SANKARASUBRAMANIAN ARUMUGAM

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Research Expertise: Hydroclimatology, Climate-Food-Energy-Water Nexus, Water and Power Demand Prediction, Human-Environmental Systems: Synthesis and Data-Driven Modeling, Water and Ecological Modeling: Reservoir Re-operation and Designer Flows, Near-term Climate Change Projections and Seasonal Hydroclimatic Forecasts : Post-processing & Uncertainty Reduction, Climate-informed Flood Frequency Analysis

I. Education

- PhD in Water Resources Engineering, 2002, Tufts University, Medford, MA.
  Dissertation Title: Annual Hydroclimatology of the Continental United States.
  Advisor: Richard M. Vogel

- M.S. in Water Resources Engineering, 1996, Indian Institute of Technology, Madras, India.
  Thesis Title: Regional Flood Frequency Analyses using L-Moments.
  Advisor: K. Srinivasan

- B.E (Agricultural Engineering), 1991, Tamilnadu Agricultural University, Coimbatore, India.
  Project Title: Design of 3-Dimensional Solar Ranger.

II. Professional Experience

- Professor and University Faculty Scholar, Department of Civil, Construction and Environmental Engineering, NC State University, Aug 2015 – Present.

- Faculty Affiliate and Faculty Advisory Board, South East Climate Adaptation Science Center, NC State University, Aug 2013 –Present.

- Fellow, Center for Geospatial Analytics, Aug 2018 – Present.

- Associate Professor, Department of Civil, Construction and Environmental Engineering, NC State University, Aug 2011 – July 2015.

- Assistant Professor, Department of Civil, Construction and Environmental Engineering, NC State University, Aug 2005 – July 2011.

- Adjunct Research Scientist, International Research Institute for Climate and Society, Columbia University, NY, Nov 2005- 2015.

- Associate Research Scientist, International Research Institute for Climate Prediction, Columbia University, NY, Feb 2004 – July 2005.

- Postdoctoral Research Scientist, International Research Institute for Climate Prediction (Advisor: Upmanu Lall), Columbia University, NY, Dec 2001 – Jan 2004.

- Instructor, Boston University, Boston, MA, Jan 2001- May 2001.

- Consultant, South Asia Social and Environmental Section, World Bank, Washington DC, Aug 2000-Dec 2000.
- Research Assistant, Department of Civil and Environmental Engineering, Tufts University, MA, August 1997- Sep 2000.
- Senior Project Officer, Indian Institute of Technology Madras, India, Nov 1995- Jul 1997.
- Research Scholar, Department of Civil Engineering, Indian Institute of Technology Madras, India, Jan 1993-Oct 1995.
- Intern, Department of Agricultural Engineering, Coimbatore, Jan 1992-Dec 1992.

III. Scholarly and Professional Honors

- Invited member for National Academies Workshop on Groundwater Recharge and Flow: Approaches and Challenges for Monitoring and Modeling Using Remotely Sensed Data, 2019.
- Expert opinion for US Government Accounting Office (GAO) on Water Infrastructure Resiliency under Climate Change, 2019.
- Panelist and Author, Water Chapter, National Climate Assessment IV, US Global Change Research Program, 2017 (Released Nov 2, 2017).
- Visiting Scientist, UCAR, Advanced Studies Program, 2017, 2019.
- University Faculty Scholar, NC State University, 2014-Present.
- Panelist and Author, Water Chapter – Southeast US, National Climate Assessment III, US Global Change Research Program, 2013.
- National Institute of Water Resources – Impact Award for the best project in the Southeast US, 2011.
- National Science Foundation CAREER award, 2009.
- Early Career Award by NC Sea Grant and NC Water Resources Research Institute, 2009.
- Authored an expert opinion paper on climate change and water from NCSU to the University of North Carolina system, 2008.
- Indian Union Ministry of Water -Department of Irrigation Medal for Best Paper, Jan 1998.
- National Graduate Scholarship in IIT, Madras, Jan 1993-Dec 1995.

IV. Refereed Publications (§ indicates mentored graduate student co-author)
Citation Statistics: Google Scholar: h-index – 32; Total Number of Citations – 3527
ORCID: https://orcid.org/0000-0002-7668-1311
Journal Articles
Published/In-Press

1. Awasthi, C., Archfield, S. A., Ryberg, K. R., Kiang, J. E., & Sankarasubramanian, A., Projecting Flood Frequency Curves Under Near-Term Climate Change, *Water Resources Research*, 58(8), e2021WR031246, 2022.
2. Ford, L., de Queiroz, A., DeCarolis, J., & Sankarasubramanian, A. Co-Optimization of Reservoir and Power Systems (COREGS) for seasonal planning and operation, *Energy Reports*, 8, 8061-8078, 2023.

3. Ruhi Vidal, A., J. Hwang, N. Devineni, S. Mukhopadhyay[§], H. Kumar[§], L. Comte, S. Worland, and A. Sankarasubramanian, How does flow alteration propagate across a large, highly-regulated basin? Dam attributes, network context, and implications for biodiversity, *Earth's Future*, DOI: 10.1029/2021EF002490, 2022.

4. Johnson, J. M., T.Narock, J.Singh-Mohudpur, D.Fils, K.Clarke, S.Saksena, A. Shepherd, A. Sankarasubramanian and L.Yeghiazarian Knowledge graphs to support real-time flood impact evaluation. AI Magazine, 43(1), 40-45, 2022.

5. Kumar, H.[§,] J. Hwang, N. Devineni and A. Sankarasubramanian, Dynamic Flow Alteration Index for Complex River Networks with Cascading Reservoir Systems, Water Resources Research, 57 (12), https://doi.org/10.1029/2021WR030491, 2021.

6. Chalise, D.[§], A. Aiyyer and A. Sankarasubramanian, Tropical cyclones contribution to seasonal precipitation and streamflow using station-based data in Southeastern and Southcentral United States, *Geophysical Research Letters*, 48 (15), e2021GL094738, 2021.

7. Chalise, D.[§], A. Sankarasubramanian and A. Ruhi Vidal, Dams and climate interact to alter river flow regimes across the United States, *Earth's Future*, 9 (4), 10.1029/2020EF001816, 2021.

8. Hwang, J., H. Kumar[§], A. Ruhi Vidal, A. Sankarasubramanian and N. Devineni, Quantifying dam-induced fluctuations in streamflow frequencies across the Colorado River Basin, *Water Resources Research,* 57(10), e2021WR029753, 2021.

9. Yao, L., A. Sankarasubramanian, D. Wang, Climatic and Landscape Controls on Long-term Baseflow, *Water Resources Research*, 57(6), e2020WR029284, 2021.

10. Miller, J., K.Karimi, A.Sankarasubramanian, and D.R. Obenour, Assessing inter-annual variability in nitrogen sourcing and retention through hybrid Bayesian watershed modeling, *Hydrology and Earth System Sciences*, 25(5), 2789-2804, 2021.

11. Cawthorne, D.[§], A. Sankarasubramanian, and J.F. DeCarolis, The Role of Temperature Variability on Seasonal Electricity Demand in the Southern US, *Frontiers in Energy,* 3(43), 2021.

12. Mazrooei, A.[§], D. Wang, M. Reitz and A. Sankarasubramanian, Urbanization Impacts on Evapotranspiration Across Various Spatio-temporal Scales, *Earth's Future*, 9 (8), e2021EF002045, 2021.

13. Mazrooei, A.[§], A. Sankarasubramanian, and A. Wood, Variational Assimilation of Streamflow Observations in Improving Monthly Streamflow Forecasting, *Journal of Hydrology*, 600, 10.1016/j.jhydrol.2021.126559, 2021.

14. Esraghi, H.[§], A.de Queiroz, J. Patskoski, A. Sankarasubramanian and J. DeCarolis, Quantification of Climate-Induced Interannual Variability of Residential Electricity Demand over the CONUS, *Energy*, 236, 10.1016/j.energy.2021.121273, 2021.

15. Mukhopadhyay, S.[§], A. Sankarasubramanian and A. de Queiroz, Performance Comparison of Equivalent and Multi-Reservoir models for linking Water and Power Systems, *Journal of Water Resources Planning and Management*, 147(4), 04021005, 2021.

16. Mukhopadhyay, S.[§], A. Sankarasubramanian and F. Chandramauli, Developing the hydrological dependency structure between streamgage and reservoir networks, *Nature-Scientific Data*, 7(1), 1-9, 2020.

17. Yao, L., D. Libera, M. Kheim, A. Sankarasubramanian and D. Wang, The Roles of Climate Forcings and its Variability on Runoff at Daily, Monthly, Annual, and Long-Term Scales, *Water Resources Research*, 56(7), 10.1029/2020WR027111, 2020.

18. Xuan, Y.[§], L. Ford[§], F. de Souza, U. Lall, G. Mahinthakumar and A. Sankarasubramanian, GRAPS: A Next Generation Multi-Reservoir System Analysis Program, *Environmental Modeling and Software*, 133, doi.org/10.1016/j.envsoft.2020.104802, 2020.

19. A. Sankarasubramanian, D. Wang, S. Archfield, M. Reitz, R.M. Vogel, A. Mazrooei and S. Mukhopadhyay[§], HESS Opinions: Beyond the Long-term Water Balance: Evolving Budyko's Legacy for the Anthropocene towards a Global Synthesis of Land-surface Fluxes under Natural and Human-altered Watersheds, *Hydrology and Earth System Sciences*, 24(4),1975-1984, 2020.

20. Das Bhowmik, R.[§], S. B. Seo[§], P. Das, and A. Sankarasubramanian, Synthesis of irrigation water supply use in the United States: spatio-temporal patterns, *Journal of Water Resources Planning and Management*, 146(7), 2020.

21. Das Bhowmik, R.[§], and A. Sankarasubramanian, A Performance-based Multimodel Combination Approach to Reduce Uncertainty in Seasonal Temperature Change Projections, *International Journal of Climatology*, 41 (S1), 10.1002/joc.6870, 2020.

22. Mazrooei, A.[§], Sankarasubramanian, A., and Lakshmi, V.: Technical Note: Evaluation of the skill in monthly-to-seasonal soil moisture forecasting based on SMAP satellite observations over the southeastern US, *Hydrology and Earth System Sciences*, 24, 1073–1079, 10.5194/hess-24-1073-2020, 2020.

23. Das Bhowmik, R.[§], and A. Sankarasubramanian[1], Limitations of Univariate Bias Correction and Downscaling Techniques in Preserving Cross-correlation between Climate Variables, *International Journal of Climatology*, https://doi.org/10.1002/joc.6086, 2019.

24. Huang, Y., B. Reich, M. Feuntes and A. Sankarasubramanian, A Complete Spatial Downscaler, *Annals of Applied Statistics*, 2019.

25. Queiroz, A., D. Mulcahy, A. Sankarasubramanian, J. DeCarolis, J. Patskoski, G. Mahinthakumar and N. Lu, Repurposing an Energy System Optimization Model for Seasonal Power Generation Planning, *Energy*, https://doi.org/10.1016/j.energy.2019.05.126, 2019.

26. Mazrooei, A.[§], and A. Sankarasubramanian, Improved Monthly Streamflow Forecasts through Assimilation of Observed Streamflow for Basins under Rainfall-Runoff Regime across the CONUS, *Journal of Hydrology*, https://doi.org/10.1016/j.jhydrol.2019.05.071, 2019.

27. Seo, S. B.[§], R. Das Bhowmik[§], G. (K.) Mahinthakumar, A. Sankarasubramanian and M. Kumar, The role of cross-correlation between precipitation and temperature in basin-scale simulations of hydrologic variables, *Journal of Hydrology*, 570, 304-314, 2019.

