

Long-Form Curriculum Vitae for:

Trenton E. Franz

Updated 7/18/2017

School of Natural Resources
University of Nebraska-Lincoln
3310 Holdrege St.
Lincoln, NE 68583-0996

Office: 303 Hardin
Email: tfranz2@unl.edu
Phone: (402) 472-8718

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:

Summary Grants/Contracts:

	Applied	Awarded to Date (as of 7/18/17)	Pending (as of 7/18/17)
Internal	\$139,441.48	\$139,441.48	\$-
State	\$4,686,482.00	\$-	\$-
Federal	\$13,336,584.00	\$1,994,595.00	\$598,448.00
Contracts	\$-	\$174,600.00	\$-
Total	\$18,162,507.48	\$2,308,636.48	\$598,448.00

Awarded Grants

Year	Title	Role	Source	Source (0 internal, 1 State, 2 Federal)	Amount
2017-2018	Assessing the long-term water savings of reduced irrigation pumping in western	PI	UNL	0	\$10,000
2017-2018	Improving Soil Sampling Methodologies for the Evaluation of Spatial and Temporal Dynamics of Soil Microbial Communities in Managed Agroecosystems	CO-PI	UNL	0	\$9,996
2016-2020	Long-Term Maize-Based Agro-Ecosystem Core Sites as Part of the AmeriFlux Management Project Network	CO-PI	UCB National Lab	2	\$656,798
2016-2019	Observed and modeled quantification of reduced pumping volumes using advanced irrigation technologies in Western Nebraska	PI	UNL	0	\$49,500
2016-2019	IUSE: Fostering Undergraduate Students Disciplinary Learning and Water Literacy	CO-PI	NSF	2	\$299,018
2015-2018	Can Improving Predictions of Soil Oxygen Dynamics Increase Understanding of Greenhouse Gas Hotspots and Hot Moments	CO-PI	NSF	2	\$699,254
2015-2016	Improving Soil Moisture Monitoring in Agricultural Systems using Hydrogeophysics	PI	UNL	0	\$10,000
2015-2016	Design of Multi-Scale Soil Moisture Monitoring Networks in Agricultural Systems Using Hydrogeophysics	PI	USGS	2	\$20,000
2014-2016	Improving soil moisture monitoring in agricultural systems using hydrogeophysics	PI	UNL	0	\$59,945
2014-2015	Advancing the Cosmic-Ray Neutron Method for Real-Time Mobile Soil Moisture Mapping	PI	DOD	2	\$50,000

2014-2015	FIRST: Quantifying ecosystem scale soil and plant water dynamics across different biomes	PI	NSF EPSCoR	2	\$20,000
2013-2015	Pastoralism in Transition: Linking Localized Interactions and System Behavior to Evaluate Social-Ecological Vulnerability	Consultant	NSF	2	\$249,525

Grants Under Review or Unfunded

Year	Title	Role	Source	Source (0 internal, 1 State, 2 Federal)	Amount
2018-2021 (pending)	INFEWS/T1: Assessing sustainability and adaptation benefits for irrigation for U.S. food and biofuel production under climate change	PI	NSF	2	\$98,448.00
2018-2020 (pending)	Integration of remote sensing and hydrological models for real-time monitoring and forecasting of crop irrigation requirement and water resource management in Western Nebraska	PI	USDA AFRI	2	\$500,000.00
2017-2019	Western Nebraska Irrigation Project	PI	NE Env. Trust	1	\$67,917
2016-2021	Irrigation Water Management Technology Evaluation and Education Project	CO-PI	NE WSF	1	\$3,764,871
2016-2021	LTREB: Grassland Ecohydrology, Resilience, and the Stability of Semi-Arid Dunes	CO-PI	NSF	2	\$444,498

