Mike Mahoney

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Education

State University of New York College of Environmental Science and Forestry (SUNY-ESF) *Syracuse, New York*

Doctor of Philosophy in Environmental Science (Area of Study: Coupled Natural and Human Systems) *August 2020 - Present*

State University of New York College of Environmental Science and Forestry (SUNY-ESF) *Syracuse, New York*

Bachelor of Science with Honors magna cum laude in Forest Ecosystem Science (GPA: 3.723) *December 2018*

- Thesis: Beaver Foraging Preferences and Impacts on Forest Structure in New York's Adirondack Mountains

Publications

In Review

2022 Johnson, L. K., **Mahoney, M. J.,** Bevilacqua, E., Stehman, S. V., Domke, G. M., and Beier, C. M. In Review. High-resolution landscape-scale biomass mapping using a spatiotemporal patchwork of LiDAR coverages In review at Environmental Research Letters. https://doi.org/10.48550/arXiv.2205.08530

2022 **Mahoney, M. J.,** Johnson, J. K., and Beier, C. M. In Review. Classification and mapping of low-statured 'shrubland' cover types in post-agricultural landscapes of the US Northeast. In review at Landscape Ecology. https://doi.org/10.48550/arXiv.2205.05047

2022 **Mahoney, M. J.,** Johnson, J. K., Bevilacqua, E., and Beier, C. M. In Review. Ground noise filtering produces inferior models of forest aboveground biomass. In review at GIScience and Remote Sensing. https://doi.org/10.31223/X5HG99

Peer-Reviewed Publications

2022 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. 2022. unifir: A Unifying API for Interacting with Unity from R. Journal of Open Source Software, 7(73), 4388. https://doi.org/10.21105/joss.04388

2022 Tamiminia, H., Salehi, B., Mahdianpari, M., Beier, C. M., Johnson, L. K., Phoenix, D. B., and **Mahoney, M. J.** 2022. Decision tree-based machine learning models for above-ground biomass estimation using multi-source remote sensing data and object-based image analysis. Geocarto International. https://doi.org/10.1080/10106049.2022.2071475

2022 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. 2022. terrainr: An R package for creating immersive virtual environments. Journal of Open Source Software, 7(69), 4060. https://doi.org/10.21105/joss.04060

2020 **Mahoney, M. J.** and Stella, J. C. 2020. Stem size selectivity is stronger than species preferences for beaver, a central place forager. Forest Ecology and Management, 475, 118331. https://doi.org/10.1016/j.foreco.2020.118331

Conference Papers

2021 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. 2021. Interactive landscape simulations for visual resource assessment. VRSC 2021 Conference Proceedings.

Awards and Honors

2021 New York State GIS Association Application Award
2020 EarthCube AGU Scholarship
2018 Robin Hood Oak Award for Academic Excellence
2018 Robert M. Hicks Award for Academic Achievement
2018 ESF Career Fellowship
2017 Outstanding Student Award for Accomplishments in Field Ecology and Dendrology

Fellowships

2022 Federation of Earth Science Information Partners (ESIP) Community Fellowship - Machine Learning Cluster

Invited Talks

2022 **Mahoney, M. J.** Using AI/ML to help New York State manage lands for net zero carbon. Federation of Earth Science Information Partners (ESIP) January Meeting, Annapolis, MD (Virtual).

2021 **Mahoney, M. J.** terrainr: Spatial data access and visualization in R. Federation of Earth Science Information Partners (ESIP), Severna Park, MD (Virtual).

2021 Nell, C., **Mahoney, M. J.,** and Platt, L. Accessing the USGS National Map and making 3D maps with terrainr. USGS Center for Data Integration, Lakewood, CO (Virtual).

2021 **Mahoney, M. J.** terrainr: Landscape visualizations using data from The National Map. USGS National Geospatial Technical Operations Center, Denver, CO (Virtual).

Conference Activity

Sessions Organized

2022 Sun, Z., and, **Mahoney, M. J.** AI for All People: How to Make AI Useful for Earth Science Applications? Session organized at the Federation of Earth Science Information Partners (ESIP) July Meeting, Pittsburgh, PA.

2022 Sun, Z., Rao, Y., **Mahoney, M. J.,** Lin, C., and Burgess, A. Improving ”FAIRness” and ”Fairness” of AI/ML in Geoscience. Session organized at the Federation of Earth Science Information Partners (ESIP) January Meeting, Annapolis, MD (Virtual).

Workshops Facilitated

2021 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. Interactive 3D visualizations of environmental data using the terrainr R package. Workshop organized at the Visual Resources Stewardship Conference, Syracuse, NY (Virtual).

Contributed Talks

2022 **Mahoney, M. J.,** Johnson, L. K., and Beier, C. M. Detecting regenerating forestland at a landscape level. Ecological Society of America and Canadian Society for Ecology and Evolution Joint Annual Meeting, Montreal, Quebec, Canada.

2022 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. unifir: A Unifying API for Working with Unity in R. useR! 2022, Nashville, Tennessee (Virtual).

2022 **Mahoney, M. J.,** Johnson L. K., Bevilacqua E., and Beier C. M. Filtering ground noise from LiDAR returns produces inferior models of forest aboveground biomass. North American Forest Ecology Workshop, Sault Ste Marie, Ontario (Virtual).

