

# Ronnie Abolafia-Rosenzweig, Ph.D.

<https://cires.colorado.edu/cga-member/ronnie-abolafia-rosenzweig>

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## Education

**Ph.D. Civil, Environmental, and Architectural Engineering, Emphasis: Hydrology, 2020**

University of Colorado Boulder, Boulder, CO

Dean's Graduate Assistantship Recipient and Doctoral Assistantship of Excellence

**B.S. Civil Engineering, 2016 (Summa Cum Laude)**

Texas A&M University, College Station, TX

Concentration: Environmental Engineering

Dean's Honor Roll: Fall 2014-Spring 2016

## Professional Experience

**Postdoctoral Research Scientist**

2020-Present

**National Center for Atmospheric Research (NCAR)**

- Improve and assess Noah-MP land surface model flood and drought predictability

**Doctoral Research Assistant**

2017-2020

**University of Colorado Boulder and Cooperative Institute for Research in Environmental Science (CIRES)**

- Quantify the terrestrial water budget using physical models and remote sensing
- Communicate research through journal articles and conference presentations

**Technical Expert/Research Assistant**

2019-2020

**USAID, RTI International**

- Calibrate a land surface model to simulate predictions of hydrologic states through 2050 over the Balkan region and Albanian reservoirs

**Hydrological Scientist Student Intern**

Summer 2019 and Summer 2020

**NASA Goddard Space and Flight Center Hydrological Sciences Laboratory, Greenbelt, MD**

- Terrestrial water budget simulations with Noah-MP.4.0.1 land surface model in data assimilation systems
- Developed particle filter data assimilation algorithm for NASA's Land Information System

**Reviewer for Educational Resources on Climate**

Spring 2020

**Climate Literacy & Energy Awareness Network (CLEAN), funded by NOAA, NSF, and the U.S. DOE**

- Reviewed hydrometeorology and hydroclimate resources for CLEAN, which provides expert-reviewed resources to K-12 and undergraduate students

**Graduate Mentor**

2019-2020

**Discovery Learning Apprenticeship, University of Colorado Boulder**

- Mentored an undergraduate student (mathematics major), holding weekly meetings with him to develop his skills in computational data analysis while contributing to on-going research

**Teaching Assistant**

Fall 2018

**CVEN 3323: Hydraulic Engineering, University of Colorado Boulder**

- Taught 70 junior and senior level students closed and open channel hydraulics

**Land Data Assimilation System Student Intern**

Summer 2018

**NOAA/National Weather Service, Environmental Modeling Center, College Park, MD**

- Validated soil moisture outputs from NLDAS land surface models with remote sensing and ground-based observations

## Relevant Skills

Physical Modeling: Noah-MP and Variable Infiltration Capacity Land Surface Models, NASA Land Information System

Programming and geospatial data processing: R Statistical Computing, MATLAB, Perl, Fortran 90, NCO, CDO to process various data formats, e.g. GRIB, HDF, NetCDF, ASCII

Operating systems: in Linux, Mac, and Windows

Supercomputing: SLURM

Machine Learning: linear regression, generalized linear models, generalized additive models, kriging, principle component analysis, classification and regression tree and clustering

Data Assimilation: Ensemble Kalman Smoother and Particle Batch Filter and Smoother

Remote sensing data analysis: AVHRR, CHIRPS, ECOSTRESS, GLEAM, GRACE, MSWEP, MODIS, PERSIANN, Sentinel-1, SMAP, SRTM, TRMM

