Trenton E. Franz

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Current Position:
2013- Assistant Professor, School of Natural Resources, University of Nebraska-Lincoln

Education and Professional Experience:
2012-2013- Research Assistant Professor, Hydrology and Water Resources, University of Arizona
2011-2012-Postdoctoral Researcher, Hydrology and Water Resources, University of Arizona
2011- Ph.D. Civil and Environmental Engineering, Princeton University.
2008- M.A. Civil and Environmental Engineering, Princeton University.
2007- M.S. Civil and Environmental Engineering, Princeton University.
2005- M.S. Civil Engineering, University of Wyoming.
2004- B.S. Civil Engineering, University of Wyoming. *cum laude.*

Research Experience:
- Gained extensive experience on ecohydrologic modeling of dryland ecosystems
- Modeling was influenced by the disciplines of hydrology, hydraulics, and savanna ecology
- Worked on a field team to collect novel soil moisture measurements with near surface geophysical instrumentation in tropical dryland ecosystems and around continental US

Grants/Contracts/Awards/Honors/Fellowships:

Grants
"Assessing the long-term water savings of reduced irrigation"
University of Nebraska-Lincoln Grant-in-Aid
$10,000 01/2017 – 12/2017
1.00 person-months per year as a PI

"Observed and modeled quantification of reduced pumping volumes using advanced irrigation technologies in Western Nebraska"
Daugherty Water for Food Graduate Student Research Grant
$49,500 07/2016 – 06/2019
0.50 person-months per year as a PI

"IUSE: Fostering Undergraduate Students' Disciplinary Learning and Water Literacy"
National Science Foundation (NSF)
$299,018
08/2016-07/2019
0.33 person-months per year as CO-PI

"Design of Multi-Scale Soil Moisture Monitoring Networks in Agricultural Systems Using Hydrogeophysics"
United States Geological Survey 104b
$20,000 03/2015-02/2016
0.25 person-months per year as PI

"Can improving predictions of soil oxygen dynamics increase understanding of greenhouse gas hotspots and hot moments?"
National Science Foundation (NSF)
$699,254 03/2015 – 02/2018
0.50 person-months per year as CO-PI

"Long-Term Maize-Based Agro-Ecosystem Core Sites as Part of the AmeriFlux Management Project Network"
University of California Berkeley National Laboratory
$222,000 03/2014-09/2016
0.10 person-months per year as CO-PI

"Pastoralism in Transition: Linking Localized Interactions and System Behavior to Evaluate Social-Ecological Vulnerability"
National Science Foundation (NSF)
$249,525 09/2013 – 08/2015
1.00 person-months per year as a consultant

"Quantifying ecosystem scale soil and plant water dynamics across different biomes"
National Science Foundation (NSF) EPSCoR FIRST Award
$20,000 05/2014 – 04/2015
0.50 person-months per year as a PI

"Improving soil moisture monitoring in agricultural systems using hydrogeophysics"
Daugherty Water for Food Graduate Student Research Grant
$59,945 08/2014 – 07/2016
0.50 person-months per year as a PI

"Advancing the cosmic-ray neutron method for real-time mobile soil moisture mapping"
Department of Defense (DOD), Cold Regions Research and Engineering Laboratory (CRREL)
$50,000 09/2014 – 08/2015
1.00 person-months per year as a PI

Contracts
"Hydrogeophysical mapping and soil hydraulic functions"
Patricio Grassini- University of Nebraska-Lincoln
$10,000 09/2016 – 01/2017

"Hydrogeophysical mapping and soil hydraulic functions"

Valmont Inc.
$5,000 01/2016 – 12/2016

"Hydrogeophysical mapping and soil hydraulic functions"
The Nature Conservancy
$12,000 01/2016 – 12/2016

"Hydrogeophysical mapping and soil hydraulic functions"
The Climate Corporation
$49,000 03/2016 – 03/2017

