Aaron Kamoske, PhD

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EDUCATION

2021	PhD, Geography, Environment, & Spatial Sciences; Michigan State University
2018	Graduate Certificate, Spatial Ecology; Michigan State University
2015	BS, Resource Conservation; University of Montana, College of Forestry
2015	Undergraduate Certificate, GIS Sciences and Technologies; University of Montana

PROFESSIONAL STATEMENT

I strive to find practical solutions to natural resource conservation and management issues by utilizing my remote sensing and geospatial research, teaching, and work experience, as well as my background in field-data collection. Through a host of coding languages, software platforms, and field-based skills I enjoy working on complex projects, while bringing cooperators together to build capacity by utilizing my interpersonal and communication skills.

POSITIONS HELD

May 2020 - present

Remote Sensing Specialist at USDA Forest Service's Geospatial Technology and Applications Center

- Developed a national remote sensing program utilized by the USDA Forest Service's Forest Health and Protection program that strategically and continuously investigates, identifies, demonstrates, and facilitations viable remote sensing applications, products, and tools, including satellite and airborne sensors for surveying, detecting, and mapping damage and mortality caused by insects and disease in America's forests.
- Coordinated and implemented long-rang plans and the annual program of work for identify appropriate applications of remote sensing-based survey tools for the USDA Forest Service's Forest Health and Protection program that considered multiple forest goals, objectives, values, and use of diverse land ownerships as well as long term forest health, resiliency, and sustainability.
- Planed and created opportunities that increase awareness of remote sensing technologies through technology evaluation and technology transfer projects and coordinated remote sensing training opportunities for USDA Forest Service employees as well as State and Academic partners.
- Ensured an efficient and effective workflow for collecting, storing, and managing remote sensing-based forest health data across all USDA Forest Service Regions, including ArcGIS Online web maps, dashboards, groups, and geospatial databases.
- Investigated technological advances and supported the development and use of multiple technical tools and recommended new remote sensing approaches and/or applications, while providing technical advice and guidance, resolving discrepancies, and identifying and recommending against duplications of effort.

- As a Contracting Officer Representative Level II, established performance measurement baselines and milestones, created schedules and adjusted for scheduling constraints, planed and executed project tasks, determined dependencies with other projects and applications, identified roles, responsibilities, and tasks for project team members, and developed and analyzed assumptions, risks, and contingencies, and reviewed and approved deliverables from project contractors.
- Established and fostered strong and lasting working relationships with key partners such as USDA Forest Service Research personnel, National Forest System Staff, State and Private Forestry Staff, Washington Office leadership, as well as State, Academic, and Private partners to ensure program results while addressing local, regional, and national needs.
- Represented the USDA Forest Service on various committees and workgroups (e.g., NASA Landsat Next Federal Experts Panel, Forest Health Remote Sensing Technical Working Group, National Digital Orthoimagery Program) and delivered oral presentations at technical, scientific, administrative, and other professional meetings.

Aug. 2016 – May 2020 **Research Assistant at Michigan State University**

- Created algorithms, workflows, protocols, and solutions to process, analyze, and visualize large remote sensing datasets (LiDAR, hyperspectral, Landsat, MODIS, etc.) using R, Python, ENVI, ERDAS, ArcGIS, eCognition, GDAL, and QGIS
- Analyzed geospatial, remote sensing, and field data across large geographical regions
- Compiled and created data (natural resource, ecological, topographic, and cartographic) in a variety of resolutions and formats to create cartographic products including thematic maps for presentations and publications for diverse audiences
- Evaluated advanced geospatial technology for applicability to novel situations, methodologies, and procedures related to ecological, forestry, and natural resource programs
- 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 applications, 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
- Oversaw data management organization and maintenance related to geospatial and field data collected across multiple sites over multiple years
- Provided expertise, development, and training of specialized GIS and remote sensing workflows and products to meet the needs of ecosystem and forest ecology projects
- 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, managed, and developed work schedules for three different field crews of undergraduate and graduate students from diverse backgrounds to collect, process, and analyze field data
- Served as the point of contact on a large grant for multiple individuals across learning institutions, professional organizations, and for other individuals concerned with the processing of GIS, GPS, and remote sensing 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

