

CURRICULUM VITAE

CONNIE A. WOODHOUSE

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EDUCATION

PhD (December 1996) Department of Geosciences, University of Arizona, Tucson, Arizona

MS (March 1989) Department of Geography, University of Utah, Salt Lake City, Utah

BA (May 1979) Prescott College, Prescott, Arizona

PROFESSIONAL POSITIONS

Professor (May 2013 - present), School of Geography and Development, Laboratory of Tree-Ring Research, and Department of Geosciences, University of Arizona, Tucson, AZ

Interim Director (Jan. 2014 – May 2015), School of Geography and Development, University of Arizona, Tucson, AZ

Associate Director (Aug. 2012-Mar. 2014), School of Geography and Development, University of Arizona, Tucson, AZ

Associate Professor (Jan. 2007 – Apr. 2013), School of Geography and Development, Laboratory of Tree-Ring Research, and Department of Geosciences, University of Arizona, Tucson, AZ

Physical Scientist (Apr. 2000-Dec. 2006), Paleoclimatology Branch, NOAA National Climatic Data Center, Boulder, CO

Research Scientist III, Fellow (Mar. 2004-Dec. 2006), Institute of Arctic and Alpine Research, University of Colorado, Boulder

Adjunct Assistant Professor (Feb. 2001-Dec. 2006), Department of Geography, University of Colorado, Boulder, CO

Faculty Affiliate (2004-2008), Department of Civil Engineering, Colorado State University, Fort Collins, CO

Research Scientist II (Mar. 1999-Mar. 2004), Institute of Arctic and Alpine Research, University of Colorado, Boulder

Visiting Scientist (May 1998-Apr. 2000), Paleoclimatology Program, NOAA National Geophysical Data Center, Boulder, CO

Research Scientist I (Jul. 1997-Feb. 1999), Institute of Arctic and Alpine Research, University of Colorado, Boulder

National Research Council Associate (Jan. 1997- Apr. 1998), Paleoclimatology Program, NOAA National Geophysical Data Center, Boulder

AWARDS

José A. Boninsegna Frontiers in Dendrochronology Award, Tree-Ring Society, 2016

University of Arizona Graduate and Professional Students Council Achievement Award, Honorable Mention, Outstanding Mentor of Graduate/Professional Students, 2011

Udall Center Fellowship, Udall Center for Public Policy and the Institute of the Environment, University

of Arizona, 2010
California Department of Water Resources, Climate Science Service Award, 2007
Administrator's Award, National Oceanic and Atmospheric Administration, 2006
Bronze Award, Department of Commerce, 2005
Andrew Ellicott Douglass Memorial Scholarship, Laboratory of Tree-Ring Research, University of Arizona,
1996

RESEARCH GRANTS

NSF-ATM, Expanded and Lengthened Dendroclimatic Reconstructions of Great Plains Drought, PI,
\$304,827, 04/01/98 - 03/31/01.
NSF-ESH, Temperature Variability since AD 1000 in the Western United States from Tree Rings, Co-PI,
\$52,782 (my part), 10/01/98 -09/30/01.
NSF-ESH, Collaborative Research: Reconstructions of Drought and Streamflow over the Coterminous
United States from Tree Rings with extensions into Mexico and Canada, Co-PI , \$35,674 (my
part), 09/01/00 - 08/31/03.
NOAA Environmental Services Data and Information Management (ESDIM), Fire History Database, PI,
\$82,000, 3/2003-12/2003.
NOAA Environmental Services Data and Information Management (ESDIM), Historical Climate Data
Catalogue, PI, \$30,000, 3/2004 – 12/2004.
NOAA Office of Global Programs, Extended Hydroclimatic Records for the Upper Colorado River Basin,
PI, \$154,515, 08/01/02 - 07/31/04.
US Geological Survey, Tree-Ring Chronologies from Remnant Collections, Western Colorado, PI, \$22,250,
4/05 - 12/05, \$22, 250, 1/06 – 12/06, \$22,260, 1/07-12/07.
Denver Water, Updates and Improvements of Tree-Ring Reconstructions of South Platte and Colorado
River Streamflow, PI, \$28,000 6/03-7/05.
National Park Service, Riparian Forest Age Structure, Sand Creek Massacre NHS, Co-PI, \$11,000, 09/05-
10/06.
NSF- BCS - Geography and Regional Science, Climate and Woodland Expansion in the Western Great
Plains, USA, \$6,000 (co-PI part), 9/1/04 - 8/31/06.
NOAA Climate Program Office, 'Living' Blended North American Drought Reconstruction Grid, \$40,000
(co-PI part), 01/01/04 -12/31/06.
NOAA Climate Program Office, A Multiproxy Paleofire Database, PI, \$93,000, 03/01/03 -02/28/06.
NOAA Climate Program Office, Tree-Ring Reconstructions of Hydroclimatic Variability in the Rio Grande
Basin, New Mexico, PI, \$55,000, 7/1/07- 6/30/08.
NOAA Climate Program Office, Interpreting and Refining the Climate Signal in Millennial-Length 5-
Needle Pine Chronologies, PI, \$189,000, 7/1/07- 6/30/09.
Science Foundation of Arizona, Decision Support for Defining Historical Fire Regimes: The International
Multiproxy Paleofire Database, PI, \$75,000, 4/1/07- 8/31/08
NOAA Climate Program Office, TreeFlow: A Drought Planning Resource for Water Management in the
Western U.S., PI, \$108,161, 8/1/08-7/30/10.
NOAA Climate Program Office, In With the Old: Evaluation of Paleo Data in Drought Planning for
California, PI, \$63,055, 8/1/08-7/30/09, extended to 2010.
NSF-Paleoclimate Perspectives on Climate Change program, An Investigation of North American
Monsoon Variability using Instrumental and Tree-Ring Data, PI, \$607,829, 9/1/08-8/31/13.
California Department of Water Resources, Drought Planning Workshops for California. PI, \$25,024,

9/1/08-6/30/09.

NOAA - Sector Applications and Research Program (SARP), Knowledge to Action: An Assessment of the Transfer of Climate Science to Decision Making. Co-PI , \$122,559; 5/1/09-10/31/10

Bureau of Reclamation, Enhancing Water Supply Reliability Through Improved Predictive Capacity and Response. Phase 3. Co-PI, \$457,331, 4/1/09-12/31/10.