"Hydrogeophysical mapping and soil hydraulic functions"
Platte River Recovery Project
$25,600 01/2016 – 12/2016

"Hydrogeophysical mapping and soil hydraulic functions"
Platte River Recovery Project
$16,000 01/2015 – 12/2015

"Hydrogeophysical mapping and soil hydraulic functions"
Paulman Farms
$10,000 01/2014 – 12/2014

Scholarships

2010-2011	Princeton University Engineering School, *"Wu Prize for Excellence"*
2009-2010	NSF OISE IRES/DDEP, *"International: The impact of macropores on the spatial and temporal patterns of soil moisture in dryland ecosystems of central Kenya"*
2009- 2009	Walbridge Fund Graduate Award in Energy and Environmental Research *"Quantifying Soil Moisture Patterns at the Spatial Scale of Hillslopes"*
2008	Princeton University Technology for Developing Regions
2007	Princeton University Technology for Developing Regions, travel funds
2005-2006	NCAA post graduate scholarship
2005-2006	National Football Foundation Post Graduate Scholarship. Scholarship is given to 15 seniors for academic, athletic and community service
2004	Finalist for NCAA varsity football "*Draddy Award*," considered to be equivalent to academic Heisman trophy
2004-2005	Alfred N. Pence scholarship
2003-2004	Bruce A. Campbell "Athletic Scholar" scholarship
2002-2003	Ryan Willson, *"Want to"* scholarship
2000-2005	Full scholarship awarded for football

Academic Honors

2015-2020	Technical Collaborator, FAO and IAEA Joint Programme on nuclear methods in agriculture
2015-2017	AGU Hydrogeophysics Technical Committee
2015-2016	Robert B. Daugherty Water for Food Institute Annual Conference Organizer

2015-2016	MOISST Conference Organizer
2014	AGU fall meeting, "Outstanding Student Paper Award, Hydrology Section", awarded to MS Student, Catherine Finkenbiner
2014	Frontiers in Geoscience Colloquia, Los Alamos National Laboratory
2013-2017	Robert B. Daugherty Water for Food Institute Faculty Fellow
2012	August 2012 Cover Article for Water Resources Research
2009	AGU Chapman Conference on Ecochydrology, "Young Professional Invited Speaker"
2009	Graduate student representative for Princeton University, Vice President of Campus Life steering committee
2008	AGU fall meeting, "Outstanding Student Paper Award, Hydrology Section"
2004	1st Team NCAA Varsity Football Academic All-American
2003-2004	Mortar Board, National Honor Society
2002-2004	Tau Beta Pi, Engineering Honor Society
2002-2004	Selected to COSIDA Academic All-Region team, Varsity Football
2001-2004	Selected Academic All-Conference, Varsity Football
2001	Tau Beta Pi "Freshman of the Year" Award
2001	EPSCOR Research Grant studying Fiber Reinforced Polymer concrete members.
2000-2004	Dean's List (5 times), President's List (3 times)

Teaching Experience:

2014-2017	NRES 498/853, Hydrology, SNR, UNL
2013-2016	WATS 281, Introduction to Water Science, SNR, UNL
2012-2013	HWRS 513A, Field Hydrology, HWR Dept., University of Arizona
2009	CEE 205, Solid Mechanics, CEE Dept., Princeton University
2009	CEE 307, Field Ecohydrology, Mpala Research Center, Kenya, CEE Dept., Princeton University

Publications:

Invited Talks:

1. **Franz, T.E.** (2016) "Design of multiscale soil water content monitoring networks", American Geophysical Union, San Francisco, California, December 2016.

2. **Franz, T.E.,** Loecke, T., Burgin, A**.** (2016) "Identification of biogeochemical hot spots using time-lapse hydrogeophysics", American Geophysical Union, San Francisco, California, December 2016.

3. **Franz, T.E**. (2016) "Spatiotemporal monitoring of soil moisture in upland agro-ecosystems using cosmic-ray neutron probes", Vienna, Austria, July 2016.

