Nathan Mietkiewicz, Ph. D.

Postdoctoral Reserach Fellow, Earth Lab
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Education

Clark University, Worcester, MA

Ph. D., Geography, 2012 - 2016
M.A., Geography, 2015
M.S., GIS for Development and Environment, 2010-2012

University of Maine, Orono, ME

B.S., Earth Science, 2009

Current research appointment

Postdoctoral Research Fellow 2016–present

Earth Lab and the Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder

Leading cutting-edge research to examine how short and long-term alterations of disturbance regimes, including novel climate and fire cycles, alters ecosystem function and human vulnerability. Some of my daily tasks include:

-Deploying geospatial, reproducible workflows in a salable, cloud-compute environments via Amazon Web Services (AWS) via Docker Hub and GitHub to build stable, collaborative work environments across platforms
-Writing clean, efficient code to download, process, and analyze big geospatial data ranging, but not limited to, satellite imagery, satellite derived products, governmental records, and climate time-series at local to national scales to answer landscape to continental scale questions
-Building out and optimizing statistical models using a variety of techniques, including generalized linear mixed models, random forests, supervised and unsupervised classifications, neural networks, and other machine learning algorithms.
-Mentoring/managing graduate level interns and research assistants.

Past research Appointments

2013 - 2016	Research Assistant, Forest Ecology Research Laboratory, Clark University
	Forest Ecology Research Laboratory Manager, Clark University
2012	Research and Development, Clark Labs, Worcester, MA
2011	GIS Consultant, Department of Public Works, Ashland, MA GIS Analyst, United States Department of Agriculture: National Resource Conservation Service
2008	Field Researcher, Scott Glacier, Antarctica via University of Maine, Orono
2007	Field Researcher, Marine Sediments Laboratory, University of Maine, Orono
2006	Laboratory Technician, Climate Change Institute, University of Maine, Orono Numerical Modeling Technician, Numerical Modeling Laboratory, University of Maine, Orono

Peer-reviewed Publications

N. Mietkiewicz, J. K. Balch, T. Schoennagel, S. Leyk, L. St. Denis, B. Bradley. (submitted) *Consequences of human-ignited wildfires in the US: from the Wildland-Urban Interface to wildlands*. Nature Communications

Joseph, M. B., M. W. Rossi, **N. P. Mietkiewicz**, A. L. Mahood, M. E. Cattau, L. A. St. Denis, R. C. Nagy, V. Iglesias, J. T. Abatzoglou, and J. K. Balch. (submitted) *Understanding and predicting extreme wildfires in the contiguous United States*. Ecological Applications.

Balch, J., T. Schoennagel, A. Williams, J. Abatzoglou, M. Cattau, **N. Mietkiewicz**, and L. St. Denis. 2018. *Switching on the Big Burn of 2017*. Fire 1.

Mietkiewicz, N., D. Kulakowski, and T. T. Veblen 2018. *Pre-outbreak forest conditions mediate the effects of spruce beetle outbreaks on fuels in subalpine forests of Colorado*. Ecological Applications 28:457-472.

Mietkiewicz, N., D. Kulakowski, D. Rogan, and P. Bebi. 2017. *Long-term change in sub-alpine forest cover, tree line and species composition in the Swiss Alps*. Journal of Vegetation Science. 28:951-964. DOI: 10.1111/jvs.12561

Schoennagel, T., J. K. Balch, H. Brenkert-Smith, P. E. Dennison, B. J. Harvey, M. A. Krawchuk, **N. Mietkiewicz**, P. Morgan, M. A. Moritz, R. Rasker, M. G. Turner, and C. Whitlock. 2017. *Adapt to more wildfire in western North American forests as climate changes*. Proceedings of the National Academy of Sciences. 114:4582-4590.

Mietkiewicz, N. and D. Kulakowski. 2016. *Relative importance of climate and mountain pine beetle outbreaks on the occurrence of large wildfires in the western US*. Ecological Applications:10.1002/eap.1400

Bakaj, F., **N. Mietkiewicz**, T. T. Veblen, and D. Kulakowski. 2016. *The relative importance of tree and stand properties in susceptibility to spruce beetle outbreak in the mid-20th century*. Ecosphere 7(10):e01485. 10.1002/ecs2.1485

Hart, S. J., T. T. Veblen, **N. Mietkiewicz**, and D. Kulakowski. 2015. *Negative Feedbacks on Bark Beetle Outbreaks: Widespread and Severe Spruce Beetle Infestation Restricts Subsequent Infestation*. PLoS ONE 10:e0127975.

Pre-prints

Joseph, M. B., M. W. Rossi, **N. P. Mietkiewicz**, A. L. Mahood, M. E. Cattau, L. A. St. Denis, R. C. Nagy, V. Iglesias, J. T. Abatzoglou, and J. K. Balch. 2018. Understanding and predicting extreme wildfires in the contiguous United States. bioRxiv; doi: https://doi.org/10.1101/384115

Book Chapters

Rogan, J., and **N. Mietkiewicz**. 2015. *Land Cover Change Detection* in A. Aranganathan, editor. Land Resources Monitoring, Modeling, and Mapping with Remote Sensing.

