

# Curriculum Vitae

*Gabriele Villarini*

## WORK ADDRESS

IIHR-Hydrosience & Engineering  
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## PERSONAL DATA

Date of Birth: July 30, 1978  
Place of Birth: Rome, Italy  
Citizenship: Italian; U.S.A.  
Family Status: Married  
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## RESEARCH INTERESTS:

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

## EDUCATION:

*August 2008:* Ph.D., Department of Civil and Environmental Engineering, The University of Iowa.

*July 2003:* 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 “*. Università degli Studi “La Sapienza”, Rome, Italy.

## **PROFESSIONAL EXPERIENCE:**

*February 2018 – present:* 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 – present:* 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

*January 2003 – June 2003: Research Assistant, Environmental Sciences, State University of New York, Purchase College*

**TEACHING EXPERIENCE:**

*Spring 2016: Water Resources Engineering, Civil and Environmental Engineering, The University of Iowa (undergraduate/graduate).*

*Fall 2015: Engineering Fundamentals I: Statics, Civil and Environmental Engineering, The University of Iowa (undergraduate).*

*Spring 2015: Hydroclimatology, Civil and Environmental Engineering, The University of Iowa (graduate).*

*Fall 2014: Probabilistic Methods in Hydroscience, Civil and Environmental Engineering, The University of Iowa (graduate).*

*Spring 2014: Water Resources Engineering, Civil and Environmental Engineering, The University of Iowa (undergraduate/graduate).*

*Fall 2013: Probabilistic Methods in Hydroscience, Civil and Environmental Engineering, The University of Iowa (graduate).*

*Spring 2013: Water Resources Engineering, Civil and Environmental Engineering, The University of Iowa (undergraduate/graduate).*

*Fall 2012: Probabilistic Methods in Hydroscience, Civil and Environmental Engineering, The University of Iowa (graduate).*

*Spring 2012: Environmental Engineering Fundamentals II: Surface and Subsurface Processes, Civil and Environmental Engineering, Princeton University (graduate).*

**AWARDS AND FELLOWSHIPS:**

*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. Black, A.W., and **G. Villarini**, Effects of methodological decisions on rainfall-related crash risk estimates, *Accident Analysis & Prevention*, 2018 (in press).
2. 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*, 2018 (in press).
3. Dhanya, C.T., and **G. Villarini**, On the inherent predictability of precipitation across the United States, *Theoretical and Applied Climatology*, 2018 (in press).
4. Slater, L.J., **G. Villarini**, A.A. Bradley, and G.A. Vecchi, A statistical/dynamical framework for seasonal streamflow forecasting in an agricultural watershed, *Climate Dynamics*, 2018 (in press).
5. **Villarini G.**, B. Luitel, G.A. Vecchi, and J. Ghosh, Multi-model ensemble forecasting of North Atlantic tropical cyclone activity, *Climate Dynamics*, 2018 (in press).

6. 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, doi:10.1007/s00382-016-3286-1, *Climate Dynamics*, 2018 (in press).
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. **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.
15. Zhang, W., and **G. Villarini**, Extreme precipitation is highly sensitive to the magnitude of future warming, *Climatic Change*, 145, 249-257, 2017.
16. 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.

17. 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.
18. 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.
19. 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.
20. Slater, L.J., and **G. Villarini**, Evaluating the drivers of seasonal streamflow in the U.S. Midwest, *Water*, 9(9), 1-22, 2017.
21. 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.
22. **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.
23. Zhang, W., **G. Villarini**, E. Scoccimarro, and G.A. Vecchi, Stronger influences of increased CO<sub>2</sub> on sub-daily precipitation extremes than at the daily scale, *Geophysical Research Letters*, 44, 7464-7471, 2017.
24. 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.
25. Slater, L.J., **G. Villarini**, and A.A. Bradley, Weighting of NMME temperature and precipitation forecasts across Europe, *Journal of Hydrology*, 552, 646-659, 2017.
26. Weiss, T.L., R.F. Denniston, A.D. Wanamaker, **G. Villarini**, and A.S. von der Heydt, El Niño-Southern Oscillation-like variability in a late Miocene Caribbean coral, *Geology*, 45(7), 643-646, 2017.
27. Mallakpour, I., **G. Villarini**, M.P. Jones, and J.A. Smith, On the use of Cox regression to examine the temporal clustering of flooding and heavy precipitation across the central United States, *Global and Planetary Change*, 155, 98-108, 2017.
28. Zhang, W., and **G. Villarini**, On the unseasonal flooding over the central United States during December 2015 and January 2016, *Atmospheric Research*, 196, 23-28, 2017.
29. Zhang, W., G.A. Vecchi, **G. Villarini**, H. Murakami, R. Gudgel, and X. Yang, Statistical-dynamical seasonal forecast of Western North Pacific and East Asia