4. **Franz, T.E**. (2016) "Design of smart environmental monitoring networks in agricultural landscapes", MOISST, Stillwater, OK, May 2016.

5. **Franz, T.E**. (2015) “Design of efficient ground based soil moisture monitoring networks using cosmic-ray neutron probes and space-time data fusion”, MOISST, Stillwater, OK, June 2015.

6. **Franz, T.E.,** Wang, T. (2015) “Spatiotemporal characterization of soil moisture fields in agricultural areas using cosmic-ray neutron probes and data fusion”, European Geophysical Union, Vienna, Austria, April 2015.

7. **Franz, T.E.**, (2015) “Advances in Spatial Soil Water Mapping Using Hyrdogeophysics”, Nebraska Agricultural Technologies Association (NEATA), Grand Island, Nebraska, February 2015.

8. **Franz, T.E.**, (2015) “Investigating ecosystems through a new lens: opportunities and challenges using cosmic-ray neutron detectors”, University of KwaZulu-Natal, Pietermaritzburg, South Africa, January 2015.

9. **Franz, T.E.**, (2015) “Advances in Field Scale Soil Water Monitoring Using Cosmic-ray Neutron Probes”, University of Pretoria, Pretoria, South Africa, January 2015.

10. **Franz, T.E.** (2014) “Investigating ecosystems through a new lens: opportunities and challenges using cosmic-ray neutron detectors”, Los Alamos National Laboratory, Los Alamos, NM, April 2014.

11. **Franz, T.E.** (2013) “A deeper understanding of ecosystems: opportunities in ecohydrology using near surface hydrogeophysics”, NEON, Boulder, CO, October 2013.

12. **Franz, T.E.** (2013) “Quantifying the Cosmic-ray Neutron Probe Support Volume in Heterogeneous Systems”, Rutgers University, Students of Exploration Geophysics, Newark, NJ, September 2013.

13. **Franz, T.E.** (2013) “Understanding soil-water feedbacks between sisal and intercrop spaces”, Iowa Hunger Summit, Des Moines, IA, October 2013.

14. **Franz, T.E.** (2013) “Ecosystem Scale Measurements of Water Using Cosmic-ray Neutrons”, CSIRO Headquarters, Canberra, Australia, May 2013.

15. **Franz, T.E.** (2013) “Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function”, University of Nebraska-Lincoln, April 2013.

16. **Franz, T.E.** (2013) “Ecosystem Scale Measurements of Water Using Cosmic-ray Neutrons”, CUASHI Spring Seminar Series, 29 March 2013.

17. **Franz, T.E.** (2013) “Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function”, Michigan State University, March 2013.

18. **Franz, T.E.** (2013) "Sustainability and Food Security in Drylands: A Case Study of Understanding Green Water Use in Central Kenya", Iowa State University, March 2013.

19. **Franz, T.E.** (2013) "Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function", University of Indiana, January 2013.

20. **Franz, T.E.** (2012) "Using Cosmic-ray Neutrons to Understand Complex Ecosystems", Kutztown University, October 2012.

21. **Franz T.E.**, Zreda M., King E.G. (2012) "Application of cosmic-ray probes to long-term monitoring of soil moisture: A new tool for assessing sustainable agropastoralism in drylands", International Symposium on Managing Soils for Food Security and Climate Change Adaptation and Mitigation, Joint IAEA and FAO Programme, Vienna, Austria, IAEA-CN-191. 23-27 July, 2012.

22. **Franz T.E.**, Rosolem R., Zreda M., Ferre T.P.A., Zweck C., Zeng X., Shuttleworth W.J. (2011) "COSMOS: An in situ soil moisture observational network at intermediate spatial scales". ASA, CSSA, SSSA Annual Meeting, 243-3, San Antonio, Texas.

23. **Franz, T.E.** (2009) "Consequences of Changing Rainfall Patterns and Land use: A case study from the central Kenya highlands". Symposium: The Role of Science and Technology in African Development. Princeton University, Wesley L. Harris Scientific Society.

