ALFONSO F. TORRES-RUA
Assistant Professor of Civil and Environmental Engineering
Utah Water Research Laboratory
Utah State University
Logan, Utah 84322-8200, United States of America
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https://scholar.google.com/citations?user=hTG3MWUAAAAJ&hl

EDUCATION
Doctor in Philosophy Civil and Environmental Engineering Utah State University, 2011
Master of Science Biological and Irrigation Engineering Utah State University, 2006
Bachelor of Science Agricultural Engineering La Molina National Agrarian University, 2000

ACADEMIC EXPERIENCE
Current-2017: Assistant Professor, Civil and Environmental Engineering,
        Utah State University, Utah, United States
2017-2011: Research Engineer, Utah Water Research Laboratory,
        Utah State University, Logan, Utah, United States
2013-2011: Post-doc Fellow, Utah Water Research Laboratory,
        Utah State University, Logan, Utah, United States
2011-2007: Graduate Research Assistant, Civil and Environmental Engineering,
        Utah State University, Logan, Utah, United States
2007-2006: Graduate Research Assistant, Biological and Irrigation Engineering,
        Utah State University, Logan, Utah, United States

EXPERTISE:
My research and teaching focus on water management from a spatial perspective. Therefore, my efforts are in the remote sensing technology, applications, and solutions for natural, urban, and agricultural environments. For technology, using ground, unmanned aerial vehicles, and satellite to understand water related processes. In applications, understanding and accurate estimation of water balance components and abiotic stressors influence. Lastly, physical, data-driven, and hybrid solutions are needed due to weather and climate, crops and soil human management variability and interactions.

HONORS/AWARDS
During Tenure Track Period

Personal
2021
 "HydroLearn Educational Development Training", 2021,
        National Science Foundation. United States of America
        https://edx.hydrolearn.org/courses/course-v1:USU-UHM+CEE5003-CEE6003-
        CEE696+2022-T1/about

2020
 "Undergraduate Research Mentor of the Year," Civil and Environmental Engineering
 Department,
 Utah State University. United States of America
2019
 "Vising Professor," Agricultural Engineering Department,
 La Molina National Agrarian University, Peru.
 "Agricultural Sciences Committee Nomination," Federal Year 2020
 Environmental Protection Agency. United States of America
 " Faculty Development Symposium Travel Award,"
 National Science Foundation - Society of Hispanic Professional Engineers. United States
 of America
 " Utah Water Resources Laboratory Outstanding Faculty Spotlight,".
 Utah State University. United States of America
 "2017 -2018 Top 20 Downloaded Manuscript",
 Irrigation and Drainage Journal – Wiley. United States of America
2018
 "Travel Award to Faculty Development Symposium,"
 National Science Foundation - Society of Hispanic Professional Engineers. United States
 of America

Students
*=Torres Post-Doctoral Researcher, ** = Torres Grad Student, *** = Torres Undergrad Student*
2022
**Karem Meza-Capcha: Spring Runoff Conference Poster Competition,
 Utah State University. United States of America
**Oliver Hargreaves: Spring Runoff Conference Poster Competition,
 Utah State University. United States of America
2021
 ***Tyler Jackson: "College of Engineering Outstanding Pre-Professional Award.",
 Utah State University. United States of America
** Karem Meza-Capcha: HydroLearn Educational Development Training,
 National Science Foundation. United States of America
**Karem Meza-Capcha: Student Spotlight College of Engineering,
 Utah State University. United States of America
** Rui Gao: Runner Up Award 'Autonomous Air and Ground Sensing Systems for Agricultural
 Optimization and Phenotyping VI',
 Society of PhotoOptical Instrumentation Engineers Conference. United States of America
2020
**Ayman Nassar: " Utah Water Research Laboratory Outstanding Student Spotlight",
 Utah State University. United States of America
**Ayman Nassar: Travel Scholarship, Eight International Conference on Flood Management,
 National Science Foundation.

**Ayman Nassar: "Best Conference Paper,"
    Society of PhotoOptical Instrumentation Engineers Conference. United States of America

**Ayman Nassar: " Findable-Accessible-Interoperable-and-Reusable Program Cyber Training
    Award,"
    National Science Foundation - Purdue University. United States of America

**Mahyar Aboutalebi: " Civil and Environmental Engineering Outstanding Ph.D. Scholar of the
    Year Award,"
    Utah State University. United States of America

**Ayman Nassar: " College of Engineering First Place Technical Writing Competition,",
    Utah State University. United States of America

2019

***Tyler Jackson: Research Experience for Undergraduates: Institute for Cyber-Enabled
    Research Advanced Computational Research Experience.
    National Science Foundation. United States of America.

***Tyler Jackson: "Honors Research Funds.",
    Utah State University. United States of America.

***Paolo Consalvo: "Honors Research Fund,"
    Utah State University. United States of America

**Mahyar Aboutalebi: "Best Conference Paper,"
    Society of PhotoOptical Instrumentation Engineers Conference. United States of America

**Mahyar Aboutalebi: " Utah Water Research Laboratory Outstanding Student Spotlight,",
    Utah State University. United States of America

**Mahyar Aboutalebi: "Cyberinfrastructure for Intelligent Water Supply Model Competition,"
    National Science Foundation. United States of America

**Mahyar Aboutalebi: "2018 Outstanding Reviewer Award",
    "Multidisciplinary Digital Publishing Institute" Remote Sensing journal. United States of
    America

**Ayman Nassar: "First Place Paper Competition,"
    American Water Works Association - Intermountain Section, United States of America

2018

** Mahyar Aboutalebi: "Runner-up Conference Paper,"
    Society of PhotoOptical Instrumentation Engineers Conference. United States of America

2017

**Mahyar Aboutalebi: "First Place J. Paul Riley Paper Competition,"
    American Water Resources Association. United States of America

Before Tenure Track Period
Personal -2012
 "Travel Award to Broadening Participation in Datamining Workshop,"
    National Science Foundation. United States of America

PROJECTS

During Tenure Track Period

Current

2021-2022- "Agricultural Water Optimization Task Force Depletion Accounting Case Study",
$299,265 (Co-PI $12,930),
Utah Division of Water Rights.

2021-2024, "Evaluating Conserved Consumptive Use in the Upper Colorado River – Grant
Extension", $139,013 (PI, $32,802)
Trout Unlimited

2021-2024, "Improving the economic and environmental sustainability of tart cherry
production through precision management (resubmission)", $1,647,653, Utah State
University $745,666 (Co-PI, $388,014)
Department of Agriculture. United States of America

2021-2025, "Data Enabled Water Trading to Sustain Agrosystems of the Semi-Arid West
(resubmission)" $10,000,000, Utah State University $1,811,028, (Co-PI, $352,800)
Department of Agriculture. United States of America

2021-2025, "Ingenieros Ingeniosos (Ingenious Engineers): Connecting Latinx Youths' Workplace
Practices with Engineering via Informal Education" $1,786,398 (Collaborator, $81,448)
National Science Foundation. United States of America

2021, "Real-Time UAV Mapping Generation", $30,000 (Collaborator, $0)
Geological Survey 104b grant.

2021-2022, "Assessment of Crop Water Stress in Vineyards" $25,000 (PI, $25,000)
Department of Agriculture. United States of America

2021-2023, "Assessment of Crop Water Stress in Vineyards – Grant Extension" $45,000 (PI,
$45,000)
Department of Agriculture. United States of America

2021-2025, "Determining Almond Tree Water Use and Stress using Surface Energy Balance
Models with Unmanned Aircraft Systems" $399,881.66, (PI, $370,812)
Almond Board of California. United States of America

2019-2022, "Advancing Data Science and Analytics for Water" $568,496, (Co-I, $43,172).
National Science Foundation. United States of America

2019-2021, "Utah Agricultural Water Optimization" $221,533, (Co-I, $71,967)
Utah Department of Natural Resources. United States of America

Completed

2020-2021, "Evaluating Conserved Consumptive Use in the Upper Colorado River" $53,661, (PI,
$19,190)
Trout Unlimited. United States of America

2020-2021, "Egypt-Utah State University Center of Excellence for Water" $10,685,
(Collaborator, $10,685)
US Agency for International Development. United States of America.