2016-2019	Water Information for Nebraska: A Statewide Infrastructure for Water Information and Education	CO-PI	NE Env. Trust	1	\$253,694
2016-2019	Can the cosmic-ray rover make SMAP soil moisture data more relevant for agriculture?	PI	NASA	2	\$271,844
2016-2019	CNH-L: Water as the key to the coupled human and environmental dynamics of Lake Turkana, the worlds largest permanent desert lake	CO-PI	NSF	2	\$271,329
2016-2019	Integration of remote sensing and hydrological models for real-time monitoring and forecasting of crop irrigation requirement and water resource management in Western Nebraska	PI	NASA	2	\$502,305
2016-2019	Operational streamflow forecasts for irrigation districts in the US Great Plains using SMAP soil moisture retrievals	PI	NASA	2	\$363,848
2016-2019	The use of high-resolution modeling and uncertainty quantification (UQ) to derive specific end-user products for monitoring agricultural drought and the stability of local food supplies in the Greater Horn of Africa (GHA) region and elsewhere	CO-PI	NASA	2	\$356,459
2016-2018	Improving soil moisture monitoring in agricultural systems using hydrogeophysics	PI	USDA AFRI	2	\$499,908

2016-2017	Large scale mapping of soil moisture with a cosmic-ray neutron probe rover in an agricultural domain	PI	NASA	2	\$60,471
2015-2020	LTREB: Grassland Resilience, Ecohydrology and the Stability of Semi-Arid Dunes	CO-PI	NSF	2	\$446,417
2015-2019	Climate extremes, the role of risk management activities, and water sustainability wedges	CO-PI	USDA NIFA	2	\$1,780,440
2015-2019	Integrating crop modelling and remote sensing to improve the management of agroecosystem services	CO-PI	USDA NIFA	2	\$499,916
2015-2018	CNH-L: Implication of dams, development, and climate change for the ecosystem, land use and on human livelihoods in the Lake Turkana watershed	CO-PI	NSF	2	\$211,373
2015-2018	Irrigation Enhanced Farming Systems in Ethiopia	CO-PI	USAID	2	\$499,991
2015-2018	Transcending Heterogeneity: Towards Improved Soil Moisture Scaling Laws	PI	NSF	2	\$573,727
2014-2018	Improving soil moisture monitoring in agricultural systems using hydrogeophysics	PI	USDA AFRI	2	\$499,918

2014-2018	Transcending Heterogeneity: Towards Improved Soil Moisture Scaling Laws	PI	NSF	2	\$509,430
2014-2018	WSC-Category 3: Central Great Plains' Sustainability of Water and Agricultural Resources in a Climate Context: Developing Baselines and Understanding Uncertainties	CO-PI	NSF	2	\$2,500,000
2014-2017	WSC-Category 2: Water at the Crossroads: Social-ecological system dynamics of Turkana, the largest desert lake, in the face of dams, development and climate change	CO-PI	NSF	2	\$451,667
2014-2016	Integrated assessment of cover crops in corn-soybean systems across Nebraska	CO-PI	NE Corn Board	1	\$600,000

Awarded Contracts

Year	Funding Agency	Amount
2017 – 2019	The Nature Conservancy	\$40,000
2017 – 2018	Valmont Inc.	\$7,000
2016 – 2017	Patricio Grassini- University of Nebraska-Lincoln	\$10,000
2016 – 2017	Valmont Inc.	\$5,000
2016 – 2017	The Nature Conservancy	\$12,000
2016 – 2017	The Climate Corporation	\$49,000
2016 – 2017	Platte River Recovery Project	\$25,600
2015-2016	Platte River Recovery Project	\$16,000
2014-2015	Paulman Farms	\$10,000

Scholarships

2010-2011	Princeton University Engineering School, “ <i>Wu Prize for Excellence</i> ”
2009-2010	NSF OISE IRES/DDEP, “ <i>International: The impact of macropores on the spatial and temporal patterns of soil moisture in dryland ecosystems of central Kenya</i> ”
2009- 2009	Walbridge Fund Graduate Award in Energy and Environmental Research “ <i>Quantifying Soil Moisture Patterns at the Spatial Scale of Hillslopes</i> ”
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