28. Libera, D.,[§] and A. Sankarasubramanian, Multivariate Bias Corrections of Mechanistic Water Quality Model Predictions, *Journal of Hydrology*, 564, 529-541, 2018.

29. Seo, S. B.[§], G. (K.) Mahinthakumar, A. Sankarasubramanian and M. Kumar, Assessing the restoration time of surface water and groundwater systems under groundwater pumping, *Stochastic Environmental Research and Risk Assessment*, 32 (9), 2018.

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[1] - Journal Articles, Book Chapters and Conference Proceedings (Peer Reviewed) of Sankarasubramanian Arumugam are published under the name "A. Sankarasubramanian".

30. Libera, D., [§] A. Sharma and A. Sankarasubramanian, A Non-Parametric Toolkit for Assessing Water Quality Model Performance, *Environmental Modeling and Software*, 107, 25-33, 2018.

31. Mukhopadhyay, S., [§] J. Patskoski, and A. Sankarasubramanian, Role of Pacific SSTs in improving reconstructed streamflow over the coterminous US, *Scientific Reports*, 8(1), 4946, 2018.

32. Seo, S. B., [§] G. (K.) Mahinthakumar, A. Sankarasubramanian and M. Kumar, Assessing the restoration time of surface water and groundwater systems under groundwater pumping, *Stochastic Environmental Research and Risk Assessment*, 32(9), 2741–2759, 2018.

33. Das, P., J. Patskoski[§], and A. Sankarasubramanian, Modeling the Irrigation Withdrawals over the Coterminous US using a Hierarchical Modeling Approach, *Water Resources Research*, 54 (6), 2018.

34. Petersen, T.[§], N. Devineni, and A. Sankarasubramanian, Monthly Hydroclimatology of the continental United States, *Advances in Water Resources*, 114, 180-195, 2018.

35. Seo, S. B.[§], G. (K.) Mahinthakumar, A. Sankarasubramanian and M. Kumar, Conjunctive management of surface water and groundwater resources under drought conditions using a fully coupled hydrological model, *Journal of Water Resources Planning and Management*, 144 (9), 2018.

36. Sankarasubramanian, A., J. Sabo, K. Larson, K. L., S.B.Seo[§], T. Sinha, R. Bhowmik[§], A. Vidal, K. Kunkel, G. Mahinthakumar, E. Berglund, and J. Kominoski, Synthesis of public water supply use in the United States: Spatio-temporal patterns and socio-economic controls. *Earth's Future*, 5: 771-788. DOI: 10.1002/2016EF000511, 2017. [2]

37. Kominoski, J., A. Vidal, M. Hagler, K. Petersen, J. Sabo, T. Sinha, A. Sankarasubramanian and J.D. Olden, Patterns and drivers of fish extirpations in rivers of the American Southwest and Southeast, *Global Change Biology*, DOI: 10.1111/gcb.13940, 2017.

38. Das Bhowmik, R. [§], A. Sharma, A., and A. Sankarasubramanian, Reducing model structural uncertainty in climate model projections-A rank-based model combination approach, *Journal of Climate*, DOI:10.1175/JCLI-D-17-0225.1, 2017.

39. Mazrooei, A., [§] and A. Sankarasubramanian, Utilizing Probabilistic Downscaling Methods to Develop Streamflow Forecasts from Climate Forecasts. *Journal of Hydrometeorology*, DOI: 10.1175/JHM-D-17-0021.1, 2017.

40. Patskoski, J., [§] and A. Sankarasubramanian, Reducing Uncertainty in Stochastic Streamflow Generation and Reservoir Sizing by Combining Observed, Reconstructed and Projected Streamflow, *Stochastic Environmental Research and Risk Assessment*, DOI: 10.1007/s00477-017-1456-2, 2017.

41. Das Bhowmik, R., [§] A. Sankarasubramanian, T Sinha, J. Patskoski, G. Mahinthakumar, and K.E. Kunkel, Multivariate Downscaling Approach Preserving Cross-Correlations across Climate Variables for Projecting Hydrologic Fluxes. *Journal of Hydrometeorology*, DOI: 10.1175/JHM-D-16-0160.1, 2017.

42. Seo, S.B.[§], T. Sinha, G. Mahinthakumar, A. Sankarasubramanian and M. Kumar, Identification of dominant source of errors in developing streamflow and groundwater

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[2] - Received NSF-Science 360 coverage; also coverage under Undark Magazine and Earth's Future Editor Highlights.

projections under near-term climate change, *Journal of Geophysical Research-Atmospheres,* 121 (13): 7652-7672, 2016.

43. Mazoorei, A.,[§], T. Sinha, A. Sankarasubramanian, S. Kumar and C. Peters-Lidard, Decomposition of Sources of Errors in Seasonal Streamflow Forecasting over the US Sunbelt, *Journal of Geophysical Research-Atmospheres,* 120 (23): 11,809–11,825 10.1002/2015jd023687, 2015.

44. Patskoski, J.,[§] and A. Sankarasubramanian, Reconstructed Streamflow using SST and Tree Ring Chronologies over the Southeastern United States, *Journal of Hydrology*, 527,761-775, 2015.

45. Patskoski, J.,[§] and A. Sankarasubramanian, Improved Reservoir Sizing Utilizing Observed and Reconstructed Streamflow within a Bayesian Framework, *Water Resources Research*, DOI: 10.1002/2014WR016189, 2015.

46. Li, W.,[§] A. Sankarasubramanian and R.S. Ranjithan, Role of Multimodel Combination and Data Assimilation in Improving Streamflow Prediction Over Multiple Time Scales, *Stochastic Environmental Research and Risk Assessment,* 24 (7), 1-15, 2015.

47. Wang, H.,[§] A. Sankarasubramanian and R.S.Ranjithan, Understanding the Low-frequency Variability in Hydroclimatic Attributes over the Southeastern US, *Journal of Hydrology*, 521, 170-181, 2015.

48. Wang, H.,[§] E.D. Brill, R.S. Ranjithan and A. Sankarasubramanian, A Framework for Adaptively Incorporating Ecological Releases in Sustainable Reservoir Operation, *Advances in Water Resources*, 78, 9-21, 2015.

49. Sinha, T., and A. Sankarasubramanian, Decomposition of Sources of Errors in Monthly to Seasonal Streamflow Forecasts in a Rainfall-Runoff Regime, *Journal of Hydrometeorology*, 15, 2470-2483, 2014.

50. Li, W.,[§] A. Sankarasubramaian, R.S. Ranjithan and E.D. Brill, Improved Regional Water Management Utilizing Climate Forecasts: An Inter-basin Transfer Model with a Risk Management Framework, *Water Resources Research*, DOI: 10.1002/2013WR015248, 2014.

51. Singh, H.,[§] T. Sinha and A. Sankarasubramanian, Impact of Near-term Climate Change Projections and Population Growth on a Within-year Reservoir System, *Journal of Water Resources Planning and Management*, [10.1061/(ASCE)WR.1943-5452.0000474](#), 140(8), 2014.

52. Oh, J.,[§] T. Sinha, and A. Sankarasubramanian, Development of Daily Streamflow and Nitrogen Loadings Forecast for the Southeastern US, *Hydrology &Earth System Sciences*, 18, 2885-2898, 2014.

53. Singh, H.,[§] and A. Sankarasubramanian, Systematic Uncertainty Reduction Strategies for Developing Streamflow Forecasts utilizing multiple Climate Models and Hydrologic Models, *Water Resources Research*, 50(2),1288-1307, 2014.

54. Khan, M.Z.,[§] R. Mehrotra, A. Sharma and A. Sankarasubramanian, Global Sea Surface Temperature Forecasts Using an Improved Multi-model Approach, *Journal of Climate*, 27(10), 3505-3515, 2014.

55. Robertson, A., W. Baethgen, P. Block, U. Lall, A. Sankarasubramanian, F. De Souza and K. Verbist, Climate Risk Management in Water for Semi-Arid Regions, *Earth Perspectives*, 1:12, 2014.

56. Almanaseer, N., [§] A. Sankarasubramanian, and J. Bales, Improving Groundwater Predictions utilizing Seasonal Precipitation Forecasts from GCMs forced with SST Forecasts, *Journal of Hydrologic Engineering*, 19(1), 87-98, 2014.

57. Sankarasubramanian, A., A. Wood, B. Rajagopalan, J.C. Schaake, AGU Chapman Conference - Seasonal to Interannual Hydroclimatic Forecasts and Water Management: Progress and Challenges, *Eos Transactions of AGU*, DOI: 10.1002/2014EO010004, 95(1), 2014.

58. Oludhe, C., A. Sankarasubramanian, T. Sinha, N. Devineni and U. Lall, The Role of Multimodel Climate Forecasts in Improving Water and Energy Management over the Tana River Basin, Kenya, *Journal of Applied Meteorology and Climatology*, 52(11), 2460-2475, 2013.

59. Segura, C., D.Lazzati and A.Sankarasubramanian, The use of broken power-laws to describe the distributions of daily flow above the mean annual flow across the conterminous US, *Journal of Hydrology*, 505, 35-46, 2013.

60. Sinha, T., and A. Sankarasubramanian, Role of Climate Forecasts and Initial Land-Surface Conditions in Developing Operational Streamflow and Soil Moisture Forecasts in a Rainfall-Runoff Regime: Skill Assessment, *Hydrology and Earth System Sciences*, 17, 721–733, 2013.

61. Wang, H., [§] A. Sankarasubramanian, R.S. Ranjithan, Integration of Climate and Weather Information for Improving 15-day Ahead Accumulated Precipitation Forecasts, *Journal of Hydrometeorology*, 14 (1), 186-202, 2013.

62. Petersen, T.[§],N. Devineni and A. Sankarasubramanian, Seasonality of Monthly Runoff over the Continental United States: Causality and Relations to Mean Annual and Mean Monthly Distributions of Moisture and Energy, *Journal of Hydrology*, 468-469, 139-150, 2012.

63. Li, W.[§], and A. Sankarasubramanian, Reducing Hydrologic Model Uncertainty in Streamflow Predictions using Multimodel Combination, Water Resources Research, 48, W12516, 2012.

64. Oh, J.[§], and A. Sankarasubramanian, Climate, Streamflow and Water Quality Interactions over the Southeastern US, *Hydrology and Earth System Sciences,* 16, 2285-2298, 2012.

65. Almanaseer, N.[§], and A. Sankarasubramanian, Role of Climatic Variability in Influencing Interannual Groundwater Variability over Southeast US, *Journal of Hydrologic Engineering,* 17(9), 1001-1010, 2012.

66. Liu, L.[§], A. Sankarasubramanian, and S. Ranjithan, Logistic Regression Analysis to Estimate Contaminant Sources in Water Distribution Systems, *Journal of Hydroinformatics*, 13(3), 10.2166/hydro.2010.106, 2011.

67. Devineni, N.[§], and A. Sankarasubramanian, Improved Categorical Winter Precipitation Forecasts through Multimodel Combinations of Coupled GCMs, *Geophysical Research Letters*, 37, 2010.

68. Devineni, N.[§], and A. Sankarasubramanian, Improving the Prediction of Winter Precipitation and Temperature over the Continental United States: Role of ENSO state in Developing Multimodel Combinations[3], *Monthly Weather Review*, 138(6), 2447-2468, 2010.

69. Sankarasubramanian, A., U. Lall, F.D. Souza Filho, A. Sharma, Improved Water Allocation utilizing Probabilistic Climate Forecasts: Short-term Water Contracts in a Risk Management Framework, *Water Resources Research,* 45, W11409, doi: 10.1029/2009WR007821, 2009a.

