

Tess Alethea Russo

Rudy L. Slingerland Early Career Professor, Department of Geosciences, and
Associate, Earth and Environmental Systems Institute, The Pennsylvania State University
310 Deike Building, University Park, PA 16802
russo@psu.edu +1 814 865 7389

EMPLOYMENT

- 2016– Rudy L. Slingerland Early Career Professor in Geosciences
- 2014– Assistant Professor, Department of Geosciences, Pennsylvania State University, PA
- 2014– Adjunct Associate Research Scientist, Columbia University, NY
- 2012–14 Postdoctoral Fellow, Earth Institute, Columbia University, NY
- 2008–12 Graduate Student Researcher, University of California, Santa Cruz, CA
- 2006–07 Technical Consultant & Project Manager, Green Building Services, OR
- 2003 Physical Science Technician, Harvard-Smithsonian Center for Astrophysics, MA

EDUCATION

- 2012 Ph. D. Earth and Planetary Sciences, University of California, Santa Cruz, CA
- 2005 B.S.M.E. Mechanical Engineering, Tufts University, MA
- 2003–04 Study abroad, Mechanical Engineering, University College London, UK

HONORS AND AWARDS

- 2016 Penn State Wilson Research Initiation Award
- 2012–14 Earth Institute Postdoctoral Fellowship, Columbia University
- 2010 Charles A. Lawson and Jennifer Denny Lawson Student Award
- 2009–12 National Science Foundation Graduate Fellowship
- 2005 *Summa cum laude*, Tufts University
- 2004 Tau Beta Pi, Engineering Honors Society

PUBLICATIONS (+Advisee)

- Mirochnick, N.⁺ and T. A. Russo. Successful local adoption and management of a community water system in rural Uganda. *International Journal of Water* (In Press)
- Ho, M., V. Parthasarathy, E. Etienne, T. A. Russo, N. Devineni, and U. Lall. America's Water: agricultural water demands and the response of groundwater. *Geophysical Research Letters* (In Press)
- Sahoo, S.⁺, T. A. Russo, and U. Lall. 2016. Comment on “Quantifying renewable groundwater stress with GRACE” by A. S. Richey et al. *Water Resources Research* 52, DOI:10.1002/2015WR018085.
- Brantley, S. L., R. A. DiBiase, T. A. Russo, Y. Shi, H. Lin, K. J. Davis, M. Kaye, L. Hill, J. Kaye, A. L. Neal, D. Eissenstat, B. Hoagland⁺, A. L. Dere. 2016. Designing a suite of measurements to understand the critical zone. *Earth Surface Dynamics* 4:211-235
- Russo, T. A., N. Devineni, and U. Lall. 2015. Assessment of agricultural water management in Punjab, India using Bayesian methods. In ‘*Sustainability of Integrated Water Resources Management: Water Governance, Climate and Ecohydrology*’. Edited by Shimelis G. Setegn and Maria C. Donoso, Springer.

- Harpold, A. A., J. A. Marshall, S. W. Lyon, T. B. Barnhart, B. Fisher, M. Donovan, K. M. Brubaker, C. J. Crosby, N. F. Glenn, C. L. Glennie, P. B. Kirchner, N. Lam, K. D. Mankoff, J. L. McCreight, N. P. Molotch, K. N. Musselman, J. Pelletier, T. A. Russo, H. Sangireddy, Y. Sjöberg, T. Swetnam, and N. West. 2015. Laser vision: lidar as a transformative tool to advance critical zone science, *Hydrology and Earth System Sciences*, 19:2881-2897, doi:10.5194/hess-19-2881-2015
- Russo, T. A., A. T. Fisher, and B. S. Lockwood. 2015. Assessment of Managed Aquifer Recharge site and influence using GIS and numerical modeling. *Groundwater*, DOI: 10.1111/gwat.12213 (In Press)
- Russo, T. A., K. A. Alfredo, J. Fisher. 2014. Sustainable water management in urban, agricultural, and natural systems. *Water*, 6:3934-3956. DOI: 10.3390/w6123934
- Russo, T. A., A. T. Fisher, and D. Winslow. 2013. Increases in extreme precipitation intensity in the San Francisco Bay Area, California between 1890 and 2010. *Journal of Geophysical Research – Atmospheres*, 118:3392-3401. DOI:10.1029/2012JD018231
- Mankoff, K. D. and T. A. Russo, 2013. The Kinect: A low-cost, high-resolution, short-range, 3D camera. *Earth Surface Processes and Landforms*, 38:926-936. DOI: 10.1002/esp.3332
- Russo, T. A., A. T. Fisher, and J. Roche, 2012. Improving riparian wetland conditions based on infiltration and drainage behavior during and after controlled flooding. *Journal of Hydrology*. 432:98-111. DOI: 10.1016/j.jhydrol.2012.02.022
- Di Stefano, R., F. A. Primini, A. K. H. Kong, and T. A. Russo, 2004. Quasisoft X-Ray Sources: Unusual States of Stellar-Mass Objects, or Intermediate Mass Black Holes? *Astrophysical Journal*, arXiv:astro-ph/0405238v1
- Di Stefano, R., A. K. H. Kong, J. Greiner, F. A. Primini, M. R. Garcia, P. Barmby, P. Massey, P. W. Hodge, B. F. Williams, S. S. Murray, S. Curry, and T. A. Russo, 2004. Supersoft X-Ray Sources in M31. I. A *Chandra* Survey and an Extension to Quasi-soft Sources. *Astrophysical Journal*, 610:247-260.