- landfalling tropical cyclones using the GFDL FLOR coupled climate model, 30(6), 2209-2232, *Journal of Climate*, 2017.
30. Zhang, W., **G. Villarini**, and G.A. Vecchi, Impacts of the Pacific Meridional Mode on June-August precipitation in the Amazon River Basin, *Quarterly Journal of the Royal Meteorological Society*, 143, 1936-1945, 2017.
  31. Nayak, M.A., and **G. Villarini**, A long-term perspective of the hydroclimatological impacts of atmospheric rivers over the central United States, *Water Resources Research*, 53, 1144-1166, 2017.
  32. Barth, N.A., **G. Villarini**, M. Nayak, and K. White, Mixed populations and annual flood frequency estimates in the western United States: The role of atmospheric rivers, *Water Resources Research*, 53, 257-269, 2017.
  33. Czajkowski, J., **G. Villarini**, M. Montgomery, E. Michel-Kerjan, and R. Goska, Assessing current and future freshwater flood risk from North Atlantic tropical cyclones via insurance claims, *Scientific Reports*, 7, 1-10, 2017.
  34. Black, A.W., **G. Villarini**, and T.L. Mote, Effects of rainfall on vehicle crashes in six U.S. states, *Weather, Climate, and Society*, 9, 53-70, 2017.
  35. Zhang, W., G.A. Vecchi, **G. Villarini**, H. Murakami, A. Rosati, X. Yang, L. Jia, and F. Zeng, Modulation of Western North Pacific tropical cyclone activity by the Atlantic Meridional Mode, *Climate Dynamics*, 48(1), 631-647, 2017.
  36. Khouakhi, A., and **G. Villarini**, Attribution of annual maximum sea levels to tropical cyclones at the global scale, *International Journal of Climatology*, 37, 540-547, 2017.
  37. Khouakhi, A., **G. Villarini**, and G.A. Vecchi, Contribution of tropical cyclones to rainfall at the global scale, *Journal of Climate*, 30, 359-372, 2017.
  38. Dhanya, C.T., and **G. Villarini**, An investigation of predictability dynamics of temperature and precipitation in reanalysis datasets over the continental United States, *Atmospheric Research*, 183, 341-350, 2017.
  39. Slater, L.J., and **G. Villarini**, Recent trends in US flood risk, *Geophysical Research Letters*, 43(24), 12428-12436, 2016.
  40. Zhang, W., G.A. Vecchi, H. Murakami, **G. Villarini**, T.L. Delworth, K. Paffendorf, R. Gudgel, L. Jia, F. Zeng, and X. Yang, Influences of natural variability and anthropogenic forcing on the extreme 2015 accumulated cyclone energy in the Western North Pacific [in "Explaining Extremes of 2015 from a Climate Perspective"], *Bulletin of the American Meteorological Society*, 97(12), S131-S135, 2016.



