

TYSON LEE SWETNAM
The University of Arizona
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EDUCATION

- | | | |
|------|--|------------|
| 2013 | School of Natural Resources and Environment, The University of Arizona
➤ Doctor of Philosophy Watershed Management
➤ Remote Sensing & Spatial Analysis Minor
➤ Dissertation “ <i>Cordilleran forest scaling dynamics and disturbance regimes quantified by aerial lidar</i> ” | Tucson, AZ |
| 2006 | School of Natural Resources and Environment, The University of Arizona
➤ Master of Science Watershed Management
➤ GIS Technical Certificate
➤ Thesis “ <i>Fire Regime Condition Class Accuracy: A comparison to tree-ring fire histories</i> ” | Tucson, AZ |
| 2002 | Ecology and Evolutionary Biology, The University of Arizona
➤ Bachelor of Science | Tucson, AZ |

PROFESSIONAL PREPARATION

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|-------------|--|--------------------|
| 2019 – | BIO5 Institute, The University of Arizona
➤ <i>Research Assistant Professor of Geoinformatics</i> | Tucson, AZ |
| 2016 – 2018 | BIO5 Institute, The University of Arizona
➤ <i>Science Informatician, CyVerse</i> | Tucson, AZ |
| 2015 – 2016 | School of Natural Resources and Environment, The University of Arizona
➤ <i>Associate Research Scientist, Remote Sensing & Ecohydrology</i> | Tucson, AZ |
| 2015 | Department of Geology and Geophysics, University of Utah
➤ <i>Research Associate, Remote Sensing & Ecohydrology</i> | Salt Lake City, UT |
| 2014 – 2015 | Department of Geosciences, The University of Arizona
➤ <i>Postdoctoral Associate, Santa Catalina-Jemez Critical Zone Observatory</i> | Tucson, AZ |
| 2012 – 2013 | School of Natural Resources and Environment, The University of Arizona
➤ <i>Graduate Research Assistant, Remote Sensing</i> | Tucson, AZ |
| 2008 – 2012 | Coronado National Forest, The United States Forest Service
➤ <i>Fire Management Specialist, Supervisor’s Office</i> | Tucson, AZ |

2008 – 2012	Laboratory of Tree Ring Research, The University of Arizona ➤ <i>Graduate Research Assistant</i> , Dendroecology, Fire History	Tucson, AZ
2006 – 2008	School of Natural Resources and Environment, The University of Arizona ➤ <i>Graduate Teaching Assistant</i> , Introduction to Wildland Fire	Tucson, AZ
2005 – 2006	Ecology and Evolutionary Biology, University of Arizona ➤ <i>Graduate Teaching Assistant</i> , Introductory Biology	Tucson, AZ
2005 – 2006	Rocky Mountain Tree Ring Research ➤ <i>Research technician</i> , Fire History	Fort Collins, CO
2002 – 2005	Saguaro National Park ➤ <i>Forestry Technician</i> , Fire Crew and Fire Use Module	Tucson, AZ

AWARDS

- Scholarly Achievement Award, School of Natural Resources and Environment 5/2014
- Kel M. Fox Award Outstanding Graduate in Watershed Management 9/2012
- President's award UA Grad. & Professional Student Council: Best graduate exhibit 12/2009
- School of Natural Resources and Environment Graduate Teaching Assistant of the Year 5/2009

PROFESSIONAL SOCIETIES

- American Geophysical Union (AGU), Ecological Society of America (ESA), Critical Zone Exploration Network (CZEN), Association for Fire Ecology (AFE), Earth Science Information Partners (ESIP).