PUBLICATIONS IN REVIEW AND PREPARATION (+Advisee)

- Russo, T. A., and U. Lall. Depletion and response of deep groundwater to climate induced pumping variability. *Science* (In Review)
- Alfredo, K. A. and T. A. Russo. Sustainable water-quality in the United States: Urban, Agricultural, and Environmental Protection practices. *WIREs Water* (In Review)
- Hoagland, N. E. ⁺, T. A. Russo, X. Gu, L. Hill, J. Kaye, B. Forsythe, S. L. Brantley. Hyporheic zone regulates concentration-discharge relationships in headwater sandstone stream. *Water Resources Research* (In Review)
- Russo, T. A., U. Lall, K. Vatta, and R. S. Sidhu. Reversing groundwater depletion in Punjab, India: an analytical framework for sustainable management through agricultural reforms. *Water International* (In Review)
- Sahoo, S. ⁺, T. A. Russo, J. Elliott, and I. Foster. Machine learning algorithms for modeling groundwater level changes in agricultural regions of the United States. *Water Resources Research* (In Review)

Russo, T. A., K. L. Tully, C. P. Palm, and C. Neill. Modeling nitrate losses from tropical agricultural soils receiving different fertilizer treatments. (Submitting to *Agricultural Water Management*)

Tully K. L., T. A. Russo, J. E. Hickman, C. Neill, and C. P. Palm. One size does not fit all: Green Revolution recommendations must be tailored to soil type to prevent nitrogen losses from African soils (Submitting to *Proceedings of the National Academy of Sciences*)

Dzwonczyk, J. ⁺, T. A. Russo, and K. Calvert. Water in the hydraulic fracturing process. (Submitting to *Energy*)

GRANT SUPPORT

- 2016–18 (Co-PI) Predicting the effects of agricultural intensification on water quality and quantity in the Department of Vichada, Colombia (\$1,200,000)
- 2015–16 (Lead-PI) Water Resource and Economic Benefits of Floodplain Restoration (\$24,456)
- 2014–17 (Senior Personnel) America’s Water – The Changing Landscape of Risk, Competing Demands, and Climate (\$2,016,098)
- 2014–16 (Co-PI) Parched Earth: Climate Change, Groundwater Depletion, and the Future of Food Production in North America (\$190,000)
- 2014–15 (Co-PI) Assessing Environmental Risk, Human Rights Impacts, and Community Perceptions in Mining-Affected Areas at the Watershed Scale in Papua New Guinea (\$34,020)
- 2014–19 (Co-PI) Using the Susquehanna – Shale Hills CZO to Project from the Geological Past to the Anthropocene Future
- 2013–14 (Lead PI) The Role of Water in Sustainable Human Development (\$7880)

FIELD RESEARCH (*active)