70. Golembesky, K.[§], and A. Sankarasubramanian, and N. Devineni[§], Improved Management of Falls Lake Reservoir during the Summer Season using Climate Information based Monthly Streamflow Forecasts: Role of Restrictions in Water supply and Water Quality Management, *Journal of Water Resources Planning and Management,* 35(3), 188-197, 2009.

71. Sankarasubramanian, A., U. Lall, N. Devineni[§], and S. Espunevea, Utility of Operational Streamflow Forecasts in Improving within-season Reservoir Operation, *Journal of Applied Climatology & Meteorology*, 48(7), 1464–1482, 2009.

72. Choudhury, P. and A. Sankarasubramanian, Flood Forecasting in River Networks using Muskingum Equivalent Inflow, *Journal of Hydrologic Engineering,* 14(7), 745-751,2009.

73. Vankalaya, P.[§], A. Sankarasubramanian, S.R. Ranjithan, and G. Mahinthakumar, Contaminant Source Identification in Water Distribution Networks under the conditions of Uncertainty, *Environmental Forensics*, 10(3), 253-263, 2009.

74. Devineni, N.[§], A. Sankarasubramanian, and S. Ghosh (2008), Multi-model Ensembling of Probabilistic Streamflow Forecasts: Role of Predictor State Space in Skill Evaluation, *Water Resources Research*, 44, W09404, doi:10.1029/2006WR005855.

75. Sankarasubramanian, A., U. Lall, and S. Espuneva, Role of Retrospective Forecasts of GCMs Forced with Persisted SST anomalies in Operational Streamflow Forecasts Development, *Journal of Hydrometeorology*, 9(2), 212-227, 2008.

76. Broad, K., A. Pfaff, R. Taddei, A. Sankarasubramanian and U. Lall, Climate, Streamflow Prediction and Water Management in North East Brazil, *Climatic Change,* 84(2), DOI 10.1007/s10584-007-9257-0, 2007.

77. Matalas, N.C., and A. Sankarasubramanian, Effect of Persistence on Trend Detection via Regression, *Water Resources Research,* 39(12), art.no.1342, 2003.

78. Vogel, R.M., and A. Sankarasubramanian, The Validation of a Watershed Model without Calibration, *Water Resources Research,* 39(10), art.no.1292, 2003.

79. Sankarasubramanian, A. and U. Lall, Flood Quantiles and Changing Climate: Seasonal Forecasts and Causal Relations, *Water Resources Research,* 39 (5), art.no.1134, 2003.

80. Sankarasubramanian, A. and R. M. Vogel, Hydroclimatology of the Continental U.S., *Geophysical Research Letters,* 30(7), art. no. 1363, 2003.

81. Sankarasubramanian, A. and R. M. Vogel, Comment on the Paper: "Basin Hydrologic Response Relations to Distributed Physiographic Descriptors and Climate", *Journal of Hydrology,* 263,257-261, 2002.

82. Sankarasubramanian, A. and R. M. Vogel, Annual Hydroclimatology of the United States, *Water Resources Research,* 38(6), art. no. 1083, 2002.

---

[3] - *Paper received press coverage on international (Canadian newspapers and radio shows), national (NSF-Science 360 and other science blogs), academic (Bulletin of American Meteorological Society) and local (NPR-WUNC and WRAL) media.*

83. Sankarasubramanian, A., R. M. Vogel, and J. F. Limbrunner, Climate Elasticity of Streamflow in the United States, *Water Resources Research,* 37(6), 1771-1781, 2001.

84. Vogel, R.M. and A. Sankarasubramanian, Scaling Properties of Annual Streamflow in the Continental United States, *Journal of Hydrological Sciences,* 45,465-476,2000.

85. Fernandez, W., R. M. Vogel, and A. Sankarasubramanian, Regional Calibration of a Watershed Model, *Journal of Hydrological Sciences,* 45, 689-707, 2000.

86. Sankarasubramanian, A., and K. Srinivasan, Investigation and Comparison of Sampling Properties of L-moments and Conventional Moments, *Journal of Hydrology,* 218, 13-34, 1999.

87. Srinivasan, K. and A. Sankarasubramanian, Flood Frequency Models for Indian Catchments– A Relook, *Institution of Engineers* Vol. 77, 41-46,1996 *(Awarded Department of Irrigation Medal as best paper by Ministry of Water Resources, India).*

Under Review/Revision

88. Chandramauli, F. [§], S. Archfield, B. Reich and A. Sankarasubramanian, Beyond the Mann-Kendall Test: An Alternate Moments-based Approach to Detect Changes in Design Flood Quantiles, *Geophysical Research Letters*, 2022.

89. Chalise, D.[§], A. Sankarasubramanian, A. Ruhi Vidal, Spectral signatures of flow regime alteration by dams across the United States, *Earth's Future,* 2022.

90. Kumar, H., T. Zhu and A. Sankarasubramanian, Understanding the Food-Energy-Water Nexus in Mixed Irrigation Regimes using a Regional Hydroeconomic Optimization Modeling Framework, *Water Resources Research*, 2022.

91. Karimi, K., J. Miller, A. Sankarasubramanian and D. Obenour, Contrasting annual and summer phosphorus export using a hybrid Bayesian watershed model, *Water Resources Research*, 2022.

92. Das Bhowmik, R., and A. Sankarasubramanian, Influence of long-term observed trends on the performance of seasonal hydroclimate forecasts, *Water Resources Research*, 2022.

93. Basu, B., R. Das Bhowmik, and A. Sankarasubramanian, Changing Seasonality of Annual Maximum Floods over the Conterminous US: Causality and Physical Interpretations, *Journal of Hydrological Engineering,* 2022.

94. Johnson, M., A. Mazrooei, A. Sankarasubramanian, K. Clarke and L. Yeghiazarian, Diagnosing Performance in Continental-scale, High-resolution, Processed-based Hydrologic Models: The NOAA National Water Model, *Journal of Geophysical Research- Atmospheres*, 2022.

95. Han, P., A. Sankarasubramanian, X. Wang, L. Wan and L. Yao, A new Budyko-based analytical framework for unsteady-state streamflow elasticity to climate change and catchment properties, *Water Resources Research*, 2022.

96. Li, C., T. Zhu, A. Sankarasubramanian, H. Zhang and S. Bibi, Characterizing Daily Precipitation Concentration and Interannual Variability in China, *Earth's Future,* 2022.

Book Chapters (Peer reviewed)

97. Lall, U., T. Johnson, P. Colohan, A. Aghakouchak, C. Brown, G. McCabe, R. Pulwarty, and A. Sankarasubramanian, 2018: Water. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R.

Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 145–173. doi: 10.7930/NCA4.2018.CH3.

98. Wood, A., A. Sankarasubramanian and P.Mendoza, The Post-processing of Seasonal Streamflow Forecasts, Handbook of Hydrometeorology, Springer Publications, 2018.

99. Jayaprakasan, P., R.N. Uma, and A. Sankarasubramanian, Characterizing and Predicting Yelp Users' Behavior, In Highlighting the Importance of Big Data Management and Analysis for Various Applications (pp. 17-35). 2017, Springer, Cham.

100. Vogel, R. M., and A. Sankarasubramanian, Flood forecasting: a global perspective foreword. *Flood Forecasting: A Global Perspective,* XVII-XX, 2017.

101. Sun, G., P.V. Caldwell, Aris P. Georgakakos, A. Sankarasubramanian, James Cruise, Richard T. McNider, Adam Terando, Paul A. Conrads, John Feldt, Vasu Misra, Luigi Romolo, Todd C. Rasmussen, Steven G. McNulty, and Daniel A. Marion. 2012. Chapter 10. Impacts of Climate Change and Variability on Water Resources in the Southeastern US. Southeastern Regional Technical Report to the National Climate Change Assessment, Island Press, 2012.

102. A.Sankarasubramanian, U.Lall and B. Rajagopalan, Floods and Changing Climate: Seasonal Forecasts and Reconstruction, in Encyclopedia of Environmetrics, Eds. Abdel H. El-Shaarawi , Walter W. Piegorsch, Wiley Publications, New York, 2012.

103. Brown, C., Conrad, E., Sankarasubramanian, A., Someshwar, S., The use of seasonal climate forecasts within a shared reservoir system: The case of Angat reservoir, Philippines. in Climate Change Adaptation in the Water Sector eds. Ludwig et al., Earthscan, London, 274 pp, 2009.

Conference Articles (Peer Reviewed)

104. Sankarasubramanian, A. and U. Lall, Dynamic Water Allocation Framework for Multiple uses: Utility of Climate Forecasts towards Short-term Water Management, *International conference "Climate Change: A Challenge or a Threat for Water Management",* September 27-29, 2004. Amsterdam.

105. Sankarasubramanian, A., A. Sharma, and U. Lall, Water Allocation for Multiple Uses based on Probabilistic Reservoir Inflow Forecasts, *Proceedings of the IAHS-IUGG Meeting,* Soppore, Japan, June 2003.

Published National Datasets (Peer reviewed)

106. Vogel, R. M., and A. Sankarasubramanian. 2005. USGS Hydro-Climatic Data Network (HCDN): Monthly Climate Database, 1951-1990. Data set. Available on-line from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A (http://daac.ornl.gov/HYDROCLIMATOLOGY/guides/hcdn_monthly_hydroclim.html).

V. Research Grants (% represents CCEE share)

Total Awarded for Arumugam (as per Internal NCSU records, PI/Co-I): $6,282,435
USGS SESASC center for NCSU (co-I): $5,420,267

Current

1. Understanding the Changing Climatology, Organizing Patterns and Source Attribution of Hazards of Floods over the Southcentral and Southeast US, PI, Co-PIs: A. Aiyyer and C. Schreck, National Science Foundation, $673,418 (60%).

2. Projecting flood frequency curves under a changing climate using spatial extreme value analysis, Co-PI, PI: Brian Reich, National Science Foundation, $300,000 (40%), 03/24/22-05/31/22.

3. EAGER: CAS-Climate: AI-driven Probabilistic Technique, Quantile Regression based Artificial Neural Network Model, for Bias Correction and Downscaling of CMIP6 Projections, PI, Co-PI: Brian Reich (Statistics), National Science Foundation, $299,543 (80%), 12/15/31-11/14/2023.

4. Developing Potential Scenarios of Changes in Hydroclimatic Variables for analyzing the Impacts on the Tampa Bay Water Supply System, PI, Tampa Bay Water, $80,000 (100%), 01/01/22-06//30/23.

5. Convergence Accelerator Phase II: The Urban Flooding Open Knowledge Network (UF-OKN): Delivering Flood Information to AnyOne, AnyTime, AnyWhere, Co-PI, PI for NCSU: Lilit Yeghiazarian, NSF, $5,000,000, 08/17/2020 – 08/16/2022 (10%).

6. Developing Potential Scenarios of Changes in Hydroclimatic Variables for analyzing the Impacts on the Tampa Bay Water Supply System, PI, $80,000, 10/01/2020-03/31/22 (100%).

7. Hydropower and Pumped Storage Hydro Preliminary Assessments, Mesa Associates, PI, $14,412, 07/01/2021-1/31/2022.

8. Sustained-Petascale in Action: Blue Waters Enabling Transformative Science and Engineering (Lucas Ford), PI, NSF through UIUC's National Institute of Supercomputing Center (NISC), $50,000, 08/01/2021-07/31/2022.

9. Understanding causal pathways and feedbacks within complex water management systems, Funded by National Science Foundation through SESYNC, University of Maryland, 01/01/19-5/31/22 (0%).

