

Hatim M. E. Geli
Assistant Professor of Landscape Hydrology
New Mexico State University
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CURRENT POSITION

Assistant Professor, New Mexico State University and New Mexico Water Resources Research Institute September 2016-present

EDUCATION

Ph.D.	Civil and Environmental Engineering, Utah State University, USA	2012
M.S.,	Water Resources Engineering, University of Khartoum, Sudan	2004
B.Sc.	Civil Engineering, University of Khartoum, Sudan	1999

RESEARCH AREAS

Remote sensing applications in hydrology and water resources management with emphases on mapping evapotranspiration and land surface features using multispectral, thermal, LiDAR, and scintillometry; land use land cover change. Recent research applications involve applications characterization and evaluation of food-energy-water nexus resiliency under drought and socioeconomic impacts.

Academic Experience

Adjunct Assistant Professor	School of Natural Resources, University of Nebraska-Lincoln	September 2016-present
Postdoctoral Research Associate	Water for Food Global Institute, University of Nebraska-Lincoln	June-August 2016
Temporary Assistant Professor	Department of Civil and Environmental Engineering, Utah State University	2014-2016
Director	Remote Sensing Service Laboratory, Department of Civil and Environmental Engineering, Utah State University	2014-present
Co-Director	LASSI Service Center, Utah Water Research Laboratory, Utah State University	2014-present

Postdoctoral Fellow	Department of Civil and Environmental Engineering, Utah State University.	2012-2014
Ph.D. Assistantship	Remote Sensing Services Laboratory, Department of Civil and Environmental Engineering, Utah State University	2011-2012
Ph.D. Assistantship	Utah Water Research Laboratory, Utah State University	2006-2011
M.S. Assistantship	University of Khartoum, Sudan	2000-2004

Teaching

Landscape Hydrology Modeling (WSAM 589 – Spring Semester)
 Special Topics - Earth Data Retrieval (RGSC 550 – Fall Semester -every other year)
 Land cover analysis for Natural Resources (RGSC 485/585 - WSAM 585 Spring)
 Climate Change, Water, Society (RGSC 475/575 starting Fall 2019)

Publications

1. Mohammed N. Sawalhah, Jerry L. Holechek, Andres F. Cibils², Hatim M. E. Geli, Ashraf Zaied, 2018, An Assessment of Rangeland Livestock Production and Climate Trends in New Mexico, Rangeland Management (*in review*)
2. **Geli, H. M. E.**, Neale, C. M. U., and Verdin, J. (2017) *Estimating Crop Water Use with Remote Sensing Remote Sensing: Development of Guidelines and Specifications – Part 1: A Review of Evapotranspiration Models*, USGS, Technical Report, (*in review*)
3. **Geli, H. M. E.**, and Neale, C. M. U. (2017) *Estimating Crop Water Use with Remote Sensing Remote Sensing: Development of Guidelines and Specifications – Part 2: Evapotranspiration Model Intercomparison*, USGS, Technical Report, (*in review*)
4. **Geli, H. M. E.**, Piqueras, J. G., Neale, C. M. U., Balbontín, C., Campos, I., Calera, A.: Scintillometer-based estimates of sensible heat flux over irrigated vineyards (*in preparation*)
5. **Geli, H. M. E.**, and C. M. U. Neale: Effects of Spatial Heterogeneity Representation on Modeling Surface Energy Balance Fluxes and Daily Evapotranspiration in a Riparian Forest, (*in preparation*).
6. Xia, T., W. P. Kustas, M.C. Anderson, J. G. Alfieri, F. Gao, L. McKee, J.H. Prueger, **H. M.E. Geli**, C. M. U. Neale, L. Sanchez, M.M. Alsina, and Z. J. Wang, (2015): Mapping Evapotranspiration with High Resolution Aircraft Imagery over Vineyards Using One and Two Source Modeling Schemes, Hydrology and Earth System Science. Discuss., 12, 11905-11957, [doi:10.5194/hessd-12-11905-2015](https://doi.org/10.5194/hessd-12-11905-2015).
7. Lewis, C., **Geli, H. M. E.**, Neale, C. M. U., 2013, Comparison of the NLDAS Weather Forcing Model to Agrometeorological Measurements in the Western United States, *Journal of Hydrology*. [doi:10.1016/j.jhydrol.2013.12.040](https://doi.org/10.1016/j.jhydrol.2013.12.040)
8. **Geli, H. M. E.**, C. M. U. Neale, D. Watts, J. Osterberg, H. A. R. De Bruin, W. Kohsiek, R. T. Pack, and L. E. Hipps. (2012): Scintillometer-base estimates of sensible heat flux using

