

Curriculum Vitae

Gabriele Villarini

WORK ADDRESS

IIHR-Hydrosience & Engineering
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RESEARCH INTERESTS:

Hydrometeorology, climatology, extreme events, hurricanes, atmospheric rivers, seasonal forecasting, applied statistics, remote sensing of rainfall.

EDUCATION:

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| <i>May 2018:</i> | Executive MBA, Tippie College of Business, the University of Iowa (With Distinction). |
| <i>May 2018:</i> | Certificate in Leadership, Tippie College of Business, the University of Iowa. |
| <i>August 2008:</i> | Ph.D., Department of Civil and Environmental Engineering, the University of Iowa. |
| <i>July 2003:</i> | Degree in Civil Engineering, Universita' degli Studi "La Sapienza", Rome, Italy. |

THESIS:

- *"Empirically-Based Modeling of Radar-Rainfall Uncertainties"*. The University of Iowa, Iowa City, USA.
- *"From Measurements to Modeling: the Use of NEXRAD Weather Radar for Hydrological Applications"*. Universita' degli Studi "La Sapienza", Rome, Italy.

PROFESSIONAL EXPERIENCE:

July 2020 – present: Professor, Civil & Environmental Engineering. The University of Iowa.

February 2018 – August 2022: Director, IIHR—Hydroscience & Engineering. The University of Iowa.

August 2017 – February 2018: Interim Director, IIHR-Hydroscience & Engineering. The University of Iowa.

December 2016 – August 2017: Associate Director, IIHR-Hydroscience & Engineering. The University of Iowa.

July 2016 – June 2020: Associate Professor, Civil & Environmental Engineering. The University of Iowa.

July 2016 – August 2017: Director of Graduate Studies, Civil & Environmental Engineering. The University of Iowa.

June 2012 – June 2016: Assistant Professor, Civil & Environmental Engineering. The University of Iowa.

June 2012 – present: Assistant Research Engineer, IIHR-Hydroscience & Engineering. The University of Iowa.

August 2008 – May 2012: Willis Research Network Fellow.

August 2011 – May 2012: Associate Research Scholar, Civil & Environmental Engineering. Princeton University.

February 2012 – May 2012: Lecturer, Civil & Environmental Engineering. Princeton University.

August 2008 – July 2011: Research Associate, Civil & Environmental Engineering. Princeton University.

August 2003 – July 2008: Graduate Research Assistant, Hydrometeorology Group, IIHR – Hydroscience & Engineering. The University of Iowa. Adviser: Prof. W.F. Krajewski.

December 2003 – December 2004: President of SIIHR (Students of Iowa Institute of Hydraulic Research), The University of Iowa, Iowa City, USA

December 2003 – December 2004: President of SIAHR (University of Iowa Student Chapter, International Association of Hydraulic Engineering and Research), The University of Iowa, Iowa City, USA

AWARDS AND FELLOWSHIPS:

May 2022: “Faculty Excellence Award for Research” by the College of Engineering at the University of Iowa.

April 2021: “Hot List of the world’s 1,000 top climate scientists” by Reuters.

November 2020: “2020 Highly Cited Researcher” by Clarivate Web of Science.

July 2020 – June 2023: “Robert & Virginia Wheeler Faculty Fellow in Engineering” awarded by the College of Engineering at the University of Iowa.

May 2018: Fellow in the “2018-2019 Big Ten Academic Alliance (BTAA) Academic Leadership Program (ALP).”

April 2017: “2017 Water Young Investigator Award” awarded by Water.

December 2016: “Fellow” awarded by the American Geophysical Union.

December 2016: “James B. Macelwane Medal” awarded by the American Geophysical Union.

April 2014: “NSF CAREER Award” for the proposal entitled "CAREER: Temporal Clustering of Hydrometeorological Extremes"

February 2014: “Editor’s Award – Journal of Climate” awarded by the American Meteorological Society (AMS). Citation: “For thorough, prompt, and fair reviews on topics addressing the interface between water, statistics, and climate.”

January 2014: “2014 Old Gold Summer Fellowship” awarded by The University of Iowa.

December 2013: Nominated to represent The University of Iowa for the “2014 Blavatnik Award for Young Scientists” in the Physical Sciences & Engineering Category.

April 2013: “Hydrological Sciences Outstanding Young Scientist Award” awarded by the European Geosciences Union (EGU). Citation: “For innovative studies in the field of remote sensing of rainfall, flood prediction, and hydroclimatological trend analysis.”

September 2012: “Premio Torricelli” awarded by the Gruppo Italiano di Idraulica for the best young Italian researcher in hydrology and hydraulics. Citation: “Per la vasta produzione scientifica caratterizzata da importanti contributi nel settore dell’idrometeorologia e della previsione delle piene.” (“For the vast scientific production characterized by important contributions in the field of hydrometeorology and flood prediction”).

Fall 2006 – Summer 2008: NASA Earth System Science (ESS) Fellowship, National Aeronautics and Space Administration (Code Y), USA.

January 2008: Center for Global and Regional Environmental Research (CGRER) Graduate Student Travel Award, The University of Iowa, Iowa City, Iowa, USA.

December 2007: *Outstanding Student Paper Award*, Hydrology Section of the American Geophysical Union (AGU), 2007 Fall Meeting, San Francisco, California, USA.

July 2007: Center for Global and Regional Environmental Research (CGRER) Graduate Student Travel Award, The University of Iowa, Iowa City, Iowa, USA.

March 2007: Third Place in the Mathematical, Physical Sciences and Engineering Division, The University of Iowa 2007 Ninth Annual James F. Jakobsen Graduate Conference, The University of Iowa, Iowa City, Iowa, USA.

Fall 2006: Graduate Incentive Fellowship (GIF), The University of Iowa, Iowa City, Iowa, USA.

