

KAREN E. KING

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University of Tennessee
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Knoxville, TN 37916

E-mail:

PROFESSIONAL PREPARATION

- Ph.D. Geography, University of Idaho, May 2022
Dissertation title: *Blue Intensity-based temperature proxy network for temperate North America.*
- M.S. Applied Ecology and Conservation Biology, Frostburg State University, December 2017.
Thesis title: *Dendrochronological analysis of old-growth forest on Dans Mountain, Allegany County, Maryland.*
- B.S. Ethnobotany, Frostburg State University, May 2016.

APPOINTMENTS

Assistant Professor Department of Geography and Sustainability, University of Tennessee
Knoxville
2023-present

Postdoctoral Research Scientist Columbia University's Lamont-Doherty Earth Observatory
2022–2023

Graduate Research Assistant Department of Geography, University of Idaho
2020–2022

Graduate Teaching Assistant Department of Geography, University of Idaho
2018–2020

Graduate Teaching Assistant Department of Biology, Frostburg State University
2016–2017

OTHER RELEVANT PROFESSIONAL EXPERIENCE

<i>Fire and Fuels Technician</i> 2019-2020	USDA Forest Service, Dixie National Forest, Cedar City, Utah.
<i>Forestry Technician</i> 2017-2018	Maryland Department of Natural Resources, Cumberland, Maryland.
<i>Wildland Firefighter</i> 2014-2020	Maryland Department of Natural Resources- Forestry/Interagency, Annapolis, Maryland.

PUBLICATIONS (PEER-REVIEWED)

2023

- [16] **Karen J. Heeter**, Grant L. Harley, John T. Abatzoglou, Kevin J. Anchukaitis, Edward R. Cook, Bethany L. Coulthard, Laura A. Dye, and Inga K. Homfeld. Unprecedented 21st century heat across Pacific Northwest, North America, *npj Climate and Atmospheric Science*. <https://doi.org/10.1038/s41612-023-00340-3>
- [15] Grant L. Harley, Matthew D. Therrell, Justin T. Maxwell, Arvind Bhuta, Joshua C. Bregy, **Karen J. Heeter**, Thomas Patterson et al. The Longleaf Tree-Ring Network: Reviewing and expanding the utility of *Pinus palustris* Mill. Dendrochronological data. *Progress in Physical Geography: Earth and Environment*. <https://doi.org/10.1177/03091333221147652>
- [14] Meagen L. Rochner, Thomas W. Patterson, **Karen J. Heeter**, and Grant L. Harley. Increased Growth Synchrony of Red Spruce in Response to Acid Deposition Recovery and Climate Change across its Southern Range Extent, Southeastern USA. *Southeastern Geographer*.

2022

- [13] **Karen J. Heeter**, Ryszard J. Kaczka, Daniel J. King, and Grant L. Harley. Measuring blue intensity with the CooRecorder software application, *Dendrochronologia*. <https://doi.org/10.1016/j.dendro.2022.125999>
- [12] Justin T. Maxwell, Grant L. Harley, Clay S. Tucker, Toudora Galuska, Darren L. Ficklin, Joshua C. Bregy, **Karen J. Heeter et al.** "1,100-Year Reconstruction of Baseflow for the Santee River, South Carolina, USA Reveals Connection to the North Atlantic Subtropical High." *Geophysical Research Letters*. <https://doi.org/10.1029/2022GL100742>
- [11] Joshua C. Bregy, Justin T. Maxwell, Scott M. Robeson, Grant L. Harley, Emily A. Elliott, and **Karen J. Heeter**. "US Gulf Coast tropical cyclone precipitation influenced by volcanism and the North Atlantic subtropical high." *Communications Earth & Environment*. <https://doi.org/10.1038/s43247-022-00494-7>

