

VICKY ESPINOZA | Ph.D.

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EDUCATION

University of California Merced

Ph.D., Environmental Systems

Merced, CA

May 2022

University of Southern California

Master of Science, Environmental Engineering

Los Angeles, CA

May 2017

University of Chicago

Bachelor of Science, Geophysical Sciences

Chicago, IL

June 2013

WORK EXPERIENCE

NASA Jet Propulsion Laboratory/UCLA

JPL/UCLA JIFRESSE Researcher

La Cañada, CA

December 2023- Present

- Assess coastal community and habitat vulnerability in California using remote sensing
- Combine remote sensing and community engagement to develop climate change resilience strategies for California and beyond

The Nature Conservancy

Strategic Restoration Project Manager

Merced, CA

May 2022 to November 2023

- Multibenefit Land Repurposing Program (MLRP) Leadership & Strategy
 - Developed the core plan for the Department of Conservation's MLRP Tule Subbasin grantee. The core plan is a document that provides Tule Subbasin GSAs with resources, consolidated datasets, and tools to prioritize land repurposing projects for the next 10 years
 - Developed & managed project budget and teams
 - Strategized core plan approach to incorporate outreach and engagement of disadvantaged communities, farmers, and tribal groups
- Program Development & Implementation
 - Launched the inaugural Land Fallowing and Water Conservation Program in the Tule Subbasin, overseeing bid management and implementation strategy
 - Developed strategies for scaling this work to other parts of the San Joaquin Valley
 - Coordinating and collaborating with Tule Subbasin GSAs and landowners for the next phase of this program in the Tule Subbasin
- Stakeholder Engagement & Advocacy
 - Acted as the primary implementation partner for MLRP's Statewide Support Entity, developing resources that facilitate community engagement for MLRP grantees
 - Created the CaliWaterAg YouTube series on MLRP topics, supported by the Department of Conservation, covering land repurposing and community engagement
 - Co-developed the MLRP Statewide Support Entity Guide and Survey Template, translated into Spanish, and presented outreach best practices

American Farmland Trust

California Consultant—Water Resources & Farmer Outreach

Merced, CA

May 2022 to Present

- Support content development and delivery for outreach videos, radio shows, and women-focused Learning Circles in the San Joaquin Valley and other potential multimedia information sharing focused on regenerative agriculture, with a particular focus on accelerating the implementation of groundwater conservation practices among farmers in the Central Valley
- Co-facilitate events in Spanish and English with women farmers, land managers, and/or landowners, with a focus on reaching underserved audiences on topics related to land repurposing, habitat restoration, drought resilience, and on-farm strategies to adapt to climate change
- Support the development of AFT's strategic approach to building water-management resources and technical assistance, through assisting in the development of soil health case studies relevant to the San Joaquin Valley

University of California Merced

Environmental Systems Group- Doctoral Student

Merced, CA

August 2017 to May 2022

- Identified a framework to understand where and how to strategically transition irrigated land to alternative, multibenefit land uses in San Joaquin Valley to address groundwater overdraft while minimizing impacts to vulnerable communities and farmers
- Conducted a land use preferences survey across 32 underserved communities in the San Joaquin Valley to inform future irrigated agricultural land use transitions under SGMA and MLRP
- Created trilingual (English, Spanish, Hmong) resources for CaliWaterAg YouTube channel and organized workshops to inform underrepresented rural communities and small-scale farmers about groundwater law and the implications on their livelihoods
- Conducted an analysis that quantified water use, economic value, and GHG emission discrepancies resulting from land use misclassification of three key California land use datasets—Land IQ, USDA CropScape, and Kern County dataset
- Conducted analysis on regional sociohydrologic dynamics to provide insight into water management strategies that effectively balance competing water demands and address water access inequities that stem from local water mismanagement across San Joaquin Valley irrigation districts
- Experience in writing a variety of research and grant proposals and engaging with potential research funders (e.g., Environmental Defense Fund, Central Valley Community Foundation, USDA)
- Dissertation: Espinoza, V., 2022. A Framework for Strategic and Equitable Multibenefit Land Repurposing to Sustain Food-Energy-Water Systems and Address Water Injustice in the San Joaquin Valley, California (advised by Dr. Joshua Viers)

