Colin Nystrom Mast

Curriculum Vitae

Department of Forest and Rangeland Stewardship
Colorado State University
Forestry 126a | 1001 Amy Van Dyken Way, Fort Collins, CO 80521
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Research Interests:

I am a biophysical geographer interested in understanding how forested landscapes change under interacting disturbance regimes, land management, and climate change. My research combines field-based methods with remote sensing and computer simulation to assess changes in forested landscapes and predict future outcomes. My current research focuses on disturbance interactions and forest management in Northern New Mexico, utilizing a Sentinel-1 & 2 model trained with ground measurements and airborne LiDAR that predicts forest structure and composition. I am also leveraging satellite-derived products to quantify how the drivers of high-severity burn areas vary across climatic and topographic gradients in the Western United States. My previous research has focused on experimental management systems in the Oregon Coast Range, timber sustainability in central Siberia, and on comparing the performance and utility of different forest ecosystem models in predicting carbon storage in the Pacific Northwest.

Education:

Colorado State University — Fort Collins, CO
Doctor of Philosophy in Forest Science — August 2024 – present
Graduate Certificate in Data Analysis
Graduate Teaching Certificate
Advisor: Dr. Emily Francis | GPA: 4.00

University of Oregon — Eugene, OR
Master of Science in Geography — September 2022 – June 2024
Thesis: Simulating Forest Dynamics, Disturbance, and Management in the Elliott State Research Forest, Oregon: A Comparative Study of Land Sharing, Land Sparing, and Triad Management.
Advisor: Dr. Melissa Lucash | GPA: 4.05

University of Wisconsin-Madison — Madison, WI
Bachelor of Science in Geography — September 2018 – May 2022
Bachelor of Science in Environmental Studies
Minor in Mathematics
Senior Thesis: California Wildfire: A Risk Assessment of the Sierra Nevada
Phi Beta Kappa Honors | GPA: 3.9

Relevant Work Experience:

Graduate Research Assistant January 2025 - Present
Colorado State University, Fort Collins CO

- Project 1: Training a Sentinel-based model using FIA and LiDAR (New Mexico)
- Project 2: Drivers of high-severity fire across climate gradients (Western US)

Graduate Teaching Assistant August 2024 – December 2024
Colorado State University, Fort Collins CO

Graduate Research Fellow April 2023 – August 2024
University of Oregon, Eugene OR

- Project 1 (April 2023 – August 2024): Modeling outcomes of experimental management, natural disturbance, and climate change in the Elliott State Research Forest, Oregon.
- Project 2 (August 2023 – August 2024): Comparing the ability of forest landscape models to predict carbon trends under differing climate change scenarios in Oregon.
- Project 3 (January 2024 – March 2024): Projecting the impacts of interacting disturbances and logging on landscape patterns and timber sustainability in Siberia.

Graduate Teaching Fellow September 2022 – June 2024
University of Oregon, Eugene OR

Dendrochronology Forestry Field Technician May 2022 – September 2022
Oregon State University, Corvallis OR

Undergraduate Researcher - GIS Analyst 2021-2022
University of Wisconsin-Madison, Madison WI

Land Steward 2020
Schlitz Audubon Nature Center, Bayside, WI

Teaching:

Lab Instruction

- Forest & Rangeland Stewardship 321: Forest Biometry Fall 2024
- Geography 489: Mapping with Drones Spring 2024
- Geography 482/582: GI Science II Fall 2023
- Geography 410L/510L: Mapping with Drones Spring 2023
- Geography 141: Natural Environment Winter 2023
- Geography 323: Biogeography Fall 2022

Workshop Facilitation

- Geography 608: Graduate Workshop Fall 2023
- LANDIS-II basefire calibration Winter 2023

Guest Lecturing

- Geography 482/582: GI Science Fall 2023
- Environmental Studies 410: Landscape Ecology Spring 2024
- Forest & Rangeland Stewardship 321: Forest Biometry Fall 2024
- Forest & Rangeland Stewardship 321: Forest Biometry Fall 2025

Awards and Honors:

Dan A. Green & Dorothy B. Green Graduate Fellowship Award	2025
Doug Foster Graduate Community Building Service Award	2024
National Science Foundation GRFP Honorable Mention	2024
UW-Madison Distinctive Scholastic Achievement - top 20% graduate	2022
UW-Madison Dean's List	2019-2023
Phi Beta Kappa	2022
Erdman Family Math and Science Scholarship	2018
National math honorary society's service award	2018
Academic Excellence Award - Top ten graduate – Westosha Central High School	2018
First Place in the Wisconsin Economics' ten-week stock market competition	2017

Select Publications:

Mast CN, Vallet L, Zald H, Hurteau MD, Jones GM, Woolsey GA, Tinkham WT, Hoffman CM, Francis EJ. "Methods and implications of canopy base height characterization for modeling crown fire potential." *Manuscript in preparation.*

Vallet L, **Mast CN**, Banerjee S, Zald H, Hurteau MD, Jones GM, Francis EJ. "Operational LiDAR-Trained Sentinel Workflow for Mapping Forest Structure, Cover, and Fuel." *Manuscript in preparation.*

Banerjee A, **Mast CN**, Francis EJ. "Mapping Coastal Redwoods (Sequoia sempervirens) across their natural range: An-updateable and field-validated distribution map using Sentinel satellite data and cloud computing." GI Science and Remote Sensing (2026).