Fall 2003 – Summer 2006: Graduate Research Assistantship, IIHR–Hydroscience & Engineering, The University of Iowa, Iowa City, Iowa, USA.

July 2006: Center for Global and Regional Environmental Research (CGRER) Graduate Student Travel Award, The University of Iowa, Iowa City, Iowa, USA.

May 2006: Graduate Student Senate Travel Funds Award, The University of Iowa, Iowa City, Iowa, USA.

April 2006: Travel grant by the World Meteorological Organization to present at the Second International Symposium on Quantitative Precipitation Forecasting and Hydrology, Boulder, Colorado.

March 2006: Third Place in the Mathematical, Physical Sciences and Engineering Division, The University of Iowa 2006 Eighth Annual James F. Jakobsen Graduate Conference, The University of Iowa, Iowa City, Iowa, USA.

January 2006: Center for Global and Regional Environmental Research (CGRER) Graduate Student Travel Award, The University of Iowa, Iowa City, Iowa, USA.

October 2005: Travel grant to attend the International Conference on Civil and Environmental Engineering 2005 (ICCEE05), Hiroshima, Japan.

October 2004: International Programs Graduate Student Travel Award, The University of Iowa, Iowa City, Iowa, USA.

PROFESSIONAL SOCIETIES:

American Geophysical Union (AGU); American Meteorological Society (AMS)

PEER-REVIEWED PAPERS:

1. Ekolu, J., B. Dieppois, M. Sidibe, J.M. Eden, Y. Trambly, **G. Villarini**, D. Peña-Angulo, G. Mahé, J.-E. Paturel, C. Onyutha, and M. van de Wiel, Long-term variability in hydrological droughts and floods in sub-Saharan Africa: New Perspectives from a 65-year daily streamflow dataset, *Journal of Hydrology*, 2022 (in press).
2. Kim, H., **G. Villarini**, R. Jane, T. Wahl, S. Misra, and A. Michalek, On the generation of high-resolution probabilistic design events capturing the joint occurrence of rainfall and storm surge in coastal basins, *International Journal of Climatology*, 2022 (in press).
3. Michalek, A., F. Quintero, **G. Villarini**, and W.F. Krajewski, Advantages of physically-based flood frequency analysis with long term simulations for Iowa, *Journal of Hydrologic Engineering*, 2022 (in press).
4. Li, X., J. Ghosh, and **G. Villarini**, A comparison of Bayesian multivariate versus univariate regression models for prediction in moderate dimensional model, *The American Statistician*, 2022 (in press).
5. Li, X., J. Ghosh, and **G. Villarini**, Bayesian negative binomial regression model with unobserved covariates for predicting the frequency of North Atlantic tropical storms, *Journal of Applied Statistics*, 2022 (in press).
6. Quintero, F., **G. Villarini**, A.F. Prein, W.F. Krajewski, and W. Zhang, On the role of atmospheric simulations horizontal grid spacing for flood modeling, *Climate Dynamics*, 2022 (in press).
7. Veatch, W., and **G. Villarini**, Modeling riverine flood seasonality with mixtures of circular probability density functions, *Journal of Hydrology*, 613, 1-11, 2022.
8. Kim, H., and **G. Villarini**, Evaluation of the Analysis of Record for Calibration (AORC) rainfall across Louisiana, *Remote Sensing*, 14(14), 3284, 2022.
9. Ren, M., **G. Villarini**, B. Pang, Z. Xue, L. Du, and Y. Wang, Hydrological response in a highly urbanized watershed in China, *Journal of Water and Climate Change*, 13(5), 2171-2187, 2022.
10. Zhang, J., C. Lu, W. Crumpton, C. Jones, H. Tian, **G. Villarini**, K. Schilling, and D. Green, Heavy precipitation impacts on nitrogen loading to the Gulf of Mexico in the 21st century: Modeling projections under future climate scenarios, *Earth's Future*, 10(4), e2021EF002141, 2022.
11. Mishra, A., S. Mukherjee, B. Merz, V. Singh, D. Wright, **G. Villarini**, S. Paul, N. Kumar, P. Khedun, D. Niyogi, G. Schumann, and J.R. Stedinger, Challenges and future directions in flood research, *Journal of Hydrologic Engineering*, 27(6), 1-30, 2022.

12. **Villarini, G.**, W. Zhang, P. Miller, D. Johnson, L. Grimley, and H. Roberts, Probabilistic rainfall generator for tropical cyclones affecting Louisiana, *International Journal of Climatology*, 42(3), 1789-1802, 2022.
13. Ayers, J.R., **G. Villarini**, K. Schilling, C. Jones, A. Brookfield, S.C. Zipper, and W.H. Farmer, The role of climate in monthly baseflow changes across the continental United States, *Journal of Hydrologic Engineering*, 27(5), 04022006, 2022.
14. Yang, Z., G. Villarini, and E. Scoccimarro, Evaluation of the capability of regional climate models in reproducing the temporal clustering in heavy precipitation over Europe, *Atmospheric Research*, 269, 106027, 1-10, 2022.
15. Ayers, J., **G. Villarini**, K. Schilling, and C. Jones, Projected changes in monthly baseflow across the U.S. Midwest, *International Journal of Climatology*, 41(12), 5536-5549, 2021.
16. **Villarini, G.**, and C. Wasko, Humans, climate and streamflow, *Nature Climate Change*, 1-2, 2021.
17. Scoccimarro, E., **G. Villarini**, S. Gualdi, and A. Navarra, The Pacific Decadal Oscillation modulates tropical cyclone days on the interannual timescale in the North Pacific Ocean, *Journal of Geophysical Research*, 126, e2021JD034988, 1-10, 2021.
18. Vecchi, G.A., C. Landsea, W. Zhang, **G. Villarini**, and T. Knutson, Changes in Atlantic major hurricane frequency since the late-19th century, *Nature Communications*, 12, 4054, 1-9, 2021.
19. Zhang, W., **G. Villarini**, E. Scoccimarro, M. Roberts, P.L. Vidale, B. Vanniere, L.-P. Caron, D. Putrasahan, C. Roberts, R. Senan, and M.-P. Moine, Tropical cyclone precipitation in the HighResMIP Atmosphere-only Experiments of the PRIMAVERA Project, *Climate Dynamics*, 57, 253-273, 2021.
20. Trambly, Y., **G. Villarini**, E.M. El Khalki, G. Gründemann, and D. Hughes, Evaluation of the drivers responsible for flooding in Africa, *Water Resources Research*, 57, e2021WR029595, 1-14, 2021.
21. Yang, L., Y. Yang, **G. Villarini**, X. Li, H. Hu, L. Wang, G. Blöschl, and F. Tian, Climate more important for Chinese flood changes than reservoirs and land use, *Geophysical Research Letters*, 48, e2021GL093061, 1-10, 2021.
22. Ayers, J., **G. Villarini**, K. Schilling, and C. Jones, Development of statistical models for estimating daily nitrate load in Iowa, *Science of the Total Environment*, 782, 1-10, 2021.
23. Slater, L., **G. Villarini**, S. Archfield, D. Faulkner, R. Lamb, A. Khouakhi, and J. Yin, Global changes in 20-year, 50-year and 100-year river floods, *Geophysical Research Letters*, 48, e2020GL091824, 2021.