NASA Jet Propulsion Laboratory

La Cañada, CA

Earth Sciences Division – Earth Science Research Assistant

June 2016 to August 2017

- Incorporated global climate CMIP5 model simulation output into the Atmospheric Rivers Detection Algorithm to gain an understanding of atmospheric river trends with climate change effects globally
- Analyzed thermodynamic and dynamic changes of atmospheric rivers in a hypothetical aqua planet simulation under climate change conditions

University of Southern California

Los Angeles, CA

Environmental Engineering- Research Assistant

August 2015 to May 2016

- Developed a per-pixel classification of crops to help identify crop changes in Central Valley, CA during drought conditions through the use of remote sensing and ground survey data

Argonne National Laboratory

Lemont, IL

Earth Sciences Division- Research Assistant

June 2014 to June 2015

- Researched extreme climate events; drought effects on hydropower generation and flood risk assessment
- Utilized ArcGIS' Soil Water Assessment Tool (SWAT) to model future California drought effects on hydropower plant energy production
- Utilized HEC-HMS, HEC-RAS, and FLO-2D models for flood risk assessment for select nuclear power plants in the United States
- Wrote technical reviews for flood risk assessment of nuclear power plants in flood-prone regions

Pomona College Geology Department

Claremont, CA

Laboratory Technician

June 2013 to June 2014

- Researched climate change effects on marine mono-nitrogen oxides (NO_x) through ancient/modern corals and marine samples
- Gathered marine particulate matter from a sonde at various water column depths at the San Pedro Basin to observe nitrogen cycling in the ocean
- Processed Neo-Archean to modern-day corals through acidification and crushing of samples and analyze for mono-nitrogen oxides concentration detection

University of Alaska Fairbanks Geophysical Institute

Fairbanks, AK

NSF REU- Atmospheric Science Intern

June 2012 to August 2012

- Analyzed measurement concentrations of PM_{2.5} and meteorological parameters over Fairbanks, AK to interpret the cause(s) of the Fairbanks region exceeding the National Ambient Air Quality Standard (NAAQS) set by the EPA required by the Clean Air Act

Argonne National Laboratory

Lemont, IL

Earth Sciences Division- Atmospheric Science Intern

June 2011 to August 2011

- Developed 3D regional climate models with real-time meteorology—forward and backward trajectories of aerosol particles and modeled aerosol distribution and daily trends over India and China
- Climate models created contributed to the Ganges Valley Aerosol Experiment (GVAX) project and website

TEACHING EXPERIENCE

University of California Merced

Merced, CA

Spatial Analysis & Modeling (ENGR 180)

June – August 2021

- Lectured an accelerated 8-week summer course (~30 undergraduate students)
- Developed course materials (e.g., assignments, quizzes, exams, lectures)
- Managed and coordinated with course teaching assistant to ensure learning and course objectives were met

Watershed Science & Management

August 2021 – June 2022

- Developed course objectives and learning outcomes for graduate level course focused on California watershed science and management
- Created course material that meets course objectives and learning outcomes (e.g., lectures, problem sets, readings, quizzes, and exams)

UCLA Ecology & Evolutionary Biology (EEB 183) Course

2022

- Partnership project with UCLA EEB 183 undergraduate students; a group of five students helped client (Vicky Espinoza and East Merced Resource Conservation District) complete an environmental research project
- Developed project and materials for students; students will analyze the demographics of unrepresented, groundwater-reliant regions in the San Joaquin Valley, California
- Prepared weekly meeting materials and lectures on spatial and statistical analysis using R and ArcGIS software

Environmental Engineering- Teaching Assistant

January 2017 to May 2018

- Water Resources Management (~30 undergraduate level students)