Gustafson EJ, Lucash MS, Shvidenko AZ, Sturtevant BR, Schepaschenko D, **Mast CN** & Williams NG. "Climate change threatens the sustainability of current timber harvesting practices across a latitudinal gradient in Siberia." *European Journal of Forest Research* (2025). https://doi.org/10.1007/s10342-025-01782-5

Mast CN, Williams NG, Betts MG, and Lucash MS. "Land sharing, land sparing, and Triad forestry: modeling forest composition, diversity, and carbon storage under climate change and natural disturbances." *Landscape Ecology* (2025). https://doi.org/10.1007/s10980-024-02041-5

Lucash MS, **Mast CN**, Williams NG, Strimbu BM, West T "Landscape level planning: a modeling approach." In: Oregon State University College of Forestry (ed) Elliott state research forest management plan. (2023) Oregon State University, Corvallis, pp 99–119. https://www.forestry.oregonstate.edu/elliott-state-forest/forest-management-plan.

Conference Presentations:

Mast C, Steel Z, and Francis E. 2025. Drivers of high-severity burn area vary across a climatic water deficit gradient in western U.S. conifer forests. International Fire Ecology and Management Congress. New Orleans, Louisiana.

Vallet L, **Mast C**, Zald H, Woolsey G, Hurteau M, Jones G, Hoffman C, Tinkham W, Francis E. 2025. A scalable LiDAR workflow for mapping forest structure and fuels in the western U.S. International Fire Ecology and management Congress. New Orleans, Louisiana.

Vallet L, **Mast C**, Banerjee S, Hurteau M, Zald H, Jones G, Francis E. 2025. A satellite-based system for mapping and monitoring fuel structure in southwestern U.S. forests. International Fire Ecology and management Congress. New Orleans, Louisiana.

Brosseau P, Lucash M, **Mast C**. 2025. Modeling forest growth under climate change in the Oregon Coast Range. University of Oregon Undergraduate Research Symposium, Eugene, Oregon.

Mast C, Williams N, and Lucash MS. 2024. Using LANDIS-II to model potential outcomes of an experimental management system in coastal forests under climate change, windstorms, and wildfire. International Union of Forest Research Organizations. Stockholm, Sweden

Mast C, Lucash MS. 2023. Comparing carbon and fire consequences of alternative management scenarios in the coastal forests of Oregon. American Geophysical Union. San Francisco, California

Mast C, Williams N, Lucash MS. 2023. Modeling future shifts in species habitat, carbon storage, and timber production in the Elliott State Research Forest under a Triad management system, windstorms, wildfire, and climate change. Ecological Society of America. Portland, Oregon.

Mast C, Williams N, and Lucash MS. 2023. Exploring a novel approach to forest management that aims to promote wildlife habitat and store carbon while producing timber in the Elliott State Research Forest, Oregon. Joint Campus Conference. Eugene, Oregon.

Lucash MS, Williams N, and **Mast C**. 2023. Using landscape modeling to inform forest management planning of the Elliott State Research Forest, the largest research forest in North America. International Association for Landscape Ecology-North America. Riverside, California.

Mast C, Williams N, and Lucash M. 2023. Integrated effects of a Triad harvesting regime with wind and fire disturbances on key ecosystem services in the Elliott State Research Forest, Oregon. International Association for Landscape Ecology-North America. Riverside California.

Professional Associations:

Member, Association for Forest Ecology	2025-present
Member, International Union of Forest Research Organizations	2023-present
Faculty Liaison and Chair, Associated Graduate Students in Geography, UO	2023-2024
Representative and Secretary, Associated Graduate Students in Geography, UO	2023-2024
Member, American Geophysical Union	2023-present
Member, Ecological Society of America	2023-present
Member, International Association of Landscape Ecology	2023-present
Department Steward, Graduate Teaching Fellows Federation, Univ. of Oregon	2022-2024
Member, Associated Graduate Students in Geography, University of Oregon	2022-present
Member, Phi Beta Kappa Honors Society	2022-present
Member, Delta Epsilon Phi Honors Society	2017-present

Member, Mu Alpha Theta Honors Society 2017-present

Peer Review:

European Geoscience Union	2023
Ecological Modeling	2025
Journal of Forestry	2025
Ecological Applications	2025

Certifications:

Graduate Certificate in Data Analysis	2025
Graduate Teaching Assistant Certificate	2024
Fire Fighter Type II (Wildland Fire Crewmember)	2023
Van Driver Certification – University of Oregon and Oregon State University	2022