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## Education

Ph.D., Civil Engineering, Purdue University, May 2008
- Major: Hydraulic and Hydrologic Engineering
- Dissertation: Multivariate Statistical Analysis of Indiana Hydrologic Data
- Advisor: Dr. Rao S. Govindaraju

M.S., Civil Engineering, National Taiwan University, June 2001
- Major: Hydraulic Engineering
- Thesis: A Study in Development of Regional Design Hyetographs
- Advisor: Dr. Gwo-Fong Lin

B.S., Civil Engineering, National Taiwan University, June 1999

*Other:*
- NAFTA Student Exchange Program, Lakehead University (Canada), June–July 2006

## Appointments

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|---|---|
| Oct 2020–present | Group Leader, Water Resource Science and Engineering Group, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| Jan 2017–present | Senior Research Staff, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| Jan 2017–present | Joint Faculty, The Bredesen Center for Interdisciplinary Research and Graduate Education, University of Tennessee, Knoxville, TN |
| Dec 2013–Sep 2020 | Team Leader, Hydrologic Systems Analysis Team, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| Dec 2013–Dec 2016 | Research Staff, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| Dec 2010–Nov 2012 | Research Associate, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| Feb 2009–Nov 2010 | Post-doctoral Research Associate, Computational Sciences and Engineering Division, Oak Ridge National Laboratory, Oak Ridge, TN |
| May 2008–Jan 2009 | Post-doctoral Research Associate, School of Civil Engineering, Purdue University, West Lafayette, IN |
| Aug 2004–May 2008 | Graduate Research/Teaching Assistant, School of Civil Engineering, Purdue University, West Lafayette, IN |
| March 2003–July2004 | Full-time Teaching Assistant, Department of Civil Engineering, National Taiwan University, Taipei, Taiwan |

## Honors / Certificates

July 2020 PASC20 Best Paper Award – Sharif et al. (2020), Performance Evaluation of a Two

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| | Dimensional Flood Model on Heterogeneous High-Performance Computing Architectures, https://www.pasc-conference.org/pasc20-papers-open-access-via-acms-opentoc-and-best-paper-award/. |
| April 2014 | Significant Event Award – "National Hydropower Asset Assessment Program (NHAAP)," Oak Ridge National Laboratory |
| Oct 2013 | Statistical Hydrology Best Paper Award, International Commission on Statistical Hydrology, International Association of Hydrological Sciences |
| Jan 2010 | Outstanding Reviewer Award, Journal of Hydrologic Engineering, American Society of Civil Engineers |
| Oct 2008 | Civil Engineering Best Dissertation Award, Purdue University |
| Apr 2008 | Gerrit H. Toebes Memorial Award, Purdue University |
| Oct 2007 | Jacques W. Delleur Traveling Award, Purdue University |
| April 2006 | Estus H. and Vashti L. Magoon Outstanding Teaching Assistant Award, Purdue University |
| Oct 2005 | Passed the NCEES Fundamentals of Engineering Examinations |
| June 2001 | Honorary member of the Phi Tau Phi Scholastic Society, Taiwan |
| May 2001 | Certificate of Civil Engineer, Taiwan (PE equivalent) |

## List of Publications

***Peer-reviewed Journal Articles***

[46] Heidari, H., M. Arabi, T. Warziniack, and S.-C. Kao (2020), Assessing Shifts in Regional Hydroclimatic Conditions of U.S. River Basins in Response to Climate Change over the 21st Century, *Earth's Future*, *8*, e2020EF001657, doi:10.1029/2020EF001657.

[45] Konapala, G., S.-C. Kao, S. L. Painter, and D. Lu (2020), Machine Learning Assisted Hybrid Models Can Improve Streamflow Simulation in Diverse Catchments across the Conterminous US, *Environ. Res. Lett.*, doi:10.1088/1748-9326/aba927.

[44] Shao, M., G. Zhao, S.-C. Kao, L. Cuo, C. Rankin, and H. Gao (2020), Quantifying the Effects of Urbanization on Floods in a Changing Environment to Promote Water Security — A Case Study of Two Adjacent Basins in Texas, *J. Hydrol.*, *589*, 125154, doi:10.1016/j.jhydrol.2020.125154.

[43] Morales Hernández, M., M. B. Sharif, S. Gangrade, T. T. Dullo, S.-C. Kao, A. Kalyanapu, S. K. Ghafoor, K. J. Evans, E. Madadi Kandjani, and B. R. Hodges (2020), High Performance Computing in Water Resources Hydrodynamics, *J. Hydroinform.*, doi:10.2166/hydro.2020.163.

