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## **Professor Ricardo Mantilla**

Correspondence language: English

### **Contact Information**

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#### **Address**

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## Professor Ricardo Mantilla

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### Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Spanish; Castilian	Yes	Yes	Yes	Yes	Yes

### Degrees

- 2009/10            Post-doctorate, Civil Engineering - Water Resources, University of Iowa  
Supervisors: Witold Krajewski, 2008/1 - 2009/10
- 2007/12           Post-doctorate, Civil Engineering - Water Resources, New Mexico Tech (New Mexico  
Institute of Mining & Technology)  
Supervisors: Enrique Vivoni, 2007/1 - 2007/12
- 2007/8            Doctorate, Civil Engineering - Water Resources, University of Colorado at Boulder  
Supervisors: Vijay K Gupta, 2001/1 - 2007/8
- 2003/6            Master's Thesis, Civil Engineering, Universidad Nacional de Colombia  
Supervisors: Oscar Mesa, 1999/8 - 2003/1
- 2000/6            Bachelor's, Civil Engineering, Universidad Nacional de Colombia  
Supervisors: , 1995/1 -

### User Profile

Research Specialization Keywords: River Network Hydrology, Flood Forecasting, Hydrologic Modeling, Remote Sensing, Nonlinear Dynamics, Groundwater

### Employment

- 2021/7            Associate Professor  
Civil Engineering, Price Faculty of Engineering, The University of Manitoba  
Full-time, Term, Associate Professor  
Tenure Status: Tenure Track  
Research, teaching, and departmental and college service
- 2015/8 - 2021/6    Assistant Professor  
Civil and Environmental Engineering, College of Engineering, University of Iowa  
Part-time, Term, Assistant Professor  
Tenure Status: Tenure Track  
Research, teaching, and departmental and college service

2009/11 - 2015/7      Research Engineer - Iowa Flood Center  
 Civil and Environmental Engineering, IIHR Hydroscience and Engineering, University of Iowa  
 Full-time, Term  
 Tenure Status: Non Tenure Track  
 Developing and implementing a regional high-resolution flood forecasting system for the state of Iowa

## Research Funding History

### Completed [n=3]

2016/8 - 2020/12      Exploring Utility of SMAP Products for Real Time Flood Forecasting, Grant  
 Co-investigator  
**Funding Sources:**  
 National Aeronautics and Space Administration (NASA)  
 Total Funding - 658,439  
 Portion of Funding Received - 658,439  
 Funding Competitive?: Yes  
 Principal Investigator : Witold F Krajewski

2018/8 - 2020/8      Real-Time Flood Forecasting for River Crossings - Phase I, Phase II, Phase III, Grant  
 Principal Investigator  
**Funding Sources:**  
 Mid-American Transportation Center, Lincoln Nebraska  
 MATC Research Grants  
 Total Funding - 210,000  
 Portion of Funding Received - 210,000  
 Funding Competitive?: Yes  
 Principal Investigator : Witold F Krajewski

2015/5 - 2016/4      IEC Opportunity Grant: Estimating potential hydrokinetic energy and recovery fraction in Iowa waterways, Grant  
 Principal Investigator  
**Funding Sources:**  
 Iowa Energy Center  
 Iowa Energy Center Grants Program  
 Total Funding - 60,000  
 Portion of Funding Received - 60,000  
 Funding Competitive?: Yes  
 Co-investigator : Corey Markfort

## Student/Postdoctoral Supervision

### Master's Thesis [n=2]

2019/1 - 2020/12      Faruk Gurbuz (Completed) , The University of Iowa  
 Academic Advisor      Thesis/Project Title: Flood Reduction Using Distributed Active Small Reservoirs Controlled by Artificial Intelligence  
 Present Position: Water Resources Engineer, DSI - General Directorate of State Hydraulic

2015/8 - 2017/5  
Academic Advisor  
Andre Zanchetta (Completed) , The University of Iowa  
Thesis/Project Title: Exploring Hydroinformatics Tools for Hydrological Model Output Representation  
Present Position: PhD Candidate, McMaster University

#### **Doctorate [n=4]**

2016/8 - 2021/5  
Academic Advisor  
Navid Jadidoleslam (Completed) , The University of Iowa  
Thesis/Project Title: Exploring Utility of Satellite-Based Soil Moisture in Real-Time Flood Forecasting  
Present Position: Postdoctoral Research Fellow, Georgia Institute of Technology

