

## **Luke A. Pangle, PhD**

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### **APPOINTMENTS**

- 2016            Assistant Professor, Georgia State University, Department of Geosciences
- 2013 - 2015    Post-doctoral Research Scientist, University of Arizona - Biosphere 2, Landscape Evolution Observatory

### **EDUCATION**

- 2013            PhD., Oregon State University, Water Resources Graduate Program  
Concentration: Water Resources Science
- 2006            M.S., University of Georgia, Warnell School of Forestry and Natural Resources  
Concentration: Ecosystem Ecology
- 2003            B.S. Elon University (*cum laude*), Elon, NC  
Major: Environmental Studies  
Minor: Biology

### **MERITORIOUS AWARDS AND FELLOWSHIPS**

- 2012            Richard A. Herbert Memorial Scholarship Recipient, American Water Resources Association (AWRA)
- 2012            Outstanding oral presentation, Oregon Water Research Symposium, Oregon State University
- 2012            Outstanding oral presentation, Western Forestry Graduate Research Symposium, Oregon State University
- 2009-2011      Multiple Competitive Graduate Fellowships and Scholarships, COF, Oregon State University, >\$15K.
- 2006            Outstanding oral presentation, Warnell School of Forestry and Natural Resources Graduate Student Symposium, University of Georgia
- 2003            Golden Oak Award for the outstanding graduate in Environmental Studies at Elon University

### **ORGANIZATIONAL AFFILIATIONS**

2012- American Water Resources Association  
2009- American Geophysical Union

## RESEARCH-GRANT PROPOSALS

Advancing real-time monitoring applications of electrical resistivity tomography at the Landscape Evolution and Critical Zone Observatories; Water, Energy, and Environmental Solutions Funding Initiative, University of Arizona; Co-PI, \$50,000.

## PEER-REVIEWED PUBLICATIONS

### *In prep or under review*

**Pangle, L.A.**, Kim, M., Cardoso, C., Lora, M., Wang, Y., Volkmann, T.H., Troch, P.A., and C.J. Harman, *In prep*, Physical origins of time-variable transit times during the periodic-tracer-hierarchy (PERTH) experiment, *Proceedings of the American Geophysical Union Annual Meeting, 2014*, H23L-1043.

Kim, M., **Pangle, L.A.**, Cardoso, C., Lora, M., Wang, Y., Harman, C.J., and P.A. Troch, *In prep*, Using new theory and experimental methods to understand the relative controls of storage, antecedent conditions, and precipitation intensity on transit time distributions through a sloping soil lysimeter, *Proceedings of the American Geophysical Union Annual Meeting, 2014*, H33D-0861.

**Pangle, L.A.**, L. Hopp, J.W. Gregg, J.J. McDonnell, *In prep*, Soil-water flow under aggrading grassland vegetation: seeking evidence of hydrologically significant soil alteration by roots, To be submitted to *Ecology*.

Scudeler, C., **L. Pangle**, D. Pasetto, G.Y. Niu, C. Paniconi, M. Putti, P. Troch, *In prep*, Flow and transport modeling of a isotope tracer experiment at B2 LEO using integrated and distributed multisensory observational data.

### *Published*

Pasetto, D., Niu, G.-Y., **Pangle, L.**, Paniconi, C., Putti, M., Troch, P.A., *In Press*, Observability and sensor failure analysis for the Biosphere 2 Landscape Evolution Observatory based on distributed soil moisture data, *Advances in Water Resources*

**Pangle, L.A.**, et al. [29 coauthors], 2015, The Landscape Evolution Observatory: A large-scale controllable infrastructure to study coupled Earth-surface processes, *Geomorphology* 244, 190-203.

Gevaert, A.I., Teuling, A.J., Uijlenhoet, R., DeLong, S.B., Huxman, T.E., **Pangle, L.A.**, Breshears, D.D., Chorover, J., Pelletier, J.D., Saleska, S.R., Zeng, X., Troch, P.A., 2014, Hillslope-

scale experiment demonstrates role of convergence during two-step saturation, *Hydrology and Earth System Sciences* (18), 3681-3692.

