

## Henry D. Adams

### Assistant Professor

Department of Plant Biology, Ecology, & Evolution  
Oklahoma State University, Stillwater, OK 74078  
<http://plantbio.okstate.edu/Adams/>

[Henry.Adams@okstate.edu](mailto:Henry.Adams@okstate.edu)  
405-744-4742  
<http://henrydadams.com>

I am an ecologist broadly interested in global change, and specifically in forest response to climate-related disturbances. My research is focused on the physiological process of tree mortality from drought, its sensitivity to temperature, interactions with tree defenses against insects and pathogens, and the ecosystem consequences for forests. I seek to understand mechanisms of climate-related ecological responses with an application toward improved prediction of climate change and its effects on the earth system.

### EDUCATION

Alfred University	(1995-1999)	B.A. Biology, Environmental Studies 1999
Northern Arizona University	(2001-2003)	M.S. Forestry 2003
University of Arizona	(2007-2012)	Ph.D. Ecology & Evolutionary Biology 2012

### PROFESSIONAL EXPERIENCE

2015 – Present:	<i>Assistant Professor</i> , Department of Plant Biology, Ecology, & Evolution, Oklahoma State University
2014 – 2016:	<i>Adjunct Assistant Professor</i> , Department of Biology, University of New Mexico
2012 – 2015:	<i>Director's Postdoctoral Fellow</i> , Earth and Environmental Sciences, Los Alamos National Laboratory
2010 – 2012:	<i>US EPA Science to Achieve Results (STAR) Fellow</i> , Biosphere 2, University of Arizona
2010 – 2011:	<i>Teaching Assistant</i> , Ecology & Evolutionary Biology, University of Arizona
2007 – 2010:	<i>USDA Ecohydrology Fellow</i> , Ecology & Evolutionary Biology, University of Arizona
2007 – 2008:	<i>Science and Society Fellow</i> , Biosphere 2, University of Arizona
2004 – 2006:	<i>Professional Research Assistant</i> , Institute of Arctic and Alpine Research, University of Colorado, Boulder
2001 – 2003:	<i>Graduate Assistant</i> , Forestry, Northern Arizona University

### HONORS AND AWARDS

2013	<b>Competitively Selected Participant</b> , DISCCRS VII Symposium, Dissertation Initiative for the advancement of Climate Change Research.
2013	<b>Spot Award for Service</b> , Impacts of Climate Change Tour, 70 <sup>th</sup> Anniversary Celebration, Los Alamos National Laboratory
2011	<b>William G. McGinnies Graduate Scholarship</b> , Arid Lands Studies, University of Arizona
2011	<b>First Prize Oral Presentation</b> , Environmental Research Grad Blitz, University of Arizona
2008	<b>Outstanding Student Paper Award</b> , Fall Meeting of the American Geophysical Union

## **RESEARCH AND SCHOLARSHIP**

**Peer-reviewed Publications** (41 published or in press, h-index: 18(ISI), 23(Google Scholar), \*graduate student supervised, \*\*undergraduate supervised)