### **Peer-Reviewed Publications**

- Abolafia-Rosenzweig, R.,** Livneh, B., Pan, M., Zeng, J.L., (2021). Remotely sensed ensembles of the terrestrial water budget over major global river basins: An assessment of three closure techniques. *Remote Sensing of Environment*. <https://www.sciencedirect.com/science/article/pii/S0034425720305642>
- Abolafia-Rosenzweig, R.,** Livneh, B., (2020). Including human activity in estimates of the terrestrial water cycle using models and remote sensing satellites. *Doctoral Dissertation*.
- Abolafia-Rosenzweig, R.,** Livneh, B., Small, E.E., Badger, A.M., (2020). A continental-scale soil evaporation dataset derived from Soil Moisture Active Passive satellite drying rates. *Scientific Data*. <https://rdcu.be/ca4ku>
- Abolafia-Rosenzweig, R.,** Livneh, B., Small, E.E., Kumar, S.V., **2019**. Soil moisture data assimilation to estimate irrigation water use. *Journal of Advances in Modeling Earth Systems*, <https://doi.org/10.1029/2019MS001797>.
- Small, E., Badger, A., **Abolafia-Rosenzweig, R.,** and Livneh, B., **2018**. Estimating Soil Evaporation Using Drying Rates Determined from Satellite-Based Soil Moisture Records. *Remote Sensing* 10, no. 12 <https://doi.org/10.3390/rs10121945>.

### **In review:**

- Jalilvand, E., **Abolafia-Rosenzweig, R.,** Das, N., (*in review*). Does SMAP/Sentinel 1 high-resolution soil moisture data contain sufficient irrigation signal over an agricultural region? *Remote Sensing of Environment*.

### **Public Data**

- Abolafia-Rosenzweig, R.,** Livneh, B., **2020**. “Remotely sensed ensemble of the water cycle”, Mendeley Data, v3, <http://dx.doi.org/10.17632/r24rdxt73j.3>.
- Abolafia-Rosenzweig, R.;** Badger, A.; Small, E.; Livneh, B., **2020**, “E-SMAP: Evaporation-Soil Moisture Active Passive”, Mendeley Data, v2, <http://dx.doi.org/10.17632/ffw8zbdm2>.

### **Public Code**

- Particle filter data assimilation algorithm for NASA’s Land Information System (<https://github.com/NASA-LIS/LISF/tree/master/lis/dataassim/algorithm/pf>)
- Code repository for E-SMAP soil evaporation dataset (<https://github.com/RAbolafiaRosenzweig/ESMAP>)

### **Outreach and Service**

**Media:** **Abolafia-Rosenzweig, R., 2020.** A GREAT WAY TO MEASURE IRRIGATION, Whiteboard Animation available at: [https://www.youtube.com/watch?v=y1yxz2ZpM9k&feature=emb\\_logo](https://www.youtube.com/watch?v=y1yxz2ZpM9k&feature=emb_logo)

**Policy:** Texas Rapporteur for [Tracking COVID-19 Policymaking](#)  
International Network for Government Science Advice (INGSA)

**Reviewer:** *Remote Sensing, Water Resources Research*

### **Selected Conference Presentations**

- Abolafia-Rosenzweig, R.** Livneh, B., Pan, M., American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 2019: *REESEN: A remotely sensed ensemble for estimating the terrestrial water balance* (oral).
- Abolafia-Rosenzweig, R.** Livneh, B., Badger, A.M., and Small, E.E., American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 2019: *A SMAP-based Continental-scale Soil Evaporation Dataset* (oral).
- Abolafia-Rosenzweig, R.** Livneh, B. and Small, E.E., Cooperative Institute for Research in Environmental Sciences Rendezvous, Boulder, Colorado, May 2019: *A data assimilation framework to estimate irrigation: merging soil moisture retrievals with land surface models* (poster).
- Abolafia-Rosenzweig, R.,** Livneh, B., Xia, Y., Mocko, D., Dirmeyer, P., Kumar, S., Peters-Lidard, C., Wei, H., Kain, J., Annual Meeting of the American Meteorological Society, Phoenix, Arizona, Jan. 2019: *Comparing Operational NLDAS-2 and Experimental NLDAS-3 Soil Moisture with Observational Soil Moisture Data from In-Situ Networks and SMAP Remote Sensing* (oral).
- Abolafia-Rosenzweig, R.,** Livneh, B., Small, E. E., Badger, A. M., Kumar, S., American Geophysical Union Fall Meeting, Washington, DC, Dec. 2018: *A framework for predicting irrigation through soil moisture data assimilation* (oral).
- Abolafia-Rosenzweig, R.,** Livneh, B., Small, E. E., Annual Meeting of the American Geophysical Union Hydrology Days, Fort Collins, Colorado, Mar. 2018: *Evaluation of soil moisture data assimilation to improve hydrologic partitioning over agricultural areas* (poster).