24. Fowler, H.J., H. Ali, R.P. Allan, N. Ban, R. Barbero, P. Berg, S. Blenkinsop, N. Senol Cabi, S. Chan, M. Dale, R.J.H. Dunn, M. Ekström, J.P. Evans, G. Fosser, B. Golding, S.B. Guerreiro, G.C. Hegerl, A. Kahraman, E.J. Kendon, G. Lenderink, E. Lewis, X. Li, P.A. O’Gorman, H.G. Orr, K.L. Peat, A.F. Prein, D. Pritchard, C. Schär, A. Sharma, P.A. Stott, R. Villalobos-Herrera, **G. Villarini**, C. Wasko, M.F. Wehner, S. Westra, and A. Whitford, Towards advancing scientific knowledge of climate change impacts on short-duration rainfall extremes, *Philosophical Transactions A*, 379(2195), 1-22, 2021.
25. Wasko, C., S. Westra, R. Nathan, H.G. Orr., **G. Villarini**, R. Villalobos Herrera, and H.J. Fowler, Incorporating climate change in flood estimation guidance, *Philosophical Transactions A*, 379(2195), 1-24, 2021.
26. Zhang, W., and **G. Villarini**, Greenhouse gases drove the increasing trends in spring precipitation across the Central United States, *Philosophical Transactions A*, 379(2195), 1-9, 2021.
27. Zhang, W., **G. Villarini**, E. Scoccimarro, and F. Napolitano, Examining the precipitation associated with medicanes in the high-resolution ERA-5 reanalysis data, *International Journal of Climatology*, 41(S1), E126-E132, 2021.
28. Yang, Z., and **G. Villarini**, Evaluation of the capability of global climate models in reproducing the temporal clustering in heavy precipitation over Europe, *International Journal of Climatology*, 41(1), 131-145, 2021.
29. Ayers, J.R., **G. Villarini**, K.E. Schilling, and C.S. Jones, On the statistical attribution of changes in monthly baseflow across the U.S. Midwest, *Journal of Hydrology*, 592, 1-10, 2021.
30. Fowler, H.J., G. Lenderink, A.F. Prein, S. Westra, R.P. Allan, N. Ban, R. Barbero, P. Berg, S. Blenkinsop, H.X. Do, S.B. Guerreiro, J.O. Haert, E.J. Kendon, E. Lewis, C. Schär, A. Sharma, **G. Villarini**, C. Wasko, and X. Zhang, Anthropogenic intensification of short-duration rainfall extremes, *Nature Reviews Earth & Environment*, 2, 107-122, 2021.
31. Wang, C., W. Zhang, and **G. Villarini**, On the use of convolutional Gaussian processes to improve the seasonal forecasting of precipitation and temperature, *Journal of Hydrology*, 593, 1-9, 2021.
32. Vittal, H., **G. Villarini**, S. Karmakar, L. Wilcox, and M. Collins, Northward propagation of the intertropical convergence zone and strengthening of Indian summer monsoon rainfall, *Geophysical Research Letters*, 47, 23, 1-10, 2020.
33. **Villarini, G.**, W. Zhang, F. Quintero, W.F. Krajewski, and G.A. Vecchi, Attribution of the impacts of the 2008 flooding in Cedar Rapids (Iowa) to anthropogenic forcing, *Environmental Research Letters*, 15, 1-8, 2020.