Guest Lectures at UC Merced

2017- 2022

- ENVE 140 (Dr. Viers)- Lecture on groundwater trading (~20 undergraduate students) Winter 2019
- ENVE 140 (Dr. Viers)- Groundwater lecture (~20 undergraduate students) Winter 2019
- ENVE 140 (Dr. Medellin-Azuara)- California Water Management (~20 undergraduate students) Fall 2018

University of Southern California

Los Angeles, CA

Environmental Engineering- Teaching Assistant

August 2015 to May 2017

- Energy and the Environment (90 students, mix of PhD and Master's level students)
- Introduction to Environmental Engineering (22 students, undergraduate Freshman level students)

JOURNAL PUBLICATIONS

1. **Espinoza, V.** and Viers, J.H.. The paradox of production: surface water supply drives agricultural productivity but not prosperity in California's San Joaquin Valley. *PLOS. Under Review.*
2. **Espinoza, V.,** Bernacchi, L.A., Eriksson, M., Schiller, A., Hayden, A., Viers, J.H.. 2023. From fallow ground to common ground: Perspectives on future land uses in the San Joaquin Valley under sustainable groundwater management. *Journal of Environmental Management*, 33. <https://doi.org/10.1016/j.jenvman.2023.117226>
3. **Espinoza, V.,** Booth, L.A., Viers, J.H.. 2023. Land Use Misclassification Results in Water Use, Economic Value, and GHG Emission Discrepancies in California's High-Intensity Agriculture Region. *Sustainability*, 15, 6829. <https://doi.org/10.3390/su15086829>
4. Rallings, A.M., Clifton, B., **Espinoza, V.,** Hao, Z., Chen, W., Duan, W., Peng, Q., Luo, P., and Viers, J.H.. 2022. Regional hydrologic classification for sustainable dam operations in China: exploratory applications in the Yangtze River basin. *JAWRA*, 58 (6), 1216-1229. <https://doi.org/10.1111/1752-1688.12966>
5. Hao, Z., Rallings, A.M., **Espinoza, V.,** Luo, P., Duan, W., Peng, Q., Gao, Y., Viers, J.H.. 2021. Flowing from East to West: A bibliometric analysis of recent advances in environmental flow science in China. *Ecological Indicators*, 125, 107358. <https://doi.org/10.1016/j.ecolind.2021.107358>
6. Massoud, E. C., Massoud, T., Guan, B., Sengupta, A., **Espinoza, V.,** De Luna, M., Raymond, C., Waliser, D.E..2020. Atmospheric rivers and precipitation in the middle east and north africa (Mena). *Water*, 12 (10) 2863. <https://doi.org/10.3390/w12102863>

7. Massoud, E.C., **Espinoza, V.**, Guan, B., Waliser, D.E.. 2019. Global climate model ensemble approaches for future projections of atmospheric rivers. *Earth's Future*, 7 (10), 1136-1151.
<https://doi.org/10.1029/2019EF001249>
8. **Espinoza, V.**, Waliser, D. E., Guan, B., Lavers, D. A., & Ralph, F. M.. 2018. Global analysis of climate change projection effects on atmospheric rivers. *Geophysical Research Letters*, 45, 4299–4308.
<https://doi.org/10.1029/2017GL076968>
9. Medellín-Azuara, J., Sumner, D.A., Pan, Q.Y., Lee, H., **Espinoza, V.**, Cole, S.A., Bell, A., Davila Olivera, S., Viers, J.H., Herman, J., Lund, J.R.. (University of California, Davis and University of California, Merced). 2018. Economic and Environmental Implications of California Crop and Livestock, Adaptation to Climate Change. *California's Fourth Climate Change Assessment, Issue*, California Natural Resources Agency. Publication number: CCCA4-CNRA-2018-018.