[42] Gangrade, S., S.-C. Kao, and R. A. McManamay (2020), Multi-model Hydroclimate Projections for the Alabama-Coosa-Tallapoosa River Basin in the Southeastern United States, *Sci. Rep.*, *10*, 2870, doi:10.1038/s41598-020-59806-6.

[41] Yang, Y., M. Pan, H. E. Beck, C. K. Fisher, R. E. Beighley, S.-C. Kao, Y. Hong, and E. F. Wood (2019), In Quest of Calibration Density and Consistency in Hydrologic Modeling: Distributed Parameter Calibration against Streamflow Characteristics, *Water Resour. Res.*, *55*, 7784–7803, doi:10.1029/2018WR024178.

[40] Forbes, W. L., J. Mao, D. M. Ricciuto, S.-C. Kao, X. Shi, A. A. Tavakoly, M. Jin, W. Guo, T. Zhao, Y. Wang, P. E. Thornton, and F. M. Hoffman (2019), Streamflow in the Columbia River Basin: Quantifying Changes over the Period 1951–2008 and Determining the Drivers of those Changes, *Water Resour. Res.*, *55*, 6640–6652, doi:10.1029/2018WR024256.

[39] Gangrade, S., S.-C. Kao, T. T. Dullo, A. J. Kalyanapu, and B. L. Preston (2019), Ensemble-based Flood Vulnerability Assessment for Probable Maximum Flood in a Changing Environment, *J. Hydrol.*, *576*, 342–355, doi:10.1016/j.jhydrol.2019.06.027.

[38] Chegwidden, O. S., B. Nijssen, D. E. Rupp, J. R. Arnold, M. P. Clark, J. J. Hamman, S.-C. Kao, Y. Mao, N. Mizukami, P. Mote, M. Pan, E. Pytlak, and M. Xiao (2019), How do Modeling Decisions Affect

the Spread among Hydrologic Climate Change Projections? Exploring a Large Ensemble of Simulations across a Diversity of Hydroclimates, *Earth's Future*, *7*, 623–637, doi:10.1029/2018EF001047.

[37] Beigi, E., F. T.-C. Tsai, V. P. Singh, and S.-C. Kao (2019), Bayesian Hierarchical Model Uncertainty Quantification for Future Hydroclimate Projections in Southern Hills-Gulf Region, USA, *Water*, *11*(2), 268, doi:10.3390/w11020268.

[36] Kao, S.-C., S. T. DeNeale, and D. B. Watson (2019), Hurricane Harvey Highlights: Need to Assess the Adequacy of Probable Maximum Precipitation Estimation Methods, *J. Hydrol. Eng.*, *24*(4), 05019005, doi:10.1061/(ASCE)HE.1943-5584.0001768.

[35] McManamay, R. A., M. J. Troia, C. R. DeRolph, A. O. Sheldon, A. Barnett, S.-C. Kao, and M. Anderson (2018), A Stream Classification System to Explore the Physical Habitat Diversity and Anthropogenic Impacts in Riverscapes of the Eastern United States, *PLoS ONE*, *13*(6), e0198439, doi:10.1371/journal.pone.0198439.

[34] Zhao, G., H. Gao, S.-C. Kao, N. Voisin, and B. S. Naz (2018), A Modeling Framework for Evaluating the Drought Resilience of a Surface Water Supply System under Non-stationarity, *J. Hydrol.*, *563*, 22–32, doi:10.1016/j.jhydrol.2018.05.037.

[33] Gangrade, S., S.-C. Kao, B. S. Naz, D. Rastogi, M. Ashfaq, N. Singh, and B. L. Preston (2018), Sensitivity of Probable Maximum Flood in a Changing Environment, *Water Resour. Res.*, *54*(6), 3913–3936, doi:10.1029/2017WR021987.

[32] Forbes, W., J. Mao, M. Jin, S.-C. Kao, W. Fu, X. Shi, D. Ricciuto, P. Thornton, A. Ribes, Y. Wang, S. Piao, T. Zhao, C. Schwalm, F. Hoffman, J. Fisher, A. Ito, B. Poulter, Y. Fang, H. Tian, A. Jain, and D. Hayes (2018), Contribution of Environmental Forcings to US Runoff Changes for the Period 1950–2010, *Environ. Res. Lett.*, *13*(5), doi:10.1088/1748-9326/aabb41.

[31] Naz, B. S., S.-C. Kao, M. Ashfaq, H. Gao, D. Rastogi, and S. Gangrade (2018), Effects of Climate Change on Streamflow Extremes and Implications for Reservoir Inflow in the United States, *J. Hydrol.*, *556*, 359–370, doi:10.1016/j.jhydrol.2017.11.027.

