

Hunter Stanke

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Education

PhD in Forestry

ADVISORS(S): ANDREW O. FINLEY

Michigan State University

May 2021 - Present

PhD in Environmental and Forest Science

ADVISORS(S): BRIAN J. HARVEY & DAVID E. BUTMAN

University of Washington

Sep. 2020 - May 2021

MS in Forestry

ADVISOR(S): ANDREW O. FINLEY

Michigan State University

Jan. 2019 - Mar. 2020

BS in Forestry

HONORS COLLEGE

Michigan State University

Aug. 2016 - May 2019

Research Experience

Forest Geospatial Lab

RESEARCH FELLOW

Michigan State University

May 2021 - Present

- Lead development of small area estimation techniques for application to national forest inventories, namely the US Forest Inventory and Analysis Program. Techniques in unit-level and area-level models, and span design- and model-based estimation paradigms.
- Lead backend development of USFS Carbon Online Estimation Engine.

The Harvey Lab

GRADUATE RESEARCH ASSISTANT

University of Washington

Sep. 2020 - May 2021

- Lead quantitative comparison of design-based (i.e., FIA), model-based (i.e., GNN), and model-assisted (i.e., FIA + GNN) estimators of forest structural restoration need across the dry and humid domains of the Pacific Northwest.
- Develop and implement design-based estimators of temporal change in forest structural stage distributions in the Pacific Northwest, and subsequently attribute temporal changes in forest restoration need to various disturbance and successional processes.

Forest Geospatial Lab

GRADUATE RESEARCH ASSISTANT

Michigan State University

Jan. 2019 - Present

- Lead comprehensive assessment of recent population dynamics of top tree species in the western US. Results indicate forests in the region have undergone recent, broad-scale changes in composition and structure.
- Developed and released **rFIA**, an open-source R package designed to improve access to the spatial-temporal estimation capacity of the USDA Forest Inventory and Analysis (FIA) Database in R.
- Leveraged the FIA Database to assess the status and trends (2005-2016) in forest health along the Appalachian National Scenic Trail.

Boone and Crockett Quantitative Wildlife Center

RESEARCH ASSISTANT

Michigan State University

Aug. 2016 - Dec. 2018

- Designed agent-based and network-based models to assess functional connectivity of disparate white-tailed deer (*Odocoileus virginianus*) populations affected by Chronic Wasting Disease in Southern Michigan.
- Designed novel least cost path modelling framework to assess anisotropy in landscape connectivity in a fragmented agricultural-forest matrix. Model results used to inform management of Chronic Wasting Disease in Michigan white-tailed deer populations.
- Assist in capture, sedation, and GPS collaring of adult white-tailed deer using clover traps, drop-nets, and suspended net launchers.

Watershed Hydrology and Engineering Group

RESEARCH ASSISTANT

H.J. Andrews Experimental Forest

Jun. 2018 - Sep. 2018

- Carried out conservative solute tracer tests, fluorescent dye tracer tests, and Hvorslev slug tests to describe solute transport behavior and hyporheic exchange in mountain headwater streams of the Western Cascades.
- Application of hierarchical models and machine learning techniques to assess influence of three-dimensional structural heterogeneity of stream beds on solute transport behavior in mountain headwater streams.

Walters Silvicultural Laboratory

RESEARCH ASSISTANT

Michigan State University

Sep. 2016 - Jan. 2017

- Layout of experimental silvicultural treatments in sugar maple (*Acer saccharum*) dominated Northern Hardwoods stands in Michigan. Treatments comprise single tree selection, shelterwood, and seed tree silvicultural systems.
- Independent field navigation and operation in remote terrain and inclement weather.

Skills

DATA SCIENCE

- Programming** R (Advanced-level, package development, automation), Python, LaTeX, Hugo, Linux CLI
- Statistics** Bayesian hierarchical modeling, advanced regression and classification (mixed-models, additive models, ML)
- Visualization** Advanced graphics in R (ggplot2), LucidChart, RShiny, Plotly
- Optimization** Linear and integer programming, dynamic programming, Gurobi solvers
- Other** AWS, Agent-based modeling, QGIS, Libre Office Suite, Microsoft Office

FIELD SKILLS

- Ecological Restoration** Prescribed burn planning and operations, oak savanna and tall grass prairie restoration
- Forest Management** Forest inventory & mensuration, silvicultural planning, timber sale preparation & administration
- Certifications** Wildland Firefighter Type II (S-130, S-190, S-212), Pesticide Application (MI #C005160375)
- Other** Forest harvest systems and logging operations, heavy equipment operation and maintenance

Awards & Honors

NATIONAL

- 2019 **Graduate Research Fellowship**, National Science Foundation \$138,000
- 2018 **Honorable Mention**, Goldwater Scholarship
- 2018 **Institutional Nominee**, Udall Scholarship
- 2017 **Best Student Poster**, 24th International Meeting of The Wildlife Society

LOCAL

- 2017 **Distinguished Presenter**, Red Cedar Undergraduate Research Journal
- 2017 **Humphrey Scholarship**, MSU Department of Forestry \$8500
- 2017 **Sanctuary Essay Award**, Rajendra Neotropical Migrant Bird Sanctuary Endowment \$1000
- 2016 **STATE Scholarship**, MSU Honors College \$20,000
- 2016 **Professorial Assistantship**, MSU Honors College \$5000
- 2016 **Emil Schmeling Award**, Cass County Conservation Club \$1000

Work Experience

Environmental Data Science Consultant

Burr Oak, MI

SELF-EMPLOYED

Feb. 2021 - Present

- Leverage data (big and small) and advanced statistics to design solutions to environmental problems and empower clients to make informed, data-driven decisions. Currently serving clients in the forest products and natural climate solution industries.
- Services include, but are not limited to: R programming (package development, automation), statistical modeling, data management, technical writing, and forest inventory/ biometrics.

