Michele S. Buonanduci

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Research interests

Spatial & statistical analysis, landscape ecology, forest ecology, forest disturbances

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 in Washington & 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

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 experience

Winter 2023 **Teaching Assistant**
ESRM 101: Forests, Fire & Society (University of Washington)

Winter 2021 **Teaching Assistant**
QSCI 381: Introduction to Probability and Statistics (University of Washington)

Spring 2020 **Teaching Assistant**
ESRM 315: Old-Growth Forest Ecology & Management (University of Washington)

Spring 2019 **Teaching Assistant**
QSCI 381: Introduction to Probability and Statistics (University of Washington)

Winter 2019 **Teaching Assistant**
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

In press Few large or many small fires: Using spatial scaling of severe fire to quantify effects of fire-size distribution shifts.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey.
Ecosphere.

In press 'Mind the Gap' - Reforestation needs vs. reforestation capacity in the western United States.
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, M.D. Hurteau, J. Loevner, H.D. Safford, and J. Sloan.
Frontiers in Forests and Global Change.

2023 Consistent spatial scaling of high-severity wildfire can inform expected future patterns of burn severity.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey.
Ecology Letters 26:1687-1699. 10.1111/ele.14282

2023 Emergent hotspots of biotic disturbances and their consequences for forest resilience.
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.
Frontiers in Ecology and the Environment 21(8):388-396. 10.1002/fee.2659

2023 Fuel profiles and biomass carbon following bark beetle outbreaks: Insights for disturbance interactions from a historical thinning experiment.
Morris, J.E., **M.S. Buonanduci**, M.C. Agne, M.A. Battaglia, and B.J. Harvey.
Ecosystems 26:1290–1308. 10.1007/s10021-023-00833-5

2023 Spatial interactions among short-interval fires reshape forest landscapes.
Harvey, B.J., **M.S. Buonanduci**, and M.G. Turner.
Global Ecology and Biogeography 32:586–602. 10.1111/geb.13634

2023 Fine-scale spatial heterogeneity shapes compensatory responses of a subalpine forest to severe bark beetle outbreak.
Buonanduci M.S., J.E. Morris, M.C. Agne, M.A. Battaglia, and B.J. Harvey.
Landscape Ecology 38:253-270. 10.1007/s10980-022-01553-2

2022 Does the legacy of historical thinning treatments foster resilience to bark beetle outbreaks in subalpine forests?
Morris, J.E., **M.S. Buonanduci**, M.C. Agne, M.A. Battaglia, and B.J. Harvey.
Ecological Applications 32(1):e02474. 10.1002/eap.2474

2020 Neighborhood context mediates probability of host tree mortality in a severe bark beetle outbreak.
Buonanduci, M.S., J.E. Morris, M.C. Agne, and B.J. Harvey.
Ecosphere 11(8):e03236. 10.1002/ecs2.3236

2015 Fish consumption as a driver of risk-management decisions and human health-based water quality criteria.
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. Schaider, D.E. Vidal-Dorsch.
Environmental Toxicology and Chemistry 34(11):2427-2436. 10.1002/etc.3155

2012 Seasonal patterns of foliar reflectance in relation to photosynthetic capacity and color index in two co-occurring tree species, *Quercus rubra* and *Betula papyrifera*.
Dillen, S.Y., M. Op de Beeck, K. Hufkens, **M. Buonanduci**, and N.G. Phillips.
Agricultural and Forest Meteorology 160:60-68. 10.1016/j.agrformet.2012.03.001

In prep, review, or revision

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

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

Selected presentations (†invited)

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

Aug. 2023† Scaling burn severity patterns across regions and fire regimes yields insights into historically climate-limited fire regimes.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey.
Ecological Society of America Annual Meeting, Portland, OR

Feb. 2023 Examining wildfires from other regions and fire regimes yields insights into future patterns of burn severity in western Cascadia.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey.
Post-Fire Research and Monitoring Symposium, Corvallis, OR

May 2022† Western Cascadia wildfire: spatial patterns of burn severity and implications for future ecological impacts.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, M.C. Kennedy, and B.J. Harvey.
University of Washington School of Aquatic and Fishery Sciences Quantitative Seminar

Nov. 2021 Potential impacts of future fires in western Cascadia: scaling spatial patterns of burn severity.
Buonanduci, M.S., D.C. Donato, J.S. Halofsky, and B.J. Harvey.
International Fire Ecology and Management Congress

Aug. 2020 Tree neighborhood characteristics affect growth responses of host and non-host trees following a severe mountain pine beetle outbreak.
Buonanduci, M.S., J.E. Morris, M.C. Agne, and B.J. Harvey.
Ecological Society of America Annual Meeting

Apr. 2019 Individual tree and local tree neighborhood factors affecting mountain pine beetle-induced lodgepole pine mortality.
Buonanduci, M.S., J.E. Morris, M.C. Agne, and B.J. Harvey.
Annual Meeting of the US Regional Association of the International Association for Landscape Ecology, Fort Collins, CO

Mar. 2019 Within-stand factors affecting survival of lodgepole pine following a severe mountain pine beetle outbreak.
Buonanduci, M.S., J.E. Morris, M.C. Agne, and B.J. Harvey.
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, 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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