[30] Rastogi, D., S.-C. Kao, M. Ashfaq, R. Mei, E. D. Kabela, S. Gangrade, B. S. Naz, B. L. Preston, N. Singh, and V. G. Anantharaj (2017), Effects of Climate Change on Probable Maximum Precipitation: A Sensitivity Study over the Alabama-Coosa-Tallapoosa River Basin, *J. Geophys. Res.–Atmos.*, *122*, 4808–4828, doi:10.1002/2016JD026001.

[29] Zhao, G., H. Gao, B. S. Naz, S.-C. Kao, and N. Voisin (2016), Integrating a Reservoir Regulation Scheme into a Spatially Distributed Hydrological Model, *Adv. Water Resour.*, *98*, 16–31, doi:10.1016/j.advwatres.2016.10.014.

[28] Pagán, B., M. Ashfaq, D. Rastogi, D. Kendall, S.-C. Kao, B. S. Naz, R. Mei, and J. S. Pal (2016), Extreme Hydrological Changes in the Southwestern U.S. Drive Reductions in Water Supply to Southern California by Mid Century, *Environ. Res. Lett.*, *11*(9), 094026, doi:10.1088/1748-9326/11/9/094026.

[27] Ashfaq, M., D. Rastogi, R. Mei, S.-C. Kao, S. Gangrade, B. S. Naz, and D. Touma (2016), High-resolution Ensemble Projections of Near-term Regional Climate over the Continental United States, *J. Geophys. Res.–Atmos.*, *121*, 9943–9963, doi:10.1002/2016JD025285.

[26] Mani, A., F. T.-C. Tsai, S.-C. Kao, B. S. Naz, M. Ashfaq, and D. Rastogi (2016), Conjunctive Management of Surface and Groundwater Resources under Projected Future Climate Change Scenarios, *J. Hydrol.*, *540*, 397–411, doi:10.1016/j.jhydrol.2016.06.021.

[25] Naz, B. S., S.-C. Kao, M. Ashfaq, D. Rastogi, R. Mei, and L. C. Bowling (2016), Regional Hydrologic Response to Climate Change in the Conterminous United States Using High-resolution Hydroclimate Simulations, *Global Planet. Change*, *143*, 100–117, doi:10.1016/j.gloplacha.2016.06.003.

[24] McManamay, R. A., C. Oigbokie, S.-C. Kao, and M. S. Bevelhimer (2016), Classification of US Hydropower Dams by their Modes of Operation, *River Res. Appl.*, *32*(7), 1450–1468, doi:10.1002/rra.3004.

[23] Pasha, M. F. K., D. Yeasmin, S. Saetern, M. Yang, S.-C. Kao, and B. T. Smith (2016), Uncertainty Analysis in Geospatial Merit Matrix-Based Hydropower Resource Assessment, *J. Water Res. Pl.*, *142*(4), 06016001, doi:10.1061/(ASCE)WR.1943-5452.0000599.

[22] Pasha, M. F. K., M. Yang, D. Yeasmin, S. Saetern, S.-C. Kao, and B. T. Smith (2016), Identifying High-Power-Density Stream-Reaches through Refined Geospatial Resolution in Hydropower Resource Assessment, *J. Water Res. Pl.*, 06016001, doi:10.1061/(ASCE)WR.1943-5452.0000599.

[21] Touma, D., M. Ashfaq, M. A. Nayak, S.-C. Kao, and N. S. Diffenbaugh (2015), A Multi-model and Multi-index Evaluation of Drought Characteristics in the 21st Century, *J. Hydrol.*, *526*, 196–207, doi:10.1016/j.jhydrol.2014.12.011.

[20] Kao, S.-C., M. J. Sale, M. Ashfaq, R. Uría Martínez, D. P. Kaiser, Y. Wei, and N. S. Diffenbaugh (2015), Projecting Changes in Annual Hydropower Generation Using Regional Runoff Data: An Assessment of the United States Federal Hydropower Plants, *Energy*, *80*, 239–250, doi:10.1016/j.energy.2014.11.066.

[19] McManamay, R. A., N. Samu, S.-C. Kao, M. S. Bevelhimer, and S. C. Hetrick (2015), A Multi-scale Spatial Approach to Address Environmental Effects of Small Hydropower Development, *Environ. Manage.*, *55*(1), 217–243, doi:10.1007/s00267-014-0371-2.

[18] Pasha, M. F. K., D. Yeasmin, S.-C. Kao, B. Hadjerioua, Y. Wei, and B. T. Smith (2014), Stream-reach Identification for New Run-of-River Hydropower Development through a Merit Matrix–Based Geospatial Algorithm, *J. Water Res. Pl.*, *140*(8), 04014016, doi:10.1061/(ASCE)WR.1943-5452.0000429.

