DR. MATTHEW P. DANNENBERG

Dept. of Geographical and Sustainability Sciences
University of Iowa
308 Jessup Hall
Iowa City, IA 52242
Email: matthew-dannenberg@uiowa.edu

EDUCATION

Ph.D. **University of North Carolina**, Chapel Hill, NC, Department of Geography, May 2017

M.A. **University of North Carolina**, Chapel Hill, NC, Department of Geography, May 2013

B.A. **Hope College**, Holland, MI, Departments of English & Philosophy, May 2007 (*summa cum laude*)

ACADEMIC APPOINTMENTS

2019 – **University of Iowa**, Iowa City, IA
Assistant Professor, Department of Geographical and Sustainability Sciences

2017 – 2018 **University of Arizona**, Tucson, AZ
Postdoctoral Research Associate, School of Natural Resources and the Environment

HONORS AND AWARDS

2020 John Russell Mather Paper of the Year Award, Climate Specialty Group, American Association of Geographers [for Dannenberg, Wise & Smith, 2019].

2019 John I. Davidson President's Award for Practical Papers (2nd Place), American Society for Photogrammetry and Remote Sensing [for Dannenberg, Song & Hakkenberg, 2018].

2018 Best Paper Award for Early Career Scholars in Remote Sensing, Remote Sensing Specialty Group, American Association of Geographers [for Dannenberg, Song & Hakkenberg, 2018].

2018 Ellen Mosley-Thompson Best Publication Award (with Erika K. Wise), Paleoenvironmental Change Specialty Group, American Association of Geographers [for Wise & Dannenberg, 2017].

2014 Remote Sensing Specialty Group Student Honors Paper Competition (3rd Place), American Association of Geographers

PUBLICATIONS

UNDER REVIEW

Dannenberg, M. P. and M. R. Johnston, Effects of eastern and central Pacific El Niño on Northern Hemisphere photosynthetic phenology, submitted to *Environmental Research: Climate*.

Lee, C. C. and **M. P. Dannenberg**, Frequencies of multivariate air masses drive global tree growth, submitted to *Journal of Geophysical Research: Biogeosciences*.

JOURNAL ARTICLES

Dannenberg, M. P., M. L. Barnes, W. K. Smith, M. R. Johnston, S. K. Meerdink, X. Wang, R. L. Scott, and J. A. Biederman (2023), Upscaling dryland carbon and water fluxes with artificial neural

networks of optical, thermal, and microwave satellite remote sensing, *Biogeosciences*, 20, 383-404. doi:10.5194/bg-20-383-2023.

Atkins, J. W., J. Costanza, K. Dahlin, **M. P. Dannenberg**, A. Elmore, M. Fitzpatrick, C. R. Hakkenberg, B. Hardiman, A. Kamoske, E. LaRue, C. A. Silva, A. E. L. Stovall, and E. K. Tielens (2023), Scale dependency of lidar-derived forest structural diversity, *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.14040.

Au, T. F., J. T. Maxwell, S. M. Robeson, J. Li, S. M. O. Siani, K. Novick, **M. P. Dannenberg**, R. Phillips, T. Li, Z. Chen, and J. Lenoir (2022), Younger trees in the upper canopy layer are more sensitive but also more resilient to drought, *Nature Climate Change*, 12, 1168-1174. doi:10.1038/s41558-022-01528-w.

Wise, E. K. and **M. P. Dannenberg** (2022), Simulating the impacts of changes in precipitation timing and intensity on tree growth, *Geophysical Research Letters*, 49, e2022GL100863. doi:10.1029/2022GL100863.

Dannenberg, M. P., D. Yan, M. L. Barnes, W. K. Smith, M. R. Johnston, R. L. Scott, J. A. Biederman, J. F. Knowles, X. Wang, T. Duman, M. E. Litvak, J. S. Kimball, A. P. Williams, and Y. Zhang (2022), Exceptional heat and atmospheric dryness amplified losses of primary production during the 2020 U.S. Southwest hot drought, *Global Change Biology*, 28(16), 4794-4806. doi:10.1111/gcb.16214.

