

*Curriculum Vitae*  
**Mallory L. Barnes**  
August 2018

School of Public and Environmental Affairs  
Indiana University  
Email: malbarn@indiana.edu

## **EDUCATION**

2018. Ph.D. School of Natural Resources and the Environment: Watershed Management and Ecohydrology program. University of Arizona.  
Dissertation Title: 'Flashy, patchy, and coupled: using spectral and gas exchange approaches to refine dryland carbon uptake predictions across spatial and temporal scales'.  
Dissertation co-advisors: David D. Breshears and David J.P. Moore.
2013. M.S. Natural Resources and Environmental Management. University of Hawaii at Manoa.  
M.S. advisor: Tomoaki Miura
2009. B.S. Zoology. University of Wisconsin-Madison.

## **PROFESSIONAL APPOINTMENTS**

- 2018-present. Postdoctoral Research Fellow  
Indiana University, School of Public and Environmental Affairs
- 2016-2018 Graduate Research Assistant  
University of Arizona, School of Natural Resources and the Environment
- 2014-2016 Assistant Research Scientist  
University of Arizona, School of Natural Resources and the Environment
- 2013-2014 Biological Sciences Technician  
United States Department of Agriculture, Southwest Watershed Research Center
- 2011-2013 Graduate Research Assistant  
University of Hawaii at Manoa, Natural Resources and Environmental Management
- 2011 Teaching Assistant – applied calculus  
University of Hawaii at Manoa, Natural Resources and Environmental Management

## **AWARDS AND HONORS**

- 2018 Travel Award: Ecological Society of America, Physiological Ecology Section.
- 2018 Plenary Speaker. University of Arizona Earth Week, Tucson.
- 2018 Third Place Poster: University of Arizona Earth Week.
- 2017 Travel Award: Graduate Student and Professional Council.
- 2017 Scholarship: Alma L. Wilson Memorial Scholarship
- 2017 Travel Award: North American Carbon Program Meeting.
- 2017 Scholarship: William G. McGinnies Graduate Scholarship in Arid Land Studies

2016 Scholarship: Bartley P. Cardon Scholarship  
2016 Scholarship: Clifford W. Carstens Jr. Endowment,  
2015 Best Poster: Phenology Research and Observations of Southwest Ecosystems  
2015 Best Poster: Research Insights in Semiarid Ecosystems  
2014 Best Poster. Phenology Research and Observations of Southwest Ecosystems.  
2013 Fellowship. University of Hawaii at Manoa Pacific Islands Climate Science Center  
Graduate Student Fellowship.  
2013 Award of Merit: College of Tropical Agriculture MS Oral Presentation  
2012 Travel Award: University of Hawaii at Manoa Graduate Student Organization.

## PUBLICATIONS

### Peer-Reviewed Manuscripts

**Barnes, M.L.**, Scott, R.L., Moore, D.J.P, Ponce Campos, G.E., Biederman, J. A., MacBean, N., Breshears, D.D. (*in prep*). Flashy, patchy and coupled: refined dryland carbon flux predictions developed from the North American Southwest reveal altered global dryland dynamics. ~75% completed. For submission to *Science*.

Minor, J., Colella, T., **Barnes, M.L.**, Mann, S., Murphy, P., Pearl, J., Barron-Gafford, G. (*in revision*). Critical Zone Science in the Anthropocene: Opportunities for Biogeographic and Ecological Theory and Praxis to Drive Earth Science Integration. In revision for *Global Ecology and Biogeography*.

**Barnes, M.L.**, van Leeuwen, W.J.D., Moore, D.J.P. (*in prep*). Integrating Remote Sensing Observations and Eddy Flux Observations to Improve Understanding of Ecosystem Processes. ~70% completed. For submission to *Frontiers in Ecology and the Environment*.

