Transforming Agriculture: Remote Sensing for Crop Water Management

Speaker Bios

Bill Kustas is a Research Hydrologist at the U.S. Department of Agriculture-Agricultural Research Service, Hydrology and Remote Sensing Laboratory in Beltsville, Maryland. He began his research career with the USDA-ARS in 1986. His research has primarily focused on understanding and modeling land surface-atmosphere energy exchange processes, and evapotranspiration at both micro and macro scales using remote sensing. He has led remote sensing field experiments over different agricultural systems in Arizona, New Mexico, Oklahoma, Iowa, Texas, and California. His current research project - GRAPEX - primarily aims to refine and apply a multi-scale remote sensing toolkit for mapping crop water use and crop stress for improved irrigation scheduling and water management in vineyards in the Central Valley of California. This toolkit will be available to vineyard managers and ultimately other growers of perennial and annual crops for improving water management and irrigation scheduling.

Andrew McElrone is a Research Plant Physiologist with USDA-ARS, an adjunct professor in Viticulture and Enology at UC Davis, and served as the Acting Director of the USDA California Climate Hub. For over two decades, he has studied plant responses to changing environmental conditions in agricultural and natural ecosystems, and is a recognized expert in plant water use and responses to drought with specific applications to irrigation management and sensor technology development. His research program is screening woody perennial crops for improved drought and heat stress tolerance, developing efficient genotype-specific irrigation strategies, and advancing new technology to better quantify crop water use and stress with proximal and remote sensors. Along with collaborators, he pioneered the use of X-ray microCT for studying plant water uptake and transport processes at Lawrence Berkeley National Lab's Advanced Light Source. As a collaborator and lead on the GRAPEX and T-REX projects (Grape Remote sensing and Atmospheric Profiling and Evapotranspiration eXperiment; Tree crop Remote sensing of Evapotranspiration eXperiment), he is helping to ground truth crop ET and stress estimates via soil moisture sensing, leaf and whole plant physiological measurements, and ecosystem fluxes. Prior to his current position, Dr. McElrone studied water use in deep tree roots using caves (~20 meters below ground) and examined plant- and pathogenic-response to changing atmospheric conditions—both as a post-doctoral researcher at Duke University and an assistant professor of biology and environmental science at Saint Joseph's University in Philadelphia. He earned his PhD in Plant Biology from the University of Maryland in College Park.

Sebastian Saa focuses his time developing and implementing strategic research plans for the Almond Board of California (ABC). He serves as a staff liaison for the Almond Production Stewardship Workgroup, where he analyzes priorities around sustainability, harvest, pest management, irrigation, pomology, and nutrients. Before joining ABC, Sebastian was a horticulture professor in Chile and a Project Scientist at UC Davis. Sebastian obtained his Ph.D. and Post-Doc at UC Davis Horticulture and Agronomy Program.