- LiDAR-derived surface roughness, *Journal of Hydrometeorology*. 13, 1317–1331. doi: <http://dx.doi.org/10.1175/JHM-D-11-085.1>
9. Neale, C. M. U., **H. M. E. Geli**, W. P. Kustas, J. G. Alfieri, P. H. Gowda, S. R. Evett, J. H. Prueger, L. E. Hipps, W. P. Dulaney, J. L. Chávez, A. N. French, and T. A. Howell, (2012): Soil water content estimation using a remote sensing based hybrid evapotranspiration modeling approach, *Advances in Water Resources*, doi: <http://dx.doi.org/10.1016/j.advwatres.2012.10.008>.
 10. **Geli, H. M. E.**, Neale, C. M. U., Verdin, J., and Senay, G., 2013, Estimating Crop Water Use with Remote Sensing: Development of Guidelines and Specifications, 7th International Conference on Irrigation and Drainage, USCID, Phoenix, Arizona, 16-19 April
 11. **Geli, H. M. E.**, C. M. U. Neale, D. R. Watts, J. Osterberg, and R. T. Pack, (2012), Incorporating LIDAR data into scintillometer-based estimates of sensible heat flux considering different atmospheric stability conditions, *IAHS-AISH publication*, Remote Sensing and Hydrology (September 2010), ISSN 0144-7815, 352,191-194
 12. **Geli, H. M. E.** and C. M. U. Neale, (2012), Spatial evapotranspiration modeling interface (SETMI), *IAHS-AISH publication*, Remote Sensing and Hydrology (September 2010), ISSN 0144-7815, 351,171-174
 13. Neale, C. M. U., **H. Geli**, S. Taghvaeian, A. Masih, R. T. Pack, R. D. Simms, M. Baker, J. A. Milliken, S. O'Meara and A. J. Witherall, (2011), Estimating evapotranspiration of riparian vegetation using high resolution multispectral, thermal infrared and lidar data, *Proc. SPIE 8174*, Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII, 81740P (October 18, 2011); doi:10.1117/12.903246; <http://dx.doi.org/10.1117/12.903246>
 14. Neale, C. M. U., Taghvaeian, S., **Geli, H.**, Sivarajan, S., Masih, A., Pack, B., ... & Milliken, J. (2011). *Evapotranspiration water use analysis of saltcedar and other vegetation in the Mojave River Floodplain, 2007 and 2010*, Mojave Water Agency Water Supply Management Study. Phase 1 Rep., US Bur. of Reclamation, August 2011, available at <http://www.usbr.gov/lc/socal/reports/MWAStudy/Phase1.pdf>.
 15. **Geli, H. M. E.**, and C. M. U. Neale (2009), Estimation of spatial evapotranspiration over non-irrigated agricultural areas using a two-source energy balance model. Irrigation and Drainage for Food, Energy and the Environment. pp 49-64. *Proc. USCID 5th International Conference on Irrigation and Drainage*. Salt Lake City, Utah Nov. 3-6, 2009. https://dspace.library.colostate.edu/bitstream/handle/10217/46491/106_Proceedings%202009%20USCID%20SLC%20Geli.pdf?sequence=5&isAllowed=y
 16. **Geli, H. M. E.** (2012), Modeling Surface Energy Fluxes Over Agricultural and Riparian Vegetation Using Remote Sensing, Department of Civil and Environmental Engineering, Utah State University, USA (*Ph.D. Dissertation*)
 17. **Geli, H. M. E.** (2004), Streamflow Forecasting Using Artificial Neural Network, Department of Civil and Environmental Engineering, University of Khartoum, Sudan (*MS Thesis*)