2015/1 - 2019/7  
Academic Advisor  
Gabriel Perez (Completed) , The University of Iowa  
Thesis/Project Title: Connecting the statistics of regional flood frequency estimation to physical processes that generate floods  
Present Position: Postdoctoral Research Fellow, Vanderbilt University

2012/8 - 2015/5  
Co-Supervisor  
Morgan Fonley (Completed) , The University of Iowa  
Thesis/Project Title: Linear and nonlinear response of outlet flow to fluctuating rain patterns at different basin scales  
Present Position: Associate Professor, Alma College

2011/1 - 2015/5  
Co-Supervisor  
Tibebu Ayalew (Completed) , The University of Iowa  
Thesis/Project Title: Physical Basis of the Power-Law Spatial Scaling Structure of Peak Discharges  
Present Position: Principal Hydrologist, Berkshire Hathaway Specialty Insurance

#### **Post-doctorate [n=4]**

2018/9 - 2021/6  
Academic Advisor  
Nicolas Velasquez Giron, The University of Iowa  
Thesis/Project Title: Parameterization of Flood Forecasting Models at River Crossings Beyond Iowa  
Present Position: Postdoctoral Researcher, The University of Iowa

2015/8 - 2017/5  
Academic Advisor  
Gheorghi Guzun (Completed) , The University of Iowa  
Thesis/Project Title: Implementation of Communication Protocols Between Web-based Interfaces and High Performance Computing Cluster  
Present Position: Assistant Professor, San Jose State University

2015/8 - 2017/5  
Academic Advisor  
Felipe Quintero (Completed) , The University of Iowa  
Thesis/Project Title: Assessment of changes in flood frequency due to the effects of climate change: Implications for engineering design  
Present Position: Research Scientist, Iowa Flood Center

2015/6 - 2016/5  
Co-Supervisor  
Shaghayegh Pournazeri (Completed) , The University of Iowa  
Thesis/Project Title: Optimization and initial testing of a model-scale horizontal axis hydrokinetic turbine  
Present Position: Unknown

## **Presentations**

1. (2019). A Physical Interpretation for Peak Flow Scaling of Rainfall-Runoff Events with Implications on Peak Flow Regionalization. International Conference on Weather Forecast and Hydrological Applications of Radar, Seoul, Korea, Republic of  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No

## Publications

### Journal Articles

1. Xiang, Zhongrun and Demir, Ibrahim and Mantilla, Ricardo and Krajewski, Witold F. (2021). A Regional Semi-Distributed Streamflow Model Using Deep Learning. *Journal of Hydrology*.  
Revision Requested  
Refereed?: Yes
2. Mantilla, Ricardo and Perez, Gabriel and Velasquez, Nicolas and Wright, Daniel Benjamin and Yu, Guo. (2021). Regional Flood Frequency Analysis Using Physics-based Hydrologic Modeling. *Water Resources Research*.  
Revision Requested  
Refereed?: Yes, Open Access?: Yes
3. Fonley, MR and Qiu, K and Velasquez, N and Haut, NK and Mantilla, R. (2021). Development and Evaluation of an ODE Representation of 3D Subsurface Tile Drainage Flow Using the HLM Flood Forecasting System. *Water Resources Research*. 57(3): e2020WR028177.  
Accepted  
Refereed?: Yes
4. Jadidoleslam, Navid and Mantilla, Ricardo and Krajewski, Witold F. (2021). Data Assimilation of Satellite-Based Soil Moisture into a Distributed Hydrological Model for Streamflow Predictions. *Hydrology*. 8(1): 52.  
Accepted  
Refereed?: Yes
5. Perez, G and Gomez-Velez, JD and Mantilla, R and Wright, DB and Li, Z. (2021). The Effect of Storm Direction on Flood Frequency Analysis. *Geophysical Research Letters*. 48(9): e2020GL091918.  
Accepted  
Refereed?: Yes
6. Jadidoleslam, Navid and Hornbuckle, Brian K and Krajewski, Witold F and Mantilla, Ricardo and Cosh, Michael H. (2021). Exploring the Potential of SMAP Soil Moisture for Improving Real-time Streamflow Prediction in the US Corn Belt. *IEEE Transactions on Geoscience and Remote Sensing*.  
Revision Requested  
Refereed?: Yes
7. Velasquez, Nicolas and Mantilla, Ricardo. (2020). Limits of Predictability of a Global Self-Similar Routing Model in a Local Self-Similar Environment. *Atmosphere*. 11(8): 791.  
Accepted  
Refereed?: Yes
8. Bressan, F and Mantilla, R and Schilling, KE and Palmer, JA and Weber, L. (2020). Hydrologic-hydraulic modeling of sediment transport along the main stem of a watershed: role of tributaries and channel geometry. *Hydrological Sciences Journal*. 65(2): 183--199.  
Accepted  
Refereed?: Yes
9. Quintero, Felipe and Krajewski, Witold F and Seo, Bong-Chul and Mantilla, Ricardo. (2020). Improvement and evaluation of the Iowa Flood Center Hillslope Link Model (HLM) by calibration-free approach. *Journal of Hydrology*. 584: 124686.  
Accepted  
Refereed?: Yes
10. Jadidoleslam, Navid and Goska, Radoslaw and Mantilla, Ricardo and Krajewski, Witold F. (2020). Hydrovise: A non-proprietary open-source software for hydrologic model and data visualization and evaluation. *Environmental Modelling & Software*. 134: 104853.  
Accepted  
Refereed?: Yes