2017- UN Expert Mission to Austria (1 weeks), FAO and IAEA Joint Programme on nuclear methods in agriculture
 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
 2015-2017 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 Ecohydrology, “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:

2017 Cosmic Ray Neutron Method, Vienna, Austria, FAO/IAEA
 2017 SCIL 109, Water and Society, CASNR, UNL
 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:

28. **Franz, T.E.** (2017) “Recent advances in the cosmic-ray neutron probe method: estimating soil water content across spatiotemporal scales”, Soil Science Society of America 2017, Tampa, FL, October 2017.

27. **Franz, T.E.**, Loecke, T., Burgin, A. (2017) “Improved monitoring strategies for understanding greenhouse gas emissions from variable saturated landscapes”, HydroEco 2017, Birmingham, United Kingdom, June 2017.

26. **Franz, T.E.** (2017) “Estimates of soil properties using a cosmic-ray neutron rover”, MOISST, Stillwater, OK, May 2017.

25. **Franz, T.E.** (2017) “Cosmic-ray neutron probes? Advances in soil and plant water monitoring”, Napa Valley Grape Growers, UC Davis Extension, Napa, CA, April 2017.

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

23. **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.

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

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

20. **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.

19. **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.

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

17. **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.
16. **Franz, T.E.**, (2015) “Advances in Field Scale Soil Water Monitoring Using Cosmic-ray Neutron Probes”, University of Pretoria, Pretoria, South Africa, January 2015.
15. **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.
14. **Franz, T.E.** (2013) “A deeper understanding of ecosystems: opportunities in ecohydrology using near surface hydrogeophysics”, NEON, Boulder, CO, October 2013.
13. **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.
12. **Franz, T.E.** (2013) “Understanding soil-water feedbacks between sisal and intercrop spaces”, Iowa Hunger Summit, Des Moines, IA, October 2013.
11. **Franz, T.E.** (2013) “Ecosystem Scale Measurements of Water Using Cosmic-ray Neutrons”, CSIRO Headquarters, Canberra, Australia, May 2013.
10. **Franz, T.E.** (2013) “Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function”, University of Nebraska-Lincoln, April 2013.
9. **Franz, T.E.** (2013) “Ecosystem Scale Measurements of Water Using Cosmic-ray Neutrons”, CUASHI Spring Seminar Series, 29 March 2013.
8. **Franz, T.E.** (2013) “Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function”, Michigan State University, March 2013.
7. **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.
6. **Franz, T.E.** (2013) “Using Near Surface Geophysics to Help Understand Ecosystem Structure and Function”, University of Indiana, January 2013.
5. **Franz, T.E.** (2012) “Using Cosmic-ray Neutrons to Understand Complex Ecosystems”, Kutztown University, October 2012.
4. **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.

