Kristen M. Brubaker

Hobart and William Smith Colleges

300 Pulteney Street

Geneva, NY 14456

[brubaker@hws.edu](mailto:brubaker@hws.edu)

315-781-3445

**Education**

**The Pennsylvania State University,** University Park, PA,2007-2011

Ph.D.,School of Forest Resources, Watershed Stewardship option, Dec. 2011

Dissertation Title: *Multi-scale LiDAR-based approaches for characterizing stream networks, surface roughness, and landforms of forest watersheds.*

Advisors: Wayne Myers and Elizabeth Boyer

**Mississippi State University,** Starkville, MS, 2004-2006

M.S. in Geosciences in the Teachers in Geosciences program

**The Pennsylvania State University,** University Park, PA, 1999-2003

B.S. in Secondary Education, Earth and Space Science option

Graduated with Honors from Schreyer Honors College

**Professional Positions**

2018-present Associate Professor of Environmental Studies, Hobart and William Smith Colleges.

2012-2018 Assistant Professor of Environmental Studies. Hobart and William Smith Colleges.

2019 Visiting Research Associate, Earth and Environmental Systems Institute, Penn State University.

2011-2012 Visiting Postdoctoral Fellow in Spatial and Sustainability Science. Dickinson College, Center for Sustainability Education.

2009-2011 Instructor, graduate assistant. Penn State University, School of Forest Resources.

Spring 2009 Adjunct Professor. Susquehanna University, Earth and Environmental Studies.

2007-2010 Research and teaching assistant. Penn State University, School of Forest Resources.

2003-20078th Grade Science Teacher. Bradford Area School District, Bradford, PA.

2001-2002, Summers Hydrology Technician. USDA Forest Service, Rocky Mountain Research Station.

**Undergraduate Teaching**

2012-present **Hobart and William Smith Colleges:**Fundamentals of GIS, Advanced GIS, Intro to Environmental Studies, Group Senior Integrative Experience, FSEM-Sustainable Living and Learning Community, Environmental Science, Environmental Statistics, Achieving Conservation Goals in Australia and Globally

2009-2011 **Penn State University:**Natural Resources GIS, Remote Sensing and Spatial Data Handling

2009 **Susquehanna University:**Introduction to GIS

**Peer Reviewed Publications**

(Underline indicates undergraduate co-author)

*Published*

Styers, D.M., Schafer, J.L., Kolozsvary, M.B., **Brubaker, K.M**., Scanga, S.E., Anderson, L.J., Mitchell, J.J. and Barnett, D., 2021. Developing a flexible learning activity on biodiversity and spatial scale concepts using open‐access vegetation datasets from the National Ecological Observatory Network. Ecology and Evolution. In press.

**Brubaker, K**. and Cosentino, B. 2021. Forest Structure and Biomass in Post‐Agricultural Forests: Lessons Learned with New Spatial Tools. Applied Vegetation Science. In press.

Kaye, J.P., Brantley, S.L. and Zan Williams, J., **the SSHCZO team**. 2019. Ideas and perspectives: Proposed best practices for collaboration at cross-disciplinary observatories. Biogeosciences, 16(23), pp.4661-4669.

**Brubaker, K.**,Q. Johnson, and M. Kaye. 2018. Spatial patterns of tree and shrub biomass in a deciduous forest using leaf-off and leaf-on LiDAR*.* Canadian Journal of Forest Research. 48(9):1020-1033.

Cosentino, B. J., **K Brubaker.** 2018. Effects of land use legacies and habitat fragmentation on salamander abundance. Landscape Ecology. 33(9):1573-1584.

Hall, E., B. Martin, **K. Brubaker**, and C. Grant. 2018. Predatory morphological adaptation in *Micropterus salmoides* (largemouth bass) in response to geographic divergence: Reexamining body morphology using modern technologies. Marine and Freshwater Research. 69(9):1480-1485.

Brantley, S.L., White, T., West, N., Williams, J.Z., Forsythe, B., Shapich, D., Kaye, J., Lin, H., Shi, Y., Kaye, M. and Herndon, E. Davis, K., He, Y., Eissenstat, D., Weitzman, J., DiBiase, R., Reed, W., **Brubaker, K**., Gu, X., 2018. Susquehanna Shale Hills Critical Zone Observatory: Shale Hills in the context of Shaver’s Creek watershed. Vadose Zone Journal, 17(1).