Colorado Springs Utilities, Reconstructions of the Arkansas River, \$8,535; 8/17/09-9/30/10

California Department of Water Resources, Tree-Ring Study for California. Co-PI, \$399,718; 10/1/10-4/30/13.

NOAA-Western Water Assessment, Lower Colorado River Basin Paleohydrology. Co-PI, \$30,000; 10/1/10-9/30/11

NOAA Climate Program Office, The Climates of Southwestern North American Megadrought: Multi-Proxy, Multivariate Observations and Analysis, Co-PI, \$419,510; 05/01/11-04/30/14.

NSF-Macrosystem Biology program, Collaborative Research: Processes and Patterns in The North American Monsoon Macrosystem. Co-PI, \$2,949,091; 04/01/11-03/31/16.

NSF- Paleoclimate Perspectives on Climate Change program, Reconstructing Winter Temperatures in the Rockies using Tree-Ring Oxygen Isotopes, PI, \$239,049; 06/01/11-05/31/14.

WaterSmart, Bureau of Reclamation, Tree-Ring Reconstructions of Streamflow: Using Analogues from the Past for Water Resource Decision Making in California, PI, \$200,000; 10/01/11-09/20/14.

DOI Southwest Climate Science Center, Disentangling the Influence of Antecedent Temperature and Soil Moisture on Colorado River Water Resources, PI, \$140,207, 2014-2016

State of New Mexico, Update of Tree-Ring Reconstruction of the Rio Grande at Otowi Bridge, New Mexico, PI, \$25,000, 2014.

NSF- Paleoclimate Perspectives on Climate Change, Collaborative Research: Multi-Site Paleo-Reconstruction of Missouri River Streamflows from Tree Rings; PI with E. Cook and M. Lall (Columbia University), E. Wise (U. North Carolina), G. Pederson (USGS), \$166,666 (UA part), 2014-2017.

California Department of Water Resources, University of Arizona Southern California Tree-Ring Study. Co-PI, \$596,691, 7/1/15-12/31/17.

DOI Southwest Climate Science Center, Anticipating Future Impacts on Streamflow using Multi-Century Climate Records and Applied Hydrologic Models, PI, \$132,829; 10/01/2017-03/31/2020.

NSF- Paleoclimate Perspectives on Climate Change program, Collaborative Research – The Flavors of SW Hydroclimatic Extremes. PI, \$920,430; 09/01/2017-08/31/2020.

NOAA Climate Program Office Regional Integrated Sciences and Assessments (RISA) Program, Collaboratively Assessing Critical Social-Ecological System Buffers to Help Build Regional Climate Resilience: The Climate Assessment for the Southwest. Co-PI, \$3,464,261; 09/01/2017-08/31/2022

Bureau of Reclamation, Baseline Assessments for SECURE Water Act Report 2021. PI, \$77,364; 10/01/2019 - 03/31/2021

NSF- Paleoclimate Perspectives on Climate Change program, Collaborative Research --Multi-Century Perspectives on Current and Future Flow in the Lower Missouri River Basin. UA PI with E. Wise (PI, U. North Carolina), E. Cook (LDEO), M. Dannenberg (U. Iowa), \$113,853 (UA part), 07/01/2020-6/30/2023

PUBLICATIONS

Peer reviewed

- Frederick, S.E. and **C.A. Woodhouse**. 2020. A Multi-Century Perspective on the Relative Influence of Seasonal Precipitation on Streamflow in the Missouri River Headwaters. *Water Resources Research*. <https://doi.org/10.1029/2019WR025756>
- Martin, J.T., G.T. Pederson, **C.A. Woodhouse** and 16 co-authors. 2020. Increased drought severity tracks warming in the United States' largest river basin. *Proceedings of the National Academies of Science (PNAS)*, www.pnas.org/cgi/doi/10.1073/pnas.1916208117
- Woodhouse, C.A. and E.K. Wise. 2020. The Changing relationship between the upper and lower Missouri River basins during drought. *International Journal of Climatology* 1–18. doi.org/10.1002/joc.6502
- Stahle, D.W., E.R. Cook, D. J. Burnette, M. C.A. Torbenson, I. M. Howard, D. Griffin, J. Villanueva, B. I. Cook, P. A. Williams, E. Watson, D. Sauchyn, N. Pederson, **C. A. Woodhouse**, G. T. Pederson, D. Meko, B. Coulthard, C. J. Crawford. 2020. Dynamics, variability, and change in seasonal precipitation reconstructions for North America. *Journal of Climate* <https://doi.org/10.1175/JCLI-D-19-0270.1>
- Pendergrass, A.G., G.A. Meehl, R. Pulwarty, M. Hobbins, A. Hoell, A. AghaKouchak, C. J.W. Bonfils, A. J.E. Gallant, M. Hoerling, D. Hoffmann, L. Kaatz, F. Lehner, D. Llewellyn, P. Mote, R. Neale, J. T. Overpeck, A. Sheffield, K. Stahl, M. Svoboda, M.C. Wheeler, A. W. Wood, **C. A. Woodhouse**. 2020. Flash droughts: High impact events that present a new challenge for subseasonal to seasonal prediction. *Nature Climate Change* 10, 191–199. <https://doi.org/10.1038/s41558-020-0709-0>
- Woodhouse, C.A., D.M. Meko, and E. Bigio. 2020. A long view of southern California water supply: perfect droughts revisited. *Journal of the American Water Resources Association*. 56, 212-229. <https://doi.org/10.1111/1752-1688.12822>
- Arizpe, A., D.A. Falk, **C.A. Woodhouse**, T.W. Swetnam, in revision. Widespread fire years in the US-Mexico sky islands are contingent on both winter and monsoon precipitation. *International Journal of Wildland Fire*.
- Martin, J., Pederson, G.T., **Woodhouse, C.A.**, Cook, E.R, McGuire, M., Broman, D., Lanini, J., et al. 2019. 1200 years of Upper Missouri River streamflow reconstructed from tree rings. *Quaternary Science Reviews*, 224, 105971. doi.org/10.1016/j.quascirev.2019.105971
- Ravindranath, A., N. Devineni, U. Lall, E.R. Cook, G. Pederson, J. Martin, **C.A. Woodhouse**. 2019. Streamflow Reconstruction in the Upper Missouri River Basin Using a Novel Bayesian Network Model. *Water Resources Research*. Doi: 10.1029/2019WR024901
- Rao, M.P., E.R. Cook, B.I. Cook, J.G. Palmer, M. Uriart, N. Devineni, U. Lall, R.D. D'Arrigo, **C.A. Woodhouse**, M. Ahmed, 2018. Six centuries of Upper Indus Basin streamflow variability and its climatic drivers. *Water Resources Research*, doi: 10.1029/2018WR023080
- Woodhouse, C. A. and G. T. Pederson, 2018. Investigating runoff efficiency in upper Colorado River streamflow over past centuries. *Water Resources Research*, 54, <https://doi.org/10.1002/2017WR021663>
- Wise, E.K., **C.A. Woodhouse**, G.J. McCabe, G.T. Pederson, and J-M. St. Jacques. 2018. Hydroclimatology of the Missouri River basin. *Journal of Hydrometeorology*, 19, 161-182, doi: 10.1175/JHM-D-17-0155.1
- Hallett, L.M, T.L. Morelli, L. R. Gerber, M.A. Moritz, M. W. Schwartz, N.L. Stephenson, J. L. Tank, M.A.