11. Perez, Gabriel and Mantilla, Ricardo and Krajewski, Witold F and Quintero, Felipe. (2019). Examining observed rainfall, soil moisture, and river network variabilities on peak flow scaling of rainfall-runoff events with implications on regionalization of peak flow quantiles. *Water Resources Research*. 55(12): 10707--10726.  
Accepted  
Refereed?: Yes
12. Fonley, Morgan and Mantilla, Ricardo and Curtu, Rodica. (2019). Doing Hydrology Backwards—Analytic Solution Connecting Streamflow Oscillations at the Basin Outlet to Average Evaporation on a Hillslope. *Hydrology*. 6(4): 85.  
Accepted  
Refereed?: Yes
13. Jadidoleslam, Navid and Mantilla, Ricardo and Krajewski, Witold F and Cosh, Michael H. (2019). Data-driven stochastic model for basin and sub-grid variability of SMAP satellite soil moisture. *Journal of Hydrology*. 576: 85--97.  
Accepted  
Refereed?: Yes
14. Jadidoleslam, Navid and Mantilla, Ricardo and Krajewski, Witold F and Goska, Radoslaw. (2019). Investigating the role of antecedent SMAP satellite soil moisture, radar rainfall and MODIS vegetation on runoff production in an agricultural region. *Journal of Hydrology*. 579: 124210.  
Accepted  
Refereed?: Yes
15. Perez, Gabriel and Mantilla, Ricardo and Krajewski, Witold F. (2018). The influence of spatial variability of width functions on regional peak flow regressions. *Water Resources Research*. 54(10): 7651--7669.  
Accepted  
Refereed?: Yes
16. Perez, Gabriel and Mantilla, Ricardo and Krajewski, Witold F. (2018). Estimation of historical-annual and historical-monthly scale-invariant flow duration curves with implementation for Iowa. *Journal of Hydrologic Engineering*. 23(12): 05018021.  
Accepted  
Refereed?: Yes
17. Quintero, Felipe and Mantilla, Ricardo and Anderson, Christopher and Claman, David and Krajewski, Witold. (2018). Assessment of changes in flood frequency due to the effects of climate change: Implications for engineering design. *Hydrology*. 5(1): 19.  
Accepted  
Refereed?: Yes
18. Ghimire, Ganesh Raj and Krajewski, Witold F and Mantilla, Ricardo. (2018). A power law model for river flow velocity in Iowa basins. *JAWRA Journal of the American Water Resources Association*. 54(5): 1055--1067.  
Accepted  
Refereed?: Yes
19. Ayalew, TB and Krajewski, WF and Mantilla, R and Zimmerman, DL. (2018). Can floods in large river basins be predicted from floods observed in small subbasins?. *Journal of Flood Risk Management*. 11(3): 331--338.  
Accepted  
Refereed?: Yes