Smith, W.K., Biederman, J.A., Scott, R.L., Moore, D.J.P, He, M., Kimball, J.S., Yan, D., Hudson, A., **Barnes, M.L.**, MacBean, N., Fox, A., Litvak, M.E. 2018. Evidence of a robust relationship between solar-induced chlorophyll fluorescence and gross primary productivity across dryland ecosystems of southwestern North America. *Geophysical Research Letters* 45 (2), 748-757.

**Barnes, M.L.**, Breshears, D.D., Law, D., van Leeuwen, W.J.D, Monson, R.K., Fojtack, A.F., Barron-Gafford, G.A., Moore, D.J.P. Beyond greenness: potential for detecting temporal changes in photosynthetic metabolism with hyperspectral reflectance data. *PLoS one* 12 (12).

**Barnes, M.L.**, Moran, M.S., Scott, R.L., Kolb, T.E., Ponce-Campos, G.E., Moore, D.J.P., Ross, M.A., Mitra, B., Dore, S. 2016a. Vegetation responds to sub-annual climate variability across semi-arid biomes. *Ecosphere* 7 (5).

**Barnes, M.L.**, Miura, T., Giambelluca, T. 2016b. An Assessment of Seasonal and Diurnal Changes in Cloud Cover Over the Hawaiian Islands Using Terra and Aqua MODIS. *Journal of Climate* 29 (1), 77-90.

Longman, R.J., Giambelluca, T.W., Allis, R.J. and **Barnes, M.L.** 2014. Temporal Solar Radiation Change at High Elevations in Hawaii. *Journal of Geophysical Research: Atmospheres* 119 (10), 6022-6033.

### Official Reports and Datasets

**Barnes, M.L.** Data for "Beyond greenness: detecting temporal changes in photosynthetic capacity with hyperspectral reflectance data" (PLoS one). Project on *Open Science Framework*.

Giambelluca, T., Shuai, X., **Barnes, M.L.**, Alliss, R., Longman, R., Miura, T., Chen, Q., Frazier, A., Mudd, R. Hawai'i Evapotranspiration Mapping Project Final Report. 2014. *Official Report* with 70 citations- published online and by the State of Hawaii.

## PROFESSIONAL PRESENTATIONS

### National Conference Presentations

2018. (*invited*) **Barnes, M.L.**, Scott, R.L., Moore, D.J.P, Ponce Campos, G.E., Biederman, J. A., MacBean, N., Breshears, D.D. Upscaling semi-arid ecosystem carbon flux measurements using spaceborne imagery: a machine learning approach. Oral presentation. Ecological Society of America Annual Meeting. August 5-10, New Orleans, LA.

2017. **Barnes, M.L.**, Moore, D.J.P, Scott, R.L., MacBean, N., Ponce Campos, G.E., Breshears, D.D. Upscaling Ameriflux observations to assess drought impacts on gross primary productivity across the Southwest. Oral presentation. American Geophysical Union Fall Meeting. December 14-18, New Orleans, LA.

2017. **Barnes, M.L.**, Moore, D.J.P, Breshears, D.D., Law, D.J., Fojtik, A.C. (\*). Beyond greenness: Potential for detecting temporal changes in photosynthetic capacity with hyperspectral imaging. Oral presentation. Ecological Society of America Annual Meeting. August 6-11, Portland, OR.

2017. **Barnes, M.L.**, Moore, D.J.P., Scott, R.L., MacBean, N. "Upscaling Ameriflux observations to assess drought impacts on gross primary productivity across the Southwest". Poster. Joint North American Carbon Program and Ameriflux PI Meeting. March 26-30, Bethesda, MD.

2016. Fojtik, A.C. (\*), **Barnes, M.L.**, Breshears, D.D., Law, D., Moore, DJP. Water stress reduces evaporative cooling in hybrid poplars during hot drought: genotype influences degree of coupling between thermal stress and atmosphere. Poster. American Geophysical Union Fall Meeting. December 12-16, San Francisco, CA.