2020-2021, "Active Transportation Facilities in Canal Corridors" $46,000 (Co-PI, $6,630)
Utah Department of Transportation. United States of America

2017-2021, "Monitoring Vineyard Water Use and Vine Water Status with Land Surface Temperature for Improved and Sustainable Water Management from Field to Regional Scales" $4,000,000, ($1,347,823, Utah State University, PI, $272,689)
National Aeronautics and Space Administration. United States of America

2018-2020, "Use of small Unmanned Aerial Systems for mapping wetland flow paths and consumptive use on the San Rafael River, Utah," $39,000; (PI, $39,000)
US Geological Survey 104b Grant

2018-2019, "Plant scale characterization using Unmanned Aerial Systems Point Cloud and Reflectance Maps for Modeling Vine and Soil/Cover Crop Water Use." $25,000, (PI, $25,000) Department of Agriculture. United States of America

2017 "Training in remote sensing with small unmanned aerial systems", $6,500, (Co-I, $2,564)
Hankuk University of Foreign Studies.

2017," Utah State University AggieAir for Mamba device testing, $24,749, (Co-I, $5,129).
OceanIT Company

2018, "Tile Drainage Identification with UAV imagery, $28,000 (Co-I, $0)
US Geological Survey 104b Grant

Projects before Tenure Track Period (5 projects)

2016-2018, "Using High Resolution Remote Sensing Information for Yield Estimation under Deficit Irrigation" $25,600, (Co-I, $20,480)
Utah State University Extension

2016-2018, "Measuring Water Use and Assessment the Spatial Variability of a Golf Course using Remote Sensing Information, $90,000, (CO-I, $0)
US Golf Association

2015-2017, "Verification of Water Conservation from Deficit Irrigation Pilot Projects in the Upper Colorado River Basin" $120,00, (Co-I, 84,792).
Walton Family Foundation & S.D. Bechtel, Jr. Foundation

2014-2019, Utility of Evapotranspiration and Plant Stress Mapping over Vineyards Using UAS High-Resolution Remote Sensing Data, $25,000 (CO-I, $25,000)
Department of Agriculture. United States of America

2014-2016; Utility of Evapotranspiration and Plant Stress Mapping over Vineyards Using UAS remote sensing data at finer and coarser pixel resolutions, $25,000 (Co-I, $25,000)
Department of Agriculture. United States of America

PEER-REVIEWED PUBLICATIONS
*=Torres Post-Doctoral Researcher, ** = Torres Grad Student, *** = Torres Undergrad Student
+= Post-Doctoral Researcher, ++ = Grad Student, +++ = Undergrad Student

<u>During Tenure Track Period</u>

2022 (5)
++ Crump, M. S., Singleton, P., **Torres-Rua, A.,** & Pack, A. B. (2022). Active Transportation Routes Using Canal Corridors: Decision Tools in Creating Successful Canal Trail Projects. Journal of Urban Planning and Development, 148(3), 04022030. Impact Factor 2.28.

** Gao, R., Torres-Rua, A.F., Aboutalebi, M., White, W.A., Anderson, M., Kustas, W.P., Agam, N., Alsina, M.M., Alfieri, J., Hipps, L. and Dokoozlian, N., 2022. LAI estimation across California vineyards using sUAS multi-seasonal multi-spectral, thermal, and elevation information and machine learning. Irrigation Science, pp.1-29. Impact Factor 2.940

Nassar, A., **Torres-Rua, A., Hipps, L., Kustas, W., McKee, M., Stevens, D., Nieto, H., Keller, D., Gowing, I. and Coopmans, C., 2022. Using Remote Sensing to Estimate Scales of Spatial Heterogeneity to Analyze Evapotranspiration Modeling in a Natural Ecosystem. MDPI Remote Sensing, 14(2), p.372. Impact Factor 4.509

++Tunca, E., Köksal, E.S., **Torres-Rua, A.,** Kustas, W.P. and Nieto, H., 2022. Estimation of bell pepper evapotranspiration using two-source energy balance model based on high-resolution thermal and visible imagery from unmanned aerial vehicles. Journal of Applied Remote Sensing, 16(2), p.022204. Impact Factor 1.53

Kustas, W.P., Nieto, H., Garcia-Tejera, O., Bambach, N., McElrone, A.J., Gao, F., Alfieri, J.G., Hipps, L.E., Prueger, J.H., **Torres-Rua, A. and Anderson, M.C., 2022. Impact of advection on two-source energy balance (TSEB) canopy transpiration parameterization for vineyards in the California Central Valley. Irrigation Science, pp.1-17. Impact Factor 2.940

2021 (2)
++ Gomes, M.D., Román, R.M.S., **Torres-Rua, A.,** Álves, É. and McKee, M., 2021. Comparação Do NDVI Obtido Por Meio De Drone E Satélite Nas Fases Fenológicas Da Videira. Irriga, 26(3), pp.605-619. Impact Factor 0.25

Nassar, A., **Torres-Rua, A., Kustas, W., Alfieri, J., Hipps, L., Prueger, J., Nieto, H., Alsina, M.M., White, W., McKee, L. and Coopmans, C., 2021. *"Assessing Daily Evapotranspiration Methodologies from One-Time-of-Day sUAS and EC Information in the GRAPEX Project."* MDPI Remote Sensing, 13(15), p.2887. Impact Factor 4.509.

2020 (4)
Xue, J., Anderson, M.C., Gao, F., Hain, C., Sun, L., Yang, Y., Knipper, K.R., Kustas, W.P., **Torres-Rua, A.** and Schull, M., (2020). "Sharpening ECOSTRESS and VIIRS land surface temperature using harmonized Landsat-Sentinel surface reflectance." Remote Sensing of Environment, 251, p.112055. Impact Factor 9.384

++Parajuli, K.++, Jones, S.B., Tarboton, D.G., Hipps, L.E., Zhao, L., Sadeghi, M., Rockhold, M.L., **Torres-Rua, A.,** and Flerchinger, G.N., (2020). "Stone Content Influence on Land Surface Model Simulation of Soil Moisture and Evapotranspiration at Reynolds Creek Watershed." Journal of Hydrometeorology, 21(8), pp.1889-1904. Impact Factor 3.891

[Invited] Chávez, J.L., **Torres-Rua, A.,** Boldt, W.E., Zhang, H., Robertson, C., Marek, G., Wang, D., Heeren, D., Taghvaeian, S. and Neale, C.M., (2020). "A Decade of Unmanned Aerial Systems in Irrigated Agriculture in the Western US." Applied Engineering in Agriculture – American Society of Agricultural and Biological Engineers. DOI: 10.13031/aea.13941, Impact Factor 0.973

** Nassar, A., **Torres-Rua, A.,** Kustas, W., Nieto, H., McKee, M., Hipps, L., Stevens, D., Alfieri, J., Prueger, J., Alsina, MM and McKee, L., (2020). "Influence of Model Grid Size on the Estimation of Surface Fluxes Using the Two-Source Energy Balance Model and sUAS Imagery in Vineyards." MDPI Remote Sensing, 12(3), p.342., Impact Factor 4.509.

2019 (4)

Aboutalebi, M., **Torres-Rua, A.F., McKee, M., Kustas, W.P., Nieto, H., Alsina, M.M., White, A., Prueger, J.H., McKee, L., Alfieri, J. and Hipps, L., (2019). "Incorporation of Unmanned Aerial Vehicle (UAV) Point Cloud Products into Remote Sensing Evapotranspiration Models." MDPI Remote Sensing, 12(1), p.50., Impact Factor 4.409.

++ Garousi-Nejad, I., Tarboton, D., Aboutalebi, M., **Torres-Rua, A.** (2019) "Terrain Analysis Enhancements to the Height Above Nearest Drainage Flood Inundation Mapping Method," Water Resources Research, Impact Factor:4.31.