24. **Franz, T.E.**, Caylor, K.K. (2009) "Prediction of regional woody species distribution patterns in the drylands of the central Kenyan highland", 2009 AGU Chapman Conference, Sun Valley, Idaho.

Journal Publications (advised *postdocs*, *grad* or #undergrads)**:**

1. *Wang, T.*, **T. E. Franz**, J. You, M. D. Shulski, and C. Ray (2016, in review), Evaluating controls of soil properties and climatic conditions on the use of an exponential filter for converting near surface to root zone soil moisture contents, *Journal of Hydrology*.

2. *Gibson, J.*, **T. E. Franz**, *Wang, T.*, J. Gates, P. Grassini, H. Yang, and D. E. Eisenhauer (2016 in review), A case study of field-scale maize irrigation patterns in Western Nebraska: Implications to water managers and recommendations for hyper-resolution land surface modelling, *Hess Discussions*.

3. *Wang, T.*, **T. E. Franz**, R. Li, M. D. Shulski, and C. Ray (2016 In review), Analysis of effects of climate and soil on regional soil moisture spatial variability using EOFs in a semiarid region, *Journal of Hydrology*.

4. *Foolad, F.*, **T. E. Franz**, *Wang, T.*, *J. Gibson*, A. Kilic, R. G. Allen, and A. Suyker (2016 in review), Feasibility analysis of using inverse modeling for estimating field-scale evapotranspiration in maize and soybean fields from soil water content monitoring networks, *Hess Discussions*.

5. *Barker, J. B.*, **T. E. Franz**, D. M. Heeren, C. M. Neale, and J. D. Luck (2016 in review), Soil Water Content Monitoring for Irrigation Management: A Geostatistical Analysis, *Agric. Water Manage.*

6. Gibson, K. E. B., H. Yang, **T. E. Franz**, K. Hanford, D. E. Eisenhauer, J. Gates, P. Nasta, B. S. Farmaha, and P. Grassini (2016 in review), Revealing explanatory factors for variation in irrigation amounts across farmer fields, *Agric. Water Manage.*

7. Lawston, P. M., J. A. Santanello, **T. E. Franz**, and M. Rodell (2016 in review), Assessment of Irrigation Physics in a Land Surface Modeling Framework Using Non-traditional and Human-Practice Datasets, *Hess Discussions*.

8. Peters-Lidard, C., M. Clark, L. Samaniego, N. E. C. Verhoest, T. van Emmerik, R. Uijlenhoet, K. Achieng, and **T. E. Franz** (2016 in review), Scaling, Similarity, and the Fourth Paradigm for Hydrology, *Hess Discussions*.

9. Loecke, T., A. Burgin, *K. Jarecke*, and **T. E. Franz** (2016, in review), Biotic and Abiotic Controls on Soil Oxygen Dynamics at the Aquatic-Terrestrial Interface, *Journal of Geophysical Research - Biogeosciences*.

10. Yue, W. F., *Wang, T.*, **T. E. Franz**, and X. H. Chen (2016), Spatiotemporal patterns of water table fluctuations and evapotranspiration induced by riparian vegetation in a semiarid area, *Water Resources Research*, *52*(3), 1948-1960.

11. Woodbury, B., R. Eigenberg, and **T. E. Franz** (2016), Development of non-collinear arrays for use near wastewater holding ponds, *Journal of Environmental and Engineering Geophysics*.

12. Wonkka, C., D. Twidwell, **T. E. Franz**, C. A. Taylor Jr., and W. E. Rogers (2016), Persistence of a Severe Drought Increases Desertification but not Woody Dieback in Semiarid Savanna, *Rangeland Ecology & Management*, 69, 491-498.

