Dr. Mahesh Lal Maskey

1509 Deering Street
Cleveland, MS, 38732
mmaskey@formerstudents.ucdavis.edu
530 – 220- 5562

SUMMARY PROFILE

Computational Hydrologist with over 15 years of interdisciplinary experience in hydrologic modeling, agricultural water management, and climate resilience. I integrate physically based and hydroeconomic models (e.g., APEX, MODFLOW, CALVIN) with remote sensing, geospatial tools, and HPC systems to support sustainable water solutions in inland and coastal systems.

My research in the Mississippi Delta and California's Central Valley informs coastal resilience challenges such as saltwater intrusion, stormwater planning, and aquifer recharge. I've led federally funded projects (USDA, NSF, CEC), co-developed decision tools with stakeholders, and published over 40 peer-reviewed articles.

As an inclusive educator and mentor, I involve students and professionals in applied modeling, hands-on data translation, and community-driven research to build scientific confidence and impact.

RESEARCH INTERESTS

Computational Hydroscience and Engineering, Physical and Stochastic Hydrology (surface and subsurface), Hydroinformatics, Climate Change Impacts, Modeling Evapotranspiration, High-Performance Computing (HPC) for Hydrological Simulations, Remote Sensing, Agricultural Water Management, Crop Modeling, Hydroeconomic Modeling, Geospatial and Statistical Analysis, Complexity and Scaling in Hydrology, Machine Learning and Data Mining.

TEACHING INTERESTS

Computational and Statistical Hydrology (surface and subsurface), Hydroinformatics, Numerical Methods in Water Resources, Geostatistics, Agricultural Water Management, Climate Change Impacts, Evapotranspiration Modeling, Remote Sensing, Machine Learning Applications in Hydrology.

EDUCATION

Ph.D. in Hydrologic Sciences: *University of California, Davis,* 2017
M.Sc. in Civil & Environmental Engineering: *The University of Iowa, Iowa City,* 2011
M.Sc. in Hydroinformatics: *UNESCO-IHE, the Netherlands,* 2004
B.E. in Civil Engineering: *Tribhuvan University, Nepal,* 1997

ADDITIONAL TRAINING:

- UC Merced Summer Institute on Scientific Teaching, 2021
- Carpentries Instructor Training, Data Science Initiative, UC Davis, 2019
- College Teaching Seminars and Workshops, UC Davis, 2016–2017
- Fundamentals of AutoCAD Civil3D 2009, Autodesk Training, Napa Valley College, 2008
- Intensive Course: Collaborative Engineering (Hydro Europe), Nice, France, UNESCO-IHE, 2003
- Visual Basic 6.0, APTECH Computer Education, Nepal, 2001

RESEARCH EXPERIENCE

Research Computational Hydrologist, Sustainable Water Management Research Management Unit (SWRMU)/National Center for Alluvial Aquifer Research (NCAAR), United States Department of Agriculture, Agricultural Research Service (USDA-ARS), Apr 2024-date

- Developed, adapted, and improved surface and groundwater models to quantify energy and water fluxes across spatial and temporal scales by integrating hydrological simulations with economic modeling tools.
- Advanced and implemented SLURM-based job scheduling in high-performance computing (HPC) environments to automate and efficiently manage large batches of hydrological simulations for scenario analysis and model testing.
- Set up and calibrated more than a dozen APEX model instances using the Nutrient Tracking Tool and APEXEditor to simulate farm-scale watersheds under integrated water management scenarios such as manual versus automated irrigation, cover cropping, and conservation practices.
- Designed and implemented predictive models using machine learning and deep learning algorithms to estimate water use in non-reported wells based on reported usage patterns.
- Developed data-driven models to predict soil water tension near the Stoneville experimental farm, translating these into soil moisture metrics for use in irrigation scheduling and watershed-scale modeling.

Postdoctoral Hydrological Modeling Fellow, S*ustainable Water Management Research Management Unit (SWRMU)/National Center for Alluvial Aquifer Research (NCAAR), Department of Agriculture-Agricultural Research Service (USDA-ARS),* Jun 2022 – Apr 024

- Conducted research using observational and simulation data from the Lower Mississippi River Basin, Oklahoma, and other regions to develop and evaluate hydrological models that assess the impacts of best management practices on runoff quantity and water quality in cropping and pasture systems.
- Led the establishment of a High-Performance Computing (HPC) platform for the Sustainable Water Management Research Unit (SWRMU) through the USDA-ARS SCINet initiative to support large-scale, data-intensive agrohydrological modeling.
- Developed and implemented an enhanced framework for the calibration, sensitivity, and uncertainty analysis of APEX and APEXgraze models. Applied this framework to simulate watershed processes under grazing conditions using long-term field data from the USDA-ARS Grazinglands Research Laboratory in Oklahoma.
- Collaborated with interdisciplinary teams to initiate a hydroeconomic modeling framework integrating surface and groundwater simulations with economic assessments tailored to water management challenges in the Mississippi Delta