 [Invited] Nieto, H., Kustas, W., **Torres-Rua, A.,** Alfieri, J. (2019) "Evaluation of TSEB turbulent fluxes using different methods for the retrieval of soil and canopy component temperatures from UAV thermal and multispectral imagery." Irrigation Science. Doi: 10.1007/s00271-018-0585-9, Impact Factor 3.014

[Invited] ** Aboutalebi, M., **Torres-Rua, A.,** Kustas, W., Nieto, H., Coopmans, C., McKee, M., (2018) "Assessment of different methods for shadow detection in high- resolution optical imagery and evaluation of shadows impact on calculation of NDVI, and evapotranspiration," Irrigation Science. Doi: 10.3390/rs10122058, Impact Factor 3.014

2018 (2)

** Aboutalebi, M., **Torres-Rua, A.,** & Allen, N. (2018). "Spatial and Temporal Analysis of Precipitation and Effective Rainfall Using Gauge Observations, Satellite, and Gridded Climate Data for Agricultural Water Management in the Upper Colorado River Basin." MDPI Remote Sensing, 10(12), 2058. Impact Factor 4.509

[Invited] Kustas, W., Anderson, M., Alfieri, J., Knipper K., **Torres-Rua, A.,** Parry, C., et al. (2018) The Grape Remote sensing Atmospheric Profile and Evapotranspiration eXperiment (GRAPEX), American Meteorological Society https://doi.org/10.1175/BAMS-D-16-0244.1. Impact Factor 9.085

2017 (3)

++ Hassan-Esfahani, L.++, Ebtehaj, A.M., **Torres-Rua, A.** and McKee, M., (2017). "Spatial Scale Gap Filling Using an Unmanned Aerial System: A Statistical Downscaling Method for Applications in Precision Agriculture." MDPI Sensors, 17(9), p.2106. DOI: 10.3390/s1709210. Impact Factor: 3.275

Torres-Rua, A. (2017). "Vicarious Calibration of sUAS Microbolometer Temperature Imagery for Estimation of Radiometric Land Surface Temperature." MDPI Sensors, 17(7), 1499. doi:10.3390/s17071499. Impact Factor: 3.275

++Hassan-Esfahani, L., **Torres-Rua, A.,** Jensen, A., and McKee, M. (2017) Spatial Root Zone Soil Water Content Estimation in Agricultural Lands Using Bayesian-based Artificial Neural Networks and High- Resolution Visual, NIR, and Thermal Imagery. Irrig. And Drain., 66: 273–288. DOI: 10.1002/ird.2098. Impact Factor: 1.202

Before Tenure Track Period (10 peer review publications)

2016(1)
Torres-Rua, A., Ticlavilca, A.+, Bachour, R.++, McKee, M., (2016) "Estimation of Surface Soil Moisture by Assimilation of Landsat Vegetation Indices, Surface Energy Balance Products and Relevance Vector Machines," Water 2016, 8(4), 167; doi:10.3390/w8040167. Impact factor 1.832

2015(4)
 ++ Hassan-Esfahani, L.; **Torres-Rua, A**.; McKee, M. (2015) "Assessment of optimal irrigation water allocation for pressurized irrigation system using water balance approach, learning machines, and remotely sensed data." Agricultural Water Management. 153, 42-50. doi:10.1016/j.agwat.2015.02.005. Impact Factor 2.848

++ Hassan-Esfahani L++, Torres-Rua A, Jensen A, McKee M. (2015) "Assessment of Surface Soil Moisture Using High-Resolution Multi-Spectral Imagery and Artificial Neural Networks." Remote Sensing.7(3):2627-2646. doi:10.3390/rs70302627. Impact Factor 3.244

 ++ Elarab M., Ticlavilca, A. M., Torres-Rua, A. F., McKee, M., Maslova, I. (2015) "Estimating chlorophyll with thermal and broadband multispectral high-resolution imagery from an unmanned aerial system using relevance vector machines for precision agriculture." International Journal of Applied Earth Observation and Geoinformation, 2015, DOI: 10.1016/j.jag.2015.03.017 Impact Factor 3.930

++ Hassan-Esfahani, L. Torres-Rua A., Jensen A., and McKee, M. (2015). High-Resolution Root-Zone Soil Water Content Estimation Using Bayesian-Based Artificial Neural Networks and High Resolution Visual, NIR, and Thermal Imagery. Accepted in Irrigation and Drainage

2013(1)
 ++ Bachour, R., Walker, W. R., **Torres-Rua, A. F.,** McKee, M., "Assessment of Reference Evapotranspiration by the Hargreaves Method in the Bekaa Valley, Lebanon," Journal of Irrigation and Drainage Engineering,139,11,933-938,2013, doi:10.1061/(ASCE)IR.1943-4774.0000646. Impact Factor 1.983

2012(1)
 Torres-Rua, A. F., Ticlavilca, A. M., Walker, W. R., McKee, M., (2012) "Machine Learning Approaches for Error Correction of Hydraulic Simulation Models for Canal Flow Schemes," Journal of Irrigation and Drainage Engineering,138,11,999-1010,2012, DOI: 10.1061/(ASCE)IR.1943-4774.0000489. Impact Factor 1.983

2010(1)
 Torres, A. F., Walker, W. R., McKee, M.,(2010) "Forecasting daily potential evapotranspiration using machine learning and limited climatic data," Agricultural Water Management, 98,4,553-562,2011, Elsevier, DOI: 10.1016/j.agwat.2010.10.012. Impact Factor 2.848

2008(1)

Torres, A. F., Merkley, G. P., (2008) "Cutthroat measurement flume calibration for free and submerged flow using a single equation," Journal of irrigation and drainage engineering,134,4,521-526, 2008, DOI: 10.1061/(ASCE)0733-9437(2008)134:4(521). Impact Factor 1.983

2007 (1)

++ Weber, R. C., Merkley, G. P., Skogerboe, G., **Torres, A. F**., "Improved calibration of Cutthroat flumes," Irrigation Science,25,4,361-373,2007, DOI: 10.1007/s00271-006-0052-x. Impact factor: 1.822

CONFERENCE PROCEEDINGS / WHITEPAPER PUBLICATIONS

<u>During Tenure Track Period</u>

2021 (2)

Gao, R., **Torres-Rua, A., Nassar, A., Alfieri, J., Aboutalebi, M., Hipps, L., Ortiz, N.B., Mcelrone, A.J., Coopmans, C., Kustas, W. and White, W., 2021, April. Evapotranspiration partitioning assessment using a machine-learning-based leaf area index and the two-source energy balance model with sUAV information. In Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping VI (Vol. 11747, p. 117470N). International Society for Optics and Photonics.

Nassar, A., **Torres-Rua, A., Merwade, V., Dey, S., Zhao, L., Kim, I.L., Kustas, W.P., Nieto, H., Hipps, L., Gao, R. and Alfieri, J., 2021, April. Development of high-performance computing tools for estimation of high-resolution surface energy balance products using sUAS information. In Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping VI (Vol. 11747, p. 117470K). International Society for Optics and Photonics.

2020 (3)

Nassar, A., **Torres-Rua, A.F., Nieto, H., Alfieri, J., Hipps, L.E., Prueger, J.H., Alsina, M.M., McKee, L.G., White, W., Kustas, W.P. and McKee, M., 2020, April. Implications of soil and canopy temperature uncertainty in the estimation of surface energy fluxes using TSEB2T and high-resolution imagery in commercial vineyards. In Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping V (Vol. 11414, p. 114140F). International Society for Optics and Photonics.

Torres-Rua, A.F., Ticlavilca, A.M., Aboutalebi, M., Nieto, H., Alsina, M.M., White, A., Prueger, J.H., Alfieri, J.G., Hipps, L.E., McKee, L.G. and Kustas, W.P., 2020, April. Estimation of evapotranspiration and energy fluxes using a deep learning-based high-resolution emissivity model and the two-source energy balance model with sUAS information. In Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping V (Vol. 11414, p. 114140B). International Society for Optics and Photonics.

Nassar, A., **Torres-Rua, A., Kustas, W., Nieto, H., McKee, M., Hipps, L., Alfieri, J., Prueger, J., Alsina, M.M., McKee, L. and Coopmans, C., 2020, May. To what extent does the Eddy Covariance footprint cutoff influence the estimation of surface energy fluxes using the two-source energy balance model and high-resolution imagery in commercial vineyards?. In Autonomous Air and Ground Sensing Systems for Agricultural

Optimization and Phenotyping V (Vol. 11414, p. 114140G). International Society for Optics and Photonics.