Li, L., DiBiase, R.A., Del Vecchio, J., Marcon, V., Hoagland, B., Xiao, D., Wayman, C., Tang, Q., He, Y., Silverhart, P. and Szink, I., Forsythe, B., Williams, J., Shapich, D., Mount, G., Kaye, J., Guo, L., Lin, H., Eissenstat, D., Dere, A., **Brubaker, K**., Kaye, M., Davis, K., Russo, T., Brantley, S. 2018. The Effect of Lithology and Agriculture at the Susquehanna Shale Hills Critical Zone Observatory. Vadose Zone Journal, 17(1).

Buonaccorsi, V. P., J. Malloy, M. Peterson, **K. Brubaker**, and C. J. Grant. 2017. Landscape genomic analysis of brook trout *Salveninus fontinalis* in Pennsylvania’s Appalachian region. Transactions of the American Fisheries Society 146(3): 485-494.

Brantley, S. L., R. A. DiBiase, T. A. Russo, Y. Shi, H. Lin, K. J. Davis, M. Kaye, L. Hill, J. Kaye, D. M. Eissenstat, B. Hoagland, A. L. Dere, A. L. Neal, **K. M**. **Brubaker**, and D. K.Arthur. 2016. Designing a suite of measurements to understand the critical zone. Earth Surface Dynamics 4: 211-235.

Harpold, A. A., J. A. Marshall, S. W. Lyon, T. B. Barnhart, B. A. Fisher, M. Donovan, **K. M. Brubaker,** C. J. Crosby, N. F. Glenn, C. L. Glennie, P. B. Kirchner, N. Lam, K. D. Mankoff, J. L. McCreight, N. P. Molotch, K. N. Musselman, J. Pelletier, T. Russo, H. Sangireddy, Y. Sjöberg, T. Swetnam, and N. West. 2015. Laser vision: lidar as a transformative tool to advance critical zone science. Hydrology and Earth System Science 12(1): 2881–2897.

Grant, C. J., A. B. Weimer, N. K. Marks, E. S. Perow, J. M. Oster, **K. M. Brubaker**, R. V. Trexler, C. M. Solomon, and R. Lamendella. 2015. Marcellus and mercury: Assessing potential impacts of unconventional natural gas extraction on aquatic ecosystems in northwestern Pennsylvania. Journal of Environmental Science and Health, Part A 50(5): 482-500.

Grant, C. J., J. M. Graves, A. K Lutz, J. M. Oster, and **K. Brubaker**. 2014. What are brook trout hiding? Elevated mercury concentrations in brook trout relative to co-habitating brown trout. In R. F. Carline and C. LoSapio (editors), Looking back and moving forward: Proceedings of the wild trout XI symposium, Bozeman, MT, pp.

119-125.

**Brubaker, K. M.,** S. E. Johnson, J. Brinks, and L. Leites. 2014. Estimating canopy height of deciduous forests at a regional scale with leaf off, low density LiDAR. Canadian Journal of Remote Sensing 40(2): 123-134.

**Brubaker, K**. **M**., W. L. Myers, P. J. Drohan, D. A. Miller, and E. W. Boyer. 2013. The use of LiDAR terrain data in characterizing surface roughness and microtopography. Applied and Environmental Soil Science 2013: 1-13.

Zenner,E. K., J. E. Peck, **K. Brubaker**, B. Gamble, C. Gilbert, D. Heggenstaller, J. Hickey, K. Sitch, and R. Withington. 2010.**Combining ecological classification systems and conservation filters could facilitate the integration of wildlife and forest management. Journal of Forestry** 108(6): 296-300.

*In Review*

Lisa Ma, David Oakley, Andrew Nyblade, Seulgi Moon, Natalie Accardo, Wei Wang, Xin Gu, **Kristen Brubaker**, Gregory J. Mount, Brandon Forsythe, Bradley J. Carr, Susan L. Brantley. In review. Seismic imaging of a shale landscape under compression shows limited influence of topography-induced fracturing. Geophysical Research Letters.

**Reports/non-peer reviewed publications**

**Brubaker, K.,** and the SSHCZO team. Etrail guide, Critical Zone Science at Shaver’s Creek Environmental Center. ibook. 2019.

**Brubaker, K.,** L. Leites, S. Johnson, and J. Brinks. 2014. Determining the accuracy of LiDAR-derived dominant

treeheight in Pennsylvania State forests. . PA Department of Conservation of Natural Resources, Bureau of Forestry.

Golden, D. and **K. Brubaker.** 2012. Agroforestry on the Dickinson College Farm. Center for Sustainability Education, Dickinson College.