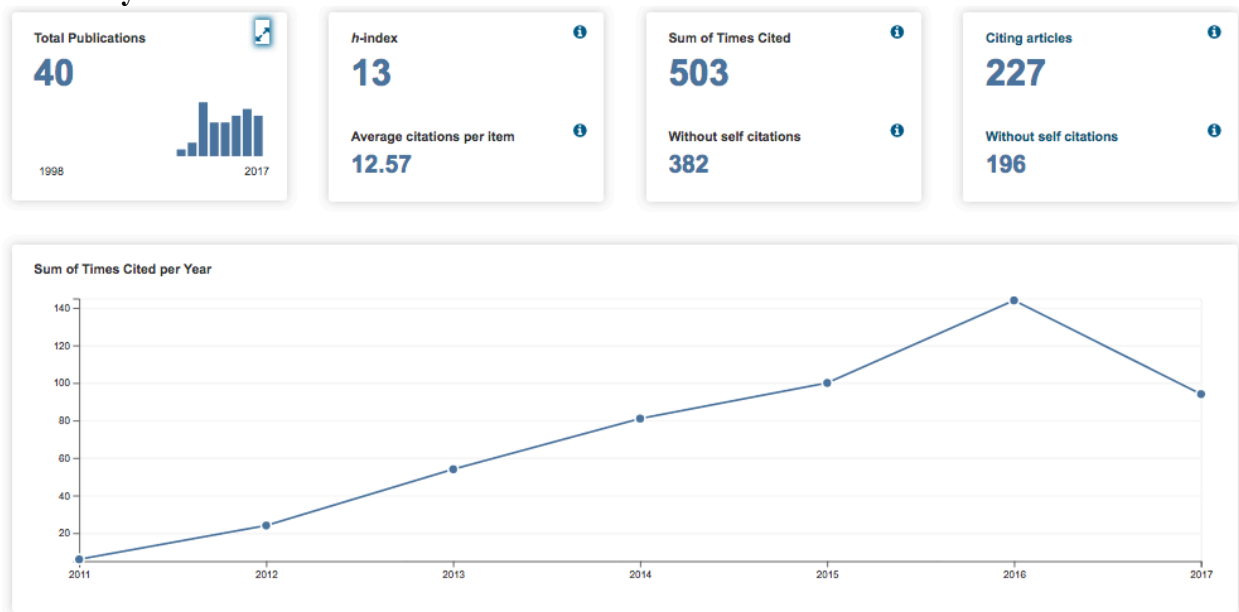
3. **Franz T.E.**, Rosolem R., Zreda M., Ferre T.P.A., Zweck C., Zeng X., Shuttleworth W.J. (2011) “COSMOS: An in situ soil moisture observational network at intermediate spatial scales”. ASA, CSSA, SSSA Annual Meeting, 243-3, San Antonio, Texas.

2. **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.

1. **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.

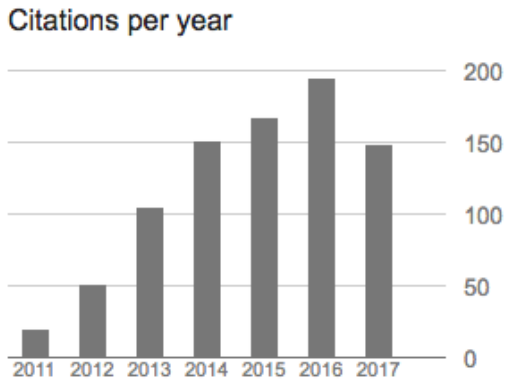
Peer-Reviewed Journal Publications (advised *postdocs*, *grad* or #undergrads):

Summary



Web of Science “TE Franz” citation summary as of 7/18/17.

Citation indices	All	Since 2012
Citations	838	814
h-index	16	16
i10-index	25	25



Google scholar “TE Franz” citation summary as of 7/18/17.

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

46. Wang, T., Q. Liu, **T. E. Franz**, R. Li, and Y. Lang, C.A. Fiebrich (2017 In Press), Spatial patterns of soil moisture from two regional monitoring networks in the United States, *Journal of Hydrology*. [5 year Impact Factor (IF) = 4.043; Web of Science (WoS) citations = 0]

45. Adams, H., M. Zeppel, W. Anderegg, H. Hartmann, S. Landhausser, T. D., T. E. Huxman, P. Hudson, **T. E. Franz**, C. D. Allen, L. Anderegg, G. Barron-Gafford, D. Beerling, D. D. Breshears, T. Brodrigg, H. Bugmann, R. Cobb, A. Collins, L. Dickman, H. Duan, B. Ewers, L. Galiano, D. Galvez, N. Garcia-Forner, M. Gaylord, M. Germino, A. Gessler, U. Hacke, R. Hakamada, A. Hector, M. Jenkins, J. Kane, T. Kolb, D. Law, J. Lewis, J. Limousin, D. Love, A. K. Macalady, J. Martinez-Vilalta, M. Mencuccini, P. Mitchell, J. Muss, M. O'Brien, O. G. A., R. Pangle, E. Pinkard, F. Piper, J. Plaut, W. T. Pockman, J. Quirk, K. Reinhardt, F. Ripullone, M. Ryan, A. Sala, S. Sevanto, J. Sperry, R. Vargas, M. Vennetier, D. Way, C. Xu, E. A. Yezpez, and N. McDowell (2017 in press), A multi-species synthesis of physiological mechanisms in drought-induced tree mortality, *Nature Ecology & Evolution*. [IF = Not Available; WoS citations = 0]