2019 (5)

Aboutalebi, M., Allen, L.N., **Torres-Rua, A., McKee, M., Coopmans, C., "Estimation of soil moisture at different soil levels using machine learning techniques and unmanned aerial vehicle (UAV) multispectral imagery," Proc. SPIE 11008, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping IV, 110080S (May 14, 2019);

Aboutalebi, M., **Torres-Rua, A., McKee, M., Kustas, W., Nieto, H., Coopmans, C., "Validation of digital surface models (DSMs) retrieved from unmanned aerial vehicle (UAV) point clouds using geometrical information from shadows," Proc. SPIE 11008, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping IV, 110080L (May 14, 2019);

Torres-Rua, A., Aboutalebi, M., Wright, T., Nassar, A.**, Guillevic, P., Hipps, L., Gao, F., Jim, K., Alsina, M., Coopmans, C., McKee, M., Kustas, W., "Estimation of surface thermal emissivity in a vineyard for UAV microbolometer thermal cameras using NASA HyTES hyperspectral thermal, and Landsat and AggieAir optical data," Proc. SPIE 11008, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping IV, 1100802 (May 14, 2019);

Aboutalebi, M., **Torres-Rua, A., McKee, M., Nieto, H., Kustas, W., Coopmans, C., "The impact of shadows on partitioning of radiometric temperature to canopy and soil temperature based on the contextual two-source energy balance model (TSEB-2T)," Proc. SPIE 11008, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping IV, 1100804 (May 14, 2019);

Tarboton et al 2019, "The Utah Water Research Laboratory: Empowering Water and Environmental Research in Utah and around the World", Water Resources Impact magazine, American Water Research Association.

2018 (4)

Aboutalebi M., **Torres-Rua, A., McKee, M., Kustas W., Nieto H., Coopmans C., "Behavior of vegetation/soil indices in shaded and sunlit pixels and evaluation of different shadow compensation methods using UAV high-resolution imagery over vineyards," Proc. SPIE 10664, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping III, 1066407 (May 21, 2018);

Aboutalebi, M., **Torres-Rua, A, Allen, N., "Multispectral remote sensing for yield estimation using high-resolution imagery from an unmanned aerial vehicle," Proc. SPIE 10664, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping III, 106640K (May 21, 2018);

Torres-Rua A., Nieto, H., Parry C., Elarab M., Collatz W., Coopmans C., McKee, L., McKee, M., Kustas W., "Inter-comparison of thermal measurements using ground-based sensors, airborne thermal cameras, and eddy covariance radiometers," Proc. SPIE 10664, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping III, 106640E (May 15, 2018);

McKee, M., Nassar A., **Torres-Rua, A.,** Aboutalebi M., Kustas, W., "Implications of sensor inconsistencies and remote sensing error in the use of small unmanned aerial systems

for generation of information products for agricultural management," Proc. SPIE 10664, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping III, 1066402 (May 21, 2018);

2017 (3)

Torres-Rua, A "Use of UAV for support of intensive agricultural management decisions: from science to commercial applications," SPIE Proceedings Volume 10218, Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping II; 102180A (2017); DOI: 10.1117/12.2267725

Torres-Rua, A "Drones in Agriculture: An Overview of Current Capabilities and Future Directions," 2017 Utah Water Users Workshop, Saint George, UT

Nieto, H., Bellvert, J., Kustas, W.P., Alfieri, J.G., Gao, F., Prueger, J., **Torres-Rua, A.F.**, Hipps, L.E., Elarab, M. and Song, L., 2017, July. Unmanned airborne thermal and multispectral imagery for estimating evapotranspiration in irrigated vineyards. In 2017 Institute of Electrical and Electronic Engineering, International Geoscience and Remote Sensing Symposium (IGARSS) (pp. 5510-5513). IEEE.

Before Tenure Track Period

2014

++Hassan-Esfahani, L; **Torres-Rua, A**.; Jensen, A.; McKee, M. "Topsoil moisture estimation for precision agriculture using unmanned aerial vehicle multispectral imagery." Proceedings of the 2014 Institute of Electrical and Electronic Engineering, International Geoscience and Remote Sensing Symposium (IGARSS), Quebec City, QC, Canada, 13–18 July 2014; pp. 3263–3266. doi:10.1109/IGARSS.2014.6947175

2013

++Al-Arab, M.; **Torres-Rua, A.;** Ticlavilca, A; Jensen, A; McKee, M, "Use of high-resolution multispectral imagery from an unmanned aerial vehicle in precision agriculture," Geoscience and Remote Sensing Symposium (IGARSS), 2013 IEEE International", 2852-2855, 2013, Institute of Electrical and Electronic Engineering. doi:10.1109/IGARSS.2013.6723419

REPORT PUBLICATIONS

During Tenure Track Period

2022

++Crump, M., Singleton, P.A., Torres-Rua, A. and Pack, A., 2022. Active Transportation Facilities in Canal Corridors (No. UT-22.04). Utah Department of Transportation.

2021

Cabot, P.E., Derwingson, A. and Torres-Rua, A.F., 2021. Evaluating Conserved Consumptive Use in the Upper Colorado 2020 Report.

2020

Allen L., Hipps, L., Allen, R., Torres-Rua, A., et al. (2020) Depletion Accounting for Irrigation Water Rights in Utah. Utah Division of Water Resources.

Allen, L.N., et al 2020. Irrigation Water Use–Drip v. Surface Irrigation of Onions Interim Draft Report Utah Agricultural Water Optimization.

2018

Allen, L., Torres-Rua, A., (2018) Verification of Water Conservation from Deficit Irrigation Pilot projects in the Upper Colorado River Basin, Environmental Defense Fund / Walton Foundation.

CREATIVE PUBLICATIONS

During Tenure Track Period

2022

[ONLINE COURSE] **Capcha-Meza, K., Bateni, S., **Torres-Rua, A.** (2021) Remote Sensing Applications in Irrigation. HydroLearn. https://edx.hydrolearn.org/courses/course-v1:USU-UHM+CEE5003-CEE6003-CEE696+2022-T1/course/about.

2021

[SOFTWARE]**Gao, R., **A. F. Torres-Rua**, A. Nassar, H. Nieto (2021). TSEB modeling and the comparison between the model results and the eddy-covariance monitored data within the footprint area, HydroShare, http://www.hydroshare.org/resource/eb6eeeccdbe546fc941f3c219cb05a34

[SOFTWARE]**Gao, R., A. Nassar, A. F. Torres-Rua (2021). Footprint area generating based on eddy covariance records, HydroShare, http://www.hydroshare.org/resource/9118e2c1034e40e4ba4721cd17702f70

[SOFTWARE]**Gao, R., **A. F. Torres-Rua**, M. Aboutalebi, A. Nassar (2021). Feature extraction approaches for leaf area index estimation in California vineyards via machine learning algorithms, HydroShare, http://www.hydroshare.org/resource/923cf9a7a3bb49369a4e65d48237002b

2020

[SOFTWARE]**Torres-Rua, A**. "Remote Sensing Laboratory Material " [Github repository https://github.com/torresrua/prj_earthengine_hydroshare] Torres-Rua, A., Aboutalebi, M., 2020.

2019

[SOFTWARE]**Aboutalebi M et al. "Open-Source code companion for paper" [Github repository https://github.com/Mahyarona/VSSIXA] Aboutalebi, M., Torres-Rua, A., McKee, M., Kustas, W. P., Nieto, H., Alsina, M., White, A., Prueger, J., McKee, L., Alfieri, J., Hipps, L., Coopmans, C., and Dokoozlian, N. "Incorporation of Unmanned Aerial Vehicle (UAV) Point Cloud Product into Remote Sensing Evapotranspiration Models," Remote Sensing, 2019.

PROFESSIONAL PRESENTATIONS

During Tenure Track Period

2022 (6)

**Meza, K. et al, Estimation of Evapotranspiration of Urban Turfgrass Using Eddy Covariance Flux Measurements and Remote Sensing-Based Models, 2022 CRA-WP Grad Cohort for Women Workshop, Computing Research Association, New Orleans, LA.

** Meza, K. et al, Estimation of Evapotranspiration of Urban Turfgrass Using Eddy Covariance Flux Measurements and Remote Sensing-Based Models, 2022 Spring Runoff Conference, Utah State University.