Sherwin, L. S., **K. Brubaker**, P. Sharpe, J. Kozak, M. May, A. Lashaway, K. Jensen, and K. L. Gordon. 2013. Valley Forge National Historical Park Natural resource condition assessment. Natural Resource Report NPS/VAFO/NRR—2013/737. National Park Service, Fort Collins, CO.

Sherwin, L. S., **K. Brubaker, K,** J. Kozak, A. Lashaway, K. Gordon, L. Iavorivska. 2009. Upper Bald Eagle Creek Watershed Assessment. Center for Watershed Stewardship, Penn State University.

**Conferences, Meetings, and Workshops**

October 2019 Funded Participant, Macrosystems Biology workshop II, NSF funded workshop, Swarthmore College, Swarthmore, PA.

April 2019 US-International Association of Landscape Ecology, Fort Collins, CO. *Using Lidar to Model Effects of Land Use Legacy on Current Forest Structure*. (Poster)

July 2018 Funded Participant, Macrosystems Biology Workshop I, NSF funded workshop, Appalachian State University, Boone, NC.

June 2017 Critical Zone Science: Current Advances and Future Opportunities. NSF-sponsored workshop, Arlington, VA. *Using leaf-on and leaf-off airborne LiDAR to understand spatial patterns of tree and shrub biomass in a deciduous forest.* (Poster)

April 2017 US-International Association of Landscape Ecology, Baltimore, MD. *Effects of forest fragmentation and land use history on woodland salamander abundance.* (Presentation)

Nov 2016ForestSAT 2016: a bridge between forest sciences, remote sensing and geo-spatial applications, Santiago, Chile. *Using leaf-on and leaf-off airborne LiDAR to model vegetation structure and above-ground carbon storage in the critical zone.*(Presentation)

April 2016 US-International Association of Landscape Ecology, Asheville, NC. *Using LiDAR to model vegetation structure and above-ground carbon storage in the critical zone.* (Presentation)

Jan. 2016 National Conference on Science and the Environment: Food Energy Water Nexus, Washington D.C. Conference Panel: Data Creation, Access and Utilization for Energy Development and Water Conservation. (Panel member)

Dec. 2015 American Geophysical Union, San Francisco, CA. *The tree water isocape of a central Pennsylvania catchment: ecohydrolic patterns and processes.* K. Gaines and K. M. Brubaker (Poster)

Aug. 2015 Ecological Society of America, Baltimore MD. Organized Oral Session: Intraspecific Genetic Adaptation in Forest Trees and its Ecological Implications Under a Changing Climate. (Moderator)

Nov. 2014 ForestSAT2014: a bridge between forest sciences, remote sensing and geo-spatial applications, Riva Del Garda, Italy. (Participant)

Oct. 2014 Society of American Foresters, 2014 Convention, Salt Lake City, UT. *The effect of forest structure, community, and patch dynamics on red back salamander (*Plethodon cinereus*) presence and abundance at Finger Lakes National Forest*. K. Brubaker, T. Dirgins, R. Symmes, and B. Cosentino. (Poster)

Aug. 2014 CUAHSI 2014 Biennial Colloquium, Shepardstown, WV. *Comparing vegetation across topographic positions in two watersheds at the Susquehanna Shale Hills Critical Zone Observatory.* Q. Johnson, K. Brubaker, and M. Kaye (Poster)

May 2014 Community Workshop: The Next Generation of LiDAR Analysis for Critical Zone Research, Boulder, CO. (NSF funded fellow)

Oct. 2013 Society of American Foresters, 2013 Convention, Columbia, SC. *Estimating canopy height of deciduous forests at a regional scale with leaf-off, low-density LiDAR*. (Poster)

Mar 2013 Northeast Regional Geosciences of America Conference, Mt. Washington, NH. *LiDAR reveals thousands of 18th and 19th century charcoal hearths on South Mountain, South-central Pennsylvania*. (Poster)

Mar 2013 Northeast Regional Geosciences of America Conference, Mt. Washington, NH. *The use of LiDAR terrain data in characterizing surface roughness and microtopography.* (Poster)

Feb 2012 AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, Kona, HI*. Multi-scale LiDAR greatly improve characterization of forested headwater streams in central Pennsylvania*.(Poster)

July 2011 Gordon Research Conference for Catchment Science, Bates College, ME. *LiDAR imagery improves classification of forest function in the Ridge and Valley physiographic province of Pennsylvania.* (Poster)