Ecological Restoration Consultant

Burr Oak, MI

SELF-EMPLOYED

Mar. 2017 - Apr. 2020

- Provide clients with technical services and expertise related to natural resource planning and ecological restoration.
- Services include: tall grass prairie design and implementation; timber sale preparation and administration; contract negotiation; reforestation planning and monitoring; development of forest management plans.
- Lead small-scale logging operations on private land.

Forestry Intern

Cottonwood, ID

BUREAU OF LAND MANAGEMENT

May 2017 - Aug. 2017

- Implemented silvicultural prescriptions and forest inventory in high and low-elevation forest types across north-central Idaho.
- Administered green-tree and fire salvage timber sales, planting, spraying and other site preparation operations.
- Served as wildland firefighter with Coeur d'Alene River Ranger District
- Worked independently and in small groups to carry out forestry and firefighting operations in remote, difficult terrain.

Wildlife Assistant

Jones, MI

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Apr. 2016 - Aug. 2016

- Implemented habitat management plans on state game areas in southern Michigan, including oak savanna restoration, invasive species management, food plot installation and maintenance.

Publications

Advancing broad-scale forest health evaluation and monitoring with rFIA

Hunter Stanke, Andrew O Finley, Grant M Domke

USFS Gen. Tech. Rep. SRS-261, 2021. DOI: 10.2737/SRS-GTR-261

Over half of western United States' most abundant tree species in decline

Hunter Stanke, Andrew O Finley, Grant M Domke, Aaron S Weed, David W MacFarlane

Nature Communications, 2021. DOI: 10.1038/s41467-020-20678-z

rFIA: An R package for estimation of forest attributes with the US Forest Inventory and Analysis database

Hunter Stanke, Andrew O Finley, Aaron S Weed, Brian F Walters, Grant M Domke

Environmental Modelling & Software, 2020. DOI: 10.1016/j.envsoft.2020.104664

Effects of long-term changes in climate suitability on populations dynamics of tree species at sub-continental scales

Hunter Stanke, Andrew O Finley, Grant M Domke

Global Change Biology, IN PREPERATION

Re-evaluating forest structural restoration needs in the Pacific Northwest: A comparison of design- and model-based approaches

Hunter Stanke, Madison Laughlin, Tom DeMeo, Jon D Baaker, Brian J Harvey

Forest Ecology and Management, IN PREPERATION

Simplifying small area estimation with rFIA: a demonstration of tools and techniques

Hunter Stanke, Andrew O Finley, Grant M Domke

Frontiers in Forests and Global Change, IN PRESS

Presentations

American Geophysical Union International Fall Meeting

HUNTER STANKE

Press briefing: Wildfire and climate change

New Orleans, LA

Dec. 2021

American Geophysical Union International Fall Meeting

HUNTER STANKE, ANDREW O FINLEY, GRANT M DOMKE, AARON S WEED, DAVID W MACFARLANE

Recent, broad-scale changes in forest composition and structure in the Western United States

New Orleans, LA

Dec. 2021

International Association for Landscape Ecology - North America

HUNTER STANKE, ANDREW O FINLEY, GRANT M DOMKE, BRIAN J HARVEY

Advancing broad-scale forest health evaluation and monitoring with rFIA

Reno, NV

Apr. 2021

Small Area Estimation Focus Sessions of the FIA National User Group Meeting

HUNTER STANKE, ANDREW O FINLEY, GRANT M DOMKE

Small area estimation of forest variables with rFIA

Washington, DC

Oct. 2020

FIA Stakeholders Science Meeting

HUNTER STANKE, ANDREW O FINLEY, AARON S WEED, BRIAN F WALTERS, GRANT M DOMKE

rFIA: Unlocking the FIA Database in R

Knoxville, TN

Nov. 2019

MSU Department of Forestry Graduate Student Symposium

HUNTER STANKE, ANDREW O FINLEY, AARON S WEED

Assessing the Status & Trend in Forest Condition Along the Appalachian National Scenic Trail

East Lansing, MI

Jan. 2019

Symposium of the Ecosystem Informatics Summer Institute

HUNTER STANKE, STEVE WONDZELL, JULIA JONES, ADAM WARD

Vertical Stream Concavity as a Predictor of Solute Transport Behavior in Mountain Headwater Streams

Corvallis, OR

Aug. 2018

Annual Meeting of the Michigan Chapter of The Wildlife Society.

HUNTER STANKE, SONJA CHRISTENSEN, JONATHAN COOK, WILLIAM PORTER, DAVID WILLIAMS

Connecting the Dots: A Landscape Approach for Michigan CWD

Gaylord, MI

Mar. 2018

Michigan Boone and Crockett Club Annual Partners Meeting

HUNTER STANKE, SONJA CHRISTENSEN, JONATHAN COOK, WILLIAM PORTER, DAVID WILLIAMS

Connecting the Dots: A Landscape Approach for Michigan CWD

Jackson, MI

Mar. 2018

24th International Meeting of The Wildlife Society

HUNTER STANKE, SONJA CHRISTENSEN, JONATHAN COOK, WILLIAM PORTER, DAVID WILLIAMS

Connecting the Dots: A Landscape Approach for Michigan CWD (Awarded Best Student Poster)

Albuquerque, NM

Sep. 2017

References

Andrew Finley

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David Williams

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Brian Harvey

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University of Washington
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Julia Jones

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