José M. Rodríguez-Flores

Graduate Student Researcher · University of California Merced

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Personal Profile

I work on transdisciplinary research to find climate change adaptation solutions in agriculture, water and communities. I am experienced modeling and analysing agricultural and water systems to find policies that achieve sustainability, are robust to climate change, support communities and balance trade-offs. My research overlaps economics and hydrology in the study of agricultural production, surface water, groundwater, society and environment. I aim to develop research, tools and data visualization that can support sustainable and multi-benefit water and land decision making, environmental justice and science-communication. During my Ph.D. I have studied the California's complex water system, agriculture, vulnerable communities and the challenges and opportunities to address climate change and the Sustainable Groundwater Management Act (SGMA).

Education

University of California Merced *Merced, CA*

Ph.D. Environmental Systems *2019 - Current (Exp. July 2023)*

- Water Systems Management Lab
- **Advisor:** Dr. Josué Medellín-Azuara
- **Research:**
  - Analysis on groundwater access during droughts for agriculture and domestic wells vulnerability
  - Assess adaptive groundwater policies to achieve economic and groundwater sustainability goals in the San Joaquin Valley agriculture
  - Multi-benefit cropland repurposing to achieve environmental and socioeconomic justice for Disadvantage Communities in the Central Valley, California

Colegio de Postgraduados *México*

M.S. Economics *2016 - 2018*

- **Field Study:** Agricultural Economics
- **Research:** Economic Valuation of Water for Irrigation under Scarcity Scenarios in the Mexican High-plains

Universidad Autónoma Chapingo *México*

B.S. Economics *2011 - 2015*

- **Field Study:** Agricultural Economics
- Passed with Distinction

Work Experience

University of California Merced *Merced, CA*

Graduate Student Researcher *Sept 2019 - Present*

- **Main Tasks:** Data consolidation of water supply (CVP, SWP, water rights and groundwater) and water demand in California. Analysis of water use, land use and economic production of San Joaquin Valley agriculture. Led data collection, modeling, coding and visualization. Undergraduate student mentor.
- **Key Projects:**
  - Multibenefit Land Repurposing in the Tule Subbasin
  - Economic Analysis of the 2020-2022 Drought in California
  - Land use, water use and agricultural economics data visualization (Link)
  - Open DAP: Agricultural production model to support land decision making in the California's Delta
  - Kern County Coupled Hydro-economic model to analyse impacts of water shortages and groundwater policies
- **Technical Skills:** Excel, Python (Pandas, Numpy, Matplotlib, Pyomo and Pymc), R (tidyverse, ggplot, sf, rgdal and shiny) and IMPLAN. Familiarity with DWR's data sets, USDA-NASS, Ag Commissioners' data listing, SSEBop, USDA CDL, Water Rights (eWRIMS), GSPs, SGMA, Water Budgets and LandIQ

University of California Merced *Merced, CA*

Research Internship *May 2018 - July 2018*

- Master's Degree Internship in UC Merced with Dr. Josué Medellín-Azuara
- **Project:**
  - Economic Valuation of Water for Agriculture in an Irrigation District in the Mexican High-plains using a calibrated Hydro-economic model
- Training on hydro-economic models
- **Technical Skills:** GAMS

Oklahoma State University *Stillwater, OK*

Research Internship *February 2015 - April 2015*

- Undergraduate research internship in the School of Business with Dr. José Sagarnaga

Publications

Journal Articles

Water, environment, and socioeconomic justice in California: A multi-benefit cropland repurposing framework
Fernandez-Bou, Angel Santiago, **Rodríguez-Flores, José M.**, Guzman, Alexander, Ortiz-Partida, J. Pablo, Classen-Rodriguez, Leticia M., Sánchez-Pérez, Pedro A., Valero-Fandiño, Jorge, Pells, Chantelise, Flores-Landeros, Humberto, Sandoval-Solís, Samuel, Characklis, Gregory W., Harmon, Thomas C., McCullough, Michael, and Medellín-Azuara, Josué
Science of The Total Environment p. 159963. 2023. DOI: 10.1016/j.scitotenv.2022.159963

