

# ADRIAN A. HARPOLD

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## EDUCATION

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- 1999 - 2003            Virginia Polytechnic Institute (Virginia Tech)            Blacksburg, VA  
■ B.S. in Biological Systems Engineering, *summa cum laude*
- 2003 - 2005            Virginia Polytechnic Institute            Blacksburg, VA  
■ M.S. in Biological Systems Engineering, thesis title: "Stream discharge measurement using a large-scale particle velocimetry prototype"
- 2005 - 2010            Cornell University            Ithaca, NY  
■ Ph.D. in Biological and Environmental Engineering, dissertation title: "Hydrogeomorphological controls on stream chemistry and aquatic biota in the Catskill Mountains, New York State"

## RESEARCH AND TEACHING EXPERIENCE

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- 2014 - present            Natural Resources and Env. Science, University of Nevada            Reno, NV  
*Assistant Professor*  
■ Teaching and lead of the Nevada Mountain Ecohydrology Group
- 2012 - 2014            INSTAAR, University of Colorado and NCAR            Boulder, CO  
*Postdoctoral Research Fellow*  
■ Improving representations of snow-vegetation interactions in land-surface models
- 2010 - 2012            Hydrology and Water Resources Dept., University of Arizona            Tucson, AZ  
*Postdoctoral Researcher*  
■ Jemez River Critical Zone Observatory and impacts of pine beetles in the Rocky Mountains
- 2005 - 2010            Biological and Env. Engineering Dept., Cornell University            Ithaca, NY  
*Graduate Research Fellow*  
■ Funded by the National Science Foundation
- 2003 - 2005            Biological Systems Engineering Dept., Virginia Tech            Blacksburg, VA  
*Graduate Teaching Assistant*  
■ Departmental assistantship for teaching an undergraduate thermodynamics course

## AWARDS AND LEADERSHIP POSITIONS

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- Outstanding Faculty Member: UNR Graduate Program in Hydrologic Sciences, 2016
- National Science Foundation EAR Postdoctoral Fellowship, 2012 - 2014
- NSF Graduate Research Fellowship, 2005 - 2009
- Virginia Conservationist of the Year, Soil and Water Conservation Society (SWCS), 2005
- President Student Chapter of SWCS, 2003 - 2004
- 2<sup>nd</sup> Place Student Poster, 2004 SWCS Meeting
- *Summa cum laude*, B.S., 2003
- NSF Research for Undergraduates Fellowship, 2002
- Virginia Tech Biological Systems Engineering Sophomore of the Year, 2002

## PROFESSIONAL SOCIETIES AND TRAINING

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American Geophysical Union (AGU), Critical Zone Exploration Network (CZEN), International Association of Hydrological Sciences (IAHS), Nevada Water Resources Associate (NWRA)

Alpha Epsilon Honor Society, Phi Kappa Phi Honor Society, Golden Key Honor Society, National Society of Collegiate Scholars

Engineer-in-Training (EIT) in the State of Virginia 2003, graduate of University of Aberdeen Catchment Science School 2010, participant NCAR Community Land Model course 2014, SERC Early Career workshop graduate

## PUBLICATIONS

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**\*denotes student co-author at time of publication, # graduate student co-author directly supervised by Harpold, \$undergraduate student co-author directly supervised by Harpold**