Nui, G-Y, D. Passeto, C. Scudeler, C. Paniconi, M. Putti, P. Troch, S. DeLong, K. Dontsova, **L. Pangle**, D. Breshears, J. Chorover, T. Huxman, J. Pelletier, S. Saleska, and X. Zeng, 2014, Incipient subsurface heterogeneity and its effect on overland flow generation – insight from a modeling study of the first experiment at the Biosphere 2 Landscape Evolution Observatory, *Hydrology and Earth System Sciences* 18(5) 1873-1883, DOI: 10.5194/hess-18-1873-2014.

**Pangle, L.A.**, J.J. McDonnell, J.W., Gregg, 2014, Rainfall seasonality and an ecohydrological feedback offset the potential climate warming impact on evapotranspiration and groundwater recharge. *Water Resources Research* 50(2), 1308-1321, DOI: 10.1002/2012WR013253.

**Pangle, L.A.**, J. Klaus, J.J. McDonnell, E. Berman, M. Gupta, 2013, A new multi-source and high-frequency approach to measuring  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  in hydrological field studies, *Water Resources Research* 49(11), 7797-7803, DOI: 10.1002/2013WR013743.

Clark, J., Bell, D., Jin Chu, C., Courbaud, B., Dietze, M., Hersh, M., HilleRisLambers, J., Ibanez, I., LaDeau, S., McMahon, S., Metcalf, J., Mohan, J., Moran, E., **Pangle, L.**, Pearson, S., Salk, C., Shen, Z., Valle, D., Wyckoff, P. 2010. High dimensional coexistence based on individual variation: a synthesis of evidence. *Ecological Monographs* 80(4) 569-608. DOI: 10.1890/09-1541.1.

**Pangle, L.A.**, Vose, J.M., Teskey, R.O. 2009. Radiation use efficiency in adjacent pine and hardwood forests in the southern Appalachians. *Forest Ecology and Management* 257(3) 1034-1042, DOI: 10.1016/j.foreco.2008.11.004.

## **PUBLIC PRESENTATIONS OF RESEARCH**

### *Invited*

**Pangle, L.A.** et al. [29 co-authors], 2015, The Landscape Evolution Observatory: A large-scale controllable infrastructure to study coupled Earth-surface processes, *Venue: Binghamton Geomorphology Conference*, University of Buffalo. *Invited seminar.*

**Pangle, L.A.** et al. [29 co-authors], 2014, The Landscape Evolution Observatory (LEO) at Biosphere 2: an experimental tool to investigate landscape function with implications for managing degraded arid landscapes. *Venue: University of California, Irvine, Center for Environmental Biology; Workshop on Restoration of Steep Slopes.* *Invited seminar.*

**Pangle, L.A.** et al. [29 co-authors], 2014, How water moves through landscapes: cutting edge science from the Landscape Evolution Observatory, *Venue: University of Arizona, Science Café Series.* *Invited presentation.*

**Pangle, L.A.**, L. Hopp, J. Klaus, J.W. Gregg, J.J. McDonnell, 2013, Hydroclimatic and ecohydrological mediation of water-budget partitioning and transport time scales in a seasonally semi-arid environment. *Venue: University of Arizona, Biosphere 2. Invited seminar.*

### ***Contributed***

**Pangle, L.A.**, Kim, M., Cardoso, C., Lora, M., Wang, Y., Volkmann, T.H., Troch, P.A., and C.J. Harman, Physical origins of time-variable transit times during the periodic-tracer-hierarchy (PERTH) experiment, *Proceedings of the American Geophysical Union Annual Meeting, 2014*, H23L-1043. *Contributed poster.*

Kim, M., **Pangle, L.A.**, Cardoso, C., Lora, M., Wang, Y., Harman, C.J., and P.A. Troch, *In prep*, Using new theory and experimental methods to understand the relative controls of storage, antecedent conditions, and precipitation intensity on transit time distributions through a sloping soil lysimeter, *Proceedings of the American Geophysical Union Annual Meeting, 2014*, H33D-0861. *Contributed poster.*

**Pangle, L.A.**, Phillips, C., McDonnell, J.J., Gregg, J.W. 2013. Climate-warming impacts on water and carbon cycling in a seasonally semi-arid grassland ecosystem. American Geophysical Union Chapman Conference; Tucson, AZ. *Contributed poster.*