Postdoctoral Scholar, *University of California, Merced,* Dec 2019 – Dec 2021

- Upgraded pre-and post-processing input and output from a statewide hydro-economic model, CALVIN.
- Conceptualized framework on the study of the impact of hydropower operation on managed aquifer recharge for the NOAA-funded project with South Carolina University.
- Developing research frameworks on statewide Innovative Food-Energy-Water Systems coupled with hydrology, climate and economics for an NSF-funded project with Oregon State University, the University of Hawaii, the University of California, Santa Barbara, the University of California, Los Angeles, and the Department of Water Resources.
- Conducted literature reviews on climate change impact on San Joaquin Valley of California with the Union of Concerned Scientists
- Improved and developed the framework for bias correction, upgrading codes, running the PYWR model to investigate indicators of hydrological alterations under different climate scenarios implied by Global Circulation (Climate) Models (GCMs) for the CEC-funded project.

Postdoctoral Scholar, *University of California, Davis, and Merced,* Jan 2018 – Jul 2019

- Processed, automated, and analyzed bio-meteorological data to estimate evapotranspiration by integrating ground-based measurements with remotely sensed observations.
- Installed and maintained field-scale micro-meteorological sensors, measured stem water potential, and analyzed trunk dendrometer data to assess plant physiological responses.
- Conducted literature reviews on bioclimatic indices and developed research proposals focused on climate adaptation in agriculture. Investigated the effects of climate change on nut-tree systems using multiple GCMs to simulate pest dynamics under future scenarios.
- Developed machine learning models to forecast strawberry yields at the field scale, incorporating weather, soil, and management variables.

Graduate Student Researcher, *University of California, Davis,* Sep 2012 – Dec 2017

- Upgraded and optimized MATLAB codes for multiple variants of the Fractal-Multifractal (FM) model to improve computational performance and scalability.
- Developed and tested novel FM model variants tailored to characterize hydrological and climatic variables such as streamflow, precipitation, and temperature across multiple temporal and spatial scales.
- Designed evaluation frameworks to assess model accuracy and robustness. Conducted comprehensive literature reviews on fractal geometry, mathematical modeling, and hydrological applications.
- Developed the theoretical framework for geometrical representations of hydrological processes using FM methods as part of doctoral dissertation research.

Graduate Student Researcher, *University of California, Davis,* Jan 2017 – Dec 2017

- Reviewed SWEEP (State Water Efficiency and Enhancement Program) project proposals and conducted literature reviews on the impacts of climate change on California agriculture. Evaluated evapotranspiration rates and irrigation scheduling strategies for an alfalfa irrigation project at UC Davis.
- Developed a user-friendly software tool to visualize flux data from Eddy Covariance and Surface Renewal systems.
- Collected and analyzed stem water potential measurements at Safari's vineyards to assess vine water status.
- Conducted additional reviews on climate-related vulnerabilities and adaptation strategies specific to California's agricultural sector.

Graduate Research Assistant, *The University of Iowa, Iowa City,* Aug 2010 – Dec 2011

- Digitized small-scale stream networks across the state of Iowa to support hydrological mapping and flood risk assessment for the Iowa Flood Center.
- Explored the application of the Gridded Surface Hydrology Analysis (GSHA) model for enhancing streamflow estimation and watershed-scale hydrologic simulation.

Postgraduate Participant, *UNESCO-IHE, Delft, the Netherlands,* Oct 2002 – Feb 2004

- Enhanced rainfall-runoff modeling using committee machine algorithms under the supervision of Professor Dimitri P. Solomatine as part of an individual research project toward the Master of Engineering degree.
- Developed data-driven hydrological models employing instance-based learning techniques within the Java-based Waikato Environment for Knowledge Analysis (WEKA)

platform to improve predictive accuracy and model generalization in watershed-scale simulations.

TEACHING EXPERIENCE

- **Guest Lecturer**, UC, Merced (2021),
  Course: Spatial Analysis and Modeling (ENGR 180)
  - Visualizing climate data in space
- **Guest Lecturer**, UC Davis (2018)
  Course: Modeling of Hydrological Process.
  - The Fractal-Multifractal tool for hydrological modeling
- Teaching Assistant, UC Davis (2012-2017)
  - Physical Hydrology
  - Systems Hydrology
  - Hydrologic Modeling with HEC Software
- **Instructor**, R-Spatial Workshop – "Map Time," UC Davis (2019)
  - NDVI data extraction and time-series mapping with R.
- **Instructor**, USDA-ARS SCINet Geospatial Working Group, (2025)
  - A Tool to Extract Actual Evapotranspiration from the USGS MODIS Data Portal.