Professional Presentations

1. Geli, H.M.E., Hain, C, Anderson, M.C., 2018, Seasonal Variability and Trends in Long Time Series Remote Sensing-Based Evapotranspiration and its Impacts on New Mexico's Water Use and Food Production, 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018
2. Hayes, M., Graham, L., Geli, H.M.E., 2018, Building an Improved Drought Climatology for FEW System Impacts in New Mexico Using New Drought Monitoring Tools, 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018
3. Zaied, J.A., Geli, H.M.E. Cibils, A., Sawalhah, M.N., 2018, An Evaluation of Historical Trends in New Mexico Beef Production in Relation with Water, Energy, and Economic Shocks, 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018
4. Sawalhah, M.N., Cibils, A., Geli, H.M.E., Zaied, J.A., 2018 Identifying Linkages between water and beef production in New Mexico: a FEW Systems Analysis, 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018
5. Gedefaw, M. Geli, H.M.E., 2018, Evaluating the impact of land use/ land cover change on food production using cloud-based dense time series analysis to Support New Mexico's Food-Energy-Water Systems Analysis, 2018 Fall Meeting, AGU, Washington DC, 10-14 Dec. 2018
6. **Geli, H.M.E.**, Hain, C., Anderson, M., and Senay, G., "A Review of Remote Sensing of Evapotranspiration Models for Agricultural Water Resources Management," ASPRS – PECORA 2017 Conference, Sioux Falls, SD, November 13-16, 2017
7. **Geli, H. M. E.**, Hain, C., Anderson, M., and Senay, G., Assessment of Statewide Remote Sensing-Based Evapotranspiration Estimates, 98th American Meteorological Society Annual Meeting, AMS, Austin, TX, 7-11 January 2018
8. **Geli, H. M. E.**, Jedd, T. M., Svoboda, M., Wardlow, B., Neale, C., Hain, C., Anderson M, Regional Analysis of Remote Sensing Based Evapotranspiration Information, 2016 Fall Meeting, AGU, New Orleans, L.A., 11-15 Dec. 2016
9. **Geli, H. M. E.**, Jedd, T. M., Svoboda, M., Wardlow, B., Neale, C.M.U., Mike Hayes, Hain, C., Anderson, M., and Verdin, J. P., Highlighting the Use of Remote Sensing of Evapotranspiration for Agricultural Drought Early Warning and Water Resources Management, 97th American Meteorological Society Annual Meeting, AMS, Seattle, Washington, 22-26 January 2017
10. **Geli, H. M. E.**, Jedd, T. M., Svoboda, M., Wardlow, B., Neale, C., Hain, C., Anderson M, Evaluation of the performance of multiple drought indices for Tunisia, 2016 Fall Meeting, AGU, San Francisco, California, 12-16 Dec. 2016
11. Jose Gonzalez-Piqueras, **Hatim M. E. Geli**, and Isidro Campos, Evaluation of Modeling Schemes to Estimate Evapotranspiration and Root Zone Soil Water Content over Vineyard using a Scintillometer and Remotely Sensed Surface Energy Balance, 2016 Fall Meeting, AGU, San Francisco, California, 12-16 Dec. 2016
12. **Geli, H. M. E.**, T. Xia, W. P. Kustas, M. C. Anderson, K. A. Semmens, J. G. Alfieri^c, F. Gao^c, L. McKee^c, J. H. Prueger^c, C. M.U. Neale, L. Sanchez^g, and M. del Mar Alsina Mapping Seasonal Evapotranspiration and Root Zone Soil Moisture using a Hybrid Modeling Approach over Vineyards, 2015 Fall Meeting, AGU, San Francisco, California, 14-18 Dec. 2015
13. **Geli, H M. E.**, C. M. U. Neale, J. Verdin, G. Senay, R. G. Allen, R. Trezza, A. Ershadi, M.