41. **Villarini G.**, C.S. Jones, and K.E. Schilling, Soybean area and baseflow driving Raccoon River nitrate, *Journal of Environmental Quality*, 45(6), 1949-1959, 2016.
42. Zhang, W., G.A. Vecchi, **G. Villarini**, H. Murakami, T. Delworth, L. Jia, R. Gudgel, and F. Zeng, Simulated connections between ENSO and tropical cyclones near Guam in a high-resolution GFDL coupled climate model: Implications for seasonal forecasting, *Journal of Climate*, 29, 8231-8248, 2016.
43. Murakami, H., G.A. Vecchi, **G. Villarini**, T. Delworth, R. Gudgel, S. Underwood, X. Yiang, W. Zhang, and S.-J. Lin, Seasonal forecasts of major hurricanes and landfalling tropical cyclones using a high-resolution GFDL coupled climate model, *Journal of Climate*, 29, 7977-7989, 2016.
44. Denniston, R.F., C.C. Ummenhofer, A.D. Wanamaker, M.S. Lachniet, **G. Villarini**, Y. Asmerom, V.J. Polyak, K.J. Passaro, J. Cugley, D. Woods, and W.F. Humphreys, Expansion and contraction of the Indo-Pacific tropical rain belt over the last three millennia, *Scientific Reports*, 6, 1-9, 2016.
45. Khouakhi, A., and **G. Villarini**, On the relationship between atmospheric rivers and high sea water levels along the U.S. West Coast, *Geophysical Research Letters*, 43, 8815-8822, 2016.
46. Zhang, W., **G. Villarini**, G.A. Vecchi, H. Murakami, and R. Gudgel, Statistical-dynamical seasonal forecast of western North Pacific and East Asia landfalling tropical cyclones using the High-Resolution GFDL FLOR coupled model, *Journal of Advances in Modeling Earth Systems*, 8, 538-265, 2016.
47. **Villarini G.**, K.E. Schilling, and C.S. Jones, Assessing the relation of USDA conservation expenditures to suspended sediment reductions in an Iowa watershed, *Journal of Environmental Management*, 180, 375-383, 2016.
48. Murakami, H., **G. Villarini**, G.A. Vecchi, W. Zhang, and R. Gudgel, Statistical-dynamical seasonal forecast of North Atlantic and U.S. landfalling tropical cyclones using the high-Resolution GFDL FLOR Coupled Model, *Monthly Weather Review*, 144(6), 2101-2123, 2016.
49. Mallakpour, I., and **G. Villarini**, Investigating the relationship between the frequency of flooding over the central United States and large-scale climate, *Advances in Water Resources*, 92, 159-171, 2016.
50. Zhang, W., G.A. Vecchi, H. Murakami, T. Delworth, A. Wittenberg, W. Anderson, A. Rosati, S. Underwood, L. Harris, R. Gudgel, S.-J. Lin, **G. Villarini**, and J.-H. Chen, Improved simulation of tropical cyclone responses to ENSO in the western North Pacific in the high-resolution GFDL HiFLOR coupled climate model, *Journal of Climate*, 29(4), 1391-1415, 2016.

51. Zhang, W., G.A. Vecchi, H. Murakami, **G. Villarini**, and L. Jia, The Pacific Meridional Mode and the occurrence of tropical cyclones in the Western North Pacific, *Journal of Climate*, 29(1), 381-398, 2016.
52. Mallakpour, I., and **G. Villarini**, A simulation study to examine the sensitivity of the Pettitt test to detect abrupt changes in mean, *Hydrological Sciences Journal*, 61(2), 245-254, 2016.
53. **Villarini, G.**, and R.F. Denniston, Contribution of tropical cyclones to extreme rainfall in Australia, *International Journal of Climatology*, 36(2), 1019-1025, 2016.
54. Nayak, M., and **G. Villarini**, Evaluation of the capability of the Lombard test in detecting abrupt changes in variance, *Journal of Hydrology*, 534, 451-465, 2016.
55. Nayak, M.A., **G. Villarini**, and A.A. Bradley, Atmospheric rivers and rainfall during NASA's Iowa Flood Studies (IFloodS) campaign, *Journal of Hydrometeorology*, 17(1), 257-271, 2016.
56. **Villarini, G.**, On the seasonality of flooding across the continental United States, *Advances in Water Resources*, 87, 80-91, 2016.
57. Little, C.M., R.M. Horton, R.E. Kopp, M. Oppenheimer, G. Vecchi, and **G. Villarini**, Joint projections of US East Coast sea level and storm surge, *Nature Climate Change*, 5, 1114-1120, 2015.
58. Giuntoli, I., **G. Villarini**, C. Prudhomme, I. Mallakpour, and D. Hannah, Evaluation of global impact models ability to reproduce runoff characteristics over the central United States, *Journal of Geophysical Research*, 120, 9138-9159, 2015.
59. **Villarini, G.**, E. Scoccimarro, K.D. White, J.R. Arnold, K.E. Schilling, and J. Ghosh, Projected changes in discharge in an agricultural watershed in Iowa, *Journal of the American Water Resources Association*, 51(5), 1361-1371, 2015.
60. Knutson, T., J. Sirutis, M. Zhao, R. Tuleya, M. Bender, G.A. Vecchi, **G. Villarini**, and D. Chavas, Global projections of intense tropical cyclone activity for the late 21st century from dynamical downscaling of CMIP5/RCP4.5 scenarios, *Journal of Climate*, 28(18), 7203-7224, 2015.
61. Denniston, R.F., **G. Villarini**, A.N. Gonzales, V.J. Polyak, C.C. Ummenhofer, M.S. Lachniet, A.D. Wannamaker, W.F. Humphreys, D. Woods, and J. Cugley, Reply to Nott: Assessing biases in speleothem records of flood events, *Proceedings of the National Academy of Sciences of the United States of America*, 112(34), E4637, 2015.
62. Scoccimarro, E., **G. Villarini**, M. Vichi, M. Zampieri, P.G. Fogli, A. Bellucci, and S. Gualdi, Projected changes in intense precipitation over Europe at the daily and sub-daily time scales, *Journal of Climate*, 28(15), 6193-6203, 2015.

