

Nathaniel W. Chaney

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Research Interests Hydrology, Earth system science, soil science, ecology, geomorphology, numerical modeling, high performance computing, machine learning, environmental data delivery, and data assimilation.

Education **Princeton University**
Ph.D., Civil and Environmental Engineering 6/2015
M.A., Civil and Environmental Engineering 6/2012

UC Berkeley
B.A., Applied Mathematics 5/2010
B.A., *cum laude*, Earth and Planetary Sciences: Atmospheric Sciences 5/2010

Experience **Assistant Professor**, Duke University 8/2018 – Present

Associate Research Scholar, Princeton University 7/2018

Postdoctoral Research Associate, Princeton University 7/2015 – 6/2018

Visiting Research Scientist, Geophysical Fluid Dynamics Laboratory 7/2015 – 7/2018
Supervisor Elena Shevliakova.

Research Assistant, Princeton University 9/2010 – 6/2015
Advisor Eric F. Wood.

Assistant Instructor, Princeton University Fall 2014
Fundamentals of Environmental Studies: Population, Land Use, Biodiversity, and Energy (ENV 201).

Visiting Scholar, University of Sydney 4/2014
Supervisor Alex McBratney.

Research Assistant, UC Berkeley 2008 – 2010
Supervisor Inez Fung.

Awards **Wu Prize for Excellence**, Princeton University 2014
Awarded to engineering graduate students who perform at the highest level as scholars and researchers.

Publications *Refereed Journal Articles*
Chaney, N. W., M. Van Huijgevoort, E. Shevliakova, S. Malyshev, P.C.D. Milly, P. Gauthier, and B. Sulman: Harnessing Big Data to Rethink Land Heterogeneity in Earth System Models, 2018. *Hydrology and Earth System Sciences*, **22**, 3,311-3,330
Chaney, N. W., J. D. Herman, M. Ek, E. F. Wood, 2016: Deriving Global Parameter Estimates for the Noah Land Surface Model using FLUXNET and Machine Learning, 2017. *Journal of Geophysical Research - Atmospheres.*, **121**, 13,218-13,235.