- Law DJ, **Adams HD**, Breshears DD, Cobb NS, Bradford JB, Zou CB, Field JP, Gardea AA, Williams AP, Huxman TE. 2018. Bioclimatic envelopes for individual demographic events driven by extremes: plant mortality from drought and warming. *International Journal of Plant Sciences*. Accepted.
- Dee JR, **Adams HD**, Palmer MW. 2018. Belowground annual ring growth coordinates with aboveground phenology and timing of carbon storage in two tallgrass prairie forb species. *American Journal of Botany*. Accepted.
- Li W, Hartmann H, **Adams HD**, Zhang H, Jin C, Zhao C, Guan D, Wang A, Yuan F, Wu J. 2018. The sweet side of global change—dynamic responses of non-structural carbohydrates to drought, elevated CO<sub>2</sub>, and N fertilization in tree species. *Tree Physiology*. doi:10.1093/treephys/tpy059.
- McBranch NA, Grossiord C, **Adams HD**, Borrego I, Collins AD, Dickman LT, Ryan M, Sevanto S, McDowell NG. 2018. Lack of acclimation of leaf area:sapwood area ratios in piñon pine and juniper in response to precipitation reduction and warming. *Tree Physiology*. Accepted.
- Zhang H, Li W, **Adams HD**, Wang A, Wu J, Jin C, Guan D, Yuan F. 2018. Responses of woody plant functional traits to nitrogen addition: a meta-analysis of leaf economics, gas exchange, and hydraulic traits. *Frontiers in Plant Science*. doi:10.3389/fpls.2018.00683.
- Manrique-Alba À, Sevanto SA, **Adams HD**; Collins AD, Dickman LT, Chirino E, Bellot J, McDowell NG. 2018. Stem radial growth and water storage responses to heat and drought vary between conifers with differing hydraulic strategies. *Plant, Cell & Environment*. doi:10.1111/pce.13340.
- Hein CJ, Ten Hove JE, Gopalakrishnan S, Livneh B, **Adams HD**, Marino EK, Weiler CS. 2018. Overcoming early career barriers to interdisciplinary climate change research. *Wiley Interdisciplinary Reviews Climate Change*. doi:10.1002/wcc.530.
- Hartmann H, **Adams HD**, **Hammond WM\***, Hoch G, Landhäusser SM, Wiley E, Zähle S. 2018. Identifying differences in carbohydrate dynamics of seedlings and mature trees to improve carbon allocation in models for trees and forests. *Environmental and Experimental Botany*. doi:10.1016/j.envexpbot.2018.03.011.
- Hartmann H, Moura CF, Anderegg WRL, Ruehr NK, Salmon Y, Allen CD, Arndt S, Breshears DD, Davi, H, Galbraith D, Ruthroff KX, Wunder J, **Adams HD**, Bloemen J, Cailleret M, Cobb R, Gessler A, Grams TEE, Jansen S, Kautz M, Lloret F, O'Brien MJ. 2018. Research frontiers for improving our understanding of drought-induced tree and forest mortality. *New Phytologist* 218: 15-28.
- Cobb RC, Ruthrof KX, Breshears DD, Lloret F, Aakala T, **Adams HD**, Allen CD, Anderegg WRL, Ewers BE, Galiano L, Grünzweig JM, Hartmann H, Huang C-Y, Klein T, Kunert N, Kitzberger T, Landhäusser SM, Levick S, Priesler Y, Suarez ML, Trotsiuk V, Zeppel MJB. 2017. Ecosystem dynamics and management after forest die-off: a global synthesis with conceptual state-and-transition models. *Ecosphere* 8: Article e02034.
- Adams HD**, Barron-Gafford GA, Minor RL, Gardea AA, Bentley LP, Law DJ, Breshears DD, McDowell NG, Huxman TE. 2017. The temperature response surface for mortality risk of tree species with future drought. *Environmental Research Letters* 12: Article 115014.
- Adams HD**, Zeppel MJB, Anderegg WRL, Hartmann H, Landhäusser SM, Tissue DT, Huxman TE, Hudson PJ, Franz TE, Allen CD, Anderegg LDL, Barron-Gafford GA, Beerling DJ, Breshears

- DD, Brodribb TJ, Bugmann H, Cobb RC, Collins AD, Dickman LT, Duan H, Ewers BE, Galiano L, Galvez DA, Garcia-Forner N, Gaylord ML, Germino MG, Gessler A, Hacke UG, Hakamada R, Hector A, Jenkins MW, Kane JM, Kolb TE, Law DJ, Lewis JD, Limousin J-M, Love DM, Macalady AK, Martinez-Vilalta J, Mencuccini M, Mitchell PJ, Muss JD, O'Brien MJ, O'Grady AP, Pangle RE, Pinkard EA, Piper FI, Plaut JA, Pockman WT, Quirk J, Reinhardt K, Ripullone F, Ryan MG, Sala A, Sevanto S, Sperry JS, Vargas R, Vennetier M, Way DA, Xu C, Yopez EA, McDowell NG. 2017. A multi-species synthesis of physiological mechanisms in drought-induced tree mortality. *Nature Ecology and Evolution* 1: 1285-1291.
- Smith AMS, Talhelm AF, Johnson DM, Sparks AM, Kolden CA, Yedinak KM, Apostol KG, Tinkham WT, Abatzoglu JT, Lutz JA, Davis AS, Pregitzer KS, **Adams HD**, Kremens RL. 2017. Effects of fire radiative energy density dose on *Pinus contorta* and *Larix occidentalis* seedling physiology and mortality. *International Journal of Wildland Fire* 26:82-94.
- Grossiord C, Sevanto S, **Adams HD**, Collins AD, Dickman LT, McBranch N, Michaletz S, Stockton EA, Vigil M, McDowell NG. 2017. Precipitation, not air temperature, drives functional responses of trees in semi-arid ecosystems. *Journal of Ecology* 105:163-175.
- Grossiord C, Sevanto S, Dawson TE, **Adams HD**, Collins AD, Dickman LT, Newman BD, Stockton EA, McDowell NG. 2017. Warming combined with more extreme precipitation regimes modifies the water sources of trees. *New Phytologist* 213: 584-596.
- Garcia-Forner N, **Adams HD**, Sevanto S, Collins AD, Dickman LT, Hudson P, Zeppel MJB, Martínez-Vilalta J, McDowell NG. 2016. Responses of two semiarid conifer tree species to reduced precipitation and warming reveal new perspectives for stomatal regulation. *Plant, Cell, and Environment* 39: 38-49.
- Smith AMS, Talhelm AF, Kolden CA, Newingham BA, **Adams HD**, Cohen JD, Yedinak KM, Kremens RL. 2016. The ability of winter grazing to reduce wildfire size and fire-induced plant mortality was not demonstrated: A comment on Davies et al. 2015. *International Journal of Wildland Fire* 25: 484-488.
- Adams HD**, Collins AD, **Briggs SP\*\***, Vennetier M, Dickman LT, Sevanto SA, Garcia-Forner N, Powers HH, McDowell NG. 2015. Experimental drought and heat can delay development and reduce foliar and shoot growth in semiarid trees. *Global Change Biology* 21:4210-4220.
- Quentin AG, Pinkard EA, Ryan MG, Tissue DT, Bagget LS, **Adams HD**, Maillard P, Marchand J, Landhausser SM, et al. 2015. Non-structural carbohydrates in woody plants compared among laboratories. *Tree Physiology* 35: 1146-1165.
- Villegas JC, Dominguez F, Barron-Gafford GA, **Adams HD**, Guardiola-Claramonte M, Sommer E, Wiede AL, Rivera IC, Espeleta JF, Zou CB, Breshears DD, Huxman TE. 2015. Sensitivity of regional evapotranspiration partitioning to variation in woody plant cover. *Global Ecology and Biogeography* 24:1040-1048.
- Zeppel MJB, Harrison SP, **Adams HD**, Li G, Kelley DI, West A, Dawson T, Fensham R, Medlyn BR, Palmer A, Tissue DT, McDowell NG. 2015. Drought and resprouting plants. *New Phytologist* 206:583-589.
- Hartmann H, **Adams HD**, Anderegg WRL, Jansen S, Zeppel MJB. 2015. Research frontiers in drought-induced tree mortality: crossing scales and disciplines. *New Phytologist* 205:965-969.
- Adams HD**, Williams AP, Xu C, Rauscher SA, Jiang X, McDowell NG. 2013. Empirical and process-based approaches to climate-induced forest mortality models. *Frontiers in Plant Science* 4: Article 438.