**Pangle, L.A.**, L. Hopp, J.J. McDonnell. 2012. Biophysical and ecological effects of aggrading vegetation on unsaturated water flow in the vadose zone. American Geophysical Union Annual Meeting; San Francisco, CA. *Contributed poster.*

Stöcker, F., J. Klaus, **L.A. Pangle**, J.J. McDonnell. 2012. High-frequency observations of  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  in precipitation. American Geophysical Union Annual Meeting; San Francisco, CA. *Contributed poster.*

**Pangle, L.A.**, J. Klaus, J.J. McDonnell, E. Berman, M. Gupta. 2012. A new method for in situ high frequency sampling of  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  in multiple water flows: implications for soil and catchment studies. Consortium of Universities of the Advancement of Hydrologic Science (CUAHSI), Biennial Colloquium; Boulder, CO. *Contributed poster.*

**Pangle, L.A.**, Gregg, J.W., McDonnell, J.J. 2011. Seasonal rainfall and an ecohydrological feedback offset the potential hydrological impact of climate warming in a Mediterranean grassland. American Geophysical Union Annual Meeting; San Francisco, CA. *Contributed oral presentation.*

**Pangle, L.A.**, Gregg, J.W., McDonnell, J.J. 2011. Water budget response to symmetric and asymmetric climate warming in Willamette Valley grasslands. Oregon Section of American Water Resources Association, Oregon Water Conference; Corvallis, OR. *Contributed poster.*

**Pangle, L.A.,** Gregg, J.W., McDonnell, J.J. 2009. Groundwater recharge in Willamette Valley grasslands shows resilience to climate warming. American Geophysical Union, Chapman Conference on Ecohydrological Feedbacks of Landscape Change in Semi-Arid Environments; Sun Valley, ID. *Contributed poster*

**Pangle, L.A.,** Vose, J.M., Teskey, R.O. 2006. The relationship between intercepted solar radiation and aboveground net primary productivity in two southern Appalachian forests. Ecological Society of America Annual Meeting; Memphis, TN. *Contributed oral presentation.*

**Pangle, L.A.,** Vose, J.M., Teskey, R.O. 2006. Using the radiation use efficiency to predict carbon storage in southern Appalachian forests. USDA Southern Research Station, Carbon Cycling in Southern Forests Conference; Asheville, NC. *Contributed poster*

**Pangle, L.A.** and Teskey, R.O. 2006. Comparing the efficiency of resource use between deciduous and evergreen conifer forests along environmental gradients. Southeastern Evolution and Ecology Conference; Tuscaloosa, AL. *Contributed oral presentation.*

**Pangle, L.A.** and Teskey, R.O. 2006. Radiation use efficiency as a robust parameter for estimating net primary productivity in forests. Warnell School of Forestry and Natural Resources Graduate Student Symposium; Athens, GA. *Contributed oral presentation*

## **PROFESSIONAL EXPERIENCE**

2013-2015 Post-Doctoral Research Scientist, University of Arizona – Biosphere 2.  
2007-2008 Research Associate, Duke University, Nicholas School of the Environment  
2004 Forestry Technician, DOI National Park Service, Great Smoky Mountains  
Exotic species assessment and management team.  
2002 Biological Science Technician, USDA Forest Service, Coweeta Hydrologic  
Laboratory and NSF LTER Site

## **TEACHING AND STUDENT ADVISING**

### *Teaching*

2014 Co-Instructor, CUAHSI Master Watershed Hydrology Course at Biosphere 2.  
- Developed curriculum and led instruction on methods for calculation of transit-times of subsurface flow in soils and catchments. Developed curriculum and led instruction on numerical modeling exercise to simulate variably-saturated subsurface flow.  
2012 Teaching Assistant, Oregon State U., WRP 524-Socio-Technical Aspects of Water Resources:

- Developed curriculum and led instruction for two field-based learning experiences that taught graduate students about methods used for gauging streamflow and for monitoring climatic variables. Developed a spreadsheet-based modeling exercise that allowed students to calculate potential evapotranspiration using local climate data and the Penman-Monteith model.