44. Andreasen, M., K. H. Jensen, D. Desilets, T. E. Franz, M. Zreda, H. Bogena, and M. C. Looms (2017 in press), Status and perspectives of the cosmic-ray neutron method for soil moisture estimation and other environmental science applications, *Vadose Zone Journal*. [IF= 2.426; WoS citations = 0]

43. McCabe, M. F., M. Rodell, D. E. Alsdorf, D. G. Miralles, R. Uijlenhoet, W. Wagner, A. Lucieer, R. Houborg, N. Verhoest, **T. E. Franz**, J. Shi, H. Gao, and E. F. Wood (2017 in press), The Future of Earth Observation in Hydrology, *HESS*. [IF= 5.064; WoS citations = 0]

42. Peters-Lidard, C., M. Clark, L. Samaniego, N. E. C. Verhoest, T. van Emmerik, R. Uijlenhoet, K. Achieng, **T. E. Franz**, R. Woods (2017 in press), Scaling, Similarity, and the Fourth Paradigm for Hydrology, *HESS*. [IF= 5.064; WoS citations = 0]

41. **Franz, T. E.**, T. Loecke, A. Burgin, Y. Zhou, T. Le, and D. Moscicki (2017), Spatio-temporal predictions of soil properties and states in variably saturated landscapes, *Journal of Geophysical Research – Biogeosciences*, 122. [IF= 3.651; WoS citations = 0]
40. Lawston, P. M., J. A. Santanello, **T. E. Franz**, and M. Rodell (2017), Assessment of Irrigation Physics in a Land Surface Modeling Framework Using Non-traditional and Human-Practice Datasets, *HESS*, 21, 2953-2966. [IF= 5.064; WoS citations = 0]
39. Wang, T., **T. E. Franz**, J. You, M. D. Shulski, and C. Ray (2017), 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*, 548, 683-696. [IF= 4.043; WoS citations = 0]
38. Wang, T., **T. E. Franz**, R. Li, M. D. Shulski, and C. Ray (2017), Evaluating climate and soil effects on regional soil moisture spatial variability using EOFs, *Water Resources Research*, 53, 4022-4035. [IF= 4.703; WoS citations = 0]
37. *Barker, J. B.*, **T. E. Franz**, D. M. Heeren, C. M. Neale, and J. D. Luck (2017), Soil Water Content Monitoring for Irrigation Management: A Geostatistical Analysis, *Agric. Water Manage*, 188, 36-49. [IF= 3.366; WoS citations = 0]
36. *Gibson, J.*, **T. E. Franz**, Wang, T., J. Gates, P. Grassini, H. Yang, and D. E. Eisenhauer (2017), 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*, 21, 1051-1062. [IF= 5.064; WoS citations = 0]
35. *Foolad, F.*, **T. E. Franz**, Wang, T., *J. Gibson*, A. Kilic, R. G. Allen, and A. Suyker (2017), Feasibility analysis of using inverse modeling for estimating field-scale evapotranspiration in maize and soybean fields from soil water content monitoring networks, *HESS*, 21, 1263-1277. [IF= 5.064; WoS citations = 0]
34. 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. [IF= 4.703; WoS citations = 1]
33. 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*. 21, 231-236. [IF= 0.813; WoS citations = 2]
32. 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. [IF= 2.03; WoS citations = 0]
31. *Avery, W.*, *C. Finkenbinder*, **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. [IF= 5.064; WoS citations = 3]
30. 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. [IF= 2.683; WoS citations = 0]
29. **Franz, T. E.**, A. Wahbi, M. Vreugdenhil, G. Weltin, L. Heng, M. Oismueller, P. Strauss, 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*. [IF= NA; WoS citations = 2]
28. 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. [IF= 4.043; WoS citations = 7]
27. Schreiner-McGraw, A. P., E. R. Vivoni, G. Mascaró, 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. [IF= 5.064; WoS citations = 4]
26. 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. [IF= 0.813; WoS citations = 1]
25. 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. [IF= 4.043; WoS citations = 12]
24. 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. [IF= 4.043; WoS citations = 8]
23. 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. [IF= 4.043; WoS citations = 8]
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*. 14 [IF= 2.426; WoS citations = 7]
21. **Franz, T. E.**, Wang, T., W. Avery, #C. Finkenbinder, 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. [IF= 4.579; WoS citations = 13]