20. Krajewski, Witold F and Ceynar, Daniel and Demir, Ibrahim and Goska, Radoslaw and Kruger, Anton and Langel, Carmen and Mantilla, Ricardo and Niemeier, James and Quintero, Felipe and Seo, Bong-Chul and others. (2017). Real-time flood forecasting and information system for the state of Iowa. *Bulletin of the American Meteorological Society*. 98(3): 539--554.  
Accepted  
Refereed?: Yes
21. Wright, Daniel B and Mantilla, Ricardo and Peters-Lidard, Christa D. (2017). A remote sensing-based tool for assessing rainfall-driven hazards. *Environmental Modelling & Software*. 90: 34--54.  
Accepted  
Refereed?: Yes
22. Sloan, Brandon P and Mantilla, Ricardo and Basu, Nandita B and Fonley, Morgan. (2017). Hydrologic Impacts of Subsurface Drainage from the Field to Watershed Scale. *Hydrological Processes*.  
Accepted  
Refereed?: Yes
23. Ayalew, Tibebe B and Krajewski, Witold F and Mantilla, Ricardo and Wright, Daniel B and Small, Scott J. (2017). Effect of spatially distributed small dams on flood frequency: insights from the Soap Creek watershed. *Journal of Hydrologic Engineering*. 22(7): 04017011.  
Accepted  
Refereed?: Yes
24. Tamerius, JD and Zhou, X and Mantilla, R and Greenfield-Huitt, T. (2016). Precipitation effects on motor vehicle crashes vary by space, time, and environmental conditions. *Weather, Climate, and Society*. 8(4): 399--407.  
Accepted  
Refereed?: Yes
25. Sloan, Brandon P and Basu, Nandita B and Mantilla, Ricardo. (2016). Hydrologic impacts of subsurface drainage at the field scale: Climate, landscape and anthropogenic controls. *Agricultural Water Management*. 165: 1--10.  
Accepted  
Refereed?: Yes
26. Fonley, Morgan and Mantilla, Ricardo and Small, Scott J and Curtu, Rodica. (2016). On the propagation of diel signals in river networks using analytic solutions of flow equations. *Hydrology and Earth System Sciences*. 20(7): 2899--2912.  
Accepted  
Refereed?: Yes
27. Quintero, Felipe and Krajewski, Witold F and Mantilla, Ricardo and Small, Scott and Seo, Bong-Chul. (2016). A spatial--dynamical framework for evaluation of satellite rainfall products for flood prediction. *Journal of Hydrometeorology*. 17(8): 2137--2154.  
Accepted  
Refereed?: Yes
28. Choi, Chi Chi and Constantinescu, George and Mantilla, Ricardo. (2015). Implementation of a hydraulic routing model for dendritic networks with offline coupling to a distributed hydrological model. *Journal of Hydrologic Engineering*. 20(11): 04015023.  
Accepted  
Refereed?: Yes
29. Choi, Chi Chi and Mantilla, Ricardo. (2015). Development and analysis of GIS tools for the automatic implementation of 1D hydraulic models coupled with distributed hydrological models. *Journal of Hydrologic Engineering*. 20(12): 06015005.  
Accepted  
Refereed?: Yes

30. Gupta, Vijay K and Ayalew, Tibebu B and Mantilla, Ricardo and Krajewski, Witold F. (2015). Classical and generalized Horton laws for peak flows in rainfall-runoff events. *Chaos: An Interdisciplinary Journal of Nonlinear Science*. 25(7): 075408.  
Accepted  
Refereed?: Yes
31. Ayalew, Tibebu B and Krajewski, Witold F and Mantilla, Ricardo. (2015). Insights into expected changes in regulated flood frequencies due to the spatial configuration of flood retention ponds. *Journal of Hydrologic Engineering*. 20(10): 04015010.  
Accepted  
Refereed?: Yes
32. Moser, Ben A and Gallus Jr, William A and Mantilla, Ricardo. (2015). An initial assessment of radar data assimilation on warm season rainfall forecasts for use in hydrologic models. *Weather and Forecasting*. 30(6): 1491--1520.  
Accepted  
Refereed?: Yes
33. Ayalew, Tibebu B and Krajewski, Witold F and Mantilla, Ricardo. (2015). Analyzing the effects of excess rainfall properties on the scaling structure of peak discharges: Insights from a mesoscale river basin. *Water Resources Research*. 51(6): 3900--3921.  
Accepted  
Refereed?: Yes

### Book Chapters

1. Perez, G. and Mantilla, R. and Krajewski, W.F. (2018). Spatial Patterns of Peak Flow Quantiles Based on Power-Law Scaling in the Mississippi River Basin. Taronis, A. *Advances in Nonlinear Geosciences*. : 100--150.  
Accepted, Springer  
Refereed?: Yes

### Reports

1. Krajewski, Witold and Mantilla, Ricardo and others. (2018). Real-Time Flood Forecasting for River Crossings. 20. University of Nebraska-Lincoln. Mid-America Transportation Center.
2. Anderson, Christopher J and Claman, David and Mantilla, Ricardo. (2015). Assessing Vulnerability of Iowa's Highway Infrastructure to Climate Change Projections of Streamflow. 50. Transportation Research Board.