- Williamson, C. **A. Woodhouse**. 2017. Navigating translational ecology: creating opportunities for scientist participation. *Frontiers in Ecology and the Environment* 15, 578–586, doi: 10.1002/fee.1734.
- Schwartz, M.W., J.K. Hiers, F.W. Davis, G. M. Garfin, S.T Jackson, A.J. Terando, **C.A. Woodhouse**, T.L. Morelli, M.A. Williamson, M.W. Brunson. 2017. Developing a translational ecology workforce. *Frontiers in Ecology and the Environment* 15, 587–596, doi: 10.1002/fee.1732.
- Enquist, C.A.F, S.T. Jackson, G. M. Garfin, F.W. Davis, L.R. Gerber, J.A. Littell, J.L. Tank, A.J. Terando, T.U. Wall, B. Halpern, J.K. Hiers, T.L. Morelli, E. McNie, N.L. Stephenson, M.A. Williamson, **C.A. Woodhouse**, L. Yung, M.W. Brunson, K.R. Hall, L.M. Hallett, D.M. Lawson, M.A. Moritz, K. Nydick, A. Pairis, A.J. Ray, C. Regan, H.D. Safford, M.W. Schwartz, and M.R. Shaw. 2017. Foundations of translational ecology. *Frontiers in Ecology and the Environment* 15, 541–550, doi: 10.1002/fee.1733.
- McAfee, S.A., G.T. Pederson, **C.A. Woodhouse**, G. J. McCabe. 2017. Application of synthetic scenarios to address water resource concerns: A management-guided case study from the Upper Colorado River Basin, *Climate Services* 8, 26-35, <https://doi.org/10.1016/j.cliser.2017.10.003>.
- McCabe, G., D. Wolock, G. Pederson, **C. Woodhouse**, and S. McAfee. 2017. Evidence that recent warming is reducing upper Colorado River Flows. *Earth Interactions*, 21, 1-14, doi:10.1175/EI-D-17-0007.1.
- Malevich, S.B. and **C.A. Woodhouse**. 2017. Pacific SSTs, mid-latitude atmospheric circulation, and widespread interannual anomalies in Western US streamflow. *Geophysical Research Letters*, doi: 10.1002/2017GL073536.
- Margolis, E. Q., **C.A. Woodhouse**, and T.W. Swetnam. 2017. Drought, multi-seasonal climate and wildfire in northern New Mexico. *Climatic Change* #, 1-14, doi: 10.1007/s10584-017-1958-4.
- Wilding, T. and **C.A. Woodhouse**. 2017. Assessing the potential of pinyon pine for climate reconstructions in eastern California. *Tree-Ring Research* 73, 11-12.
- Bracken, C, B. Rajagopalan, **C.A. Woodhouse**. 2016. A Bayesian hierarchical nonhomogeneous hidden Markov model for multisite streamflow reconstructions, *Water Resources Research*, 52, 7837–7850, doi:10.1002/2016WR018887.
- Routson, C.C., **C.A. Woodhouse**, J.T. Overpeck, J.L. Betancourt, N.P. McKay. 2016. Teleconnected ocean forcing of western North American droughts and pluvials during the last millennium. *Quaternary Science Reviews* 146, 238-250. doi.org/10.1016/j.quascirev.2016.06.017
- Littell, J.S., G.T. Pederson, S.T. Gray, M. Tjoelker, A.F. Hamlet, **C.A. Woodhouse**. 2016. Reconstructions of Columbia River streamflow from tree ring chronologies in the Pacific Northwest, USA. *Journal of the American Water Resources Association* 1-21. doi: 10.1111/1752-1688.12442.
- Woodhouse, C.A., G.T. Pederson, K. Morino, S.A. McAfee, G.J. McCabe. 2016. Increasing influence of air temperature on upper Colorado River Streamflow. *Geophysical Research Letters* 43, doi:10.1002/2015GL067613.
- Routson, C.C., J.T. Overpeck, **C.A. Woodhouse**, W.F. Kenney. 2016. Three millennia of southwestern North American dustiness and future implications. *PLOS One*, doi: 10.1371/journal.pone.0149573.
- Carillos, C.M., C.L. Castro, **C.A. Woodhouse**, and D. Griffin. 2016. Low frequency variability of the North American monsoon as diagnosed through earlywood and latewood tree-ring chronologies in the southwestern U.S. *International Journal of Climatology*, 36, 2254–2272, doi:10.1002/joc.4493.
- Gandopadhyah, S. G. McCabe, and **C.A. Woodhouse**. 2015. Beyond annual streamflow reconstructions for the Upper Colorado River Basin: A paleo-water-balance approach. *Water Resources Research* 51, doi:10.1002/2015WR017283.