May 2011 CZO All Hands Meeting, Tuscon, AZ. *LiDAR imagery improves classification of forested landforms in the Shale Hills/Susquehanna Critical Zone Observatory of Pennsylvania*.(Poster)

Nov 2010 School of Forest Resources Colloquium presentation.Penn State University, PA *Advancing delineation of the stream in an upland forested catchment using new LiDAR imagery.* (Presentation)

Mar 2010 National Institutes for Water Resources Annual Meeting, Washington D. C. (Participant)

June 2009 Fellow 2009 iGov Research Institute, Center for Technology in Government, Seattle, WA. (Participant)

Dec 2007 Workshop on remote sensing/GIS for college lecturers, Jalgaon, India. (Organizer and teacher)

**Invited Lectures**

Nov. 2019 Juniata College, Huntingdon, PA. *Using spatial data to understand watersheds.*

Oct. 2019 SUNY Cortland, Cortland, NY. Using remote sensing to understand the effects of land use legacy on forests at the Finger Lakes National Forest., NY.

Oct. 2019 Alfred University, Alfred, Using remote sensing to understand the effects of land use legacy on forests at the Finger Lakes National Forest., NY.

May 2019 Penn State SSHCZO CZO all hands meeting, Shaver’s Creek Environmental Center. Intermediate erosion hypothesis: Does nutrient input rate control vegetation structure and diversity?

Nov. 2015 Susquehanna Shale Hills CZO seminar series, Penn State University. *Understanding the influence of bedrock on patterns of vegetation and fine scale above-ground carbon storage.*

June 2015 University of Sassari. Sardinia, Italy. *Estimating canopy height and site productivity of deciduous forests at a regional scale with LiDAR*.

Sept. 2014 Penn State University, Department of Ecosystem Science and Management Seminar Series, University Park, PA. *Estimating canopy height of deciduous forests at a regional scale with leaf-off, low point density LiDAR*.

Oct. 2013 Utica College Biology Seminar Series, Utica, NY. *Estimating canopy height and site productivity of deciduous forests at a regional scale with leaf off, low density LiDAR*.

Jan 2011 School of Forest Resources Seminar Series. Penn State University, PA. *Improving characterization of forest streams using new LiDAR: a case study at the Leading Ridge watersheds*.

Dec 2007 Jalgaon DG INT Group Meeting for Digital Governance and Hotspot GeoInformatics, Jalgaon, India. *Remote Sensing and GIS.* (Invited talk)

**Grants and Funding Received**

May 2015 Susquehanna/Shale Hills CZO Seed Grant. $19,927. Modeling fine-scale above ground carbon storage using LiDAR: A comparison across two watersheds.

May 2014 Fellow. Community Workshop: The Next Generation of LiDAR Analysis for Critical Zone Research, Boulder, CO.

Jan 2014 Mellon Foundation Digital Pedagogy Grant. $6,000. Spatial and Quantitative Reasoning in Environmental Studies Core Courses.

May 2013 Mellon Foundation Digital Pedagogy Grant. $4,000. Spatial Literacy in the Social Sciences.

July 2012 PA Department of Conservation of Natural Resources. $45,132. Determining the Accuracy of LiDAR-Derived Dominant Tree Height in Pennsylvania State Forests

March 2012 Dickinson College Center for Sustainability Education. $4,600. Forest Farming and Agroforestry at the Dickinson College Farm.

Jan 2010 Penn State University, College of Agricultural Sciences Student Technology Grant. $2,500. Professional Grade GPS unit for Forest Management.

2007-2008 Penn State University Graduate Fellowship

**Outside Professional Development**

Spring 2021 Project EDDIE/QUBES faculty mentoring group participant

**Service at HWS**

2020-2021 FSEM fellow

2018, 2021 Grievance Committee, chair 2021

2020-present Cooper’s Woods Committee

2012-Present HWS Tree Committee

2018-Present HWS Bee Committee

2014-2019 HWS Fribolin Farm Committee, chair 2017-2018

2016-2018 Instructor, Environmental Studies Summer Youth Institute

2014-2015 Fac IT Committee

2014-2015 CoFAC

2013-2014 Committee to Plan a New Sustainability First Year program

**Professional Service**

Member, Kashong Conservation Committee

Reviewer for Journal of the American Water Resources Association; International Journal of Geographical Information Science; Scandinavian Journal of Forest Research; Agriculture, Ecosystems, and Environment.