** Hargreaves, O. et al, Estimation of crop water consumption for irrigated crops using soil moisture data, 2022 Spring Runoff Conference, Utah State University.

** Christiansen, L. et al, Comparison of Consumptive Water Use Methodologies at Farm Scale Using Ground and Remote Sensing Information in Modena, UT, 2022 Spring Runoff Conference, Utah State University.

Torres-Rua, Life as a First Gen Latino Immigrant in Academia, Life of a Latinx Leader Series, Latinxs in Action, Utah State University.

++Crump M. et al. "Active Transportation Routes using canal corridors: Decision tools in creating successful canal trail projects". 1001st Annual Meeting of the Transportation Research Board.

2021 (7)

Alsina, M., et al "SY22A-05Implementing a Remote Sensing Data-based Evapotranspiration Toolkit for Real-Time Irrigation Scheduling in California vineyards: Performance and Limitations", American Geophysical Union Fall Meeting.

++ Crump M., et al, "Canal plus Trails: Considerations and Opportunities", 2021 Utah Water Users Workshop.

**Nassar, A., et al, H008-0016 Influence of Spatial Heterogeneity in Evapotranspiration Modeling at Natural Areas Using sUAS High Resolution Data. American Geophysical Union Fall Meeting.

Kustas, W., et al H026-08Estimating vineyard water use with remote sensing: Lessons learned from the GRAPEX project. American Geophysical Union Fall Meeting.

Gao F. et al." Improving 30-m Leaf Area Index (LAI) Retrieval for Vines over the GRAPEX Sites". 34th Conference on Agricultural and Forest Meteorology, American Meteorological Society. Online Conference

Torres-Rua A. et al "Evaluating ET partitioning using a Two-Source Energy balance Model and UAV Imagery", 34th Conference on Agricultural and Forest Meteorology, American Meteorological Society. Online Conference

Torres-Rua, A. "Challenges and opportunities of unmanned aerial vehicles in agriculture in the next decade." SPIE – International Society of Optics and Photonics, Online Conference.

2020 (7)

** Gao, R., et al. H008-0012Grapevine Leaf Area Index Estimation with Machine Learning and Unmanned Aerial Vehicle Information. American Geophysical Union Fall Meeting.

++Safre, A., et al. H026-03 Validation of the SAFER ET model using Landsat 8 and Sentinel-2 images over commercial vineyards in California. American Geophysical Union Fall Meeting.

Torres-Rua, A., et al. "AggieAir Applications in Agriculture", Aviation and AggieAir Flight Demo Day, Utah State University.

Alsina M. et al. "Evaluation of a Remote Sensing-based toolkit to monitor vine water use and status for irrigation scheduling in California vineyards." 7th International Conference on Drylands, Deserts, and Desertification, Ben-Gurion University of the Negev, Israel. https://dddconf.org/

Gao F. et al. "Satellite retrieval of vineyard leaf area index and impact of vine canopy structure and interrow cover crop on retrieval algorithm." 7th International Conference on Drylands, Deserts, and Desertification, Ben-Gurion University of the Negev, Israel. https://dddconf.org/

Torres-Rua A. et al. "The utility of UAV high-resolution imagery and point cloud data for canopy volume/structure/satellite LAI retrieval and T and E separation." 7th International Conference on Drylands, Deserts, and Desertification, Ben-Gurion University of the Negev, Israel. https://dddconf.org/

Kustas, W., et al. "Developing an Operational Evapotranspiration Toolkit for Vineyard Water Management: Perspectives from the GRAPEX Project," Earth Observation for Water Cycle Science, Italy.

2019 (7)

Kustas, W., et al. "B31N-2395 - Evaluating ET Partitioning in Vineyards from a Two-source Energy Balance Model using Land Surface Temperature from Canopy to Field Scale Resolutions.' American Geophysical Union Fall Meeting.

**Nassar A. et al. "B31N-2396 - Assessment of High-Resolution Daily Evapotranspiration Models Using Instantaneous sUAS ET in Grapevine Vineyards." American Geophysical Union Fall Meeting.

**Aboutalebi M. et al. "B42E-03 - Incorporation of Unmanned Aerial Vehicle (UAV) Point Cloud Product into Remote Sensing Evapotranspiration Models and Yield Estimation in Grapevine Vineyards." American Geophysical Union Fall Meeting.

 [Invited] Torres-Rua et al. "B54D-05 - Getting closer to Landsat: Advances from the GRAPEX Project in the Application of UAVs for High-Resolution Evapotranspiration", American Geophysical Union – Fall Meeting.

Torres-Rua A. "Vine water use/stress/architecture/canopy volume using UAVs," National Grape Research Alliance – US Department of Agriculture / Agricultural Research Service - Sensor Technology Workshop.

**Aboutalebi M. et al. "Two-Source Energy Balance Model (TSEB) with Internal LAI Estimation for Evapotranspiration Estimation Using sUAS High-Resolution Imagery over Vineyards, American Meteorological Society.

**Nassar A. et al. "Assessment of UAV Flight Times for Estimation of Daily High-Resolution Evapotranspiration in Complex Agricultural Canopy Environments, Universities Council on Water Resources.

2018 (10)

++Miksch M., et al. "H41Q-2359 Evapotranspiration and Energy Balance of Irrigated Urban Turfgrass", American Geophysical Union – Fall Meeting

++Garousi I., et al., "H34G-08 Assessment and Enhancement of National Water Model Height above Nearest Drainage Flood Inundation Mapping Using Planet CubeSat for the 2017 Bear River Flood Event", American Geophysical Union – Fall Meeting

**Aboutalebi M., et al. "H33I-2193 Assessment of Landsat Harmonized sUAS Reflectance Products Using Point Spread Function (PSF) on Vegetation Indices (VIs) and Evapotranspiration (ET) Using the Two-Source Energy Balance (TSEB) Model", American Geophysical Union – Fall Meeting

**Nassar A., et al. "H31B-08 Pixel Resolution Sensitivity Analysis for the Estimation of Evapotranspiration Using the Two-Source Energy Balance Model and sUAS Imagery under Agricultural Complex Canopy Environments", American Geophysical Union – Fall Meeting

McKee M.., et al. "B24D-05 Fusion of satellite and UAV imagery and big data for smarter farming". American Geophysical Union – Fall Meeting

Alsina M., et al. "B23D-08 CWSI derived from Landsat 8 thermal imagery as an affordable alternative to high-resolution imagery for irrigation management in California vineyards, American Geophysical Union – Fall Meeting

Kustas, W.; et al. "B23D-01 GRAPEX: A Project Integrating Ground, Aerial and Satellite Observations for Improved Water Management of Vineyards", American Geophysical Union – Fall Meeting

Torres-Rua, A; et al. '*Monitoring Reduced Irrigation in The Colorado River with Landsat",* Utah Geographic Information Council, Vernal, Utah

++Parajuli K. et al. "Evapotranspiration Estimates in Stony Soils using Noah-MP Land Surface Model." Soil Science Society of America Annual Meeting

Torres-Rua, "Remote Sensing for Irrigation Decisions," Utah Association of County Agricultural Agents Summer Meeting and Tour, Utah State University.

2017 (4)

** Aboutalebi M., et al., *"Assessment of different methods for shadow detection in high-resolution imagery and evaluation of shadows impact on calculation of NDVI, LAI, and evapotranspiration"* American Geophysical Union – Fall Meeting

Torres-Rua, A.; "*Remote Sensing as A Tool for Water Management*"; Utah State University Spring Runoff. Logan, Utah.

Kustas W. et al. "A Thermal-based Two-Source Energy Balance Model for Estimating Evapotranspiration over Complex Canopies, European Geophysical Union Meeting.

Torres-Rua, et al, "USDA Panel on Precision Agriculture", Society for Advancement of Chicanos/Hispanics and Native Americans in Science.

<u>Before Tenure Track Period</u>
2016
Torres-Rua, A. *"Vicarious Calibration of sUAS Thermal Imagery for Scientific Remote Sensing Applications."* American Geophysical Union – Fall Meeting.