- Barger, N.N. and **C.A. Woodhouse**, 2015. Piñon pine (*Pinus edulis* Engelm.) growth responses to climate and substrate in southern Utah, U.S.A.. *Plant Ecology* doi 10.1007/s11258-015-0478-4.
- Peterson, T.C., Heim Jr., R.R., Hirsch, R., Kaiser, D.P., Brooks, H., Diffenbaugh, N.S., Dole, R.M., Giovannetone, J.P., Guirguis, K., Karl, T.R., Katz, R.W., Kunkel, K., Lettenmaier, D., McCabe, G.J., Paciorek, C.J., Ryberg, K.R., Schubert, S., Silva, V.B.S., Stewart, B.C., Vecchia, A.V., Villarini, G., Vose, R.S., Walsh, J., Wehner, M., Wolock, D., Wolter, K., **Woodhouse, C.A.**, Wuebbles, D. 2013. Monitoring and understanding changes in heat waves, cold waves, floods, and droughts in the United States: State of knowledge. *Bulletin of the American Meteorological Society* 94, 821 – 834.
- Meko, D.M., R. Touchan, J. Villanueva Diaz, Griffin, D., **C.A. Woodhouse**, C.L. Castro, C. Carillo, S.W. Leavitt. 2013. Sierra San Pedro Mártir, Baja California, cool-season precipitation reconstructed from earlywood width of *Abies concolor* tree rings. *Journal of Geophysical Research: Biogeosciences*, 118, 1-14, doi: 10.1002/2013JG002408.
- Ciancarelli, B., C.L. Castro, **C.A. Woodhouse**, F. Dominguez, H-I. Chang, C. Carrillo, and D. Griffin. 2013. Dominant patterns of U.S. warm season precipitation variability in a fine resolution observational record, with focus on the Southwest. *International Journal of Climatology*, doi: 10.1002/joc.3716.
- Malevich, S.B., **C.A. Woodhouse**, D.M. Meko. 2013. Tree-ring reconstructed hydroclimate of the Upper Klamath basin. *Journal of Hydrology*, doi.org/10.1016/j.jhydrol.2013.04.048
- Woodhouse, C.A., D.M. Meko, D. Griffin, and C.L. Castro. 2013. Tree Rings reveal multi-season drought variability in the lower Rio Grande basin, USA. *Water Resources Research* 49, 1-7. doi:10.1002/wrcr.20098.
- Griffin, D., **C.A. Woodhouse**, D.M. Meko, D.W. Stahle, H.L. Faultich, C. Carillo, R. Touchan, C.L. Castro, S.W. Leavitt. 2013. A paleoclimate regime of concurrent cool-season and monsoon drought in the Southwest. *Geophysical Research Letters* 40, 1-5. doi:10.1002/grl.50184.
- Ault, T.R., J.E. Cole, J.T. Overpeck, G.T. Pederson, S. St. George, B. Otto-Bliesner, **C.A. Woodhouse**, and C. Deser. 2013. The continuum of drought variability in western North America: insights from instrumental, paleoclimate and global climate model data. *Journal of Climate* 26, 5863-5878. DOI: 10.1175/JCLI-D-11-00732.1
- Williams, A.P., C. D. Allen, A. K. Macalady, D. Griffin, **C. A. Woodhouse**, D. M. Meko, T. W. Swetnam, S. A. Rauscher, R. Seager, H. D. Grissino-Mayer, J. S. Dean, E. R. Cook, C. Gangodagamage, M. Cai, N. G. McDowell, 2012. Temperature as a potent driver of regional forest drought stress and tree mortality. *Nature Climate Change*, DOI: 10.1038/NCLIMATE1693
- Faultstich, H.L., **C.A. Woodhouse**, and R. Griffin. 2012. Reconstructed cool- and warm-season precipitation over the tribal lands of northeastern Arizona. *Climatic Change*, DOI 10.1007/s10584-012-0626-y.
- Kariyeva, J., W.D.J. van Leeuwen, and **C.A. Woodhouse**. 2012. Impacts of climate gradients on the vegetation phenology of major land use types in Central Asia (1981–2008). *Frontiers of Earth Science* 6, 206–225, doi 10.1007/s11707-012-0315-1.
- Woodhouse, C.A., D.W. Stahle, and J. Villanueva-Díaz. 2012. Rio Grande and Rio Conchos water supply variability from instrumental and paleoclimatic records. *Climate Research*.51, 125-136. doi: 10.3354/cr01059
- Routson, C.C, **C.A. Woodhouse**, and J.T. Overpeck. 2011. Second century megadrought in the Rio Grande headwaters, Colorado: How unusual was medieval drought? *Geophysical Research Letters*, doi:10.1029/2011GL050015.