10. Assessing Controls on Nutrient Loading at the Watershed Scale Through Data-Driven Modeling, Co-PI, PI: Daniel Obenour, NC Water Resources Research Institute, $60,000, 03/01/20-02/28/22 (75%).

11. Collaborative Research: NSF-NSFC: Improving Food-Energy-Water system sustainability over the Southeast US and North China Plain: A cross-regional synthesis considering uncertainties in climate and regional development, NSF, PI, Co-PIs: Joe DeCarolis (NCSU), Dingbao Wang (UCF), Tingju Zhu (IFPRI, Washington DC), Jinxia Wang (Peking University), Jing Ma (China Institute of Water Resources and Hydropower Research), $1,000,000 (NSF and NSFC combined), 08/16/18-08/15/23 (65%).

12. Collaborative Research: NSF-NSFC: Improving Food-Energy-Water system sustainability over the Southeast US and North China Plain: A cross-regional synthesis considering uncertainties in climate and regional development, NSF, Supplement to graduate student H. Kumar for research with the IFPRI, $54,720, 08/16/18-08/15/23 (100%).

13. Collaborative Research: NSF-NSFC: Improving Food-Energy-Water system sustainability over the Southeast US and North China Plain: A cross-regional synthesis considering uncertainties in climate and regional development, NSF, Supplement to graduate student L. Ford for research with the ORNL, $50,054, 08/16/18-08/15/23 (100%).

14. Collaborative Research: NSF-NSFC: Improving Food-Energy-Water system sustainability over the Southeast US and North China Plain: A cross-regional synthesis considering uncertainties in climate and regional development, NSF, Supplement to graduate student F. Chandramauli with the USGS, $78,631, 08/16/18-08/15/23 (100%).

15. Hosting the Southeast Climate Science Center, US Geological Survey, Co-PI, $6,533,038, 08/01/17-07/31/22 (2 grad students per year to be supported by the SECASC for the CCEE).

16. A Global Synthesis of Land-Surface Fluxes Under Natural and Human-altered Watersheds using the Budyko Framework, US Geological Survey, PI, Co-PIs: Dingbao Wang (UCF), Stacey Archfield (USGS), Meredith Reitz (USGS), $196, 385, 11/01/17-05/30/22 (100%).

Pending

17. Accelnet-Implementation: International Network of Networks (FEWS-AccelNet) for Accelerating FEWS resilience under S2S hydroclimatic risk and variability, PI, National Science Foundation, $1,993,624 (55%).

Research Grants - Completed

18. Convergence Accelerator Phase I (RAISE): The Urban Flooding Open Knowledge Network, NSF, Co-PI, PI for NCSU: Lilit Yeghiazarian, $1,027,958, 09/01/19 – 05/31/21 (15%).

19. Cybersees-Type II: Cyber-enabled Water and Energy Systems Sustainability utilizing Climate Information, PI, Co-PIs: G. Mahinthakumar, Joe Decarolis, Ning Lu and Sarat Sreepathi, National Science Foundation (NSF), $1,200,000, 09/01/14-02/28/21 (80%).

20. Cybersees-Type II: Cyber-enabled Water and Energy Systems Sustainability utilizing Climate Information, UCAR Internship supplement to PhD student Sudarshana Mukhopadhyay, National Science Foundation (NSF), $41,498, 09/01/14-08/31/19 (100%).

21. Jordan Lake Watershed and Water Quality Modeling to Assess Eutrophication Trends under Historical and Projected Scenarios, UNC Policy Collaboratory, Co-PI, PI: Dan Obenour, $407,256, 08/01/18-06/30/20 (100%).

22. SUS – Workshop: A systems approach to managing the Urban Infrastructure Grid, National Science Foundation, Co-PI, PI for NCSU: Lilit Yeghiazarian (University of Cincinnati), $49,983, 06/01/19-05/31/20 (0%).

23. WSC - Category 3: Collaborative Research: Water Sustainability under Near-term Climate Change: A Cross-Regional Analysis Incorporating Socio-Ecological Feedbacks and Adaptations, PI, Co-PIs (NCSU): Emily Berglund, G. Mahinthakumar, Tushar Sinha and Ken Kunkel, Co-PIs (ASU): John Sabo and Kelli Larson, Co-PI (UGA): John Kominoski, NSF, $1,449, 999, 09/01/12-08/31/18 (50%).

24. Research Experience for Undergraduates Supplement: WSC - Category 3: Collaborative Research: Water Sustainability under Near-term Climate Change: A Cross-Regional Analysis Incorporating Socio-Ecological Feedbacks and Adaptations, PI, Co-PIs; Emily Berglund, G. Mahinthakumar, Tushar Sinha and Ken Kunkel, NSF, $7,995, 09/01/12-08/31/16 (100%).

25. **CAREER:** Climate Informed Uncertainty Analyzes for Integrated Water Resources Sustainability, Principal Investigator (PI), NSF, $424,351, 06/01/2010-05/31/2017 (100%).

26. Integrated Drought Management and Assessment Portal for the State of North Carolina, PI, Co-PIs: Ryan Boyles (MEAS, SCO), Sujay Kumar (NASA), NC-Water Resources Research Institute (NC-WRRI), $119,940, 04/01/14-09/31/16 (100%).

27. A Research Network on Water Solutions (ReNeWS): the U.S. Southeast and Beyond, Co-PI, PI: Laura Taylor, other Co-PIs: Walter Robinson, Ryan Emmanuel, Emily Berglund, Susan White and JoAnn Burkholder, NCSU Research and Innovation Seed Funding Program, $24,544, 01/01/15-12/31/15 (0%).

28. Experimental Reservoir Storage Forecasts Utilizing Climate-Information Based Streamflow Forecasts, PI, Co-PI: Ryan Boyles (MEAS), NC Urban Water Consortium, $93,577, 01/01/12-12/31/13 (100%).

29. AGU Chapman Conference - Seasonal to Interannual Hydroclimatic Forecasts and Water Management, PI, NSF, $49,998, 07/01/13-06/30/14 (100%).

30. An Integrated Framework for Assessing the Dynamics of Population Growth, Land Use and Climate Change for Urban Water Resources Management, Co-PI, PI: Emily Zechman, NC-WRRI, $50,000, 03/01/12-02/28/14 (100%).

31. Improving Water Resources Sustainability utilizing Multi-time Scale Streamflow Forecasts, PI, Co-PI: Ranji Ranjithan, Agency, NSF, 03/15/08 -03/14/11, $375,278, 03/15/2008-02/28/2013 (100%).

32. Uncertainty in Surface Water Availability over North Carolina due to Climate and Land use Changes, PI, Co-PI: Tushar Sinha, NC-WRRI, $49,991, 03/01/11-02/28/13 (100%).

33. Climate Information based Water and Energy Management in the Greater Horn of Africa (GHA), PI, Co-PIs: Fred Semazzi (MEAS), Upton Hatch (WRRI), National Oceanic and Atmospheric Administration (NOAA), $299,445, 08/01/2009- 07/31/2012 (85%).

34. Early Career Award: Vulnerability of Coastal Watersheds in NC to Climate Change and Variability, NC Sea Grant and NC-Water Resources Research Institute (NC-WRRI), $19,986, 07/01/2009-03/31/2011 (100%).

35. Seasonal Streamflow Forecasts for the Hydrologic Unit Code (HUC-8) Basins in North Carolina utilizing Multimodel Climate Forecasts, PI, Co-PI: Ryan Boyles (State Climate Office of NC), 03/01/09-02/28/10, $47,987, 02/01/2009-02/28/2011 (100%).

36. Streamflow Forecasting for the Lewis River basin, WA, PI, Meso, Inc., $56,188, 11/01/2009-09/30/2010 (100%).

37. Improved Drought Management Strategies for the Triangle Area utilizing Climate-Information based Probabilistic Streamflow Forecasts, PI, (NC-WRRI), 03/01/08-02/28/09, $35,000, 03/01/2008-12/31/2009 (100%).

38. Improved Water Management Strategies for the Neuse Basin utilizing Climate-Information based Probabilistic Streamflow Forecasts, PI, NC-WRRI , 03/01/06 – 02/28/07, $49,054, 03/01/2006-12/31/2009[4] (100%).

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[4] - Nominated by the WRRI as the best project for the year 2011; Won the NIWR-Impact Award for the Southeast Region.

VI.   Research and Graduate Students Advising
Post-Doctoral Scientists - 6 (Current -3)

Shiqi Fang, Jan 2021 – Current

Chingta Kalai, Sep 2022 – Current

Jengwoo Hwang, Oct 2022- Current

Amir Mazrooei, Jan 2018- April 2020

Jason Patskoski, September 2015 – 2017

Anderson de Queiroz, November 2015 - 2017

Tushar Sinha, July 2010 – August 2014

Chris Oludhe, March 2010 – September 2010

Visiting Scientists - 4

Jing Ma, China Institute of Water Resources and Hydropower Research, 2018-2020.

Bidroha Basu, Trinity College, Dublin, 2017

Ashish Sharma, UNSW, Sydney, August-September 2016

Parthasarathy, National Institute of Water Resources, 2008

Doctoral Students –Completed: 12

1. Dol Raj Chalise, PhD, Jan 2022, Impact of Dam and Climate on Flow Alteration and Pathways to Mitigate Them Using Reservoir Reoperation.
2. Sudarshana Mukhopadhyay, PhD, Feb 2020, Subseasonal to seasonal streamflow forecasts and reservoir management.
3. Dominic Libera, PhD, May 2018, Climate variability and Total Nitrogen Forecasts over the Southeast US.
4. Amir Mazoorei, PhD, Dec 2017, Uncertainty reduction in monthly-to-seasonal land-surface attributes using climate forecasts and variational data assimilation, Dec 2017.
5. Rajarshi Bhowmik, PhD, Aug 2016, Uncertainty reduction in near-term climate change projections using multivariate bias correction and multimodel combination, Dec 2016.
6. Seung Beom Seo, PhD, Aug 2016, Near-term climate change and groundwater management, Dec 2016.
7. Jason Patskoski, PhD, Utility of Tree Ring and Future Climate Change Projections in Reservoir Sizing, July 2014.
8. Weihua Li, PhD, Uncertainty Reduction in Hydrologic Modeling and Regional Water Management utilizing Inter-basin Transfer, December 2011.
9. Hui Wang, PhD, Improved Streamflow Forecasts and Adaptive Reservoir Operation for Ecological Analyses, December 2011.
10. Jeseung Oh, PhD, Climate, Streamflow and Nutrients Variability over the Southeastern US, July 2011.
11. Naser Almanaseer, PhD, Climate, Streamflow and Groundwater Variability over the Southeastern US, July 2011.
12. Naresh Devineni, PhD, Seasonal Hydroclimatology of the Continental US: Forecasting and its relevance to Water Management, August 2010.

Masters Students –Completed: 9

1. Amirhossein Mazrooei, MS, Decomposition of Sources of Errors in Seasonal Streamflow Forecasting Over the US Sunbelt Using Multiple Land Surface Models, July 2014.

2. Bandar Almutari, MS, Climate-water-energy nexus in the Middle East, May 2013.

3. Harminder Singh, MS, Systematic Uncertainty Reduction Strategies for Developing Streamflow Forecasts utilizing multiple Climate Models and Hydrologic Models, July 2012.

4. Jason Patskoski, MS, Low-dimensional Models for Reconstructing Annual Streamflow using Tree ring Chronologies and Nino3.4, May 2012.

5. Danielle Touma, MS, A Quantitative Framework for Assessing the Effects of Climate and Land-use Change on Streamflow, July 2011.