- 2015 *Vichada, Colombia**
Developing monitoring stations along major tributaries to the Orinoco in areas of agricultural development
Measuring efficacy of riparian forests as nutrient buffers in tropical system with fire impact and high stage variability
- 2015 *Cosumnes River, CA, USA**
Collecting soil cores for mesocosm experiments to measure relative importance of three different nitrogen cycling pathways
Estimate water quality benefits of levee removal
- 2015 *Porgera, Papua New Guinea**
Measuring heavy metals in streams near a gold mine
Modeling metal mobilization based on expected changes when mine stops treating stream water pH
- 2014 *Shale Hills Critical Zone Observatory, PA, USA**
Quantifying controls on stream solute concentration – discharge relationships, including varying flow paths, lithology, and land use
- 2012 *Punjab, India**
Modeling groundwater availability under current and possible crop scenarios

- Measuring groundwater age to determine recharge dynamics
- Quantifying relationship between groundwater fluctuation, redox changes due to fertilizer leachate, and uranium contamination
- 2009–12 *Pajaro Valley, CA, USA*
 - Measuring performance of managed aquifer recharge (MAR) projects
 - Modeling impacts of MAR scenarios on groundwater level and seawater intrusion
- 2009–11 *Scott Creek, CA, USA*
 - Measuring changes in streambed hydraulic conductivity following fire
- 2008–09 *Yosemite National Park, CA, USA*
 - Measuring floodplain infiltration response to controlled flood event
 - Modeling flood scenarios to increase wetland benefit while conserving water

INTERNATIONAL COLLABORATIONS

Guelph, Canada	University of Guelph
Bogota, Colombia	Instituto Humboldt
Puerto Carreño, Colombia	Governor and Secretary of Agriculture
Ludhiana, India	Punjab Agricultural University
Delhi, India	Centers for International Projects Trust
Sauri, Kenya	Millennium Villages Project
Guanajuato, Mexico	Comisión Estatal de Aguas de Guanajuato
Port Moresby, Papua New Guinea	University of Papua New Guinea
Lausanne, Switzerland	École Polytechnique Fédérale de Lausanne
Mbola, Tanzania	Millennium Villages Project
Ruhiira, Uganda	Millennium Villages Project

ORAL PRESENTATIONS (selected)

- Russo, T. A. New agricultural procurement and subsidy programs to sustain food security in India. Food Security and Sustainable Supply Chains, Center for the Economic Analysis of Risk (CEAR), Robinson College of Business, Georgia State University, Atlanta, GA, 2016. (*Invited*)
- Russo, T. A., A. T. Fisher, B. Lockwood, and P. C. Larrauri. MAR site suitability using GIS and modeling: Case studies in coastal California, US and Guanajuato, Mexico. 9th International Symposium on Managed Aquifer Recharge, Mexico City, Mexico, 2016.
- Russo, T. A. Groundwater levels, extraction, and climate connections in the United States. Pennsylvania Groundwater Symposium, State College, PA, 2016. (*Invited*)
- Russo, T. A. Extended Learning Session: Agricultural management practices and impacts on groundwater, National Groundwater Association Summit, Denver, CO, 2016. (*Invited*)
- Session Organizer, 16th National Conference and Global Forum on Science, Policy and the Environment: The Food-Energy-Water Nexus, National Council for Science and the Environment, Washington D. C., 2016.
- Russo, T. A. Desarrollo Agrícola e hidrología en Vichada: Precauciones, Monitoreamiento, y Proyecciones (Agricultural development and hydrology in Vichada: Lessons, monitoring,