2004-2006 Teaching Assistant, University of Georgia, FORS 3000-Forest Ecology.  
- Assistant instructor of field-based undergraduate laboratory course that introduced students to methods used to measure ecosystem processes, species diversity, and net primary productivity. Contributed a guest lecture on forest communities of the southern Appalachian Mountains.

### *Advising*

2014 Advisor of undergraduate-student research, University of Arizona:

Student: Jon Barta, Department of Physics, Whitworth College.

Project Title: Using sulfur hexafluoride to quantify the gas-diffusion coefficient of the crushed basalt within the Landscape Evolution Observatory (LEO).

Poster Presentation: *Research Experience for Undergraduates Colloquium*, University of Arizona, and at the *American Geophysical Union Fall Meeting*, 2014, San Francisco, CA.

Student: Maira Costa, Department of Civil Engineering, Universidade Federal Fluminense, Brazil.

Project Title: Using sulfur hexafluoride to quantify the gas-leakage rate from the Landscape Evolution Observatory (LEO) closed-chamber facility.

Poster Presentation: *Research Experience for Undergraduates Colloquium*, University of Arizona.

Student: Xadani Escobar Rito, Universidad Nacional Autonoma de Mexico, Commission for Cultural and Educational Exchange (COMEXUS).

Project Title: Analytical approach to quantifying sensible heat flux above the Landscape Evolution Observatory (LEO) hillslopes.

Poster Presentation: *Research Experience for Undergraduates Colloquium*, University of Arizona.

Student: Yadi Wang, Department of Chemical Engineering, University of Arizona.

Project Title: Streamflow generation through precipitation-induced subsurface flow: a controlled experiment to examine the capillary fringe hypothesis.

Poster Presentation: *El dia de Agua; Hydrology and Water Resources Department Student-Research Symposium, University of Arizona.*

Student: Katherine Reynolds, Department of Chemical Engineering, Honors College, University of Arizona.

Project Title: Quantifying the steady-state transit-time distribution of water flow through a basalt-derived soil via a stable-isotope tracer injection.

Poster Presentation: *Honors College Internship Research Symposium, University of Arizona.*

2011 Advisor, Oregon State University College of Forestry Undergraduate Research Experience:

Student: Kirsten Tilleman, College of Forestry, Oregon State University.

Project Title: High-frequency analysis of the stable-isotope composition of rainfall within and between storms: what are the driving climatic variables?

## SERVICE ACTIVITIES

### *University Service*

2013-2015 Leader of multiple education and outreach activities as part of the education and outreach mission of the University of Arizona – Biosphere 2.

2011-2012 Elected Secretary/Web Manager of the Hydrophiles – OSU Student Chapter of the American Water Resources Association

- Co-developer of new Hydrophiles website [groups.oregonstate.edu/hydro](http://groups.oregonstate.edu/hydro): modernized web presence, enhanced usage, linked with multiple social media sites including Hydrophiles Facebook and LinkedIn pages.
- Co-coordinator of the 2012 Water Research Symposium at Oregon State University: transformed the annual event into a multi-university showcase of graduate student research in western Oregon.
- Coordinator and Moderator, 2009 & 2012 Hydro-Careers Panel Discussions: Interactive professional development events organized for OSU graduate and undergraduate students.
- Coordinator, 2012 Hydrophiles Recreational and Educational Snow Hydrology Field Trip: A two-day trip to Oregon's Cascade Mountains for skiing and

- participation in a one-kilometer survey of snow depth measurements, coupled with a tutorial on climate station instrumentation in snow-dominated terrain.
- Coordinator, 2011 Hydrophiles Willamette River Rafting Trip

2011-2012 Volunteer Mentor, Hydrophiles New Student Mentoring Program

*Academic Service*

- 2012- - Peer reviewer:  
*Hydrological Processes*  
*Hydrology and Earth System Sciences*

*Community Service*

- 2010 -SOLV Volunteer, Corvallis, Oregon. Dixon Creek stream-bank restoration project.
- 2010 -Mary's River Watershed Council Volunteer, Corvallis, OR, Greasy Creek stream-bank restoration project.