Wang, X., J. A. Biederman, J. F. Knowles, R. L. Scott, A. J. Turner, **M. P. Dannenberg**, P. Köehler, C. Frankenberg, M. E. Litvak, G. N. Flerchinger, B. E. Law, H. Kwon, S. C. Reed, W. J. Parton, G. A. Barron-Gafford, and W. K. Smith (2022), Satellite solar-induced fluorescence and near-infrared reflectance capture complementary aspects of dryland vegetation dynamics, *Remote Sensing of Environment*, 270, 112858. doi:10.1016/j.rse.2021.112858

Zhang, J., Y. Zhang, G. Sun, C. Song, **M. P. Dannenberg**, J. Li, N. Liu, K. Zhang, and Q. Zhang (2021), Vegetation greening significantly reduced the capacity of water supply to China's South-North Water Diversion Project, *Hydrology and Earth System Sciences*, 25(10), 5623-5640. doi:10.5194/hess-25-5623-2021.

Zhang, Y., C. Song, T. Hwang, K. Novick, J. Coulston, J. Vose, **M. P. Dannenberg**, C. Hakkenberg, J. Mao, and C. Woodcock (2021), Land cover change-induced decline in terrestrial gross primary production over the conterminous United States from 2001 to 2016, *Agricultural and Forest Meteorology*, 308-309, 108609. doi:10.1016/j.agrformet.2021.108609.

Dannenberg, M. P. (2021), Modeling tree radial growth in a warming climate: Where, when, and how much do potential evapotranspiration models matter?, *Environmental Research Letters*, 16, 084017. doi:10.1088/1748-9326/ac1292.

Norton, C. L., **M. P. Dannenberg**, D. Yan, C. Wallace, J. Rodriguez, S. M. Munson, W. J. D. van Leeuwen, and W. K. Smith (2021), Climate and socioeconomic factors drive irrigated agriculture dynamics in the lower Colorado River Basin, *Remote Sensing*, 13(9), 1659. doi:10.3390/rs13091659.

Dannenberg, M. P., W. K. Smith, Y. Zhang, C. Song, D. N. Huntzinger, and D. J. P. Moore (2021), Large-scale reductions in terrestrial carbon uptake following central Pacific El Niño, *Geophysical Research Letters*, 48(7), e2020GL092367. doi:10.1029/2020GL092367.

Zhang, F., J. A. Biederman, **M. P. Dannenberg**, D. Yan, S. Reed, and W. K. Smith (2021), Five decades of observed daily precipitation reveal longer and more variable drought events across much of the western United States, *Geophysical Research Letters*, 48(7), e2020GL092293. doi:10.1029/2020GL092293.

Wang, X., **M. P. Dannenberg**, D. Yan, M. O. Jones, J. S. Kimball, D. J. P. Moore, W. J. D. van Leeuwen, K. Didan, and W. K. Smith (2020), Globally consistent patterns of asynchrony in the

phenology of optical, microwave, and fluorescence satellite data, *Journal of Geophysical Research: Biogeosciences*, 125, e2020JG005732. doi:10.1029/2020JG005732.

Dannenberg, M. P., X. Wang, D. Yan, and W. K. Smith (2020), Phenological characteristics of global ecosystems based on optical, fluorescence, and microwave remote sensing, *Remote Sensing*, 12(4), 671. doi:10.3390/rs12040671. [*Invited paper for special issue on Remote Sensing of Vegetation Phenology*]

Dannenberg, M. P., C. Song, E. K. Wise, N. Pederson, and D. A. Bishop (2020), Delineating environmental stresses to primary production of U.S. forests from tree rings: Effects of climate seasonality, soil, and topography, *Journal of Geophysical Research: Biogeosciences*, 125, e2019JG005499. doi:10.1029/2019JG005499.