PEER-REVIEWED PUBLICATIONS

22. Gedir, J.V., J.W. Cain, T.L. Swetnam, P.R. Krausman, & J.R. Mogart (2020) Extreme drought and adaptive resource selection by a desert mammal. *Ecosphere* <https://doi.org/10.1002/ecs2.3175>
21. Mitra, B., S.A. Papuga, M.R. Alexander, T.L. Swetnam, & N. Abramson (2019) Allometric relationships between primary size measures and sapwood area for six common tree species in snow-dependent ecosystems in the Southwest United States. *Journal of Forestry Research* 1-10. <https://doi.org/10.1007/s11676-019-01048-y>
20. Gillan, J., M.P. McClaran, T.L. Swetnam, & P. Heilman (2019) Estimating forage utilization with drone-based photogrammetric point clouds. *Journal of Rangeland Ecology & Management* <https://doi.org/10.1016/j.rama.2019.02.009>
19. Norman, L.M., J.B. Callegary, L. Lacher, N.R. Wilson, C. Fandel, B.T. Forbes, & T.L. Swetnam (2019) Modeling Riparian Restoration Impacts on the Hydrologic Cycle at the Babacomari Ranch, SE Arizona, USA. *Water* 11, 381. <https://doi.org/10.3390/w11020381>
18. Hancock, D., C. Stewart, M. Vaughn, J. Fischer, J.M. Lowe, G. Turner, T.L. Swetnam, T.K. Chafin, E. Afgan M.E. Pierce, & W. Snapp-Childs (2018) Jetstream—Early operations performance, adoption, and impacts. *Concurrency and Computation: Practice and Experience* <https://doi.org/10.1002/cpe.4683>
17. Perdrial, J., P.D. Brooks, T.L. Swetnam, K.A. Lohse, C. Rasmussen, M. Litvak, A.A. Harpold, X. Zapata-Rios, P. Broxton, B. Mitra, T. Meixner, K. Condon, D. Huckle, C. Stielstra, A. Vázquez-Ortega, R. Lybrand, M. Holleran, C. Orem, J.D. Pelletier, & J. Chorover (2018) A net ecosystem carbon budget for snow dominated

