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Engineering & Scientific Consulting

Maryam Pournasiri Poshtiri, Ph.D., P.E.

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Professional Profile

Dr. Pournasiri's expertise includes surface water hydrology and hydraulics, flood control and river engineering, and hydro-climate science. Her expertise in civil and river engineering encompasses both consulting and construction in multiple project phases including planning, designing, developing project documents, and performing site inspections.

Her expertise includes:

- Forensic hydrology analysis and evaluation
- Flood control and river engineering
- Hydrology and watershed analysis (i.e., HEC-HMS)
- River system analysis and modeling (i.e., HEC-RAS)
- Characterizing extreme hydro-climate events (i.e., flood, drought) and their land-atmosphere interaction
- Hydrologic and climate data analysis and evaluation
- Civil infrastructure cost analysis
- Computational statistics and data analysis

Dr. Pournasiri has multidisciplinary expertise in fields of the forensic engineering, consulting, and construction. Her consulting experience includes the planning and design of flood control structures, erosion control and river training measures, and surface drainage systems. She also has expertise evaluating water damages including flooding, erosion, and drainage problems using field measurements, engineering analysis, and FEMA base flood elevation and documents. In addition, she has experience estimating construction costs, analyzing delays and loss of productivity, reviewing design drawings and technical reports, and construction site inspections.

Dr. Pournasiri has conducted research on hydro-climatology, human (or anthropogenic) impact, and sustainability. Her doctoral research focused on understanding the multi-faceted nature of streamflow and hydrological drought across US river basins and their association with climate drivers and land-atmosphere interactions. She developed streamflow drought indicators for the major watershed regions across the US and identified regional changes and decadal shifts in hydrological drought, echoing local climatic changes, soil moisture trends, changes in cropping and irrigation practices, and creation of forest plantations. She investigated the spatio-temporal variability of river intermittency indicators across the U.S. and their association with regional and large-scale climate anomalies. In addition, Dr. Pournasiri collaborated with national scientists and regional hydrologists to develop a framework for capturing hydrologic extremes and supporting local water supply planning and management in the southwest US. She used statistical methods to determine how understanding changes in precipitation patterns could potentially help mitigate decreasing regional water supply and how understanding the connection

between large-scale weather patterns and local streamflow conditions can support the effective use of non-snow-derived water supplies from extreme precipitation events within southwest basins.

Academic Credentials & Professional Honors

Ph.D., Civiil Engineering, University of Colorado, Denver, 2017

M.Sc., Civil Engineering, Power and Water University of Technology, 2006

B.Sc., Civil Engineering, Isfahan University of Technology, Iran, 2004

Outstanding Graduate Student, University of Colorado Denver, Civil Engineering Department, Denver, CO, 2017.

German Academic Exchange Service Scholarship, Summer school on Computer Applications in Civil Engineering, Wuppertal, Germany, 2003.

Licenses and Certifications

Certified Floodplain Manager (CFM)

Academic Appointments

Affiliate Faculty, Global Water Concerns, Earth and Atmospheric Sciences Department, Metropolitan State University of Denver, 2017-2018.

Lecturer, “Engineering and Science Informatics” and “Fundamentals of Sustainability and Climate Change,” Civil Engineering Department, University of Colorado Denver, 2016-2018.

Research Assistant, Streamflow Droughts in Major Watershed Regions of the Conterminous US, Civil Engineering Department, University of Colorado Denver, 2013-2017.

Prior Experience

Staff Engineer/Hydrologist, Bryant Consultants, 2018-2021

Visiting Scientists, National Center for Atmospheric Research (NCAR), 2018

Project Engineer, Mehrab Omran Construction Company, 2009-2012

Surface Water Engineer, Abrah Gostar Tadbir Consultant Engineers, 2006-2009

Professional Affiliations

American Society of Civil Engineers (ASCE)

American Meteorological Society (AMS)

American Geophysical Union (AGU)

Association of State Floodplain Managers (ASFM)

Colorado Association of Stormwater and Floodplain Managers (CASFM)

Publications

Pournasiri Poshtiri M., Pal I., Lall U., Naveau P., and Towler E. Variability patterns of the annual frequency and timing of low streamflow days across the USA and their linkage to regional and large-scale climate. Hydrological Processes Journal 2019; 33:1569–1578.

Pournasiri Poshtiri M., Towler E., Llewellyn D., and Prein F. A. Extremes of opportunity: examining recent trends in warm season precipitation for New Mexico river basins. 86th Annual Western Snow Conference. Albuquerque, New Mexico 2019; pp.1-7.

Pournasiri Poshtiri M., Towler E., and Pal I. Characterizing and understanding the variability of streamflow drought indicators within the United States. Hydrological Sciences Journal 2018; 63: 1791-1803.

Pournasiri Poshtiri M., and Pal I. Patterns of hydrological drought indicators in major US river basins. Climatic Change 2016; 134:549–563.

Pournasiri Poshtiri M., Towler E., and Pal I. Streamflow drought indicators across conterminous United States. Research Data Archive at the National Center for Atmospheric Research (NCAR), Computational and Information Systems Laboratory 2017; pp.1-27.

Pournasiri Poshtiri M., and Pal I. Variability of natural low flow magnitudes in the Upper Colorado River Basin: Identifying monotonic and periodic trends, and relative role of large-scale climate dynamics. Hydrology and Earth System Sciences Discussion 2014; 11, 8779–8802.

Presentations

Pournasiri Poshtiri, M., Towler, E. Llewellyn, d., and Prein A. Extremes of Opportunity: Characterizing Warm Season Streamflow in New Mexico River Basins. American Geophysical Union Fall Meeting, Washington, D.C., 2018.

Pournasiri Poshtiri, M., and Pal, I. Spatiotemporal variability of stream dry days across the contiguous United States. Universities Council on Water Resources annual conference, Fort Collins, CO, 2017.

Pournasiri Poshtiri, M., and Pal, I. Understanding hydro-meteorological variability and trends of streamflow droughts in the headwater basin of Colorado River. American Water Resources Association Annual Conference, Denver, CO, 2016.

Pournasiri Poshtiri, M., and Pal, I. Spatial-temporal patterns of hydrological drought indicators in major U.S. river basins. Universities Council on Water Resources annual conference, Henderson, NV, 2015.

Pournasiri Poshtiri, M., and Pal, I. Understanding extreme low flow characteristics of Colorado River. Universities Council on Water Resources annual conference annual conference, Tufts University, Medford, MA, 2014.

Pournasiri Poshtiri, M., and Pal, I. Understanding extreme low flow variability of the Colorado River and its dynamical connections. American Geophysical Union Chapman conference on water management, Portland, Oregon, 2013.

Pournasiri Poshtiri, M., and Pal, I. Climate change, droughts, and low stream flow conditions in the major river basins in the U.S. Research and Creative Activities Symposium, Denver, CO, 2013.

Additional Education & Training

HAZWOPER 40-Hour Training, June 2022