2021

- [10] **Karen J. Heeter**, Grant L. Harley, Justin T. Maxwell, Robert J. Wilson, John T. Abatzoglou, Shelly A. Rayback, Maegen L. Rochner, Katherine A. Kitchen. Tree-ring blue intensity-based temperature reconstructions for the low-to-mid latitude temperate zones of western North America, *Quaternary Science Reviews*, <https://doi.org/10.1016/j.quascirev.2021.107064>
- [9] Daniel J. King, Grant L. Harley, Justin T. Maxwell, **Karen J. Heeter**, Ben Vandermyde, Robert Cosgriff. 20th century decline of *Carya illinoensis* (Wangenh.) K. Koch (northern pecan) at its northern latitudinal range margin, Upper Mississippi River System, USA, *Forest Ecology and Management*, <https://doi.org/10.1016/j.foreco.2021.119454>

- [8] Thomas W. Patterson, Grant L. Harley, David H. Holt, Raymond T. Doherty, Daniel J. King, **Karen J. Heeter**, Ashley L. Chasez, Alyssa C. Crowell, and Ian M. Stewart. Latewood ring width reveals CE 1734 felling dates for Wlaker House timbers in Tupelo, Mississippi, USA, *Forests*, <https://doi.org/10.3390/f12060670>
- [7] Maegen L. Rochner, **Karen J. Heeter**, Grant L. Harley, Matthew F. Bekker, Sally P. Horn. Climate-induced treeline mortality during the termination of the Little Ice Age in the Greater Yellowstone Ecoregion, USA, *The Holocene*, <https://doi.org/10.1177/09596836211011656>
- [6] **Karen J. Heeter**, Maegen L. Rochner, Grant L. Harley. 1,250 years of summer air temperature for the Greater Yellowstone Ecoregion (770-2019 CE), *Geophysical Research Letters*, <https://doi.org/10.1029/2020GL092269>
- [5] Brittany Rinaldi, R. Stockton Maxwell, Thomas Callahan, Rebecca Brice, **Karen J. Heeter**, and Grant L. Harley. Climate and ecological disturbance analysis of Engelmann spruce and Douglas fir in the Greater Yellowstone Ecosystem, *Trees, Forests, and People*, <https://doi.org/10.1016/j.tfp.2020.100053>

2020

- [4] Grant L. Harley, **Karen J. Heeter**, Justin T. Maxwell, Shelly A. Rayback, R. Stockton Maxwell, Ty E. P. Reinemann, and Alan Taylor. Towards broad-scale, long-term temperature reconstructions for Eastern North America using blue light intensity from tree rings, *International Journal of Climatology*, <https://doi.org/10.1002/joc.6910>
- [3] **Karen J. Heeter**, Grant L. Harley, Justin T. Maxwell, James H. McGee, and Trevis T. Matheus. Late summer temperature variability for the Southern Rocky Mountains (USA) since 1735 CE: applying blue light intensity to low-latitude *Picea engelmannii* Parry ex Engelm., *Climatic Change*, <https://doi.org/10.1007/s10584-020-02772-9>

2019

- [2] **Karen J. Heeter**, Grant L. Harley, Saskia L. van de Gevel, and Philip B. White. Blue intensity as a temperature proxy in the eastern United States: a pilot study from a low latitude population of *Picea rubens* (Sarg.), *Dendrochronologia* 55: 105–109, <https://doi.org/10.1016/j.dendro.2019.04.010>
- [1] **Karen J. Heeter**, Sunshine L. Brosi, Gwenda L. Brewer. Dendroecological Analysis of Xeric, Upland, Quercus-Dominated Old-Growth Forest within the Ridge and Valley Province of Maryland, USA. *Natural Areas Journal* 39.3: 319-332, <https://doi.org/10.3375/043.039.0304>

IN REVIEW

Karen E. King, Edward R. Cook, Kevin J. Anchukaitis, Benjamin I. Cook, Jason E. Smerdon, Richard Seager, Grant L. Harley, and Benjamin Spei. The increasing prevalence of hot drought across western North America since the 16th century, *in review*.

Grant L. Harley, R. Stockton Maxwell, Christopher Gentry, R. Justin DeRose, **Karen J. Heeter**, Mathew F. Bekker, and Joey Pettit. Was the 16th century fire-temperature-drought nexus foreshadowing for the Greater Yellowstone Ecosystem? *in review*.