- Breshears DD, **Adams HD**, Eamus D, McDowell NG, Law DJ, Will RE, Williams AP, Zou CB. 2013. The critical amplifying role of increasing atmospheric moisture demand on tree mortality and associated regional die-off. *Frontiers in Plant Science* 4: Article 266.
- Franz TE, Zreda M, Rosolem R, Hornbuckle BK, Irvin SL, **Adams HD**, Kolb TE, Zweck C, Shuttleworth WJ. 2013. Ecosystem-scale measurements of biomass water using cosmic ray neutrons. *Geophysical Research Letters* 40:3929-3933.
- Adams HD**, Germino MJ, Breshears DD, Barron-Gafford GA, Guardiola-Claramonte M, Zou CB, Huxman TE. 2013. Nonstructural leaf carbohydrate dynamics of *Pinus edulis* during drought-induced tree mortality reveal role for carbon metabolism in mortality mechanism. *New Phytologist* 197:1142-1151.
- Zeppel MJB, Anderegg WRL **Adams HD** 2013. Forest mortality due to drought: latest insights, evidence and unresolved questions on physiological pathways and consequences of tree death. *New Phytologist* 197:372-374.
- Adams, HD**, Luce CH, Breshears DD, Allen CD, Weiler M, Hale VC, Smith AMS, Huxman TE. 2012. Ecohydrological consequences of drought- and infestation-triggered tree die-off: Insights and hypotheses. *Ecohydrology* 5:145-159.
- Royer PD, Cobb NS, Clifford MJ, Huang C, Breshears DD, **Adams HD**, Villegas JC. 2011. Extreme event-triggered overstory vegetation loss increases understory solar input regionally: multi-scale ecological implications. *Journal of Ecology* 99:714-723.
- Zeppel MJB, **Adams HD**, Anderegg WRL 2011. Mechanistic causes of tree drought mortality: recent results, unresolved questions and future research needs. *New Phytologist* 192:800-803.
- Adams HD**, Macalady AK, Breshears DD, Allen CD, Stephenson NL, Saleska SR, Huxman TE, McDowell NG. 2010. Climate-induced tree mortality: earth system consequences. *Eos, Transactions, American Geophysical Union* 91:153-154. (Invited Paper)
- Koepke, DF, Kolb TE, **Adams HD**. 2010. Variation in woody plant mortality and dieback from severe drought among soils, plant groups, and species within a northern Arizona ecotone. *Oecologia*. 163:1079-1090.
- Adams HD** et al. 2009. Reply to Leuzinger et al.: Drought-induced tree mortality temperature sensitivity requires pressing forward with best available science. *Proceedings of the National Academy of Sciences, USA* 106:E107-E107.
- Adams HD** et al. 2009. Reply to Sala: Temperature sensitivity in drought-induced tree mortality hastens the need to further resolve a physiological model of death. *Proceedings of the National Academy of Sciences, USA* 106:E69-E69.
- Adams HD**, Guardiola-Claramonte M, Barron-Gafford GA, Villegas JC, Breshears DD, Zou CB, Troch PA, Huxman TE. 2009. Temperature sensitivity of drought-induced tree mortality portends increased regional die-off under global-change-type drought. *Proceedings of the National Academy of Sciences, USA* 106:7063-7066.
- Barger NN, **Adams HD**, Woodhouse CA, Neff JC, Asner GP. 2009. Influence of livestock grazing and climate on pinyon pine (*Pinus edulis*) dynamics. *Rangeland Ecology and Management* 62:531-539.
- Breshears DD, Huxman TE, **Adams HD**, Zou CB, Davison JE. 2008. Vegetation synchronously leans upslope as climate warms. *Proceedings of the National Academy of Sciences, USA* 105: 11591-11592.