6. Naresh Devineni[5], MS, Multi-model Ensembles of Streamflow forecasts: Role of Predictor State in Developing Optimal Combinations, August 2007.

7. Weihua Li, Masters in Civil Engineering, The Role of Multimodel Combinations in improving Streamflow Prediction, 2007.

8. Kurt Golembesky, Masters in Civil Engineering, Improved Drought Management of Falls Lake Reservoir: Role of Multimodel Streamflow Forecasts in Setting up Restrictions, 2006.

9. Aimee Bella, Masters in Civil Engineering, Fall 2009.

Doctoral Students – Current: 6

1. Hemant Kumar, PhD, Dec 2022, Hydro-Economic Modeling for understanding the FEWS Nexus.

2. V. Chandramauli, PhD, Dec 2022, Ability of multimodel GCM Hindcasts in projecting the changes in IDF curves.

3. Lucas Ford, Dec 2022, Integrated water and energy system model for the TVA basin (***Received National Institute of Super Computing fellowship from UIUC (funded by NSF)***).

4. Jessica Levey, May 2025, Hydrologic Extremes and Feedback signals on Water Management over the Southeast US (***Mentor - NSF graduate fellowship awardee 2020).***

5. Hart Henrichsen, May 2027, Flash flood forecasting over the Southeast US (co-advised with Dr. Ranjithan)

6. Kichul Bae, May 2027, Flood Frequency Analysis over the CONUS (**Fulbright Scholar**, currently Masters, will convert to PhD by Fall 23).

Undergraduate Students – Research Advising: 5

1. Lucas Ford – Python interface for multi-reservoir system modeling, 2018.

2. Vinnie Taguchi – Co-advised with Drs. Sinha and Mahinthakumar – Water use analyses over the Sunbelt, Ongoing (2012-till date) (***Mentor - NSF graduate fellowship awardee 2016***).

3. Dylan Cawthorne – Co-advised with Dr. DeCarolis – Climate-Water-Energy Nexus over the Eastern US. 2012-2014

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[5] - Received "Outstanding Student Paper Award" for the presentation based on his Master's thesis research at Fall-2007 AGU conference under Hydrology Section. Outstanding student paper awards were awarded for top 5% out of a total of 650 student papers presented in the Hydrology Section.

4. Thomas Petterson, Senior in Civil Engineering, 2010 - Topic: Synthesis of Budyko's Framework at monthly time scales over the US. (***Mentor - NSF graduate fellowship awardee 2014***).

5. Andrew McNamara, Senior in Civil Engineering, 2009 - Topic: Developing Streamflow forecasts for the Hydrologic Unit Code (HUC-8) Basins in NC

6. Harminder Singh, Senior in Civil Engineering, 2009 - Topic: Vulnerability of NC Coastal Watersheds under Climate Change

PhD External Examiner

- PhD Dissertation – Poornima Unnikrishnan – Indian Institute of Technology, Bombay, 2017.

- PhD Dissertation – Shahadat Hussian – University of New South Wales, Australia, 2009.

VII: Non-Refereed Publications

Conference Articles (Non-Refereed)

1. Mazrooei, A.[§], and S. Arumugam, Utilizing Enkf Data Assimilation in Improving 'abcd' Lumped Water Balance Model Performance, EWRI, Sacramento, May 21-25, 2017.

2. Patskoski, J. S. Mukhopadhyaya[§], and S. Arumugam, A Hybrid Approach Towards Streamflow Reconstruction Using Tree-ring Chronologies and SSTs over the United States, EWRI, Sacramento, May 21-25, 2017.

3. Seo, S.B.[§], R. Das Bhowmik, G.Mahinthakumar, and S.Arumugam, Impact of Correlation Between Precipitation and Temperature on Hydrologic Simulations, EWRI, Sacramento, May 21-25, 2017.

4. Mukhopadhyaya, S.,[§] A. Quieroz, and S. Arumugam Equivalent Reservoir Modeling for Multipurpose and Multi-reservoir Systems over the Southern United States, EWRI, Sacramento, May 21-25, 2017.

5. Seo, S.B.[§], G. Mahinthakumar, S. Arumugam and M.Kumar, Understanding the Effects of Groundwater Pumping on Streamflow: Human-Feedback Analysis on Downstream Impacts and Relevance to Reservoir Management, EWRI, West Palm Beach, May 22-26, 2016.

6. Bhowmik, R.D.[§] and S. Arumugam, Importance of Preserving Cross-correlation in developing Statistically Downscaled Climate Forcings, EWRI, West Palm Beach, May 22-26, 2016.

7. Libera, D.[§], and S. Arumugam, Multivariate Bias Correction Procedures for Improving Water Quality Predictions using Mechanistic Models, EWRI, West Palm Beach, May 22-26, 2016.

8. Mazrooei, A[§]., and S. Arumugam, Developing Categorical Streamflow Forecasts from Climate Forecasts Using Probabilistic Downscaling Methods, EWRI, West Palm Beach, May 22-26, 2016.

9. Das, P.[§], and S. Arumugam, Predictive Classical and Hierarchical Bayesian Modeling for Yearly Irrigation Water Withdrawal over the Coterminous USA, EWRI, West Palm Beach, May 22-26, 2016.

10. Ranjithan, R.S., D.Touma[§], E.D.Brill and A. Sankarasubramanian, A Quantitative Framework for Assessing the Effects of Climate and Land-use Change on Streamflow, Proceedings of the EWRI conference, Cincinnati, May 19-23, 2013.

11. Nakka, A.[§], E.Zechman and A.Sankarasubramanian, A Complex Adaptive System Approach Assessing the Dynamics of Population Growth, Land Use and Climate Change for Urban Water Resources Management, EWRI conference, Cincinnati, May 19-23, 2013.

12. Patskoski, J.[§], and A. Sankarasubramanian, Low-dimensional Models of Annual Streamflows using Tree ring data and Nino3.4, Proceedings of the EWRI conference, Albquerque, May 20-24, 2012.

13. Wang, H.[§], A. Sankarasubramanian and R.S. Ranjithan, Seamless Integration of Weather and Climate Forecasts in Developing Operational Climate Forecasts, *Proceedings of the EWRI-ASCE Conference*, Providence, May 12-22, 2010.

14. Li, W.[§], A. Sankarasubramanian and R.S. Ranjithan, Utility of Climate Forecasts in promoting Interbasin Transfer in the North Carolina Triangle Area, *Proceedings of the EWRI- ASCE Conference*, Providence, May 12-22, 2010.

15. Almanaseer, N.[§], and A. Sankarasubramanian, Climate, Streamflow and Groundwater Interaction over the Southeastern US, *Proceedings of the EWRI- ASCE Conference*, Providence, May 12-22, 2010.

16. Oh, J.[§], and A. Sankarasubramanian, Climate, Streamflow and Nutrients Variability over the Southeastern US, *Proceedings of the EWRI- ASCE Conference*, Providence, May 12-22, 2010.

17. Devineni, N.[§], and A. Sankarasubramanian, Climatology of Monthly Runoff: Causality and Relation to Precipitation and Temperature, *Proceedings of the EWRI- ASCE Conference*, Providence, May 12-22, 2010.

18. Ward, M.N., A. Sankarasubramanian, J. Hansen, M. Indeje, and C. Mutter, To What Extent can Climate Information Contribute to Solving Problems, *Clivar Exchanges,* 9(2), 5-8, 2004.

19. Sankarasubramanian, A., U. Lall, A. Sharma, and J. Lucas: Utility of Climate Information Based Reservoir Inflow Forecasts in Annual Water Allocation: Ceara Case Study, *Workshop on Climate Adaption - Insights and Tools for Adaptation: Learning from Climate Variability,* Washington, November 18-20, 2003.

20. Sankarasubramanian, A. and U. Lall, Flood Quantiles and Climate Variability: Seasonal Forecasts and Reconstruction of Past Flood Records, *Proceedings of the EWRI- ASCE Conference,* Philadelphia, June 2003.

21. Sankarasubramanian, A. and R.M. Vogel**,** Annual Hydroclimatology of the United States**,** *Proceedings of the 27th Annual WRPM Conference,* ASCE, Minneapolis, Minnesota, July 30 - August 2, 2000.

22. Vogel, R.M., A. Sankarasubramanian, J. F. Limbrunner, and I. Wilson, Comparison of Climate Elasticity of Streamflow in the United States, *Proceedings of the 26th Annual WRPM Conference,* ASCE, Tempe, Arizona June 6-9, 1999.

23. Vogel, R.M., and A. Sankarasubramanian, On the Validation of a Watershed Model, Poster *Presentation at IUGG*, University of Buckingham, August 1999.

24. Sankarasubramanian, A. and K. Srinivasan, Evaluation of Sampling Properties of General Extreme Value (GEV) Distribution-L-Moments Vs Conventional Moments, *Proceedings of the 24th Annual WRPM conference,* ASCE, Anaheim, 1996.

Conference Presentations/Abstracts (Non-refereed)

1. [**Invited**] S. Arumugam, U. Lall, L. Ford and N. Devineni, Seasonal Hydroclimatic Forecasts and Water and Energy Management : Progress and Challenges, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

2. S. Fang, M. Johnson, L. Yeghiazarian, S. Arumugam, Spatio-temporal hierarchical modeling for Improved National Water Model Predictions, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

3. S. Fang, S. Al-Amin, Q. Adegbite, J. Levey, M. Johnson, R. Ranjithan and S. Arumugam, Developing Probabilistic Flood Inundation Forecasts using SWMM, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

4. J. Levey, S. Arumugam and S. Fang, Forecasting Precipitation Extremes in an Age of Changing Climate: Does the Performance of Forecast Methods Vary Across the CONUS? AGU Fall meeting, Dec 13-17, New Orleans, 2021.

5. [**Invited**] Merwade, V., L. Yeghiazarian, S.Arumugam, X.Cai, A.Shepherd, M.Johnson, M., ... & M.S. Riasi, The Urban Flooding Open Knowledge Network: Delivering Flood Information to AnyOne, AnyTime and AnyWhere, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

6. Ford, L., and S. Arumugam, Data-driven Generalized Release Policies for Reservoirs in the Tennessee River Basin, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

7. Awasthi, C., B. Reich and S. Arumugam, Quantifying the Sampling Uncertainty in Non-stationary Design Flood Estimation Approaches, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

8. Chalise, D., S. Arumugam, H.Wang, S. Erkhiyun and T. Asefa, Developing Potential Scenarios of Changes in Hydroclimatic Variables for Analyzing the Impacts on a Regional Water Supply System, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

9. Li., C., T. Zhu, S. Arumugam, H. Zhang, Y. Cao and L. Zhang, Characterizing Daily Precipitation Concentration and their Interannual Variability over Mainland China, AGU Fall meeting, Dec 13-17, New Orleans, 2021.

10. Chalise, D., S.Arumugam, G.Mahinthakumar, R.S.Ranjithan, Mi.Eaton and A. Ruhi Vidal, A framework for ecological flow allocation in multiple reservoir operation, AGU Fall Meeting, Online, Dec 15, 2020.

11. [**Invited**] Lall, U., S.Arumugam, F.Cioffi, N.Devineni, J.Doss-Gollin, H.Kwon and B. Rajagopalan, America's Water: Multiscale Forecasting and Innovation in Infrastructure Design & Management Instruments is critical for Climate Adaptation, AGU Fall Meeting, Online, Dec 15, 2020.