63. Yeung, J.K., J.A. Smith, M.L. Baeck, and **G. Villarini**, Lagrangian analyses of rainfall structure and evolution for organized thunderstorm systems in the urban corridor of the Northeastern US, *Journal of Hydrometeorology*, 16(4), 1575-1595, 2015.
64. Bates, N.S., J.A. Smith, and **G. Villarini**, Flood response for the watersheds of the Fernow experimental forest in the central Appalachians, *Water Resources Research*, 51(6), 4431-4453, 2015.
65. Walsh, K.J.E., S.J. Camargo, G.A. Vecchi, A.S. Daloz, J. Elsner, K. Emanuel, M. Horn, Y.-K. Lim, M. Roberts, C. Patricola, E. Scoccimarro, A.H. Sobel, S. Strazzo, **G. Villarini**, M. Wehner, M. Zhao, J. Kossin, T. LaRow, K. Oouchi, S. Schubert, H. Wang, J. Bacmeister, P. Chang, F. Chauvin, C. Jablonowski, H. Murakami, T. Ose, K.A. Reed, R. Saravanan, Y. Yamada, C.M. Zarzycki, P.L. Vidale, J.A. Jonas, and N. Henderson, Hurricanes and climate: the U.S. CLIVAR working group on hurricanes, *Bulletin of the American Meteorological Society*, 96(6), 997-1017, 2015.
66. Lavers, D.A., and **G. Villarini**, The relationship between daily European precipitation and measures of atmospheric water vapour transport, *International Journal of Climatology*, 35(8), 2187-2192, 2015.
67. Denniston, R.F., **G. Villarini**, A.N. Gonzales, K.-H. Wyrwoll, V.J. Polyak, C.C. Ummenhofer, M.S. Lachniet, A.D. Wannamaker, W.F. Humphreys, D. Woods, and J. Cugley, Extreme rainfall activity in the Australian tropics reflects changes in the El Niño/Southern Oscillation over the last two millennia, *Proceedings of the National Academy of Sciences of the United States of America*, 112(15), 4576-4581, 2015.
68. Mallakpour, I., and **G. Villarini**, The changing nature of flooding across the central United States, *Nature Climate Change*, 5, 250-254, 2015.
69. Lavers, D.A., and **G. Villarini**, The contribution of atmospheric rivers to precipitation in Europe and the United States, *Journal of Hydrology*, 522, 382-390, 2015.
70. **Villarini, G.**, R. Goska, J.A. Smith, and G.A. Vecchi, North Atlantic tropical cyclones and U.S. flooding, *Bulletin of the American Meteorological Society*, 95(9), 1381-1388, 2014.
71. Vecchi, G.A., T. Delworth, R. Gudgel, S. Kapnick, A. Rosati, A. Wittenberg, F. Zeng, W. Anderson, V. Balaji, K. Dixon, L. Jia, H.-S. Kim, L. Krishnamurthy, R. Msadek, W.F. Stern, S.D. Underwood, **G. Villarini**, X. Yang, and S. Zhang, On the seasonal forecasting of regional tropical cyclone activity, *Journal of Climate*, 27, 7994-8016, 2014.
72. Chaney, N.W., J. Sheffield, **G. Villarini**, and E.F. Wood, Development of a high resolution gridded daily meteorological data set over Sub-Saharan Africa: Spatial analysis of trends in climate extremes, *Journal of Climate*, 27(15), 5815-5835, 2014.

