# Elahe Tajfar


CONTACT INFORMATION

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Google Scholar


EDUCATION

- **Ph.D., Civil Engineering** (Major: Environmental Engineering) *2014 – 2019*
  *The University of Hawai'i at Manoa* *Honolulu, HI*

PROFESSIONAL EXPERIENCE

- **NASA Jet Propulsion Laboratory** *Pasadena, CA*
  *Post-doctoral Scholar* *Jan 2023 – Present*
  *Advisor: Dr. Madeleine Pascolini-Campbell*

  - **Projects**:
    - Analyze a wide range of hydrology, surface energy balance and carbon satellite data as well as land surface model input.
    - Characterize the link between the energy, carbon, and water cycles at regional to global scales.
    - Synthesis different satellite data, observations, and land surface model output.
    - Disentangle the role of the land use and vegetation on the partitioning of energy and water balance component.

- **University of Arkansas** *Fayetteville, AR*
  *Post-doctoral Fellow* *Apr 2020 – Jan 2023*
  *Advisor: Dr. Benjamin R. Runkle*

  - **Projects**:
    - Synthesis of Carbon and Water Fluxes from various landscapes and under different types of conservation-oriented irrigation management in the U.S. Mid-South.
    - A Network of Evapotranspiration Observation Sites to Constrain ET Estimation Methods and Water Availability Models in the Mississippi Alluvial Plain (Open ET).

- **University of Hawai'i at Manoa** *Honolulu, HI*
  *Research Assistant* *2014 – 2019*
  *Advisor: Dr. Sayed M. Bateni*

  - **Thesis:** Estimation of Turbulent Heat Fluxes via the Synergistic Assimilation of Land Surface Temperature, Air Temperature and Specific Humidity into a Variational Data Assimilation Model

- Assimilating sequences of air temperature and specific humidity into an atmospheric boundary layer model within a variational data assimilation (VDA) framework to estimate turbulent heat fluxes as well as atmospheric boundary layer (ABL) height, potential temperature, and humidity. Applications: Accurate estimation of evaporation, irrigation scheduling, drought monitoring, weather forecasting.

- Advancing the existing VDA approach by the synergistic assimilation of land surface temperature, air temperature and specific humidity into a coupled land surface-atmospheric boundary layer model to estimate turbulent heat fluxes.
- Estimation of snow depth equivalent using snow depth data and Gene Expression Programming.
- Evaluating the effect of groundwater on land surface temperature.

- **University of Hawai'i at Manoa** (CEE Department) *Honolulu, HI*
  - Teaching Assistant (Fluid Mechanics Fundamental) *2017 – 2018*
  - Laboratory Instructor (Hydraulics Lab) *2017 – 2018*
  - Instructor (Fluid Mechanics, Hydraulics and Hydrologic Systems, Dynamics, Statics) *2017 – 2018*

RESEARCH INTERESTS

- Carbon and Water Cycling
- Climate Change
- Sustainable Agriculture
- Land-Atmosphere Interaction
- Data Assimilation
- Numerical Hydrology
- Weather Forecasting and Climate Prediction
- Probabilistic and Statistical Approaches in Hydrology
- Environmental Systems Analysis
- Optimization Techniques in Environmental Engineering

COMPUTERE SKILLS

MATLAB, LINGO, R, Python, Scilab, Gene Expression, HEC-HMS, MODFLOW, Arc GIS, SWAT, ETABS, AutoCAD

SELECTED GRADUATE LEVEL COURSES

- Surface-Water Hydrology
- Groundwater Hydrology
- Remote Sensing
- Satellite Meteorology
- System Analysis Engineers

INVITED SPEAKER

- JPL Carbon Club Seminars, November 3, 2022.

SELECTED LEADERSHIP EXPERIENCE

- Group Leader, Introduction to Data Science workshop at Purdue University, Summer 2018.
- Group Leader, East-West Center Culthural Booth Event, Fall 2019.
- Group Leader, Persian Dance Performance at International Night, UH Manoa, 2015. Persian New Year Event, UH Manoa, 2015. Honolulu Museum of Art, 2015. Shangri La, Museum of Islamic Art, Culture and Design, Honolulu, 2017.

