

Curriculum Vitae

Gabriele Villarini

WORK ADDRESS

Civil and Environmental Engineering
Princeton University
E418 Engineering Quad
Princeton, New Jersey 08544
Office: (609) 258-3761
E-mail: gvillari@princeton.edu
Personal Webpage: <http://www.gabrielevillarini.com>

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 2023 – present: Professor, Civil & Environmental Engineering and High Meadows Environmental Institute. Princeton University.

July 2020 – June 2023: 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 – June 2023: 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. Deng, Z., **G. Villarini**, Z. Wang, X. Wu, Z. Zeng, and C. Lai, Urbanization intensifies heavy hourly rainfall preconditioned by heatwaves, *Journal of Geophysical Research – Atmospheres* (2025).
2. Kraft, L.L., **G. Villarini**, J. Czajkowski, D. Zimmerman, and R. Amorim, Developing a spatial regression model framework for insured flood losses in Houston, Texas, *ASCE Open: Multidisciplinary Journal of Civil Engineering*, 2025 (in press).
3. Treppiedi, D., **G. Villarini**, J. Bender, and L.V. Noto, Precipitation extremes projected to increase and to occur in different times of the year, *Environmental Research Letters*, 20(1), 014014, 2025.
4. Amorim, R., and **G. Villarini**, Impacts of urbanization on the riverine flooding in major cities across the eastern United States, *Hydrological Processes*, 38(12), e70027, 2024.
5. Michalek, A., F. Quintero, and **G. Villarini**, Contiguous United States hydrologic modeling using the Hillslope Link Model TETIS, *Journal of the American Water Resources Association*, 60(6), 1058-1079, 2024.
6. Maduwantha, P., T. Wahl, S. Santamaria-Aguilar, R. Jane, J. Booth, H. Kim, and **G. Villarini**, A multivariate statistical framework for mixed populations in compound flood analysis, *Natural Hazards and Earth System Sciences*, 24, 4091-4107, 2024.
7. Nanditha, J.S., **G. Villarini**, H. Kim, and P. Naveau, Strong linkage between observed daily precipitation extremes and anthropogenic emissions across the contiguous United States, *Geophysical Research Letters*, 51(20), e2024GL109553, 2024.
8. Torelló-Sentelles, H., F. Marra, M. Koukoulou, **G. Villarini**, and N. Peleg, Intensification and changing spatial extent of heavy rainfall in urban areas, *Earth's Future*, 12, e2024EF004505, 2024.
9. Kim, H., and **G. Villarini**, Floods across the eastern United States are projected to last longer, *npj Natural Hazard*, 1, 23, 2024.
10. Ekolou, J., B. Dieppois, Y. Trambly, **G. Villarini**, L.J. Slater, G. Mahé, J.-E. Paturel, J.M. Eden, S. Moulds, M. Sidibe, P. Camberlin, B. Pohl, and M. van de Wiel, Variability in flood frequency in Sub-Saharan Africa: The role of large-scale climate modes of variability and their future impacts, *Journal of Hydrology*, 640, 131679, 2024.

