Aaron Kamoske

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EDUCATION

Current	PhD, Geography, Environment, & Spatial Sciences, Michigan State University *Dissertation*: Seeing within the canopy: Measuring three-dimensional forest traits and processes across ecosystems. *Committee:* Kyla Dahlin, Scott Stark, Ashton Shortridge, David Rothstein
2018	Graduate Certificate, Spatial Ecology Michigan State University, Department of Forestry
2015	BS, Resource Conservation, University of Montana, College of Forestry *Advisor:* Kevin McManigal
2015	Undergraduate Certificate, GIS Sciences and Technologies University of Montana, Department of Geography

RESEARCH FOCUS

Ecological Remote Sensing | *Landscape Ecology* | *Forest Function and Structure*

My research examines terrestrial ecosystem patterns and processes across spatial scales by combining air- and spaceborne remote sensing (primarily hyperspectral and LiDAR), spatial statistics, ecological modeling, and ecophysiological information from traditional forest plots.

POSITIONS HELD

Aug. 2016 - *Present*

Research Assistant at Michigan State University

- Created algorithms and workflows to process, analyze, and visualize large remote sensing datasets (LiDAR, hyperspectral, Landsat, MODIS, etc.) using R, Python, ENVI, ERDAS, ArcGIS, eCognition, GDAL, and QGIS
- Created and currently maintain multiple R packages on GitHub
- Developed an advanced working knowledge of the R programming language, including for remote sensing and geospatial application, for data visualization, and for statistical analysis of large datasets.
- Applied statistical methods including spatial statistics (IDW, kriging), regression models (elastic net, partial least squares, multiple regression), clustering algorithms (k-means, principal components), and simulation techniques (Monte Carlo, jackknife resampling, bootstrapping) to derive inferences about ecological phenomena from a variety of large datasets

- Designed, coordinated, and completed three extensive forestry field campaigns with several field assistants across six sites in the eastern United States spanning from Alabama to Massachusetts
- Established multiple sampling and data processing protocols for ecological and forestry field and laboratory research
- Hired, trained, and managed three different field crews of undergraduate and graduate students from diverse backgrounds to collect, process, and analyze field data
- Collaborated with graduate students, post-docs, faculty, and researchers from multiple institutions, universities, and national laboratories on research projects
- Communicated scientific findings and the scientific basis behind these results to diverse audiences at national conferences and invited talks in written, oral, and visual formats
- Contributed text and figures to successful National Science Foundation grants

Mar. 2016 – Aug. 2016 **Lead Cartographer at Panthera & University of Montana**

- Supervised a team of twelve undergraduate student cartographers working on topographic maps for tiger conservation in Nepal
- Trained undergraduate students in using ArcGIS for geospatial data creation and using Adobe Photoshop and Illustrator for production cartography
- Diagnosed and provided solutions to problems and issues within the data creation process
- Communicated progress updates with project supervisors, implemented workflow suggests, and delivered maps ahead of schedule and under budget

Mar. 2015 – Mar. 2016 **GIS Technician at Panthera & University of Montana**

- Developed Python scripts to automate the QA/QC process for newly created geospatial data
- Created a master map temperate for uniform map production using Adobe Illustrator and Photoshop
- Digitized data and classified land cover using remote sensing data

May 2015 – Aug. 2015 **Range Technician at the Bureau of Land Management, Western Montana**

- Led a team of three field technicians to conduct rangeland vegetation surveys in remote locations
- Analyzed GIS and remote sensing data to provide updated information for the district's resource management plan

Sept. 2014 – May 2015 **Office Support at the Arthur Carhart National Wilderness Center**

- Created and prepared materials for Wilderness management training courses
- Provided reports about online course usage statistics using Tableau data visualization tools

May 2014 – Aug. 2014 **Range Technician at the Bureau of Land Management, Western Montana**

- Conducted rangeland health and vegetation monitoring surveys
- Established baseline forage quality and quantity measurements for a proposed wild horse sanctuary

RESEARCH

PUBLICATIONS

([Q# - Category] = Quartile from Scimago Journal Rank in specific category for publication year, see www.scimagojr.com)