73. Nayak, M.A., **G. Villarini**, and D.A. Lavers, On the skill of numerical weather prediction models to forecast atmospheric rivers over the central United States, *Geophysical Research Letters*, 41, 4354-4362, 2014.
74. Ferguson, C.R., and **G. Villarini**, An evaluation of the statistical homogeneity of the Twentieth Century Reanalysis, *Climate Dynamics*, 42(11-12), 2841-2866, 2014.
75. Scoccimarro, E., S. Gualdi, **G. Villarini**, G.A. Vecchi, M. Zhao, K. Walsh, and A. Navarra, Intense precipitation events associated with landfalling tropical cyclones in response to a warmer climate and increased CO<sub>2</sub>, *Journal of Climate*, 27(12), 4642-4654, 2014.
76. **Villarini, G.**, D.A. Lavers, E. Scoccimarro, M. Zhao, M.F. Wehner, G.A. Vecchi, T.R. Knutson, and K.A. Reed, Sensitivity of tropical cyclone rainfall to idealized global scale forcings, *Journal of Climate*, 27(12), 4622-4641, 2014.
77. Wright, D.B., J.A. Smith, **G. Villarini**, and M.L. Baeck, Long-term high-resolution radar rainfall fields for urban hydrology, *Journal of the American Water Resources Association*, 50(3), 713-734, 2014.
78. Fox, J. W. Ford, K. Strom, **G. Villarini**, and M. Meehan, Benthic control upon the morphology of transported fine sediments in a low-gradient stream, *Hydrological Processes*, 28(11), 3776-3788, 2014.
79. **Villarini, G.**, and A. Strong, Roles of climate and agricultural practices in discharge changes in an agricultural watershed in Iowa, *Agriculture, Ecosystems and Environment*, 188, 204-211, 2014.
80. Vecchi, G.A., and **G. Villarini**, Next season's hurricanes, *Science*, 343(6171), 618-619, 2014.
81. Vecchi, G.A., R. Msadek, W. Anderson, Y.-S. Chang, T. Delworth, K. Dixon, R. Gudgel, A. Rosati, W. Stern, **G. Villarini**, A. Wittenberg, X. Yang, F. Zeng, R. Zhang, and S. Zhang, Reply to comments on "Multi-year predictions of North Atlantic hurricane frequency: Promise and limitations," *Journal of Climate*, 27(1), 490-492, 2014.
82. **Villarini, G.**, B.-C. Seo, F. Serinaldi, and W.F. Krajewski, Spatial and temporal modeling of radar rainfall uncertainties, *Atmospheric Research*, 135-136, 91-101, 2014.
83. Lavers, D.A., and **G. Villarini**, Were global numerical weather prediction systems capable of forecasting the extreme Colorado rainfall of 9-16 September 2013?, *Geophysical Research Letters*, 40(24), 6405-6410, 2013.

84. Czajkowski, J., **G. Villarini**, E. Michel-Kerjan, and J.A. Smith, Determining tropical cyclone inland flooding loss on a large-scale through a new flood peak ratio-based methodology, *Environmental Research Letters*, 8(4), 1-7, 2013.
85. Smith, J.A., M.L. Baeck, **G. Villarini**, D.B. Wright, and W.F. Krajewski, Extreme flood response: The June 2008 flooding in Iowa, *Journal of Hydrometeorology*, 14(6), 1810-1825, 2013.
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- **Villarini, G.**, W.F. Krajewski, and G.J. Ciach, Empirical characterization of radar rainfall uncertainties: preliminary results, *International Conference on Civil and Environmental Engineering 2005*, Hiroshima, Japan, October 26-27, 2005.
- Ciach, G.J., W.F. Krajewski, **G. Villarini**, D. Kitzmiller, and R.A. Fulton, Ensemble generator of radar-based QPE, *32nd Conference on Radar Meteorology*, Albuquerque, New Mexico, October 24-29, 2005.
- Ciach, G.J., W.F. Krajewski, and **G. Villarini**, Radar based probabilistic quantitative precipitation estimation: first results of large sample data analysis, *Eos Trans. AGU*, Jt. Assem. Suppl., Abstract H43E-06, 2005.