12. Merwade, V., L. Yeghiazarian, S.Arumugam, X.Cai, A.Shepherd, M.Johnson, M., ... & M.S. Riasi, The Urban Flooding Open Knowledge Network: Delivering Flood Information to AnyOne, AnyTime AnyWhere, AGU Fall Meeting 2020, Online, Dec 15, 2020.

13. Kumar, H., Arumugam, S., & Zhu, T. , Understanding the food-energy-water nexus through hydroeconomic modeling under near-term climate change and regional development portfolios, AGU Fall Meeting 2020, Online, Dec 15, 2020.

14. Ford, L. C., Queiroz, A., DeCarolis, J., & Arumugam, S. (2020, December). COREGS: An optimization framework to analyze water and power systems together under a changing climate. AGU Fall Meeting 2020, Online, Dec 15, 2020.

15. Mukhopadhyay, S., A. Wood, S. Arumugam and B. Rajagopalan, Understanding Drivers of Subseasonal to Seasonal Streamflow Variability over Contiguous United States, AGU Fall Meeting 2019, San Francisco.

16. Mazrooei, A., S. Arumugam and A. Wood, The Utility of Gauge-measured Streamflow Records in Improving Month-ahead Streamflow Forecasts through Variational Data Assimilation, AGU Fall Meeting 2019, San Francisco.

17. Chandramauli, A., Archfield, J. Kiang, J, K. Ryberg, and S. Arumugam, Revising Flood-Frequency Curves under Climate Change in the United States, AGU Fall Meeting 2019, San Francisco.

18. Yeghiazarian, L., Merwede, H. Golden, S. Arumugam, C.Welty, J.Bales and X.Cai, Sustainable Urban Systems: Managing the Urban Multiplex and its Hydrologic Challenges, AGU Fall Meeting 2019, San Francisco.

19. Chalise, D., S. Arumugam, and A. Ruhi, Human and climate variables explain spatio-temporal patterns of streamflow variation across the United States,AGU Fall Meeting 2019, San Francisco.

20. Tu, T., S. Arumugam, X. Dong, C. Dyckman, T. Grantham, Olson, B.Ruddell, N. Ulibarri and A. Ruhi, Sustainable Water Management in the Lower Colorado Basin: Influence of Climate and Regulatory Context on the Ability to Meet Human and Environmental Water Needs, AGU Fall Meeting 2019, San Francisco.

21. Ruhi, A., J. Hwang, N. Devineni, S. Mukhopadhyay, H. Kumar, L. Comte, S.Worland, and S. Arumugam, How does flow alteration propagate across a large, highly-regulated basin? Dam attributes, network context, and implications for biodiversity",AGU Fall Meeting 2019, San Francisco.

22. Mazrooei, A., S. Arumugam and D. Wang, How Regional Evapotranspiration Fluxes are altered due to Urbanization? AGU Fall Meeting 2019, San Francisco.

23. Libera, D., D.Wang, and A.Sankarasubramanian, Using an Integrated Groundwater and Surface Water Model for Understanding the Effects of Climate Change Scenarios on the Food-Energy-Water Nexus, AGU Fall Meeting 2019, San Francisco.

24. Kumar, H., and S. Arumugam, The role of climate on crop yield per unit area across the contiguous United States, AGU Fall Meeting 2019, San Francisco.

25. Ford, L., A. Queiroz, J. DeCarolis, S. Arumugam, Climate-Water-Energy Nexus: An Integrated Modeling Framework to Analyze Water and Power Systems Under a Changing Climate, AGU Fall Meeting 2019, San Francisco.

26. Archfield, S., K.Ryberg, A.Blum, N. Barth, A.Chandramauli, H.Li, G.Abeshu, and S. Arumugam, What defines a flood? Building shared understanding across differing attributes and definitions of flooding, AGU Fall Meeting 2019, San Francisco.

27. Yao, L., D.Libera, M. Kheimi, S. Arumugam, and D.Wang, The Roles of Climate Variability on Runoff at Daily, Monthly, Inter-annual, and Mean Annual Scales, AGU Fall Meeting 2019, San Francisco.

28. Mukhopadhyay, S., A. Mazrooei, and S. Arumugam, A Geo-processing Tool for co-locating the dependency of critical infrastructure with hydrologic information network, AGU Fall Meeting 2019, San Francisco.

29. Yao, L.; D.Wang, D. Libera, and S.Arumugam, Evaluating the Controls of the Long-Term Water Balance through a Conceptual Hydrological Model Representing Saturation Excess and Infiltration Excess Runoff Generations,AGU Fall Meeting Abstracts, 2018.

30. Mazrooei, A., M.Reitz, and S. Arumugam, Global assessment of evapotranspiration impacted by anthropogenic land cover changes, AGU Fall Meeting Abstracts,2018.

31. S. Arumugam, D. Wang and N. Devineni, A Conceptual Approach using the Limits Concept for Extending Budyko's Framework for Natural Watersheds and Human-Altered Landscapes, AGU Fall Meeting Abstracts, 2018,

32. Libera, D., D.Wang, L.Yao, and S.Arumugam, The Role of Spatial Variability of Climate Variables on the Long-Term Water Balance Using a Semi-distributed (SWAT) Mechanistic Model, AGU Fall Meeting Abstracts, 2018.

33. Ruhi, A., S.Worland, S. Mukhopadhyay, N.Devineni, D. Chalise, J.L. Salinas, A.Mazrooei, G. Abeshu, and S. Arumugam, Understanding the cumulative effects of dams on regional streamflow dynamics, AGU Fall Meeting Abstracts, 2018.

34. Mukhopadhyay, S. and S. Arumugam, Application of Sub-seasonal to Seasonal (S2S) precipitation forecast in multipurpose multi-reservoir system for water and energy management, AGU Fall Meeting Abstracts, 2018,

35. Johnson, T., U.Lall, A. AghaKouchak, S. Arumugam, C. Brown, G.McCabe Jr, R. Pulwarty, P. Colohan, K. Lewis and A. Lustig, Water: Fourth US National Climate Assessment (NCA4) Volume 2, Chapter 3,AGU Fall Meeting Abstracts, 2018.

36. Chalise, D., S. Arumugam and A. Ruhi, Effects of dam purpose and degree of regulation on flow regime alteration over the continental United States, AGU Fall Meeting Abstracts, 2018.

37. **[Invited]** S. Arumugam, Climate-Water-Energy Nexus: Uncertainty Reduction in Climate Forecasts Using Multimodel Combination and their Relevance to Water and Energy Management, World Council for Energy and Climate, Shanghai, 2018.

38. [**Invited**]S. Arumugam, A. Mazrooei[§] and R. Cumbie-Ward, Integrated Drought Monitoring and Forecasts for Decision Making in Water and Agricultural Sectors over the Southeastern US under Changing Climate, AGU Fall meeting, New Orleans, Dec 11-15, 2017.

39. D. Libera[§] and S. Arumugam, Multivariate Bias Correction Procedures for Improving Water Quality Predictions from the SWAT Model, AGU Fall meeting, New Orleans, Dec 11-15, 2017.

40. S. Mukhopadhyaya[§] and S. Arumugam, Sub-seasonal-to-seasonal Reservoir Inflow Forecast using Bayesian Hierarchical Hidden Markov Model, AGU Fall meeting, New Orleans, Dec 11-15, 2017.

41. A. Mazrooei[§], S. Arumugam, V. Lakshmi and A. Wood, Data Assimilation using observed streamflow and remotely-sensed soil moisture for improving sub-seasonal-to-seasonal forecasting, AGU Fall meeting, New Orleans, Dec 11-15, 2017.

42. S. Arumugam, A. Quieroz, J. Patskoski, G.Mahinthakumar and J. DeCarolis, Utilizing Climate Forecasts for Improving Water and Power Systems Coordination, AGU Fall meeting, San Francisco, Dec 12-16, 2016.

43. S.Arumugam, A. Ruhi, J. Sabo, T. Sinha, S.B. Seo, R.D. Bhowmik, Synthesis of US Public Water Supply: Spatio-temporal Patterns and Socio-Economic Controls, AGU Fall meeting, San Francisco, Dec 12-16, 2016.

44. S.Arumugam, A. Ruhi, J. Sabo, T. Sinha, S.B. Seo, R.D. Bhowmik, The role of hydroclimate and water use on freshwater sustainability over the Coterminous US, AGU Fall meeting, San Francisco, December 14-18, 2015.

45. **[Invited]** S. Arumugam, Climate-Water-Energy Nexus: Opportunities and Challenges, World Meteorological Organization, Geneva, Private Sector Partnership Forum: Climate Services and Decision Support Tools for the Energy Sector, March 23-24, 2015.

46. [**Invited**] S. Arumugam, Improved Water and Energy Management Utilizing Seasonal to Interannual Hydroclimatic Forecasts, AGU Fall Conference, 2014.

47. [**Invited**] S. Arumugam, Implications of Water Use and Hydroclimatic Anomalies on the Freshwater Sustainability across the US Sunbelt, AGU Fall Conference, 2014.

48. Sinha T., and S. Arumugam, The Utility of CMIP5 Climate Change Projections in Estimating Hydrologic Impacts in the Conterminous US, UCOWR-NIWR-CUAHSI International Conference, Tufts University, MA, Jun 18-20, 2014.

49. Patskoski, J. [§], and S. Arumugam, Reducing the uncertainty in projecting future streamflow using paleo and instrumental records along with near-term climate change projections, Tufts University, MA, Jun 18-20, 2014.

50. Sinha, T., A. Mazoorei[§], S. Arumugam and R.Boyles, Experimental Inflow and Storage Forecasts for the State of NC, AGU Chapman Conference "Seasonal to Interannual Hydroclimatic Forecasts and Water Management", Portland, July 2013.

51. Mazoorei, A.,[§] T.Sinha and S. Arumugam, Decomposition of Sources of Errors in developing Seasonal Streamflow Forecasts over the Sunbelt, AGU Chapman Conference "Seasonal to Interannual Hydroclimatic Forecasts and Water Management", Portland, July 2013.

52. Seo, S.B, [§] T.Sinha, G.Mahinthakumar, and S. Arumugam, Near-term Climate Change Impacts on Surface water and groundwater interactions over the Sunbelt, AGU Chapman Conference "Seasonal to Interannual Hydroclimatic Forecasts and Water Management", Portland, July 2013.

53. Bhowmik, R., [§] S. Arumugam and J. Patskoski[§], Multivariate Downscaling of Decadal Climate Change Projections over the Sunbelt, AGU Chapman Conference "Seasonal to Interannual Hydroclimatic Forecasts and Water Management", Portland, July 2013.

54. Patskoski, J. [§], and S.Arumugam, Estimating Required Reservoir Storage from Synthetically Generated Streamflow through a Hierarchical Bayesian Framework Combining Observed and Paleo Streamflow, AGU Fall Conference, 2012.

55. Sinha,T., and S.Arumugam, Decomposition of Sources of Errors in Seasonal Streamflow Forecasts in a Rainfall-Runoff Dominated Basin, AGU Fall Conference, 2012.

56. Patskoski, J.,[§] and S.Arumugam, Predicting Streamflow in the Southeastern United States using Climate and Tree Ring Data, American Geophysical Union, Fall Conference, San Francisco, 2011.

57. Li, W.,§ S. Arumugam, and R.S. Ranjithan, Utility of Climate Forecasts in promoting optimal inter-basin transfer in the North Carolina Triangle Area, American Geophysical Union, Fall Conference, San Francisco, 2011.

58. Singh, H.,§ and S.Arumugam, Systematic uncertainty reduction in streamflow forecasts development: Importance of Input and Hydrologic Model Uncertainty, American Geophysical Union, Fall Conference, San Francisco, 2011.