29. Harpold, A.A., M. Kaplan, Z. Klos, T. Link, J. McNamara, R. Schumer, C. Steele, and S. Rajagopal. Rain or Snow: Processes, Observations, Prediction, and Research Needs For Hydrologic Sciences. <*Hydrology and Earth System Sciences Discussions*> doi:10.5194/hess-2016-436
28. Harpold, A.A., K. Sutcliffe, J. Clayton, A. Goodbody, and S. Vazquez. Can Soil Moisture Information Improve Operational Streamflow Forecasts In Snow-Dominated Watersheds? <accepted in *Journal of the American Water Resources Association*>
27. Barnhart\*, T. N.P. Molotch, B. Livneh, A.A. Harpold, J. Knowles, and D. Schneider\*. Snowmelt Rate Dictates Streamflow. (2016) *Geophysical Research Letters*. 43. doi: 10.1002/2016GL069690  
- UNR press release: <http://www.unr.edu/nevada-today/news/2016/snowpack-research>
26. Rajagopal, S. and A.A. Harpold. (2016). Testing and Improving Temperature Thresholds for Snow and Rain Prediction in the Western United States. *Journal of American Water Resources Association*. DOI: 10.1111/1752-1688.12443
25. Harpold, A.A. (2016) Diverging Sensitivity of Soil Water Stress To Changing Snowmelt Timing in the Western U.S. *Advances in Water Resources*. 92: 116-129. Doi: 10.1016/j.advwatres.2016.03.017
24. Biederman, J. A., Meixner, T., Harpold, A. A., Reed, D., Gutmann, E., Guan\*, J., and Brooks, P. Bark beetle disturbance drives nitrogen loss comparable to clear-cut harvest, but riparian buffer zones protect headwater streams. (2016) *Journal of Geophysical Research, Biogeosciences*. 121. doi: 10.1002/2015JG003284
23. Biederman, J.A., A. Somor, A.A. Harpold, E. Gutmann, D.D. Breshears, P.A. Troch, D.J. Gochis, R.L. Scott, A.J.H. Meddens, and P.D. Brooks. Recent tree die-off has little effect on streamflow in contrast to expected increases from historical studies. (2015) *Water Resources Research*. 51, 9775–9789, doi: 10.1002/2015WR017401  
- AGU research spotlight in *EOS Transactions* 98. doi:10.1029/2016EO047593  
- WRR Editor's Choice Award (given to less than 1% of WRR papers)
22. Harpold, A.A. and N.P. Molotch. Sensitivity of Soil Water Availability to Changing Snowmelt Timing in the Western U.S. *Geophysical Research Letters*. 42. 10.1002/2015GL065855
21. Harpold, A. A., Marshall\*, J. A., Lyon, S. W., Barnhart\*, T. B., Fisher\*, B. A., Donovan\*, M., Brubaker, K. M., Crosby, C. J., Glenn, N. F., Glennie, C. L., Kirchner, P. B., Lam\*, N., Mankoff, K. D., McCreight, J. L., Molotch, N. P., Musselman, K. N., Pelletier, J., Russo, T., Sangireddy\*, H., Sjöberg\*, Y., Swetnam, T., and West, N. (2015). Laser vision: lidar as a transformative tool to advance critical zone science, *Hydrol. Earth Syst. Sci.*, 19, 2881-2897, doi:10.5194/hess-19-2881-2015, 2015.
20. Harpold, A.A. (2015) "Use of LiDAR in Environmental Science." In Oxford Bibliographies in Environmental Science. Ed. Ellen Wohl. New York: Oxford University Press, forthcoming.
19. Knowles\*, J.F., Harpold, A.A., Cowie, R., Zelif\*, M., Barnard, H.R., Burns, S.P., Blanken, P.D., Morse, J.F., and Williams, M.W. (2015), The relative contributions of alpine and subalpine ecosystems to the water balance of a mountainous, headwater catchment. *Hydrological Processes*. 29: 4794-4808. doi: 10.1002/hyp.10526.
18. Harpold, A.A., N.P. Molotch, P.D. Brooks, R. Bales, M. Litvak, K. Musselman. And P. Kirchner. (2015) Snowmelt infiltration in mixed-conifer subalpine forests. *Hydrological Processes*. 29: 2782-