- McCabe, A. Elhaddad, Y. Yang, and M. C. Anderson (2015) Evapotranspiration Models Intercomparison and the Need for a Common Framework, 2015 International Workshop on Evapotranspiration Mapping for Water Security, sponsored by NASA and World Bank, The World Bank, Washington, DC September 15-17, 2015.
14. Neale, C. M. U., Campos, I., **Geli, H. M. E.**, Remote sensing of evapotranspiration: a review of models and applications, 26th IUGG General Assembly 2015, Prague, Czech Republic, June 22- July 2, 2015.
 15. Kustas, W. P., Anderson, M.C., Prueger, J. H., Alfieri, J. G., McKee, L. G., Xia, T., Sanchez, L., **Geli, H.**, Neale, C. M. U. (2014). Utility of Thermal Remote Sensing for Evapotranspiration Estimation of Vineyards. American Meteorological Society's 31st Conference on Agricultural and Forest Meteorology. Available: <https://ams.confex.com/ams/31AgF2BioGeo/webprogram/Paper246963.html>
 16. **Geli, H. M. E.**, Neale, C. M. U., Trezza, R., McCabe, M. Elhaddad, A. Yang, Y. and Anderson, M.C., 2014, Intercomparison of remote sensing models for estimating actual daily and seasonal Evapotranspiration, presented at 2014 Fall Meeting, AGU, San Francisco, California, 15-19 Dec
 17. Biudes, M., Machado, N., **Geli, H. M. E.**, and Neale, C. M. U., 2014, Evapotranspiration estimates using remote sensing in a tropical forest in Brazil, presented at 2014 Fall Meeting, AGU, San Francisco, California, 15-19 Dec 2014.
 18. **Geli, H. M. E.**, Neale, C. M. U., and Verdin, James, 2014: Intercomparison of remote sensing models for Evapotranspiration, presented at the ASA-CSSA, & SSSA international annual meeting, Long Beach, California, Nov 2-5
 19. **Geli, H. M. E.** and Neale, C. M. U., 2014: Seasonal Evapotranspiration using Remote Sensing based Hybrid Modeling Approach , IAHS 3rd Remote Sensing and Hydrology Symposium 2014, Guangzhou, China, August 24-27
 20. **Geli, H. M. E.**, Lewis, C. S., and Neale, C. M. U., 2014, Seasonal evapotranspiration using a two-source energy balance model and gridded weather forcing and reference evapotranspiration data, presented at 2014 ASABE International symposium, ASABE, Raleigh, North Carolina, 7-11 April
 21. Lewis, C. S., **Geli, H. M. E.**, and Neale, C. M. U., 2014, Salt Cedar Evapotranspiration: Field Measurements and Estimation through Different Approaches, presented at 2014 ASABE International symposium, ASABE, Raleigh, North Carolina, 7-11 April
 22. Neale, C. M. U., R.W.D. Bosquilia, D.R.P. Leite, J.A. Frizzone, **H. M. Geli**, J.I. Corcoles, and S. Vieira-Limaand, 2014, Monitoring Evapotranspiration of Tropical Fruit Crops Using Geo-spatial Techniques and Modeling, presented at 2014 ASABE International symposium, ASABE, Raleigh, North Carolina, 7-11 April
 23. **Geli, H. M. E.**, Lewis, C. S., and Neale, C. M. U., 2014, Estimation of Saltcedar Evapotranspiration through Different Methods, presented at 2014 Tamarisk Coalition Conference-Riparian Restoration in the Western U.S., Grand Junction, Colorado, 18-20 February
 24. Hobbins, M, **Geli, H. M. E.**, Lewis, C. S., Senay, G., and Verdin, J., 2013, NOAA introduces its first-generation reference evapotranspiration product, presented at 2013 Fall Meeting,

AGU, San Francisco, California, 9-13 Dec

25. **Geli, H. M. E.**, Neale, C. M. U., Hobbins, M. S., Verdin, J., and Senay, G., 2013, Actual Evapotranspiration using a two source energy balance model and gridded reference ET₀, presented at 2013 Fall Meeting, AGU, San Francisco, California, 9-13 Dec
26. González-Piqueras J., **H. M. E. Geli**, M. P. González-Dugo, A. Andreu, C. M. U. Neale, C. Balbontín, I. Campos, and A. Calera, 2013, Evapotranspiration estimations over a vineyard combining a remote sensing based energy balance model with scintillometer and eddy covariance. Techniques, presented at the Tübingen Atmospheric Physics Symposium "Scintillometers and Applications", Tübingen, Germany, 7 - 9 Oct 2013
27. **Geli, H. M. E.**, and Neale, C. M. U. 2013, The use of a Hybrid Evapotranspiration Model with Multiple Source Remote Sensing Data, presented at the ASA-CSSA, & SSSA international annual meeting, Tampa, Florida, Nov 3-6, 2013
28. **Geli, H. M. E.**, Neale, C. M. U., Verdin, J., and Senay, G., 2013, Estimating Crop Water Use with Remote Sensing: Development of Guidelines and Specifications, presented at the 7th International Conference on Irrigation and Drainage, USCID, Phoenix, Arizona, 16-19 April
29. **Geli, H. M. E.**, Piqueras, J. G., Torres, E. Campos, I., Neale, C. M. U., and Calera, A., 2013, The application of a hybrid evapotranspiration approach in rainfed wheat, presented at 2013 General Assembly, EGU, Vienna, Austria, 7-12 April
30. Lewis, C. S., **Geli, H. M. E.**, Neale, C. M. U., Verdin, J., and Senay, G., 2013, Comparison of the NLDAS Weather Forcing Model with Ground-Based Measurements over Agricultural Areas Throughout the Western United States, presented at the Spring Runoff Conf., Utah State University, Logan, Utah, USA 9-10 April
31. **Geli, H. M. E.**, Neale, C. M. U., Lewis, C. S., Verdin, J., and Senay, G., 2012, Comparison of NLDAS weather forcing data with ground-based measurements in Utah, presented at 2012 Fall Meeting, AGU, San Francisco, California, 3-7 Dec.
32. Neale, C. M. U., **Geli, H. M. E.**, Verdin, J., and Senay, G., 2012, Using NLDAS weather forcing data on remote sensing of ET using a two source energy balance model, presented at 2012 Fall Meeting, AGU, San Francisco, California, 3-7 Dec
33. **Geli, H. M. E.** and C. M. U. Neale, 2012: Evapotranspiration of Natural Vegetation Using Landsat and Airborne Remote Sensing, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, Kona, Hawaii, USA
34. Neale, C. M. U., S. Taghvaeian, **H. M. E. Geli**, 2012: Water balance of Large Irrigation Systems using Remotely Sensed ET Estimates, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, Kona, Hawaii, USA
35. Neale, C. M. U., **H. M. E. Geli**, S. Taghvaeian, A. Masih, R. T. Pack, R. Simms, M. Baker, J. A. Milliken, S. O'Meara, and A. J. Witherall, 2011: Estimating evapotranspiration of riparian vegetation using high resolution multispectral, thermal infrared and Lidar data, SPIE Remote Sensing, Prague, Czech Republic
36. **Geli, H. M. E.**, Neale, C. M. U., Pack, R. T., Watts, D. R., and Osterberg, J., 2011, Estimating Evapotranspiration over Heterogeneously Vegetated Surfaces using Large Aperture Scintillometer, LiDAR, and Airborne Multispectral Imagery presented at 2011 Fall