59. Wang, H.,§ S.Arumugam and R.S.Ranjithan, I: Low-frequency oscillation in annual precipitation and streamflow over Southeastern United States, American Geophysical Union, Fall Conference, San Francisco, 2011.

60. Sinha, T., and S.Arumugam, Role of initial conditions and climate variability on seasonal streamflow forecasting in the southeastern US, American Geophysical Union, Fall Conference, San Francisco, 2011.

61. Almanaseer, N.,§ S.Arumugam and J.Bales, Improving Groundwater Predictions using Seasonal Precipitation Forecasts, American Geophysical Union, Fall Conference, San Francisco, 2011.

62. Wang, H.,§ S. Arumugam, and R.S. Ranjithan, Interannual to Decadal Variability in Hydroclimatic Data: Analyses and Implications to Water Management, American Geophysical Union, Fall Conference, San Francisco, 2010.

63. Li, W.,§ S. Arumugam, and R.S. Ranjithan, The Role of Multimodel Combination and Data assimilation in Improving Streamflow Prediction, American Geophysical Union, Fall Conference, San Francisco, 2010.

64. Oh, J.,§ and S. Arumugam, Probabilistic Water quality trading model conditioned on season-ahead nutrient load forecasts, American Geophysical Union, Fall Conference, San Francisco, 2010.

65. Almanaseer, N.,§ S. Arumugam and J. Bales, Role of Climate Variability in Modulating Surface Water and Groundwater Interaction over the Southeast United States, American Geophysical Union, Fall Conference, San Francisco, 2010.

66. Arumugam, S. and W. Li§, The Role of Multimodel Combinations in improving Streamflow Prediction, American Geophysical Union, Fall Conference, San Francisco, 2008.

67. Devineni, N.,§ and S. Arumugam, Improved Drought Management of Falls Lake Reservoir: Role of Multimodel Streamflow Forecasts in Setting up Restrictions, Annual NC WRRI Conference, Raleigh, October 2008.

68. Oh, J.,§ and S. Arumugam, Role of Streamflow Seasonality in Influencing Water Quality Variability in the Southeastern US, Annual NC WRRI Conference, Raleigh, October 2008.

69. Li, W.,§ and S. Arumugam, Improving Hydrological Predictions through better representation of Model Uncertainty, Annual NC WRRI Conference, Raleigh, October 2008.

70. Arumugam, S. and N. Devineni§, Predictability of U.S. Winter Precipitation: Role of ENSO state in Developing Multimodel Combinations, American Geophysical Union, Fall Conference, San Francisco, Dec 10-14, 2007.

71. Devineni, N.,§,# and S. Arumugam, Multimodel Ensembles of Streamflow Forecasts: Role of Predictor State in Developing Optimal Combinations, American Geophysical Union, Fall Conference, San Francisco, Dec 10-14, 2007 *(#- Awarded Outstanding Student Paper Award for Devineni in Fall-2007 AGU conference).*

72. Devineni, N.,[§] S. Arumugam, and S. Ghosh, Multi-model Ensembling of Probabilistic Streamflow Forecasts: Role of Predictor State Space in Skill Evaluation, Annual NC WRRI conference, Raleigh, March 2007.

73. Golembesky, K.,[§] S. Arumugam, and N. Devineni[§], Improved Management of Falls Lake Reservoir during the Summer Season using Climate Information based Monthly Streamflow Forecasts: Role of Restrictions in Water supply and Water quality management, Annual NC WRRI Conference, Raleigh, March 2007.

74. Arumugam, S, and U. Lall, Climate Forecasts and Reservoir Management – Possibilities and Challenges, 21st Conference on Hydrology, AMS, San Antonio, January 07.

75. Arumugam, S., N. Devineni, and S. Ghosh, Multi-model Ensembling of Probabilistic Streamflow Forecasts: Role of Predictor State Space in Skill Evaluation, AGU Fall Conference, San Francisco, December 2006.

76. Arumugam, S., and U. Lall, Improved Operation of Reservoir Systems – Utility of Seasonal and Monthly Updated Climate Forecasts, 18th Conference on Climate Variability and Change, AMS, Atlanta, January 06.

77. Brown, A., U. Lall, and S. Arumugam, Climate-informed Decision Tools for the Water and Energy Sector (***Invited Presentation***), 18th Conference on Climate Variability and Change, AMS, Atlanta, January 06.

78. Arumugam, S., and U. Lall, Use of Operational Climate Forecasts in Reservoir Management and Operation, AGU Fall Conference, San Francisco, December 2005.

79. Arumugam, S., and U. Lall, Climate Forecasts and Reservoir Management – Possibilities and Challenges (***Selected Presentation***), Climate Change Science Program Workshop, November 14-16, 2005.

80. Ward, N.M., J. W. Hansen, S. Arumugam, D. Osgood, L. Zubair, C. Brown, and A. Mishra, Decision Systems Research and Tool Development at the IRI, Climate Change Science Program Workshop, November 14-16, 2005.

81. Arumugam, S., and U. Lall, Operational Streamflow Forecasts Development Using GCM Predicted Precipitation Fields, AGU Fall Conference, San Francisco, December 12-17, 2004.

82. Arumugam, S., U. Lall, and A. W. Robertson, Multimodel Probabilistic Hydroclimatic Ensemble Forecasts, AGU Spring Conference, Montreal, May 17-21, 2004.

83. Lall, U., A. Sharma, S. Arumugam, and F. Souza Filho, From Interannual Streamflow Forecasts to New Water Management Strategies for Ceara, North East Brazil, AGU Fall Conference, San Francisco, Dec 12-16, 2002.

Technical Reports (Non-Refereed)

1. L. Yeghiazarian, S. Arumugam, X. Cai and V. Merwade, Convergence Accelerator Phase I (RAISE): The Urban Flooding Open Knowledge Network, National Science Foundation, 2021.

2. Sankarasubramanian, A., G. Mahinthakumar, J. DeCarolis, A. de Quieroz and N. Lu, CyberSEES: Cyber-enabled Water and Energy Systems Sustainability utilizing Climate Information, National Science Foundation, 2021.

3. Sankarasubramanian, A., G. Mahinthakumar and E.Berglund, WSC - Category 3: Collaborative Research: Water Sustainability under Near-term Climate Change: A Cross-

Regional Analysis Incorporating Socio-Ecological Feedbacks and Adaptations, National Science Foundation, 2018.

4. Sankarasubramanian, A., Climate Informed Uncertainty Analyzes for Integrated Water Resources Sustainability, National Science Foundation, 2017.

5. Sankarasubramanian, A., R. Boyles, A. Mazoorei and H. Singh, Experimental Reservoir Storage Forecasts Utilizing Climate-Information Based Streamflow Forecasts, NC Water Resources Research Institute, March 2015.

6. Sankarasubramanian, A. and R.S. Ranjithan, Improved Water Resources Sustainability utilizing Multi Time-scale Streamflow Forecasts, National Science Foundation, May 2013.

7. Sankarasubramanian, A. and T. Sinha, Uncertainty in Surface Water Availability over NC under climate and land use changes, NC Water Resources Research Institute, March 2013.

8. Sankarasubramanian, A., F.Semazzi, U.Hatch, Climate Information based Urban Water Supply and Energy Management in the Greater Horn of Africa, National Oceanic and Atmospheric Administration, October 2012.

9. Sankarasubramanian, A. and U. Lall, Climate Forecasts and Water Management, AGU Hydrology Section Newsletter, July, 2012.

10. Sankarasubramanian, A. and R.Boyles, Seasonal Streamflow Forecasts for the Hydrologic Unit Code (HUC-8) Basins in North Carolina utilizing Multimodel Climate Forecasts, NC-Water Resources Research Institute Research Report, 2011.

11. Sankarasubramanian, A., Vulnerability of Coastal Watersheds to Climate Change and Variability, NC Sea Grant and NC Water Resources Research Institute, 2011.

12. Sankarasubramanian, A. and N. Devineni, Utilizing Three-Month ahead Multimodel Streamflow Forecasts for Improving the Management Of Falls Lake, NC-Water Resources Research Institute Research Report, 2010.

13. Sankarasubramanian, A., N. Devineni and S. Ghosh, Multi-model Ensembling of Probabilistic Streamflow Forecasts: Role of Predictor State Space in Skill Evaluation, Institute of Statistics Nimeo Series 2595, NC State University, 2006.

VIII.   Contributed Talks and Presentations

1. Keynote talk on "Climate-Informed Water and Energy Management: Opportunities and Challenges", One Day Seminar on Advances in Water Resources Planning and Management, IIT Madras, May 22, 2022.

2. Invited panelist on Digital Hydrologic Connectivity and Infrastructure Management: Progress and Opportunities", CUAHSI Cyber seminar Series, Nov 30, 2021.

3. Invited talk on "Climate and Water Management: Opportunities and Challenges" by the Government of India, Vaibhav Summit, Oct 2020.

4. Water Security under changing climate: Stressors, Opportunities and Challenges, University of Colorado, Boulder, October 2020.

5. Invited talk on "Challenges in Understanding Continental Scale Groundwater Variability, Change and Appropriation, National Academies Workshop on Groundwater Recharge and Flow: Approaches and Challenges for Monitoring and Modeling Using Remotely Sensed Data, Washington DC, 06/27/19-06/28/19.

6. Invited talk on "Climate-Water-Energy Nexus: Opportunities and Challenges", CoPE workshop funded by NSF, Atlanta, October 2018.

7. Climate-Water-Energy Nexus: Uncertainty Reduction in Climate Forecasts using Multimodel Combination and their relevance to Water and Energy Management, Indian Institute of Science, June 19, 2018.

8. Synthesis of public water supply use in the United States and China: Spatio-temporal patterns and socio-economic controls, Tsinghua University, Beijing, May 22, 2018.

9. Synthesis on National Water Use: Spatial Patterns and Socio-economic Controls, State of America's Water: Present and Future, University of Cincinnati, April 6, 2018.

10. Synthesis on National Water Use: Spatial Patterns and Socio-economic Controls, State of America's Water: Present and Future, One NOAA Science Seminar Series, Jan 10, 2018.

11. Decomposition of Sources of Errors in Seasonal Streamflow Forecasting over the US Sunbelt, University Council for Atmospheric Research, Boulder, July 13, 2017.

12. Uncertainty Reduction in Climate Forecasts using Multimodel Combination and their Relevance to Water and Energy Management, University of South Carolina, Columbus, March 16, 2017

13. Utilizing Climate Information for Improving Water, Energy, & Ecological Management, Southeast Climate Science Center, April 20, 2017.

14. Water and ecological sustainability under near-term climate change, Water Sustainability and Climate (WSC) PI meeting, National Science Foundation, March 10, 2016.

15. Climate Variability and its Impacts over the Southeast, Guest Lecture on Environmental Sciences, Columbia University, February 8, 2016.

16. Synthesis on National Water Use: Spatial Patterns and Controls, Tufts University, October 6, 2015.

17. Leonardo da Vinci: Contribution of the renaissance artist towards water management, North Carolina Museum of Arts, October 2015.

18. Synthesis on National Water Use: Spatial Patterns and Socio-economic Controls, State of America's Water: Present and Future, CUAHSI- Columbia Water Center Cyber seminar series, May 2015.

19. Water and ecological sustainability under near-term climate change, Water Sustainability and Climate (WSC) PI meeting, National Institute of Food and Agriculture, January 28, 2014.

20. Climate, Water and Energy Management in the Greater Horn of Africa, Workshop on Water and Climate Change in Africa, Duke University, March 23, 2013.