2798. doi: 10.1002/hyp.10400
17. Vazquez-Ortega, A., J. Perdrial, A.A. Harpold, X. Zapata, C. Rasmussen, J. McIntosh, M. Schaap, M.D. Amistadi, and J. Chorover. (2015) Rare earth elements as reactive tracers of biogeochemical weathering in the Jemez River Critical Zone Observatory. *Geochimica et Cosmochimica Acta*. doi: 10.1016/j.chemgeo.2014.10.016
  16. Broxton, P., A.A. Harpold, J. Biederman, P.D. Brooks, P.A. Troch, and N.P. Molotch. (2015) Quantifying the effects of vegetation structure on wintertime vapor losses from snow in mixed-conifer forests. *Ecohydrology*. doi: 10.1002/eco.1565
  15. Harpold, A.A., Q. Guo, N. Molotch, P. Brooks, R. Bales, J.C. Fernandez-Diaz, K.N. Musselman, T. Swetnam\*, P. Kirchner\*, M. Meadows, J. Flannagan\*, and R. Lucas\*. (2014) A LiDAR derived snowpack dataset from mixed conifer forests in the Western U.S. *Water Resources Research*. 50(3): 2749-2755. doi: 10.1002/2013WR013935
  14. Harpold, A.A., J. Biederman\*, K. Condon\*, M. Merino\*, Y. Korganokar\*, T. Nan\*, L.L. Sloat\*, M. Ross\*, and P.D. Brooks. (2014) Changes in winter season snowpack accumulation and ablation following the Las Conchas Forest Fire. *Ecohydrology*. 7: 440-452. doi: 10.1002/eco.1363.
  13. Biederman, J.A., A.A. Harpold, D. Reed, D. Gochis, B. Ewers, E. Gutmann, and P.D. Brooks. (2014) Increased evaporation following widespread tree mortality limits streamflow response. *Water Resources Research*. 50, 5395–5409, doi:10.1002/2013WR014994.
  12. Harpold, A.A., P.D. Brooks, S. Rajogopalan\*, I. Heidebuchel\*, A. Jardine\*, and C. Stielstra\*. Changes in snowpack volume and snowmelt timing in the Intermountain West. (2012) *Water Resources Research*. 48:11. doi: 10.1029/2012WR011949  
- AGU research spotlight in EOS Transactions 94(28). doi:10.1002/2013EO020012
  11. Biederman, J., P.D. Brooks, A.A. Harpold, D. Gochis, E. Gutman, D. Reed, E. Pendall, and B. Ewers. (2014) Multi-scale Observations of Snow Accumulation and Peak Snowpack Following Widespread, Insect-induced Lodgepole Pine Mortality. *Ecohydrology*. doi:10.1002/eco.1342.
  10. Perdrial, J. McIntosh, A.A. Harpold, P.D. Brooks, X. Zapata-Rios, J. Ray, T. Meixner, T. Kanduc, M. Litvak, P. Troch, and J. Chorover. (2014) Stream water carbon controls in seasonally snow-covered mountain catchments: impact of interannual variability of water fluxes, catchment aspect and seasonal processes. *Biogeochemistry*. doi:10.1007/s10533-013-9929-y
  9. Sorooshian, A.S., T.S. Shingler, A.A. Harpold, C.W. Feagles, T.M. Meixner, and P.D. Brooks. (2013) Aerosol and Precipitation Chemistry in the Southwestern United States: Spatiotemporal Trends and Interrelationships. *Atmospheric Chemistry and Physics*. 13: 7361-7379. doi:10.5194/acp-13-7361-2013
  8. Perdrial, J., N. Perdrial, A.A. Harpold, X. Gao, K. LaSharr, J. Chorover. (2012) Probing dissolved organic matter in the critical zone: a comparison between in situ passive capillary wick samplers (PCaps) to aqueous soil extracts. *Soil Science Society of America Journal*. 76(6): 2019-2030. doi:10.2136/sssaj2012.0061
  7. Chorover, J., P.A. Troch, C. Rasmussen, P.D. Brooks, J.D. Pelletier, D.D. Breshears, T.E. Huxman, S.A. Kurc, K.A. Lohse, J.C. McIntosh, T. Meixner, M.G. Schaap, M.E. Litvak, J. Perdrial, A.A. Harpold, M. Durcik. (2011) Probing how water, carbon, and energy driven landscape evolution and surface water dynamics: Jemez River Basin – Santa Catalina Mountains Critical Zone Observatory. *Vadose Zone Journal*. 10(3): 884-899. doi:10.2136/vzj2010.0132
  6. Harpold, A.A., D.A. Burns, M.T. Walter, and T. Steenhuis. (2010) Explaining the spatial variability of aquatic biota using watershed features in the Neversink River watershed, New York, USA. *Ecological Applications*. 23: 791-800. doi: 10.1890/12-0603.
  5. Harpold, A.A., S.B. Shaw, D.A. Burns, M.T. Walter, and T. Steenhuis. (2010) Relating hydrogeomorphologic properties to stream buffering chemistry in the Neversink River watershed, New York, USA. *Hydrological Processes*. 24(26): 3759-3771. doi:10.1002/hyp.7802
  4. Harpold, A.A., S.W. Lyon, P.A. Troch, and T.S. Steenhuis. (2009) The hydrological effects of lateral preferential flow paths in a glaciated watershed in the Northeastern U.S. *Vadose Zone Journal*. 9(2): 397-414. doi:10.2136/vzj2009.0107.
  3. Shaw, S. A.A. Harpold, J.A. Taylor, and M.T. Walter. (2007) Investigating a high-resolution, stream chloride time series from Biscuit Brook catchment, Catskills, NY. *Journal of Hydrology*. 348(3-4): 245-256. doi:10.1016/j.hydrol.2007.10.009
  2. Harpold, A.A., S. Mostaghimi, P. Vlachos, K. Brannan, and T. Dillaha. (2006) Stream discharge