Hakkenberg, C. R., **M. P. Dannenberg**, C. Song, and G. Vinci (2020), Automated continuous fields prediction from Landsat time series: Application to fractional impervious cover, *IEEE Geoscience and Remote Sensing Letters*, 17(1), 132-136. doi:10.1109/LGRS.2019.2915320.

Smith, W. K.[1], **M. P. Dannenberg**[1], D. Yan, S. Herrmann, M. L. Barnes, G. A. Barron-Gafford, J. A. Biederman, S. Ferrenberg, A. M. Fox, A. R. Hudson, J. F. Knowles, N. MacBean, D. J. P. Moore, P. L. Nagler, S. C. Reed, W. A. Rutherford, R. L. Scott, X. Wang, and J. Yang (2019), Remote sensing of dryland ecosystem structure and function: Progress, challenges, and opportunities, *Remote Sensing of Environment*, 233, 111401. doi:10.1016/j.rse.2019.111401. [*Invited paper for 50th anniversary special issue*]

Dannenberg, M. P., E. K. Wise, and W. K. Smith (2019), Reduced tree growth in the semiarid United States due to asymmetric responses to intensifying precipitation extremes, *Science Advances* 5(10), eaaw0667. doi:10.1126/sciadv.aaw0667.

Zhang, Y., **M. P. Dannenberg**, T. Hwang, and C. Song (2019), El Niño–Southern Oscillation-induced variability of terrestrial gross primary production during the satellite era, *Journal of Geophysical Research: Biogeosciences* 124(8), 2419-2431. doi:10.1029/2019JG005117.

Wise, E. K. and **M. P. Dannenberg** (2019), Climate factors leading to asymmetric extreme capture in the tree-ring record, *Geophysical Research Letters* 46, 3408-3416. doi:10.1029/2019GL082295.

Hakkenberg, C. R., **M. P. Dannenberg**, C. Song, and K. B. Ensor (2019), Characterizing annual land cover change dynamics in Greater Houston from 1997 to 2017 using Landsat imagery, *International Journal of Remote Sensing* 40(2), 693-718. doi:10.1080/01431161.2018.1516318.

Dannenberg, M. P., C. Song, and C. R. Hakkenberg (2018), A long-term, consistent land cover history of the southeastern United States, *Photogrammetric Engineering and Remote Sensing* 84(9), 559-568. doi:10.14358/PERS.84.9.559.

Tucker, C., D. Yan, **M. Dannenberg**, S. Reed, and W. Smith (2018), Science at the frontier: multi-method research to evaluate ecosystem change across multiple scales, *New Phytologist* 218(4), 1318-1320. doi:10.1111/nph.15195.

Dannenberg, M. P., E. K. Wise, M. Janko, T. Hwang, and W. K. Smith (2018), Atmospheric teleconnection influence on North American land surface phenology, *Environmental Research Letters* 13(3), 034029. doi:10.1088/1748-9326/aaa85a.

Dannenberg, M. P. and E. K. Wise (2017), Shifting Pacific storm tracks as stressors to ecosystems of western North America, *Global Change Biology* 23(11), 4896-4906. doi:10.1111/gcb.13748.

[1] Smith and Dannenberg contributed equally

Wise, E. K. and **M. P. Dannenberg** (2017), Reconstructed storm tracks reveal three centuries of changing moisture delivery to North America, *Science Advances* 3, e1602263. doi:10.1126/sciadv.1602263.

Dannenberg, M. P., C. R. Hakkenberg, and C. Song (2016), Consistent classification of Landsat time series with an improved automatic adaptive signature generalization algorithm, *Remote Sensing* 8(8), 691. doi:10.3390/rs8080691.

Dannenberg, M. P. and E. K. Wise (2016), Seasonal climate signals from multiple tree-ring metrics: a case study of *Pinus ponderosa* in the upper Columbia River basin, *Journal of Geophysical Research: Biogeosciences* 121, 1178-1189. doi:10.1002/2015JG003155.