- McDowell NG, **Adams HD**, Bailey JD, Kolb TE. 2007. The role of stand density on growth efficiency, leaf area index, and resin flow in southwestern ponderosa pine forests. *Canadian Journal of Forest Research* 37:343-355.
- McDowell NG, **Adams HD**, Bailey JD, Hess M, Kolb TE. 2006. Homeostatic maintenance of ponderosa pine gas exchange in response to stand density changes. *Ecological Applications* 16:1164-1182.
- Adams HD** and Kolb TE. 2005. Tree growth response to drought and temperature in a mountain landscape in northern Arizona, USA. *Journal of Biogeography* 32:1629-1640.
- Adams HD** and Kolb TE. 2004. Drought responses of conifers in ecotone forests of northern Arizona: tree ring growth and leaf  $\delta^{13}\text{C}$ . *Oecologia* 140:217-225.

### **Scholarly Presentations** (as Lead Author and Presenter)

- Adams HD**, Chow PS, Dickman LT, Furze ME, Kuhlman I, Schmid S, Wiesenbauer J, Wild B, Gleixner G, Hartmann H, Hoch G, McDowell NG, Richardson AD, Richter A, Landhäusser, SM. 2018. Standardized protocols and procedures can precisely and accurately quantify non-structural carbohydrates. Talk. Annual meeting of the Ecological Society of America. August 8<sup>th</sup>, Ernest N. Morial Convention Center, New Orleans, LA.
- Adams HD**. 2018. Life and death of trees on the dry forest edge. **Invited Seminar**. School of Forestry. April 4<sup>th</sup>. Northern Arizona University, Flagstaff, AZ.
- Adams HD**. 2018. Life and death of trees on the dry forest edge. **Invited Seminar**. Department of Microbiology and Plant Biology. February 8<sup>th</sup>. University of Oklahoma, Norman OK.
- Adams HD**. 2017. Life and death of trees on the dry forest edge. **Invited Seminar**. Division of Biology. October 6<sup>th</sup>. Kansas State University, Manhattan, KS.
- Adams HD**. 2017. Life and death of trees on the dry forest edge. **Invited Seminar**. Department of Integrative Biology. September 22<sup>nd</sup>. Oklahoma State University, Stillwater, OK.
- Adams HD**, Collins AD, Stockton EA, Briggs SP, Vennetier M, Dickman LT, Sevanto SA, Garcia-Fornier N, McDowell NG. 2017. Experimental drought and heat can delay development and reduce growth of semiarid trees. **Invited Talk**. Annual meeting of the Ecological Society of America. August 9<sup>th</sup>, Oregon Convention Center, Portland, OR.
- Adams HD**. 2017. Life and death of trees on the dry forest edge. **Invited Seminar**. Land Resources and Environmental Sciences Department. April 7<sup>th</sup>. Montana State University, Bozeman, MT.
- Adams HD**, Hallgren S, DeSantis R. 2017. Tree community change in Oklahoma Cross Timbers: Is there evidence for mesophication? Talk. Cross Timbers Ecosystem Symposium, Oklahoma Natural Resources Conference. February 22<sup>nd</sup>. Hyatt Regency Hotel, Tulsa, OK.
- Adams HD**. 2016. Drought-induced Tree Mortality. **Invited Seminar**. Landhäusser Research Group, Department of Renewable Resources. April 6<sup>th</sup>. University of Alberta, Edmonton, Alberta, Canada.
- Adams HD**, Collins AD, Briggs SP, Vennetier M, Dickman LT, Sevanto SA, Garcia-Fornier N, Powers HH, McDowell NG. 2015. Experimental drought and heat can delay phenological development and reduce growth in semiarid trees. Poster. Annual meeting of the Ecological Society of America. August 10<sup>th</sup>. Baltimore Convention Center, Baltimore, MD.
- Adams HD**. 2014. Tree stress and mortality from drought. **Invited Seminar**. Department of Biological Sciences. November 13<sup>th</sup>. Oakland University, Rochester, MI.