13. *Avery, W.*, *C. Finkenbiner*, T. E. Franz, *T. Wang*, A. L. Nguy-Roberston, A. Suyker, T. Arkebauer, and F. Munoz-Arriola (2016), Incorporation of globally available datasets into the roving cosmic-ray neutron probe method for estimating field-scale soil water content, *HESS*, *20*, 3859-3872.

14. King, E. G., and **T. E. Franz** (2016), Combining ecohydrologic and transition probability-based modeling to simulate vegetation dynamics in a semi-arid rangeland, *Ecol. Model.*, *329*, 41-63.

15. **Franz, T. E.,** A. Wahbi, M. Vreugdenhil, G. Weltin, L. Heng, M. Oismueller, P. Straub, G. Dercon, and D. Desilets (2016), Using Cosmic-ray Neutron Probes to Monitor Landscape Scale Soil Water Content in Mixed Land Use Agricultural Systems, *Applied and Environmental Soil Science*, *In Press*.

16. *Wang, T.*, **T. E. Franz**, W. F. Yue, J. Szilagyi, V. A. Zlotnik, J. S. You, X. H. Chen, M. D. Shulski, and A. Young (2016), Feasibility analysis of using inverse modeling for estimating natural groundwater recharge from a large-scale soil moisture monitoring network, *Journal of Hydrology*, *533*, 250-265.

17. Schreiner-McGraw, A. P., E. R. Vivoni, G. Mascaro, and **T. E. Franz** (2016), Closing the Water Balance with Cosmic-ray Soil Moisture Measurements and Assessing Their Spatial Variability within Two Semiarid Watersheds, *HESS*, *20*, 329-345.

18. Woodbury, B., R. Eigenberg, and **T. E. Franz** (2015), Resistivity Arrays as an Early Warning System for Monitoring Runoff Holding Ponds, *Journal of Environmental and Engineering Geophysics*, *20*(4), 319-335.

19. *Wang, T.*, D. A. Wedin, **T. E. Franz**, and J. Hiller (2015), Effect of vegetation on the temporal stability of soil moisture in grass-stabilized semi-arid sand dunes, *Journal of Hydrology*, *521*.

20. *Wang, T.*, **T. E. Franz**, V. A. Zlotnik, J. You, and M. D. Shulski (2015), Investigating soil controls on soil moisture spatial variability: Numerical simulations and field observations, *Journal of Hydrology*, *524*, 576-586.

21. *Wang, T.*, **T. E. Franz**, and V. A. Zlotnik (2015), Controls of soil hydraulic characteristics on modeling groundwater recharge under different climatic conditions, *Journal of Hydrology*, *521*.

22. *Wang, T.*, and **T. E. Franz** (2015), Field Observations of Regional Controls of Soil Hydraulic Properties on Soil Moisture Spatial Variability in Different Climate Zones, *Vadose Zone Journal*.

23. **Franz, T. E.**, *Wang, T.*, *W. Avery*, #C. Finkenbiner, and L. Brocca (2015), Combined analysis of soil moisture measurements from roving and fixed cosmic ray neutron probes for multiscale real-time monitoring, *Geophysical Research Letters*, *42*.

24. Rosolem, R., T. Hoar, A. Arellano, J. L. Anderson, W. J. Shuttleworth, X. Zeng, and **T. E. Franz** (2014), Translating aboveground cosmic-ray neutron intensity to high-frequency soil moisture profiles at sub-kilometer scale, *Hydrology and Earth System Sciences*, *18*(11), 4363-4379.

25. Ling, L., **T. E. Franz**, D. A. Robinson, and S. B. Jones (2014), Measured and Modeled Soil Moisture Compared with Cosmic-Ray Neutron Probe Estimates in a Mixed Forest, *Vadose Zone Journal*, *13*(12).

26. Stillman, S., J. Ninneman, X. B. Zeng, **T. E. Franz**, R. L. Scott, W. J. Shuttleworth, and K. Cummins (2014), Summer Soil Moisture Spatiotemporal Variability in Southeastern Arizona, *J. Hydrometeorol.*, *15*(4), 1473-1485.