Wise, E. K., M. L. Wrzesien, **M. P. Dannenberg**, and D. L. McGinnis (2015), Cool-season precipitation patterns associated with teleconnection interactions in the United States, *Journal of Applied Meteorology and Climatology* 54(2), 494-505. doi:10.1175/JAMC-D-14-0040.1.

Dannenberg, M. P., C. Song, T. Hwang, and E. K. Wise (2015), Empirical evidence of El Niño—Southern Oscillation influence on land surface phenology and productivity in the western United States, *Remote Sensing of Environment* 159, 167-180. doi:10.1016/j.rse.2014.11.026.

Wise, E. K. and **M. P. Dannenberg** (2014), Persistence of pressure patterns over North America and the North Pacific since AD 1500, *Nature Communications* 5, 4912. doi:10.1038/ncomms5912.

Dannenberg, M. P. and E. K. Wise (2013), Performance of climate field reconstruction methods over multiple seasons and climate variables, *Journal of Geophysical Research: Atmospheres* 118(17), 9595-9610. doi:10.1002/jgrd.50765.

Song, C., **M. P. Dannenberg**, and T. Hwang (2013), Optical remote sensing of terrestrial ecosystem primary productivity, *Progress in Physical Geography* 37(6), 834-854. doi:10.1177/0309133313507944. [*Invited paper*]

BOOK CHAPTERS

Song, C., J. M. Chen, T. Hwang, A. Gonsamo, H. Croft, Q. Zhang, **M. Dannenberg**, Y. Zhang, C. Hakkenberg, and J. Li (2015), Ecological characterization of vegetation using multi-sensor remote sensing in the solar reflective spectrum, in *Remote Sensing Handbook, Volume 2: Land Resources Monitoring, Modeling, and Mapping*, edited by P. S. Thenkabail, pp. 533-575, CRC Press, Boca Raton, FL.

OTHER PUBLICATIONS AND DATA CONTRIBUTIONS

Dannenberg, M. P., M. L. Barnes, W. K. Smith, M. R. Johnston, S. K. Meerdink, X. Wang, R. L. Scott, and J. A. Biederman (2022), Monthly 0.05° gross primary production, net ecosystem exchange, and evapotranspiration estimates for western U.S. drylands, *Iowa Research Online*. doi:10.25820/data.006185.

Lee, C. C. and **M. P. Dannenberg** (2022), Air masses and tree rings, *Mendeley Data*, v1. doi:10.17632/5s5xykzwyd.1.

Dannenberg, M. P., X. Wang, D. Yan, and W. K. Smith (2019), Global 0.5 degree phenoregions from satellite NDVI, solar-induced fluorescence, and vegetation optical depth, *Mendeley Data*, v1. doi:10.17632/k35ry274gv.1.

Wise, E. K. and **M. P. Dannenberg** (2017), North American/North Pacific 300 Year Reconstructed Cool-Season Storm Tracks. National Centers for Environmental Information, NESDIS, NOAA, U.S. Department of Commerce, https://www.ncdc.noaa.gov/paleo/study/22198.

Dannenberg, M. P. (2017), *Environmental Limitations to Forest Growth and Productivity in North America*, Ph.D. Thesis, Department of Geography, University of North Carolina at Chapel Hill.

Dannenberg, M., C. Hakkenberg, and C. Song (2017), Automatic Adaptive Signature Generalization in R, *Mendeley Data*, v2. doi:10.17632/s7c3vfr84w.2.

Wise, E. K. and **M. P. Dannenberg** (2015), North America-North Pacific 500 hPa Geopotential Height Reconstruction. National Centers for Environmental Information, NESDIS, NOAA, U.S. Department of Commerce, Contribution #noaa-recon-19103, https://www.ncdc.noaa.gov/paleo/study/19103.

