

Michele S. Buonanduci

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Research interests

Spatial & statistical analysis, landscape ecology, forest disturbance ecology

Education

- 2020 – 2023 **Ph.D.** Quantitative Ecology and Resource Management
University of Washington, Seattle, WA
Spatio-temporal patterns of forest disturbance in western North America: implications for forest resilience
- 2017 – 2019 **M.S.** Quantitative Ecology and Resource Management
University of Washington, Seattle, WA
Modeling individual lodgepole pine mortality from mountain pine beetle outbreak in a spatially explicit framework
- 2008 – 2012 **B.A.** Environmental Science
Boston University, Boston, MA

Research experience

- 2023 – Present **Postdoctoral Researcher**
The Nature Conservancy & University of Washington
- 2017 – 2023 **Graduate Research Assistant**
Quantitative Ecology and Resource Management & School of Environmental and Forest Sciences, University of Washington
- 2010 **Undergraduate Research Assistant**
Department of Geography and Environment, College of Arts and Sciences, Boston University

Research grants & fellowships

- 2024 – Present Science for Nature and People Partnership Research Fellowship
Integrating salmon and forest resilience to wildfire in the western United States
(\$86K - Fellow)
- 2021 – 2022 Northwest Climate Adaptation Science Center Research Fellowship
Potential impacts of future fires in the western Cascades: insights from spatial metrics of burn severity (\$46K - Fellow)
- 2021 – 2022 Joint Fire Science Program Graduate Research Innovation Award
Does high-severity patch structure scale consistently with fire size across the Northwest US? (\$25K – PI)

2017 – 2018 UW Quantitative Ecology & Resource Management First Year Fellowship
(3 quarters graduate tuition + stipend)

Teaching assistantships

Winter 2023 ESRM 101: Forests, Fire & Society (University of Washington)
Winter 2021 QSCI 381: Introduction to Probability and Statistics (University of Washington)
Spring 2020 ESRM 315: Old-Growth Forest Ecology & Management (University of Washington)
Spring 2019 QSCI 381: Introduction to Probability and Statistics (University of Washington)
Winter 2019 QSCI 381: Introduction to Probability and Statistics (University of Washington)

Professional experience

2017 – 2020 **Staff Scientist, Part Time as Needed** – Arcadis, Seattle, WA
2015 – 2017 **Staff Scientist** – Arcadis, Denver, CO
2013 – 2015 **Scientist II** – Arcadis, Chelmsford, MA
2012 – 2013 **Scientist I** – Arcadis, Chelmsford, MA

Publications

- 2024 **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Few large or many small fires: Using spatial scaling of severe fire to quantify effects of fire-size distribution shifts. *Ecosphere* 15(6):e4875. [10.1002/ecs2.4875](https://doi.org/10.1002/ecs2.4875)
- 2024 Dobrowski, S., M.M. Aghai, A. Chichilnisky du Lac, R. Downer, J. Fargione, D.L. Haase, T. Hoecker, O.A. Kildisheva, A. Murdoch, S. Newman, M. North, P. Saksa, M. Sjoholm, T. Baribault, **M.S. Buonanduci**, M.E. Chambers, L. Gonzales-Kramer, B.J. Harvey, M.D. Hurteau, J. Loevner, H.D. Safford, and J. Sloan. ‘Mind the Gap’—Reforestation needs vs. reforestation capacity in the western United States. *Frontiers in Forests and Global Change* 7:1402124. [10.3389/ffgc.2024.1402124](https://doi.org/10.3389/ffgc.2024.1402124)
- 2023 **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Consistent spatial scaling of high-severity wildfire can inform expected future patterns of burn severity. *Ecology Letters* 26:1687–1699. [10.1111/ele.14282](https://doi.org/10.1111/ele.14282)
- 2023 Harvey, B.J., S.J. Hart, P.C. Tobin, T.T. Veblen, D.C. Donato, **M.S. Buonanduci**, A.M. Pane, H.D. Stanke, and K. Rodman. Emergent hotspots of biotic disturbances and their consequences for forest resilience. *Frontiers in Ecology and the Environment* 21(8):388–396. [10.1002/fee.2659](https://doi.org/10.1002/fee.2659)
- 2023 Morris, J.E., **M.S. Buonanduci**, M.C. Agne, M.A. Battaglia, and B.J. Harvey. Fuel profiles and biomass carbon following bark beetle outbreaks: Insights for disturbance interactions from a historical thinning experiment. *Ecosystems* 26:1290–1308. [10.1007/s10021-023-00833-5](https://doi.org/10.1007/s10021-023-00833-5)