- and projections). Vichada Department of Agriculture Conference, Puerto Carreño, Colombia, 2015 (*Invited*).
- Russo, T. A. Is recharge the right metric for sustainable groundwater use?" Department of Geosciences Chill and Spill, State College, PA, 2015 (*Invited*).
- Russo, T. A. Groundwater levels, extraction, and climate connections in Punjab, India and the United States. School of Engineering, University of Guelph, Canada, 2014. (*Invited*)
- Russo, T. A. Groundwater Depletion in the United States: Mapping, Modeling, and Restoration. Penn State Department of Geography Seminar, PA, 2014. (*Invited*)
- Russo, T. A., A. T. Fisher, and B. S. Lockwood. Assessment of managed aquifer recharge site suitability using a GIS and modeling. 14th Biennial Symposium on Managed Aquifer Recharge, 2014. (Presented by Andrew Fisher).
- Tully, K. L., T. A. Russo, J. E. Hickman, C. A. Palm. The effects of African Green Revolution on nitrogen losses from two contrasting soil types in sub-Saharan Africa. American Geophysical Union Fall Meeting, 2013. (Presented on behalf of Katherine Tully)
- Tully, K. L., T. A. Russo, J. E. Hickman, C. A. Palm. The effects of African Green Revolution on nitrogen losses from two contrasting soil types in sub-Saharan Africa. Ecological Society of America Annual Meeting, 2013.
- Russo, T. A. Pt 1. Regional changes in extreme precipitation and Pt 2. Climate data in hydrologic models. Punjab Agricultural University, Ludhiana, India, 2013.
- Russo, T. A., A. T. Fisher, D. M. Winslow. Observations Indicate Regional and Local Increases in Storm Intensity in the San Francisco Bay Area, USA, Between 1890 and 2010. GC11E-05, American Geophysical Union Fall Meeting, 2012.
- Russo, T. A., A. T. Fisher and B. Lockwood. Spatial analysis of suitability for managed aquifer recharge in a groundwater basin in Central coastal California. California Groundwater Association Annual Meeting, Sacramento, CA, 2011.
- Russo, T. A., A. T. Fisher, M. Los Huertos, N. Jacuzzi. Suitability for managed aquifer recharge (MAR) projects within the Pajaro Valley: Update on GIS analysis and percolation evaluation for MAR potential. Pajaro Valley Community Water Meeting, Watsonville, CA, 2011.
- Russo, T. A., A. T. Fisher., and N. Finnegan. Stream channel surface water – groundwater interactions in a fire impacted watershed. Scott Creek Research Symposium, CA, 2010.
- Russo, T. A., A. T. Fisher, and N. Finnegan. Monitoring the impact of fire on stream channel exchange processes and geomorphology. University of California, Santa Cruz, Graduate Research Symposium, 2010.
- Russo, T. A., A. T. Fisher and J. Roche. Development and maintenance of wetland conditions in association with controlled flooding on the Tuolumne River. Upper Tuolumne River Ecosystem Workshop, CA, 2009.
- Russo, T. A., A. T. Fisher and J. Roche. Development and maintenance of wetland conditions in association with controlled flooding on the Tuolumne River. Yosemite Hydroclimatology Conference, CA, 2009.

POSTER PRESENTATIONS (Selected)

- Russo, T. A., K. Alfredo, and J. Fisher. Sustainable water management in domestic, agricultural and natural systems. American Water Works Association, Sustainable Water Management Conference, 2015.
- Russo, T. A. and U. Lall. Irrigation, Climate, and Groundwater Depletion in Agricultural Regions of the US. GC21B-0531, American Geophysical Union Fall Meeting, 2014.
- Russo, T. A. and U. Lall. Groundwater trends, use, and climate connections in the US. National Science Foundation, Water Sustainability and Climate meeting, 2014.
- Russo, T.A., N. Devineni, U. Lall. Assessment of agricultural water management in Punjab, India using Bayesian methods. H31C-1182, American Geophysical Union Fall Meeting, 2013.
- Russo, T.A., D. Winslow and A.T. Fisher. Extreme precipitation events increasing in the San Francisco Bay Area, CA, USA between 1890 and 2010. EGU2012-964, European Geosciences Union General Assembly, 2012.
- Mankoff, K. D. and T.A. Russo. The Kinect as a low cost high resolution small scale LiDAR for water surface and shallow subsurface measurements. European Geosciences Union General Assembly, 2012.
- Russo, T. A., A. T. Fisher, R. T. Hanson, and B. Lockwood. Spatial analysis of suitability for managed aquifer recharge in a groundwater basin in central coastal California. H13E-1259, American Geophysical Union Fall Meeting, 2011.
- Mankoff, K. D., T. A. Russo, B. K. Norris, S. Hossainzadeh, L. H. Beem, J. I. Walter, and S. M. Tulaczyk. Kinects as sensors in earth science: glaciological, geomorphological, and hydrological applications. American Geophysical Union, Fall Meeting, 2011.
- Russo, T. A. and A. T. Fisher. Managed aquifer recharge project suitability in the Pajaro Valley: Future impact on aquifer overdraft and seawater intrusion. University of California, Santa Cruz, Graduate Research Symposium, 2011.
- Russo, T. A. and A. T. Fisher. Stream channel surface water – groundwater interactions in a fire impacted watershed. H41G-1183, American Geophysical Union Fall Meeting, 2010.
- Schmidt, C. M., T. A. Russo, A. T. Fisher, A. J. Racz, C. G. Wheat, M. Los Huertos, B. S. Lockwood. Mitigating agricultural impacts on groundwater using distributed managed aquifer recharge ponds. H53A-0984, American Geophysical Union Fall Meeting, 2010.
- Russo, T. A., A. T. Fisher, and J. Roche. Improving riparian wetland conditions through evaluation of infiltration and drainage behavior during and after a controlled flood event. H53G-1019, American Geophysical Union Fall Meeting, 2009.