11. Kim, T., **G. Villarini**, J.M. Done, D.R. Johnson, A.F. Prein, and C. Wang, Dominant sources of uncertainty for downscaled climate: A military installation perspective, *Journal of Geophysical Research – Atmospheres*, 129, e2024JD040935, 2024.
12. Michalek, A., J. Done, and **G. Villarini**, Future changes in regional tropical cyclone wind, precipitation and flooding using event-based downscaling, *Earth's Future*, 12(6), e2023EF004279, 2024.
13. Treppiedi, D., **G. Villarini**, and L.V. Noto, Climate change exacerbates the compounding of heat stress and flooding in the mid-latitudes, *International Journal of Climatology*, 44(7), 2283-2296, 2024.
14. Kim, T., and **G. Villarini**, Projected changes in daily precipitation, temperature and wet-bulb temperature across Arizona using statistically downscaled CMIP6 climate models, *International Journal of Climatology*, 44, 1994-2010, 2024.
15. Kim, H., **G. Villarini**, C. Wasko, and Y. Trambly, Changes in the climate system dominate the inter-annual variability in flooding across the globe, *Geophysical Research Letters*, 51, e2023GL107480, 2024.
16. Amorim, R., and **G. Villarini**, Assessing the performance of parametric and non-parametric tests for trend detection in partial duration time series, *Journal of Flood Risk Management*, 17(1), e12957, 2024.
17. Wasko, C. S. Westra, R. Nathan, A. Pepler, T.H. Raupach, A. Dowdy, F. Johnson, M. Ho, K.L. McInnes, D. Jakob, J. Evans, **G. Villarini**, and H.J. Fowler, A systematic review of climate change science relevant to Australian design flood estimation, *Hydrology and Earth System Sciences*, 28, 1251-1285, 2024.
18. Deng, Z., X. Wu, G. Villarini, Z. Wang, C. Lai, and Z. Zeng, Stronger exacerbation of extreme rainfall at the hourly than daily scale by urbanization in a warming climate, *Journal of Hydrology*, 633, 131025, 2024.
19. Michalek, A., **G. Villarini**, and T. Kim, Understanding the impact of precipitation bias-correction and statistical downscaling methods on projected changes in flood extremes, *Earth's Future*, 12(3), e2023EF004179, 2024.
20. Kim, H., and **G. Villarini**, Higher emissions scenarios lead to more extreme flooding in the United States, *Nature Communications*, 15, 237, 2024.
21. Kuntla, S.K., M. Saharia, S. Prakash, and **G. Villarini**, Precipitation inequality exacerbates streamflow inequality, but dams moderate it, *Science of the Total Environment*, 912, 169098, 2024.

22. Michalek, A., **G. Villarini**, T. Kim, F., Quintero, and W.F. Krajewski, Disentangling the sources of uncertainties in the projection of floods risk across the central United States (Iowa), *Geophysical Research Letters*, 50, e2023GL105852, 2023.
23. **Villarini G.**, D., Treppiedi, and L.V. Noto, Sensitivity of the SIMulation-EXtrapolation (SIMEX) methodology to mis-specification of the statistical properties of the measurement errors, *Theoretical and Applied Climatology*, 153, 311-321, 2023.
24. Kim, H., and **G. Villarini**, On the potential use of weather types to describe the interannual variability of annual maximum discharge across the conterminous United States, *Hydrological Processes*, 37(11), e15014, 2023.
25. Michalek, A., **G. Villarini**, and A. Husic, Climate change projected to impact structural hillslope connectivity at the global scale, *Nature Communications*, 14, 1-8, 2023.
26. Amorim, R., **G. Villarini**, W. Veatch, and K. White, Reduced and more fragmented Mississippi River navigability by rising flow, *Geophysical Research Letters*, 50(19), 1-8, 2023.
27. 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*, 77(3), 304-312, 2023.
28. Islam, S., **G. Villarini**, and W. Zhang, Quantification of the role of urbanization in changing the rainfall associated with tropical cyclones affecting Charlotte, North Carolina, *Urban Climate*, 52, 101681, 2023.
29. Michalek, A., **G. Villarini**, T. Kim, F., Quintero, W.F. Krajewski, and E. Scoccimarro, Evaluation of CMIP6 HighResMIP for hydrologic modeling of annual maximum discharge in Iowa, *Water Resources Research*, 59, 1-18, 2023.
30. Kraft, L., **G. Villarini**, and J. Czajkowski, Characterizing the 2019 Midwest flood: A hydrologic and socio-economic perspective, *Weather, Climate, and Society*, 15(3), 603-617, 2023.
31. Michalek, A., F. Quintero, **G. Villarini**, and W.F. Krajewski, Projected changes in annual maximum discharge for Iowa communities, *Journal of Hydrology*, 625, 1-8, 2023.
32. 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*, 50(9), 2014-2035, 2023.
33. Slater, L.J., L. Arnal, M.-A. Boucher, A. Y.-Y. Chang, S. Moulds, C. Murphy, G. Nearing, G. Shalev, C. Shen, L. Speight, **G. Villarini**, R.L. Wilby, A. Wood, and M. Zappa, Hybrid forecasting: Blending climate predictions with AI models, *Hydrology and Earth System Sciences*, 27, 1865-1889, 2023.