TECHNICAL TRAINING & WORKSHOPS

- **Instructor**, Data Carpentry Workshop, CSU Chico (2021)
  Delivered instruction on R programming for social science and spatial data analysis
- **Tutor**: Microsoft Project, Kathmandu, Nepal (2005)
- **Tutor**: AutoCAD, Kathmandu, Nepal, (2000-2001)

PEDAGOGICAL TRAINING & MENTORSHIP PHILOSOPHY

My teaching emphasizes technically rigorous, practice-relevant instruction grounded in hydrologic modeling and climate adaptation. I prioritize inclusive pedagogy, model-based learning, and student confidence-building across STEM disciplines

- **Summer Institute on Scientific Teaching**, UC Merced (2021)
  Focused on active learning, inclusive pedagogy, and course design.
- **College Teaching Seminars and Workshops**, UC Davis (2016–2017)
  Topics included learner-centered teaching, thoughtful pedagogy, and inclusive classroom strategies.
- **Mentorship Approach**
  I approach mentorship as a collaborative and inclusive process grounded in mutual growth. At USDA-ARS, UC Davis, and UC Merced, I have mentored students and early-career researchers—including Dr. Alyssa DeVincentis, David Joseph Auresy Serrano Suárez, Arvey Fernando Torres, Maria Paula Sanabria, Dr. Liying Li, Dr. Samira Ismaili, Baotuan Nguyen, Michael A. Aiyedun, and Katherine Atkins—many of whom have co-authored peer-reviewed publications or presented at national conferences. My approach emphasizes adapting to each mentee's background and learning style to build scientific confidence, intellectual independence, and a supportive environment where all individuals—especially those from underrepresented or non-traditional pathways—can thrive and lead.

- **Teaching Portfolio available:** Spatial Hydrology – Course Outline with Rubric [maskeyTeachingPortfolio.pdf]

TECHNICAL EXPERIENCE

- **Hydrologist / Junior Engineer**, R.E.B. Engineering Inc., St. Helena, CA, 2006-2019
- **Engineering Consultant**, Dip Consultancy (P.) Ltd., Kathmandu, Nepal, 2005
- **Water Resource Engineer,** ERMC (P.) Ltd., Kathmandu, Nepal, 2004
- **Hydropower Engineer**, Butwal Power Company Ltd., Kathmandu, Nepal, 2004-2006
- **Civil Engineer**, Nepal Consult (P) Ltd., Lalitpur, Nepal, 1997-2002

TECHNICAL AND COMPUTING SKILLS

- **Programming Languages:** R, Python, MATLAB, FORTRAN, Visual Basic, JavaScript
- **Hydrological and Environmental Modeling Tools:** APEX, APEXgraze, MODFLOW, HEC-HMS, HEC-RAS, CALVIN, PYWR
- **Climate and ET Tools:** MODIS-based ET retrievals, OpenET, bias correction of GCMs
- **High-Performance Computing (HPC):** SLURM-managed clusters for ensemble simulations, automated batch job scheduling
- **Geospatial Analysis & Preprocessing:** ArcGIS, QGIS, R (raster, rgdal), Python (rasterio, geopandas, gdal, rioaxarry)
- **Reproducible Coding & Version Control**: GitHub (sharing workflows, training materials), Google Drive

KEY TOOLS: MODFLOW, APEX, SWAT+, PYWR, CALVIN, R, Python, ArcGIS, QGIS, SLURM, OpenET, GitHub

PUBLICATIONS

- Kharel, T.P., H.L. Tyler, P. Mubvumba, Y. Huang, A. B. Bhandari, R. S. Fletcher, S. Anapalli, D. R. Joshi, A. Mengistu, G. Birru, K. Adhikari, M. Dhakal, M. L. Maskey, K. N. Reddy, and D. E. Clay. 2025. Machine Learning on Multi-Spectral Imagery to Estimate Nutrient Yield of Mixed-Species Cover Crops. Agricultural & Environmental Letters, 10(1), p.e70009.
- **Maskey, M. L.,** A. M. Nelson, B. K. Northup and D. N. Moriasi. 2025. Developing a Framework for Sensitivity Analysis for Hydrological Models and Testing it for Farm-Scale Watersheds Under Grazing Operations, Environmental Modeling and Software. Under Review.
- **Maskey, M. L.,** A. M. Nelson, D. N. Moriasi and B. K. Northup. 2025. Uncertainty Analysis of Hydrological Parameters of the APEXgraze Model for Grazing Activities, Ecological Modeling, 499, p.110917
- Nelson, A. M., **M. L. Maskey**, B. K. Northup, and D. N. Moriasi. 2024. Calibrating Agro-Hydrological Model under Grazing Activities and its Challenges and Implications. Hydrology, 11(4), 42.
- Nelson, A. M, **M. L. Maskey**, B. K. Northup, J. L Osorio and D.N. Moriasi. 2023. Qualitative and quantitative assessment of farm-scale runoff as response to grazing operation. *In:* Sedimentation and Hydrologic Modeling Conference (pp. 1-19). SEDHYD, Inc.
- **Maskey, M. L.**, A. M. Nelson, B. K. Northup, J. L Osorio, and D.N. Moriasi. 2023. Calibration of Apex Model to Assess Farm-Scale Runoff for Grazing Operation and Uncertainty Analysis. *In:* Sedimentation and Hydrologic Modeling Conference 2023 (pp. 1-11). SEDHYD, Inc.
- Partida, J. P. O., A. F. Bou, **M. L. Maskey**, J. M. Rodríguez-Flores, J. Medellín-Azuara, S. Sandoval-Solis, T. Ermolieva, Z. Kanavas, R. K. Sahu, Y. Wada, and T. Kahil. 2022. Hydro-

economic modeling of water resources management challenges: current applications and future directions, Water Economics and Policy, 9(1).