[17] McManamay, R. A., M. S. Bevelhimer, and S.-C. Kao (2014), Updating the US Hydrologic Classification: An Approach to Clustering and Stratifying Ecohydrologic Data, *Ecohydrology*, *7*(3), 903–926, doi:10.1002/eco.1410.

[16] Oubeidillah, A. A., S.-C. Kao, M. Ashfaq, B. S. Naz, and G. Tootle (2014), A Large-Scale, High-Resolution Hydrological Model Parameter Data Set for Climate Change Impact Assessment for the Conterminous US, *Hydrol. Earth Syst. Sci.*, *18*, 67–84, doi:10.5194/hess-18-67-2014.

[15] Ashfaq, M., S. Ghosh, S.-C. Kao, L. C. Bowling, P. Mote, D. Touma, S. A. Rauscher, and N. S. Diffenbaugh (2013), Near-term Acceleration of Hydroclimatic Change in the Western U.S., *J. Geophys. Res.–Atmos.*, *118*, 10,676–10,693, doi:10.1002/jgrd.50816.

[14] Kao, S.-C., H. K. Kim, C. Liu, X. Cui, and B. L. Bhaduri (2012), Dependence-preserving Approach to Synthesizing Household Characteristics, *Transport. Res. Record*, *2302*, 192–200, doi:10.3141/2302-21.

[13] Cui, X., H. K. Kim, C. Liu, S.-C. Kao, and B. L. Bhaduri (2012), Simulating the Household Plug-in Hybrid Electric Vehicle Distribution and Its Electric Distribution Network Impacts, *Transport. Res. D–TR. E.*, *17*, 548–554, doi:10.1016/j.trd.2012.05.011.

[12] Kao, S.-C., and N.-B. Chang (2012), Copula-Based Flood Frequency Analysis at Ungauged Basin Confluences: Nashville, Tennessee, *J. Hydrol. Eng.*, *17*(7), 790–799, doi:10.1061/(ASCE)HE.1943-5584.0000477.

[11] Ghosh, S., D. Das, S.-C. Kao, and A. R. Ganguly (2012), Lack of Uniform Trends but Increasing Spatial Variability in Observed Indian Rainfall Extremes, *Nature Climate Change*, *2*, 86–91, doi:10.1038/nclimate1327.

[10] Kao, S.-C., and A. R. Ganguly (2011), Intensity, Duration, and Frequency of Precipitation Extremes under 21st-century Warming Scenarios, *J. Geophys. Res.–Atmos.*, *116*, D16119, doi:10.1029/2010JD015529.

[9] Kao, S.-C., and R. S. Govindaraju (2010), Reply to Comment by T. P. Hutchinson on "Trivariate Statistical Analysis of Extreme Rainfall Events via the Plackett Family of Copulas", *Water Resour. Res.*, *46*, W04802, doi:10.1029/2009WR008774.

[8] Kao, S.-C., and R. S. Govindaraju (2010), A Copula-based Joint Deficit Index for Droughts, *J.*

*Hydrol.*, *380*, 121–134, doi:10.1016/j.jhydrol.2009.10.029.
[7] Kao, S.-C., T. P. Chan, R. Sultana, T. Konopka, T. Cooper, B. Partridge, and R. S. Govindaraju (2009), Hydrologic and Environmental Performance of a Subsurface Constructed Wetland at a Highway Rest Area: A Case Study, *Water Qual. Expo. Health*, *1*, 35–48, doi:10.1007/s12403-009-0004-9.
[6] Kao, S.-C., and R. S. Govindaraju (2008), Trivariate Statistical Analysis of Extreme Rainfall Events via Plackett Family of Copulas, *Water Resour. Res.*, *44*, W02415, doi:10.1029/2007WR006261.
[5] Kao, S.-C., and A. R. Rao (2008), At-Site Based Evaluation of Rainfall Estimates for Indiana, *J. Hydrol. Eng.*, *13*(3), 184–188, doi:10.1061/(ASCE)1084- 0699(2008)13:3(184).
[4] Kao, S.-C., and R. S. Govindaraju (2007), A Bivariate Frequency Analysis of Extreme Rainfall with Implications for Design, *J. Geophys. Res.–Atmos.*, *112*, D13119, doi:10.1029/2007JD008522.
[3] Kao, S.-C., and R. S. Govindaraju (2007), Probabilistic Structure of Storm Surface Runoff Considering the Dependence between Average Intensity and Storm Duration of Rainfall Events, *Water Resour. Res.*, *43*, W06410, doi:10.1029/2006WR005564.
[2] Rao, A. R., and S.-C. Kao (2007), Discussion of "Updated Precipitation Frequency Estimates for Kansas City: Comparison with TP–40 and HYDRO–35" by C. Bryan Young and Bruce M. McEnroe, *J. Hydrol. Eng.*, *12*(6), 694–699, doi:10.1061/(ASCE)1084-0699 (2007)12:6(694).
[1] Lin, G.-F., L.-H. Chen, and S.-C. Kao (2005), Development of Regional Design Hyetographs, *Hydrol. Process*, *19*, 937–946, doi:10.1002/hyp.5550.

