Wesley Rancher

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Terrestrial Ecosystems Ecology and Landscapes Lab
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Summary

Biogeographer specializing in spatial data science and ecology, with a focus on understanding ecosystem dynamics and environmental change across diverse landscapes and time scales. Skilled in GIS, remote sensing, and spatial modeling and passionate about leveraging these tools to address pressing environmental problems and communicate research findings to the public. Eager to contribute to research and industry initiatives that support data-driven climate solutions and enhance ecological and social resilience.

Education

University of Oregon
M.S. in Geography (Anticipated Spring 2025)
GPA: 3.9, Advisor: Dr. Melissa Lucash

Ohio Wesleyan University
B.A. in Environmental Studies and Geography
Minor in Philosophy
GPA: 3.5, Advisor: Dr. Nathan Rowley

Skills

- **GIS & Remote Sensing**: Advanced in ArcGIS, QGIS, Google Earth Engine
- **Programming**: Advanced in R and Python; proficient in Bash, Git, and AWS CLI; familiar with Docker
- **UAS**: FAA Certified Remote Pilot (#4802988); experience with Pix4D, Drone2Map, Agisoft; experience in LiDAR and Dual Red-Edge sensors calibration
- **Languages**: Working proficiency in Spanish

Research Experience

Graduate Research Assistant – University of Oregon September 2023 – Present
Advisor: Dr. Melissa Lucash

- Contributor in lab research investigating forest dynamics (succession, wildfire, hydrology) under climate change in temperate and boreal ecosystems
- Worked in collaboration with Bonanza Creek LTER to investigate boreal ecosystem change using simulation modeling and remote sensing
- Wrote code in Google Earth Engine to perform atmospheric and topographic corrections, and cross-sensor calibration for Landsat sensors following literature
- Processed Landsat imagery and wrote machine learning code in R using (tidymodels, randomForest, spatialRF) to make spatial imputations of aboveground biomass
- Created Docker images to containerize LANDIS-II (forest landscape model)
- Acquired and processed large climate datasets from CMIP5 and CMIP6

Graduate Research Fellow – NASA Develop June 2023 – August 2023
Advisor: Dr. Anthony Vorster

- Collaborated with Grand Staircase Escalante Partners to map invasive plant communities in the Paria River Watershed, Utah
- Integrated field observations of plant cover with vegetation indices and senescence observations from Landsat imagery and random forest algorithms
- Processed LiDAR datasets and Landsat imagery using ArcGIS and Google Earth Engine

Undergraduate Research Assistant – Ohio Wesleyan University December 2022 – May 2023
Advisor: Dr. Nathan Rowley

- Reproducibly estimated supraglacial lake depth development in Western Greenland using radiative transfer models
- Developed workflows to process Landsat imagery (raster sieving and feature detection)
- Calibrated dual-red-edge (Micasense) and LiDAR sensors with DJI drones
- Created study material for FAA Part 107 exam

Undergraduate Research Fellow – University of Central Oklahoma June 2022 – July 2022
Advisor: Dr. Victor Gonzalez

- Participant in undergraduate research program (REU) funded by the NSF, focused on analyzing climate stressors on heat tolerances of honeybees and sweat bees in Lesvos, Greece
- Created apparatuses for testing desiccation, conducted fieldwork, and contributed to research methodology for temperature acclimation, starvation, and thermal limit assays
- Discovered that bees remain heat tolerant following desiccation and starvation

Teaching Experience

Graduate Teaching Assistant – University of Oregon September 2023 – Present

- **Geography 485/585: Remote Sensing I** Winter 2025, Fall 2024
  - Developed lab exercises, taught GIS and remote sensing software (ArcGIS, QGIS, R), and provided hands-on demonstrations to undergraduates and graduates to apply remote sensing and spatial analysis concepts
- **Geography 199: Global Wildfire** Spring 2024
  - Supported curriculum development, provided supplemental instruction for different wildfire topics, and assisted with student questions on concepts and theory
  - ***Guest lectures:***
    - *"Changing Wildfire in Brazil"* – Discussed landscape drivers of a changing fire regime in Brazil
    - *"Bees and Wildfire"* – Introduced the interplay between post-wildfire effects, vegetation, and pollinators
- **Geography 181: Our Digital Earth** Winter 2024, Fall 2023
  - Facilitated labs focused on digital mapping and spatial data; helped students with ArcGIS Online basics and digital geography concepts

Awards and Honors

Rippey Research Grant ($1000, UO)	2024
NASA Develop Scholarship ($1500, SSAI)	2023
Dean's List (OWU)	Fall '22, Spring '20, '22, '23
Robert E. Shanklin Distinguished Scholar (Geography, OWU)	2023
Phi Sigma Tau (Philosophy, OWU)	2023
Our New Gold Digital Storytelling winner (Spanish, OWU)	2022

Publications

- **Rancher W**, Matsumoto H, Lamping J, Lucash MS. 2025. "Comparing Aboveground Carbon Estimates Using Machine Learning and Process-Based Models" *(In preparation)*
- Weiss S, **Rancher W**, Hayes K, Buma B, Lucash MS. 2024. "Wildfire Dynamics Under Climate Change in Interior Alaska" *(In preparation)*
- Gonzalez VHB., **Rancher W**, Vigil R, Garino-Heisey I, Oyen K, Tscheulin T, Petanidou T, Hranitz J, Barthell J. 2024. "Bees Remain Heat Tolerant After Acute Exposure to Desiccation and Starvation"
- Rowley N, **Rancher W**, Karmosky C. 2024. "Comparison of Multiple Methods for Supraglacial Melt-Lake Volume Estimation in Western Greenland During the 2021 Summer Melt Season"

Presentations

- **Rancher W**, Matsumoto H, Lamping J, Lucash ML. 2025. *"Estimating Recent Shifts in Aboveground Carbon and Species Composition in Interior Alaska Using Landsat Imagery and Random Forests"* – Northwest Scientific Association – Eugene, OR *(Poster)*
- **Rancher W**, Matsumoto H, Lamping J, Lucash ML. 2024. *"Assessing Vegetation Shifts in Boreal Alaska by Integrating Landsat Imagery with Spatial Modeling"* – American Geophysical Union – Washington DC *(Poster)*
- **Rancher W**, VanArnam M, Kowalski A, Anarella T, Vorster A. 2023. *"Mapping Russian Olive and Tamarisk to Inform Invasive Species Management along the Paria River, Utah"* – NASA Develop Day – Washington, DC *(Virtual talk)*
- **Rancher W**, W, Rowley N. 2023. *"Estimating Supraglacial Melt Lake Volume Changes in West Central Greenland Using Multiple Remote Sensing Methods"* – Ohio Wesleyan Spring Symposium – Delaware, OH *(Poster)*
- **Rancher W,** Vigil R, Garino-Heisey I, Gonzalez V. 2022. *"Effects of Desiccation on Bees' Heat Tolerance"* – Ohio Wesleyan Connection Conference – Delaware, Ohio *(Poster)*
- **Rancher W**, Gonzalez V. 2022. *"Effects of Desiccation on Bees' Heat Tolerance"* – IUSSI Sección Andina y del Caribe – Panama City, Panama *(Talk)*