Dannenberg, M. P. (2013), *Empirical Evidence for the Association of El Niño—Southern Oscillation with Terrestrial Vegetation Dynamics in the Western United States*, M.A. Thesis, Department of Geography, University of North Carolina at Chapel Hill.

GRANTS AND FELLOWSHIPS

2022 – 24	*RII Track-4: NSF: Amplification of drought effects on vegetation by anthropogenic warming*, Established Program to Stimulate Competitive Research (EPSCoR), National Science Foundation (NSF), PI: Matthew P. Dannenberg ($220,480).
2022	*Responses of bur oak photosynthetic capacity to rainfall amount and variability*, Iowa Center for Research by Undergraduates, University of Iowa, PI: Matthew P. Dannenberg; Co-Is: Susan Meerdink, Emmeline Kraus ($2,500).
2021 – 22	*A hard rain's gonna fall: Responses of Iowa's bur oak to increased precipitation variability*, Interdisciplinary, Scalable Solutions for a Sustainable Future (ISSSF) Project, Office of Sustainability and the Environment, University of Iowa, PI: Matthew P. Dannenberg; Co-Is: Susan Meerdink, Mary Skopec, Adam Skibbe ($35,497).
2021	*Sensitivity of white oak growth to past climate variability in eastern and central Iowa*, Iowa Center for Research by Undergraduates, University of Iowa, PI: Matthew P. Dannenberg; Co-I: Greg Eckley ($2,500).
2020 – 23	*Leveraging SMAP soil moisture and multi-source Earth observations to quantify variability and drivers of global dryland carbon and water fluxes*, National Aeronautic and Space Administration (NASA), PI: Matthew P. Dannenberg; Co-Is: Mallory L. Barnes, William K. Smith; Collaborators: Joel Biederman, Russell Scott, John Kimball, Dong Yan, Xian Wang. ($502,893).
2020 – 23	*Collaborative Research: Multi-century perspectives on current and future flow in the Lower Missouri River Basin*, Paleo Perspectives on Climate Change (P2C2), National Science Foundation (NSF), Lead PI: Erika K. Wise; Co-PIs: Matthew P. Dannenberg, Connie Woodhouse, Edward R. Cook. (UI Portion: $177,382).
2020	*Contributions of anthropogenic warming to drought-induced loss of vegetation health*, Public Policy Center, University of Iowa, PI: Matthew P. Dannenberg ($6,000).
2019 – 21	*Once and future forests: Exploring divergent responses of Douglas-fir and limber pine to recent climate change in the central Rocky Mountains*, Center for Global and Regional Environmental Research, University of Iowa, PI: Matthew P. Dannenberg ($30,000).
2016	Graduate Student Transportation Grant, Graduate School of UNC-Chapel Hill
2016	Student Travel Award, U.S. Regional Association of the International Association for Landscape Ecology

2015 – 16 *Estimating terrestrial primary production through integration of remote sensing and dendrochronology*, Dissertation Completion Fellowship, UNC-Chapel Hill, PI: Matthew P. Dannenberg ($26,237).

2015 Dissertation Research Grant, American Association of Geographers, PI: Matthew P. Dannenberg, $1,000.

2015 Seed Research Award, Dept. of Geography, UNC-Chapel Hill, PI: Matthew P. Dannenberg, $950.

2015 Future Faculty Fellowship Program, Center for Faculty Excellence, UNC-Chapel Hill, $450.

2014 *Seasonal tree growth and satellite vegetation indices: A case study in eight ponderosa pine forests in the Columbia River Basin, Washington, USA*, DigitalGlobe Foundation Award, American Society of Photogrammetry and Remote Sensing (ASPRS).

2014 The Ed and Carol Smithwick Summer Research Fellowship, UNC-Chapel Hill, $4,000.

SCHOLARLY PRESENTATIONS

INVITED ACADEMIC SEMINARS AND COLLOQUIA

2022 "Have you ever seen the rain: Drought and (semi)arid ecosystem function in a warmer and more variable world," Department of Geographical and Sustainability Sciences, University of Iowa, Iowa City, IA (4 February 2022).