Meeting, AGU, San Francisco, California, 5-9 Dec

37. Jose González-Piqueras, **H. M. E. Geli**, Christopher M. U. Neale, Claudio Babontín¹, Isidro Campos¹, Alfonso Calera, 2011: Estimation of Sensible Heat Flux over Irrigated Vineyard Trees, 3rd Scintillometer Workshop, Wageningen, Netherland
38. **Geli, H. M. E.**, C. M. U. Neale, and J. Osterberg, 2011: The Application of the Two- Source Model Using High/Low Spatial Resolution Imagery and LiDAR data to Estimate the Evapotranspiration of Tamarisk, NASA/USDA Workshop on Evapotranspiration: An Essential Observation for Climate Understanding and Efficient Water Management, Silver Spring, Maryland, USA
39. **Geli, H. M. E.**, S. T. Taghvaeian, C. M. U. Neale, R. Pack, D. R. Watts, and J. Osterberg, 2010: Estimation of Evapotranspiration of Tamarisk using Energy Balance Models with High Resolution Airborne Imagery and LIDAR Data, AGU Fall 10 Meeting, San Francisco, California, USA
40. Piqueras, J. G., **H. M. E. Geli**, C. M. U. Neale, C. Balbontin, I. Campos, and A. Calera, 2010: Scintillometer-based estimates of sensible heat flux over row oriented vineyard trees, AGU Fall 10 Meeting, San Francisco, California, USA
41. **Geli, H. M. E.**, C. M.U. Neale, D. Watts, J. Osterberg, and R. Pack, 2010: Incorporating LIDAR Data into Scintillometer-Based Estimation of Sensible Heat Flux Considering Different Atmospheric Stability Conditions, Remote Sensing and Hydrology 2010, Jackson Hole, Wyoming, USA
42. **Geli, H. M. E.**, and C. M.U. Neale, 2010, Spatial EvpoTranspiration Modeling Interface (SETMI), Remote Sensing and Hydrology 2010: Jackson Hole, Wyoming, USA
43. **Geli, H. M. E.**, C. M. U. Neale, D. Watts, S. Sritharan, 2010: Improved Scintillometer Estimates of Latent Heat and Sensible Heat Flux over Naturally Vegetated Heterogeneous Semi-Arid Areas using LIDAR Data, Applied Remote Sensing of Evapotranspiration Conference, Las Vegas, NV, USA
44. **Geli, H. M. E.**, and C. M. U. Neale, 2009: A Hybrid Approach for Estimating Evapotranspiration Using Remote Sensing (HET), AGU Fall 09 Meeting, San Francisco, California, USA
45. **Geli, H. M. E.**, and C. M. U. Neale, 2009: Estimation of Spatial Evapotranspiration over Non-Irrigated Agricultural Areas using Two-source Energy Balance Model, USCID, Fifth International Conference on Irrigation & Drainage, Salt Lake City, Utah, USA
46. **Geli, H. M. E.**, and C. M. U. Neale, 2008: Comparison of One-layer and the Two-source Energy Balance Model for the Estimation of Spatial Evapotranspiration over Irrigated Agricultural Areas, the 5th Spring Runoff Conference and 14th Intermountain Meteor. Workshop, Utah State University, Logan, Utah, USA

Professional Services

Member, ASCE-EWRI Evapotranspiration in Irrigation and Hydrology Committee
Member, AGU Remote Sensing Task Committee

Professional Affiliations

American Geophysical Union (AGU)

American Meteorological Society (AMS)

International Association of Hydrological Sciences (IAHS)