***Software***

[1] Morales Hernández, M., K. J. Evans, S. Gangrade, S.-C. Kao, M. B. Sharif, S. K. Ghafoor, A. J. Kalyanapu, T. T. Dullo (2020), TRITON, computer software, version 0, Oak Ridge National Laboratory, https://www.osti.gov/biblio/1630725.

***Technical Reports***

[15] Bensi, M., S. Mohammadi, S.-C. Kao, and S. T. DeNeale (2020), *Multi-Mechanism Flood Hazard Assessment: Critical Review of Current Practice and Approaches*, ORNL/TM-2020/1447, Oak Ridge National Laboratory, Oak Ridge, TN, doi:10.2172/1637939.
[14] DeNeale, S. T., and S.-C. Kao (2018), *Technical Evaluation Report: Review of the Site-Specific Probable Maximum Precipitation Study for the Tennessee Valley Authority Nuclear Power Plants*, ORNL/TM-2018/994, Oak Ridge National Laboratory, Oak Ridge, TN.
[13] Kao, S.-C., and K. Johnson (2018), *An Assessment of Energy Potential at Public Drinking Water Systems: Initial Report on Methodology*, ORNL/TM-2018/869, Oak Ridge National Laboratory, Oak Ridge, TN.
[12] Stewart, K. M., B. T. Smith, A. Witt, S. T. DeNeale, M. Bevelhimer, J. L. Pries, T. A. Burress, S.-C. Kao, M. Mobley, K. Lee, S. Curd, A. Tsakiris, C. Mooneyham, T. Papanicolaou, K. Ekici, M. Whisenant, T. Welch, and D. Rabon (2017), *Simulation and Modeling Capability for Standard Modular Hydropower Technology*, ORNL/TM-2017/175, Oak Ridge National Laboratory, Oak Ridge, TN, doi:10.2172/1394299.
[11] Allen, M. R., T. J. Wilbanks, B. L. Preston, S.-C. Kao, and J. Bradbury (2017), *Assessing the Costs and Benefits of Resilience Investments: Tennessee Valley Authority Case Study*, ORNL/TM-2017/13, Oak Ridge National Laboratory, Oak Ridge, TN.
[10] Kao, S.-C., S. Chinthavali, S. Lee, K. M. Stewart, M. R. Allen, B. T. Smith, and B. L. Bhaduri (2016), *Scoping Analytical Tools and Methods for Vulnerability Analysis of Linked Electricity Generation and River Basin Systems*, ORNL/TM-2016/282, Oak Ridge National Laboratory, Oak Ridge, TN.
[9] Kao, S.-C., M. Ashfaq, B. S. Naz, R. Uría Martínez, D. Rastogi, R. Mei, Y. Jager, N. M. Samu, and M. J. Sale (2016), *The Second Assessment of the Effects of Climate Change on Federal Hydropower*,

ORNL/SR-2015/357, Oak Ridge National Laboratory, Oak Ridge, TN, doi:10.2172/1340431.

[8] Schubel, J., J. A. Lentz, F. Qader, A. Kishaba, D. Bader, L. Perkins, E. Yam, A. Kaneda, L. Brown, B. R. Pagán, J. S. Pal, C. Gao, J. Reichenberger, D. R. Kendall, M. Ashfaq, D. Rastogi, S.-C. Kao, B. S. Naz, and D. Otto (2015), *City of Long Beach Climate Resiliency Assessment Report*, prepared by the Aquarium of the Pacific (AOP), for the City of Long Beach, CA.

[7] Kao, S.-C., R. A. McManamay, K. M. Stewart, N. Samu, B. Hadjerioua, S. T. DeNeale, D. Yeasmin, M. F. K. Pasha, A. A. Oubeidillah, and B. T. Smith (2014), *New Stream-reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States*, GPO DOE/EE-1063, Wind and Water Power Program, Department of Energy, Washington, DC.

[6] Hadjerioua, B., S.-C. Kao, R. A. McManamay, M. F. K. Pasha, D. Yeasmin, A. A. Oubeidillah, N. Samu, K. M. Stewart, M. S. Bevelhimer, S. C. Hetrick, Y. Wei, and B. T. Smith (2013), *An Assessment of Energy Potential from New Stream-reach Development in the United States: Initial Report on Methodology*, ORNL/TM-2012/298, Oak Ridge National Laboratory, Oak Ridge, TN.