Grant L. Harley, Kristine L. DeLong, Carl A. Reese, Samuel Bentley, Kehui Xu, Suyapa Gonzalez, Jonathan Troung, **Karen J. Heeter**, and Alicia Caporaso. Rapid decline and mortality of a Pleistocene-aged submerged *Taxodium distichum* forest in the northern Gulf of Mexico, *in review*.

RESEARCH SUPPORT

PI *Principal investigator*

RESEARCH SUPPORT: ONGOING

Millennium-Length Temperature Records from Tree Rings in Semi-Arid Utah and New Mexico for the Study of Past Summer Temperature Effects on the Development of Megadroughts, Role: PI, Duration: 2022-2024. Lamont Doherty Earth Observatory Climate Center. **\$10,584**.

RESEARCH SUPPORT: COMPLETED

Lamont-Doherty Earth Observatory Postdoctoral Research Fellowship: A spatial field reconstruction approach to assessing the influence of temperature on North American megadrought conditions, Role: PI, Duration: 2022–2024, Lamont-Doherty Earth Observatory, **\$139,500**.

NSF GSS—Doctoral Dissertation Research: Temperature reconstructions for the United States Intermountain West, Role: Co-PI, Duration: 2019–2021, National Science Foundation—Geography and Spatial Sciences, **\$17,700**.

Mountain Bugbane Preservation through population analysis and outreach materials, Maryland Native Plant Society, Role: Co-PI (PI Sunshine L. Brosi), Duration: 2014-2016 *2014*, **\$1,995**.

Tree Campus USA Sustainability Grant, Frostburg State University, Role: PI, Duration: 2015-2016, **\$2,100**.

President's Advisory Council for Sustainability Grant Request 2016: Forestry Equipment for Research, Frostburg State University, Role: PI, Duration: 2016-2017, **\$800**.

President's Advisory Council for Sustainability Grant Request 2016: Participation and training at North American Dendroecological Field Week 2017, Frostburg State University, Role: PI, Duration: 2016-2017, **\$1,300**.

FY'18 Foundation Opportunity Grant: Presenting Graduate Research at Society for American Foresters National Convention, Frostburg State University, Role: PI, Duration: 2017-2018, **\$610**.

Old-growth forest inventory of western Maryland, Maryland Department of Natural Resources Natural Heritage Service. Role: PI, Duration: 2018-2019, **\$10,000**.

TEACHING EXPERIENCE

GEOG 331—Natural Hazards, Department of Geography and Sustainability, University of Tennessee, Knoxville, Fall 2023

GEOG385—Introductory GIS Primer (laboratory), Department of Geography, University of Idaho, Spring 2020

GEOG100—Introduction to Physical Geography, Department of Geography, University of Idaho, Fall 2019

GEOG100L—Introduction to Physical Geography Laboratory, Department of Geography, University of Idaho, 2018–2019

BIOL405-Dendrology, Department of Biology, Frostburg State University, Fall 2017

BIOL161- General Botany, Frostburg State University, Spring 2016

BIOL149- General Biology, Frostburg State University, Fall 2016

Workshop Co-leader, AmeriDendro 2022, Montréal, Canada, June 2022.

Workshop Co-leader, Southeast Asia Paleo Environments Consortium, Bidoup Nui Ba National Park (BDNP), Lam Dong Province, Vietnam, January 2020.

Group Leader/Facilitator, North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, Wyoming, 2018, 2019, 2021.

Instructor (AmeriCorps Volunteer), K-12 Environmental Education, Evergreen Heritage Center, Mt. Savage, Maryland, 2014-2017.

Academic Tutor (French Language), Frostburg State University, Frostburg, Maryland, 2014-2017.

HONORS AND AWARDS

A.H. Featherstone Award, 2018&2019, Department of Geography, University of Idaho, **\$2,200**.

Harley Johansen Merit Award, 2019, Department of Geography, University of Idaho, **\$1,100**.

Competitive Travel Award, 2018, to present graduate research at the Association of America Geographers annual conference in Washington D.C., University of Idaho, **\$550**.

Society for Economic Botany Annual Meeting Travel Award, 2018, to present graduate research at the Society for Economic Botany’s annual conference in Madison, Wisconsin, National Science Foundation, **\$500**.