2021 "Climate change, extreme events, and the functioning of water-limited ecosystems," Department of Geography, Kent State University, Kent, OH (3 December 2021).

2021 "Contributions of anthropogenic warming to drought-induced loss of vegetation health," Public Policy Center, University of Iowa, Iowa City, IA (2 February 2021).

2020 "Once and future forests: Responses of terrestrial ecosystems to changes in hydroclimatic variability," Department of Biology, University of Iowa, Iowa City, IA (28 February 2020).

2018 "Ocean-atmosphere influence on North American ecosystems: patterns and predictability," School of Geography and Development, University of Arizona, Tucson, AZ (30 March 2018).

2018 "Responses of North American vegetation to coupled ocean-atmosphere circulation patterns," Department of Geography, Indiana University, Bloomington, IN (22 January 2018).

2018 "Linking ecosystem processes to oceanic and atmospheric circulation: patterns and predictability," Department of Geographical and Sustainability Sciences, University of Iowa, Iowa City, IA (18 January 2018).

2017 "Once and future storm tracks: A geospatial perspective on the atmospheric drivers of vegetation activity," Department of Geography, University of British Columbia, Vancouver BC, Canada (31 October 2017).

2017 "Environmental stresses to forest growth in the United States," Laboratory of Tree-Ring Research, University of Arizona, Tucson, AZ (11 October 2017).

2017 "Remote sensing perspectives on climate, water, and vegetation in North American ecosystems," Department of Geography and Geographic Information Science, University of Illinois, Urbana-Champaign, IL (17 January 2017).

2013 "Meter-scale urban land cover mapping for EPA EnviroAtlas in Tampa and Phoenix: overview of remote sensing methods," Landscape Characterization Branch, U.S. Environmental Protection Agency, Research Triangle Park, NC.

INVITED CONFERENCE TALKS

2021 "Reduced tree growth in the semiarid United States due to asymmetric responses to intensifying precipitation extremes," *Annual Meeting of the American Association of Geographers*. (presented virtually due to COVID-19)

2020 "Anthropogenic contributions to reduced solar-induced fluorescence during the severe 2012-2015 U.S. West Coast drought," *Ecological Society of America Annual Meeting*, Salt Lake City, UT. (presented virtually due to COVID-19)

2019 "Large-scale reductions in terrestrial carbon uptake due to central Pacific El Niño revealed by remote sensing and land surface models," *American Geophysical Union Fall Meeting*, San Francisco, CA.

INVITED WEBINARS

2022 "Exceptional heat and atmospheric dryness amplified losses of primary production during the 2020 U.S. Southwest hot drought," AmeriFlux AMP Year of Water Fluxes Webinar – Water Limitations on ET (27 April 2022). (virtual webinar)

2022 "Modeling dryland carbon and water fluxes with a machine learning fusion of optical, thermal, and microwave remote sensing," Grass-Cast Productivity Forecasting Science Team, Earth Dynamics Observatory, University of Arizona, Tucson, AZ (17 March 2022). (virtual webinar)

2021 "Carbon cycle responses to the 2020 western U.S. drought," NASA Soil Moisture Active Passive (SMAP) DAART/ST (2 June 2021). (virtual webinar)

CONTRIBUTED CONFERENCE TALKS

2022 "Upscaling dryland carbon and water fluxes with artificial neural networks of optical, thermal, and microwave remote sensing," *American Geophysical Union Fall Meeting*, Chicago, IL.

2022 "Exceptional heat and atmospheric dryness amplified losses of primary production during the 2020 U.S. Southwest drought," *Ecological Society of America Annual Meeting*, Montréal, Quebec, Canada.