++Hassan-Esfahani, L.; et al. *"Application of Unmanned Aerial Systems in Spatial Downscaling of Agricultural Parameters."* American Geophysical Union – Fall Meeting

2015
Nieto, H., et al.; *"Advances in the Two-Source Energy Balance (TSEB) model using very high-resolution remote sensing data in vineyards"* American Geophysical Union – Fall Meeting.

Torres-Rua, A., et al. "Spatial Surface Soil Moisture Using Landsat VI, ET, And Relevance Vector Machines," Universities Council on Water Resources, Las Vegas, NV.

++ King, T; et al.; *"High-resolution channel geometry from repeat aerial imagery"* American Geophysical Union – Fall Meeting.

McKee, M; et al.; *"Use of UAS to Support Management in Precision Agriculture: The AggieAir Experience"* American Geophysical Union – Fall Meeting.

2012
Torres-Rua, A. et al. American Geophysical Union – Fall Meeting, San Francisco, CA.

Torres-Rua, A. et al. American Water Resources Association – 40th Annual Utah Session Water Resources Conference, Salt Lake, UT.

Torres-Rua, A. et al. Society for Industrial and Applied Mathematics - International Conference in Data mining, Anaheim, CA.

Torres-Rua, A. et al. Utah State University – Spring Runoff Conference, Logan, UT.

2010
Torres-Rua, A. et al. Utah State University – Spring Runoff Conference, Logan, UT.

Torres-Rua, A. et al. Utah Water Users Workshop, St. George, UT.

2009
Torres-Rua, A. et al. American Water Resources Association – Summer Specialty Conference, Snowbird, UT.

2008
Torres-Rua, A. et al. American Water Resources Association – Annual Water Resources Conference, New Orleans, LA.

2007
Torres-Rua, A. et al. United States Committee on Irrigation and Drainage – International Congress of Irrigation and Drainage, Sacramento, CA.

INVENTION DISCLOSURES

During Tenure Track Period

2021
Torres-Rua, "Spatially estimating thermal emissivity," US Patent App. 17/230,498, 2021
2019
Torres-Rua, A., Spatial Estimation of thermal emissivity for IRT and microbolometer cameras for estimation of kinematic temperature. Utah State University Invention ID: D19018, filed April 17, 2019, Status: closed.
2017
Torres-Rua, A., Atmospheric calibration of aerial imagery using Arduino weather sensor. Utah State University Invention ID: D18030, filed September 21, 2017, Status: closed.

Torres-Rua, A., Vicarious calibration of microbolometer temperature cameras when used in UAVs or manned aircraft. Utah State University Invention ID: D17036, filed May 2, 2017, Status: closed.

AREAS OF EXPERTISE
Current Research Areas
- Water management and markets.
- Precision agriculture tools for Utah high value crops.
- Evapotranspiration and Water Stress in high value crops.
- Real-time Unmanned Aerial Vehicles remote sensing technology.
- Total and partial fallowing for consumptive water conservation in the Upper Colorado River Basin.

Prior Areas of Research
- Unmanned Aerial Vehicles data and products standardization
- Precipitation sources for agricultural water management
- Satellite applications for deficit irrigation in the Western US
- Unmanned Aerial Vehicles applications for yield estimation
- Agricultural water structures modeling

PROFESSIONAL ACTIVITIES
Reviewer:

During Tenure Track Period

> **Journals**
> **(6) 2021**
> (1) Water Resources Research
> (1) Land Degradation and Development

(1) Water
(1) Wiley Interdisciplinary Reviews
(1) Remote Sensing of Environment
(1) Computers and Electronics in Agriculture
(8) 2020
(3) Remote Sensing
(1) Scientific Reports
(2) Journal of Applied Remote Sensing
(1) Open Geosciences
(1) Sensors
(23) 2019
(3) Sensors
(1) Environmental Earth Sciences
(2) Journal of Applied Remote Sensing
 (6) Remote Sensing
(1) Water
(5) Agronomy
(1) Land Degradation and Development
(2) Agricultural Water Management
(1) Pakistan Journal of Scientific and Industrial Research
(1) Engineering Reports
(5) 2018
(4) Remote Sensing
(1) American Society of Agricultural and Biological Engineers - Applied Engineering in Agriculture
(16) 2017
(1) Revista Facultad de Ingenieria, Universidad de Antioquia
(2) Hortscience: A Publication of the American Society for Horticultural Science
(2) Journal of Irrigation and Drainage Engineering
(2) Sensors
(1) Journal of Applied Remote Sensing
(1) Transactions of the American Society of Agricultural and Biological Engineers
(4) Remote Sensing
(1) Irrigation Science
(1) Advances in Space Research
(1) Water

Before Tenure Track Period
(5) 2016
(1) Agricultural Water Management
(1) Journal of Irrigation and Drainage Engineering
(3) Water

Invited Lectures/Presentations

<u>During Tenure Track Period</u>

2022
Utah State University, *UAV applications in Urban Green Areas – Summer Course in Drone Applications*, Logan, Utah.
2020
La Molina National Agrarian University, *Technologies for Water Resources Monitoring*, Peru.
2019
Jorge Basadre Grohman National University, *Technologies for Water Resources Monitoring*, Peru.
US Department of Agriculture- National Grape Research Alliance, *UAV applications in Vineyards*, Sacramento, CA
American Geophysical Union – Fall Meeting. Getting closer to Landsat: Advances from the GRAPEX Project in the Application of UAVs for High-Resolution Evapotranspiration"
2018
Utah Association of County Agricultural Agents Summer Meeting and Tour, *Remote Sensing for Irrigation Decisions*, Heber City, UT
Utah Geographic Information Council, *Verification of Water Conservation from Deficit Irrigation in the Upper Colorado River Basin*, Vernal, UT
2017
SACNAS, US Department of Agriculture- Panel "*From Science to Commercial Applications: UAVs for Decision Making in Agriculture*," Salt Lake City, UT.
Utah State University Spring Runoff: *Remote Sensing as a Tool for Water Management*, Logan, UT

<u>Before Tenure Track Period</u>
2016
Association for Unmanned Vehicle Systems International, "*Using UAS in Agriculture: The AggieAir Experience*," New Orleans, LA.
Rural Water technology Alliance Workshop, "*Emerging Opportunities for Using Satellite Data in Farm Operations (for almost Free!)*", Orem, UT.
2015
SusTech, "*Development of Unmanned Aerial Systems for Use in Precision Agriculture: The AggieAir Experience*," Salt Lake City, UT.
World Bank, "*UAVs Applications for ET Mapping*" in International Workshop on Evapotranspiration Mapping for Water Security. DC
2012
La Molina Agricultural National University *Optimization and Learning Machine Models for Water Resources Management*, Lima, Peru.

Additional Service:

External

During Tenure Track Period

2022
Conference Session Organizer, Society of PhotoOptical Instrumentation Engineers
Stakeholder, OpenET Colorado River Basin Working Group
2021
Speaker, Utah Water Users Organization
Conference Session Organizer, Society of PhotoOptical Instrumentation Engineers
Stakeholder, OpenET Colorado River Basin Working Group
2020
Speaker, La Molina Agrarian University, Peru
Conference Session Organizer, Society of PhotoOptical Instrumentation Engineers
Panel Reviewer, National Science Foundation
Stakeholder, OpenET Colorado River Basin Working Group
2019
Speaker, Jorge Basadre Grohman National University, Peru
Stakeholder, OpenET Colorado River Basin Working Group
Panel Reviewer, NASA Research Opportunities in Space and Earth Science program
Panel Reviewer NASA Postdoctoral Program
Panel Member, Technical Standards American Society of Agricultural and Biological Engineers
    (UAV MS-60 Unmanned Aerial Systems)
Speaker, US Department of Agriculture- National Grape Research Alliance
2018
Panel Reviewer, National Science Foundation
Stakeholder, OpenET Colorado River Basin Working Group
Panel Reviewer, NASA Research Opportunities in Space and Earth Science program
Panel Reviewer NASA Postdoctoral Program
Panel Member, Technical Standards American Society of Agricultural and Biological Engineers
    (UAV MS-60 Unmanned Aerial Systems)
Panel Reviewer, National Science Foundation / US Department of Agriculture
Speaker, Utah Geographic Information Council
Proposal Reviewer, University of Wisconsin Water Resources Institute (WRI)
2017
Panel Reviewer NASA Postdoctoral Program
Panel Member, Technical Standards American Society of Agricultural and Biological Engineers
    (UAV MS-60 Unmanned Aerial Systems)
Speaker, USDA Panel on Precision Agriculture, Society for Advancement of Chicanos/Hispanics
    and Native Americans in Science.