Published

2019 **Kamoske AG,** Dahlin KM, Stark SC, and Serbin SP. Leaf area density from airborne LiDAR: Comparing sensors and resolutions in a temperate broadleaf forest ecosystem. *Forest Ecology and Management*, 433: 364-375. https://doi.org/10.1016/j.foreco.2018.11.017 [Q1 – Forestry]

In Review or Revision

20XX Dahlin KM, Zarnetske P, Read Q, Twardochleb L, **Kamoske AG**, Cheruvelil K, and Soranno P. Interactions between biodiversity and ecosystem function among terrestrial and aquatic realms. *Frontiers in Ecology and the Environment.* [Q1 – Ecology]

20XX Schaetzl R, Nyland K, Kasmerchak C, **Kamoske AG**, Breeze V, Thomas S, Grove L, Komoto K, and Miller B. Spatial analysis of Holocene-aged loess deposits in the lee of large dunes in norther Michigan, USA. *Aeolian Research.* [Q1 – Earth Surface Processes]

PRESENTATIONS

(first author is presenting author unless otherwise indicated by *)

2019 Bond-Lambert BP, Gough CM, Shiklomanov AN, Atkins JW, Haber L, Mathes KC, Grigri M, Tallant J, **Kamoske AG**, and Dahlin KM. Linking field, model, and remote sensing methods to understand when tree mortality breaks the forest carbon cycle. AGU Fall Meeting, San Francisco, CA.

2019 Dahlin, KM, **Kamoske AG***, Serbin SP, and Stark SC. Ecosystems in Four Dimensions: Measuring changes to forest structure and function in the Anthropocene. NSF Macrosystems Biology Annual Meeting, Boulder, CO.

2018 **Kamoske AG**, Dahlin KM, Stark SC, and Serbin SP. Leaf area density from airborne LiDAR: Comparing sensors and resolutions in a forest ecosystem. ForestSat, College Park, MD.

2018 Dahlin KM, **Kamoske AG**, Serbin SP, and Stark SC. Within-canopy leaf functional traits from airborne remote sensing. Ecological Society of America Fall Meeting, New Orleans, LA.

2018 Kasmerchak C, Nyland K, **Kamoske AG**, Breeze V, Bomber M, and Schaetzle R. Silty sand eolian sediment in the lee of large dunes in Michigan's Upper Peninsula. Geological Society of America North-Central Annual Meeting, Ames, IA.

2018 Dahlin KM, **Kamoske AG**, Stark SC, and Serbin SP. Ecosystems in four dimensions. National Science Foundation Macrosystems Biology Meeting, Washington D.C

2018 Twardochleb L, Read Q, Zarnetske P, Hitner E, Dahlin K, and **Kamoske AG**. Scaling relationships between freshwater insect diversity and the terrestrial environment. Society of Freshwater Science Annual Meeting, Detroit, MI.

2017 **Kamoske AG**. Ecological remote sensing: Using computers to ask questions about our planet. Spatial and Community Ecology Lab Presentation for the Research Experiences for Undergraduates Program at Michigan State University, East Lansing, MI.

2017 **Kamoske AG.** From leaf to landscape: Ecological remote sensing of forest function and structure. Department of Geography Colloquium Presentation, East Lansing, MI.

2016 Dahlin KM, Swenson SC, Lombardozzi D, and **Kamoske AG**. Seasonality of semi-arid and savanna-type ecosystems in an Earth system model. American Geophysical Union Fall Meeting, San Francisco, CA.