- Griffin, D., D.M. Meko, R. Touchan, S.W. Leavitt, **C.A. Woodhouse**. 2011. Latewood chronology development for summer-moisture reconstruction in the U.S. Southwest. *Tree-Ring Research* 67, 87-101.
- Pederson, G.T., S. T. Gray, **C. A. Woodhouse**, J. L. Betancourt, D. B. Fagre, J.S. Littell, E. Watson, B. H. Luckman, L. J. Graumlich. 2011. Evidence from tree rings highlights the unusual nature of recent snowpack declines. *Science* 333, 332-335. doi: 10.1126/science.1201570
- Gray, S.T., J.J. Lukas, **C.A. Woodhouse**. 2011. Millennial-length records of streamflow from three major upper Colorado River tributaries. *Journal of the American Water Resources Association*, doi: 10.1111/j.1752-1688.2011.00535.x.
- Woodhouse, C.A., G.T. Pederson, and S.T. Gray. 2011. An 1800-year record of decadal-scale hydroclimatic variability in the Upper Arkansas River basin from bristlecone pine. *Quaternary Research*. 75, 483-490. doi: 10.1016/j.yqres.2010.12.007
- Meko, D.M. and C.A. **Woodhouse**, 2011. Dendroclimatology, dendrohydrology, and water resources management, In: *Tree Rings and Climate: Progress and Prospects* (eds. M.K. Hughes, T.W. Swetnam, H.F. Diaz). Springer, pp. 231-261.
- Pederson, G.T., S.T. Gray, T.Ault, W. Marsh, D.B. Fagre, A.G. Bunn, **C.A. Woodhouse**, L.G. Graumlich. 2010. Climatic controls on the snowmelt hydrology of the northern Rocky Mountains, USA. *Journal of Climate* 24, 1666-1687.
- Meko, D.M. **C.A. Woodhouse**, and K. Morino. 2010. Dendrochronology and links to streamflow. *Journal of Hydrology*, doi: 10.1016/j.jhydrol.2010.11.041.
- Leavitt, S.W., **C.A. Woodhouse**, C.L. Castro, W.E. Wright, D.M. Meko, R. Touchan, D. Griffin and B. Ciancarelli, 2010. The North American Monsoon in the U.S. Southwest: potential for investigation with tree-ring carbon isotopes. *Quaternary International* 235, 101-107 doi.org/10.1016/j.quaint.2010.05.006.
- Kay, M.W., **C.A. Woodhouse**, and S.T. Jackson. 2010. Persistence and expansion of ponderosa pine woodlands in the west-central Great Plains during the past two centuries. *Journal of Biogeography*. doi:10.1111/j.1365-2699.2010.02327.x
- Banner, J.L., C.S. Jackson, L. Yang, K. Hayhoe, **C. Woodhouse**, L. Gulden, K. Jacobs, G. North, R. Leung, and W. Washington. 2010. Climate change impacts on Texas water. *Texas Water Journal* 1, 1-19.
- Touchan, R., **C.A. Woodhouse**, D.M. Meko, C.D. Allen. 2010. Millennial Precipitation Reconstruction for the Jemez Mountains, New Mexico, Reveals Changing Drought Signal. *International Journal of Climatology*. DOI: 10.1002/joc.2117
- Woodhouse, C.A., D.M. Meko, G. M, MacDonald, D. W. Stahle, and E. R. Cook. 2010. A 1200-year perspective on the 21st century drought in southwestern North America. *Proceedings of the National Academies of Science (PNAS)*, 107, 21283-21288.
- Barger, N.N, H.D. Adams, **C.A. Woodhouse**, J.C. Neff, and G.P. Asner. 2009. Influence of Livestock Grazing and Climate on Pinyon Pine (*Pinus edulis*) Dynamics. *Rangeland Ecology and Management* 62, 531-539.
- Rice, J.L., **C.A. Woodhouse**, and J.J. Lukas, 2009. Science and decision-making: water management and tree-ring data in the western United States. *Journal of the American Water Resources Association* 45, 1248-1259.
- Cook, E.R., R. Seager, R.R. Heim, R.S. Vose, C. Herweijer, and **C. A. Woodhouse**, 2010. Megadroughts in North America: Placing IPCC Projections of Hydroclimatic Change in a Long-Term Paleoclimate Context. *Journal of Quaternary Science*. DOI: 10.1002/jqs.1303.
- Woodhouse, C.A., J.L. Russell, and E.R. Cook, 2009. Two modes of North American drought from instrumental and paleoclimatic data. *Journal of Climate* 22, 4336–4347.

- MacDonald, G.M., D.W. Stahle, J. Villanueva Diaz, N. Beer, S.J. Busby, J. Cerano Paredes, J.E. Cole, E.R. Cook, G. Endfield, G. Guitierrez Garcia, B. Hall, V. Magana, D.M. Meko, M. Mendez Perez, D.J. Sauchyn, E. Watson, and **C.A. Woodhouse**, 2008. Climate warming and 21st-century drought in southwestern North America. *Eos* 89, 82-83.
- Meko, D.M., **C.A. Woodhouse**, C.H. Baisan, T. Knight, J.J. Lukas, M.K. Hughes, and M.W. Salzer, 2007. Medieval drought in the upper Colorado River basin. *Geophysical Research Letters* 34m L10705, doi: 10.1029/2007GL029988
- Leavitt, S. W., T.N. Chase, B. Rajagopalan, E. Lee, P. J. Lawrence, C. A. **Woodhouse**, 2007. Southwestern U.S. drought maps from pinyon tree-ring carbon isotopes. *EOS*, Volume 88, Number 4, pp. 39-40.
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- Woodhouse, C.A., S.T. Gray, and D.M. Meko, 2006. Updated streamflow reconstructions for the Upper Colorado River basin. *Water Resources Research*, 42, W05415. doi:10.1029/2005WR004455.
- Woodhouse, C.A. and J.J. Lukas. 2006. Multi-century tree-ring reconstructions of Colorado streamflow for water resource planning. *Climatic Change* DOI: 10.1007/s10584-006-9055-0.
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- Meko, D.M. and C.A. **Woodhouse**. 2005. Tree-ring footprint of joint hydrologic drought in Sacramento and Upper Colorado River basins, western USA. *Journal of Hydrology*, 308, 196-213.
- Pielke, R.A., N. Doesken, O. Bliss, T. Green, C. Chaffin, J.D. Salas, C.A. **Woodhouse**, J.J. Lukas, and K. Wolter. 2005. Drought 2002 in Colorado – An Unprecedented Drought or a Routine Drought? *Pure and Applied Geophysics (PAGEOPH)*, 162, 1455-1479.
- Cook, E.R., C.A. **Woodhouse**, C.M. Eakin, D.M. Meko, and D.W. Stahle. 2004. Long-term aridity changes in the western United States. *Science*, 306, 1015-1018.
- Woodhouse, C.A., 2004. A Paleo Perspective on Hydroclimatic Variability in the Western United States. *Aquatic Sciences*, 66, 346-356.
- Woodhouse, C.A. 2003. A 431-year reconstruction of western Colorado snowpack. *Journal of Climate*, 16, 1551-1561.
- Jain, S., C.A. **Woodhouse**, M.P. Hoerling. 2002. Multidecadal streamflow regimes in the interior western United States: implications for the vulnerability of water resources. *Geophysical Research Letters*, 29, 2036-2039.
- Woodhouse, C.A., J.J. Lukas, and P.M. Brown. 2002. Drought in the western Great Plains, 1845-56: impacts and implications. *Bulletin of the American Meteorological Society* 83, 1485-1493.
- Woodhouse, C.A. and P.M. Brown. 2001. Tree-ring evidence for Great Plains drought. *Tree-Ring Research*, 57, 89-103.
- Woodhouse, C.A. 2001. A tree-ring reconstruction of streamflow for the Colorado Front Range. *Journal of the American Water Resources Association* 37, 561-570
- Woodhouse, C.A. 1999. Artificial neural networks and dendroclimatic reconstructions: an example from the Front Range, Colorado, USA. *The Holocene* 9, 521-529.
- Woodhouse, C.A. and J.T. Overpeck. 1998. 2000 years of drought variability in the central United States. *Bulletin of the American Meteorological Society* 79, 2693-2714.
- Woodhouse, C.A. and D.M. Meko. 1997. Number of precipitation days reconstructed from southwestern tree rings. *Journal of Climate* 10, 2663-2669.
- Woodhouse, C.A. 1997. Tree-ring reconstructions of circulation indices. *Climate Research* 8, 117-127.
- Woodhouse, C.A. 1997. Winter climate and atmospheric circulation patterns in the Sonoran Desert