- Krajewski, W.F., and **G. Villarini**, Radar-rainfall, uncertainties: implications for flash-flood forecasting and rainfall modeling, *New Frontiers in Hydrology*, 3rd CNR-Princeton Workshop, May 18-20, 2005.
- Krajewski, W.F., G.J. Ciach, and **G. Villarini**, Towards probabilistic quantitative precipitation estimation, *HFP Workshop*, Montreal, Canada, May 9-12, 2005.
- **Villarini, G.**, Effects of observational uncertainties on the estimated multifractal properties in radar rainfall fields, *The University of Iowa 2005 Seventh Annual James F. Jakobsen Graduate Forum*, Iowa City, April 29-30, 2005.
- Krajewski, W.F., G.J. Ciach, and **G. Villarini**, Towards uncertainty-based forecasting of rainfall-induced hazards, *General Assembly, EGU*, Vienna, Austria, April 24-29, 2005.
- **Villarini, G.**, G.J. Ciach, and W.F. Krajewski, Effects of observational uncertainties on the estimated multifractal properties in radar rainfall fields, *The University of Iowa College of Engineering 3rd Research Open House*, Iowa City, April 7, 2005.
- **Villarini G.**, G.J. Ciach, and W.F. Krajewski, Effects of observational uncertainties on the estimated multifractal properties in radar rainfall fields. *8<sup>th</sup> International Conference on Precipitation*, Vancouver, Canada, August 8-11, 2004.
- **Villarini, G.**, G.J. Ciach, and W.F. Krajewski, Multifractal analyses of radar rainfall fields - effects of the uncertainties, *The University of Iowa College of Engineering 2nd Research Open House*, Iowa City, April 29, 2004.
- **Villarini G.**, and G.J. Ciach, Multifractal analyses of radar rainfall fields – effects of the uncertainties. *Eos Trans. AGU*, 85 (17), Joint Assembly Suppl., Abstract NG23A-04, 2004.
- Gorokhovich Y., and **G. Villarini**, Study of correlation between weather radar reflectivity and precipitation data in continental United States using free Internet resources. *Remote Sensing 2003 Conference*, Barcelona, Spain, September 8-12. Vol. 5232, 616-626, 2003.

#### SEMINARS:

- **Villarini, G.**, *Past and future changes in streamflow in the U.S. Midwest: Bridging across time scales*, University of Illinois, Champaign, IL, November 10, 2017.
- **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-)

##### *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-)

##### *Ph.D. Students*

- Iman Mallakpour (2012-2016)
- Munir Nayak (2013-2016)
- Nancy Barth (2015-)
- Jessica Ayers (2017-)
- Alex Morrison (2017-)
- Zhiqi Yang (2017-)

##### *M.S. Students*

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

### *Undergraduate Students*

- Anda Shi (2014-2015)
- Alexa Hanson (2016-2017)

### *Visiting Students and Researchers*

- Ignazio Giuntoli (2014)
- Dr. Dhanya C.T. (2015)
- Evan Cunningham (2016)
- Andrea Neri (2017-)

### **FUNDED PROJECTS:**

- 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  
Award: \$253,496 [01/01/2017 – 12/31/2019]
- Source of Support: National Science Foundation  
Co-PI. Title: NRT-INFEWS: Paths to Sustainable Food-Energy-Water Systems in Resource-Limited Communities  
Award: \$2,999,869 [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  
Award: \$468,264 [12/28/2015 – 12/31/2018]
- 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  
Award: \$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  
Award: \$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  
Award: \$119,532 [09/01/2014 – 08/31/2016]

- Source of Support: U.S. Army Corps of Engineers  
Lead PI. Title: IPA Agreement with USACE  
Award: \$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  
Award: \$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  
Award: \$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?  
Award: \$30,000 [07/01/2014 – 06/30/2015]
- Source of Support: National Science Foundation  
Lead PI. Title: CAREER: Temporal Clustering of Hydrometeorological Extremes  
Award: \$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  
Award: \$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  
Award: \$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  
Award: \$263,206 [09/01/2013 – 08/31/2016]
- Source of Support: U.S. Army Corps of Engineers  
Lead PI. Title: IPA Agreement with USACE  
Award: \$27,888 [09/01/2013 – 07/31/2014]
- Source of Support: U.S. Army Corps of Engineers  
Lead PI. Title: IPA Agreement with USACE  
Award: \$200,000 [09/26/2012 – 08/31/2014]

## SERVICE:

- *March 2015 – present*: 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*
  - *Asia-Pacific Journal of Atmospheric Sciences*
  - *Atmospheric Research*
  - *Atmospheric Science Letters*
  - *Australian Meteorological and Oceanographic Journal*
  - *Climate Dynamics*
  - *Climatic Change*
  - *Earth-science Reviews*
  - *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*
  - *Physical Geography*
  - *Proceedings of the National Academy of Sciences*
  - *Quarterly Journal of the Royal Meteorological Society*
  - *Regional Environmental Changes*
  - *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*
    - *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*