- Adams HD**, Sevanto S, Dickman LT, Gaylord MG, Plaut, J, McDowell NG, Pockman W, Breshears DD, Huxman TE. 2014. The physiology of direct climate stress on tree mortality: where do insects fit in? **Invited Talk**. Entomological Society of America, Entomology 2014. November 18<sup>th</sup>. Oregon Convention Center, Portland, OR.
- Adams HD** and the Tree Drought Mortality Review Team. 2014. The physiology of tree mortality from drought. Talk. International Union of Forestry Research Organizations World Congress. October 9<sup>th</sup>. Salt Palace Convention Center, Salt Lake City, UT.
- Adams HD** and the Tree Drought Mortality Review Team. 2014. A multiple species synthesis of tree mortality physiology – how prevalent are hydraulic failure and carbohydrate depletion? **Invited Talk**. Annual meeting of the Ecological Society of America. August 14<sup>th</sup>. Sacramento Convention Center, Sacramento, CA.
- Adams HD**, Sevanto SA, Dickman LT, and McDowell NG. 2014. Does NSC storage influence survival under drought? **Invited Talk**. Annual meeting of the Ecological Society of America. August 14<sup>th</sup>. Sacramento Convention Center, Sacramento, CA.
- Adams HD**. 2014. Tree stress and mortality from drought. **Invited Seminar**. Department of Forest, Rangeland and Fire Science. February 14<sup>th</sup>. University of Idaho, Moscow, ID.
- Adams HD**. 2014. Tree stress and mortality from drought. **Invited Seminar**. Plant Biology Department. January 13<sup>th</sup>. University of Vermont, Burlington, VT.
- Adams HD**. 2013. Warmer drought kills trees faster, but by how much? Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS) VIII Symposium. **Invited Talk**. October 16<sup>th</sup>. La Foret Conference Center, Colorado Springs, CO.
- Adams HD**, Sevanto S, Dickman LT, Williams AP, Rauscher S, Jiang X, Xu C, Cai M, Pockman WT, McDowell NG, and members of the McDowell and Pockman labs. 2013. Investigation of climate-induced forest mortality from physiological mechanism to carbon consequences. Poster. Fourth All-Investigators Meeting of the North American Carbon Program. February 6<sup>th</sup>, Hyatt Regency Albuquerque, Albuquerque, NM.
- Adams HD**, Dickman LT, Sevanto S, McDowell NG, Pockman WT, Breshears DD, Huxman TE. 2012. What can non-structural carbohydrates tell us about tree drought mortality mechanism?: An analysis of results from several experiments on southwest US species. Talk. Fall meeting of the American Geophysical Union. December 4<sup>th</sup>, Moscone Center, San Francisco, CA.
- Adams HD**, Breshears DD, McDowell NG. 2012. Drought-induced tree mortality in the Southwest: temperature sensitivity and earth system feedbacks. Talk. Southwest Climate: Past, Present, and Future. September 7<sup>th</sup>, Valles Caldera National Preserve Science and Education Center, Jemez Springs, NM.
- Adams HD**, Barron-Gafford GA, Marasco LM, Wiede AL, Heard MM, Minor RL, Gardea AA, Bentley LP, Law DJ, Breshears DD, Huxman TE. 2012. Drought-induced *Pinus* seedling mortality hastens linearly with temperature and respiration during stomatal closure. Poster. Annual meeting of the Ecological Society of America. August 8<sup>th</sup>, Oregon Convention Center, Portland, OR.
- Adams HD**, Luce CH, Breshears DD, Weiler M, Hale VC, Allen CD, Smith AMS, Huxman TE. 2011. Ecohydrological consequences of drought- and infestation-triggered tree die-off: Insights and hypotheses. Poster. Fall meeting of the American Geophysical Union. December 7<sup>th</sup>, Moscone Center, San Francisco, CA.
- Adams HD**, Germino MJ, Breshears DD, Barron-Gafford GA, Guardiola-Claramonte M, Zou CB, Huxman TE. 2011. Experimental evaluation of interrelated physiological mechanisms of tree drought mortality: Reduced non-structural carbohydrates with drought induced tree death. Talk.

Annual meeting of the Ecological Society of America. August 11<sup>th</sup>, Neal Kocurek Memorial Austin Convention Center, Austin, TX.