2021 "Modeling tree radial growth in a warming climate: Where, when, and how much do potential evapotranspiration models matter?" *American Geophysical Union Fall Meeting*, New Orlean, LA. (presented virtually)

2020 "Reduced tree growth in the semiarid United States due to asymmetric responses to intensifying precipitation extremes," *European Geophysical Union General Assembly*, Vienna, Austria. (presented virtually due to COVID-19)

2019 "Reduced tree growth in the United States due to asymmetric responses to intensifying precipitation extremes," *Ecological Society of America Annual Meeting*, Louisville, KY.

2019 "A long-term, consistent land cover history of the southeastern United States based on automatic adaptive signature generalization and multi-temporal Landsat imagery," *Annual Meeting of the American Association of Geographers*, Washington, DC.

2016 "Environmental stresses recorded in tree rings: development and evaluation of a continental-scale index of environmental limitations to plant growth," *Annual Symposium of the US Regional Association of the International Association for Landscape Ecology*, Asheville, NC.

2014 "Empirical evidence of the El Niño – Southern Oscillation influencing variability in land surface phenology and productivity in the western United States," *Annual Meeting of the Association of American Geographers,* Tampa, FL.

CONTRIBUTED CONFERENCE POSTERS

2018 "Atmospheric teleconnection influence on North American land surface phenology," *American Geophysical Union Fall Meeting*, Washington, DC.

2017 "Recent responses of western North American forests and hydroclimate to Pacific storm track position and intensity," *American Geophysical Union Fall Meeting*, New Orleans, LA.

2017 "Tree rings reveal climate and land surface constraints on primary production at the continental scale," *Annual Meeting of the American Association of Geographers*, Boston, MA.

2016 "Ecosystem responses to Pacific storm track variability," *American Geophysical Union Fall Meeting*, San Francisco, CA.

2016 "Consequences of midlatitude Pacific storm track variability for ecosystems of western North America," *Mountain Climate Conference (MtnClim)*, Leavenworth, WA.

2015 "An improved Automatic Adaptive Signature Generalization (AASG) algorithm for land-cover classification of Landsat image time series," *Annual Meeting of the Association of American Geographers,* Chicago, IL.

2015 "Seasonal climate signals in multiple tree-ring parameters: a pilot study of *Pinus ponderosa* in the Columbia River Basin," *2nd Annual UNC Climate Change Symposium*, Chapel Hill, NC.

2014 "Seasonal climate signals in multiple tree-ring parameters: a pilot study of *Pinus ponderosa* in the Columbia River Basin," *American Geophysical Union Fall Meeting*, San Francisco, CA.

2013 "Differences in land surface phenology and primary productivity in the western United States during El Niño and La Niña events from 2000-2012," *American Geophysical Union Fall Meeting,* San Francisco, CA.

2012 "Variations in performance of tree ring-based paleoclimate field reconstruction methods over multiple climate parameters," *American Geophysical Union Fall Meeting*, San Francisco, CA.

2012 "Effects of El Niño-Southern Oscillation on primary production in the western United States," *Annual Symposium of the US Regional Association of the International Association for Landscape Ecology*, Newport, RI.

2012 "Climate field reconstruction methods for synoptic dendroclimatology," *Annual Meeting of the Association of American Geographers*, New York, NY.

TEACHING

UNIVERSITY OF IOWA

Instructor of Record

GEOG:1020: The Global Environment (Spring 2020, Spring 2021, Spring 2022)
GEOG:2310: Introduction to Climatology (Fall 2019, Fall 2020, Fall 2021, Fall 2022)
GEOG:3315/5315: Ecosystem Ecology (Fall 2020, Fall 2022)
GEOG:4310: Climate Change (Spring 2023)
GEOG:4470: Ecological Climatology (Spring 2020, Fall 2021)
GEOG:6300: Seminar in Environment, Conservation and Land Use (Spring 2019)
GEOG:7000: Geography Colloquium (Fall 2019, Spring 2020)

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Future Faculty Fellow

GEOG 110: The Blue Planet: An Introduction to Earth's Environmental Systems (Fall 2015)

Graduate Research Consultant

GEOG 89: Climate Change and the Media (Spring 2016)
GEOG 110: The Blue Planet: An Introduction to Earth's Environmental Systems (Fall 2016)
GEOG 414: Climate Change (Spring 2015)

Graduate Teaching Assistant

GEOG 477: Introduction to Remote Sensing (Fall 2011)

SERVICE AND PROFESSIONAL ACTIVITIES

SERVICE TO DISCIPLINE

Member, NASA Soil Moisture Active-Passive (SMAP) Science Team, 2020-present.