Ashland TREX Travel Award, 2018, to participate in a prescribed fire training in Ashland, Oregon, Northwest Fire Science Consortium, **\$300**.

Graduate Student and Least Developed Country Member Travel Award, 2017, to present graduate research at the Society for Economic Botany’s annual conference in Braganca, Portugal, The Society for Economic Botany, **\$1,000**.

Johnson Merit Award, 2016&2017, Frostburg State University, **\$1,500**.

Old Main, Loats Foundarion, and Spahr Merit Awards, 2015&2016, Frostburg State University, **\$5,500**.

OTHER PUBLICATIONS (UNREFEREED) AND REPORTS

- Becky Brice, **Karen J. Heeter**, Andrew Orlemann, Thomas Callahan, Brittany Rinaldi, William Wittebraker, Shayla Otake, Marlaysia Haskell. 2018. An examination of the growth and climate response of multiple co-occurring species at the Stacked Rock site, Absaroka Mountains, WY. Final Report, 28th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, Wyoming, 15 pp.
- Karen J. Heeter**, Sunshine L. Brosi. 2018. Old-growth Forest Inventory of Dans Mountain Wildlife Management Area 2018. Maryland Department of Natural Resources Natural Heritage Service. Technical Report, 50 pp.
- Breeden, C., Doerner, J., **Heeter, K.**, Montañez, C., and Rochner, M. Dendroecological Evaluation of Whitebark Pine as a Facilitator Species on Subalpine Tree Islands, Beartooth Plateau, Wyoming, U.S.A. Final Report, 27th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, Wyoming, 20 pp.
- Karen J. Heeter, Sunshine L. Brosi.** 2017. Dendrochronological Analysis of Old-Growth Forests on Dans Mountain Wildlife Management Area, Allegany County, Maryland, USA. Maryland Department of Natural Resources Natural Heritage Service. Technical Report, 58 pp.
- Karen J. Heeter**, Laura M. Price, Sunshine L. Brosi. 2017. Distinguishing black cohosh from look alikes, *Journal of Medicinal Plant Conservation* 2017(2): 5-7.

INVITED PRESENTATIONS

- Unprecedented 21st century heat across Pacific Northwest, North America.* NASA Goddard Space Flight Center scientific colloquium, 29 November 2023.
- Tree rings and 'hot-drought': a spatial field reconstruction approach to assessing the influence of temperature on North American megadrought conditions.* Harvard Forest, 22 March 2023.
- Tree-rings and temperature: applying novel dendrochronological techniques to improve paleoestimates of temperature variability across North America.* Eastern Washington University, Department of Geography virtual seminar, 10 March 2022.
- Examination of blue intensity methods across the contiguous United States.* International Blue Intensity Network Development Working Group (I-BIND) virtual seminar, 24 November 2021.
- A temperature proxy network for the mid-latitudes of North America derived from tree ring blue intensity.* LTRR Tree-Ring Talk Series, Laboratory of Tree Ring Research, University of Arizona, Tucson, 13 October 2021.
- Towards the North America Paleo-temperature Atlas, a 2.5x2.5° spatial field reconstruction of summer air temperatures.* Biology and Paleo Environment Seminar Series, Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, 4 October 2021.
- Development of blue intensity networks across the continental United States.* Southeast Asia Paleo Environments Consortium, Bidoup Nui Ba National Park, Lam Dong Province, Vietnam, 10 January 2020.
- Prescribed Fire for Ecological Management: Learning and Burning with The Nature Conservancy.* University of Idaho- Student Association for Fire Ecology Meeting, 8 April 2019.
- A 1259-yr reconstruction of summer temperature for the Greater Yellowstone Ecosystem.* 29th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, Wyoming, 27 July 2019.
- Dendrochronological analysis of old-growth forest on Dans Mountain, Allegany County, Maryland.* The Nature Conservancy National Office. Bethesda, Maryland. 9 January 2018.

Western Maryland through the eyes of an old-growth tree: the role of old-growth forests as ecological records. Western Maryland Chapter of the Maryland Native Plant Society. Frostburg, Maryland, 19 October 2017.