- Adams HD**, Macalady AK, Breshears DD, Allen CD, Luce CH, Royer PD, Huxman TE. 2010. Climate-induced tree mortality: earth system consequences for carbon, energy, and water exchanges. **Invited Poster**. Fall meeting of the American Geophysical Union. December 15<sup>th</sup>, Moscone Center, San Francisco, CA.
- Adams HD**, Guardiola-Claramonte M, Barron-Gafford GA, Breshears DD, Germino MJ, Zou CB, Law DJ, Cobb NS, Huxman TE. 2010. Global warming, extreme drought events, and tree mortality: ecological transformations, mechanisms, impacts, and uncertainties. **Invited Talk**. Annual meeting of the Ecological Society of America. August 3<sup>rd</sup>, David L. Lawrence Convention Center, Pittsburgh, PA.
- Adams HD**, Breshears DD, Zou CB, Law DJ, Cobb, NE, Huxman TE. 2009. Rapid landscape change along semiarid elevation gradients: ecohydrological drivers and temperature sensitivity of drought-triggered tree die-off. Poster. AGU Chapman Conference on Examining Ecohydrological Feedbacks of Landscape Change Along Elevation Gradients in Semiarid Regions. October 7<sup>th</sup>, Boise and Sun Valley, ID.
- Adams HD**, Guardiola-Claramonte M, Barron-Gafford GA, Sommer E, Villegas JC, Breshears DD, Zou, CB, Troch PA, Law DJ, Cobb NE, Huxman TE. 2009. Global change enhances vegetation vulnerability to drought: Warmer drought will kill trees faster and more frequently. Talk. Annual meeting of the Ecological Society of America. August 5<sup>th</sup>, 2009. Albuquerque Convention Center, Albuquerque, NM.
- Adams HD**, Breshears DD, Guardiola-Claramonte M, Zou, CB, Huxman TE. 2008. Global change enhances vegetation vulnerability to drought: Warmer drought kills pinyon pines faster. Talk. Fall meeting of the American Geophysical Union. December 16<sup>th</sup>, Moscone Center, San Francisco, CA.
- Adams HD**, Zou, CB, Breshears DD, Guardiola-Claramonte M, Cobb NE, Huxman TE, Troch, PA. 2008. Experimental determination of thresholds of tree mortality in response to global-change-type drought: Accounting for root volume in transplant manipulations to facilitate cross-study comparisons. Poster. Annual meeting of the Ecological Society of America. August 5<sup>th</sup>, Midwest Airlines Center, Milwaukee, WI.
- Adams HD**, Villegas JC, Guardiola-Claramonte M, Barron-Gafford GA, Breshears DD, Zou, CB, Huxman TE. 2007. Biosphere 2: Testing the influence of global change dynamics on key interactions between plants and water. Poster. Integrating Science and Management on the Colorado Plateau. October 31<sup>st</sup>, Northern Arizona University, Flagstaff, AZ.
- Adams, HD** and Kolb TE. 2003. Using radial growth and foliar  $\delta^{13}\text{C}$  as measures of drought sensitivity in trees at ecotone communities in northern Arizona. Poster. Annual meeting of the Ecological Society of America. August 4<sup>th</sup>, Savannah International Trade & Convention Center, Savannah, GA.
- Adams, HD** and Kolb TE. 2003. Tree radial growth response to climate for different species, elevations, and environments in northern Arizona. Poster. 2003 Southwest Drought Summit. May 12<sup>th</sup>, at Northern Arizona University, Flagstaff AZ.

## GRANTS AND CONTRACTS

NSF, Integrative Organismal Systems (IOS) - Collaborative Research: How to live on a (carbon and water) budget: Tree investment in chemical defenses across a gradient of physiological drought stress. **\$1,042,178** (\$232,011 to Adams), Integrative Ecological Physiology Program (IEP), Physiological and Structural Systems Cluster (PSS). PI (Trowbridge, Montana State U.), Co-PI (**Adams**), Co-PI (Pockman, U. of New Mexico. 12/15/18-12/14/21).

Oklahoma Center for the Advancement of Science and Technology (OCAST) – A burning question for catastrophic wildfire in Oklahoma: How much drought causes eastern redcedar to switch from suppressing fire to promoting fire? **\$78,970** Basic Plant Research, PI (**Adams**) 7/1/17-6/30/19.

NSF, Oklahoma EPSCoR – Remember the dry times: the effect of variable drought stress on tree recovery and survival. **\$4,995**, Oklahoma EPSCoR Research Experience for Undergraduates Program, PI (**Adams**) 5/15/17-8/18/17.

DOE, Office of Science – Stress responses in two tree species to drought and warming. **\$10,000**, Science Undergraduate Laboratory Internship Program, Mentor/PI (**Adams**) 5/01/14-8/31/14.

DOE, Office of Science – Tree response to drought and increased temperature: phenology, growth, and physiology. **\$16,000**, Science Undergraduate Laboratory Internship Program, Mentor/PI (**Adams**) 1/2/14-5/31/14.

DOE, Los Alamos National Laboratory Directed Research and Development Program – Cosmic-ray measurement of ecological disturbance from die-off and fire. **\$46,000**, Equipment Purchase Grant, PI (**Adams**), Co-PI (McDowell) 7/25/13.

DOE, Office of Science – Tree phenological and growth response to drought and increased temperature in pinyon pine and juniper. **\$10,000**, Science Undergraduate Laboratory Internship Program, Mentor/PI (**Adams**) 5/20/13-8/31/13.

DOE, Office of Science – The influence of species drought response strategy on the physiology of tree mortality. **\$10,000**, Science Undergraduate Laboratory Internship Program, Mentor/PI (**Adams**) 5/20/13-8/31/13.

DOE, Los Alamos National Laboratory Directed Research and Development Program – Determining physiological predictors of climate-driven forest mortality. **\$304,400** Director's Postdoctoral Fellowship Grant, PI/Mentor (McDowell), Co-PI/Mentee (**Adams**) 5/29/12-5/28/14.