[5] Sale, M. J., S.-C. Kao, M. Ashfaq, D. P. Kaiser, R. Uría Martínez, C. Webb, and Y. Wei (2012), *Assessment of the Effects of Climate Change on Federal Hydropower*, ORNL/TM-2011/251, Oak Ridge National Laboratory, Oak Ridge, TN, doi:10.2172/1220238.

[4] Hadjerioua, B., Y. Wei, and S.-C. Kao (2012), *An Assessment of Energy Potential at Non-powered Dams in the United States*, GPO DOE/EE-0711, Wind and Water Power Program, Department of Energy, Washington, DC.

[3] Hadjerioua, B., S.-C. Kao, M. J. Sale, Y. Wei, S. K. SanthanaVannan, H. A. Shanafield III, D. P. Kaiser, R. Devarakonda, C. Odeh, G. Palanisamy, and B. T. Smith (2010), *National Hydropower Asset Assessment Project (NHAAP) 2010 Final Annual Report*, ORNL/TM-2010/260, Oak Ridge National Laboratory, Oak Ridge, TN.

[2] Kao, S.-C., S. Tripathi, T. J. Cooper, T. P. Chan, J. E. Alleman, and R. S. Govindaraju (2008), *The I-70 Greenfield Rest Area Wetland Projects: Final Report*, Joint Transportation Research Program Report, Purdue University, West Lafayette, IN.

[1] Rao, A. R., and S.-C. Kao (2006), *Statistical Analysis of Indiana Rainfall Data*, Joint Transportation Research Program Report, C-36-62R, Purdue University, West Lafayette, IN.

***Dissertation / Thesis***

[2] Kao, S.-C. (2008), *Multivariate Statistical Analysis of Indiana Hydrologic Data*, Ph.D. Dissertation, School of Civil Engineering, Purdue University, West Lafayette, IN.

[1] Kao, S.-C. (2001), *A Study in Development of Regional Design Hyetographs*, Master Thesis, Department of Civil Engineering, National Taiwan University, Taipei, Taiwan.

***Book Chapter***

[2] Grimaldi, S., S.-C. Kao, A. Castellarin, S.-M. Papalexiou, A. Viglione, F. Laio, H. Aksoy, and A. Gedikli (2011), Statistical Hydrology, *Treatise on Water Science*, *479*, doi:10.1016/B978-0-444-53199-5.00046-4.

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***Other Publication***

[5] *Contributor* – River Management Joint Operating Committee (2018), *Climate and Hydrology Datasets for RMJOC Long-Term Planning Studies: Second Edition (RMJOC-II), Part I: Hydroclimate Projections and Analyses*, River Management Joint Operating Committee (RMJOC): Bonneville Power Administration, US Army Corps of Engineers, and Bureau of Reclamation.

[4] *Lead author* – U.S. Department of Energy (2017), *Effects of Climate Change on Federal*

*Hydropower: The Second Report to Congress*, Department of Energy, Washington, DC.

[3] *Contributor* – U.S. Department of Energy (2016), *Hydropower Vision: A New Chapter for America's 1st Renewable Electricity Source*, Wind and Water Power Program, Department of Energy, Washington, DC.

[2] *Lead author* – U.S. Department of Energy (2013), *Effects of Climate Change on Federal Hydropower: Report to Congress*, DOE/GO-102016-4869, Department of Energy, Washington, DC.

[1] Hadjerioua, B., S.-C. Kao, Y. Wei, B. T. Smith, and H. Battey (2012), Non-powered Dams: An Uptapped Source of Renewable Electricity in the USA, *The International Journal on Hydropower and Dams*, *19*(4), 45–48.

***Selected Conference Paper / Presentation***

[84] Sharif, M. B., S. K. Ghafoor, T. H. Hines, M. Morales Hernández, K. J. Evans, S.-C. Kao, A. J. Kalyanapu, T. T. Dullo, and S. Gangrade (2020), Performance Evaluation of a Two Dimensional Flood Model on Heterogeneous High-Performance Computing Architectures, *Proceedings of the 2020 Platform for Advanced Scientific Computing Conference (PASC20)*, Article No. 8, 1–9, doi:10.1145/3394277.3401852 (peer-reviewed).

[83] Gangrade, S., S.-C. Kao, and R. A. McManamay (2019), Multi-model, Multi-resolution Hydroclimate Projections and Associated Uncertainties: A Case Study for the Alabama-Coosa-Tallapoosa River Basin in the Southeastern United States, American Geophysical Union 2019 Fall Meeting, Dec. 9–13, San Francisco, CA.