Hydro-economic modeling of water resources management challenges: current applications and future directions.
Ortiz Partida, Jose Pablo, Fernandez-Bou, Agel Santiago, Maskey, Mahesh, **Rodriguez-Flores, José M.**, Medellin-Azuara, Josue, Sandoval-Solis, Samuel, Ermolieva, T., Wada, Yoshihide, and Kahil, Taher
In-Preparation. 2023

Implementing adaptive operating policies to achieve economic, and groundwater sustainability goals in agriculture using Evolutionary Multi-Objective Direct Policy Search
Rodriguez-Flores, José M., Gupta, Rohini, Zeff, Harrison, Reed, Patrick, and Medellin-Azuara, Josue
In-Preparation. 2023

Groundwater access of agricultural and domestic users: crop transitions and domestic dry wells
Rodriguez-Flores, José M. and Medellin-Azuara, Josue
In-Preparation. 2023

Global Sensitivity Analysis of a Coupled Hydro-Economic Model and Groundwater Restriction Assessment
Rodríguez-Flores, José M., Valero Fandiño, Jorge A., Cole, Spencer A., Malek, Keyvan, Karimi, Tina, Zeff, Harrison B., Reed, Patrick M., Escriva-Bou, Alvar, and Medellín-Azuara, Josué
Water Resources Management pp. 6115–6130. 2022. DOI: 10.1007/s11269-022-03344-5

3 Challenges, 3 Errors, and 3 Solutions to Integrate Frontline Communities in Climate Change Policy and Research: Lessons From California
Fernandez-Bou, Angel Santiago, Ortiz-Partida, J. Pablo, Classen-Rodriguez, Leticia M., Pells, Chantelise, Dobbin, Kristin B., Espinoza, Vicky, **Rodríguez-Flores, José M.**, Thao, Chia, Hammond Wagner, Courtney R., Fencl, Amanda, Flores-Landeros, Humberto, Maskey, Mahesh L., Cole, Spencer A., Azamian, Shayda, Gamiño, Eliseo, Guzman, Alexander, Alvarado, Ana Grace F., Campos-Martínez, Miriam S., Weintraub, Coreen, Sandoval, Espi, Dahlquist-Willard, Ruth M., Bernacchi, Leigh A., Naughton, Colleen C., DeLugan, Robin M., and Medellín-Azuara, Josué
Frontiers in Climate. 2021. DOI: 10.3389/fclim.2021.717554

Insights from a Calibrated Optimization Model for Irrigated Agriculture under Drought in an Irrigation District on the Central Mexican High Plains
Rodríguez-Flores, José M., Medellín-Azuara, Josué, Valdivia-Alcalá, Ramón, Arana-Coronado, Oscar A., and García-Sánchez, Roberto C.
Water p. 858. 2019. DOI: 10.3390/w11040858

Reports

Economic Impacts of the 2021 Drought on California Agriculture. Preliminary Report
Medellin-Azuara, J., Escriva-Bou, A., Abatzoglou, J.A., Viers, J.H., Cole, S.A., **Rodriguez-Flores, J.M.**, and Sumner, D.A.
A report for the California Department of Food and Agriculture, University of California, Merced, 2022

Economic Impacts of the 2020–22 Drought on California Agriculture
Medellín-Azuara, Josué, Escriva-Bou, Alvar, **Rodríguez-Flores, José M.**, Cole, Spencer A., Abatzoglou, John, Viers, Joshua H., Santos, Nicholas, and Summer, Daniel A.
A report for the California Department of Food and Agriculture, University of California, Merced, 2022

Resilient Staten Island: Landscape Scenario Analysis Pilot Application
Whipple, Alison, Grenier, Letitia, Safran, Samuel, Zeleke, Dawit, Wells, Emily, Deverel, Steve, Olds, Marc, Cole, Spencer, **Rodríguez-Flores, José M.**, Guzman, Alexander, and Medellín-Azuara, Josué
Prepared for the U.S. Fish and Wildlife Service, San Francisco Estuary Institute, Richmond, CA, 2022

