i> , Interview for Contributor Profile |
| 2015 | <i>Big Sky Weekly</i> , Interview and content for multipart newspaper series; <i>Nautilus</i> , Interview for article |
| 2013 | <i>Society for Science and the Public</i> , Interview for Scientist Profile |

2012 *National Public Radio All Things Considered*, Interview for radio broadcast; *BBC*, Interview for news article

TEACHING

2019 Guest seminar, *Global Climate Change*, Texas State University
2017 Guest instructor, *Glacial Geology*, Montana State University
2017 Instructor, Sea level rise modules in *World in Crisis?* (Year 1 undergraduates), University of Bristol
2016 – 2017 Co-Instructor, *Fundamentals of Modern Glaciology* (Year 2 undergraduates), University of Bristol
2016 – 2017 Advisor, Undergraduate dissertations, University of Bristol
2016 – 2017 Instructor, Tutorials (all undergraduate levels), University of Bristol
2016 Instructor, Pre-sessional field trip (Year 1 undergraduates), University of Bristol
2016 Lecturer, ESA Advanced Training Course on Remote Sensing of the Cryosphere, University of Leeds
2016 Guest instructor, *Glacial Geology*, Montana State University
2015 Faculty, Juneau Icefield Research Program, Alaska
2014 Guest lecturer, *The Arctic Climate System*, University of Colorado
2013 Instructor and Center for Multiscale Modeling of Atmospheric Processes Fellow, *Introduction to Global Climate Change*, Colorado College
2012 Guest lecturer, *Understanding Science through Imagery*, Cornish College of the Arts
2011 Organizer, Remote Sensing Seminar, University of Washington
2011 Creator & Instructor, *Climate Science Explained*, Montana State University Extended University
2003 – 2005 Instructor, National Outdoor Leadership School
2001 – 2003 Instructor, Geology 7: Stanford Outdoor Education Program, Stanford University
2001 – 2003 Co-founder & Instructor, Stanford Outdoor Outreach Program, Stanford University

STUDENT MENTORING

2018 – present PhD committee member, Tasha Snow, Cooperative Institute for Research in Environmental Sciences and Department of Geography, University of Colorado
2016 – 2017 PhD co-supervisor, Jenny Maddalena, University of Bristol, Greenland mass balance from CryoSat and Sentinel 3
2016 – 2017 PhD co-supervisor, Matt Trevers, University of Bristol, Modeling of calving processes informed by observations
2016 Visiting undergraduate researcher, Anna Covey, University of Southampton

FIELD ACTIVITIES

2018 Northwest Greenland, Field Researcher, Glacial environment and narwhal study
2016 LeConte Glacier, Alaska, Field Researcher, Ice-ocean interaction study

2015 Juneau Icefield, Alaska, Instructor, Juneau Icefield Research Program
2013 Western Greenland, Field Researcher, Supraglacial lakes study
2006 Western Greenland, Field Researcher, Supraglacial lakes study
2003 Juneau Icefield, Alaska, Student, Juneau Icefield Research Program