2015. **Barnes, M.L.**, Moran, M.S., Scott, R.L. Detecting soil moisture pulses and associated vegetation response in a southern Arizona watershed using SMAP and MODIS. Poster. American Geophysical Union Fall Meeting. December 14-18. San Francisco, CA.

2015. **Barnes, M.L.**, Moore, D.J.P., Breshears, D.D., Moran, M.S. Combined influence of soil moisture and vapor pressure deficit on productivity of US forests. Oral Presentation. Ecological Society of America Annual Meeting. August 9-14. Baltimore, MD.

2014. **Barnes, M.L.**, Moran, M. S., Scott, R. L., Ponce-Campos, G. E., Mitra, B., Kolb, T.E. Spatial patterns of vegetation response to climate variability across the American Southwest. Oral Presentation. Ecological Society of America Annual Meeting. August 10-15, Sacramento, CA.

2012. **Barnes, M.L.**, Miura, T., Giambelluca, T., Chen, Q. An Assessment of Seasonal and Diurnal Cloud Cover Changes Over the Hawaiian Islands. Poster. American Geophysical Union Fall Meeting, Dec 3-7. San Francisco, CA.

2012. **Barnes, M.L.**, Miura T., Giambelluca, T., Chen, Q. Detection of Spatial and Temporal Cloud Cover Patterns Over Hawaii Using Observations from Terra and Aqua MODIS. Poster. American Geophysical Union Chapman Conference on Remote Sensing of the Terrestrial Water Cycle. Feb 19-22, Kona, HI.

(\*) indicates undergraduate mentee

### Campus/Local Presentations

2018. **Barnes, M.L.**, Upscaling semi-arid ecosystem carbon flux measurements using spaceborne imagery: a machine learning approach. Plenary speaker. School of Earth and Environmental Sciences Earth Week. April 9-13, Tucson, AZ.

2018. **Barnes, M.L.**, Scott, R.L., Moore, D.J.P, Ponce Campos, G.E., Biederman, J. A., MacBean, N., Breshears, D.D. Poster. University of Arizona Earth Week 2018. Poster. Upscaling semi-arid ecosystem carbon flux measurements using spaceborne imagery: a machine learning approach. School of Earth and Environmental Sciences Earth Week. April 9-13, Tucson, AZ.

2018. (*invited*) **Barnes, M.L.** Flashy, patchy and coupled: refined dryland carbon flux predictions developed from the Southwest reveal altered global dryland dynamics. Oral Presentation. Tree Ring Seminar. April 25, Tucson, AZ.

2018. **Barnes, M.L.** Plants, climate change, and the carbon cycle. Oral Presentation. University of Arizona Grad Slam. March 23, Tucson, AZ.

2017. (*invited*) **Barnes, M.L.**, Beyond greenness: linking remote sensing and flux measurements to study coupled carbon and water cycles in semi-arid ecosystems. Oral Presentation. School of Natural Resources and Environment departmental seminar. April 3, Tucson AZ.

2016. Fojtik, A.C. (\*), **Barnes, M.L.**, Breshears, D.D., Law, D., Moore, DJP. Water stress reduces evaporative cooling in hybrid poplars during hot drought: genotype influences degree of coupling between thermal stress and atmosphere. Poster. Undergraduate Research Opportunities Consortium (UROC) Poster Session. August 8, Tucson, AZ.

2015. **Barnes, M.L.**, Moore, D.J.P., Moran, M.S. Consideration of sub-annual climate conditions improves understanding of vegetation response to drought in the Southwest. Poster. Research Insights in Semi-Arid Ecosystems. October 17, Tucson, AZ.

2015. **Barnes, M.L.**, Moore, D.J.P., Moran, M.S. Consideration of sub-annual climate conditions improves understanding of vegetation response to drought in the Southwest. Poster. Phenology Research and Observations of Southwest Ecosystems Symposium. October 16, Tucson, AZ.

2014. **Barnes, M.L.**, Spatial patterns of vegetation response to climate variability across the American Southwest. Oral Presentation. University of AZ Grad Blitz. November 2014. Tucson, AZ.