Grants, Awards, and Fellowships

2018	$1,758,933 - PREEVENTS Track 2: Coupled extremes: Understanding and predicting how droughts, fires, and floods interact. Senior Personal. Pending. $931,768 - CAREER: Fire impacts on forest carbon recovery in a warming world: training the next generation of Earth analysts by exploring a missing scale of observations. Postdoctoral Associate Support. Pending.
2017	$1200 - Fire Predicition Across Scales conference travel award - Columbia University
2015	$700 - Clark University's Outstanding Teaching Assistant Award $300 - Marion I. Wright '46 Travel Award, Fall 2015 $250 - Pruser Dissertation Enhancement Award $300 - Graduate Student Council Travel Award, Spring 2016
2013	$600 - Marion I. Wright '46 Travel Award, Spring/Fall 2013 $750 - Pruser Dissertation Enhancement Award
2012	$4,000 - Libbey Enhancement Award $55,000 - Full tuition remission and stipend (5 years, approx. per year)
2010	$15,980 - Awarded scholarship towards Master's degree (2 years, approx. per year)

Teaching Appointments

Faculty Positions

Clark University

2015 Forest Ecology (GEOG 116); Overall Effectiveness = 4.6/5

Teaching Assistant Positions

Clark University

2015 Advanced Topics in GIS: Raster GIS (GEOG 397); Overall Effectiveness = 4.94/5

2014 Introduction to Remote Sensing (GEOG 383); Overall Effectiveness = 4.89/5
Advanced Topics in GIS: Raster GIS (GEOG 397); Overall Effectiveness = 4.74/5

2013 Forest Ecology (GEOG 116); Overall Effectiveness = 4.62/5
Advanced Topics in GIS: Raster GIS (GEOG 397); Overall Effectiveness = 4.74/5

2012 Earth System Science (GEOG 104); Overall Effectiveness = 4.97/5

Professional Presentations

2017 **Mietkiewicz, N.**, Balch, J., St. Denis, L., Schoennagel, T. *Drivers of historic and future wildfire occurrence across the United States: the relative contribution of human ignitions vs climate to fire size and probability*.

Presentation at the Fire Prediction Across Scales Conference, Columbia University, New York City, NY, USA.

2017 **Mietkiewicz, N.**, Balch, J., St. Denis, L., *Human-ignited fires at the wildland-urban interface: consequences and costs*. Presentation at the Ecological Society of America Portland, OR, USA.

2016 **Mietkiewicz, N.**, D. Kulakowski, and T.T. Veblen. *Spruce beetle legacies on fire behavior under a varying climate in CO, USA*. Paper presentation at the Association of American Geographers, San Francisco, CA.

2016 **Mietkiewicz, N.**, D. Kulakowski, and T.T. Veblen. *Spruce beetle legacies on fire behavior under a varying climate in CO, USA*. Poster presentation at the 5th International Fire Behavior and Fuels Conference, Portland, OR

2014 **Mietkiewicz, N.**, Kulakowski, D. *How do spruce beetle outbreaks affect fuel loads in the southern Rocky Mountains, CO*. Paper presented at the Association of American Geographers, Tampa, FL.

2013 **Mietkiewicz, N.**, Kulakowski, D., and Rogan, J. *Identifying sub-continental drivers of wildland fire under a varying climate*. Paper presented at New England-St. Lawrence Valley Geographical Society (NESTVAL), Worcester, MA.

2013 **Mietkiewicz, N.**, Kulakowski, D., and Rogan, J. *What are the landscape requirements preceding wildland fire occurrence?* Paper presented and Biogeography session chaired at the Annual Conference of the Association of American Geographers, Los Angeles, CA.

2012 **Mietkiewicz, N.**, Kulakowski, D., and Rogan, J. *A century of ecological change in a subalpine forest of the Swiss Alps*. Paper presented at the Annual Conference of the Association of American Geographers, New York, NY.

Outreach, Synergistic Activities, and Professional Development

2018 **Invite Participant** in the Environmental Extremes CodeFest, Univeristy of Colorado, Boulder, CO.

2017 **Invited Speaker** in an undergraduate class, Introduction to Physical Geography, University of Colorado, Boulder, CO.

2017 **Participant** at the Rocky Mountain Advanced Computing Consortium 2017, University of Colorado, Boulder, CO.

2017 **Invited Speaker** at the Wildfire Information Development Workshop, Boulder, CO, USA. Entitled: Human-ignited fires at the wildland-urban interface: case study for using ICS-209s.

2017 **Participant** at the NASA Wildland Fire Applications 2017 Team Meeting, University of Colorado, Boulder, CO.

2017 **Invited Speaker** at the Earth Science & Observation Center Colloquium, University of Colorado, Boulder, CO. Entitled: Earth Lab: Accelerating discovery with advanced earth analytics.

2014 **Participant** in a Seminar in College Teaching, Certificate in College Teaching. Colleges of Worcester Consortium, Inc.

2014 **Professional exhibitor** representing Clark Labs at the Annual Conference of the Association of American Geographers, Tampa, FL.

2014 **Professional exhibitor** representing Clark Labs at the American Society for Photogrammetry and Remote Sensing, Baltimore, MD.

2013 **Professional exhibitor** representing Clark Labs at the Annual Conference of the Association of American Geographers, Los Angeles, CA.

Peer-reviewed for the following journals: Ecology and Evolution, International Journal of Wildfire, Open Access Forests, Ecography

Technology Proficiencies

Applications: RStudio, Jupyter Notebooks, Amazon Web Services (S3, EC2), ArcGIS 9.3-10.6x, QGis, IDRISI/Terrset, Adobe CS6 Illustrator,

Programming: R (expert), Python (general understanding), RMarkdown, Docker, GitHub, UNIX Shell Programing (general understanding)