Regional Report for the San Joaquin Valley Region on Impacts of Climate Change
Fernandez-Bou, Angel Santiago, Ortiz-Partida, J. Pablo, Pells, Chantelise, Classen-Rodriguez, Leticia M., Espinoza, Vicky, **Rodríguez-Flores, José M.**, and Medellin-Azuara, Josue
California's Fourth Climate Assesment, California Natural Resources Agency SUM-CCCA4-2021-003, Sacramento, 2021

Blog Posts

Lessons from Three Decades of Evolution of Cropland use in the Central Valley
Rodríguez-Flores, José M., Spencer, A. Cole, Guzman, Alexander, Medellin-Azuara, J., Lund, Jay, and Sumner, Daniel A.
URL: https://californiawaterblog.com/2021/09/05/lessons-from-three-decades-of-evolution-of-cropland-use-in-the-central-valley/, California WaterBlog, 2021

Selected Conference Presentations

On Assessing Drought Economic Impacts on Agriculture and Communities: Lessons Learned from California Droughts (Presenting Autor)
Medellin-Azuara, Josue, **Rodriguez-Flores, José M.**, Cole, Spencer, Escriva-Bou, A, Abatzoglou, John, Viers, Joshua H, and Santos, Nicholas
Poster, AGU Fall Meeting, 2022

Implementing adaptive operating policies to achieve agricultural, economic, and groundwater sustainability goals for the San Joaquin Valley using Evolutionary Multi-Objective Direct Policy Search
Rodriguez-Flores, José M., Gupta, Rohini, Zeff, Harrison, Reed, Patrick, and Medellin-Azuara, Josue
Oral Presentation, AGU Fall Meeting, 2022

Global Sensitivity Analysis for a coupled Hydro-economic model under a groundwater management policy in Kern County, California.
Rodriguez-Flores, José M., Valero-Fandiño, Jorge, Spencer, A. Cole, Malek, K., Karimi, Tina, Zeff, H. B., Escriva-Bou, A, and Medellin-Azuara
Poster, AGU Fall Meeting, 2020

Professional Training

Climate Adaptation Science Academy - Experiential Learning Expedition (CASA ELE) *CA*
Secure Water Future (SWF), UC Merced *2022*
- Learned climate adaptation decision-making processes in water, agriculture and natural resources during an immersive learning experience. Learned from mentors how to develop transdisciplinary climate research and outreach.

Introduction to Groundwater, Watersheds, and Groundwater Sustainability Plans *Remote, CA*
University of California, Division of Agriculture and Natural Resources *2020*
- Studied the monitoring, assessment, and sustainable management of groundwater and watersheds in relation to California Groundwater Sustainability Plans (GSPs) and other water management programs.

CALVIN Workshop *Merced, CA*
University of California Merced *September 2020*
- Basic overview of California's CALVIN hydro-economic water supply model with interactive Python demonstrations.

Computer Skills

R	Data Wrangling, Data Analysis, Statistical Modeling, Spatial Analysis, Visualization and Shiny App Development
Python	Data Wrangling, Optimization Models and Visualization
QGIS	Spatial Analysis, Map Production
Other	Excel, Word, LaTeX, Linux, Git, IMPLAN, GAMS, Matlab, Cluster Computing

Honors and Awards

2019-2023 **CONACyT - UC Mexus Fellow,** Doctoral Fellowship to study in the University of California *México - US*
2016-2018 **CONACyT Fellow,** Master's Degree Fellowship *México*
2015 **Graduated with Honors,** Undergraduate Degree in Economics *Mexico*

Service

Environmental Systems Seminar Committee (Fall 2021 - Spring 2022)
Support coordinating the UC Merced Environmental Systems Seminar Series

Journal Reviewer
Journal of Water Resources Planning and Management

Languages

English	Professional Proficiency
Spanish	Native Language