2014. **Barnes, M.L.**, Scott, R.L, Moran, M. S., Kolb, T.E., Ponce-Campos, G., Dore, S., Mitra, B. Spatial patterns of vegetation response to climate variability across the American Southwest. Poster. Research Insights in Semi-Arid Ecosystems. October 18, Tucson, AZ.

2014. **Barnes, M.L.**, Spatial patterns of vegetation response to climate variability across the American Southwest. *Poster*. Phenology Research and Observations of Southwest Ecosystems (PROSE) Symposium. October 17, Tucson, AZ.

2013. **Barnes, M.L.** An Assessment of Seasonal and Diurnal Cloud Cover Changes Over the Hawaiian Islands. *Oral Presentation*. 1<sup>st</sup> Annual Pacific Islands Climate Science Center (PICSC) Annual Symposium. July 14, Honolulu, HI.

2013. **Barnes, M.L.** An Assessment of Seasonal and Diurnal Cloud Cover Changes Over the Hawaiian Islands. *Oral presentation*. 25<sup>th</sup> Annual CTAHR Student Research Symposium. Apr 12-13, Honolulu, HI.

(\*) indicates undergraduate mentee

### SERVICE TO PROFESSION

### **Conference Session Organizer**

2017. American Geophysical Union Fall Meeting. Dec 11-15. Co-chair/convenor:  
“Remote Sensing in Terrestrial Ecosystems: Cross-Scale Approaches to Understanding Structure, Function, and process”. Received 54 abstracts, 3 oral sessions, and 1 poster session.

2015. American Geophysical Union Fall Meeting. Dec 14-18. Co-chair/primary convenor:  
“Integrating Remote Sensing Observations and Eddy Covariance Observations”. Received 20 abstracts, 1 oral session, and 1 poster session.

### **Reviewer**

Journal Reviewer: *Agricultural and Forest Meteorology*, *Ecological Applications*, *Global Change Biology*, *Trees*, *International Journal of Wildland Fire*, *Environmental Science and Pollution Research*

Internal Reviewer: USGS

### **UNIVERSITY SERVICE**

Spring 2017. Student representative on search committee for associate professor of ecohydrology in the School of Natural Resources and the Environment at University of Arizona.

2014-2016. Treasurer and social chair of Natural Resources Graduate Student Organization.

2015. Natural Resources Graduation Student Organization Earth Week representative.

### **ADDITIONAL TRAINING**

2016. Participant in the two-week 9<sup>th</sup> Annual Flux Course on measuring and modeling fluxes at the Mountain Research Station in Nederland, CO.

2014. Attendee of the SMAP pre-launch science team meeting at the Jet Propulsion Laboratory in Pasadena, CA.

2014. Attendee of the SMAP applications workshop in Boulder, CO.

2013. Climate Boot Camp Fellow at a weeklong immersive training on climate change communication at the Northwest Climate Science Center in McCall, ID.

### **COMMUNITY OUTREACH**

Volunteer with 500 Women Scientists: STEM night at Donaldson Elementary School in Tucson, AZ. March 29, 2018.

Speaker, Osher Lifelong Learning Institute – University of Arizona. Talk Title: “Ecology from Space”. September 24, 2017.

Speaker and Participant, NASA Space Grant Workshop: Hands-on, inquiry-based STEM curriculum development with high school teachers. June 14, 2017.

Speaker, Osher Lifelong Learning Institute – University of Arizona. Talk Title: “Ecology from Space”. March 24, 2017.

Workshop Organizer, Expanding Your Horizons Conference at Sahurita Middle School, Saurhita, Arizona, January 18, 2017. Through the Women in Science and Engineering Program at University of Arizona.

### **TEACHING AREAS**

Geographic Information Systems, Environmental Remote Sensing, Ecohydrology, Natural Resource Management, Computational Ecology

**PROFESSIONAL AFFILIATIONS**

American Geophysical Union

Ecological Society of America