34. Kim, T., **G. Villarini**, H. Kim., R. Jane, and T. Wahl, On the compounding of nitrate loads and discharge, *Journal of Environmental Quality*, 52(3), 706-717, 2023.
35. Su, Y., J.A. Smith, and **G. Villarini**, Extreme convective rainfall and flooding from winter season extratropical cyclones in the Mid-Atlantic region of the United States, *Journal of Hydrometeorology*, 24(3), 497-520, 2023.
36. Yang, Z., W. Zhang, and **G. Villarini**, Impact of coronavirus-driven reduction in aerosols on precipitation in the western United States, *Atmospheric Research*, 288, 1-7, 2023.
37. 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*, 43(2), 761-771, 2023.
38. Su, Y., J.A. Smith, and **G. Villarini**, The hydrometeorology of extreme floods in the Lower Mississippi River, *Journal of Hydrometeorology*, 24(2), 203-219, 2023.
39. Rashid, M., T. Wahl, **G. Villarini**, and A. Sharma, Fluvial flood losses in the contiguous United States under climate change, *Earth's Future*, 11(2), 1-14, 2023.
40. Kemter, M., N. Marwan, G. Villarini, and B. Merz, Controls on flood trends across the United States, *Water Resources Research*, 59(2), 1-21, 2023.
41. Ayers, J., **G. Villarini**, Y. Trambly, and H. Kim, Observed changes in monthly baseflow across Africa, *Hydrological Sciences Journal*, 68(1), 108-118, 2023.
42. Denniston, R.F., C.C. Ummenhofer, K. Emanuel, R. Ingrosso, F.S.R. Pausata, A.D. Wanamaker, M.S. Lachniet, K.T. Carr, Y. Asmerom, V.J. Polyak, J. Nott, W. Zhang, **G. Villarini**, J. Cugley, D. Brooks, D. Woods, and W.F. Humphreys, Sensitivity of northwest Australian tropical cyclone activity to ITCZ migration since CE 500, *Science Advances*, 9(2), 1-10, 2023.
43. Kim, H., and **G. Villarini**, On the attribution of annual maximum discharge across the conterminous United States, *Advances in Water Resources*, 171, 1-13, 2023.
44. Trambly, Y., **G. Villarini**, M. Saidi, C. Massari, and L. Stein, Classification of flood-generating processes in Africa, *Scientific Reports*, 12, 1-9, 2022.
45. Quintero, F., **G. Villarini**, A.F. Prein, W. Zhang, and W.F. Krajewski, Discharge and floods projected to increase more than precipitation extremes, *Hydrological Processes*, 36(11), 1-12, 2022.
46. 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*, 613A, 1-17, 2022.

47. 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*, 59, 3167-3174, 2022.
48. 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*, 27(12), 1-11, 2022.
49. Veatch, W., and **G. Villarini**, Modeling riverine flood seasonality with mixtures of circular probability density functions, *Journal of Hydrology*, 613, 1-11, 2022.
50. Kim, H., and **G. Villarini**, Evaluation of the Analysis of Record for Calibration (AORC) rainfall across Louisiana, *Remote Sensing*, 14(14), 3284, 2022.
51. 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.
52. 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.
53. 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.
54. **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.
55. 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.
56. 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.
57. 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.

58. **Villarini, G.**, and C. Wasko, Humans, climate and streamflow, *Nature Climate Change*, 1-2, 2021.
59. 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.
60. 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.
61. 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.
62. 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.
63. 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.
64. 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.
65. 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.
66. 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.
67. 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.
68. 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.

69. 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.
70. 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.
71. 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.
72. 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.
73. 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.
74. 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.
75. **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.
76. 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.
77. 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.
78. 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.
79. Trambly, Y., **G. Villarini**, and W. Zhang, Observed changes in flood hazard in Africa, *Environmental Research Letters*, 15(10), 1-8, 2020.

80. 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.
81. 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.
82. 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.
83. **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.
84. 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.
85. 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.
86. 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.
87. 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.
88. 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.
89. 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.
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- Krajewski, W.F., B.C. Seo, A. Kruger, P. Domaszczynski, **G. Villarini**, and C. Gunyon, Hydro-NEXRAD radar rainfall estimation algorithm development, testing and evaluation, *World Environmental and Water Resources Congress 2007*, Tampa, Florida, May 15-19, 2007.
- **Villarini, G.**, P.V. Mandapaka, W.F. Krajewski, and G.J. Ciach, A simulation study to investigate rain gauge representativeness errors in rainfall fields, *The University of Iowa College of Engineering 5th Research Open House*, Iowa City, April 19, 2007.