2021 Hanavan RP, **Kamoske AG**, Schaaf AN, Eager T, Fish H, Ellenwood J, Warren K, Asaro C, Vanderbilt B, Hutten K, Leatherman L, Finco M, Frament W, Ryerson D, Ross J, Schwert B, Chastain R, Smith B, Hof J, Tischler C, and Downing M. Supplementing the Forest Health National Aerial Survey Program with remote sensing during the COVID-19 pandemic: Lessons learned from a collaborative effort. *Journal of Forestry* [Q1 - Forestry]

2021 Dahlin KM, Zarnetske PL, Read QD, Twardochleb LA, **Kamoske AG**, Cheruvelil KS, and Soranno PA. Linking terrestrial and aquatic biodiversity to ecosystem function across scales, trophic levels, and realms. *Frontiers in Environmental Science*, 9, 217. DOI: 10.3389/fenvs.2021.692401 [Q1 – Environmental Science]

2021 **Kamoske AG**, Dahlin KM, Serbin SP, and Stark SC. Leaf traits and canopy structure together explain canopy functional diversity: An airborne remote sensing approach. *Ecological Applications,* 31(2), e02230. DOI: 10.1002/eap.2230 [Q1 - Ecology]

2020 Atkins JW, Agee E, Barry A, Dahlin KM, Dorheim K, Grigri MS, Haber LT, Hickey LJ, **Kamoske AG,** Mathes K, McGuigan C, Paris E, Pennington SC, Rodriguez C, Schafer A, Shiklomanov A, Tallant J, Gough CM, and Bond-Lamerty B. The *fortedata* R package: open-science datasets from a manipulative experiment testing forest resilience. *Earth System Science Data* 13(3), 1-18. DOI: 10.5194/essd-2020-112 [Q1 – Earth and Planetary Sciences]

2020 Schaetzl RJ, Nyland KE, Kasmerchak CS, Breeze V, **Kamoske A**, Thomas SE, Bomber M, Grove L, Komoto K, and Miller BA. Holocene, silty-sand loess downwind of dunes in Northern Michigan, USA. *Physical Geography*. DOI: 10.1080/02723646.2020.1734414 [Q2 – Earth and Planetary Sciences]

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. DOI: 10.1016/j.foreco.2018.11.017 [Q1 – Forestry]

PRESENTATIONS

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

2020 **Kamoske AG**, Dahlin KM, Serbin AP, Stark SC. Leaf functional diversity is not equivalent to canopy functional diversity: Mappiny whole canopy traits with imaging spectroscopy and lidar fusion. European Geosciences Union General Assembly. Vienna, Austria. *presentation cancelled due to COVID-19.

2020 Dahlin KM, **Kamoske AG**, Serbin SP, Stark SC. Mapping Plant Functional Diversity Within and Among Forest Canopies. World Biodiversity Forum 2020. Davos, Switzerland.

2019 **Kamoske AG**, Dahlin KM, Serbin SP, Stack SC. Patterns and drivers of total canopy nitrogen (g/m^2) in a southeastern US mixed temperate forest: a three-dimensional remote sensing approach to ecosystem function. AGU Fall Meeting, San Francisco, CA.

2019 Bond-Lamberty BP, Gough CM, Shiklomanov AN, Atkins JW, Haber L, Mathes KC, Grigri MS, Tallant J, **Kamoske AG**, 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.

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

Hyperspectral Imaging in Crop Systems

2019 Michigan State University Agronomy Farm, East Lansing, Michigan, USA

TEACHING

TEACHING EXPERIENCE

Graduate Teaching Assistant and Lab Instruction

Spring Semesters: 2017, 2018, 2019, 2020

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 sessions 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

Spring Semesters: 2020

GEO 324: Remote Sensing of the Environment (Online Section)

- Graded exams, quizzes, and lab assignments
- Taught weekly lab session on interpreting and analyzing remote sensing data
- Set up student accounts for online server access

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 in R 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 describing the research that was accomplished during PhysFest2

2017 Building Committee Liaison for the Geography Graduate Group

MANUSCRIPT REVIEWER for *Natural Areas (1); Methods in Ecology and Evolution (1); PLOS One (1); Remote Sensing of Environment (1); Global Ecology and Biogeography (1)*

ORGANIZATION MEMBERSHIPS: American Geophysical Union, European Geosciences Union

PRESS

NEON Science Observatory Blog (December 11, 2019). Looking for missing carbon in the forest canopy. https://www.neonscience.org/observatory/observatory-blog/looking-missing-carbon-forest-canopy [Highlights the research that **AGK** is involved in]

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 including 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 Geodatabases (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)