- **Maskey, M. L.,** J. Medellin-Azuara, M. S. Dogan, A. Guzman, L. Li, A. S. Fernandez-Bou, W. Arnold, and E. Goharian. 2022. Managing aquifer recharge to overcome overdraft in the Lower American River, California, USA, Water, 14(6), 966
- **Maskey, M. L.**, G. F. Dourado, A. Rallings, D. E. Rheinheimer, J. Medellin-Azuara, J. H. Viers. 2022. Assessing hydrological alteration by climate change and reservoir operations in San Joaquin River Basin, California, *Frontiers in Environmental Science*, 10, 765426.
- Fernandez-Bou, A. S., J. Pablo Ortiz-Partida, C. Pells, L. M. Classen-Rodriguez, V. Espinoza, J. M. Rodríguez-Flores, L. Booth, J. Burmistrova, A. Cai, A. Cairo, J. A. Capitman., S. A. Cole, H. Flores-Landeros, A. Guzman, **M. L. Maskey**, D. Martínez-Escobar, P. A. Sanchez-Perez, J. Valero-Fandiño, J. H. Viers, L. Westerling, and J. Medellín Azuara 2022. Regional Report for the San Joaquin Valley Region on Impacts of Climate Change.
- Fernandez-Bou, A. S., J. Pablo Ortiz-Partida, L. M. Classen-Rodriguez, C. Pells, K. B. Dobbin, V. Espinoza, J. M. Rodríguez-Flores, C. Thao, C. R. H. Wagner, A. Fencl, H. Flores-Landeros, **M. L. Maskey**, S. A. Cole, S. Azamian, E. Gamiño, A. Guzman, A. G. F. Alvarado, M. S. Campos-Martínez, C. Weintraub, E. Sandoval, R. M. Dahlquist-Willard, L. A. Bernacchi, C. C. Naughton, R. M. DeLugan, and J. Medellín-Azuara, 2021. 3 Challenges, 3 Errors, and 3 Solutions to Integrate Frontline Communities in Climate Change Policy and Research: Lessons from California. *Frontiers in Climate*, 104.
- Marino, G., P. Lima, **M. L. Maskey**, F. E. R. RUBKE, R. R.L. Snyder, K. Shapiro, K. Suvocarev, B. Sanden, and D. Zaccaria. (2021). Maximum daily trunk shrinkage sensitivity to the water use of pistachio under saline conditions. *Acta Horticulturae*, 1314, 47-52.
- DeVincentis, A., S. S. Solis, S. Rice, D. Zaccaria, R. Snyder, **M. Maskey**, and A. Gomes, A. Gaudin, and J. Mitchell, 2021. Impacts of winter cover cropping on soil moisture and evapotranspiration in California's specialty crop fields may be minimal during the winter months. https://doi.org/10.3733/ca.2021a0021.
- Pathak, T. B., **M. L. Maskey**, and J. P. Rijal. 2020. Impact of Climate Change on Navel Orangeworm, a Major Pest of Tree Nuts in California. *Science of the Total Environment*, 755, 142657
- DeVincentis, A., S. Sandoval-Solis, S. Rice, D. Zaccaria, **M. L. Maskey**, G. Anna, A. Gaudin, E. Bruno, J. Mitchell. 2020. Hydrologic impacts of winter cover cropping on California's specialty crop fields are minimal. *CLEAN: Soil Air Water*, under review
- **Maskey, M. L.**, T. Pathak., and S. K. Dara. 2019. Weather Based Strawberry Yield Forecasts at Field Scale Using Statistical and Machine Learning Models. *Atmosphere,* 10(7), 378
- Marino G., D. Zaccaria, R. L. Snyder, O. Lagos, B. D. Lampinen, L. Ferguson, S. R. Grattan, C. Little, K. Shapiro, **M. L. Maskey**, D. L. Corwin, E. Scudiero, and B. L. Sanden, 2018. Evapotranspiration and Tree Performance of Mature Micro-irrigated Pistachio Orchards Grown on Saline-sodic Soils in the San Joaquin Valley of California. *Agriculture*, 9(4), 76
- Souto, C., O. Lagos, **M. L. Maskey**, E. Holzapfel and D. Zaccaria. 2019. A modified Surface Energy Balance to Model Crop Transpiration and Soil Evaporation on Partially Wetted Orchard with Micro-irrigation Systems. *Water,*
- **Maskey**, **M. L.**, C.E. Puente, and B. Sivakumar. 2018. Temporal downscaling rainfall and streamflow records through a deterministic fractal geometric approach. *Journal of Hydrology* 568, 447-461
- Pathak, T. B., **M. L. Maskey**, J. A. Dahlberg, F. Kearns, K. M. Bali, and D. Zaccaria. 2018. Climate change trends and impacts on California agriculture: A detailed review. *Agronomy*, 8(3), 25