- **Villarini, G.**, and W.F. Krajewski, Detailed evaluation of the research-version of TMPA three-hourly $0.25^\circ \times 0.25^\circ$ rainfall estimates over Oklahoma, *General Assembly, EGU*, Vienna, Austria, April 15-20, 2007.
- **Villarini, G.**, J.B. Lang, F. Lombardo, F. Napolitano, F. Russo, and W.F. Krajewski, Impact of different regression frameworks on the estimation of the scaling properties of radar-rainfall, *General Assembly, EGU*, Vienna, Austria, April 15-20, 2007.
- **Villarini, G.**, A simulation study to investigate rain gauge representativeness errors in rainfall fields, *The University of Iowa 2007 Ninth Annual James F. Jakobsen Graduate Conference*, Iowa City, March 31, 2007.
- **Villarini, G.**, P.V. Mandapaka, W.F. Krajewski, and G.J. Ciach, A simulation study to investigate spatial representativeness errors in lognormal fields: Application to rainfall, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H51D-0514, 2006.
- Mandapaka, P.V., W.F. Krajewski, G.J. Ciach, and **G. Villarini**, Estimation of radar-rainfall error spatial correlation, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H51D-0515, 2006.
- Krajewski, W.F., **G. Villarini**, and G.J. Ciach, Recent advances in modeling radar-rainfall uncertainties at small space-time scales, *The 7th International Workshop on Precipitation in Urban Areas*, St. Moritz, Switzerland, December 7-10, 2006.
- **Villarini, G.**, F. Lombardo, F. Napolitano, F. Russo, and W.F. Krajewski, Scaling properties of a polarimetric C-band weather radar: preliminary results, *XXX° Convegno di Idraulica e Costruzioni Idrauliche*, Rome, Italy, September 10-15, 2006.
- Krajewski, W.F., **G. Villarini**, and G.J. Ciach, Effects of radar-rainfall estimates uncertainties on inferring scaling properties of space-time rainfall, *20 Years of Nonlinear Dynamics in Geosciences*, Rhodes, Greece, June 11-16, 2006.
- **Villarini, G.**, W.F. Krajewski, and G.J. Ciach, Generator of empirically-based synthetic radar-rainfall data, *Second International Symposium on Quantitative Precipitation Forecasting and Hydrology*, Boulder, Colorado, June 4-8, 2006.
- **Villarini, G.**, W.F. Krajewski, K.P. Georgakakos, and A. Ntelekos, An investigation on the combined effects of the uncertainties in radar-rainfall estimates and flash flood guidance, *AGU Joint Assembly*, Baltimore, Maryland, May 23-26, 2006.
- Mandapaka, P.V., W.F. Krajewski, and **G. Villarini**, Effects of sampling on the estimation of spatial correlation structure of normal and lognormal random fields, *AGU Joint Assembly*, Baltimore, Maryland, May 23-26, 2006.

- Kitzmiller, D., R. Fulton, S. Guan, F. Ding, W.F. Krajewski, **G. Villarini**, and G.J. Ciach, Development and planned operational applications of a conditional error model for radar rainfall estimates, *AGU Joint Assembly*, Baltimore, Maryland, May 23-26, 2006.
- **Villarini, G.**, W.F. Krajewski, and G.J. Ciach, Empirically-based ensemble generator of radar rainfall, *The University of Iowa College of Engineering 4th Research Open House*, Iowa City, April 20, 2006.
- **Villarini, G.**, W.F. Krajewski, and G.J. Ciach, Empirically-based ensemble generator of radar-rainfall data, *General Assembly, EGU*, Vienna, Austria, April 2-7, 2006.
- **Villarini, G.**, Empirical characterization of radar rainfall uncertainties: preliminary results, *The University of Iowa 2006 Eighth Annual James F. Jakobsen Graduate Conference*, Iowa City, March 25, 2006.
- **Villarini, G.**, W.F. Krajewski, and G.J. Ciach, Nonlinear modeling of radar-rainfall errors at different time scales, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H31J-04, 2005.
- Mandapaka, P.V., W.F. Krajewski, G.J. Ciach, and **G. Villarini**, Estimation of radar-rainfall error spatial covariance, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract H33E-1422, 2005.
- **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. *8th 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.**, *Projecting Flooding Across the United States: Climate Change as a Risk Multiplier*, Università degli Studi di Palermo, July 10, 2024.
- **Villarini, G.**, *Projecting Flooding Across the United States: Climate Change as a Risk Multiplier*, Tulane University, March 21, 2024.
- **Villarini, G.**, *Projecting Flooding Across the United States: Climate Change as a Risk Multiplier*, Tulane University, October 20, 2023.
- **Villarini, G.**, *Looking Back to Move Forward: Future Changes in the Frequency of Flood Events across the Central United States*, Princeton University, April 22, 2022.
- **Villarini, G.**, *Increasing Frequency of Flood Events across the Central United States: A Hierarchy of Whys*, Beijing Normal University, August 24, 2020.
- **Villarini, G.**, *Increasing Frequency of Flood Events across the Central United States: A Hierarchy of Whys*, Arizona State University, March 18, 2020.
- **Villarini, G.**, *Increasing Frequency of Flood Events across the Central United States: A Hierarchy of Whys*, University of Oxford, February 7, 2020.