- region. *International Journal of Climatology* 17, 859-873.
- Schuster, W.S.F., J.B. Mitton, D.K. Yamaguchi, and C.A. **Woodhouse**. 1995. A comparison of limber pine (*Pinus flexilis*) ages at lower and upper treeline sites east of the Continental Divide in Colorado. *American Midlands Naturalist* 133, 101-111.
- Woodhouse, C.A. 1993. Tree-growth response to ENSO events in the central Colorado Front Range. *Physical Geography* 14, 417-435.
- Woodhouse, C.A. and P.A. Kay. 1990. The use of tree-ring chronologies to show spatial and temporal changes in an air mass boundary. *Physical Geography* 11, 172-190.

Book Chapters

- Woodhouse, C.A., J.J. Lukas, K. Morino, D.M. Meko, K.K. Hirschboeck. 2016. Using the past to plan for the future – The value of paleoclimate reconstructions for water resource planning. In K. Miller, A. Hamlet, D. Kenney and K. Redmond, eds. *Western Water Policy and Planning in a Variable and Changing Climate*, Drought and Water Crises: Science, Technology, Management, and Policy Issues for the 21st Century, Donald A. Wilhite (Series Editor), CRC Press - Taylor and Francis.
- Woodhouse, C.A. 2003. Dendrochronological Evidence for Long-Term Hydroclimatic Variability. Lewis, W.M. Jr., Editor, *Water and Climate in the Western United States*, University Press of Colorado, Boulder, pp. 49-58.
- Hirschboeck, K.K., F. Ni, M.L. Wood, C.A. **Woodhouse**, 1996. Synoptic dendroclimatology: overview and outlook. In: J.S. Dean, D.M. Meko, and T.W. Swetnam, eds., *Tree Rings, Environment, and Humanity*. Radiocarbon, Tucson, Arizona, pp. 205-223.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

American Geophysical Union
American Meteorological Society
American Quaternary Society
Association of American Geographers
Tree-Ring Society

PROFESSIONAL ACTIVITIES

Presentations at conferences, workshops (first authored oral presentations only) (2012-present):

- Woodhouse, C.A. 2019. Practicing Collaborative Research. Healthy Forests, Healthy Watersheds Workshop, University of Arizona, Tucson, AZ, November 14, 2019*
- Woodhouse, C.A. 2019. The Role of Dendrochronology in the 21st Century: Lessons Learned from Water Managers. Laboratory of Tree-Ring Research Brown Bag Seminar, University of Arizona, November 6, 2019
- Woodhouse, C.A. 2019. Missouri River Hydroclimatology Overview. Improving Sub-Seasonal to Seasonal (S2S) Precipitation Forecasting, Western States Water Council and California Department of Water Resources, San Diego CA, May 22-24, 2019*
- Woodhouse, C.A. 2019. Tree-ring reconstructions of Colorado River streamflow: Drought and Implications for Power Generation. Centre for Energy Advancement through Technological

- Innovation International, Hydropower Conference, Tucson AZ, March 20, 2019*
- Woodhouse, C.A. 2018. The Effects of Temperature on Colorado River Drought over Past Centuries Inferred from a Runoff Efficiency Reconstruction. When the Rain Stops: Drought on Subseasonal and Longer Timescales, Aspen Global Change Institute, Aspen CO, September 9-14, 2018*
- Woodhouse, C.A. 2018. Using Tree Rings to Inform Water Resource Management. 2018 California Extreme Precipitation Symposium, University of California, Davis, CA, July 9, 2018*
- Woodhouse, C.A. 2018. The Role of Dendrochronology in the 21st Century: Lessons Learned from Water Managers. Plenary, 10th World Dendro Conference, Thimphu, Bhutan, June 10-15, 2018*
- Woodhouse, C.A. 2018. Southern California Perfect Drought: How Common? 10th World Dendro Conference, Thimphu, Bhutan, June 10-15, 2018
- Woodhouse, C.A., G.T. Pederson, S. McAfee, G. McCabe, and K. Morino. 2018. Colorado River Runoff Efficiency: Placing the Instrumental Record in a Long-Term Context. Surviving Peak Drought and Temperature Workshop University of Arizona, March 29-30, 2018*
- Woodhouse, D. Meko and E. Bigio. 2018. Where We've Been: Drought in the Southern California Paleo Record. Paleo Drought Workshop: Using the Past to Improve Drought Preparedness Now April 19, 2018, San Pedro, CA*
- Woodhouse, C.A. 2018. The impact of warming temperatures on Colorado River flow. Law of Colorado River Conference, CLE International, Tucson, AZ, Mar 2, 2018*
- Woodhouse, C.A. 2017. Reconstructions of Paleo Droughts in Southern California. National Water Research Institute meeting, Orange County Water District, Fountain Valley, CA, Dec 5, 2017*
- Woodhouse, C.A. 2017. Making the Connection between Quaternary Science and Decision Making 2017 Geological Society of America Annual Meeting, Seattle, WA, Oct 22-25, 2017*
- Woodhouse, C.A. 2017. Evaluating the influence of air temperature and soil moisture conditions on Colorado River streamflow. Colorado River Hydrology Research Symposium, Las Vegas, NV, May 22 – 23, 2017*
- Woodhouse, C.A., S.E. Frederick, G.T. Pederson, E.K. Wise. 2017. Spatial and Temporal Variability in Upper Missouri River Basin Droughts and Pluvials. Association of American Geographers Conference, Boston, April 5-9, 2017
- Woodhouse, C.A. and G.T. Pederson. 2016. Warm and Cool Droughts: The Influence of Temperature on Colorado River Flow, GC13E-1238. American Geophysical Union, San Francisco, CA, Dec. 11-16, 2016
- Woodhouse, C.A. 2016. Using the Paleoclimatic Data Record to Understand Historical Precipitation Patterns. Workshop on Drought Vulnerability and Tools for Improving Water Resilience. Long Beach CA, October 19, 2016.*
- Woodhouse, C.A. Use-Inspired Hydroclimatic Research in the Upper Colorado River Basin. Biennial Conference of Science & Management on the Colorado Plateau & Southwest Region, Flagstaff, AZ, October 6, 2015.*
- Woodhouse, C.A., D. B. Ferguson, and J.L. Rice. Some Practical Guidelines for Science/Decision-Making Collaborations. 2015 UCOWR/NIWR/CUAHSI Annual Conference, Henderson, NV, June 16-18, 2015*
- Woodhouse, C.A., G.Pederson, K. Morino, and G. McCabe. The Role of Temperature in Mediating Relationships between Cool Season Precipitation and Water Year Streamflow in the UCRB. Colorado River Hydrology Work Group Meeting, Tucson AZ, May 27, 2015.
- Woodhouse, C.A. Paleodroughts: Analogues for the Future? New Mexico Geological Society Annual Meeting, Socorro, New Mexico, April 24, 2015. Keynote*
- Woodhouse, C.A. Drought Planning: The Long-Term Context. 2015 U.S. Drought Monitor Forum, Desert