GRANTS & AWARDS

2019	Michigan State University Graduate Office Fellowship	$1000
2018	Michigan State University Graduate Office Fellowship	$1000
2018	Ecophysiology Fest 2 Travel Award	$500
2017	Michigan State University Graduate Office Fellowship	$800

FIELD EXPERIENCE

Forest Canopy Sampling for Chemical Analysis

2019	University of Michigan Biological Station, Michigan, USA
2018	Harvard Forest, Massachusetts, USA
2018	Mountain Lake Biological Station, Virginia, USA
2018	Oak Ridge National Laboratory, Tennessee, USA
2018	Talladega National Forest, Alabama, USA
2017	Harvard Forest, Massachusetts, USA
2017	Smithsonian Environmental Research Center, Maryland, USA

Forest Canopy Sampling for Water and Gas Exchange

2018	Holden Arboretum, Ohio, USA

Rangeland Vegetation Monitoring

2016	Bureau of Land Management, Western Montana, USA
2015	Bureau of Land Management, Western Montana, USA

TEACHING

TEACHING EXPERIENCE

Graduate Teaching Assistant and Lab Instruction

Spring Semesters: 2017, 2018, 2019

GEO 424: Advanced Remote Sensing

- Proctored and graded exams, quizzes, and lab assignments
- Lectured on selected topics including LiDAR and hyperspectral remote sensing, image classification techniques, and the physical basis of remote sensing
- Taught two weekly lab session on processing and analyzing remote sensing data using ERDAS, ArcGIS, and R.

- Developed multiple lab exercises for processing and analyzing LiDAR and other remote sensing datasets

SERVICE & OUTREACH

WORKSHOPS DEVELOPED

2018 **Kamoske AG**. GitHub 101. Short workshop covering how to use GitHub, creating R packages on GitHub, and making websites hosted on GitHub for 10 graduate students at Michigan State University.

2017 Nagelkirk R and **Kamoske AG**. Practical Programming with R. Three-session course covering analysis with rasters, shapefiles, point data, and CSV spreadsheets for 25 graduate students at Michigan State University.

SERVICE & OUTREACH

2019 Geography Department Steward for the Graduate Employee's Union at Michigan State University

2018 Mentored two undergraduate students in using remote sensing for ecological research, field data collection, applying to graduate school, and career goals

2018 Prepared and published two outreach articles for the Holden Arboretum Magazine described the research that was accomplished during PhysFest2 for the general public

2017 Building Committee Liaison for the Geography Graduate Group

MANUSCRIPT REVIEWER for *Natural Areas, Methods in Ecology and Evolution*

ORGANIZATION MEMBERSHIPS: American Geophysical Union

PRESS

Holden Arboretum (January 28, 2019) PhysFest2 at the Holden Arboretum. Youtube. https://www.youtube.com/watch?v=ovlodZRAW8w&list=PLLjjKM5UkM3xB6o65TvvPrmbHQVS94Va&index=2&t=270s [**AGK** interviewed for and quote in video – see 4:25 timestamp]

Chaney, Rob (December 16, 2015) Nepali tiger poachers fear University of Montana mapmakers. Missoulian Newspaper. https://missoulian.com/outdoors/nepali-tiger-poachers-fear-university-of-montana mapmakers/article_40c44f52-bbe2-5c87-80f0-ab5668c58ad0.html [**AGK** interviewed for and quoted in article].

PROFESSIONAL DEVELOPMENT

SPECIALIZED TRAINING

2018 **PhysFest 2: Ecophysiology Training Workshop**

- Collected leaves across a vertical gradient within the canopy to quantify variability in physiology using a host of instruments inclusing ATMOS 41 weather stations, METER NDVI and PRI sensors, a water potential pressure chamber, Li-COR

6400 IRGAs, a Walz Mini-Pam flurometer, an A325sc thermal camera, and a Headwall Nano hyperspectral camera
- Analyzed hyperspectral and thermal imagery using the R programming language

2015 **ESRI Certifications**

- Getting Started with Geodatabase (3 hours)
- Working with Geodatabase Domains and Subtypes in ArcGIS (3 hours)
- Getting Started with Geodatabase Topology (3 hours)
- Creating and Editing Metadata in ArcGIS (3 hours)
- Building Models for GIS Analysis using ArcGIS (3 hours)
- Basic of Raster Data (3 hours)
- Processing Raster Data using ArcGIS (3 hours)
- Georeferencing Raster Data using ArcGIS (3 hours)
- Deriving Rasters for Terrain Analysis using ArcGIS (3 hours)
- Basics of Python for ArcGIS (3 hours)
- Python Scripting for Geoprocessing Workflows (3 hours)
- Python Scripting for Map Automation (3 hours)