[82] DeNeale, S. T., S.-C. Kao, E. Yegorova, J. Kanney, and M. L. Carr (2019), A Watershed-based Assessment of Precipitation Areal Reduction Factors in the Ohio River Basin, American Geophysical Union 2019 Fall Meeting, Dec. 9–13, San Francisco, CA.

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## Research Projects

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| Oct 2019–present | National Conduit Hydropower Resource Assessment. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Role: Principal Investigator. |
| Apr 2019–present | ExaSheds: Advancing Watershed System Science using Machine Learning for Data-Intensive Extreme-Scale Simulation. Sponsor: Biological and Environmental Research Program, U.S. Department of Energy. Role: Co-investigator (Principal Investigator: S. L. Painter, ORNL). |
| Oct 2018–present | Methods for Estimating Joint Probabilities of Coincident and Correlated Flooding Mechanisms for Nuclear power Plant Flood Hazards Assessments. Sponsor: Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission. Role: Principal Investigator. |
| July 2018–present | Air Force / Oak Ridge National Laboratory R&D Collaboration. Sponsor: Numerical Weather Modeling Program, U.S. Air Force. Role: Co-investigator (Principal Investigator: K. J. Evans, ORNL). |
| Oct 2017–present | Effects of Climate Change on Federal Hydropower – The Third 9505 Assessment. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Role: Principal Investigator. |
| Feb 2015–present | Review of Site-Specific Probable Maximum Precipitation Analyses. Sponsor: Office of New Reactors, U.S. Nuclear Regulatory Commission. Role: Co-investigator (Principal Investigators: D. B. Watson and S. T. DeNeale, ORNL). |
| Oct 2017–Mar 2020 | Application of Point Precipitation Frequency Estimates to Watersheds. Sponsor: Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission. Role: Principal Investigator. |
| Jul 2017–Jul 2018 | Developing New Hydropower Using Existing Non-powered Dams. Sponsor: Small Business Vouchers Pilot Program, U.S. Department of Energy. Role: Principal Investigator. |
| Apr 2018–Sep 2018 | Near Real-Time High-Resolution Gridded Weather Data System as New Force for Energy and Environmental Research. Sponsor: Climate Change Science Institute, Oak Ridge National Laboratory. Role: Co-investigator (Principal Investigator: Yaxing Wei, ORNL). |
| Feb 2010–Sep 2018 | National Hydropower Asset Assessment Program. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Role: Principal Investigator. |
| Oct 2013–Mar 2017 | Effects of Climate Change on Federal Hydropower – The Second 9505 Assessment. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Role: Principal Investigator. |
| Mar 2016–Sep 2016 | Improve the Connection Between Earth System Models and Human Water Resources Alterations. Sponsor: Climate Change Science Institute, Oak Ridge National Laboratory. Role: Principal Investigator. |
| Oct 2014–Sep 2016 | National Extreme Events Data and Research Center (NEED) – Transforming the National Capability for Resilience to Extreme Weather and Climate Events. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Co-investigator (Principal Investigator: D. P. Kaiser, ORNL). |
| Oct 2014–Sep 2016 | Fine-resolution Modeling of Urban-Energy Systems' Water Footprint in River |

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| | Networks. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Co-investigator (Principal Investigator: R. A. McManamay, ORNL). |
| Sep 2015–Mar 2016 | Scoping Analytical Tools and Methods for Vulnerability Analysis of Linked Electricity Generation and River Basin Systems. Sponsor: Office of Energy Policy and Systems Analysis, U.S. Department of Energy. Role: Principal Investigator. |
| Oct 2013–Sep 2015 | Toward the Development of an Integrated Energy-Water Risk Assessment Tool for Probable Maximum Precipitation and Flood. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Principal Investigator. |
| Oct 2011–Sep 2013 | A Hierarchical Regional Modeling Framework for Decadal-scale Hydro-climatic Predictions and Impact Assessments. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Co-investigator (Principal Investigator: M. Ashfaq, ORNL). |
| Oct 2010–Sep 2012 | Effects of Climate Change on Federal Hydropower – The First 9505 Assessment. Sponsor: Water Power Technologies Office, U.S. Department of Energy. Role: Principal Investigator. |
| Feb 2010–Jan 2011 | Enhancing Climate Impact Integrated Assessment for Water through Climate Informatics. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Co- investigator (Principal Investigator: W. Christopher Lenhardt, ORNL). |
| Feb 2009–Jan 2010 | Uncertainty Assessment and Reduction for Climate Extremes and Climate Change Impacts. Sponsor: Laboratory Directed Research and Development Program, Oak Ridge National Laboratory. Role: Co-investigator (Principal Investigator: A. R. Ganguly, ORNL). |
| Jan 2006–Jan 2009 | The I-70 Greenfield Rest Area Wetland Projects. Sponsor: Indiana Department of Transportation. Role: Participant (Principal Investigator: R. S. Govindaraju, Purdue University). |
| Aug 2004–Jul 2005 | Statistical Analysis of Indiana Rainfall Data. Sponsor: Indiana Department of Transportation. Role: Participant (Principal Investigator: A. R. Rao, Purdue University). |