- Research Institute, Western Regional Climate Center, April 14-16, 2015. Keynote*
- Woodhouse, C.A. G.T. Pederson, K. Morino, and G. McCabe. Investigating the role of temperature in mediating relationships between cool season precipitation and water year streamflow in the Upper Colorado River basin. Pacific Climate (PACLIM) Meeting, Pacific Grove, CA, March 8-11, 2015.
- Woodhouse, C.A. Connecting Environmental Science and Decision Making (CESD) – a Graduate Certificate Program. Regional Integrated Sciences and Assessment PI Meeting, Charleston, SC. Jan 15-17, 2015.
- Woodhouse, C.A., S. McAfee, G. McCabe, P. Miller, G. Pederson. Evaluating the Influence of Precipitation, Temperature, and Soil Moisture on Upper Colorado River Basin Streamflow and Drought. H31M-07. American Geophysical Union, San Francisco, CA, Dec. 15-19, 2014.
- Woodhouse, C.A. Collaborative Research on Upper Colorado River Basin Streamflow and Drought. Association of Pacific Coast Geographers meeting, Tucson, AZ. Sept. 24-27, 2014.
- Woodhouse, C.A., S.B. Malevich, D.M. Meko, and S. Gangopadhyay. Tree-ring reconstruction of the Klamath River. AMQUA 23rd Biennial Meeting, Seattle, WA. August 7-9, 2014
- Woodhouse, C.A. Great Plains Droughts in a Long-Term Context: The Tree-Ring Perspective. 40th Annual Great Plains Symposium, Lincoln, NE. April 1-4, 2014.*
- Woodhouse, C.A., R.L. Brice, M.A. Crimmins, H.L. Faulstich, D. Griffin, D.B. Ferguson, A.M. Meadow. Three-Season Hydroclimatic Variability from Tree Rings in the Four Corners Region, USA. AAG Annual Meeting, Tampa, FL, April 12, 2014.
- Woodhouse, C.A. S.B. Malevich, D.M. Meko, and S. Gangopadhyay. Klamath River Reconstruction: Strategies for Dealing with Uncertainty in Calibration Data Tree-ring reconstruction of the Klamath River. GC11A-0957, American Geophysical Union, San Francisco, CA, Dec. 9-13, 2013
- Woodhouse, C.A., S.B. Malevich, D.M. Meko, and S. Gangopadhyay. Klamath River Streamflow Reconstructed from Tree Rings: Extracting Meaningful Information from Imperfect Data. Pacific Northwest Climate Science Conference, Portland, OR, Sept. 5-6, 2013.
- Woodhouse, C.A.. A Paleoclimatic Perspective on Water Resource Vulnerability in the Western US. ACCWW Symposium Lamont Doherty Earth Observatory, May 19-23, 2013.*
- Woodhouse, C.A., D. Ferguson, J.J. Lukas, J.L. Rice. Linking Tree-Ring Research and Resource Management through Collaboration. Ameridendro Conference, Tucson, AZ, May 13-17, 2013, Keynote.*
- Woodhouse, C.A., D. Griffin, H.L., Faulstich, and C.L. Castro. Regional Patterns of Cool Season and Monsoon Precipitation in the Southwestern US over the Past Four Centuries, GC046, American Geophysical Union, San Francisco, CA, Dec. 5-9, 2012.*
- Woodhouse, C.A., D. Griffin, H.L., Faulstich, and T.W. Swetnam. Southwestern US Seasonal Precipitation and Fire Occurrence from Tree Rings, GC049, American Geophysical Union, San Francisco, CA, Dec. 5-9, 2012.
- Woodhouse, C.A., D.M. Meko, D. Griffin, C.L. Castro. Streamflow and Monsoon Reconstructions for the Lower Rio Grande Basin, USA. Mountain Climate (MtnClim) meeting, Estes Park, CO, Sept. 1-4, 2012.
- Woodhouse, C.A., A Perspective on the Challenges and Opportunities in the Hydrologic Sciences. Panel, The Future of Hydrological Sciences: Arizona and Beyond, 2012 AHS Annual Water Symposium September 18-21, 2012.*
- Woodhouse, C.A. North American Monsoon Project. Southwest Climate Workshop, Los Alamos National Laboratory, Jemez Springs NM, Sept. 6, 2012.
- Woodhouse, C.A., J.L. Rice, and D. Ferguson. Linking Environmental Research and Practice through

Collaboration. Universities Council on Water Resources Annual Conference, Santa Fe, NM. July 17-19, 2012*

Woodhouse, C.A., D. Griffin, and G. Pederson. From Monsoon to Snowpack: Hydroclimatic Variability in Western North America from Tree Rings. American Quaternary Association (AMQUA) Biennial Meeting, Duluth, MN, June 21-24, 2012.*

Woodhouse, C.A. How Can Paleoenvironmental Data Inform Adaptation? Tree Rings, Drought, and Water Resources. Adaptation Futures: 2012 International Conference on Climate Adaptations, Tucson, AZ, May 29-31, 2012.

