José M. Rodríguez-Flores

Applied Geospatial Data Scientist · California State University Monterey Bay

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Education

PhD in Environmental Systems

University of California Merced *2019 - 2023*

Advisor: Dr. Josué Medellín-Azuara - Water Systems Management Lab
Dissertation Title: Coupled water-food system analysis of agriculture in California's San Joaquin Valley: vulnerabilities, adaptations and policy trade-offs
Research:

- Groundwater use and availability for agriculture and domestic wells
- Adaptive groundwater policies to achieve economic and groundwater sustainability goals in San Joaquin Valley's agriculture
- Multi-benefit cropland repurposing as a strategy to achieve groundwater sustainability, clean energy transitions, environmental benefits and environmental justice for disadvantaged communities in California's Central Valley

MSc in Economics

Colegio de Postgraduados *2016 - 2018*

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

BSc in Economics

Universidad Autónoma Chapingo *2011 - 2015*

Field of Study: Agricultural Economics

Professional Experience

California State University Monterey Bay *Remote (Sacramento, CA)*
Applied Geospatial Data Scientist *07/2025 - Present*

Environmental Defense Fund *Remote (Sacramento, CA)*
Senior Analyst, Climate Resilient Water Systems *09/2023 - 07/2025*

University of California Merced *Merced, CA*
Graduate Student Researcher *09/2019 - 07/2023*

University of California Merced *Merced, CA*
Research Internship *04/2018 - 07/2018*

Publications

Published Papers

Cropland repurposing as a tool for water sustainability and just land transition in California: review and best practices
Fernandez-Bou, Angel Santiago, **Rodriguez-Flores, Jose M.**, Ortiz-Partida, J. Pablo, Fencl, Amanda, Classen-Rodriguez, Leticia M., Yang, Vivian, Williams, Emily, Schull, Val Zayden, Dobbin, Kristin B., Penny, Gopal, et al.
Frontiers in Water. 2025. DOI: 10.3389/frwa.2025.1510413

Synergies Between Agricultural Production and Shorebird Conservation With Climate Change in the Central Valley, California, With Optimized Water Allocation and Multi-Benefit Land Use
Li, Liying, Cole, Spencer, **Rodriguez-Flores, José M.**, Hestir, Erin, Fink, Daniel, Viers, Joshua H., Medellin-Azuara, Josue, Conklin, Martha, and Harmon, Thomas
Global Change Biology e70304. 2025. DOI: 10.1111/gcb.70304

Optimized water allocation with managed groundwater recharge and prioritized wetland deliveries to moderate human-nature water use tradeoffs under climate change
Li, Liying, Dogan, Mustafa S., Maskey, Mahesh, **Rodriguez-Flores, José M.**, Vache, Kellie B., Cole, Spencer, Null, Sarah E., Viers, Joshua H., Safeeq, Mohammad, Medellin-Azuara, Josue, et al.
Journal of Hydrology: Regional Studies p. 102496. 2025. DOI: 10.1016/j.ejrh.2025.102496

A participatory approach for developing a geospatial toolkit for mapping the suitability of California's Multibenefit Land Repurposing Program (MLRP) in support of groundwater sustainability
Nuñez-Bolaño, Yelenka, Flores-Landeros, Humberto, **Rodríguez-Flores, José M.**, Fernandez-Bou, Angel S., Medellín-Azuara, Josué, and Harmon, Thomas C.
Frontiers in Water. 2025. DOI: 10.3389/frwa.2025.1539834

Enhancing water security and landscape resilience through multibenefit land repurposing
Penny, Gopal, **Rodríguez-Flores, José M.**, Fernandez-Bou, Angel Santiago, Koebele, Elizabeth A., Schiller, Anna, Solomon, Divya, Carlson, Katie, Classen-Rodriguez, Leticia, Daniels, Molly, Grimm, Robyn, et al.
Frontiers in Water. 2025. DOI: 10.3389/frwa.2025.1620626

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, et al.
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, J. Pablo, Fernandez-Bou, Angel Santiago, Maskey, Mahesh, **Rodríguez-Flores, José M.**, Medellín-Azuara, Josué, Sandoval-Solis, Samuel, Ermolieva, Tatiana, Kanavas, Zoe, Sahu, Reetik Kumar, Wada, Yoshihide, et al.
Water Economics and Policy p. 2340003. 2023. DOI: 10.1142/S2382624X23400039