- Puente, C. E., **M. L. Maskey,** and B. *Sivakumar*, 2017. Studying the Complexity of Rainfall in Time and Space via a Fractal Geometric Method, *In* A. A. Tsonis (ed) *Advances in Nonlinear Geosciences*, Springer, Cham, pp. 519-542
- Sivakumar, B., C. E. Puente, and **M. L. Maskey**, 2017. Complex Networks and Hydrologic Applications, *In* A. A. Tsonis (ed), *Advances in Nonlinear Geosciences*. Springer, Cham, pp. 565-586
- Puente, C. E., **M. L. Maskey.**, and B. Sivakumar. 2017. Combining fractals and multifractals to model geoscience records. *In*: B. Ghanbarian, A. Hunt (eds) *Fractals: concepts and applications in geoscience,* CRC Press
- **Maskey, M. L.**, C. E. Puente, B. Sivakumar and A. Cortis. 2017. Deterministic simulation of mildly intermittent hydrologic records. *Journal of Hydrologic Engineering*, 22(8), 04017026
- **Maskey, M. L.**, C. E. Puente, B. Sivakumar and A. Cortis. 2016. Deterministic simulation of highly intermittent hydrologic records. *Journal of Stochastic Environmental Research and Risk Assessment,* DOI 10.1007/s00477-016-1343-2
- **Maskey, M. L.**, C. E. Puente and B. Sivakumar. 2016. A comparison of fractal-multifractal techniques for encoding streamflow records. *Journal of Hydrology*, 542, 564-580.
- **Maskey, M. L.**, C. E. Puente, B. Sivakumar and A. Cortis. 2015. Encoding daily rainfall records via adaptations of the fractal multifractal method. *Journal of Stochastic Environmental Research and Risk Assessment:* DOI 10.1007/s00477-015-1201-7
- Cortis, A., C. E. Puente, H. H. Huang, **M. L. Maskey,** B. Sivakumar and N. Obregón. 2013. A physical interpretation of the deterministic fractal-multifractal method realizes a generalized multiplicative cascade. *Stochastic Environmental Research and Risk Assessment*, DOI 10.1007/s00477-013-0822-y
- Solomatine, D. P., **M. Maskey** and D. L. Shrestha. 2008. Instance-based learning compared to other data-driven methods in hydrological forecasting. *Hydrological Processes*, 22(2), 275.
- Solomatine, D. P., **M. Maskey** and D. L. Shrestha. 2006. Eager and lazy learning methods in the context of hydrologic forecasting. *In:* Neural Networks. International Joint Conference (pp. 4847-4853). IEEE

PRESENTATIONS

- **Maskey, M. L.**, A. M. Nelson, G. D. Spencer, C. D. Delhom, and D. M. Gholson. 2024. Modeling farm-scale watersheds to study impacts of winter cover crops on water quantity and quality of farms in the Mississippi Delta using Agricultural Policy Environmental eXtender. American Geophysical Union Annual Meeting, Washington D. C., USA, December 9-13.
- Atkins K., A. M. Nelson, **M. L. Maskey**, and Y. Shen. 2024. Projecting Agro-Hydrological Outcomes Using the "Apexgraze (Agricultural Policy/Environmental eXtender Graze) Model" and Various Climate Scenarios from Global Circulation Models. ASA, CSSA, SSSA International Annual Meeting, San Antonio, TX. November 10-13.
- Nelson, A.M., **M. L. Maskey**, K. Atkins, and Y. Shen. 2024. Evaluating Irrigation Best Management Practices Under Different Climate Projections. ASA, CSSA, SSSA International Annual Meeting, San Antonio, TX. November 10-13.
- **Maskey M. L. 2024**. A Tool to Extract Actual Evapotranspiration from the USGS MODIS Data Portal. SCINet Geospatial Working Group, Webinar. November 8.
- **Maskey, M. L.**, D. M. Gholson, C. D. Delhom, G. D. Spencer, and A. M. Nelson. 2024. Modeling farm-scale watersheds to study impacts of winter cover crops on water quantity and quality of farms in the Mississippi Delta using Agricultural Policy Environmental eXtender. Mississippi Water Resources Conference. Mississippi Water Resources Institute, Flowood, Mississippi, USA, October 9-11.