- **Villarini, G.**, *Looking Back to Move Forward: Future Changes in the Frequency of Flood Events across the Central United States*, University of California Los Angeles, October 22, 2019.
- **Villarini, G.**, *Hydrometeorological Extremes and Tropical Cyclones*, University of Central Florida, Florida, October 9, 2019.
- **Villarini, G.**, *Hydrometeorological Extremes and Tropical Cyclones*, Asian Institute of Technology, Bangkok, Thailand, June 24, 2019.
- **Villarini, G.**, *Hydrometeorological Extremes and Tropical Cyclones*, CMCC, Bologna, Italy, June 27, 2019.
- **Villarini, G.**, *Looking Backward to Move Forward: Future Changes in the Frequency of Flood Events*, University of Padua, Padua, Italy, June 26, 2019.
- **Villarini, G.**, *Hydrometeorological Extremes and Tropical Cyclones*, University of Rome “La Sapienza”, Rome, Italy, June 24, 2019.
- **Villarini, G.**, *Flooding and Heavy Rainfall Associated with Tropical Cyclones*, University of Notre Dame, Notre Dame, IN, February 19, 2019.
- **Villarini, G.**, *Flooding Across the Central United States: Ieri, Oggi e Domani*, CMCC, Bologna, Italy, June 21, 2018.
- **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 (2017-2020)
- Hanbeen Kim (2024-)
- Taareem Kim (2024-)

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 (2021-2024)
- Taareem Kim (2022-2024)
- Nanditha (2023-)
- Donghui Li (2024-)
- Tianjiao Pu (2024-)

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 (2018-2022)
- Sadya Islam (2020-2024)
- Lily Kraft (2021-2024)
- Alexander Michalek (2021-)
- Renato Amorim (2021-)
- Sarah Maebius (2024-)
- Manjaree Binjolkar (2024-)

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 (2020-22)
- Laura Zepeski (2021-22)

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)
- Roberto Quaglia (2022)
- Herminia Torelló I Sentelles (2023-2024)
- Zifeng Deng (2024)
- Flavia Marconi (2024)
- Maria Francesca Caruso (2024-2025)
- Cosimo Carniel (2024)

FUNDED PROJECTS:

- Source of Support: Department of Defense
Lead PI. Title: Assessment of Decadal Climate Predictions in Support of DoD Activities to Bridge Across the Weather-to-Climate Continuum
Total award: \$867,550. Award to Villarini: \$663,567
[12/12/2024 – 12/11/2026]
- Source of Support: FM
Lead PI. Title: Joint Research Agreement
Total award: \$340,833. Award to Villarini: \$340,833
[1/1/2025 – 12/31/2027]
- Source of Support: Department of Defense (subaward)
Lead PI. Title: Improving Climate Resilience of DOD Installation and Surrounding Community Infrastructure RC Project
Total award: \$25,370. Award to Villarini: \$25,370
[11/15/2024 – 12/21/2026]
- Source of Support: State of Louisiana Office of Community Development (subaward)

Lead PI. Title: Office of Community Development, State of Louisiana CEA: Coastwide Transition Zone Compound Flooding Implementation
Total award: \$75,000. Award to Villarini: \$75,000
[5/1/2024 – 12/31/2024]

