

Daniel P. Beverly

Current Position: Postdoctoral Research Assistant
O'Neill School of Public and Environmental Affairs
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Areas of Research/Interests:

Plant ecophysiology, plant physiology, ecology, biogeochemistry, ecohydrology

Education:

- 2021: PhD Water Resources / Environmental Science & Engineering (WRESE) (Botany). Dissertation Title: *Phenotypic and topographical controls of ecohydrological processes from leaf to ecosystem*. University of Wyoming-Laramie WY.
- 2013: M.S. Biology/Ecology. Thesis Title: *Impacts of Mountain Pine Beetle and Subsequent Forest Management on Soil Carbon Dioxide Efflux*. University of Northern Colorado-Greeley CO.
- 2011: B.S. Ecology and Evolutionary Biology. Minor Chemistry and Environmental Studies. University of Northern Colorado-Greeley CO.

Publications:

- Guo, Jiemin, **Beverly D. P.**, Mercer J. J., Cook C., Ewers B., Williams D. G.. Stomatal and mesophyll diffusion limitations to photosynthesis in two Rocky Mountain conifers across a hillslope gradient. *Annals of Botany* (*in review*)
- Beverly D. P.**, Laughlin D. C., Speckman H. N., Ewers B. E.. Accounting for spatial and temporal variation in critical cavitation points and whole-plant conductance improves predictions of conifer transpiration. *Plant Cell and Environment* (*in review*)
- Guadagno Carmela R., **Beverly D. P.**, Ewers B. E.. (2021) The love-hate relationship between chlorophyll a and water in PSII affects fluorescence products. *Photosynthetica*. DOI 10.32615/ps.2021.023

4. Bretfeld Mario, Speckman H. N., **Beverly D. P.**, Ewers B. E.. (2021). Bayesian predictions of bark beetle attack and mortality of three conifer species during epidemic and endemic population stages. . *Frontiers in Forest and Global Change, Ecophysiology Section*.
5. **Beverly, Daniel P.**, Guadagno C. R., Ewers B.. (2020) Biophysically Informed Imaging Acquisition of Plant Water Status. *Frontiers in Forest and Global Change, Ecophysiology Section*.
6. Tai, Xiaonan, Mackay, D., Ewers, Brent, Parsekian, Andrew, **Beverly, Daniel**, Speckman, Heather, Brooks, Paul, Anderegg, William. (2019). Plant hydraulic stress explained tree mortality and tree size explained beetle attack in a mixed conifer forest. *Journal of Geophysical Research: Biogeosciences*. 10.1029/2019JG005272.
7. **Beverly, D. P.**, Guadagno, C. R., Bretfeld, M., Speckman, H. N., Albeke, S. E., & Ewers, B. E. (2019). Hydraulic and photosynthetic responses of big sagebrush to the 2017 total solar eclipse. *Scientific Reports*, 9(1), 8839.
8. Speckman, H., Ewers, B. E., & **Beverly, D. P.** AquaFlux: Rapid, Transparent, and Replicable Analyses of Plant Transpiration. *Methods in Ecology and Evolution*.
9. Fullhart, A. T., Kelleners, T. J., Speckman, H. N., **Beverly, D.**, Ewers, B. E., Frank, J. M., & Massman, W. J. (2019). Measured and modelled above-and below-canopy turbulent fluxes for a snow-dominated mountain forest using GEOTop. *Hydrological Processes*, 33(18), 2464-2480.
10. Thayer, D., Parsekian, A. D., Hyde, K., Speckman, H., **Beverly, D.**, Ewers, B., ... & Rogers, T. (2018). Geophysical measurements to determine the hydrologic partitioning of snowmelt on a snow-dominated subalpine hillslope. *Water Resources Research*, 54(6), 3788-3808.
11. **Beverly, Daniel**, and Scott Franklin. "Heterotrophic and autotrophic soil respiration under simulated dormancy conditions." *Open Journal of Forestry* 5.03 (2015): 274.

Publications in preparation:

1. **Beverly, Daniel P.**, Franklin, S., Hubbard, R., Rhoades C.. Impacts of Mountain Pine Beetle and Subsequent Forest Management on Soil Carbon Dioxide Efflux.

Grants Awarded: (Total: \$25,272)

1. University of Wyoming Botany Department Travel Grant—2019 (\$790)
2. 2019. UWYO Instrument Grant: Spectral dynamics through conifer canopies following wildland fires— \$2750
3. 2019. G.A. Harris Fellowship runner-up. Grant: Predicting water and carbon exchange from a forest using Photochemical Reflectance Index (PRI) following compound disturbances — \$6232
4. University of Wyoming Botany Department Travel Grant—2018 (\$500)
5. 2016. UWYO Instrument Grant: Spectral reflectance proxies for plant water status using UAS— \$5000

6. 2013. UNCO BIOTA Grant: Separating Autotrophic and Heterotrophic contributors to winter soil respiration— \$3800
7. 2013. UNCO BIOTA Grant: Integrating undergraduate researchers for quantifying microbial contamination food preparation methods— \$3000
8. University of Northern Colorado Graduate School Travel Grant—October 2012 (\$200)
9. University of Northern Colorado Graduate School Summer Funding—Summer 2012 (\$3000)

Practical Experience:

1. Plant-focused research—Field-, lab-, and greenhouse-based measurements and sampling (soil and vegetation), Geospatial navigation and analysis (GIS), instrument setup and design, physiological measurements, spectral and thermal measurements, leading crews, plant identification, troubleshooting experience
2. Statistical proficiency—Frequentist and Bayesian statistics with empirical, phenomenological / process-based (e.g., Terrestrial Regional Ecosystem Exchange Simulator, TREES), and mechanistic modeling techniques
3. Computer proficiency—coding languages (Advanced in R, proficient in python and C), experienced with high performance computing (HPC) platforms, data management, GitHub, ArcGIS and QGIS, proprietary data processing (e.g., eddy pro), Microsoft suite
4. Experience with electronics-building and maintaining computers, data loggers, instruments, drones

Select Presentations: (38 not listed)

1. AGU 2021. Oral Presentation. **Daniel Beverly**, Michael Benson, Sander Denham, Richard Phillips, and Kimberly Novick. *The coordination of whole-plant and branch-level transpiration provides unique insight in of canopy-atmosphere decoupling and hydraulic capacitance.*
2. AGU 2021. **Daniel Beverly**, Elizabeth Huenupi, Adrien Gandolfo, Clara Lietzke, Darren Ficklin, Erin Anderson, Jon Raff, Kimberly Novick, and Richard Phillips. *The Forest, The Cicadas, and The Holey Fluxes: periodical cicada impacts on soil respiration depends on tree mycorrhizal type.*
3. ASPB 2020. **Daniel Beverly** et al.. *Spatial and temporal variation of whole-plant*
4. *conductivity and its influence on conifer transpiration.*
5. AGU 2018. **Daniel Beverly** et al.. *Coupling imaging to leaf-level physiology in species with extreme drought phenotypes.*

6. AGU 2017. Oral Presentation. **Daniel Beverly** et al.. *Root hydraulic vulnerability regulation of whole-plant conductance along hillslope gradients within subalpine and montane forests.*
7. Integrated Carbon and Water for Ecological and Biogeochemical Synthesis 2017. **Daniel Beverly** et al.. *Integrating time-series $\delta^{18}O$ and δD water vapor data into ecohydrological models.*

Select Invited Seminars / Lectures: (7 not listed)

1. Falconer Natural History Lecture Series, SUNY Albany Atmospheric Science Dept.—
“Blame it on the Moon: Plant and Ecosystem Responses to the August 2017 Solar Eclipse”
2021 (*Postponed due to COVID-19*)
2. Applications of Remote Sensing, University of Wyoming—Remote Sensing Methods with UAS 2019

Relevant Research Skills:

1. Indiana University: O’Neill School of Public and Environmental Affairs
 - Plant ecophysiological methods, gas exchange, eddy flux, isotopic approaches
 - Statistical and Modeling (Both empirical and process-based)
2. University of Wyoming: Wyoming Center for Environmental Hydrology and Geophysics (WyCEHG)
 - Plant ecophysiological methods, gas exchange, eddy flux, isotopic approaches
 - Statistical and Modeling (Both empirical and process-based)
 - Remote sensing techniques and drone-based observations (Licensed 2016)
 - Integrating geophysical methods into ecophysiological predictions
 - Greenhouse OSHA certification
 - Grant and budget management
3. United States Forest Service: assessment of stewardship practices post-mountain pine beetle infestation 2010-2013
 - Sapflow, carbon fluxes, and botanical assessment
 - Management of extensive data sets and statistical modeling
 - GIS techniques

Specialist Workshops and Meetings:

1. AmeriFlux Annual Meeting, Virtual, 2020
2. PhysFest2, Cleveland, Ohio 2018
3. Plant Hydraulics Methods, McCall, Idaho 2017
4. Integrated Carbon and Water for Ecological and Biogeochemical Synthesis (ICWEBS), Stevenson, Washington 2017
5. Campbell Sci. CRBasic Datalogger Programming Certification 2017

6. CTEMPS Drone Course Improving UAV Derived Data Products, Palo Alto, California 2016
7. Flux Course, Boulder, Colorado 2015
8. USFS Chainsaw Certification 2012

Professional Memberships:

1. American Geophysical Union (AGU)
2. American Society of Plant Biologists (ASPB)
3. Ecological Society of America (ESA)

Select Academic Lab Teaching: (8 not listed)

1. Field Ecology
2. Applications of Remote Sensing
3. Plant Form and Function
4. Field Botany

Select Academic Awards and Nominations: (8 not listed)

1. William Reiner's Ecophysiological Scholarship—2019 (\$1000)
2. American Geophysical Union Virtual Poster Series Award Winner 3rd place—2018
3. Payson Scholarship for Interdisciplinary Research—2016 (\$500)
4. Deans Citation for Most Outstanding Thesis—December 2013

Academic Service / Volunteering: (7 not listed)

1. O'Neil School of Public and Environmental Affairs Undergraduate Research Program: Plant physiological responses to water stress 2021 (Jane Williams)
2. Mentor of Wyoming Research Scholars Program: Microbial diversity and natural antibiotic resistance following compounding disturbances of wildland fire and bark beetle infestation 2019-20 (Collin Finley)
3. Undergraduate Research Mentoring—29 students 2015-2020
4. Mentor of Wyoming Research Scholars Program: Hydrological dynamics across hillslopes of Panama Canal watersheds 2016-17 (Jazlynn Hall)
5. SRAP Mentoring— 20 high school students focused on STEM placement 2014—2018

Research Recognition: (2 not listed)

- Ecological Society of America Frontiers Photography Award from the Brood X Celebration. 2021
- The New York Times: During a Solar Eclipse, What Are Plants Doing?, 2019 (<https://www.nytimes.com/2019/07/02/science/plants-solar-eclipse.html>)
- The Journal of Water Resources Research cover image selected for June 2018 issue