Before Tenure Track Period

2013
Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit & Ministry of Economy of Peru.
2006
 Field Support, Utah Department of Natural Resources, Division of Water Rights water delivery system.

Internal

During Tenure Track Period

2022 – Speaker, Utah State University Latinxs in Action
2022 – Spring Runoff Conference Poster Participation
2022 – Utah Agricultural Experiment Station, proposal reviewer
2021 – Utah State University – Institute for Land, Water and Air – 2021 Report Water Contributor https://www.usu.edu/ilwa
2021 - 2022 Committee Member, Utah State University, Civil and Environmental Engineering Hiring Committee
Present - 2017 Seminar, Utah State University, Engineering Freshman Orientation Seminars, *Introduction to Irrigation Engineering*.
2020 – Proposal Reviewer, Utah State University, Graduate Research, and Creative Opportunities Grant Program
2020 – Speaker, Aviation and AggieAir Flight Demo. Utah State University Aviation and Technical Education
Present -2020 – Advisor, Utah State University, Society of Hispanic Professional Engineers Club
2020 - 2019 Committee Member, Utah State University, Civil and Environmental Engineering Hiring Committee
Present - 2019 – Seminar, Utah State University, Field Methods for Hydrology, *Estimation of Evapotranspiration*
2019 – Seminar, Utah State University, The Robotics Guys Elementary School Visit: *AggieAir Applications*
2019 – Seminar, Utah State University, Kenya Delegation Visit: *The Utah Water Research Laboratory*
2019 – Hosting, Utah State University, Peru Universities Delegation: *The AggieAir UAV Program*
2019 – Utah Agricultural Experiment Station, proposal reviewer
2019 – Member, Utah State University, Research Landscapes https://research.usu.edu/landscapes/
2019 – 2018, Seminar, Utah State University, GearUP, Logan, UT, http://utahstars.usu.edu/
2018 – Member, Utah State University, Latinx Cultural Center http://latinx.usu.edu/index
2018 – Participant, Utah State University, Intensive English Literature Institute, *Developing Instructional Videos for international teaching assistants* https://ieli.usu.edu/about/international-teaching-assistant-training
2018 – Seminar, Utah State University, *"The GRAPEX Project*."

2018 – Seminar, Utah State University, Japanese Delegation, *"The AggieAir Experience for Ag and Natural Resources."*

2018 – Seminar, Utah State University, Latter-Day Saints FarmLand Reserve Visit, *"AggieAir Experience in Commercial Agriculture."*

2018 – Speaker, Utah Association of County Agricultural Agents Summer Meeting and Tour.

2017 – Speaker, Spring Runoff Conference, Utah State University

Before Tenure Track Period

2013 – Support, Utah State University – Peru Memorandum of Understanding on Research, Capacity Building, and Training in Water Resources.

PROFESSIONAL SOCIETIES
During Tenure Track Period

2022 – 2018 Society of PhotoOptical Instrumentation Engineers

2021- 2010 American Geophysical Union

2018 -2016 American Society of Agricultural and Biological Engineers

Before Tenure Track Period

2011 American Society of Civil Engineers

SCIENTIFIC/MEDIA OUTREACH
During Tenure Track Period

2022 (1)

Alfonso Torres-Rua, Utah State Today, Utah State University "Life of a Latinx Leader Series Provides Inspiration, Tools to Thrive in Academia" https://www.usu.edu/today/story/life-of-a-latinx_leader-series-provides-inspiration-tools-to-thrive-in-academia Accessed February, 3, 2022.

2021 (5)

Alfonso Torres-Rua, Utah State Today, Utah State University "**USU Researchers Using Drones to Improve Water Management in Almond Production**" https://www.usu.edu/today/story/usu-researchers-using-drones-to-improve-water-management-in-almond-production   Accessed December, 06, 2021.

Alfonso Torres-Rua, Utah State Today, Utah State University "**Head Above Water: Major Grant Awarded for Research on Water Markets**" https://www.usu.edu/today/story/head-above-water-major-grant-awarded-for-research-on-water-markets Accessed November, 23, 2021.

Alfonso Torres-Rua, Utah State Today, Utah State University "**USU Researchers Using Drones to Improve Water Management in Almond Production**" https://www.usu.edu/today/story/usu-researchers-using-drones-to-improve-water-management-in-almond-production Accessed December, 6, 2021.

**Karem Meza-Capcha, Student Spotlight, College of Engineering, Utah State University https://engineering.usu.edu/news/main-feed/2021/student-spotlight-karem-belen-meza-capcha, Accessed Oct 26, 2021

Alfonso Torres-Rua, Utah Water Research Laboratory "Real-time Generation of Aerial Maps for Immediate Utah Water Decision-Making Activities" https://uwrl.usu.edu/research-projects/project-details?hUDcuEMQVzrw85PrgdmY Accessed October,1, 2021

2020 (3)

Alfonso Torres-Rua, La Molina National Agrarian University "Technologies for Water Resources Monitoring" http://www.lamolina.edu.pe/Gaceta/edicion2020/notas/nota003.htm, Accessed May 22, 2020

**Ayman Nassar, Utah Water Research Laboratory Outstanding Student Spotlight, Utah State University: https://uwrl.usu.edu/news/main-feed/2020/ayman-nassar-spotlight, Accessed May 21, 2020.

Alfonso Torres-Rua, "AggieAir GreatBlue Demonstration 10/1/2020", https://www.youtube.com/watch?v=nkiKwGUDRcQ&list=UUlD3RhknL7Tcwi-nQqDMGhw&index=7 Accessed May, 27, 2022.

2019 (6)

The Utah Water Research Laboratory: Empowering Water and Environmental Research in Utah and Around the World,
September 2019 IMPACT Magazine, Water Resources Association.

Alfonso Torres-Rua, Utah Water Research Laboratory Outstanding Faculty Spotlight, Utah State University
https://uwrl.usu.edu/news/main-feed/2019/alfonso-torres-spotlight Accessed June 14, 2019

**Mahyar Aboutalebi, Utah Water Research Laboratory Outstanding Student Spotlight, Utah State University:
https://uwrl.usu.edu/news/main-feed/2019/aboutalebi-mayhar-spotlight, Accessed June 14, 2019

**Mahyar Aboutalebi Receives Society of Photonic and Industrial Engineering Award
https://uwrl.usu.edu/news/main-feed/2019/mahyar-spie-award Accessed June 14, 2019.

**Ayman Nassar receives American Water Works Association Intermountain Section Scholarship
https://uwrl.usu.edu/news/main-feed/2019/ayman-nassar-scholarship-2019 Accessed June 14, 2019

Alfonso Torres-Rua, Utah Water Research Laboratory "USU Stars! Gear Up Summer Engineering Camp" https://uwrl.usu.edu/research-projects/project-details?BM9bDgT3uTKLKXS9MPNc Accessed May, 1 2019

2018 (2)

Keeping An Eye On Crop Yield: Water bLog Newsletters December 2018
https://uwrl.usu.edu/files/pdf/newsletters/waterblog-2018-dec.pdf Accessed June 14, 2019

AggieAir Partners with Utah State University Facilities to Discover Energy Loss on Utah State Campus
https://uwrl.usu.edu/news/main-feed/2018/aggieair-usuheatloss Accessed June 14, 2019

2017 (6)

Featured Cover Page of Bulletin of the American Meteorological Society September issue.
https://journals.ametsoc.org/view/journals/bams/99/9/BAMS_999_cover1.xml

Utah State University Saving Water, Reducing Runoff and Cutting Costs (2017) US Department of Agriculture Dec 2017
https://agresearchmag.ars.usda.gov/2017/dec/water Accessed December 15, 2017
Agricultural Drones: Current Capabilities Overview and Future Directions
https://zhuanlan.zhihu.com/p/27721855 Accessed June 14, 2019
Remote Sensing as a Tool for Water Management www.youtube.com/watch?v=3TwESllHaf4
Viticulture from Space: Utah State University-NASA Study Analyzes Vineyard Water Use (2017). Utah State Engineer -Utah State University.
https://engineering.usu.edu/news/2017-10-02-viticulture. Accessed October 27, 2017.
Technologies will tackle irrigation inefficiencies in agriculture's drier future (2015) The Conversation. May 27, 2015,
https://theconversation.com/technologies-will-tackle-irrigation-inefficiencies-in-agricultures-drier-future-40601 Accessed October 27, 2017.