- 2023 Harvey, B.J., **M.S. Buonanduci**, and M.G. Turner. Spatial interactions among short-interval fires reshape forest landscapes. *Global Ecology and Biogeography* 32:586–602. [10.1111/geb.13634](https://doi.org/10.1111/geb.13634)
- 2023 **Buonanduci M.S.**, J.E. Morris, M.C. Agne, M.A. Battaglia, and B.J. Harvey. Fine-scale spatial heterogeneity shapes compensatory responses of a subalpine forest to severe bark beetle outbreak. *Landscape Ecology* 38:253–270. [10.1007/s10980-022-01553-2](https://doi.org/10.1007/s10980-022-01553-2)
- 2022 Morris, J.E., **M.S. Buonanduci**, M.C. Agne, M.A. Battaglia, and B.J. Harvey. Does the legacy of historical thinning treatments foster resilience to bark beetle outbreaks in subalpine forests? *Ecological Applications* 32(1):e02474. [10.1002/eap.2474](https://doi.org/10.1002/eap.2474)
- 2020 **Buonanduci, M.S.**, J.E. Morris, M.C. Agne, and B.J. Harvey. Neighborhood context mediates probability of host tree mortality in a severe bark beetle outbreak. *Ecosphere* 11(8):e03236. [10.1002/ecs2.3236](https://doi.org/10.1002/ecs2.3236)
- 2015 Judd, N., Y. Lowney, P. Anderson, S. Baird, S.M. Bay, J. Breidt, **M. Buonanduci**, Z. Dong, D. Essig, M.R. Garry, R.C. Jim, G. Kirkwood, S. Moore, C. Niemi, R. O'Rourke, B. Ruffle, L.A. Schaidler, D.E. Vidal-Dorsch. Fish consumption as a driver of risk-management decisions and human health-based water quality criteria. *Environmental Toxicology and Chemistry* 34(11):2427–2436. [10.1002/etc.3155](https://doi.org/10.1002/etc.3155)
- 2012 Dillen, S.Y., M. Op de Beeck, K. Hufkens, **M. Buonanduci**, and N.G. Phillips. Seasonal patterns of foliar reflectance in relation to photosynthetic capacity and color index in two co-occurring tree species, *Quercus rubra* and *Betula papyrifera*. *Agricultural and Forest Meteorology* 160:60–68. [10.1016/j.agrformet.2012.03.001](https://doi.org/10.1016/j.agrformet.2012.03.001)

In prep, review, or revision

In review **Buonanduci, M.S.**, S.J. Hart, P.C. Tobin, and B.J. Harvey. Patterns and drivers of biotic disturbance hotspots in western United States coniferous forests. Submitted to *Ecography*.

In prep **Buonanduci, M.S.**, E.R. Buhle, M.J. Case, E.R. Howe, J.C. Robertson, N. VanBuskirk, and A.K. Ettinger. Pacific salmon population responses to forest management in the context of climate change.

Selected presentations (†invited)

Dec. 2023† **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Harnessing spatial scaling relationships to inform expected future spatial patterns of burn severity across fire size distributions. *International Fire Ecology and Management Congress, Monterey, CA*

- Aug. 2023† **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Scaling burn severity patterns across regions and fire regimes yields insights into historically climate-limited fire regimes. *Ecological Society of America Annual Meeting, Portland, OR*
- Feb. 2023 **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Examining wildfires from other regions and fire regimes yields insights into future patterns of burn severity in western Cascadia. *Post-Fire Research and Monitoring Symposium, Corvallis, OR*
- May 2022† **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey. Western Cascadia wildfire: spatial patterns of burn severity and implications for future ecological impacts. *University of Washington School of Aquatic and Fishery Sciences Quantitative Seminar*
- Nov. 2021 **Buonanduci, M.S.**, D.C. Donato, J.S. Halofsky, and B.J. Harvey. Potential impacts of future fires in western Cascadia: scaling spatial patterns of burn severity. *International Fire Ecology and Management Congress*
- Aug. 2020 **Buonanduci, M.S.**, J.E. Morris, M.C. Agne, and B.J. Harvey. Tree neighborhood characteristics affect growth responses of host and non-host trees following a severe mountain pine beetle outbreak. *Ecological Society of America Annual Meeting*
- Apr. 2019 **Buonanduci, M.S.**, J.E. Morris, M.C. Agne, and B.J. Harvey. Individual tree and local tree neighborhood factors affecting mountain pine beetle-induced lodgepole pine mortality. *Annual Meeting of the US Regional Association of the International Association for Landscape Ecology, Fort Collins, CO*
- Mar. 2019 **Buonanduci, M.S.**, J.E. Morris, M.C. Agne, and B.J. Harvey. Within-stand factors affecting survival of lodgepole pine following a severe mountain pine beetle outbreak. *University of Washington School of Environmental and Forest Sciences Graduate Student Symposium*

Invited guest lectures

- Winter 2024 ESRM 101: Forests, Fires, and Society (University of Washington)
- Autumn 2021 ESRM 490/SEFS 501: Forest Community Ecology (University of Washington)
- Spring 2021 ESRM 490/SEFS 501: Forest Community Ecology (University of Washington)
- Spring 2020 ESRM 315: Old Growth Forest Ecology and Management (University of Washington)

Volunteer & service

- 2022 – Present **Manuscript reviewer**
Journals: *Fire Ecology*, *Ecology*, *Ecosphere*, *PNAS*
- 2020 – 2021 **Graduate student representative**
Diversity, Equity, and Inclusion Committee, Center for Quantitative Sciences, University of Washington

- 2020 – 2021 **Peer mentor**
Quantitative Ecology and Resource Management Program, University of Washington
- 2020 **Graduate student representative**
Grants Specialist Hiring Committee, School of Environmental and Forest Sciences, University of Washington
- 2018 – 2020 **Organizer**
Graduate Student Symposium, School of Environmental and Forest Sciences, University of Washington
- 2018 – 2020 **Graduate student representative**
Research Committee, School of Environmental and Forest Sciences, University of Washington

Honors & awards

- 2019, 2021, & 2023 Quantitative Ecology and Resource Management Student Travel Award, University of Washington
- 2019 Honorable Mention for Best Student Presentation, Annual Meeting of the U.S. Regional Association of the International Association for Landscape Ecology
- 2019 Honorable Mention, National Science Foundation Graduate Fellowship
- 2019 College of the Environment Student Travel Award, University of Washington
- 2012 – Present Phi Beta Kappa
- 2012 College Prize for Excellence in Geography & Environment, Boston University
- 2008 – 2009 College Scholar, College of Arts and Sciences, Boston University

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