measurement using a large-scale particle image velocimetry (LSPIV) prototype. *Transactions ASABE*. (49)6: 1791-1805.

1. Wynn, T., S. Mostaghimi, J. Burger, A.A. Harpold, M. Henderson, and L.-A. Henry. (2004) Variation in root density along stream banks. *Journal of Environmental Quality*. 33: 2030-2039. doi:10.2134/jeq2004.2030

#### PUBLICATIONS IN REVIEW

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- Tennant, C., A.A. Harpold, S. Godsey, and C. Crosby. Lidar Illuminates the Influence of Physiography on Seasonal Snow Distributions: Case Studies From Four western U.S. Critical Zone Observatories. <major revisions at *Water Resources Research*>
- McIntosh, J.C., C. Porter, J. Perdrial, A. Harpold, A. Vasquez-Ortega, C. Rasmussen, D. Vinson, X. Zapata-Rios, P. Brooks, T. Meixner, J. Pelletier, L. Derry, and J. Chorover. Geochemical evolution of the Critical Zone on variable time scales informs concentration-discharge relationships: Jemez River Basin Critical Zone Observatory <major revisions at *Water Resources Research*>
- Wymore, A., N.R. West, K. Maher, P.L. Sullivan, A.A. Harpold, D. Karwan, J.A. Marshall, J. Perdrial, D. Rempe, and L. Ma. Growing a Generation of International Critical Zone Scientists. <submitted to *Earth and Planetary Science Letters*>
- Harpold, A.A., M. Dettinger, and S. Rajagopal. Defining Snow Drought and Why it Matters. <submitted to *EoS*>
- Perdrial, J. Brooks, P. Swetnam, T. Lohse, K.A., Rasmussen, C. Litvak, M. Harpold, A. Zapata-Rios, X. Broxton, P. Mitra, B. Meixner, T. Condon, K. Huckle, D. Stielstra, C. Vazquez-O, A.L, R. Holleran, M. Orem, C. Pelletier, J. Chorover, J. A net ecosystem carbon budget for snow dominated forested headwater catchments: linking water and carbon fluxes to critical zone carbon storage <submitted to *Biogeochemistry* >

#### PUBLICATIONS IN PREPARATION

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- Harpold, A.A., J. Crews, S. Rajagopal, and R. Schumer. The Effects of Humidity Buffering on Sensitivity of Shifts from Snow to Rain in the Western U.S. <in preparation for *Geophysical Research Letters*>
- Harpold, A.A. and P.D. Brooks. Humidity Will Determine Snowpack Response to a Warming Climate. <in preparation for *Nature Climate Change*>
- Harpold, A.A., P. Brooks, H. Barnard, L. Bearup, M. Litvak, R. Maxwell, N. Molotch, and S. Singha. The Ecohydrology of Seasonally Snow-Covered Forests <in preparation for *Review of Geophysics*>
- Tennant, C, A.A. Harpold, T. Link, S. Godsey, and S. Rajagopal. A new snowpack classification scheme. <in preparation for *Cryosphere*>
- Swetnam, T., Brooks, P., Gallo, E., Barnard, H., Harpold, A. Topographic position regulates the distribution of forest aboveground carbon in the Front Range of the Rocky Mountains, Colorado. <revising to submit to *Ecosphere*>.

