Wesley Rancher

Department of Geography
University of Oregon
Terrestrial Ecosystems Ecology and Landscapes Lab
wesr@uoregon.edu

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 Expected 2025
M.S. in Geography (in progress)
GPA: 3.9, Advisor: Dr. Melissa Lucash

Ohio Wesleyan University 2023
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 and GitHub for version control
- **Drone Operation & Image Processing**: FAA Certified Remote UAS Pilot (#4802988); experience with Pix4D, Drone2Map, Agisoft; proficient 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

- Conducted thesis research quantifying aboveground carbon dynamics in boreal Alaska using remote sensing and simulation modeling, and contributed to lab research analyzing forest dynamics under climate change in temperate, boreal, and tundra ecosystems
- Enhanced data processing efficiency by writing code in the Python API for Google Earth Engine to perform atmospheric correction, cross-sensor calibration, and calculate spectral indices for satellite imagery
- Synthesized field data from Cooperative Alaska Forest Inventory (CAFI) with Landsat imagery and machine learning algorithms to make spatial imputations of aboveground tree carbon
- Integrated remote sensing data with a dynamic forest landscape model (LANDIS-II) to simulate ecosystem change in boreal Alaska

- Wrote code in R and Boto3 to run instances of LANDIS-II and analyze model output in HPC
- Compiled and manipulated large climate datasets from 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 native and invasive plant cover with spectral vegetation indices and senescence observations from Landsat imagery
- Processed large datasets to detect landscape attributes and change using Google Earth Engine, R, and ArcGIS

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 in Google Earth Engine for acquiring Landsat data
- Applied spectral indices and raster sieving for hydrological feature detection within satellite imagery
- Calculated sensor specific radiative transfer equations on processed imagery to generate depth images

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
- Contributed to experimental design development for testing desiccation, temperature acclimation, starvation, and thermal limit assays on honeybees and sweat bees
- Discovered that bees remain heat tolerant following desiccation and starvation

Teaching Experience

Graduate Teaching Assistant – University of Oregon September 2023 – Present

- **Lab Instructor – Geography 485/585: Remote Sensing I** Fall 2024
  - Developed lab exercises, taught GIS and remote sensing software (ArcGIS, QGIS, R), and provided hands-on demonstrations to undergraduates and graduates applying key remote sensing and spatial analysis concepts
- **Guest Lecturer** Spring 2024
  - Geography 199: "Changing Wildfire in Brazil" – Discussed landscape drivers of a changing fire regime in Brazil
  - Geography 199: "Bees and Wildfire" – Introduced the interplay between post-wildfire effects, vegetation, and pollinators
- **Course Assistant – 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
- **Lab Instructor – 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

- 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. 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)*