27. Almeida, A. C., R. Dutta, **T. E. Franz**, A. Terhorst, P. J. Smethurst, C. Baillie, and D. Worledge (2014), Combining Cosmic-Ray Neutron and Capacitance Sensors and Fuzzy Inference to Spatially Quantify Soil Moisture Distribution, *Ieee Sensors Journal*, *14*(10), 3465-3472.

28. McJannet, D., **T. E. Franz**, A. Hawdon, D. Boadle, B. Baker, A. Almeida, R. Silberstein, T. Lambert, and D. Desilets (2014), Field testing of the universal calibration function for determination of soil moisture with cosmic-ray neutrons, *Water Resources Research*, *50*(6), 5235-5248.

29. **Franz, T. E.**, M. Zreda, P. A. Ferre, and R. Rosolem (2013) "An assessment of the effect of horizontal soil moisture heterogeneity on the area-average measurement of cosmic-ray neutrons", Water Resources Research, *49*(10).

30. Rosolem, R., W. J. Shuttleworth, M. Zreda, **T. E. Franz**, X. Zeng, and S. A. Kurc (2013) "The Effect of Atmospheric Water Vapor on the Cosmic-ray Soil Moisture Signal", Journal of Hydrometeorology.

31. **Franz, T. E.**, M. Zreda, R. Rosolem, B. Hornbuckle, S. Irvin, H. Adams, T. Kolb, C. Zweck, and W. J. Shuttleworth (2013) "Ecosystem scale measurements of biomass water using cosmic-ray neutrons", Geophysical Research Letters, 40, 3929-3933.

32. Shuttleworth, W. J., R. Rosolem, M. Zreda, and **T. E. Franz** (2013) "The COsmic-ray Soil Moisture Interaction Code (COSMIC) for use in data assimilation", Hydrology and Earth System Sciences, 17, 3205-3217.

33. **Franz, T. E**., Zreda M., King, E.G. (2013) "Application of Cosmic-ray Neutron Probes to Long-term Monitoring of Soil Moisture in African Drylands". Joint IAEA and FAO Programme Conference Proceedings, Vienna, Austria, IAEA-CN-191. 23-27 July, 2012.

34. **Franz, T. E.**, M. Zreda, R. Rosolem, and T.P.A. Ferre (2013) "A universal calibration function for determination of soil moisture with cosmic-ray neutrons". Hydrology and Earth System Sciences, 17: 453-460.

35. Zreda, M., W. J. Shuttleworth, X. Xeng, C. Zweck, D. Desilets, **T. E. Franz**, R. Rosolem, and P. A. Ferre. (2012) "COSMOS: The COsmic-ray Soil Moisture Observing System". Hydrology and Earth System Sciences 16: 4079-4099.

36. **Franz T.E.**, Zreda M., Rosolem R., Ferre T.P.A (2012) "Field validation of cosmic-ray soil moisture probe using a distributed sensor network" Vadose Zone Journal, 11:4.

37. **Franz T.E.**, Zreda M., Ferre T.P.A., Rosolem R., Zweck C., Stillman S., Zeng X., Shuttleworth W.J. (2012) "Measurement depth of the cosmic-ray soil moisture probe affected by hydrogen from various sources" Water Resources Research, 48. **Cover Article**.

38. Miller, G. R., Cable J.M., McDonald A.K., Bond B., **Franz T.E.**, Wang L.X., Gou S., Tyler A.P., Zou C.B., and Scott R.L. (2012) "Understanding ecohydrological connectivity in savannas: a system dynamics modelling approach" Ecohydrology 5:2: 200-220.

39. Wang, L. X., Zou C., O'Donnell F., Good S., **Franz T.E.**, Miller G.R., Caylor K.K., Cable J.M., and Bond B. (2012) "Characterizing ecohydrological and biogeochemical connectivity across multiple scales: a new conceptual framework" Ecohydrology 5:2: 221-233.