PROFESSIONAL AFFILIATIONS

- 2016 International Association of Hydrogeologists
- 2015 National Groundwater Association, Scientists and Engineers Board of Directors
- 2014 National Groundwater Association, Member
- 2014 Association of Women Geoscientists, Member

- 2008 American Geophysical Union, Member
- 2006 LEED Accredited Professional, U.S. Green Building Council
- 2004 Tau Beta Pi, Delta Chapter (National Engineering Honors Society)

TEACHING EXPERIENCE (*actively teaching)

- 2016 Water: Science and Society* Penn State
- 2016 Hydrogeology* Penn State
- 2015 Karst Hydrogeology Penn State
- 2014 Water Systems Analysis, Instructor Columbia University
- 2010 Introduction to Geophysics, Teaching Assistant UCSC
- 2009 Geology of National Parks, Teaching Assistant UCSC
- 2005 Computer Curriculum, Teacher St. Joseph School, Hilo, HI
- 2004 “How things work and what they’re made of”,
Instructor Tufts University

GRADUATE STUDENT ADVISEES

- 2016- Kalle Jahn PhD, Penn State Advisor
- 2016- Callum Wayman PhD, Penn State Advisor
- 2016- Kenneth Roop-Eckart PhD, Penn State Co-Advisor
- 2015- Curtis Kennedy MS, Penn State Advisor
- 2014- Beth Hoagland PhD, Penn State Advisor
- 2014- Jennifer Estrada MS, Penn State Co-Advisor
- 2016 John Dzwonczyk MS, Penn State Committee member
- 2016 Christopher Ahams MS, Penn State Committee member
- 2014 Hui Wen, MS MS, Columbia University Reader
- 2014 Aleena Farishta, MS MS, Columbia University Reader

UNDERGRADUATE THESIS ADVISEES

- Current Patrick Duggan Penn State, Honors College
- Current Cecilia Cullen Penn State
- Current Adam Lewis Penn State
- Current James Delflumeri Penn State
- 2016 Rochelle Linsenbigler Penn State
- 2016 Craig Pezak Penn State
- 2015 Molly Cain Penn State
- 2015 Kenneth Weiss Penn State
- 2013 Kevin Smith Columbia University
- 2013 Tamara Harris Columbia University
- 2013 Rebecca Winter Columbia University
- 2013 Ivan Duschatzky Columbia University
- 2013 Antonia Aglialoro Columbia University

REVIEWS

- Ecological Indicators*
- Hydrologic and Earth System Sciences*
- Journal of Hydrology*
- Journal of Hydrometeorology*
- Water*

Water Resources Management
Water Resources Research
Danish Council for Strategic Research
US National Science Foundation

UNIVERSITY COMMITTEE SERVICE

- 2015-16 Department Chair's Executive Committee
- 2015 Department of Geosciences, Faculty Search Committee
- 2014-16 Graduate Program Committee
- 2014-16 Graduate Admissions Committee

MEDIA AND PUBLIC PRESENTATIONS

- 2016 Documentary on a Nestle water bottling plant in Pennsylvania
- 2015 American Museum of Natural History, New York City, NY
Isaac Asimov Memorial Debate
- 2015 Behind the Science podcast
- 2014 Startalk Radio Show with Neil DeGrasse Tyson, Live: Water
(Taped live at the Beacon Theater, NY)
- 2014 Presenter, Irrigation.org Webinar
- 2014 Scientific American: All the Food, Using Half the Water [Video]
http://www.scientificamerican.com/article/all-the-food-using-half-the-water-video/?&WT.mc_id=SA_BS_20140620
- 2014 Green Sense Podcast: Depletion of the US Groundwater Supply
<http://greensenseshow.com/ways-to-listen/Show.aspx?ShowNum=202>