34. Vittal, H., **G. Villarini**, and W. Zhang, Fidelity of global climate models in representing the horizontal water vapor transport, *International Journal of Climatology*, 40, 5714-5726, 2020.
35. Neri, A., **G. Villarini**, and F. Napolitano, Intraseasonal predictability of the duration of flooding above National Weather Service flood warning levels across the U.S. Midwest, *Hydrological Processes*, 34, 4505-4511, 2020.
36. Nayak, M.A., M.K. Cowles, **G. Villarini**, and B. Wafa, Bayesian hierarchical models for the frequency of winter heavy precipitation events over the central United States: The role of atmospheric rivers, *Water Resources Research*, 56, e2020WR028256, 1-18, 2020.
37. Trambly, Y., **G. Villarini**, and W. Zhang, Observed changes in flood hazard in Africa, *Environmental Research Letters*, 15(10), 1-8, 2020.
38. Yang, Z., and **G. Villarini**, On the role of CO₂ concentrations in enhancing the temporal clustering of heavy precipitation events across Europe, *Climatic Change*, 162, 1455-1472, 2020.
39. Zhang, W., and **G. Villarini**, Deadly compound heat stress-flooding hazard across the Central United States, *Geophysical Research Letters*, 47(15), 1-7, e2020GL089185, 2020.
40. Zhang, W., **G. Villarini**, and G.A. Vecchi, The East Asian Subtropical Jet Stream and Atlantic tropical cyclones, *Geophysical Research Letters*, 47(15), 1-9, e2020GL088851, 2020.
41. **Villarini, G.**, and W. Zhang, Projected changes in flooding: A continental U.S. perspective, *Annals of the New York Academy of Sciences*, 1472(1), 95-103, 2020.
42. Veatch, W., and **G. Villarini**, Modeling the seasonality of extreme coastal water levels with mixtures of circular probability density functions, *Theoretical and Applied Climatology*, 140, 1199-1206, 2020.
43. Neri, A., **G. Villarini**, and F. Napolitano, Statistically-based projected changes in the frequency of flood events across the U.S. Midwest, *Journal of Hydrology*, 584, 124314, 1-10, 2020.
44. Miniussi, A., **G. Villarini**, and M. Marani, Analyses through the metastatistical extreme value distribution identify contributions of tropical cyclones to rainfall extremes in the eastern US, *Geophysical Research Letters*, 47(7), e2020GL087238, 1-9, 2020.
45. Payne, A.E., M.-E. Demory, L.R. Leung, A.M. Ramos, C.A. Shields, J.J. Rutz, N. Siler, **G. Villarini**, A. Hall, and F.M. Ralph, Responses and impacts of atmospheric rivers to climate change, *Nature Reviews Earth & Environment*, 1, 143-157, 2020.

46. Yang, L., **G. Villarini**, Z. Zeng, J. Smith, M. Liu, X. Li, L. Wang, and A. Hou, Riverine flooding and landfalling tropical cyclones over China, *Earth's Future*, 8, e2019EF001451, 1-13, 2020.
47. Vittal, H., **G. Villarini**, and W. Zhang, Early prediction of the Indian summer monsoon rainfall by the Atlantic Meridional Mode, 54, 2337-2346, *Climate Dynamics*, 2020.
48. Vittal, H., **G. Villarini**, and W. Zhang, On the role of the Atlantic Ocean in exacerbating Indian heat waves, *Climate Dynamics*, 54, 1887-1896, 2020.
49. Zhang, W., **G. Villarini**, and E. Scoccimarro, Reduced extremes of sub-daily temperature swings during the boreal summer in the northern hemisphere, *International Journal of Climatology*, 40, 1306–1315, 2020.
50. Miniussi, A., M. Marani, and **G. Villarini**, Metastatistical extreme value distribution applied to floods across the continental United States, *Advances in Water Resources*, 136, 1-10, 2020.
51. Zhang, W., and **G. Villarini**, On the weather types that shape the precipitation patterns across the U.S. Midwest, *Climate Dynamics*, 53, 4217-4232, 2019.
52. Khouakhi, A., **G. Villarini**, W. Zhang, and L.J. Slater, Seasonal predictability of high sea level frequency using ENSO patterns along the U.S. West Coast, *Advances in Water Resources*, 131, 1-11, 2019.
53. Zhang, W., H. Vittal, and **G. Villarini**, Potential impacts of anthropogenic forcing on the frequency of tropical depressions in the North Indian Ocean in 2018, *Journal of Marine Science and Engineering*, 7(12), 1-7, 2019.
54. Zhang, W., **G. Villarini**, and G.A. Vecchi, Impacts of Pacific Meridional Mode on rainfall over the Maritime Continent and Australia: Potential for seasonal predictions, *Climate Dynamics*, 53, 7185-7199, 2019.
55. Slater, L.J., **G. Villarini**, A.A. Bradley, and G.A. Vecchi, A dynamical statistical framework for seasonal streamflow forecasting in an agricultural watershed, *Climate Dynamics*, 53, 7429-7445, 2019.
56. **Villarini G.**, B. Luitel, G.A. Vecchi, and J. Ghosh, Multi-model ensemble forecasting of North Atlantic tropical cyclone activity, *Climate Dynamics*, 53, 7461-7477, 2019.
57. Slater, L.J., **G. Villarini**, and A.A. Bradley, Evaluation of the skill of North-American Multi-Model Ensemble (NMME) global climate models in predicting average and extreme precipitation and temperature over the continental USA, 53, 7381-7396, *Climate Dynamics*, 2019.