Before Tenure Track Period
2013
Episode 4: Forecasting a Crop's Water Needs, Utah Public Radio (2013) – Utah State University. October 22, 2013,
http://upr.org/post/episode-4-forecasting-crops-water-needs . Accessed October 27, 2017

PROFESSIONAL DEVELOPMENT
During Tenure Track Period

2020 -2018 South Big Data Hub-Team Seminar Series (online)
2020 - Drought 2020: Let's Talk about Soil, US Department of Agriculture Southwest Climate Hub (online)
2020 - "Water Well with Center for Water-Efficient Landscaping Webinar: Grey Water Action." Utah State University (online)
2021 – The Role of the Syllabus in Water Resources and Engineering Class Development, webinar, The American University in Cairo and Utah State University.
2019 – American Geophysical Union Artificial Intelligence Workshop, San Francisco, CA
2019 – National Science Foundation Faculty Development Symposium, Cleveland, OH
2019 - OpenET Workshop, Reno, NV
2019 – Empowering Teaching Excellence Conference, Logan UT
2018 - National Science Foundation Faculty Development Symposium, Cleveland, OH
2018 – Utah State University College of Engineering Junior Faculty Workshop, Logan UT
2018 - Empowering Teaching Excellence Seminar, Logan UT
2018 - Utah State University Undergraduate Research Mentor Program, Logan UT
2018 - Big Data in Agriculture, Houston, Tx
2018 - Empowering Teaching Excellence Conference, Logan UT
2018 – Gradschoolmatch Seminar, Online
2018 - OpenET Workshop, Reno, NV
2017 - Utah State University Strong Mentorship for Undergraduates breakfast, Logan, UT
2017 - Google Earth Engine Workshop, Palo Alto, CA.

2017 - National Science Foundation Career Proposal Workshop, DC.
2017 - Write Winning Grants Workshop, Logan, UT.
2017 – Utah State University Teaching Academy.

Before Tenure Track Period
2016 - Proposal Writing Institute, Logan, UT.
2016 - SmallSats Conference, Logan, UT.
2015 - Conference on Characterization and Radiometric Calibration for Remote Sensing, Logan, UT.
2014 – 2020 -NASA Applied Remote Sensing Training
2012 - METRIC – Spatial Evapotranspiration Workshop, Reno, NV.
2011 - Western States Evapotranspiration Workshop, Boise, ID.
2004 - Inter-American Development Bank, "Project Management Series" (online)

STUDENTS
Current Undergraduate Students
　　　none
Current Graduate Students

　　　Committee Member
　　　Eliza Flint, PhD, Plant, Soils and Climate (Committee Member)
　　　Jonathan Holt, PhD, Plant, Soils and Climate (Committee Member)
　　　Mathew Crump (Ph.D.) Plant Soil Climate (Committee Member)
　　　Chad Withers, MS, Civil and Environmental Engineering (Committee Member)
　　　Major Advisor
　　　Oliver Hargreaves, MS., Civil and Environmental Engineering (Advisor)
　　　Laura Christiansen, MS., Civil and Environmental Engineering (Advisor)
　　　Karem Meza, PhD., Civil and Environmental Engineering (Advisor)
　　　Rui Gao, PhD., Civil and Environmental Engineering (Advisor)
　　　Katherine Osorio-Diaz, PhD, Civil and Environmental Engineering (Advisor)
　　　Anderson Safre., PhD, Civil and Environmental Engineering (Advisor)

Previous Undergraduate Students
　　　2022 Tyler Jackson, Civil and Environmental Engineering (Mentor, 2019 Outstanding Pre-Professional Award)
　　　2020 Paolo Consalvo, Civil and Environmental Engineering (Mentor, Honors Program)
　　　2017 Tim Clark, Civil and Environmental Engineering (Co-Advisor)
　　　2017 Ethan Sunderland, Civil and Environmental Engineering (Co-Advisor)

Previous Graduate Students
　　　2022 Aldeen Attaallah, PhD., Civil and Environmental Engineering (Committee Member)
　　　2022 Irene Garousi, Ph.D., Civil and Environmental Engineering (Committee Member)
　　　2022 Ayaa, Patricia, Ph.D., Civil and Environmental Engineering (Committee Member)
　　　2022 Chod Stevens, PhD., Plant Soil Climate (Committee Member)

2021 Ayman Nassar, PhD., Civil and Environmental Engineering (Advisor)
2020 Mahyar Aboutalebi, PhD., Civil and Environmental Engineering (Advisor)
2020 Rahman, Ashikur, MS Civil and Environmental Engineering (Committee Member)
2020 Bugra Bugdayci, PhD., Civil and Environmental Engineering (Committee Member)
2020 Tyler Ashby, MS., Civil and Environmental Engineering (Committee Member)
2019 Miksch, Matthew, MS, Plant Soil Climate (Committee Member)
2018 Tyler King, Ph.D., Civil and Environmental Engineering (Committee Member)
2018 Kshitij Parajuli, Ph.D., Civil and Environmental Engineering (Committee Member)
2018 Leah Richardson, M.S., Civil and Environmental Engineering (Committee Member)

Before Tenure Track Period
2016 Manal Elarab, Ph.D., Civil and Environmental Engineering (Project Director)
2015 Leila Hassan, Ph.D., Civil and Environmental Engineering (Project Director)
2013 Roula Bachour, Ph.D., Civil and Environmental Engineering (Project Director)

Previous Visitor Scholars
2020 Emre Tunca, PhD., Civil and Environmental Engineering (Visiting Scholar Mentor)
2020 Anderson Safre, PhD., Civil and Environmental Eng (Visiting Scholar Mentor)
2017 MaryJane Diniz De Araujo, Civil and Environmental Eng (Visiting Scholar Mentor)

TEACHING
Utah State University Classes
2022
Civil and Environmental Engineering, "GIS for Civil Engineering."
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."
2021
Civil and Environmental Engineering, "GIS for Civil Engineering."
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."
2020
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."
2019
Civil and Environmental Engineering: "Agricultural Water Management."
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."
2018
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."
2017
Civil and Environmental Engineering: "Remote Sensing of Land Surfaces."

Before Tenure Track Period
2016
Civil and Environmental Engineering: "Field Irrigation System Design and Evaluation."
2014
 Civil and Environmental Engineering: "Management of Irrigation Systems."

Utah State University Workshops/Lectures
2022
Civil and Environmental Engineering: "Evapotranspiration -Hydrology for Civil Engineers."
Civil and Environmental Engineering: "Introduction of Irrigation Engineering."
2021
Civil and Environmental Engineering: "Evapotranspiration -Hydrology for Civil Engineers."
Civil and Environmental Engineering: "Introduction of Irrigation Engineering."
2020
Aviation and Technical Education: "Drones in Agriculture."
Civil and Environmental Engineering: "Evapotranspiration -Hydrology for Civil Engineers."
Civil and Environmental Engineering: "Introduction of Irrigation Engineering."
2019
Civil and Environmental Engineering: "Evapotranspiration -Hydrology for Civil Engineers."
Civil and Environmental Engineering: "Introduction of Irrigation Engineering."

Before Tenure Track Period
2013
Civil and Environmental Engineering: "Data mining and Optimization - Water Resources Systems
    Analysis."
2011
Civil and Environmental Engineering: "First Workshop on Data Mining Techniques Applied to
    Water Resources (5 sessions)"
Civil and Environmental Engineering: "Hydraulic modeling - Open Channel Hydraulics."
2010
 Biological and Irrigation Engineering: "Remote Sensing Applications - Surface Irrigation Design."
2009
Civil and Environmental Engineering: "Datamining - Division of Environmental Engineering
Seminar."