- Chaney, N. W.**, P. Metcalfe, E. F. Wood, 2016: HydroBlocks: A Field-scale Resolving Land Surface Model for Application Over Continental Extents. *Hydrological Processes*, **30**, 3543-3559.
- Chaney, N. W.**, E. F. Wood, J. W. Hempel, A. McBratney, T. Nauman, C. Brungard, N. Odgers, 2016: POLARIS: A 30-meter probabilistic soil series map of the contiguous United States. *Geoderma*, **274**, 54-67.
- Chaney, N. W.**, J. D. Herman, P. M. Reed, E. F. Wood, 2015: Flood and Drought Hydrologic Monitoring: The Role of Model Parameter Uncertainty. *Hydrology and Earth System Sciences*, **19**, 3239-3251.
- Chaney, N. W.**, J. K. Roundy, Julio E. Herrera Estrada, E. F. Wood, 2014: High-Resolution Modeling of the Spatial Heterogeneity of Soil Moisture: Applications in Network Design. *Water Resources Research*, **51** (1), 619-638.
- Chaney, N. W.**, J. Sheffield, G. Villarini, E. F. Wood, 2014: Development of a High-Resolution Gridded Daily Meteorological Dataset over Sub-Saharan Africa: Spatial Analysis of Trends in Climate Extremes. *Journal of Climate*, **27**, 5815-5835.
- Siemann, A., **Chaney, N. W.**, E. F. Wood: Sensitivity and Uncertainty of a Long Term, High-Resolution, Global, Terrestrial Sensible Heat Flux Dataset, 2018. *Journal of Geophysical Research - Atmospheres*, **123**, 4988-5000
- Siemann, A., **Chaney, N. W.**, E. F. Wood: Development and Validation of a Long Term, Global, Terrestrial Sensible Heat Flux Dataset, 2018. *Journal of Climate*, **31** (15), 6073-6095.
- Cai, X., M. Pan, **N. W. Chaney**, A. Colliander, S. Misra, M. H. Cosh, W. T. Crow, T. J. Jackson, E. F. Wood, 2017: Validation of SMAP soil moisture for the SMAPVEX15 field campaign using a hyper-resolution model. *Water Resources Research*, **53**, 3013-3028.
- He, X., **N. W. Chaney**, M. Schleiss, J. Sheffield, 2016: Spatial Downscaling of Precipitation using Adaptable Random Forests. *Water Resources Research*, **52**, 8217-8237.
- Pan, M., X. Cai, **N. W. Chaney**, D. Entekhabi, E. F. Wood, 2016: An Initial Assessment of SMAP Soil Moisture Retrievals Using High Resolution Model Simulations and In-situ Observations. *Geophysical Research Letters*, In press.
- Estes, L. D., Searchinger, T., Spiegel, M., Tian, D., Sickinga, S., Mwale, M., Kehoe, L., Kuemmerle, T., Berven A., **Chaney, N.**, Sheffield, J., Wood, E. F., Caylor, K. K., 2016: Reconciling agriculture, carbon, and biodiversity in a savanna transformation frontier. *Philosophical Transactions B.*, **371**, 1703.
- Pan, M., Fisher, C. K., **Chaney, N. W.**, Zhan, W., Crow, W. T., Aires, F., Entekhabi, D., Wood, E. F., 2015: Triple collocation: Beyond three estimates and separation of structural/non-structural errors. *Remote Sensing of Environment*. **171**, 299-310.
- Reed, P. M., **N. W. Chaney**, J. D. Herman, M. P. Ferringer, E. F. Wood, 2015: Internationally Coordinated Multi-Mission Planning is Critical for Space-based Rainfall Observations to Aid Flood Risk Adaptation. *Environmental Research Letters*, **10** (10).
- Bierkens, M., V. A. Bell, P. Burek, **N. W. Chaney**, L. Condon, C. H. David, A. Roo, P. Dll, N. Drost, J. S. Famiglietti, M. Flrke, D. J. Gochis, P. House, R. Hut, J. Keune, S. Kollet, R. Maxwell, J. T. Reager, L. Samaniego, E. Sudicky, E. H. Sutanudjaja, N. Gielsen, H. Winsemius, E. F. Wood., 2014: Hyper-resolution global hydrological modelling: what's next?. *Hydrological Processes*, **29** (2), 310-320.
- Estes, L. D., **N. W. Chaney**, J. Herrera-Estrada, K. K. Caylor, J. Sheffield, E. F. Wood, 2014: Changing Water Availability during the African maize-growing season, 1979-2010. *Environmental Research Letters*, **9** (7).
- Xia, Y., J. Sheffield, M. B. Ek, J. Dong, **N. W. Chaney**, H. Wei, J. Meng, E. F. Wood, 2014: Evaluation of multi-model simulated soil moisture in NLDAS-2. *Journal of Hydrology*, **512**, 107-125.

- Enenkel, M., L. See, R. Bonifacio, V. Boken, **N. W. Chaney**, P. Vinck, L. You, E. Dutra, M. Anderson, 2014: Drought and food security-Improving decision-support via new technologies and innovative collaboration. *Global Food Security*, **4**, 51-55.
- Yuan, X., E. F. Wood, **N. W. Chaney**, J. Sheffield, J. Kam, M. Liang, and K. Guan, 2013: Probabilistic Seasonal Forecasting of African Drought by Dynamical Models. *Journal of Hydrometeorology*, **14** (6), 1706-1720.
- Sheffield, J., E. F. Wood, **N. W. Chaney**, K. Guan, S. Sadri, X. Yuan, L. Olang, A. Amani, A. Ali, S. Demuth, and L. Ogallo, 2013: A Drought Monitoring and Forecasting System for Sub-Sahara African Water Resources and Food Security. *Bulletin of the American Meteorological Society*, **95**, 861-882.
- Ershadi, A., M.F. McCabe, J. P. Evans, **N. W. Chaney**, E. F. Wood, 2013: Multi-site evaluation of terrestrial evapotranspiration models using FLUXNET data. *Agricultural and Forest Meteorology*, **187**, 46-61.