#### OTHER PUBLICATIONS

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- Harpold, A.A., S.W. Lyon, and J.A. Marshall. Using lidar to advance critical zone science. Meeting Notes. Eos. October 2014.
- Harpold, A.A., J.A. Biederman, and P.D. Brooks. 2013. Where did all that snow go? Compensating vapor losses following forest disturbance in the Rocky Mountains. *Mountain Views*. 7(1).
- Harpold, A.A. and T.S. White. Exploring the Critical Zone with LiDAR. American Geosciences Institute handout for K-12 teachers. Available at [criticalzone.org/national/publications](http://criticalzone.org/national/publications)

#### INVITED PRESENTATIONS

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- “Big Unresolved Questions in Ecohydrology Require Transdisciplinary Mountain Science” MTNCLIM 2016 Early Career Session. Leavenworth, WA. October 2016.
- “Variable and Unexpected Hydrological Response to Changing Snowpacks: Determining Future Winner and Losers” Sierra Nevada Research Institute, University of California, Merced. September 2016.
- “Mountain Forests: A Critical Resource Under Threat” University of Nevada, VPRI, Earth, Air, and

## Water Conference

- “The future of snow in the Great Basin” Humboldt River Basin Water Authority. July 2016.
- “Seeing the forest for the trees: assessing risks to mountain snowpacks by integrating remote sensing, observations and models” Nevada NASA EPSCoR annual meeting. May 2016.
- “Airborne Light Detection and Ranging (Lidar): Harnessing Lidar for Science and Natural Resource Management” University of Nevada, VPRI, Big Data Conference
- “Paradoxes and Tradeoffs In Hydrological Partitioning To Evapotranspiration and Runoff in Snow-Dominated Systems” UNR DGSE Colloquium. April 2015
- “White and Green: The Effects of Environmental Change on Feedbacks Between Snow and Vegetation” UNR Geography Department Colloquium. April 2015
- “Water Vapor Fluxes from Snow Covered Landscapes: The Importance of Biotic and Abiotic-Mediated Processes” CUAHSI Cyberseminar, April 2015.
- “Better Representations of Snow-Vegetation Interactions Can Improve Water and Forest Management in the 21st Century” NCAR, September 2014
- “Community Workshop To Improve LiDAR Applications in the Critical Zone Sciences” Stockholm University, April 2014
- “Evaluating the Importance of Snowmelt Infiltration to Soil Water Availability Across Western U.S. Mountain Ecosystems” University of Colorado, Hydrologic Sciences Symposium, April 2014
- “Hydrologic response of headwater catchments to forest disturbance in the Rocky Mountains” University of Colorado, INSTAAR Noon Seminar, April 2013
- “Snowpack following forest disturbance: Implications for negative feedbacks on water availability” University of Colorado, Geography Dept. Colloquia, October 2012
- “Changes in snowpacks, snow melt, and streamflow in the Inter-Mountain West” Colorado School of Mines, Environmental Science Seminar. Golden, CO, October 2011
- “Changes in snowpacks, snow melt, and streamflow in the Inter-Mountain West” University of Arizona, Hydrology and Water Resources Colloquium. Tucson, AZ, November 2011
- “Using LiDAR to map snow distributions in the Valles Caldera, NM” Executive Meeting of the Board for the Valles Caldera National Preserve, Jemez Springs, NM, May 2011

