

ESTIMATING HISTORICAL IRRIGATED PRODUCTION OF MAJOR US ROW CROPS

Samuel J. Smidt¹, Susan E. Lamb¹, Anthony D. Kendall², David W. Hyndman³

¹University of Florida, Gainesville, FL USA

²Michigan State University, East Lansing, MI USA

³University of Texas at Dallas, Richardson, TX USA

Agricultural irrigation patterns are evolving across the contiguous United States (CONUS) due to changes in irrigation technology, water availability, targeted crop demand, and expansion onto traditionally dryland areas. This evolving landscape introduces many sustainable watershed management challenges for both new and historically irrigated areas such as water allocation, drought mitigation, and soil health. Despite the importance of irrigated agriculture, historical crop production data have largely been reported as a merged average between rainfed and irrigated practices. As a result, little remains known about the use or impacts of irrigated production within historical data records. The purpose of this study is to backfill missing agricultural data using a machine learning technique to estimate irrigated row crop production for major US row crops from 1945-2017. The result of this study is a county-level dataset that estimates yields and areas for the irrigated and rainfed production of corn, hay, soybeans, and wheat. Results from this study will be used to (1) quantify the migration of irrigated production across the CONUS, (2) assess the impact of environmental policies on irrigation use and adoption, and (3) develop proactive land and water management recommendations for irrigation use beyond heavily stressed aquifer regions.

PRESENTER BIO: Sam Smidt is an Assistant Professor of watershed sciences in the Soil and Water Sciences Department. He is the PI of the Land and Water Lab, which serves as a research and education space focused on coupled human and natural systems within the broad field of environmental geoscience.