* = invited

Invited talks, seminar series, general public presentations (2012-present):

“Colorado River Runoff Efficiency from Tree Rings.” Laboratory of Tree-Ring Research, Brown Bag Seminar Series, University of Arizona, March 14, 2018.

“Runoff efficiency: The impact of warming temperatures on Colorado River drought.” CLIMAS Colloquium, University of Arizona, Jan 26, 2018.

“Tree Rings and Drought with Applications to Water Resource Management in the Western US.” Department of Geography, University of Minnesota, Brown Day, April 28, 2017.

“Past Streamflow from Tree Rings: From Implications to Applications.” Department of Geography University of Utah, April 21, 2017.

“Reconstructing Past Streamflow from Tree Rings and Applications to Water Resource Management.” NAFRI Advanced Fire Effects course, Laboratory of Tree-Ring Research, University of Arizona, January 10, 2017.

“Disentangling the Influence of Temperature and Antecedent Soil Moisture on Colorado River Water Resources – An Update. Salt River Project, Tempe, AZ, Nov. 9, 2016.

“Effects of Climate on Colorado River Flow: The influence of temperature on streamflow and drought” Utah Associated Municipal Power Systems (UAMPS) Member Conference, Midway, UT, Aug. 16, 2016.

“A Tree-Ring Perspective on Drought, Monsoon, and Fire in the Rio Grande Basin” American Association of State Climatologists Meeting, Santa Fe, New Mexico. June 30, 2016

“Effects of Climate on Colorado River Flow: Perspectives from the Past, Present, and Future” Laboratory of Tree-Ring Research Seminar Series, University of Arizona, March 22, 2016.

“Disentangling the Influence of Temperature and Antecedent Soil Moisture on Colorado River Water Resources” Water Manager Project Advisory Board workshop, Denver Federal Center, Denver, CO, Sept. 17, 2015.

“The Role of Temperature (and soil moisture) in Mediating Relationships between Cool Season Precipitation and Water Year Streamflow in the UCRB” Denver Water Board, Denver, CO, July 21, 2015; and Colorado River District brown bag talk, Glenwood Springs, CO, July 23, 2015.

“Tree Rings and Drought with Applications to Water Resource Management in the Western US” National Center for Atmospheric Research (NCAR), Invited speaker series, Boulder, CO, July 14, 2015.

“Paleohydrology of the Klamath, San Joaquin, Sacramento River Basins” California Department of Water Resources, Sacramento CA, October 29, 2014.

“Collaborative Research on Upper Colorado River Basin Streamflow and Drought” Bureau of Reclamation, Colorado River Hydrology Work Group Meeting. December 11, 2014.

“Klamath River Streamflow Reconstructed from Tree Rings” Klamath County Historical Society, Klamath Falls, OR, May 22, 2014.

- “Using Tree Rings to Document Drought in the Colorado River Basin and Colorado Plateau” UA Humanities Seminar for adult learners. March 13, 2014.
- “Lessons from the Past: Tree Rings, Drought, and Water Resources.” Burack Distinguished Lecture Series, University of Vermont, November 14, 2013.
- “Tree-Ring Reconstructions of Streamflow, Precipitation, and Monsoon Variability in the Rio Grande Basin,” Rio Grande Tree-Ring Monsoon Workshop, New Mexico State University, Las Cruces, NM, September 19, 2013
- “Colorado River Water: Past, Present, and Future? Osher Lifelong Learning Institute (OLLI), University of Arizona, March 26, 2013.
- “Tree Rings and their Role in Water Resources Decision-Making.” School of Natural Resources and Environment Seminar Series, University of Arizona, March 20, 2013.
- “Insights from Arizona’s Past Climate: A 2000 Year Perspective,” Planning for Local Government Climate Challenges: Connecting Research and Practice Workshop, Arizona State University, Tempe, AZ, Oct. 18-19, 2012.
- “Megadroughts in Western North America: Definitions and Causes?” Arizona Climate and Water Resources Alliance Collaborative Workshop on Climate Extremes, Arizona State University, Tempe, AZ, April 4, 2012

Other professional activities:

- American Quaternary Society council, paleoclimatology representative, 2010-2014
- International Tree-Ring Data Bank, chairperson of advisory board, 2001-2013
- International Multiproxy Paleofire Database, advisory board member, 2002-2012
- Associate Editor, *Dendrochronologia*, 2002-2020
- Member, National Academy of Sciences, Committee on the Scientific Bases of Colorado River Basin Water Management, 2006-2007.
- Member, National Academy of Sciences, Committee on the Challenges and Opportunities in the Hydrologic Sciences, 2009-2011.
- Member, U.S. National Committee (USNC) of the International Quaternary Association (INQUA), 2008-2015
- Peer reviewer for journal articles: *Arctic, Antarctic, and Alpine Research, Bulletin of the American Meteorological Society, Canadian Journal of Forest Research, Climatic Change, Climatic Change Letters, Climate Dynamics, Climate of the Past, Climate Research, Dendrochronologia, Earth Interactions, Earth Science Reviews, Journal of Climate, Ecology, Eos, Geology, Global Change Biology Geophysical Research Letters, International Journal of Climatology, Journal of Environmental Management, Journal of Geography in Higher Education, Journal of Geophysical Research – Atmospheres, Journal of Hydrology, Journal of the American Water Resources Association, Journal of Water Resources Planning and Management, Landscape Ecology, New Phytologist, Quaternary Research, Physical Geography, Science, Science Advances, The Holocene, Tree-Ring Research*
- Proposal reviews: NSF Paleoclimatic Perspectives on Climate Change, Climate Dynamics, Ecosystems Studies, Geography and Regional Science; the Canadian Foundation for Climate and Atmospheric Sciences, Comisión Nacional de Investigación Científica y Tecnológica, Gobierno de Chile, Natural Sciences and Engineering Research Council of Canada, NOAA Climate Program Office (OGP), Water Research Program, University of Wyoming