21. Near-term Climate Change and Water Management over the Sunbelt, National Science Foundation, Water Sustainability and Climate (WSC) PI meeting, NSF, March 11, 2013.

22. Climate-informed Uncertainty Analyses for Water and Energy Management, Nicholas School of Environmental Policy, Duke University, February 20, 2013

23. Uncertainty Reduction in Climate Forecasts using Multimodel Combination and their Relevance to Water Management, CSIRO (Land and Water), Melbourne, Australia, August 3, 2012.

24. Probabilistic Water Quality Trading conditional on seasonal nutrient forecasts, University of New South Wales, Sydney, Australia, June 29, 2012.

25. Uncertainty Reduction in Climate Forecasts using Multimodel Combination and their Relevance to Water Management, Earth System Science Interdisciplinary Center, University of Maryland, College Park, April 9, 2012.

26. Role of Climate Variability in Modulating Surface Water and Groundwater Interaction over the Southeastern US, NOAA in the Carolinas conference, Charleston, March 16, 2012.

27. Uncertainty Reduction in Streamflow Predictions over Multiple Time Scales, Hydrological Sciences Branch, NASA Goddard Space Flight Center, August 10, 2011.

28. Utility of Multimodel Climate Forecasts in Improving Reservoir Management, Cooperative Institute of Climate and Satellites, National Climatic Data Center, Asheville, NC, August 5, 2011.

29. Climate Forecasts and Water Management: Opportunities and Challenges, CUAHSI National Cyberseminar Series, April 1, 2011.

30. Role of Climate Variability and Change in Improving River Basin Management, Indian Institute of Technology Madras, Chennai (India), December 23, 2009.

31. Climate-informed Uncertainty Analyses for Integrated River Basin Management, US-Korea Conference, Raleigh, July 19, 2009.

32. Role of Climate Forecasts in Meeting NC Future Water Supply Challenges, NC Society of Engineers, January 19, 2008.

33. Climate Informed Water Management, Summer Ventures Program in Math and Science for High School Juniors and Seniors, North Carolina Central University, July 2007.

34. Climate Forecasts and Reservoir Management – Possibilities and Challenges, Central North Carolina AMS, October 19, 2006.

35. Improved Water Allocation using Climate Information Based Streamflow Forecasts: Decision Analyses and Possibilities, NC WRRI Seminar Series, October 5, 2005.

36. Climate Forecasts and Reservoir Management – Possibilities and Challenges, Nicholas School of the Environment and Earth Sciences, Duke University, March 2, 2006.

37. Climate Forecasts and Reservoir Management – Possibilities and Challenges, U.S. Climate Change Science Program Workshop: Climate Science in Support of Decision making*, Washington DC, November 14-16, 2005. – (**Selected Presentation out of 700 papers**).

38. Climate Information based Streamflow Forecasts: Predictor Identification and Model Development, Environmental Statistics Group, Department of Statistics, NC State University, November 3, 2005.

39. Improved Water Allocation using Climate Information Based Streamflow Forecasts: Decision Analyses and Possibilities, NC WRRI Seminar Series, October 5, 2005.

40. Improving Angat Reservoir Operation using Climate Forecasts: Decision Analyses and Possibilities, International Research Institute for Climate and Society, Columbia University, August 24, 2005.

41. Improved Water Allocation using Climate Information Based Streamflow Forecasts: An Assessment from System Perspective, Tufts University, June 24, 2005.

42. Improved Water Allocation using Climate Information Based Streamflow Forecasts: An Assessment from System Perspective, North Carolina State University, January 24, 2005.

43. Better Management through Better Decisions – Use of Climate Forecasts, Lamont-Doherty Earth Observatory, Open House, October 4, 2004.

44. Improved Water Allocation using Climate Information Based Streamflow Forecasts: An Assessment from System Perspective, University of Arizona, Tucson, April 29, 2004.

45. Improved Water Allocation using Climate Information Based Streamflow Forecasts: An Assessment from System Perspective, Penn State University, March 31, 2004.

46. Utility of Climate Information Based Streamflow Forecasts towards Annual Water Allocation in Jaguaribe-Metropolitan Hydro (JMH) System, Ceara, NE Brazil, International Research Institute for Climate and Society, Columbia University, March 4, 2004.

47. Utility of Climate Forecasts in Improving Reservoir Management, University of Tennessee, Knoxville, February 2003.

48. Hydroclimatology of the United States, International Research Institute for Climate and Society, Columbia University, May 2002.

49. Role of Environmental Assessments and Environmental Management Plans in enhancing the Development Effectiveness – A Review on Water and Agriculture Projects in the South Asia Region, *Brown Bag Seminar* in the South Asia Social and Environmental Section, *World Bank,* Washington D.C., December 20, 2000.

IX.   Graduate and Undergraduate Teaching

North Carolina State University – Graduate Courses

Developed one graduate (CE 586) and two advanced graduate courses (CE 796 in alternate years) for the water and environmental engineering curriculum. I am also offering one undergraduate course (CE 383) every year in the spring.

CE 586: Engineering Hydrology

The course has been given a broad base with emphasis on hydrologic processes including teleconnection and linkage to climate and Sea Surface Temperature indices. Perspectives on modeling these processes have also been addressed based on conservation of mass and energy. Simple Water balance models and approaches to calibration are discussed in the context of watershed modeling.

CE 777: Stochastic Methods in Water and Environmental Engineering

A new course has been developed focusing on stochastic modeling and its applications to water and environmental engineering. The course is primarily projects-based with topics on (a) Predictor identification (b) Dimension Reduction (c) Fourier/Spectral Analyses (d) Model Development and Multi-Model combination.

CE 786: Hydroclimatology

An advanced course on hydroclimatology has been offered in Spring 2007 for the first time underpinning the linkages between climate and weather on hydrological process and its forecasting. More specifically, the course discusses four topics: (a) Overview of Global Climate and Hydrology (b) Climate and Weather Forecasting and their Verification Measures (c) Modeling Evapotranspiration (d) Climate, Surface Water and Ground Water Interaction.

Columbia University – Graduate Courses

Management and Development of Water Systems – Co-taught with Upmanu Lall, 2004.

Undergraduate Teaching
North Carolina State University

CE 383: Hydrology and Urban Water Systems

The course has been revised to include mini-projects (2007 - Hurricane Katrina; 2008 – Drought Impacts in NC, 2009 – Water Quality Issues in NC) emphasizing the importance of understanding real world water problems.

Boston University

- Introduction to Hydrogeology and Water Chemistry, spring 2011.

X. Professional Service

Professional Activities within the University

- Member, Reappointment, Promotions and Tenure Committee, 2021-Present
- Chair, Seminars and Research Committee, 2017-Present.
- Chair (Member), Graduate Program Committee, 2015-2017 (2012-Present).
- Member, University Research Committee, 2017-2018.
- Member, College Research Committee, 2016-2018.
- Group Coordinator – Water Resources and Environmental Engineering, 2012-2015.
- Chair, Water and Coastal positions search committee, 2014-2015.
- Member, Open Search Committee, 2014, 2016, 2017.
- Member – Graduate Programs Committee – 2014.
- Member – Departmental Seminar Committee, 2011-2013.
- Member – Translational Climate Scientist Position Search Committee – Marine, Earth and Atmospheric Sciences Department, 2010.
- NC State Experts Opinion on Climate Change – UNC System, 2008.
- Chair – Departmental Seminar Committee, 2007 – 2011.
- Committee Member – Geomatics Faculty Position Search, 2006-2007.
- Committee Member – Open House Events, 2006 – present.
- Faculty member, Interdisciplinary Graduate Program, PhD in Environmental Statistics, 2006.

Professional Activities Outside University

Editorial Appointments

- Associate Editor, Geophysical Research Letters (AGU), 2020-present.
- Associate Editor, Journal of Hydrometeorology (AMS), 2016-2020.
- Associate Editor, Journal of Hydrology, 2016-2018.
- Associate Editor, Water Resources Research, AGU, 2011 – 2015
- Associate Editor, Journal of Hydrologic Engineering, ASCE, 2011– 2015.
- Editor, Journal of Water and Climate Change, IWA Publishers, 2011- 2014.

Professional Memberships and Service

American Geophysical Union (1997-Present)

- Chair (2020) and Member, Hydrological Sciences Fall Program Planning Committee, 2018-2022.

- Lead Convener, AGU Chapman Conference on "Seasonal to Interannual Hydroclimate Forecasts and Water Management", Portland, Oregon, August 2013.
- Member, Core Technical Committee, AGU Surface Water Section, 2010-2013.
- Co-chair, Freshwater, Ecosystem, and Agriculture Sustainability Under Climate and Land Use Change, AGU, San Francisco, Fall 2011-2012.
- Co-Chair, Hydrologic Prediction and Verification for Water and Energy Resources and Other Applications, AMS, New Orleans, January 2012.
- Chair, Water Management under Nonstationary Climate: Can Decadal Predictions be useful? AGU, San Francisco, Fall 2010.
- Chair, Multi-Model Ensemble Forecasts for Climate and Streamflow, Dec 2007.
- Chair, Hydroclimatic Prediction and Water Management, San Francisco, Dec 2005.
- Chair, Surface Water Hydrology and Water Resources (Student Poster), Dec 2005.
- Co-Chair, Methods and Applications of Ensemble Prediction for Hydrometeorology, Dec 2004.
- Co-Chair, Surface Water Hydrology and Water Resources (Student Poster), Dec 2004.
- Co-Coordinator, Outstanding Student Paper Award, AGU New Orleans, Spring 2005.

American Society of Civil Engineers (ASCE) (1997-Present)
- Member, Surface Water Hydrology, Committee on Environmental Water Resources Institute (EWRI), ASCE, 2011-present.
- Member, Systems committee, Committee on EWRI, ASCE, 2011-present.
- Chair, Watersheds – Hydrologic Simulation, EWRI conference, Cincinnati, May 2013

American Meteorological Society (AMS) (2006 – 2020)
- Hydrology Committee, AMS, 2012-2018.
- Program Committee, 18th Conference on Climate Variability and Change, AMS Atlanta, 2006.

Other Synergistic Activities and Service
- Organized a workshop on "Urban Flooding - An Open Knowledge Network" with CUAHSI, Lilit Yeghiazarian, Ximing Cai and Venkatesh Merwade, Raleigh, NC, Nov 12-14, 2019.
- Advisory board member for the workshop on the effectiveness of NSF-funded WSC and INFEWS projects, 2019.
- Invited Participant, NSF Workshop on Coastlines and People, October 2018
- Invited Participant, National Center for Ecological Analysis and Synthesis, University of Maryland, workshop on Water Sustainability, 2019-2020.
- Panelist, Workshop on Freshwater Sustainability and Climate Change, University of California, Santa Barbara, April 9-11, 2013.
- Panelist, Workshop on Water and Climate Change in Africa, Duke University, March 23, 2013.
- Organized a workshop "Application of Climate Forecasts for Water and Energy Management" with Fred Semazzi, Chris Oludhe (University of Nairobi), IGAD Climate Predictions and Applications Center, Nairobi, Kenya, February 22, 2012.

- Organized a workshop "Southeastern US Freshwater availability, Quality, and Equity" with Todd Rasmussen (University of Georgia) and Larry Band (UNC- Chapel Hill), Water and Health Conference, UNC-Chapel Hill, October 6, 2011.

Proposal Review Panels

- Panelist, National Science Foundation 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2012, 2010, 2009, 2008, 2006.
- Proposal review for National Institute of Water Resources, 2006, 2009.
- Proposal review for NOAA, 2006.

Journal Articles Review

- More than 40 journals in various topics ranging from hydrology, water resources, energy management, ecology and climate.