Metadata Records
Irrigation Innovation Consortium-Supported Project Datasets

Please use a separate sheet for each dataset. Answers are automatically saved.
Questions? Contact Diane DeJong: diane.de_jong@colostate.edu.

Thank you!

Question	Answer
Project name	AI Model for Estimating Crop Water Demand: An Artificial Intelligence (AI) Model to Improve Agricultural Water Use Efficiency Using Field, Plant, and Weather Data – Case Study
Project background	Relying on evapotranspiration to determine the amount of irrigation to apply is a common practice but can result in over or under irrigating. Identifying which other parameters are most important for contribute to estimating crop water requirement is useful to better predict crop water requirements and apply water more accurately in real time. This team used AI to developed a model using AI to capture and better understand the general pattern and dynamics of the crop water requirement.
Dataset name	Plant-water-soil continuum data
Primary author Include first & last name, institution affiliation, and email address.	Fayzul Pasha, Ph.D., P.E. , California State University, Fresno; mpasha@csufresno.edu
Primary contact The primary contact may be the same or different from the primary author. Include first & last name, institution affiliation, and email address.	Fayzul Pasha, Ph.D., P.E. , California State University, Fresno; mpasha@csufresno.edu
Dataset description Please provide a brief, clear summary description of the dataset contents. Indicate as applicable: purpose and scope; time period; areas of investigation; and any other special characteristics.	Weather including evapotranspiration, solar radiation, average air temparature, soil temp, relative humidty, wind speed, soil moisture etc. at daily time step
Spatial coverage Please be specific as possible about the geographic coverage of your data, and record the information according to defined standards, such as FGDC or the Getty Thesaurus of Geographic Names. You can enter lat/long data, county names, state names, etc.	The research field which is a 20 acres olive orchard is located at the University Agricultural Lab on Fresno State Campus.
Temporal coverage Describe the temporal coverage of your dataset: Start: Time of day, Date, Month, Year Finish: Time of day, Date, Month Year	Daily data from January 2016 to December 2019
Re-use limitations Describe known problems or caveats that would limit reuse of the data (e.g., uncertainty, sampling problems, blanks, quality control samples) and/or that future potential users of your dataset should know about. Or indicate "None."	

Citations Please include full citations and DOIs for articles published based on or related to this dataset. Or indicate "None."	Pasha, M. F. K., Lundeen, A., Pasha, D. F., Yeasmin, D., Nishikawa, N., and Valenzuela, G. (2021). "A Numerical Model to Quantify Plant Water Intake." World Water and Environmental Resources Congress, Virtual Online, ASCE, June 7-11, 2021 (Accepted). Pasha, M. F. K., Srinivasamurthy, N., Yeasmin, D., and Valenzuela, G. (2020). "Numerical Techniques to Analyze Crop Water Requirement Using Weather and Soil Moisture Data." American Society of Agricultural and Biological Engineers, ASABE, Virtual Annual Meeting, July 13-15, 2020. Pasha, M. F. K., Yeasmin, D., and Valenzuela, G. (2020). "An Artificial Intelligence Model to Predict Crop Water Requirement Using Weather, Soil Moisture, and Plant Health Monitoring Data." World Water and Environmental Resources Congress, ASCE, May 17-21, 2020, Henderson, NV.
Keywords Please add a few appropriate National Agricultural Library keywords: https://agclass.nal.usda.gov/vocabularies/nalt	artificial intelligence; California; olives;
Tags Please add a few of your own user-defined tags that would be useful to others who might use your dataset in the future.	crop water demand; weather, soil moisture, plant health
Acronyms & abbreviations Please define any acronyms, site abbreviations, or other project specific designations used in your dataset. Or indicate "none."	AI - artificial intelligence; UAL - University Agricultural Lab at Fresno State; PC - principal component; SLR - single linear regression, MLR - multi-linear regression (MLR), NLR - non-linear regression (NLR), PCA - principal component analysis (PCA); ANN - artificial neural network; ET - evapotranspiration, SR - solar radiation, AT - air temperature, ST - soil temperature, and RH - relative humidity
Other dataset storage location Has this dataset already been uploaded elsewhere? Yes or No Reasons may include a requirement as part of publishing a paper or storing data on GitHub or other locations to make accessible to others. If yes, please provide the link or other information to explain where the dataset is located and where or how it can be accessed.	We have already published the results in conference proceedings papers. Two research articles have been published and another paper has been accepted and in the process to be published. We also can share the results on-demand basis.