- **Maskey, M. L.,** N. Quintana-Ashwell, A. Al-Sudan, C. D. Delhom, and A. M. Nelson. 2024. Harnessing Pumping Rates to Fill the Data Gaps in the Mississippi River Valley Alluvial Aquifer Underlying the Mississippi Delta. AWRA, UCOWR, NIWR 60th Anniversaries Joint Water Resources Conference, St. Loius, Missouri, USA, September 30 – October 2.
- **Maskey, M. L.,** A. M. Nelson, A. Al-Sudan, and N. Quintana-Ashwell. 2024. Implications of Groundwater Depletion on Agricultural Productivity and Revenue in The Mississippi Delta. American Water Resource Association, Geospatial Water Technology Conference, Orlando, Florida, USA, March 25-27.
- **Maskey, M. L.,** A. M. Nelson, B. Stucky, H. Huang, B. K. Northup, D.N. Moriasi. 2023. Generalized Procedure for the Parameterization, Sensitivity, & Uncertainty Analyses of a Small Watershed Scale Hydrological Model. UCOWR/NIWR Annual Water Resources Conference, 2023, Colorado State University, Fort Collins, CO, USA, June 13-15.
- A. M. Nelson, **Maskey, M. L.**, B. K. Northup, D.N. Moriasi, and J. L Osario. 2023.Qualitative and quantitative assessment of farm-scale runoff as response to grazing operation. SEDHYD-2023, Sedimentation and Hydrologic Modeling Conference, SEDHYD, Inc., St. Louis, Missouri, USA. May 8-12.
- **Maskey, M. L.**, A. M. Nelson, B. K. Northup, D.N. Moriasi, and J. L Osario. 2023. Calibration of Apex Model to Assess Farm-Scale Runoff for Grazing Operation and Uncertainty Analysis, Sedimentation and Hydrologic Modeling Conference 2023, SEDHYD, Inc., St. Louis, Missouri, USA. May 8-12.
- **Maskey, M. L**. 2023. Simplified Framework to Calibrate the Agro-Hydrological APEX Model and Uncertainty Analysis of Runoff Parameters under Grazing Operations. NCAAR Seminar Series 2023, Capps Jr. Entrepreneurial Center at Delta Research and Extension Center, Stoneville MS, USA. May 3.
- **Maskey, M. L.**, A. M. Nelson. 2023. Generalized Approach to Calibrate Agro-Hydrological Model and Sensitivity and Uncertainty Analysis. AgriCulture Seminar Series – Research Presentations (Webinar), Spring 2023. Department of Agriculture – Agricultural Research Service Southeast Postdoc Network, Stoneville, MS, USA, April 20.
- **Maskey, M. L.**, A. Al-Sudani, A. M. Nelson, and N. Quintana Ashwell. 2023. Proposing a coupled hydroeconomic model for the Mississippi Delta of the Mississippi River Valley Alluvial Aquifer (MRVAA). Mississippi Water Resources Conference 2023. Mississippi Water Resources Institute, Mississippi State University, Starkville, USA, March 28-30.
- **Maskey, M. L.** 2023. ORISE (Oak Ridge Institute for Science & Education) Experience Talk. Agriculture, ARS Postdoc Network Seminar Series, Department of Agriculture – Agricultural Research Service Southeast Postdoc Network, Stoneville, MS, USA, Webinar, March 2.
- Peñaranda, V., D. Serrano, **M. Maskey**. 2021. The Dynamic Scaling Structure of the Intensity-Area-Duration-Frequency Relationship. arXiv preprint arXiv:2107.08184.
- Rheinheimer, D. E., G. F. Dourado, A. Wills, A. Rallings, **M. L. Maskey**, J. H. Viers. 2021. Climate Scenarios and Hydropower Optimization. California Energy Commission, Technical Advisory Committee Meeting. May 25
- **Maskey, M. L.**, L. Li, A.S. Fernandez-Bou, J. H. Viers, J. Medellin-Azuara. 2021. Integrated Spatial and Economic Analysis on Water Infrastructure Expansion Profitability and Affecting Climatic Factors within the Central Valley of California (No. EGU21-13766). European Geosciences Union, General Assembly, Copernicus Meetings, Vienna, Austria, April 19-30.
- **Maskey, M. L.**, D. J. Suarez., J. H. Viers, J. Medellin-Azuara, B. Sivakumar, L.E.G. Diaz, S. Sandoval-Solis, C. E. Puente. 2021. Fractal-multifractal ensembles of downscaled precipitation and temperature sets implied by climate models (No. EGU21-13741). European Geosciences Union, General Assembly, Copernicus Meetings, Vienna, Austria, April 19-30 (invited).