## SELECT CONFERENCE PROCEEDINGS

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- Harpold, A.A. et al. Slower Snowmelt in a Warmer World Will Alter Subsurface Hydrology and Basin-Scale Water Budgets. 2016. MTNCLIM conference. Leavenworth, WA.
- Harpold, A.A. Interactions Between Hydroclimate and Soil Properties Control the Risk For Altered Hydrologic Partitioning From Changing Snowmelt In the Sierra Nevada. 2016. Yosemite Hydroclimate Conference. Yosemite, CA.
- Harpold, A.A. et al., Does Including Soil Moisture Observations Improve Operational Streamflow Forecast in Snow-Dominated Watersheds? 2016. *Western Snow Conference*, Seattle WA.
- Harpold et al., Regional Buffering of Changes From Snow To Rain by Humidity Regimes Under Climate Warming in the Western U.S. *Western Snow Conference*, Seattle WA.
- Harpold, A.A. (2015, December). Divergent Sensitivity of Soil Water Stress To Changing Snowmelt Regimes in the Western US. In *2015 AGU Fall Meeting*. San Francisco, CA.
- Harpold, A. A., P. D. Broxton, Q. Guo, M. J. Barlage, and D. J. Gochis. "Utilizing LiDAR Datasets From Experimental Watersheds to Advance Ecohydrological Understanding in Seasonally Snow-Covered Forests." In *AGU Fall Meeting Abstracts*, vol. 1, p. 05. 2014.
- Harpold, A. A. "The Sensitivity of Soil Moisture in Western US Mountains to Changes in Snowmelt." In *AGU Fall Meeting Abstracts*, vol. 1, p. 0644. 2014.
- Harpold, A.A. and N.P. Molotch. Evaluating The Importance of Snowmelt Infiltration to Soil Water Availability Across Western U.S. Mountain Ecosystems. Global Fair and Workshop on Long-Term Observatories of Mountain Social-Ecological Systems. 2014. Reno, NV.
- Harpold, A.A. and N.P. Molotch. Investigating snowmelt infiltration dynamics in the western U.S. using the SNOTEL Network. AGU Fall Conference. 2013. San Francisco, CA.
- Harpold, A.A. and N.P. Molotch. Snowmelt infiltration dynamics in seasonally snow-covered areas of the Western U.S. AGU Chapman Conference. 2013. Biosphere 2, AZ.
- Harpold, A.A., N.P. Molotch, and D.R. Gochis. Doing Big Science With Big Data: Preliminary Ecohydrologic Investigations at Western CZO Sites. EarthCUBE Meeting. 2013. Newark, DE.

- Harpold, A.A., P.D. Brooks, J.N. Perdrial, J.C. McIntosh, T. Meixner, X. Zapata, and J. Chorover. Quantifying variation in solute sources in montane headwater catchments. AGU Fall Conference 2012. San Francisco, CA.
- Harpold, A.A., P.D. Brooks, and J.A. Biederman. Snowpack following forest disturbance: Implications for negative feedbacks on water availability. MTNCLIM Conference 2012, Estes Park, CO.
- Harpold, A.A., P.D. Brooks and J.A. Biederman. Changes in snow accumulation and ablation following the Las Conchas forest fire, NM. CUASHI Biannual Meeting. 2012. Boulder, CO.
- Harpold, A.A., P.D. Brooks, J.A. Biederman, and T. Swetnam. Estimating catchment-scale snowpack variability in complex forested terrain. Valles Caldera National Preserve, NM. AGU Fall Conference 2011. San Francisco, CA.
- Harpold, Adrian, P.D. Brooks, J.A. Biederman, A. Somor, P. Troch, D. Gochis, E. Gutmann, H. Barnard, D. Reed, E. Pendall, and B. Ewers. Quantifying the effects of tree die-off from mountain pine beetles on hydrologic partitioning at the catchment scale. Western Water Association: MPB-Water Symposium. 2010. Boulder, CO.
- Harpold, A.A., C. Stielstra, S. Rajogopalan, I. Heidebuchel, A. Jardine, and P.D. Brooks. Changes in snowpack volume and snowmelt timing in the Intermountain West. AGU Conference 2010. San Francisco, CA.
- Harpold, A.A. Explaining the Spatial Variability in Stream Acid Buffering Chemistry and Aquatic Biota in the Neversink River Watershed, Catskill Mountains, New York State. AGU Conference. 2009. San Francisco, CA.
- Harpold, A.A. and T. Steenhuis. Conceptualizing process heterogeneity at multiple spatial scales in the Catskill Mountains, New York State, USA. EGU Conference. 2009. Vienna, Austria.
- Harpold, A.A. and T. Steenhuis. Effects of groundwater springs on spatial sources of baseflow in the Catskill Mountains, N.Y. State, USA AGU Conference. 2008. San Francisco, CA.
- Harpold, A.A. and T. Steenhuis. Overland flow caused by groundwater springs in the Catskill Mountains, New York, USA. AGU Conference. 2007. San Francisco, CA.
- Shaw, S. A.A. Harpold, and T. Walter. Investigating a high resolution, stream chloride time series from Biscuit Brook catchment, Catskills, NY. AGU Conference. 2006. San Francisco, CA.
- Harpold, A.A., H. Dahlke, and T. Steenhuis. Conceptualizing lateral flowpaths on a hillslope in the Catskill Mountains. New York. AGU Conference. 2006. San Francisco, CA.
- Harpold, A., T. Steenhuis, S. Lyon, J. Nieber, M. T. Walter and N. van de Giesen. Generalized SCS Type Equations for Distributed Runoff Generation in Ungauged, Humid Upland Watersheds. Prediction in Ungauged Basins (PUB) Workshop, Corvallis, OR.
- Harpold A.A., S. Mostaghimi, P. Vlachos. Stream discharge measurement using a large-scale particle image velocimetry prototype. AGU Conference. 2005. San Francisco, CA.