40. **Franz, T. E.,** Caylor, K. K., King E. G., Nordbotten, J. M., Rodriguez-Iturbe, R. I., and Celia, M. A. (2012) "An Ecohydrological Approach to Predicting Hillslope Scale Vegetation Patterns in Dryland Ecosystems," Water Resources Research, Vol. 48, Published 18 January 2012.

41**. Franz, T. E.,** King, E. G., Caylor, K. K., and Robinson, D. A. (2011) "Coupling Vegetation Patterns to Soil Resource Heterogeneity in a Central Kenyan Dryland Using Geophysical Imagery," Water Resources Research, Vol. 47, Published 31 July 2011.

42. King, E. G., **Franz, T. E.,** and Caylor, K. K. (2011) "Ecohydrological Interactions in a Degraded Two-phase Mosaic Dryland: Implications for Regime Shifts, Resilience, and Restoration," Ecohydrology, Published online. DOI: 10.1002/eco.260.

43. **Franz, T.E.,** Nolan, J., Nordbotten, J.M., Caylor, K.K., Slater, L.D. (2011) "Quantifying Lateral Subsurface Transient Soil Moisture Dynamics Using Multi-Point Direct-Current Resistivity in Homogeneous Sand," Vadose Zone Journal, Vol. 10, pp. 286-298.

44. **Franz, T.E.**, Caylor, K.K., Nordbotten, J.M., Rodriguez-Iturbe, I., Celia, M.A. (2010) "An Ecohydrological Approach to Predicting Regional Woody Species Distribution Patterns in Dryland Ecosystems," Advances in Water Resources, Vol. 33, pp. 215-230.

Theses:

1. Characterizing Dryland Surface Hydrological Dynamics Using Ecohydrological Modeling and Geophysical Observations. Ph.D. Dissertation. *Department of Civil and Environmental Engineering Princeton University*, pp. 237, 2011.

2. Ecohydrology of the Upper Ewaso River Basin, Kenya. Master's Thesis. *Department of Civil and Environmental Engineering Princeton University*, pp. 143, 2007.

3. A Water Budget Analysis for Predicting Return Flow on the Bear River in Wyoming and Utah. Master's Thesis. *Department of Civil and Engineering University of Wyoming,* pp. 73**,** 2005.

Work/ Field Experience:

Mar.-Oct. 2016	Installed 10 cosmic ray probes around Nebraska and oversaw rover surveys

Mar.-Oct. 2011	Installed 35 cosmic ray probes around continental US for national observing network (http://cosmos.hwr.arizona.edu/)
Jul.-Aug. 2009	Kenya- Six week field campaign for data collection with geophysical instrumentation
Apr.-May 2009	Kenya- Seven week field campaign for data collection with geophysical instrumentation
Jan.-Mar. 2009	Laboratory study on measuring soil moisture patterns from mass infiltration events with electrical resistivity
Apr.-May 2008	Kenya- Four week field campaign for data collection and maintenance
Jul.-Aug. 2007	Kenya - Six week field campaign to collect instrument data and independent validation
Jan.-Feb. 2007	Kenya - Four week field campaign setting up ecohydrology field experiments
Jul. 2006	Kenya - Two week reconnaissance field campaign
2003-2004	Intern for two summers at Lidstone and Associates, an engineering and geology consulting firm in Fort Collins, CO

Technical Skills:

- ArcGIS
- MATLAB programming
- C programming
- MCNPx neutron particle modeling for cosmic ray probes
- Various field instrumentation and Campbell Scientific dataloggers
- Geophysical instrumentation, electromagnetic induction, electrical resistivity, cosmic ray neutron probes
- Surveying equipment

Extracurricular Activities:

2010-2016	Reviewed manuscripts from: Water Resources Research, Ecohydrology, Agricultural and Forest Meteorology, Soil Science Society of America Journal, Journal of Geophysical Research – Biogeosciences, Transport in Porous Media, Vadose Zone Journal, Hydrology and Earth System Sciences
2011, 2014-6	Co-chaired a session at the fall American Geophysical Union annual meeting
2007-2010	Community Associate for Princeton Graduate School. Organize two graduate school events a month with $1,000 budget annually
2007-2009	Crew member for Princeton Graduate School "reunions"
2000-2012	Member of the Professional Disc Golf Association and played in many tournaments around the country as a semi-professional disc golfer
2005-2010	Bucks County Disc Golf Alliance board member. Monthly meetings and participation in Pennsylvania state park cleanups and park service projects
2008	Selected to display photographs in a School of Engineering and Applied Science Art Show
2008	Selected to participate in a School of Engineering and Applied Science film festival based on field video diaries collected during the 2008 field campaign to Kenya

2004	Help lead the University of Wyoming to its first football bowl appearance in 11 years and first bowl victory in 38 years
2004	Finalist for "Draddy Award", also known as the Academic Heisman
2004	Captain of the Varsity Football Team
2004	Outland Trophy "Preseason Watch List". Watch list composed of Nation's top 57 interior offensive and defensive linemen
2004	All Mountain West Conference, Varsity Football, 1st Team
2002-2003	All-Conference Honorable Mention for Varsity Football
2001-2004	Letter for Varsity Football, started 43 consecutive games

Advised/Mentored Students:

Undergraduate:

2012: Adam Karczynski, "COSMOS neutron data and hydraulic conductivity determination", University of Arizona, Senior Capstone Project, Dept. of Hydrology and Water Resources, Mentored. Won Eugene S. Simpson best undergraduate poster at El Dia del Agua, March 28, 2012.
2013: William Avery, University of Nebraska-Lincoln, UCARE program.
2013-2014: Catie Finkenbiner, University of Nebraska-Lincoln, UCARE program.
2015: Matthew Russell, University of Nebraska-Lincoln. Mentored.
2016: Matthew Russell, University of Nebraska-Lincoln. UCARE.
2016: Autumn Dunn, University of Nebraska-Lincoln. UCARE.

Graduate:

2011-2013: Adam Karczynski, University of Arizona, Dept. of Hydrology and Water Resources, MS, Mentored.
2013: Bobby Chrisman, University of Arizona, Dept. of Hydrology and Water Resources, MS, Mentored/Thesis Committee Member.
2013: Samantha Irvin, Iowa State University, Agronomy: Crop, Soil, and Environmental Sciences, MS, Thesis Committee Member.
2014-2016: William Avery, University of Nebraska-Lincoln, School of Natural Resource, MS Primary Advisor.
2014: Karla Jarecke, University of Nebraska-Lincoln, School of Natural Resource, MS Thesis Committee Member.
2014: Nathan Rossman, University of Nebraska-Lincoln, Earth and Atmospheric Sciences, PhD Thesis Committee Member.
2014-2017: Foad Foolad, University of Nebraska-Lincoln, Civil Engineering, PhD Primary Advisor.
2015-2017: Xiaochen Dong, University of Nebraska-Lincoln, School of Natural Resource, MS Primary Advisor.
2015-2017: Catherine Finkenbiner, University of Nebraska-Lincoln, School of Natural Resource, MS Primary Advisor.
2016: Katherine Smith, University of Nebraska-Lincoln, Biological Systems Engineering, MS Thesis Committee Member.
2015-2017: Burdette Barker, University of Nebraska-Lincoln, Biological Systems Engineering, PhD Thesis Committee Member.

2016-2019: Justin Gibson, University of Nebraska-Lincoln, School of Natural Resource, PhD Primary Advisor.
2016-2017: Mahesh Pun, University of Nebraska-Lincoln, Civil Engineering, PhD Co-Advisor.

Postdoctoral:
2014-2016: Tiejun Wang, University of Nebraska-Lincoln, School of Natural Resource, Postdoctoral Primary Advisor.