20. 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. [IF= 5.064; WoS citations = 14]
19. Lv, 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). [IF= 2.426; WoS citations = 11]
18. 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. [IF= 4.345; WoS citations = 8]
17. 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. [IF= 2.527; WoS citations = 2]
16. 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. [IF= 4.703; WoS citations = 12]
15. **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). [IF= 4.703; WoS citations = 12]
14. 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*. 14, 1659-1671 [IF= 4.345; WoS citations = 37]
13. **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. [IF= 4.579; WoS citations = 17]
12. 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. [IF= 5.064; WoS citations = 22]
11. **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. [IF= 5.064; WoS citations = 33]

10. 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. [IF= 5.064; WoS citations = 93]
9. **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). [IF= 2.426; WoS citations = 35]
8. **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**. [IF= 4.703; WoS citations = 38]
7. 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. [IF= 2.954; WoS citations = 15]
6. 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. [IF= 2.954; WoS citations = 9]
5. **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. [IF= 4.703; WoS citations = 18]
4. **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. [IF= 4.703; WoS citations = 15]
3. 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*, 5(6), 733-745. [IF= 2.954; WoS citations = 7]
2. **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. [IF= 2.426; WoS citations = 4]
1. **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*, 33, 215-230. [IF= 4.372; WoS citations = 28]

Peer-Reviewed Journal Publications in Review (advised *postdocs*, *grad* or *#undergrads*):

4. Wieder, W., S. Shoop, L. Barna, **T. E. Franz**, and C. Finkenbiner (In review 2017), Comparison of Soil Strength Measurements of Agricultural Soils in Nebraska, *Terramechanics*.

3. Finkenbiner, C., **T. E. Franz**, J. Gibson, D. M. Heeren, and J. D. Luck (In review 2017), Integration of hydrogeophysical datasets for improved water resource management in irrigated systems, *Precis. Agric.*

2. 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.*

1. 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*.

Book Chapters/Technical Reports

B2. (In Press), Cosmic Ray Neutron Sensing: Estimation of Agricultural Crop Biomass Water Equivalent. IAEA- TECDOC-XXXX. Joint FAO/IAEA Programme Nuclear Techniques in Food and Agriculture. 37 pg. Vienna, Austria. Online at XXXX.

B1. (2017), Cosmic Ray Neutron Sensing: Use, Calibration and Validation for Soil Moisture Estimation. IAEA- TECDOC-1809. Joint FAO/IAEA Programme Nuclear Techniques in Food and Agriculture. 50 pg. Vienna, Austria. Online at <http://www-pub.iaea.org/books/IAEABooks/11097/Cosmic-Ray-Neutron-Sensing-Use-Calibration-and-Validation-for-Soil-Moisture-Estimation>

Theses:

3. 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.