#### PROFESSIONAL SERVICE

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Steering committee for National Center for Airborne Laser Mapping (NCALM), AGU Hydrology Remote Sensing technical committee

Journal manuscript reviewer for Hydrology and Earth Systems Science, Hydrometeorology, Ecology, Cryosphere, Hydrology, JGR-Atmospheres, Water Resources Research, Hydrological Processes, Biogeochemistry, Hydrogeology Journal, Hydrobiologia, Vadose Zone Journal, Transactions of ASABE, Arctic and Alpine Research, and International Journal of Climatology

Proposal reviewer for Nevada EPSCoR, NASA, NSF, and DOE

#### TEACHING AND STUDENT MENTORSHIP

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UNR Courses: Principles of Ecohydrology (2015), Small Watershed Hydrology (2016)

U. of Arizona courses co-taught: Ecohydrology and Biogeochemistry (2011, 2012) with Paul Brooks

Graduate student mentees: R. Petersky (MS), P. Longley (MS), J. Biederman (PhD), P. Broxton (PhD), X. Zapata (PhD), C. Stielstra (MS), K. Condon (MS), and A. Somor (MS).

Undergraduate student mentees: S. Weiss (REU student), K. Kauffman (student researcher), K. Hewson (student researcher), S. Vazquez (REU student), D. Stielstra (research-tech), B. Stamper (researcher), and Virginia Tech 2004 REU program advisees

#### STUDENT GRANTS AND SCHOLARSHIPS

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Students supervised by A. Harpold: Hewson - UROP (2016), Longley and Petersky - NASA EPSCoR (2015)

UNAVCO project support (2012, 2013), NSF IGERT Small Grant - Cornell (2007), The Andrew W. Mellon Research Grant - Cornell (2007), Cornell Graduate Travel Grant (2006, 2007, 2008, 2009), PUB Workshop Student Stipend Award (2006), Virginia Water Resources Grant - Virginia Tech (2004), Virginia Tech Development Program Grant (2003)

Benjamin F. Brock Scholarship (2003), George C. Vaughan Scholarship (2003), Richard L. Bidwell Engineering Scholarship (2002), John K. Anderson Scholarship (2002), Daniel & Linda Gilbert Scholarship (2001), B. L. Parsons Scholarship (2001), and North Carolina Piedmont Triad Virginia Tech Alumni Association Scholarship (2000)

#### INTERNATIONAL EXPERIENCE

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Traveled to China as part of a scientific exchange regarding Critical Zone science (October 2015)

Served as a consultant to USAID for a project related to improving water management in Mali, July - August 2004