SELECTED HONORS AND AWARDS

- Recipient of Graduate Study Scholarship, UH Manoa, 2014 – 2019.
- Recipient of Graduate Student Organization Scholarship, Fall 2015.
- Recipient of Graduate Division Achievement Scholarship-Civil & Environmental Engineering, Spring 2019.
- Recipient of June Chun Naughton International Student Services Scholarship, Fall 2017 – Spring 2018.
- Recipient of Everett E. Black Scholarship, Fall 2016 – 2019.
- Ranked second place in 2017 Hawai'i Water Environment Association Annual Conference, Honolulu, Hawai'i, USA.
- Ranked top 1% of Iran's M.Sc. National Entrance Examination in Civil Engineering.
- Ranked top 1% of Iran's B.Sc. National Entrance Examination.

SELECTED WORKSHOP ATTENDED

- Eddy Covariance Training Course, LI-COR Biosciences, Lincoln, NE, 2022.
- SEC Emerging Scholar Program, Louisiana State University (virtual), 2021.
- GHG Flux Inversion, ACT-America Community Workshop (virtual), 2020.
- Introduction to Data Science & Interdisciplinary Research Team, Purdue University, 2018.
- Introduction to Data Science Workshop, Purdue University, 2017.
- Data Analysis Using Python, The Hawai'i Data Science Institute, 2018.

REVIEWER

- Sustainability Journal, 2023.
- International Journal of Biometeorology, 2022.
- International Journal of Climatology, 2020.
- Outstanding Student Presentation Award (OSPA) Program at the American Geophysical Union (AGU), 2020.

MEMBERSHIP AND AFFILIATION

- American Geophysical Union **(AGU)**
- Environmental Dynamics Program Postdoctoral Affiliate – University of Arkansas
- East-west Center Affiliate – University of Hawaii at Manoa
- American Society of Civil Engineers **(ASCE)**
- Iranian Society of Civil Engineers **(ISCE)**

PUBLICATIONS AND PRESENTATIONS

- Tajfar, E., Bateni, S. M., Margulis, S. A., Gentine, P., and Auligne, T. (2019). "Estimation of turbulent heat fluxes via assimilation of air temperature and specific Humidity into an atmospheric boundary layer model." Journal of Hydrometeorology, 21(2), 205-225, https://doi.org/10.1175/JHM-D-19-0104.1.

- Tajfar, E., Bateni, S. M., Lakshmi, V., and Ek, M. (2020a). "Estimation of surface heat fluxes via variational assimilation of land surface temperature, air temperature and specific humidity into a coupled land surface-atmospheric

boundary layer model." Journal of Hydrology, 583, 124577, https://doi.org/10.1016/j.jhydrol.2020.124577.

- Tajfar, E., Bateni, S. M., and Xu, T. (2020b). "Evaluating the information content of reference-level air temperature and humidity for partitioning the available energy between the turbulent heat fluxes in different vegetative and climatic conditions." Remote Sensing, 12(7), 1065, https://doi.org/10.3390/rs12071065.

- Parazoo, N., Bowman, K., Baier, B., Liu, J., Lee, M., Kuai, L., Shiga, Y., Baker, I., Whelan, M., Feng, S., Krol, M., Sweeney, C., Runkle, B., Tajfar, E., and Davis, K. (2021). "Covariation of airborne biogenic tracers ($CO_2$, COS, and CO) supports stronger than expected growing season photosynthetic uptake in the southeastern US." Global Biogeochemical Cycle (DOI: 10.1029/2021GB006956).

- Tajfar, E., Reba, M. L., Suvočarev, K., Reavis, C., Moreno-García, B., Fong, B., Chiu, Y. L., Runkle, B. R. K., (2022a). "Evaluating the effect of rice irrigation management practices on net ecosystem exchange of $CO_2$." (to be submitted to the Agricultural and Forest Meteorology).

- Tajfar, E., Volk, J., Reba, M. L., Fong, B., Novick, K. A., Runkle, White, P. M., Bhattacharjee, J., Runkle, B. R. K., (2022b). "Evapotranspiration in the U.S. mid-South: Estimating crop coefficients with gridMET and eddy covariance observations across 40 field-seasons." (to be submitted to the Agricultural and Forest Meteorology).

- Tajfar, E., Bateni, S. M., Almazroui, M., Xu, T., Jun, C., (2022c). "Variational assimilation of land surface temperature, air temperature and specific humidity to estimate turbulent heat fluxes in contrasting hydrologic and vegetative conditions." (In preparation).