PRESENTATIONS

Research Presentations

- **Espinoza, V.**, Viers, J.H., “San Joaquin Valley Irrigation District Vulnerability to Groundwater Overdraft Based on Surface Water Allocation and Consumptive Water Use,” Poster session at American Geophysical Union 2020, Virtual
- **Espinoza, V.**, Viers, J.H., “Spatially and Temporally Based Sensitivity Analysis of Land Fallowing and Alternative Land Use Near Disadvantaged Communities in Kern County, California, USA,” Poster session at American Geophysical Union 2018, Washington, D.C.
- **Espinoza, V.**, “California Drought Impacts on Agricultural Regions,” Speaker for UC Merced Blum Center Summer Institute 2018, Merced, CA
- **Espinoza, V.**, Waliser, D. E., Guan, B., Lavers, D. A., “Projections of Climate Change Effects on Global Atmospheric River Landfalls,” Poster session at American Geophysical Union 2016, San Francisco, CA
- **Espinoza, V.**, Waliser, D. E., Guan, B., Lavers, D. A., “Projections of Climate Change Effects on Global Atmospheric River Landfalls,” Speaker at International Atmospheric Rivers Conference 2016, San Diego, CA
- **Espinoza, V.** and Sanders, K.T. “A Geospatial Energy Analysis of Groundwater Pumping During the Recent California Drought,” Speaker at ASCE Environmental Water Resources Institute 2016, Palm Beach, FL
- Yan, E., Tidwell, V.C., Bizjack, M., **Espinoza, V.**, Jared, A., “Modeling the Vulnerability of Hydroelectricity Generation Under Drought Scenarios,” Poster session at American Geophysical Union 2015, San Francisco, CA

San Joaquin Valley Community and Farmer Engagement Presentations

- **Espinoza, V.** TEDxUCMerced. Food, Water, and Health in the Central Valley, April 2023
- **Espinoza, V.**, Sanchez, S., and Jolley, A. “Community Outreach and Engagement,” MLRP Block Grantee Meeting, March 2023
- **Espinoza, V.**, Hart, A., Kelsey, R. “Drought and Water Scarcity Impacts on Small-Scale Farmers in California,” California Small Farm Conference, February 2023
- **Espinoza, V.** y Trujillo, A. “Introducción de programas y conexiones de American Farmland Trust,” Radio Bilingüe, February 2023
- **Espinoza, V.** “Los Impactos del Sobregrifo de Agua Subterránea en la Agricultura,” Latino Farmer Conference, January 2023
- **Espinoza, V.** “Los Impactos del Sobregrifo de Agua Subterránea en la Agricultura,” Latino Farmer Conference, January 2021
- **Espinoza, V.** “Los Impactos del Sobregrifo de Agua Subterránea: Un Ejemplo de California,” EcoFarm Conference, January 2021
- **Espinoza, V.** and Environmental Defense Fund, Community and Farmer Bilingual Workshop on Strategic Land Repurposing, January 13-14, 2021
- American Farmland Trust and **Espinoza, V.**, “Women for the Land Learning Circle- Planning for Resilience in California’s San Joaquin Valley,” virtual workshop, September 2020
- Babbitt, C. and **Espinoza, V.**, “Engaging Farmers and Communities in Response to California’s Sustainable Groundwater Management Act,” Water for Agriculture Webinar Series, April 2020
- **Espinoza, V.**, “Community Informed Strategic Land Repurposing Model,” Research and outreach pitch, 2nd Annual “Growing Together” Black Farmers Conference, February 29, 2020

- **Espinoza, V.**, “Community Informed Strategic Land Repurposing Model,” Research and outreach pitch, California Agricultural Laborers Immigration Reform Workshop with Congressmembers Costa, Pannetta, Cox and Lofgren, Madera, October 2019
- **Espinoza, V.**, “Impacts of the Sustainable Groundwater Management Act (SMGA) on Farmers,” Oral Presentation at the Latino Farmer Conference 2019, Tulare County, California