1. 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:

2010-2017	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, 2014-7	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

Service:

Department:

- 2014-2017 Member of nominating committee
- 2015 Member of search committee for groundwater hydrologist
- 2015 Member of search committee for watershed hydrologist
- 2016 Member of community outreach committee
- 2016 Member of seminar committee
- 2016 Member of search committee for limnologist
- 2017 Member of committee for GIS spatial scientist

University:

- 2015-2016 Robert B. Daugherty Water for Food Institute Annual Conference Organizer
- 2016 Search committee for IANR Vice Chancellor

Professional:

- 2015-2017 AGU Hydrogeophysics Technical Committee
- 2011, 2014-7 Co-chaired a session at the fall American Geophysical Union annual meeting
- 2015-2017 MOISST Conference Organizer, Stillwater, OK
- 2018 MOISST/National Soil Moisture Mesonet Conference Host, Lincoln, NE

Advised/Mentored Students:

Current Postdoctoral Associate (0):

None.

Former Postdoctoral Associate (1):

2014-2016: Tiejun Wang, University of Nebraska-Lincoln, School of Natural Resources, Postdoctoral Primary Advisor. Current faculty member at Institute of Surface-Earth System Science, Tianjin University, Tianjin, People’s Republic of China.

Current Graduate Students (5):

- 2014-2017: Foad Foolad, University of Nebraska-Lincoln, Civil Engineering, PhD Primary Advisor.
- 2015-2017: Xiaochen Dong, University of Nebraska-Lincoln, School of Natural Resources, MS Primary Advisor.

2016-2019: Justin Gibson, University of Nebraska-Lincoln, School of Natural Resources, PhD Primary Advisor. Awarded 3-month internship with The Climate Corporation (Spring 2017).
2016-2017: Mahesh Pun, University of Nebraska-Lincoln, Civil Engineering, PhD Co-Advisor.
2016-2020: Thigesh Vather, University Kwazulu-Natal, South Africa, Department of Hydrometeorology, PhD Co-Advisor.

Former Graduate Students (2):

2014-2016: William Avery, University of Nebraska-Lincoln, School of Natural Resources, MS Primary Advisor. Awarded 1-year internship with FAO/IAEA in Vienna, Austria.
2015-2017: Catherine Finkenbinder, University of Nebraska-Lincoln, School of Natural Resources, MS Primary Advisor. Awarded UNL extension fellowship (2 yrs), Monsanto STEM fellowship (1 yr), AGU Best Student Award Presentation (2014), Water Center summer internship in Prague. Will start PhD at Oregon State in fall 2017.

Current Graduate Student Committees (3):

2017-2018: Destini Petitt, University of Nebraska-Lincoln, School of Natural Resources, MS Thesis Committee Member.
2017-2019: Diane Lally, University of Nebraska-Lincoln, School of Natural Resources, PhD Thesis Committee Member.
2017-2020: Fatima-amor Tenorio, University of Nebraska-Lincoln, Agronomy and Horticulture, PhD Thesis Committee Member.

Former Graduate Student Committees (8):

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: Karla Jarecke, University of Nebraska-Lincoln, School of Natural Resources, MS Thesis Committee Member.
2014: Nathan Rossman, University of Nebraska-Lincoln, Earth and Atmospheric Sciences, PhD Thesis Committee Member.
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.
2016-2017: Philip Blankenau, University of Nebraska-Lincoln, Civil Engineering, MS Thesis Committee Member.

Current Undergraduate (0):

None.

Former Undergraduate (7):

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.

2013: Catie Finkenbiner, University of Nebraska-Lincoln, UCARE.

2014: Catie Finkenbiner, University of Nebraska-Lincoln, UCARE.

2015: Matthew Russell, University of Nebraska-Lincoln. Mentored.

2016: Matthew Russell, University of Nebraska-Lincoln. UCARE.

2016: Autumn Dunn, University of Nebraska-Lincoln. UCARE.