PROFESSIONAL PRESENTATIONS

- Karen J. Heeter**, Grant L. Harley, Justin T. Maxwell, Edward R. Cook, Bethany Coulthard, Robert Wilson. Introducing the North America Paleo-temperature Atlas, a Spatial Field Reconstruction of Summer Air Temperature. AmeriDendro 2022 Meeting. Montreal, Canada. 29th, 2022.
- Karen J. Heeter**, Grant L. Harley, Justin T. Maxwell, Edward R. Cook, Bethany Coulthard, Robert Wilson. A spatial field reconstruction of North American summer air temperatures derived from a tree-ring blue intensity network. American Association of Geographers Annual Meeting, Online, February 28th, 2022.
- Karen J. Heeter**, Grant L. Harley, Justin T. Maxwell, Edward R. Cook, Bethany Coulthard, Robert Wilson. Introducing the North America Paleo-temperature Atlas, a 1x1° Spatial Field Reconstruction of Summer Air Temperature. America Geophysical Union Annual Meeting. New Orleans, LA. December 16th, 2021.
- Karen J. Heeter**, Maegen L. Rochner, Grant L. Harley. 1,250 years of summer temperatures for the Greater Yellowstone Ecosystem. H5II High Elevation Five Needle Pines Conference, Missoula, MT. October 5-7th, 2021.
- Karen J. Heeter**, Grant L. Harley. Blue Intensity as a temperature proxy in the eastern United States: A pilot study from a southern disjunct population of *Picea rubens* (Sarg.). Poster presentation at the Association for American Geographers Annual Meeting, Washington D.C., April 3-8th, 2019.
- Karen J. Heeter**. Seasonal Rounds of the Lakota at Wind Cave National Park. Poster presentation at the Society for Economic Botany and Society for Ethnobiology Annual Meeting. Madison, WI. June 3-7th, 2018.
- Karen J. Heeter**. Connecting People with Park Trees and Cultural Events with Climate Change: Dendroecology near Washington, D.C., USA. Poster presentation at the Society for Economic Botany and Society for Ethnobiology Annual Meeting. Madison, WI. June 3-7th, 2018.
- Panel:* Graduate and Professional Careers in Forestry. Allegheny Chapter of Society of American Foresters annual meeting. State College, PA. February 21st, 2018.
- Karen J. Heeter**, Sunshine L. Brosi. Dendrochronological evidence of disturbance dynamics in old-growth forests in Western Maryland. Society of American Foresters National Convention. Albuquerque, NM. November 15th –19th, 2017.
- Karen J. Heeter**, Sunshine L. Brosi. Dendroecological analysis of continued *Quercus* dominance on edaphically extreme southeastern slopes of the Allegheny Front. 2017 White oak Symposium. Knoxville, TN. October 23-26, 2017.
- Karen J. Heeter**, Laura G. Smith, Sunshine L. Brosi. Dendrochronological analysis of old-growth forest and the pre-European cultural landscape of the Appalachian region, USA. Society for Economic Botany 2017 Annual Meeting. Braganza, Portugal. June 5th, 2017.
- Karen J. Heeter**, Sunshine L. Brosi, Gwenda Brewer, James McCann. Dendroecological analysis of old-growth forest on Dans Mountain, Maryland. Poster presentation at FSU Graduate Research Symposium, Frostburg, MD. May 11th, 2017.
- Karen J. Heeter**, Laura G. Smith, Sunshine L. Brosi, James McCann, Dan Feller, Gwenda Brewer. Dendrochronological Analysis to Determine Historic Dominance of Mast-Producing Species: Preliminary Findings. Northeast Association of Fish and Wildlife Agencies Annual Conference. Norfolk, VA. April 11th, 2017.