58. Vecchi, G.A., T. Delworth, H. Murakami, S. Underwood, A.T. Wittenberg, F. Zeng, W. Zhang, J. Baldwin, K. Bhatia, W. Cooke, J. He, S.B. Kapnick, T. Knutson, **G. Villarini**, K. van der Wiel, W. Anderson, V. Balaji, J.-H. Chen, K. Dixon, R. Gudgel, L. Harris, L. Jia, N. Johnson, S.-J. Lin, M. Liu, J. Ng, A. Rosati, J. Smith, and X. Yang, Tropical cyclone sensitivities to CO₂ doubling: Roles of atmospheric resolution, synoptic variability and background climate changes, *Climate Dynamics*, 53, 5999-6033, 2019.
59. Black, A.W., and **G. Villarini**, Effects of methodological decisions on rainfall-related crash risk estimates, *Accident Analysis & Prevention*, 130, 22-29, 2019.
60. Morrison, A., **G. Villarini**, W. Zhang, and E. Scoccimarro, Projected changes in extreme precipitation at sub-daily and daily time scales, *Global and Planetary Change*, 182, 1-11, 2019.
61. Yang, Z., and **G. Villarini**, Examining the capability of reanalyses in capturing the temporal clustering of heavy precipitation across Europe, *Climate Dynamics*, 53, 1845-1857, 2019.
62. Zhang, W., and **G. Villarini**, Seasonal forecasting of Western North Pacific tropical cyclone frequency using the North American Multi-Model Ensemble, *Climate Dynamics*, 52, 5985-5997, 2019.
63. Zhang, W., **G. Villarini**, and M. Wehner, Contrasting the responses of extreme precipitation to changes in surface air and dew point temperatures, *Climatic Change*, 154, 257-271, 2019.
64. Zhang, W., **G. Villarini**, G.A. Vecchi, and H. Murakami, Rainfall from tropical cyclones: High-resolution simulations and seasonal forecasts, *Climate Dynamics*, 52(9), 5269-5289, 2019.
65. Neri, A., **G. Villarini**, L.J. Slater, and F. Napolitano, On the statistical attribution of the frequency of flood events across the U.S. Midwest, *Advances in Water Resources*, 127, 225-236, 2019.
66. Neri, A., **G. Villarini**, K. Salvi, L.J. Slater, and F. Napolitano, On the decadal predictability of the frequency of flood events across the U.S. Midwest, *International Journal of Climatology*, 39(3), 1796-1804, 2019.
67. Ayers, J.R., **G. Villarini**, C.S. Jones, and K.E. Schilling, Changes in monthly baseflow across the U.S. Midwest, *Hydrological Processes*, 33(5), 748-758, 2019.
68. Zhang, W., and **G. Villarini**, On the role of the Atlantic Ocean in forcing tropic cyclones in the Arabian Sea, *Atmospheric Research*, 220, 120-124, 2019.

69. Barth, N.A., **G. Villarini**, and K. White, Accounting for mixed populations in flood frequency analysis: A Bulletin 17C perspective, *Journal of Hydrologic Engineering*, 24(3), 1-12, 2019.
70. Zhang, W., **G. Villarini**, G.A. Vecchi, and J.A. Smith, Urbanization exacerbated the rainfall and flooding caused by hurricane Harvey in Houston, *Nature*, 563, 384-388, 2018.
71. Barth, N.A., **G. Villarini**, and K. White, Contribution of tropical cyclones and their remnants on flooding in the Western United States, *International Journal of Climatology*, 38, 5441-5446, 2018.
72. Giuntoli, I., **G. Villarini**, C. Prudhomme, and D.M. Hannah, Uncertainties in projected runoff over the conterminous United States, *Climatic Change*, 150(3), 149-162, 2018.
73. Rios Gaona, M.F., and **G. Villarini**, Characterization of the diurnal cycle of maximum rainfall in tropical cyclones, *Journal of Hydrology*, 564, 997-1007, 2018.
74. Slater, L.J., and **G. Villarini**, Enhancing the predictability of seasonal streamflow via a statistical-dynamical approach, *Geophysical Research Letters*, 45, 6504-6513, 2018.
75. Dhanya, C.T., and **G. Villarini**, On the inherent predictability of precipitation across the United States, *Theoretical and Applied Climatology*, 133, 1035-1050, 2018.
76. Aryal, Y.N., **G. Villarini**, W. Zhang, and G.A. Vecchi, Long term changes in flooding and heavy rainfall associated with North Atlantic tropical cyclones: Roles of the North Atlantic Oscillation and El Niño-Southern Oscillation, *Journal of Hydrology*, 559, 698-710, 2018.
77. Rios Gaona, M.F., **G. Villarini**, W. Zhang, and G.A. Vecchi, The added value of IMERG in characterizing rainfall in tropical cyclones, *Atmospheric Research*, 209, 95-102, 2018.
78. Zhang, W., **G. Villarini**, G.A. Vecchi, and H. Murakami, Impacts of the Pacific Meridional Mode on landfalling North Atlantic tropical cyclones, *Climate Dynamics*, 50(3-4), 991-1006, 2018.
79. Zhang, W., and **G. Villarini**, Uncovering the role of the East Asian jet stream and heterogeneities in atmospheric rivers affecting the western United States, *Proceedings of the National Academy of Sciences of the United States of America*, 115(5), 891-896, 2018.
80. Zhang, W., G.A. Vecchi, H. Murakami, **G. Villarini**, T. Delworth, X. Yang, and L. Jia, Dominant role of Atlantic Multidecadal Oscillation in the recent decadal changes in western North Pacific tropical cyclone activity, *Geophysical Research Letters*, 45, 354-362, 2018.
81. Nayak, M.A., and **G. Villarini**, Remote sensing-based characterization of rainfall during atmospheric rivers over the central United States, *Journal of Hydrology*, 556, 1038-1049, 2018.