- Tajfar, E., Reba, M. L., Fong, B., Suvočarev, K., Reavis, C. W., Moreno-García, B., Chiu, Y. L., Runkle, B. R. K., (2022). "Effects of irrigation management practices on net ecosystem exchange of $CO_2$ in the U.S. mid-South rice fields." 2022 Ameriflux Annual Meeting (virtual conference).

- Tajfar, E., Volk, J., Reba, M. L., Fong, B., Novick, K. A., Runkle, White, P. M., Bhattacharjee, J., Runkle, B. R. K., (2022). "Bias-corrected crop coefficients for different land cover types in the U.S. mid-South derived from eddy covariance measurements and the gridMET dataset." 2022 AGU Fall Meeting, Chicago, USA.

- Tajfar, E., Reba, M. L., Fong, B., Novick, K. A., White, P. M., Bhattacharjee, J., Runkle, B. R. K., (2021). "Evapotranspiration in the Mid-South US: Estimating

crop coefficients with gridMET and eddy covariance observations across 32 field-seasons." 2021 Ameriflux Annual Meeting (virtual conference).

- Tajfar, E., Reba, M. L., Fong, B., Reavis, C., Runkle, B. R. K., (2021). "Estimating crop coefficients for rice fields in the U.S. mid-South using eddy covariance measurements and the gridMET dataset." 2021 AGU Fall Meeting, New Orleans, USA.

- Tajfar, E., Runkle, B. R. K., Reba, M. L., Fong, B., White, P. M., Bhattacharjee, J., Krauss, K., Novick, K. A., (2020). "The impact of land cover on net ecosystem exchange of $CO_2$ in the US Mid-South." 2020 Ameriflux Annual Meeting (virtual conference).

- Tajfar, E., Reba, M. L., Suvočarev, K., Reavis, C., Moreno-García, B., Fong, B., Chiu, Y. L., Runkle, B. R. K., (2020). "Variations of net ecosystem exchange of $CO_2$ in Arkansas rice fields." 2020 AGU Fall Meeting (virtual conference).

- Tajfar, E. (2018). "Assessing the variation of dissolved oxygen deficit as the indicator of water pollution in a river system using optimization-simulation models." 2018 Hawai'i Water Environment Association Annual Conference, Hawai'i Convention Center, Honolulu, Hawai'i, USA.

- Bateni, S. M., Tajfar, E., Neale, C., Auligne, T., and Xu, T. (2018). "Estimation of turbulent heat fluxes over different sites with contrasting climate and Vegetation conditions via variational assimilation of air temperature and specific humidity." 2018 AGU Fall Meeting, Washington, D.C., USA.

- Tajfar, E., Bateni, S. M., Gentine, P., Baltink, H. K., and Bosveld, F. (2017). "Variational assimilation of land surface temperature, specific humidity and air temperature and the estimation of turbulent heat fluxes." WaterSmart Innovations (WSI) Conference, Las Vegas, USA.

- Bateni, S. M., and Tajfar, E. (2017). "Estimation of turbulent heat fluxes by assimilation of land surface temperature, air temperature, and specific humidity into a coupled land surface-atmospheric boundary layer model." 2017 AGU Fall Meeting, San Francisco, California, USA.

- Tajfar, E., and Bateni, S. M. (2017). "Estimating surface energy fluxes using a variational data assimilation approach: A case study (Daman Site)." 2017 Hawai'i Water Environment Association Annual Conference, Hawai'i Convention Center, Honolulu, Hawai'i, USA.

- Tajfar, E. (2017). "A comparison of linear and dynamic programming models for stream water quality management." 2017 Hawai'i Water Environment

Association Annual Conference, Hawai'i Convention Center, Honolulu, Hawai'i, USA.

- Tajfar, E., Bateni, S. M., Gentine, P., and Margulis, S. A. (2017). "Estimation of surface heat fluxes via variational assimilation of air temperature and specific humidity." 2017 American Meteorological Society (AMS), Washington State Convention Center, Seattle, Washington, USA.

- Ranjbar, M. H., Tajfar, E., and Bateni, S. M. (2015). "Estimation of residence time in the Gorgan Bay via a 3D coupled model." 2015 Hawai'i Water Environment Association Annual Conference, Hawai'i Convention Center, Honolulu, Hawai'i, USA.