- Serrano, D., **M. L. Maskey**, A. Rizo, V. Peñaranda, 2021 Development of space-time rainfall intensity duration frequency curves based on a multifractal approach (No. EGU21-13705). European Geosciences Union, General Assembly, Copernicus Meetings, Vienna, Austria, April 19-30.
- Serrano, D., **M. L. Maskey**, J. Medellin-Azuara, B. Sivakumar, C.E. Puente. 2020. Revisiting the Fractal-Multifractal method in describing geometries of precipitation and temperature: Case of global circulation models outputs. American Geophysical Union, Fall Meeting, San Francisco, December 1-17.
- **Maskey, M. L.**, J. Medellin-Azuara, A.S. Fernandez-Bou, A. Guzman, E. Goharian, M. S. Dogan. 2020. Investigating benefits from additional recharge facilities within the American River Basin. American Geophysical Union, Fall Meeting, San Francisco, December 1-17.
- **Maskey, M. L.**, C. E. Puente and B. Sivakumar. 2019. Downscaling Rainfall and Temperature in Time via a Deterministic Geometric Fractal Approach. American Geophysical Union, Fall Meeting, San Francisco, December 9-13.
- **Maskey, M. L.,** T. B. Pathak, O. Lagos, C. I. Souto, S. K. Dara. 2019. Coupling weather and field-scale information to forecast strawberry yield weekly via machine learning approaches. American Geophysical Union, Fall Meeting, San Francisco, December 9-13.
- **Maskey, M. L.**, C. E. Puente and B. Sivakumar. 2019. Investigating Geometric Complexity of Precipitation in California via the Fractal-Multifractal Method. 2019 California Extreme Precipitation Symposium (CEPSYM), University of California, Davis, CA, June 25.
- **Maskey, M. L**. and K. Shapiro. 2019. Normalized Difference Vegetation Index (NDVI) Time Series Data in R. map time, University of California, Davis, April 23.
- **Maskey, M. L**. 2019. Hydrology to Agriculture to Climate: Theoretical to Applied Research. International Institute for Applied Systems Analysis, Laxenburg, Austria, April 4.
- **Maskey, M. L**. 2019. Development of a pest model using fundamental R-packages. maptimeDavis Lightning Talk, University of California, Davis, February 20.
- **Maskey, M. L**., C. E. Puente and B. Sivakumar. 2018. Projecting streamflow records one year ahead with neural networks of fractal-multifractal encodings. American Geophysical Union, Fall Meeting, Washington D.C., December 10-14.
- **Maskey, M. L.** 2018. Geometric modeling of Hydroclimate attributes coupled with data mining techniques, Enviro-Lunch, University of California, Merced, September 20 (invited).
- Puente, C. E., **M. L. Maskey** and B. Sivakumar. 2018. Estudio de la geometría de la 9xamin en California para 9xaminer efectos de cambio climático. XXVIII Congreso Latinoamericano de Hidráulica. Buenos Aires, Argentina, September 18.
- Puente, C. E., **M. L. Maskey**, B. Sivakumar and M. A. Díaz-Granados. 2018. Codificación, simulación, desagregación y predicción de caudales empleando un modelo geométrico fractal-multifractal. XXVIII Congreso Latinoamericano de Hidráulica. Buenos Aires, Argentina, September 19.
- **Maskey, M. L.,** T. B. Pathak, D. Zaccaria, C. E. Puente and L. Foglia. 2018. Modeling of air temperature to elucidate future plant phenology via the deterministic fractal geometric approach. Global Climate Action Summit, University of California, Davis, September 10 (invited).
- **Maskey, M. L.** 2018. Observed weather and climate data tool with short-term prediction. Weather and Climate tools for growing grape workshop, Bakersfield, California, May 1, 2018.
- **Maskey, M. L**., C. E. Puente and B. Sivakumar. 2018. Multi-year encoding of daily rainfall and streamflow via the fractal-multifractal method. European Geosciences Union, General Assembly, Vienna, Austria, April 7-12 (invited)

- C. E. Puente, **Maskey, M. L.** and B. Sivakumar. 2018. Mining air temperature records employing the fractal-multifractal method. European Geosciences Union, General Assembly, Vienna, Austria, April 7-12 (poster)
- **Maskey, M. L.**, C. E. Puente and B. Sivakumar. 2017. Complexity elucidation of rainfall, streamflow and temperature via fractal-multifractal encodings. European Geosciences Union, General Assembly, Vienna, Austria, April 23-28 (invited)
- **M. L. Maskey,** T. B. Pathak, D. Zaccaria, K. Bali, F. Kearns, and J. Dahlberg. 2017. Climate, water and agriculture in California and future initiatives. University of California Agriculture and Natural Resource, California, March 14.
- C. E. Puente, **Maskey, M. L.** and B. Sivakumar. 2017. Investigating the complexity of precipitation sets within California via the fractal-multifractal method. European Geosciences Union, General Assembly, Vienna, Austria, April 23-28
- **Maskey, M. L**., C. E. Puente, B. and Sivakumar. 2016. A deterministic approach to simulate and downscale hydrological records. American Geophysical Union, Fall Meeting, San Francisco, December 12-16 (invited)
- Sivakumar B., K. Fang, X. Han, J. Chen, J. Niu, **M. L. Maskey**, C. E. Puente. 2016. Complex Networks in Geosciences. 13th Annual Meeting: Asian Oceania Geosciences Society, Beijing, China, July 31 – August 5
- Puente, C. E., **M. L. Maskey**, and B. Sivakumar. 2016. Studying the complexity of Rainfall in time and Space via a fractal geometric method. 30 Years of Nonlinear Dynamics in Geosciences, Rhodes, Greece, July 03-08
- **Maskey, M. L.**, C. E. Puente and B. Sivakumar. 2016. Comparing the evolution of fractal encodings of daily streamflow and temperature as a tool to assess climate change. European Geosciences Union, General Assembly, Vienna, Austria, April 17-22
- Puente, C. E., **M. L. Maskey**, B. Sivakumar and A. Cortis. 2015. Predicting streamflow from fractal geometric encodings of yearly and decadal records. American Geophysical Union, Fall Meeting, San Francisco, December 14-18 (poster)
- **Maskey, M. L**., C. E. Puente, B. Sivakumar and A. Cortis. 2015. Encoding and simulation of daily rainfall records via adaptations of the fractal-multifractal method. American Geophysical Union, Fall Meeting, San Francisco, December 14-18
- Puente, C. E., **Maskey, M. L.**, Cortis, A., Sivakumar, B. 2013. Searching for trends in inter-annual runoff records via a fractal geometric approach. American Geophysical Union, Fall Meeting, San Francisco, December 9-13