Articles in preparation

- Chaney, N. W.**, M. Van Huijgevoort, E. Shevliakova, S. Malyshev, P.C.D. Milly: Unraveling the Role of Multi-scale Land Heterogeneity in the Earth System.
- Chaney, N. W.**, A. McBratney, E. F. Wood, C. Morgan, Y. Yimam, T. Nauman, C. Brungard: Building on POLARIS: A 30-meter probabilistic soil properties map of the contiguous United States.

Oral Presentations and Workshops

Duke University , Durham, NC	3/2018
Ohio State University , Columbus, Ohio	2/2018
U.C. Santa Barbara , Santa Barbara, CA	2/2018
University of Victoria , Victoria, BC	2/2018
UMass Amherst , Amherst, MA	2/2018
U.C. Irvine , Irvine, CA	1/2018
AGU , New Orleans, LA	12/2017
CUAHSI cyberseminar series on Hillslope Hydrology in Earth System Models	5/2017
U.T. Austin , Austin, TX	3/2017
Cornell University , Ithaca, NY	2/2017
U.C. Davis , Davis, CA	1/2017
ASA, CSSA, and SSSA meeting , Phoenix, AZ	11/2016
Lawrence Berkeley National Laboratory , Berkeley, CA	9/2016
U.C. Davis , Davis, CA	9/2016
CUAHSI Biennial Colloquium , Shepherdstown, WV	7/2016
UNESCO , Santiago, Chile	5/2016
ISMC , Austin, Texas	3/2016
NCSS national conference , Duluth, Minnesota	6/2015
EGU , Vienna, Austria	4/2015
AGU , San Francisco, CA	12/2014
UNESCO , Santiago, Chile	11/2014

	ASA, CSSA, and SSSA meeting , Long Beach, CA	11/2014
	EGU, Vienna, Austria	4/2014
	HyperHydro Workshop , Utrecht, Netherlands	2/2014
	ASA, CSSA, and SSSA meeting , Tampa, FL	11/2013
	AGRHYMET, Niamey, Niger	10/2013
	Model Complexity vs. Model Uncertainty of Catchment models , Berlin, Germany	6/2013
	EGU, Vienna, Austria	4/2013
	NGEE-Arctic, Oak Ridge, TN	4/2013
	SWALIM, Nairobi, Kenya	11/2012
	ICPAC, Nairobi, Kenya	6/2012
	AGRHYMET, Niamey, Niger	1/2012
Mentoring	Noemi Vergopolan , Ph.D. student	2016 – Present
	Jivahn Moradian , Undergraduate student	2017 – Present
Patents	E. F. Wood, J. Sheffield, M. Pan, C. K. Fisher, Chaney, N. W. , J. D. Herman, H. E. Beck: System and Method for Performing Accurate Hydrologic Determination using Disparate Weather Data Sources, 2017, U.S. Provisional Patent No. 62/530,948.	
Technical Skills	Graduate certificate in computational science , Princeton University	2015
	Python, FORTRAN, C, C++, Matlab, R, HTML, Javascript, Perl, ArcGIS, and QGIS	
Released Software	African Flood and Drought Monitor	http://stream.princeton.edu
	HydroBlocks	https://github.com/chaneyn/HydroBlocks
	Geospatialtools	https://github.com/chaneyn/geospatialtools
Professional Activities	Reviewer for <i>Water Resources Research</i> , <i>Geophysical Research Letters</i> , <i>Journal of Hydrometeorology</i> , <i>Remote Sensing</i> , <i>Journal of Hydrology</i> , <i>Hydrological Processes</i> , <i>Journal of Geophysical Research - Atmospheres</i> , <i>Scientific Reports</i> , <i>International Journal of Climatology</i> , <i>Water, Hydrology and Earth System Sciences</i> , <i>Remote Sensing of Environment</i> , <i>Ambio</i> , and <i>Global Environmental Change</i> .	
	Member, American Geophysical Union	2009 – Present
	Member, Soil Science Society of America	2014 – Present
	Member, American Meteorological Society	2017 – Present
	NASA Grant Review Panel	2016
	NSF Ad-hoc reviewer	2017

Volunteering

Assistant scoutmaster in local Boy Scouts of America Troop	2014 – Present
Youth leader at local community church	2014 – 2017
Mentor for Princeton University’s chapter of Engineers Without Borders	2015