Drivers of domestic wells vulnerability during droughts in California's Central Valley
Rodríguez-Flores, José M., Fernandez-Bou, Angel Santiago, Ortiz-Partida, J. Pablo, and Medellín-Azuara, Josué
Environmental Research Letters p. 014003. 2023. DOI: 10.1088/1748-9326/ad0d39

Identifying robust adaptive irrigation operating policies to balance deeply uncertain economic food production and groundwater sustainability trade-offs
Rodríguez-Flores, José M., Gupta, Rohini S., Zeff, Harrison B., Reed, Patrick M., and Medellín-Azuara, Josué
Journal of Environmental Management p. 118901. 2023. DOI: 10.1016/j.jenvman.2023.118901

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, et al.
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

Papers Under Review or Preparation

A Systems Approach to Drought Impact Assessment for Enhancing Climate Resilience in Agriculture and Communities: Insights from Recent California Droughts
Rodriguez-Flores, José M., Medellín-Azuara, Josué, Escriva-Bou, Alvar, Cole, Spencer A., Abatzoglou, John, Viers, Joshua H., Santos, Nicholas, and Sumner, Daniel A.
In-preparation. 2025

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, et al.
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

Other

Agrivoltaics and Ecovoltaics : How Solar Power Can Deliver Water Savings, Farm Success, and a Healthier Environment
Fernandez-Bou, Angel S., **Rodriguez-Flores, Jose M.**, Cuppari, Rosa Isabella, and Yang, Vivian
Cambridge, MA: Union of Concerned Scientists. 2024. DOI: 10.47923/2024.15501

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 Academic Presentations

Toward Sustainable Groundwater in Agriculture: 3rd International Conference Linking Science and Policy, 2024

Oral Presentation

A strategic and inclusive approach to multibenefit land repurposing in California
Rodriguez-Flores, José M., Penny, Gopal, Schiller, Anna, Sanchez, Sonia, Daniels, Molly, and Mercado, Stephanie

AGU Fall Meeting, 2022

Poster (Presenting Author)

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

AGU Fall Meeting, 2022

Oral Presentation

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

AGU Fall Meeting, 2020

Poster

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- Azuar

Selected Professional Presentations

Water Leadership Institute, Delta-Mendota Groundwater Basin *06/2024*
Speaker, Water Experts Panel

Maven's Office Hours: Multibenefit Land Repurposing Program (Maven's Notebook) *04/2024*
Speaker, discussion regarding the implementation of the Multibenefit Land Repurposing Program. Remote

The California Roundtable on Agriculture and the Environment (CRAE) (agInnovations) *04/2024*
Speaker, Land Repurposing Discussion. Remote

WELL San Joaquin Valley Water Summit: How can local leaders explore and achieve the future of water management? (Water Education For Latino Leaders). *10/2023*
Panelist, Panel: "How can we support residents impacted by land retirement and the resulting changes on our economies?" Fresno Pacific University, Visalia

What is the Future of Agriculture in California (The Maddy Institute and Climate Now). *03/2023*
Panelist, Panel: "Profitable Repurposing of Agricultural Lands". Fresno State University

Organized Sessions & Workshops

Multibenefit Land Repurposing Community of Practice *09/2023-present*
Co-orginizer and co-facilitator of monthly meetings. Organized by State Wide Support Entity of the Multibenefit Land Repurposing Program (Self-Help Enterprises, Environmental Defense Fund and Environmental Increntives). Remote Series

Workshop: State of the Science of Land Repurposing *10/2024*
Lead-organizer, Workshop organized by Environmental Defense Fund and funded by UC Merced - Secure Water Future, UC Merced

UC Merced, Environmental Systems Seminar *2021-2022*
Co-organizer, Weekly Series. UC Merced

Professional Training

Climate Adaptation Science Academy - Experiential Learning Expedition (CASA ELE) *CA*
Secure Water Future (SWF), UC Merced *2022*
- Learned water climate adaptation and decision-making processes for agriculture and ecosystems during an immersive learning experience along the Tuolumne river watershed

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

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

Service

Journal Reviewer
Journal of Water Resources Planning and Management, Water Resources Research, Journal of Environmental Management, California Agriculture

Mentorship Experience

Environmental Defense Fund - California State University - Agricultural Research Institute (ARI)
Supervised two CSU undergraduate students on research projects focusing on land repurposing, with an emphasis on community benefits, equity considerations, and job transition implications *Summer 2024*

UC Merced
Guided undergraduate and master's students on projects involving mathematical optimization, data analysis, and geospatial analysis, with a focus on California's water-food nexus and Disadvantaged Communities *2019-2023*

Languages

English Professional Proficiency
Spanish Native Language