## Service

***Reviewer – Scientific and Engineering Journals***

- *Advances in Water Resources*
- *British Journal of Environmental and Climate Change*
- *Climate Change*
- *Climate Risk Management*
- *Geophysical Research Letters*
- *Hydrological Processes*
- *Hydrological Sciences Journal*
- *Hydrology and Earth System Sciences Discussions*
- *International Journal of Climatology*
- *Irrigation and Drainage*
- *Journal of Computing in Civil Engineering*
- *Journal of Geophysical Research*
- *Journal of Earth System Science*

- *Journal of Hydrologic Engineering*
- *Journal of Hydrology*
- *Journal of Hydrometeorology*
- *Journal of the American Water Resources Association*
- *Meteorological Applications*
- *Natural Hazards*
- *Physics and Chemistry of the Earth*
- *Scientia Agricola*
- *Scientific Reports (Nature)*
- *Stochastic Environmental Research and Risk Assessment*
- *Theoretical and Applied Climatology*
- *Water Resources Research*
- *Water Security*

***Reviewer – Proposals***

- *National Science Foundation*
- *U.S. Bureau of Reclamation Science and Technology Program*
- *U.S. Dept. of Agriculture Small Business Innovation Research Program*
- *U.S. Dept. of Energy Water Power Technologies Office*
- *Louisiana Board of Regents*
- *CEATI International*

***Student Advising and Mentorship Activities***

- Ph.D. Advisor
  - Sudershan Gangrade, University of Tennessee, The Bredesen Center for Interdisciplinary Research and Graduate Education, 2017–2019
- Ph.D. Committee
  - Ehsan Beigi, Louisiana State University, Department of Civil and Environmental Engineering, 2013–2015
- Post-doctoral Research Associate
  - Dr. Goutam Konapala, Oak Ridge National Laboratory, 2018–2020
  - Dr. Bibi S. Naz, Oak Ridge National Laboratory, 2013–2016
  - Dr. Abdoul Oubeidillah, Oak Ridge National Laboratory, 2011–2012
- Student Interns
  - Ellie Chao, University of South Carolina, 2019
  - Manqing Shao, Texas A&M University, 2018
  - Tigstu Dullo, Tennessee Technological University, 2015
  - Gang Zhao, Texas A&M University, 2014–2015
  - Brenna Elrod, University of Tennessee, Knoxville, 2013
  - Clement Oigbokie II, University of Tennessee, Knoxville, 2012–2013
  - Angela Pelle, University of Tennessee, Knoxville, 2012

***Technical Association and Committee Services***

- PO.DAAC Cloud Early Adopters Program, 2019–2021.
- International Commission on Statistical Hydrology, International Association of Hydrological Sciences
- “Hydroclimate” Technical Committee, Environmental and Water Resources Institute, American Society of Civil Engineers

- "Use of Atmospheric Numerical Models for Estimating Probable Maximum Precipitation" Task Committee, Environmental and Water Resources Institute, American Society of Civil Engineers
- Board member, Chinese American Water Resources Association, May 2016 – present

***Conference/Workshop Organizing***

- Convener – "H125. Statistical Characterization and Modeling of Precipitation Variability Across Scales", American Geophysical Union 2019 Fall Meeting
- Convener – "H100. Recent Advance in Large Scale, High Resolution Hydrologic and Flood Modeling for Intensified Extreme Events in a Changing Environment" and "H116. Statistical Characterization and Probabilistic Modeling of Precipitation Variability and Extremes Across Multiple Scales", American Geophysical Union 2018 Fall Meeting
- Session Organizer – "Modeling Energy-Water Systems in a Changing Climate" in the Hydro-Climate Symposium of World Environmental and Water Resources Congress, 2015 – 2017
- Program Committee – 2010 IEEE ICDM International Workshop on Spatial and Spatiotemporal Data Mining, December 14, Sydney, Australia.
- Program Committee – 2010 IEEE ICDM Workshop on Knowledge Discovery from Climate Data: Prediction, Extremes, and Impacts, December 14, Sydney, Australia.
- Scientific Committee – 2010 IAHS-STAHY International Workshop on Advances in Statistical Hydrology, May 23-25, Taormina, Italy.
- Program Committee – 2009 IEEE ICDM Workshop on Knowledge Discovery from Climate Data: Prediction, Extremes, and Impacts, December 6, Miami, FL.