Engaging Policymakers and Other Stakeholders

- **Espinoza, V.** “California’s Sustainable Groundwater Management Act and Multibenefit Land Repurposing Program,” WELL UnTapped Fellowship Program, Discussions with local Latino water leaders, August 2023
- **Espinoza, V.**, Long, S., Rodriguez-Flores, Fernandez-Bou. “Profitable Repurposing of Agricultural Lands,” Future of Agriculture in California Summit, Fresno State, March 2023
- **Espinoza, V.**, “Achieving Water Justice in a Changing Climate,” Invited Speaker, California Water Law Symposium, January 2021
- **Espinoza, V.**, “Strategic Alternative Land Use Planning for Climate Smart Communities and Groundwater Sustainability,” Research and outreach pitch, State Water Resources Control Board, May 2020
- **Espinoza, V.**, Clinton Global Institute University Fellow, “Strategic Alternative Land Use Planning for Climate Smart Communities and Groundwater Sustainability,” Research and outreach pitch video, Washington D.C. virtual presentation, March 2020
- **Espinoza, V.**, “Strategic Alternative Land Use Planning for Climate Smart Communities and Groundwater Sustainability,” Research and outreach pitch, with Maria Herrera, California Water Commission Member, February 2020
- **Espinoza, V.**, “Climate Smart Approaches to Resilient Food-Energy-Water Systems in California,” Invited Speaker, Congressional Hispanic Caucus Institute Conference 2019, Washington D.C.
- **Espinoza, V.**, “Imagine: A story of San Joaquin Valley Disparity,” Research and outreach pitch, Invited Speaker, Next Generation Delegate at the Chicago Council on Global Affairs; 2019

Other Presentations

- **Espinoza, V.**, “Expanding Knowledge Reach Beyond Academic Audiences- Science of Storytelling,” UC Merced HSRI Social Media Workshop, November 2019

OUTREACH/VOLUNTEER

CaliWaterAg YouTube Channel

Present

- Created a trilingual (English, Spanish, and Hmong) YouTube channel for underrepresented communities and small-scale farmers to foster understanding of the Sustainable Groundwater Management Act (SGMA), its impacts on agriculture, and how communities can become involved
- The aim is to inform, empower, and involve underrepresented communities and small-scale farmers in SGMA groundwater sustainability planning and also including their voices in my doctoral community-informed land use repurposing model

Water Solutions Network Cohort 4 Member

April 2021 – June 2022

- Collaborated and co-developed solutions to water-related issues in the San Joaquin Valley and Tulare Basin
- Engaged stakeholders across various sectors, bridged differences, and aligned efforts to improve water management in the Tulare Basin
- Elevated information to enhance collective decision-making; Proposed and pursued changes needed to ensure sustainable and equitable water management in California

INFEWSer Challenge Cohort

2020-2021

- In a group of 7 graduate students from around the nation and world develop model(s) that describe the food, energy, water relationship of swine production in North Carolina
- The objective was to understand if the new permitting process for swine industry will lead to timely, effective, equitable management of swine production in North Carolina

San Joaquin Valley Grower SGMA Workshop

2020-2022

- Organized and presented workshops that inform farmers throughout the San Joaquin Valley about potential impacts of the Sustainable Groundwater Management Act (SGMA) on agriculture and how they can participate in their local groundwater sustainability agencies
- Objective of the workshops was to inform, empower, and involve growers in SGMA-related decisions and incorporate their voices into strategic land repurposing model through survey

- Two workshops presented to Spanish-speaking farmers in Merced/Stanslaus counties before COVID-19 restrictions; attendance of ~10 people total

Merced County Cortez Grower's Association

2019-2020

- Attended meetings to learn about issues Merced/Stanslaus County growers are facing, learn about seasonal practices, and build trust with growers
- Attended grower meetings every other week to talk to growers about SGMA and its potential impacts on agriculture, and give resources for how growers can become involved

U.S. Department of Agriculture Science Outreach

January-March 2020

- Engaged two 4th grade classes on hydroponics science once a week
- Created 1-hour lesson plans that covered the definition of hydroponics, lab safety, how plants grow, comparing plant hydroponics vs. soil growth, developing a hypothesis, measuring plant growth, and reporting results
- Students in groups of five grew plants in hydroponic systems they put together and soil to compare differences in growth, if any