- Source of Support: Department of Defense
Lead PI. Title: Intergovernmental Personnel Act (IPA) with the Department of Defense: Hydrologic and Flood Risk Products
Total award: \$81,833.34. Award to Villarini: \$81,833.34
[07/18/2024 – 01/31/2026]
- Source of Support: Engineer Research and Development Center (ERDC) Broad Agency Announcement (BAA)
Lead PI. Title: Probabilistic predictions of rainfall associated with tropical cyclones over land
Total award: \$391,000. Award to Villarini: \$391,000
[8/23/2024 – 8/22/2027]
- Source of Support: Cooperative Institute for Modeling the Earth System
Lead PI. Title: Expanding the capabilities of the SHiELD modeling framework to high-resolution flood inundation modeling
Total award: \$55,200. Award to Villarini: \$55,200
[7/1/2024 – 6/30/2025]
- Source of Support: North Atlantic Treaty Organization
Lead PI. Title: NATO STO CMRE (Science and Technology Organisation - Centre for Maritime Research and Experimentation) – Year 2
Total award: \$120,000. Award to Villarini: \$120,000
[2/27/2023 – 12/31/2024]
- Source of Support: City of Jacksonville (subaward)
Lead PI. Title: Citywide Probabilistic and Compound Flood Model and Real Time Forecasting System
Total award: \$50,000. Award to Villarini: \$50,000
[1/1/2024 – 6/30/2024]
- Source of Support: National Oceanic and Atmospheric Administration (subaward)
PI. Title: Co-LEARN: A Midwestern Community of Learning for Empowerment, Climate Adaptation and Resilience for the Next Generation
Total award: \$6,000,000. Award to Villarini: \$176,169
[9/1/2023 – 8/31/2028]
- Source of Support: Texas Water Development Board (subaward)
Lead PI. Title: Literature Review on relevant models & probabilistic analysis for flood hazard characterizations, and development of workflows for compound flood hazard assessment in the Coastal Texas Region

Total award: \$105,861. Award to Villarini: \$105,861
[8/1/2023 – 2/1/2024]

- Source of Support: North Atlantic Treaty Organization
Lead PI. Title: NATO STO CMRE (Science and Technology Organisation - Centre for Maritime Research and Experimentation)
Total award: \$159,000. Award to Villarini: \$159,000
[8/1/2023 – 1/31/2024]
- Source of Support: National Oceanic and Atmospheric Administration (subaward)
Lead PI. Title: Building relationships of reciprocity among researchers and marginalized groups for resilience in the Central Midwest
Total award: \$99,954. Award to Villarini: \$47,120
[12/1/2022 – 11/30/2024]
- Source of Support: Department of Defense
Lead PI. Title: Development of a decision support aid system connecting climate model downscaling and DoD infrastructure
Total award: \$1,217,735. Award to Villarini: \$487,074
[12/1/2022 – 11/30/2025]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: GLO Flood Studies - Region 1 (Phase 3)
Total award: \$267,895. Award to Villarini: \$267,895
[10/21/2022 – 08/14/2023]
- Source of Support: US Department of Housing and Urban Development (subaward)
Lead PI. Title: GLO Flood Studies - Region 2 (Phase 3)
Total award: \$292,120. Award to Villarini: \$292,120
[09/25/2022 – 07/01/2024]
- Source of Support: National Institutes of Health
Co-PI. Title: Statistical and agent-based modeling of complex microbial systems: A means for understanding enteric disease transmission among children in urban neighborhoods of Kenya
Total award: \$109,453. Award to Villarini: \$20,826
[08/30/2022 – 05/31/2023]
- 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:

- *January 2023 – present:* member of the American Meteorological Society (AMS) Probability and Statistics Committee.
- *October 2020 – present:* Editor-in-Chief for Advances in Water Resources.
- *April 2014 – present:* Associate Editor for Journal of Climate.
- Co-chair of the “Hydrometeorologic extremes: prediction, simulation, and change” session; AGU 2020-202e Fall Meeting.

- *July 2018 – June 2023*: Member of the Iowa Water Center Advisory Board.
- *January 2017 – June 2023*: Representative of the University of Iowa to the Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI).
- *March 2015 – September 2020*: Associate Editor for *Advances in Water Resources*.
- *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.