- Karen J. Heeter**, Laura G. Smith, Sunshine L. Brosi. How old is the old-growth? Dendrochronological Assessments to Protect Unique Appalachian Forest. Appalachian Studies Association Conference. Blacksburg, VA. March 11th, 2017
- Karen E. Johnson**, Laura M. Price, Sunshine L. Brosi, Conservation implications of misidentification among the genus *Actaea* in Western MD. Poster presentation at the Maryland Native Plant Society Annual Meeting. College Park, MD. September 18-19, 2016.
- Karen E. Johnson**, Laura M. Price, Sunshine L. Brosi, Conservation implications of misidentification among the genus *Actaea*. Presentations at the Society for Economic Botany Annual Meeting. Pine Mountain, KY. June 5-9, 2016.
- Karen E. Johnson**, Laura M. Price, Sunshine L. Brosi, Conservation implications of misidentification among the genus *Actaea*. Poster presentations at FSU's College of Liberal Arts and Sciences Undergraduate Research Symposium. Frostburg, MD. May 6, 2016.
- Karen E. Johnson**, Laura M. Price, Sunshine L. Brosi. Tree Campus USA. Presentations at Focus Frostburg. Frostburg, MD. April 20th, 2016.
- Karen E. Johnson**, Sabrina Wasfi, Selena Burke, Jaime Tarnai, Sunshine L. Brosi. What Do Traditional Appalachian Plant-Based Dyes Reveal About Changes in Gender Roles? Poster presentation at FSU's College of Liberal Arts and Sciences Undergraduate Research Symposium. Frostburg, MD. May 1, 2015.

PROFESSIONAL SERVICE AND TRAINING

- 2023 Organizer**, BPE Research Division Seminar Series, Lamont Doherty Earth Observatory
- 2022 Instructor**, Blue Intensity Group, AmeriDendro 2022, Montréal, Canada.
Facilitator/Instructor, Dendroclimatology and Blue Intensity Group, 31st Annual North American Dendroecological Fieldweek, Rapide-Danseur, Quebec, Canada.
Organizer/Chair, virtual session at Association of American Geographers annual meeting. *Frontiers in Dendrochronology* Session.
Committee Member, Department Chair Search Committee, University of Idaho Department of Geography and Geology.
- 2021 Group Co-Leader**, Climatology Group, Longleaf Tree-Ring Network working group
Facilitator/Instructor, Blue Intensity Group, 30th Annual North American Dendroecological Fieldweek, Red Lodge, MT.
- 2020 Committee Member**, Department Chair Search Committee, University of Idaho Department of Geography and Geology.
Group Leader/Facilitator, Blue Intensity and Climatology Group, Southeast Asia Paleo Environments Consortium Fieldweek, Bidoup Nui Ba National Park, Lam Dong Province, Vietnam.
- 2019 Guest Researcher/Facilitator**, Blue Intensity and Dendroclimatology, 29th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, WY.
Co-organizer/Chair, oral session at Association of American Geographers annual meeting. *Dendroecology Sessions*.
Facilitator/Instructor, Firefighter Type 2 trainer, University of Idaho- Student Association for Fire Ecology Chapter Prescribed Fire training. Kissimmee, FL.
- 2018 Group Leader/Facilitator**, Introduction to Dendrochronology Group, 28th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, WY.
Participant, TREX Prescribed Fire Training, Ashland, OR.

- 2017** **Participant**, Dendroecology Group, 27th Annual North American Dendroecological Fieldweek, A.L. Mickelson Field Station, Cody, WY.
Committee Member, Campus Shade Tree Commission, Frostburg State University.
Field Assistant, for “Dendroecology across the C&O Canal National Historic Park”, a project funded by the National Park Service. Summer.
- 2016** **Committee Member**, Campus Shade Tree Commission, Frostburg State University.
Field Assistant, for “Sustainable silviculture: white oak for traditional Cherokee basketry”. Winter and Summer.
Field Assistant, “Oak mast and habitat suitability for Allegheny woodrat, *Neotoma magister*”. Summer.

REVIEWER FOR

National Science Foundation
International Journal of Climatology
Ecography
Geophysical Research Letters
Nature Portfolio- Climate and Atmospheric Science
Journal of Climate

PROFESSIONAL ASSOCIATIONS

American Geophysical Union
American Association of Geographers
 Biogeography Specialty Group
Society for Economic Botany
Student Association for Fire Ecology
Society of American Foresters
American Society of Botanical Artists