Community Water Center

2017-2019

- Worked in disadvantaged communities in the San Joaquin Valley on informing community members about the Sustainable Groundwater Management Act and its implications on the future of the San Joaquin Valley through workshops; 3 workshops of about 30 people each

SOCIAL MEDIA/MEDIA COVERAGE

2017-2022

- Environmental Defense Fund feature of Espinoza's San Joaquin Valley community engagement work: <http://blogs.edf.org/growingreturns/2021/01/07/california-land-and-water-decisions-equity/>
- Espinoza's CaliWaterAg incorporated into Groundwater Exchange, educational SGMA websites: English (<https://groundwaterexchange.org/sgma-videos-in-english/>) & Spanish (<https://groundwaterexchange.org/videos-de-sigma-en-espanol/>)
- Espinoza's CaliWaterAg featured in: Brown and Caldwell's Water News (Dec. 2020), Maven's Notebook, 2020; California Ag Today Radio (2020); AgNet West (2020) (<https://agnetwest.com/bilingual-sigma-video-series-foster-better-understanding/>; <https://agnetwest.com/new-addition-made-to-bilingual-sigma-video-series/>); Water Wrights (2020) (<https://waterwrights.net/2020/08/28/caliwaterag-youtube-channel/>)
- UC Merced News; Espinoza at Chicago Council on Global Affairs Next Generation Delegate, 2019: <https://news.ucmerced.edu/news/2019/grad-student-represents-valley-global-food-security-symposium>
- UC Merced News; Graduate Research Advocacy Day with Dean Zatz, (Sacramento): <https://news.ucmerced.edu/news/2019/graduate-students-make-case-research-capitol>
- 2019 USDA Fellows: <https://www.appliedarts.txstate.edu/Announcement/2019-USDA-Fellows.html>
- Imagine H2O fellowship & global climate action summit 2018: <https://news.ucmerced.edu/news/2018/uc-climate-change-research-one-focus-global-summit-new-reports>
- NASA JPL News on Atmospheric Rivers 2018: <https://www.jpl.nasa.gov/news/news.php?feature=7141>
- NASA JPL News Intern Highlight 2018: <https://www.jpl.nasa.gov/edu/news/2018/10/4/rolling-on-the-science-of-an-atmospheric-river>

SKILLS: Multi-project Management, Leadership, Multi-stakeholder Collaboration, Critical Thinking, Strategizing, Public-speaking, Education, Project Budgeting, Teaching, Community Outreach and Engagement Strategies and Resource Development, Salesforce, ArcMap, QGIS, ArcPro, MatLab, R, Python, GrADS, ArcGIS Soil Water Assessment Tool (SWAT), FLO-2D, HEC-HMS, HEC-RAS, Model for Ozone and Related Chemical Tracers (MOZART) model, Goddard Chemistry Aerosol Radiation and Transport (GOCART) model, WRF-Chem with MOZART gas phase chemistry model

AWARDS/HONORS

- UC President's Dissertation Year Fellowship Award, 2022
- UC Merced Global Food Initiative Grow Grant Award, 2021
- Partnership with Environmental Defense Fund dissertation on community engagement, 2020 - 2022
- UC Merced Environmental Systems Summer Fellowship, 2020
- Clinton Global Institute University Fellow, 2020
- Switzer Foundation Fellowship Finalist, 2019, 2020
- USDA-CAMINOS Graduate Fellow, 2019
- Next Generation Delegate at the Chicago Council on Global Affairs, 2019
- UC Merced Graduate Student Representative for Graduate Research Advocacy Day, 2019

- Clean Energy Research Center for Water-Energy Technologies (CERC WET) Graduate Fellowship, 2017-2019
- Imagine H2O Water Innovation Policy Program Fellow, 2018
- Graduate Group Recruitment Fellowship, 2017
- National Science Foundation (NSF) Research Experiences for Undergraduates (REU), 2012