2022 **Mahoney, M. J.** It’s not what it looks like: learning to question assumptions when debugging ML models. Data Mishaps Night, Virtual.

2021 Johnson, L. K., **Mahoney, M. J.,** Bevilacqua, E., and Beier, C. M. Broad-scale forest biomass mapping: generating contiguous high-resolution predictions using a spatio-temporal patchwork of LiDAR coverages across a mixed-use landscape. American Geophysical Union Fall Meeting, New Orleans, LA.

2021 Johnson, L. K., Beier, C. M., and **Mahoney, M. J.** Greening Up Before Growing Up: Challenges in Modeling Forest Biomass Recovery Post-Harvest Using Satellite Imagery. Society of American Foresters National Convention, Virtual.

2021 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. Interactive 3D visualizations of environmental data using the terrainr R package. Paper presented at the Visual Resources Stewardship Conference, Syracuse, NY (Virtual).

2021 **Mahoney, M. J.,** Beier, C. M., and Ackerman, A. C. Virtual Environments: Using R as a Frontend for 3D Rendering of Digital Landscapes. useR! 2021, Zürich, Switzerland (Virtual).

2018 **Mahoney, M. J.** and Stella, J. C. Beaver Foraging Preferences and Impacts on Forest Structure in the Adirondack Mountains of New York. Forest Ecosystem Monitoring Collective Conference, Burlington, VT.

2018 **Mahoney, M. J.** and Stella, J. C. Beaver Foraging Preferences and Impacts on Forest Structure in the Adirondack Mountains of New York. Rochester Academy of Sciences Fall Scientific Paper Session, Geneseo, NY.

Poster Presentations

2021 **Mahoney, M. J.,** Johnson, L. K., Bevilacqua, E., and Beier, C. M. Filtering ground noise from LiDAR returns produces inferior models of forest aboveground biomass. American Geophysical Union Fall Meeting, New Orleans, LA.

2019 Dillon, G., **Mahoney, M. J.,** Chase, S., and Johnston, M. Nutritional Impacts on Invasive Beech Scale Quantification in Beech Bark Disease Aftermath Forests. New York Society of American Foresters Annual Meeting, Syracuse, NY.

2018 **Mahoney, M. J.,** Zevin, R., and Stella, J.C. Impacts of Beaver on Forest Structure and Composition. Spotlight on Student Research, Syracuse, NY.

2018 **Mahoney, M. J.,** Leimanis, V., Desrochers, M. L., Giambona, B., Johnston, M. T., Yanai, R. D., and Dillon, G. A. Impacts of Fertilization on Causal Organisms of Beech Bark Disease. Spotlight on Student Research, Syracuse, NY.

2017 Lasser, G. A., Johnston, M., **Mahoney, M.,** Leimanis, V., and Stoodley, J. An Investigation of Nutritional Effects on Beech Bark Disease Causal Organisms. Forest Ecosystem Monitoring Collective Conference, Burlington, VT.

2017 Lasser, G. A., Johnston, M., **Mahoney, M.,** Leimanis, V., and Stoodley, J. An Investigation of Nutritional Effects on Beech Bark Disease Causal Organisms. Poster session presented at the Rochester Academy of Sciences Fall Scientific Paper Session, Rochester, NY.

Research Experience

2020-Present **Climate And Applied Forest Research Institute (SUNY-ESF)**
Research Assistant

Teaching Experience

Graduate Courses

Machine Learning Concepts and Applications. Instructor of Record. Fall 2021.

Workshops Facilitated

2021 **Software Carpentry: The Unix Shell, Version Control with Git, and R for Reproducible Scientific Analysis**. Mahoney, M. J., and Devlin, M.D. SUNY-ESF, Syracuse, NY (Virtual).

Service To Profession

2022 **Reviewer:** 11th International Conference on Climate Informatics.

2022 - Present **Data Carpentry Geospatial Curriculum Advisory Committee.** Member.

Non-Academic Experience

2022 **RStudio PBC.** Open Source Engineering Intern.
Intern with RStudio's tidymodels team, working on the spatialsample R package for spatial data resampling.

Community Involvement and Outreach

2019-2020 **Code for Boston - Clean Slate Project.** Data Scientist and Project Manager (Volunteer).
Project working with Greater Boston Legal Society to advance criminal justice reform efforts.

Software Development

2022 **spatialsample**: Developer
Functions for spatial resampling with the 'rsample' package

2022 **unifir**: Lead developer
A Unifying API for working with Unity in R

2021 **terrainr**: Lead developer
Retrieve Data from the USGS National Map and Transform it for 3D Landscape Visualizations.

2020 **heddlr**: Lead developer
Tools to enable functional programming workflows for dynamic R Markdown document generation.

2020 **spacey**: Lead developer
USGS and ESRI data access for beautiful landscape visualization.

Affiliations

2021 - Present **The Carpentries**. Instructor in good standing.

2021 - Present **American Geophyiscal Union**. Member.

2021 - Present **NYS GIS Association**. Member.

2019 - Present **Data Visualization Society**. Member.