T. L. SWETNAM

- forested headwater catchments: linking water and carbon fluxes to critical zone carbon storage. *Biogeochemistry* 138: 225. <https://doi.org/10.1007/s10533-018-0440-3>
16. Swetnam, T.L., J.K. Gillan, T.T. Sankey, M.P. McClaran, M.H. Nichols, P. Heilman, & J. McVay (2018) Considerations for Achieving Cross-Platform Point Cloud Data Fusion across Different Dryland Ecosystem Structural States. *Front. Plant Sci.* 8:2144. doi:10.3389/fpls.2017.02144
 15. Pelletier J.D., G.A. Barron-Gafford, H. Gutierrez-Jurado, E.L.S. Hinckley, E. Istanbuluoglu, L.A. McGuire, G.Y. Niu, M.J. Poulos, C. Rasmussen, P. Richardson, T.L. Swetnam, & G.E. Tucker (2018) Which way do you lean? Using slope aspect variations to understand Critical Zone processes and feedbacks. *Earth Surf. Process. Landforms*, doi:10.1002/esp.4306.
 14. Evans, M.E.K., D.A. Falk, A. Arizpe, T.L. Swetnam, F. Babst, & K.E. Holsinger (2017) Fusing tree-ring and forest inventory data to infer influences on tree growth. *Ecosphere* 8(7):e01889. doi:10.1002/ecs2.1889
 13. Swetnam, T.L., P.D. Brooks, H.R. Barnard, A.A. Harpold, & E.L. Gallo (2017) Topographically driven differences in energy and water constrain climatic control on forest carbon sequestration. *Ecosphere* 8(4):e01797. doi:10.1002/ecs2.1797
 12. Pelletier, J.D., & T.L. Swetnam (2017) Asymmetry of weathering-limited hillslopes: the importance of diurnal covariation in solar insolation and temperature. *Earth Surf. Process. Landforms*, 42: 1408–1418. doi:10.1002/esp.4136.
 11. Sankey, T.T., J. McVay, T.L. Swetnam, M.P. McClaran, P. Heilman & M. Nichols (2017) UAV hyperspectral and lidar data and their fusion for arid and semi-arid land vegetation monitoring. *Remote Sens Ecol Conserv.* doi:10.1002/rse2.44
 10. Swetnam T.L., C.D. O'Connor, & A.M. Lynch (2016) Tree morphologic plasticity explains deviation from metabolic scaling theory in semi-arid conifer forests, southwestern USA. *PLoS One* 11(7):e0157582. <https://doi.org/10.1371/journal.pone.0157582>
 9. Swetnam, T.L., A.M. Lynch, D.A. Falk, D.P. Guertin, & S.R. Yool (2015) Discriminating disturbance from natural variation with LiDAR in semi-arid forests, Southwestern USA. *Ecosphere* 6(6):97. <http://dx.doi.org/10.1890/ES14-00384.1>
 8. Harpold, A.A., J.A. Marshall, S.W. Lyon, T.B. Barnhart, B. Fisher, M. Donovan, K.M. Brubaker, C.J. Crosby, N.F. Glenn, C.L. Glennie, P.B. Kirchner, N. Lam, K.D. Mankoff, J.L. McCreight, N.P. Molotch, K.N. Musselman, J.D. Pelletier, T. Russo, H. Sangireddy, Y. Sjöberg, T.L. Swetnam & N. West (2015) Laser vision: lidar as a transformative tool to advance critical zone science. *Hydrology & Earth System Science* 19, 2881-2897. doi:10.5194/hess-19-2881-2015
 7. Rasmussen, C., J.D. Pelletier, P.A. Troch, T.L. Swetnam & J. Chorover (2015) Quantifying topographic, vegetation, and disturbance effects on the transfer of energy and mass to the critical zone. *Vadose Zone* doi:10.2136/vzj2014.07.0102
 6. Swetnam, T.L., D.A. Falk, A.M. Lynch & S.R. Yool (2014) Estimating individual tree mid-and understory rank-size distributions from airborne laser scanning in semi-arid forests. *Forest Ecology and Management* 330, 271-282. doi:10.1016/j.foreco.2014.07.011
 5. Swetnam, T.L. & D.A. Falk (2014) Allometric scaling rules to limit commission error in aerial LiDAR forest inventories. *Forest Ecology and Management* 323, 158-167. doi: 10.1016/j.foreco.2014.03.016
 4. Harpold, A.A., Q. Guo, N. Molotch, P.D. Brooks, R. Bales, J.C. Fernandez-Diaz, K.N. Musselman, and T.L. Swetnam, P. Kirchner, M. Meadows, J. Flanagan & R. Lucas (2014) LiDAR-Derived Snowpack Datasets from Mixed Conifer Forests Across the Western US. *Water Resources Research* 50(3), 2749-2755. doi:10.1002/2013WR013935

3. Pelletier, J.D., G.A. Barron-Gafford, D.D. Breshears, P.D. Brooks, J. Chorover, M. Durcik, C.J. Harman, T.E. Huxman, K.A. Lohse, R. Lybrand, T. Meixner, J.C. McIntosh, S.A. Papuga, C. Rasmussen, M. Schaap, T.L. Swetnam & P.A. Troch (2013) Coevolution of nonlinear trends in vegetation, soils, and topography with elevation and slope aspect: A case study in the sky islands of southern Arizona. *Journal of Geophysical Research: Earth Surface* 1-18. doi:10.1002/jgrf.20046
2. Swetnam, T.L., D.A. Falk, A. Hessel & C. Farris (2011) Reconstructing landscape pattern of historic fires and fire regimes. In *The Landscape Ecology of Fire*, editors D MacKenzie, DA Falk, C Miller. pp. 165-192. Springer Netherlands, 2011. doi:10.1007/978-94-007-0301-8_7
1. Swetnam, T.L. & P.M. Brown (2010) Comparing Fire Regime Condition Class (FRCC) Vegetation Models to Tree Ring Data. *International Journal of Wildland Fire* 19, 1-13. <http://dx.doi.org/10.1071/WF08001>