82. Luitel, B., **G. Villarini**, and G.A. Vecchi, Verification of the skill of numerical weather prediction models in forecasting rainfall from U.S. landfalling tropical cyclones, *Journal of Hydrology*, 556, 1026-1037, 2018.
83. **Villarini, G.**, and L.J. Slater, Examination of changes in annual maximum gage height in the continental United States using quantile regression, *Journal of Hydrologic Engineering*, 23(3), 1-5, 2018.
84. Zhang, W., and **G. Villarini**, Extreme precipitation is highly sensitive to the magnitude of future warming, *Climatic Change*, 145, 249-257, 2017.
85. Salvi, K., **G. Villarini**, G.A. Vecchi, and S. Ghosh, Decadal temperature predictions over the continental United States: Analysis and enhancement, *Climate Dynamics*, 49, 3587-3604, 2017.
86. Zhang, W., **G. Villarini**, L. Slater, G.A. Vecchi, and A.A. Bradley, Improved ENSO forecasting using Bayesian updating and the North American Multi Model Ensemble (NMME), *Journal of Climate*, 30, 9007-9025, 2017.
87. Bin, O. J. Czajkowski, J. Li, and **G. Villarini**, Housing market fluctuations and the implicit price of water quality: Empirical evidence from a South Florida housing market, *Environmental and Resource Economics*, 68, 319-341, 2017.
88. Mallakpour, I., and **G. Villarini**, Analysis of changes in the magnitude, frequency, and seasonality of heavy precipitation over the contiguous United States, *Theoretical and Applied Climatology*, 130, 345-363, 2017.
89. Slater, L.J., and **G. Villarini**, Evaluating the drivers of seasonal streamflow in the U.S. Midwest, *Water*, 9(9), 1-22, 2017.
90. Salvi, K., **G. Villarini**, and G.A. Vecchi, High resolution decadal precipitation predictions over the continental United States for impacts assessment, *Journal of Hydrology*, 553, 559-573, 2017.
91. **Villarini, G.**, A. Khouakhi, and E. Cunningham, On the impacts of computing daily temperatures as the average of the daily minimum and maximum temperatures, *Atmospheric Research*, 198, 145-150, 2017.
92. Zhang, W., **G. Villarini**, E. Scoccimarro, and G.A. Vecchi, Stronger influences of increased CO₂ on sub-daily precipitation extremes than at the daily scale, *Geophysical Research Letters*, 44, 7464-7471, 2017.
93. Slater, L.J., and **G. Villarini**, On the impact of gaps on trend detection in extreme streamflow time series, *International Journal of Climatology*, 37(10), 3976-3983, 2017.

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- **Villarini, G.**, *Flooding Across the Central United States: Past, Present and Future*, CMCC, Bologna, Italy, June 16, 2016.

- **Villarini, G.**, *Flooding Across the Central United States: Past, Present and Future*, Grinnell College, Grinnell, IA, October 6, 2015.
- **Villarini, G.**, *The Changing Nature of Flooding Across the Central United States*, Northern Illinois University, DeKalb, IL, September 11, 2015.
- **Villarini, G.**, *The Changing Nature of Flooding Across the Central United States*, U.S. Geological Survey, Reston, VA, August 14, 2015.
- **Villarini, G.**, *Flooding over the United States: A climatic perspective and the role of tropical cyclones*, Bermuda Insurance Institute, Bermuda, October 28, 2014.
- **Villarini, G.**, *Flooding over the Central United States*, U.S. Geological Survey, IA, August 14, 2014.
- **Villarini, G.**, *Flooding over the Central United States*, Geophysical Fluid Dynamics Laboratory, NJ, June 20, 2013.
- **Villarini, G.**, *Is it going to rain tomorrow? Heavy rainfall and flooding over the Central United States*, Luther College, Decorah, IA, April 4, 2013.
- **Villarini, G.**, *Is it going to rain tomorrow? Heavy rainfall and flooding over the Central United States*, Coe College, Cedar Rapids, IA, March 19, 2013.
- **Villarini, G.**, *What do the observational records tell us about flooding and climate change?*, The National Center for Atmospheric Research, Boulder, CO, July 20, 2012.
- **Villarini, G.**, *A data-driven perspective on flooding and changing climate*, University of Iowa, Iowa City, IA, March 8, 2012.
- **Villarini, G.**, *A data-driven perspective on flooding and changing climate*, University of Washington, Seattle, WA, February 29, 2012.
- **Villarini, G.**, *Flooding and changing climate: A data driven perspective*, IIHR-Hydroscience & Engineering, The University of Iowa, Iowa City, IA, September 2, 2011.
- **Villarini, G.**, *Extreme events and changing climate: What does the data tell us?*, Aggravated Natural Disaster Seminar, Chartis Insurance, New York, NY, July 15, 2011.
- **Villarini, G.**, *Flooding, tropical cyclones, and climate change in the Eastern United States*, Columbia University, New York, NY, April 8, 2010.
- **Villarini, G.**, *Flooding, tropical cyclones, and climate change in the Eastern United States*, James J. Howard Marine Sciences Laboratory, Sandy Hook, NJ, March 11, 2010.

- **Villarini, G.**, *Flood frequency in the Eastern United States*, Geophysical Fluid Dynamics Laboratory, NJ, July 15, 2009.
- **Villarini, G.**, *Empirically-based modeling of radar-rainfall uncertainties*, University of Connecticut, CT, April 11, 2008.

TECHNICAL REPORTS:

- Krajewski, W.F., G.J. Ciach, and **G. Villarini**, *Towards Probabilistic Quantitative Precipitation WSR-88D Algorithms: Data Analysis and Development of Ensemble Model Generator: Phase 4*, final report, 202 pp., NWS Office of Hydrologic Development, Silver Spring, MD, 2005.

STUDENTS AND POST-DOCTORAL RESEARCHERS:

Research Scientists

- Wei Zhang (2017-2020)

Post-Doctoral Researchers

- David A. Lavers (2013-2014)
- Kaustubh Salvi (2015-2016)
- Abdou Khouakhi (2015-2016)
- Louise Slater (2015-2016)
- Alan Black (2015-2016)
- Wei Zhang (2016-2017)
- Manuel F. Ríos Gaona (2017-2018)
- Vittal Hari (2018-2019)
- Hanbeen Kim (2021-)
- Taareem Kim (2022-)

Ph.D. Students

- Iman Mallakpour (2012-2016)
- Munir Nayak (2013-2016)
- Nancy Barth (2015-2018)
- Jessica Ayers (2017-2021)
- Zhiqi Yang (2017-2021)
- William Veatch (2018-)
- Sadya Islam (2020-)
- Alexander Michalek (2021-)
- Lily Kraft (2021-)
- Renato Amorim (2021-)

M.S. Students

- Scott Rowe (2012-2014)
- Beda Luitel (2013-2016)
- Yog Aryal (2015-2017)
- Alex Morrison (2017-2019)

