

# Lucas Johnson

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## Education

**State University College of Environmental Science and Forestry**

*Doctor of Philosophy in Environmental Science*

○ Dissertation: *Mapping forest aboveground biomass stocks and changes to facilitate natural climate solutions in New York State*

**Tufts University**

*Bachelor of Science in Computer Science*

**Syracuse, New York**

*Aug 2019 - May 2024*

**Boston, Massachusetts**

*Aug 2013 - May 2017*

## Publications

### In Review.....

**2024: Johnson, L. K.,** Mahoney, M. J., Domke, G. M., and Beier, C. M. New allometric models for the USA create a step-change in forest carbon estimation, modeling, and mapping. In review at Remote Sensing of Environment. <https://doi.org/10.48550/arXiv.2405.04507>.

**2023: Mahoney, M.J., Johnson, L.K.,** Silge, J., Frick, H., Kuhn, M., and Beier, C. M. Assessing the performance of spatial cross-validation approaches for models of spatially structured data. In review at Environmental Modelling & Software. <https://doi.org/10.48550/arXiv.2303.07334>.

### Peer-Reviewed Journal Articles.....

**2024: Cranmer, N., Han, T., Chedzoy, B., Smallidge, P. J., Beier, C. M., Johnson, L.K.,** and Xu, X. 2024. Estimating merchantable and non-merchantable wood volume in slash walls using terrestrial and airborne LiDAR. *Forest Ecology and Management*, 569, 122211. <https://doi.org/10.1016/j.foreco.2024.122211>.

**2023: Johnson, L. K.,** Mahoney, M.J., Desrochers, M. L., and Beier, C. M. 2023. Mapping historical forest biomass for stock-change assessments at parcel to landscape scales. *Forest Ecology and Management*, 546, 121348. <https://doi.org/10.1016/j.foreco.2023.121348>.

**2022: Desrochers, M. L., Tripp, W., Logan, S., Bevilacqua, E., Johnson, L.K.,** and Beier, C. M. 2022. Ground-Truthing Forest Change Detection Algorithms in Working Forests of the US Northeast. *Journal of Forestry*, 120(5), 575–587. <https://doi.org/10.1093/jofore/fvab075>.

**2022: Johnson, L. K.,** Mahoney, M. J., Bevilacqua, E., Stehman, S. V., Domke, G. M., and Beier, C. M. 2022. Fine-resolution landscape-scale biomass mapping using a spatiotemporal patchwork of LiDAR coverages. *The International Journal of Applied Earth Observation and Geoinformation*, 114, 103059. <https://doi.org/10.1016/j.jag.2022.103059>.

**2022: Mahoney, M. J., Johnson, L. K.,** Guinan, A. Z., and Beier, C. M. 2022. Classification and mapping of low-statured 'shrubland' cover types in post-agricultural landscapes of the

US Northeast. *The International Journal of Remote Sensing*, 43(19-24), 7117-7138. <https://doi.org/10.1080/01431161.2022.2155086>.

**2022:** Mahoney, M. J., **Johnson, L. K.**, Bevilacqua, E., and Beier, C. M. 2022. Ground noise filtering produces inferior models of forest aboveground biomass. *GIScience and Remote Sensing*, 59(1), 1266-1280. <https://doi.org/10.1080/15481603.2022.2103069>.

#### Peer-Reviewed Book Chapters.....

**2023:** Mahoney, M. J., **Johnson, L. K.**, and Beier, C. M. 2023. AI for Shrubland Identification and Mapping. In Sun Z, Cristea N, Rivas P (eds.), *Artificial Intelligence in Earth Science*, 295-316. Elsevier. ISBN 978-0-323-91737-7. <https://doi.org/10.1016/B978-0-323-91737-7.00010-4>.

### Awards and Honors

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**2024: Outstanding PhD Scholar** - SUNY ESF Division of Environmental Science.

### Conference Activity

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#### Invited Talks.....

**2022:** **Johnson, L.K.**, Mahoney, M.J., and Beier, C.M.. Historical Time Series Biomass Modeling: To Train on Plots or Pixels? FIA Science Stakeholder Meeting (Virtual).

#### Contributed Talks.....

**2023:** Mahoney, M. J., **Johnson, L. K.**, and Beier, C. M. Consistent Workflows for Assessing Model Performance: Tools and Applications to Natural Climate Solutions. American Geophysical Union Fall Meeting, San Francisco, CA.

**2023:** Beier, C.M., **Johnson, L.K.**, Mahoney, M.J., Desrochers, M.L, and Domke, G.M. An integrated carbon monitoring framework for stock-change GHG inventory at parcel to landscape scales: approach, outputs and applications. American Geophysical Union Fall Meeting, San Francisco, CA.

**2022:** **Johnson, L.K.**, Mahoney, M.J., and Beier, C.M. A Map-based Stock Change Approach for Fine-scale Biomass and Carbon Accounting in NYS. Forest Ecosystem Monitoring Cooperative Conference, Burlington, VT.

**2022:** **Johnson, L.K.**, Mahoney, M.J., and Beier, C.M. Historical Time Series Biomass Modeling: To Train on Plots or Pixels? American Geophysical Union Fall Meeting (Virtual).

**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:** **Johnson, L.K.**, Mahoney, M.J., 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).

**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 (Virtual).

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

### Poster Presentations

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**2023: Johnson, L.K.,** Mahoney M.J., Domke, G.M., and Beier, C.M. Bridging the Gap Between Pixels and Minimum Estimation Units: Small-Area Uncertainty Estimation with Forest Aboveground Biomass Maps. American Geophysical Union Fall Meeting, San Francisco, CA.

## Experience

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**2024 - Present: Oregon State University - USFS**

**Postdoctoral Scholar.** Quantifying radiative feedbacks associated with the albedo change that results from forest growth, reforestation, and afforestation. Assisting the operationalization of carbon reporting tools based on data from NASA's GEDI mission.

**2019 - 2024: Climate and Applied Forest Research Institute (SUNY ESF)**

**Research Assistant.** Developed cloud computing infrastructure, geospatial databases, and data sharing software. Contributed writing, code, and statistical/spatial analysis to technical reports.

**2017 - 2019: Lightkeeper, LLC**

**Data Engineer.** Developed internal data management tools and software in python.

## Service to the Profession

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**2024: Reviewer:** Carbon Balance and Management.

**2023: Reviewer:** Forest Ecology and Management, Journal of Applied Earth Observation and Geoinformation, PNAS Nexus.

**2023: Workshop Assistant:** Foundations of Scientific Computing at SUNY ESF.

**2022: Workshop Assistant:** Foundations of Scientific Computing at SUNY ESF.

## Community Service

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**July 2020 - July 2021: Code for Burlington - Courtbot Project** Technical Lead (Volunteer). A free service providing text message notifications for court appearances.

## Affiliations

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**2021 - Present: American Geophysical Union.** Member.

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

## Skills

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**Programming:** R, Python, SQL, git, and Linux shell languages.

**GIS:** QGIS, ArcGIS, GDAL, Google Earth Engine, and the R spatial ecosystem.