Panelist, NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) program, 2022.

Panelist, NASA Modeling, Analysis, and Prediction (MAP) program, 2021.

Panelist, NSF Geography and Spatial Sciences (GSS) program, Doctoral Dissertation Research Improvement (DDRI) grant, 2020.

Co-Convener and Co-Chair, "Dryland Carbon, Water, and Energy Cycling in a Changing World," American Geophysical Union Fall Meeting, 12-16 December 2022, Chicago, IL.

Organizer and Chair, "Automating land cover change analyses of multi-temporal satellite imagery," Annual Meeting of the American Association of Geographers, 3-7 April 2019, Washington, DC.

Convener, Chair and OSPA Liaison, "B43A: Integrated Understanding of Climate, Carbon, Nutrient Cycles, Human Activities, and their Interactions in Terrestrial Ecosystems," American Geophysical Union Fall Meeting, 10-14 December 2018, Washington, DC.

Judge, Outstanding Student Paper Awards, American Geophysical Union Fall Meeting.
11-15 December 2017, New Orleans, LA
10-14 December 2018, Washington, DC

Editorial board: *Transactions in Earth, Environment & Sustainability*

Ad hoc grant reviews: NSF Human-Environment and Geographical Sciences (HEGS)

Ad hoc manuscript reviews: *Agricultural and Forest Meteorology* (2), *Biogeosciences, Climate of the Past, Climate Research, Climatic Change, Earth System Science Data, Earth's Future, Ecological Indicators, Ecology Letters, Forest Ecology and Management, Geophysical Research Letters* (2), *The Holocene* (2), *Hydrological Processes, International Journal of Climatology, Journal of Geophysical Research: Biogeosciences* (3), *International Journal of Remote Sensing* (3), *Journal of Applied Remote Sensing, Nature Communications, Progress in Physical Geography, Remote Sensing, Remote Sensing of Environment* (3), *Science of the Total Environment*

SERVICE TO DEPARTMENT AND UNIVERSITY

University of Iowa

Undergraduate Program Committee, Dept. of Geographical and Sustainability Sciences, 2022-present
DEI Committee, Dept. of Geographical and Sustainability Sciences, 2022-present
Environmental Science Advisory Board, 2021-present
Executive Committee, Dept. of Geographical and Sustainability Sciences, 2019-2022
Seed Grant reviewer, Center for Global and Regional Environmental Research, 2019, 2020, 2021, 2022
Faculty Assembly, College of Liberal Arts and Sciences, 2019-2020
Visiting Assistant Professor Search Committee, Dept. of Geographical and Sustainability Sciences, 2019
Graduate Program Committee, Dept. of Geographical and Sustainability Sciences, 2019-2022
Kohn Colloquium Coordinator, Dept. of Geographical and Sustainability Sciences, 2019-2020

University of North Carolina

Faculty Committee Representative, Graduate Association of Geography Students, 2014-2016.
Technology Committee Representative, Graduate Association of Geography Students, 2014-2015.
Senator, Graduate and Professional Student Federation, 2014.
Secretary, Graduate Association of Geography Students, 2013-2014.
Technology Committee Representative, Graduate Association of Geography Students, 2012-2013.

PROFESSIONAL SOCIETY MEMBERSHIPS

American Association of Geographers (since 2012)
American Geophysical Union (since 2012)
Ecological Society of America (since 2019)
European Geophysical Union (since 2020)