EPA, STAR – Temperature sensitivity and physiological mechanism of drought-induced tree mortality: Improving assessment of global change impacts. **\$111,000**, Science to Achieve Results (STAR) Fellowship, PI (**Adams**) 9/1/10 – 8/31/13.

## TEACHING AND MENTORING

### Classes Taught at Oklahoma State University

BIOL 3034 General Ecology, 4 semesters: This is a large-enrollment, lecture and laboratory class that provides students an overview of organisms' interactions with each other and their environment. I co-taught the lecture and was responsible for the laboratory section, supervising three teaching assistants who taught the laboratory sections.

BOT 1404 Plant Biology, 1 semester: This is a large-enrollment, lecture and laboratory class that covers basic plant biology concepts, including anatomy, physiology, evolution, taxonomy, and diversity. I taught the lecture and was responsible for the laboratory section, supervising three teaching assistants who taught the laboratory sections, and one graduate technical lab assistant who facilitated lab activities.



## **Guest Lectures**

Fall 2017, for BIOL 3034 General Ecology (instructor: Elisa Cabrera-Guzmán), Oklahoma State University, “Competition within and among populations”.

Fall 2015, for Biology 2210 Plant Ecophysiology (instructor: Barry Logan), Bowdoin College, “The physiology of tree mortality from drought”.

Fall 2010 and 2011, for PA 461 Global Climate Change: Integrating Science, Policy, and Decision Making (instructor: Edella Schlager), University of Arizona, “Global climate change: focus on terrestrial biosphere–atmosphere interactions”.

Fall 2008, 2009, 2010, and 2011, for WSM 452/552 Dryland Ecohydrology and Vegetation Dynamics (instructor: Dave Breshears), University of Arizona, “Field techniques in ecohydrology”.

Spring 2011, for ECOL 596W Plant Ecophysiology (instructor: Greg Barron-Gafford), University of Arizona, “The physiology of tree drought mortality”.

## **Mentoring**

### **Oklahoma State University – Graduate Students**

Current graduate students as major advisor (3): Jeff Dudek, MS in Plant Biology (The role of drought in wildfire risk from eastern redcedar); William Hammond, PhD in Plant Science (Determining thresholds for tree mortality and forest change in response to drought); Kaitlyn McNiel, MS in Plant Biology (The effect of climate and forest management on resin duct defense in loblolly pine).

Past graduate students as major advisor (1): Alissa Freeman, MS in Plant Biology, August 2018 (The effect of tree density on mortality and fungal canker infection).

Current graduate students as committee member (4): Raquel Feltrin, PhD in Natural Resources, University of Idaho; Anthony Sabella, MS in Plant Biology, Oklahoma State University, Nikolai Starzak, MS in Plant Biology, Oklahoma State University, Patricia Torquato, MS in Natural Resources, Ecology, and Management, Oklahoma State University.

Previously served as graduate committee member for (1): Justin Dee, PhD in Plant Science (2017), Oklahoma State University.

Graduate student teaching assistants and technical lab assistants mentored (11): Anthony Burger, Justin Dee, Alissa Freeman, William Hammond, John Hodge, Miranda Kersten, Ryan Koch, Qing Li, Angela Riley, Anthony Sabella, Cassondra Walker.

### **Oklahoma State University – Undergraduate Students**

Undergraduate researchers mentored (8): DeAndre Garret (Hydraulic thresholds for tree mortality), Robert Lincoln (Oak germination and transplanting), Kaitlyn McNiel (Tree-ring growth prediction of forest change), Jeremy Schallner (Tree growth response to drought and heat), Stacy Smith (Role of drought in wildfire risk from eastern redcedar) Mylissa Stover (Tree-ring growth response to climate), Luke Wilson (Tree non-structural carbohydrate response to drought stress, tree gas exchange response to VPD), Sydney Yarbrough (Tree-ring growth prediction of tree mortality).

### **Los Alamos National Laboratory – Undergraduate Students**

Undergraduate researchers mentored for the Science Undergraduate Laboratory Internship (2): Samuel Briggs, Northern Arizona University (Tree phenology response to drought and heat), Andrew Leung, Pacific Lutheran University (Constitutive and induced resin flow in pinyon pine).