CURRENT PRE-PRINTS

- Nüst, D., Eddelbuettel, D., Bennett, D., Cannoodt, R., Clark, D., Daroczi, G., ... & Marwick, B. (2020). The Rockerverse: Packages and Applications for Containerization with R. arXiv preprint arXiv:2001.10641. <https://arxiv.org/abs/2001.10641>

THESES, PROCEEDINGS, WORKING PAPERS, & TECHNICAL REPORTS

- Martínez-Meyer E., A. González-Bernal, J.A. Velasco, T.L. Swetnam, Z.Y. González-Saucedo, J. Servín, C.A. López González, N.E. Lara Díaz, C. Aguilar Miguel, C. Chávez García, and J.K. Oakleaf (2017) Mexican wolf habitat suitability analysis in historical range in the Southwestern US and Mexico. U.S. Fish and Wildlife Service, Region 2, Albuquerque, New Mexico, USA.
- Swetnam, T.L., J.D. Pelletier, C. Rasmussen, N.R. Callahan, N. Merchant, E. Lyons, M. Rynge, Y. Liu, V. Nandigam & C. Crosby (2016) Scaling GIS analysis tasks from the desktop to the cloud utilizing contemporary distributed computing and data management approaches: A case study of project-based learning and cyberinfrastructure concepts. In *Proceedings of the XSEDE16 Conference on Diversity, Big Data, and Science at Scale*, p. 21. ACM, 2016.
- Swetnam, T.L. & D.A. Falk (2015) Carbon Cycling in Southwestern Forests: Reservoirs, Fluxes, and the Effects of Fire and Management. ERI Working Paper #35. Flagstaff, AZ: Ecological Restoration Institute and Southwest Fire Science Consortium, Northern Arizona University. 15 p.
- Swetnam, TL (2013) Cordilleran forest scaling dynamics and disturbance regimes quantified by aerial LiDAR. (Doctoral Dissertation, University of Arizona) 277 p.
- Swetnam, T.L., D.P. Guertin, E. Canfield, & A. Kimoto (2013) Riparian vegetation characterization of the Lower Santa Cruz River and Ciénega Creek through remotely sensed multi-sensor data fusion. Addendum to the 'Historical Conditions of the Effluent-Dependent Santa Cruz River' Pima County.
- O'Connor C.D., D.A. Falk, A.M. Lynch, C.P. Wilcox, T.W. Swetnam, & T.L. Swetnam (2013) Growth and Demography of Pinaleño High Elevation Forests. RJVA 07-JV-11221615317. Rocky Mountain Research Station, Ft. Collins, CO.
- Swetnam, T.L., & B. Powell (2010) Example of the use of LiDAR for monitoring vegetation characteristics: An example from the Ciénega Creek Nature Preserve. Supplement to the Pima County Ecological Monitoring Program: Phase II Monitoring Plan Summary.

Swetnam, T.L. (2006) Fire Regime Condition Class Accuracy: A comparison to tree-ring fire histories. (M.S. Thesis, University of Arizona. 111 p.)