HONORS AND AWARDS

- Early Career Scientist's Travel Support: European Geosciences Union General Assembly 2017, 2018
- Graduate Student Travel Award for the period January 1 to December 31, 2016
- Henry A. Jastro Graduate Research Scholarship Award for the academic year 2014-2017
- Netherlands Fellowship Program (NFP) for the academic year 2002-2004

AFFILIATIONS

- American Water Resources Association, Since 2024
- USDA-ARS, Southeast Postdoc Network: Active in several task groups from June 2022 to April 2024
- European Geoscience Union: Complementary Member since 2016
- American Geophysical Union: General Member since 2015

OUTREACH & EXTENSION ENGAGEMENT

- Engaged 100+ stakeholders across workshops, seminars, and field days in California and Mississippi, supporting practical decision-making in climate adaptation, groundwater resilience, and on-farm water management.
- Engaged with regional water leaders and stakeholders at the Delta Council Annual Meeting, Cleveland, MS – June 7, 2024
- Shared geospatial workflows, tools, and use cases with federal scientists and early-career researchers via USDA-ARS SCINet Geospatial Working Group and GeoCDL – Fall 2022 to Spring 2025
- Participated in ongoing peer exchange and technical sessions on model optimization and uncertainty analysis through the Southeast ARS Postdoc Network – Spring 2022 to Fall 2024
- Contributed to NCAAR Seminar Series discussions and speaker sessions, fostering dialogue across hydrology, agriculture, and climate – Fall 2022 to Spring 2025
- Joined a stakeholder-focused tour of the Scott Learning Center to explore on-farm conservation and community-scale water management – September 3, 2024
- Supported program planning and research-extension integration with the UC ANR Water Resources Program Team – March 2019 & March 2020, Davis, CA
- Participated in the California Irrigation Institute's annual meeting: "Managing Our Land to Manage Our Water," focusing on land-water policy integration – Feb 4–5, 2019, Sacramento, CA
- Co-developed strategies for integrating climate science into Cooperative Extension at the UC ANR Climate Change Workshop – Jan 23–24, 2019, Merced, CA
- Gained field-level insight into pistachio irrigation and technology transfer at UC ANR's grower-led workshop and field day – May 30, 2018, Coalinga, CA
- Presented on weather-climate tools for viticulture and engaged growers at a Cooperative Extension workshop – May 1, 2018, Bakersfield, CA

ACADEMIC SERVICE & LEADERSHIP

- **AGU OSPA Judge**, American Geophysical Union Fall Meetings – 2024 (Washington, DC) and 2019 (San Francisco, CA)
- **Session Chair & Moderator**
    - **"**Modeling Advances I," Sedimentation and Hydrologic Modeling Conference – May 10, 2023, St. Louis, MO
    - "Modeling II," UCOWR/NIWR Water Resources Conference – June 15, 2023, Fort Collins, CO
- **Student Presentation Judge**, Mississippi Water Resources Conference – March 28–30, 2023, Starkville, MS
- **Program Moderator**, USDA-ARS NP211 National Leaders Panel, Southeast Postdoc Network – August 11, 2022
- **Editorial Service**
    - **Guest Editor**, Special Issue *"Influence of Weather Conditions on Agriculture"*, *Atmosphere* (2023–2025)
    - **Peer Reviewer** for over 20 journals including *Journal of Hydrology*, *Environmental Modelling & Software*, *Agricultural Water Management*, *ASCE J. of Hydrologic Engineering*, *Geoscientific Model Development*, and *Journal of Hydraulic Research*

- **Conference & Proposal Reviewer** for ASABE, IIASA, USDA, and multiple international applied science panels
- **Proposal Development** for NSF, NASA, USDA-NIFA, AFRI, and UC-System Presidential postdoctoral fellowship

CONFERENCES & PROFESSIONAL DEVELOPMENT

- Presented research on agrohydrologic modeling at the World Environmental & Water Resources Congress – May 21–25, 2017, Sacramento, CA
- Attended AGU Fall Meeting to explore remote sensing and groundwater recharge topics – Dec 3–7, 2012, San Francisco, CA
- Attended Structures and Code Institute Seminar on earthquake-resistant design – Feb 2008, Berkeley, CA
- Participated in discussions on flood risk management at the 2nd International Seminar on Disaster Mitigation – Nov 8, 2004, Kathmandu, Nepal
- Participated in scientific discussion at the 4th National Conference on Science and Technology – March 23-26, 2004, Kathmandu, Nepal
- Engaged with Nepalese engineers at the 7th National Convention of Engineers on Engineering Profession in Nation-building – Dec 11-13, 2001, Kathmandu, Nepal
- Engaged with Nepalese engineers and architects at the National Seminar on Building and Interior Décor – Jun 7-8, 1999, Kathmandu, Nepal
- Collaborate with Nepalese engineers at the 6th National Convention of Engineers on Resource Management for Infrastructure Development – Dec 3-4, 1998, Kathmandu, Nepal