Undergraduate Students

- Anda Shi (2014-2015)
- Alexa Hanson (2016-2017)
- Lara Gavin (2021-2021)
- Katey Namanny (2020-)
- Laura Zepeski (2021-)

Visiting Students and Researchers

- Ignazio Giuntoli (2014)
- Dr. Dhanya C.T. (2015)
- Evan Cunningham (2016)
- Andrea Neri (2017-2018)
- Arianna Miniussi (2018-2019)
- Ottavio Cavalcanti (2019)
- Bo Pang (2019-2020)
- Meifang Ren (2019-2020)
- Dario Treppiedi (2022-)

FUNDED PROJECTS:

- Source of Support: Office of the Vice President for Research, University of Iowa
Lead PI. Title: Building Connected Communities in Rural Watersheds: Collaborative Partnerships for Actionable Science
Total award: \$50,000. Award to Villarini: \$50,000
[06/01/2022 – 05/31/2023]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: Statewide high-resolution tropical cyclone rainfall generator and error/bias quantification for Louisiana
Total award: \$50,000. Award to Villarini: \$50,000
[04/01/2022 – 09/30/2022]
- Source of Support: U.S. Geological Survey (via the Iowa Water Center)
Lead PI. Title: Understanding the impacts of corona virus-related reduction in aerosols and pollution on precipitation and discharge across Iowa

Total award: \$20,000. Award to Villarini: \$20,000
[09/01/2021 – 08/31/2022]

- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: GLO Flood Studies - Region 2 (TGL20583)
Total award: \$83,020. Award to Villarini: \$83,020
[05/27/2021 – 04/26/2022]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: Flood Studies within Combined River Basins For Texas (GLO):
Dannenbaum
Total award: \$191,500. Award to Villarini: \$191,500
[05/11/2021 – 03/15/2023]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: Probabilistic modeling of rainfall associated with tropical cyclones affecting
Louisiana
Total award: \$190,095. Award to Villarini: \$190,095
[04/01/2019 – 11/01/2021]
- Source of Support: Willis Tower Watson
Co-PI. Title: Towards Physically Based and Usable Climate Event Scenarios
Total award: \$13,457. Award to Villarini: \$13,457
[01/01/2021 – 12/31/2021]
- Source of Support: National Aeronautics and Space Administration
Lead PI. Title: Impacts of Coronavirus-driven Reduction in Aerosols on Precipitation in
the Western United States
Total award: \$63,374. Award to Villarini: \$63,374
[08/06/2020 – 02/05/2021]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: 2020 IPA with USACE
Total award: \$150,000. Award to Villarini: \$150,000
[07/01/2020 – 12/31/2022]
- Source of Support: Iowa Department of Transportation
Lead PI. Title: Projected Changes in Flood Peak Discharge across Iowa: A Flood
Frequency Perspective
Total award: \$313,923. Award to Villarini: \$313,923
[03/01/2020 – 02/28/2023]
- Source of Support: National Science Foundation
Co-PI. Title: Support for Young Investigator Participation at the 8th International
Conference on Flood Management (ICFM8), Iowa City, August 17-19, 2020

Total award: \$45,405. Award to Villarini: \$0
[12/01/2019 – 11/30/2020]

- Source of Support: Thomas Jefferson Fund
Lead PI. Title: Attribution and Projections of Changes in Discharge Across Africa and the Euro-Mediterranean Region
Total award: \$10,000. Award to Villarini: \$10,000
[09/01/2019 – 08/31/2021]
- Source of Support: National Science Foundation
Lead PI. Title: Quantification of the Impacts of Urban Areas on Heavy Rainfall and Flooding from North Atlantic Tropical Cyclones
Total award: \$399,934. Award to Villarini: \$399,934
[04/15/2019 – 03/31/2023]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: 2018 IPA with USACE
Total award: \$160,000. Award to Villarini: \$160,000
[09/01/2018 – 12/31/2020]
- Source of Support: Center for Global & Regional Environmental Research
Co-PI. Title: Detection, Attribution and Projection of Changes in Temperature Extremes, Heat Waves and Heat Stress across the U.S. Midwest
Total award: \$35,000. Award to Villarini: \$35,000
[07/01/2018 – 06/30/2019]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: Hydrometeorological Impacts on Water Quantity and Quality across Iowa's Streams
Total award: \$253,496. Award to Villarini: \$253,496
[01/01/2017 – 12/31/2019]
- Source of Support: National Science Foundation
Co-PI. Title: NRT-INFIEWS: Paths to Sustainable Food-Energy-Water Systems in Resource-Limited Communities
Total award: \$2,999,869. Award to Villarini: \$220,000
[08/30/2016 – 08/29/2021]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: Water Resources and Geospatial Analysis: Attribution of Changes and Evaluation of Actionable Climate Information across the Northern Great Plains and the Central United States
Total award: \$384,471. Award to Villarini: \$384,471
[12/28/2015 – 06/30/2018]
- Source of Support: National Oceanic and Atmospheric Administration

Lead PI. Title: NMME Precipitation and Temperature Forecasts for the Continental United States and Europe: Diagnostic Evaluation and Development of Multi Model Applications
Total Award: \$69,999. Award to Villarini: \$69,999
[08/01/2015 – 07/31/2016]

- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: U.S. Army Corps of Engineers (USACE) Research Participation Program - Nancy Barth
Total Award: \$165,618. Award to Villarini: \$165,618
[06/01/2015 – 05/31/2018]
- Source of Support: U.S. Geological Survey
Lead PI. Title: Development of a Comprehensive Hazard to Loss Modeling Methodology for the Residential Damage Associated with Inland Flooding from North Atlantic Tropical Cyclones
Total award: \$119,532. Award to Villarini: \$119,532
[09/01/2014 – 08/31/2016]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: IPA Agreement with USACE
Total award: \$75,000. Award to Villarini: \$75,000
[09/01/2014 – 08/31/2015]
- Source of Support: National Aeronautics and Space Administration
Lead PI. Title: Remote-sensing Based Characterization of Rainfall Associated with Atmospheric Rivers
Total award: \$90,000. Award to Villarini: \$90,000
[09/01/2014 – 08/31/2017]
- Source of Support: Iowa Nutrient Research Center
Lead PI. Title: Modeling of Nitrate Loads and Concentrations in the Raccoon River
Total award: \$50,000. Award to Villarini: \$50,000
[07/01/2014 – 06/30/2015]
- Source of Support: Center for Global & Regional Environmental Research
Lead PI. Title: How Is Discharge Projected to Change for an Agricultural Watershed in Iowa Over the 21st Century?
Total award: \$30,000. Award to Villarini: \$30,000
[07/01/2014 – 06/30/2015]
- Source of Support: National Science Foundation
Lead PI. Title: CAREER: Temporal Clustering of Hydrometeorological Extremes
Total award: \$508,405. Award to Villarini: \$508,405
[05/01/2014 – 04/30/2019]

- Source of Support: U.S. Geological Survey (via the Iowa Water Center)
Lead PI. Title: Development of a Framework for Discharge Forecasting over Iowa
Total award: \$59,929. Award to Villarini: \$59,929
[04/15/2014 – 04/14/2016]
- Source of Support: NOAA Programs for Disaster Relief Appropriation Act –Non
Construction and Construction (subaward)
Lead PI. Title: Skillful Prediction of Seasonal Hurricane Frequency, Track and Fall
Total award: \$234,537. Award to Villarini: \$234,537
[12/01/2013 – 02/28/2018]
- Source of Support: National Science Foundation
Lead PI. Title: Collaborative Research: Understanding and Forecasting North Atlantic and
US Landfalling Tropical Cyclone Activity and Associated Rainfall
Total award: \$263,206. Award to Villarini: \$263,206
[09/01/2013 – 08/31/2016]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: IPA Agreement with USACE
Total award: \$27,888. Award to Villarini: \$27,888
[09/01/2013 – 07/31/2014]
- Source of Support: U.S. Army Corps of Engineers
Lead PI. Title: IPA Agreement with USACE
Total award: \$200,000. Award to Villarini: \$200,000
[09/26/2012 – 08/31/2014]

SERVICE:

- *October 2020 – present:* Editor-in-Chief for Advances in Water Resources.
- *July 2018 – present:* Member of the Iowa Water Center Advisory Board.
- *January 2017 – present:* Representative of the University of Iowa to the Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI).
- Co-chair of the “Hydrometeorologic extremes: prediction, simulation, and change” session; AGU 2020-2022 Fall Meeting.
- *March 2015 – September 2020:* Associate Editor for Advances in Water Resources.
- *April 2014 – present:* Associate Editor for Journal of Climate.

- *November 2015 –2016*: member of the American Meteorological Society (AMS) Flash Flood Statement Update Team.
- *July 2010 – 2015*: member of the American Geophysical Union (AGU) Precipitation Committee.
- *January 2011 – 2014*: member of the U.S.-CLIVAR Working Group on Hurricanes and Climate.
- Co-chair of the “Hydroclimatic Extremes: Estimation and Forecasting” session; AGU 2013 Fall Meeting.
- Invited Participant, NOAA National Climate Assessment Forum on Heatwaves, Cold Waves, Floods, and Droughts, 2011.
- *November 2010*: member of a National Academy of Sciences delegation meeting with members of the Ukrainian Academy of Sciences.
- Article reviewer for: *Advances in Water Resources*; *Annals of Geophysics*; *Asia-Pacific Journal of Atmospheric Sciences*; *Atmospheric Research*; *Atmospheric Science Letters*; *Australian Meteorological and Oceanographic Journal*; *Bulletin of the American Meteorological Society*; *Climate Dynamics*; *Climatic Change*; *Earth-science Reviews*; *Earth System Dynamics*; *Environmental Engineering and Management Journal*; *Environmental Research Letters*; *Environmental Science & Technology*; *Geophysical Research Letters*; *Hydrological Processes*; *Hydrological Sciences Journal*; *Hydrology and Earth System Sciences*; *IEEE Geoscience and Remote Sensing Letters*; *IEEE Transactions on Geoscience and Remote Sensing*; *International Journal of Climatology*; *International Journal of River Basin Management*; *Journal of Applied Meteorology and Climatology*; *Journal of Atmospheric Sciences*; *Journal of Climate*; *Journal of Flood Risk Management*; *Journal of Geophysical Research*; *Journal of Hydro-Environment Research*; *Journal of Hydrologic Engineering*; *Journal of Hydrology*; *Journal of Hydrometeorology*; *Journal of Mountain Science*; *Journal of the American Water Resources Association*; *Monthly Weather Review*; *Natural Hazards*; *Natural Hazards and Earth System Sciences*; *Natural Hazards Review*; *Nature*; *Nature Climate Change*; *Nature Communications*; *Nature Geoscience*; *One Earth*; *Physical Geography*; *Proceedings of the National Academy of Sciences*; *Quarterly Journal of the Royal Meteorological Society*; *Regional Environmental Changes*; *Philosophical Transactions A*; *Science*; *ScienceAsia*; *Scientific Reports*; *Stochastic Environmental Research and Risk Assessment*; *Tellus A*; *Water Resources Management*; *Water Resources Research*; *Weather and Forecasting*; *Weather, Climate, and Society*.
- Proposal reviewer for: City University of New York; Department of Defense; Department of Energy; Deutsche Forschungsgemeinschaft (DFG); Global and Regional Environmental Research; National Science Foundation; Netherlands Organisation for Scientific Research; U.S. Bureau of Reclamation; U.S. Geological Survey.

- Book reviewer for: American Geophysical Union; Springer.