SELECT CONFERENCE PROCEEDINGS

- Swetnam, D.A. Falk, S.R. Yool (2018) The Ecosystem Moisture Stress Index. The Madrean Conference, Tucson AZ, 17 May.
- Swetnam, T.L., R. Walls, N. Merchant (2017) CyVerse Data Commons: lessons learned in cyberinfrastructure management and data hosting from the Life Sciences. American Geophysical Union (AGU) Abstract IN12B-07. New Orleans, LA, 12 Dec.
- Swetnam, T.L., R. Walls, B. Joyce, U. Devisetty (2017) Analyzing and managing ecological data with CyVerse. Ecological Society of America. Portland, OR, 10 Aug.
- Swetnam, T.L., P.D. Brooks, E. Gallo, & A. Harpold (2015) Topographic Control of Aboveground Carbon Pools Across an Environmental Gradient, Eastern Slope of the Rocky Mountains, Colorado. AGU Abstract H033-61411. San Francisco, CA, 15 Dec.
- Swetnam, T.L., J.D. Pelletier, & N. Merchant (2015) Scaling Critical Zone analysis tasks from desktop to the cloud utilizing contemporary distributed computing and data management approaches: A case study for project based learning of Cyberinfrastructure concepts. AGU Abstract IN014-82342. San Francisco, CA, 16 Dec.
- Swetnam, T.L., A.M. Lynch, D.A. Falk, S.R. Yool & D.P. Guertin (2014) Discriminating disturbance from natural variation with LiDAR in semi-arid forests, Southwestern USA. Abstract GC33D-0543 presented at 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
- Swetnam, T.L., D.A. Falk (2008) High Resolution Paleo Fire Regime Reconstruction. International Association of Landscape Ecologists, Madison WI, March 2008.

PROFESSIONAL SERVICE

- Journal Reviewer: Canadian Journal of Forest Research, Ecological Applications, Ecosphere, International Journal of Wildland Fire, Journal of Environmental Informatics, PLOS One, Remote Sensing, Remote Sensing of Environment.
- NEON Lidar Technical Working Group 2018-Present
- NEON Data Institute 2018, Quantitative Undergraduate Biology Education and Synthesis (QUBES)
- The Carpentries Instructor and Lessons Maintainer 2017-Present
- Standing committee member on NSF EarthCube project

TEACHING AND STUDENT MENTORSHIP

Courses Taught

- Introductory Biology Lab (ECOL 181/182), fall, spring, and summer semester 8/2005 – 7/2006
- Introduction to Wildland Fire (RNR 355/455), fall semester. 8/2006 – 12/2008

Guest Lectures

- Ecological Forecasting, GEOG 595E, The University of Arizona 9/2019
- Artificial Intelligence for Health Medicine SIE578, The University of Arizona 2/2019
- NEON Data Institute on Reproducible Workflows, Boulder CO 7/2018

T. L. SWETNAM

- Open Source GIS GIST604B, The University of Arizona 11/2018
- Resource Mapping RNR422/522, The University of Arizona 8/2015 - 5/2017
- Remote Sensing GEOG330, The University of Arizona 10/2017

Workshops

- CyVerse Foundations of Open Source Science 2019 - Present
- CyVerse Container Camp, The University of Arizona 2018 - Present
- NEON Science with CyVerse, Boulder CO 2/2019
- Geospatial Carpentry, The University of Arizona 2018 - Present
- Software Carpentry, The University of Arizona 2017 - Present

Students, Committee Member, Postdoctoral Researchers:

- Post-doctoral Researcher: R. Bartelme (2020)
- Graduate: L. Carpenter (Masters-GIST, 2012), J. Kennedy (Masters-GIST, 2014), A. Ruff (Masters-GIST, 2017), A. Brischke (MS, School of Natural Resources and Environment, 2015), S. Hendryx (MS, Geography, 2017), J. Gillan (PhD, School of Natural Resources and Environment, 2019), P.L. Narayan (MS, Computer Science, 2018), D. Slovikosky (MS, Computer Science, 2018), B. LaSala (MS, Mining and Geological Engineering, 2020), J. Lindsay (MS, Computer Science, 2021)
- Undergraduate: J. Mack (NASA Space-Grant intern, 2010), D. Wilcox (NASA Space-Grant intern, 2014), N. Callahan (Computer Science, 2016), K. Pope (NSF UWIN, 2017), C. Prigge (Computer Science, 2021), V. Mehta (Computer Science 2020), J. van der Leeuw (Computer Science Mathematics, 2021).
- High School: D.S. Lee (BASIS Oro Valley High School, 2018), E. Joshi (BASIS Oro Valley High School, 2020).