## SERVICE AND OUTREACH

### Department and University Service Activities

- 2017 – Present: Manager, McPherson Preserve, Department of Plant Biology, Ecology, & Evolution
- 2016 – Present: Undergraduate Recruitment Committee, Department of Plant Biology, Ecology, & Evolution
- 2015 - Present: Curriculum Committee, Department of Plant Biology, Ecology, & Evolution
- 2015 - 2017: Presentation Judge, Oklahoma-Louis Stokes Alliance for Minority Participation Research Symposium, Oklahoma State University
- 2015 - 2016: Faculty Advisor, Oklahoma State University Botanical Society

### Outreach Presentations

- Adams HD.** 2017. Trees, drought, and how trees die from drought. **Invited Talk.** Tri-Beta National Biological Honor Society, Oklahoma State University Chapter, March 22<sup>nd</sup>, Oklahoma State University, Stillwater, OK.
- Adams HD.** 2015. Environmental Ecology. **Invited Talk.** Oklahoma State University Botanical Society, October 26<sup>th</sup>, Oklahoma State University, Stillwater, OK.
- Adams HD.** 2014. Tree Mortality in New Mexico. **Invited Talk.** Sangre De Cristo Audubon Society. April 9<sup>th</sup>, Unitarian Universalist Church, Santa Fe, NM.
- Adams HD.** 2008. Warmer droughts kill trees faster: an experiment at Biosphere 2. **Invited Talk.** Science Saturday Series. July 12<sup>th</sup>, Biosphere 2, University of Arizona, Oracle, AZ.

### Outreach Activities

- Hudson Bend Middle School, Austin, TX, **Skype a Scientist** – I had a video conference with two 7<sup>th</sup> grade biology classes to answer student’s questions about tree physiology, drought, climate change, and tree mortality. 3/7/18.
- Los Alamos National Laboratory, **Judges Science Camp** – On two occasions, I lead an interpretive tour of the Los Alamos Survival/Mortality Experiment for New Mexico appeals, district, and supreme court judges, explaining tree mortality research, experimental design, and hypothesis testing. 3/24/14, 3/23/15.
- Los Alamos National Laboratory, **70<sup>th</sup> Anniversary Celebration – Impacts of Climate Change Tour** – I interpreted research, and answered questions on climate change and forest response, including a tour of a prototype open-top-chamber for our ongoing tree drought mortality experiment. 7/27/13.
- New Energy Economy, **Face Climate Reality - Hike in the Los Conchas Burn** – I lead an interpretive hike open to the public and explained forest management, climate change, and wildfire science. 3/30/13.
- Biosphere 2, University of Arizona, **Science and Society Fellow** – I interpreted my PhD research as it happened along tour route to visitors, organized interpretive booth on plant water use, conducted hands-on measurement workshop where visitors could measure stomatal conductance on dying and healthy trees. 7/1/07 – 9/31/08.

### Professional Activities

#### Session Organizer/Co-organizer:

**Interactions among insects, pathogens, and drought in tree stress and mortality**, Organized Oral Session, Ecological Society of America (ESA) Annual Meeting, August 2017, Portland, OR.

**Drought effects on embolism formation and recovery: Linking experimental results and synthesizing observations**, Organized Oral Session, ESA Annual Meeting, August 2015, Baltimore, MD.

**Drought and tree mortality: Linking experimental results and observations with predictive models**, Organized Oral Session, ESA Annual Meeting, August 2014, Sacramento, CA.

**Climate change, drought and tree mortality: pattern, process, and prediction**, Organized Oral Session, ESA Annual Meeting, August 2013, Minneapolis, MN.

**Ecological consequences of climate- and infestation-caused tree mortality; effects on organisms and processes from local to global scales**, Organized Oral Session, ESA Annual Meeting, August 2012, Portland, OR.

Meeting Co-organizer: **International Interdisciplinary Workshop on Tree Mortality**, October 21-24, 2014, Max-Planck Institute for Biogeochemistry, Jena, Germany.

Associate Editor: *Frontiers in Plant Science*, Functional Plant Ecology Section. 2018 – present.  
*Frontiers in Forests and Global Change*, Forest Ecophysiology Section. 2018 – present.

Manuscript reviewer for: *Canadian Journal of Forest Research* (1), *Current Climate Change Reports* (1), *Ecohydrology* (3), *Ecological Applications* (1), *Ecology Letters* (1), *Environmental Research Letters* (1), *Frontiers in Plant Science* (2), *Functional Ecology* (3), *Global Change Biology* (6), *Global Ecology and Biogeography* (2), *Hydrological Processes* (2), *Journal of Arid Environments* (1), *Journal of Imaging Science and Technology* (1), *Nature Plants* (1), *New Phytologist* (15), *Oecologia* (1), *Oklahoma Native Plant Review* (1), *Physiologia Plantarum* (1), *PeerJ* (1), *Plant, Cell, & Environment* (1), *PLoS One* (2), *PNAS* (1), *Rapid Communications in Mass Spectroscopy* (1), *Remote Sensing of Environment* (1), *Tree Physiology* (2), *Trees: Structure and Function* (1), *Western North American Naturalist* (2).

Proposal reviewer for: NSF Hydrologic Sciences Program, Israeli Science Foundation Individual Research Grant Program, Oklahoma State University College of Arts & Sciences Summer Research Program, Northern Arizona University School of Forestry Mission Research, University of Central Oklahoma Faculty On-Campus Grant Program, University of Arizona Graduate and Professional Student Council Travel Grants.

Professional membership: Ecological Society of America, Society of American Foresters.