Munir Ahmad Nayak

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PROFESSIONAL EXPERIENCE:

Assistant Professor	April. 2021 – Present	Department of Civil Engineering **National Institute of Technology Srinagar** **Concentration** Hydroclimatology, Water Resources Systems
Assistant Professor	May. 2017 – April 2021	Department of Civil Engineering **Indian Institute of Technology Indore** **Concentration** Hydroclimatology, Water Resources Systems
Postdoctoral Associate	Jan. 2017 – May 2017	Biological and Environmental Engineering Department **Cornell University, USA** **Concentration:** Water Resources Systems

EDUCATION

Ph. D.	Aug. 2013 – Dec. 2016	Civil and Environmental Engineering **The University of Iowa, USA** **Concentration:** Hydraulics, Hydrology and Water Resources **Thesis title:** *Atmospheric rivers and flooding over the central United States*

M. S.	Jan. 2014 – May 2016	Statistics and Actuarial Science **The University of Iowa** **Concentration:** Statistics **Thesis title:** *Spatiotemporal modelling of extreme rainfall frequency* **Advisors:** Prof. Kate Cowles**,** Prof. Gabriele Villarini
M. S.	Aug. 2011 – May 2013	Civil and environmental Engineering **Cornell University** **Concentration:** Environmental Water Resources Systems (Major) Atmospheric Sciences (Minor) **Thesis title:** *Optimal recovery from disruptions in water distribution* systems. **Advisors:** Prof. Mark A. Turnquist, Prof. Gang Chen, Prof. Susan S. Riha
M. Tech.	Jul. 2009 – Jul. 2011	Civil Engineering **Indian Institute of Technology, Bombay** **Concentration:** Water Resources Engineering **Thesis title:** *Prediction of extreme rainfall event using weather pattern recognition and support vector machine classifier* **Advisors:** Prof. Subimal Ghosh, Prof. M. C. Deo

RESEARCH AREAS

Hydrology and Water Resources	Hydrologic extremes, Atmospheric Rivers, Optimization of water resources systems
Bayesian Statistics	Application of Bayesian methods in hydrologic extremes

HONORS AND AWARDS

Fall 2018 – Summer 2021	Early Career Research Award (ECRA), Science and Engineering Research Board (SERB), Department of Science and Technology (DST), India
Summer 2018	Visiting Fellow Award, Loughborough University, UK
Fall 2014 – Fall 2016	NASA Earth and Space Science Fellowship, USA
Spring 2016	Branson Scholarship, Civil and Environmental Engineering, The University of Iowa
Spring 2016	Graduate College Post-Comprehensive Research Award, The University of Iowa, USA
Spring 2016	Civil and Environmental Engineering Graduate Fellowship, The University of Iowa, USA
2014 – 2015	Poston Scholarship, Civil and Environmental Engineering, The University of Iowa, USA
2014 – 2016	S. K. Nanda Engineering Scholarship, IIHR-Hydroscience & Engineering, College of Engineering, The University of Iowa, USA
Summer 2012	HERE (Higher Education Research Experience) Graduate Internship at Department of Energy's (DoE) Climate Change Science Institute (CCSI), Oak Ridge National Laboratory (ORNL), USA
2010	DAAD (Deutscher Akademischer Austausch Dienst), also known as German Academic Exchange Service, Scholarship
2009 – 2011	GATE Scholarship from the Ministry of Human Resources Development for pursuing M. Tech at IIT Bombay, India

TEACHING AND RESEARCH EXPERIENCE

Fall 2017 - Present	**Indian Institute of Technology, Indore** **Instructor of Several Courses**
Fall 2015 – Fall 2014	**The University of Iowa, USA** **Graduate Research Assistant**, Advisor: Prof. Gabriele Villarini
Spring 2013	**Cornell University, USA** **Graduate Research Assistant**, Advisor: Prof. Mark A. Turnquist
Fall 2012	**Cornell University, USA** **Teaching Assistant,** Course: Uncertainty Analysis in Engineering, CEE3040**,** Instructor: Prof. Jery R. Stedinger
Spring 2011	**Cornell University, USA** **Teaching Assistant,** Course: Engineering Computation, ENGRD3200, Instructor: Prof. Christine A. Shoemaker
Fall 2011	**Cornell University, USA** **Teaching Assistant,** Course: Uncertainty Analysis in Engineering, CEE3040, Instructor: Prof. Jery R. Stedinger
2010 – 2011	**Indian Institute of Technology, Bombay, India** **M. Tech Research,** Advisors: Prof. Subimal Ghosh and Prof. M. C. Deo

SPONSORED RESEARCH PROJECTS

Funding Agency	Title	Date	Role
Science and Engineering Research Board (SERB), Department of Science and Technology (DST), India	Atmospheric Rivers and Extreme Precipitation over India	Fall 2018 – Summer 2021	Lead PI
Space Applications Centre, Indian Space Research Organisation (ISRO), India	Geospatial numerical modelling of debris flow for quantitative landslide risk assessment considering the entrainment	Fall 2018 to Fall 2021	Co-PI

National Aeronautics and Space Administration (NASA), USA	Remote-sensing Based Characterization of Rainfall Associated with Atmospheric Rivers	Fall 2014 to Fall 2017	PI

CONSULTANCY PROJECTS

Industry	Title	Date	Role
Dilip Buildcon Ltd.	Survey, Planning, Design & Construction of Navnera Barrage including Hydro-mechanical works, across river Kalisindh near village – Abra, Tehsil-Digod, district-Kota Rajasthan, Under Eastern Rajasthan Canal Project (ERCP) Phase-I (A) on	2018-2019	PI
Dilip Buildcon Ltd.	Safety & functionality of Navnera Barrage in Peak floods, such as the one in 2019	2019	PI
Dilip Buildcon Ltd.	Approval of foundation level of of OF and NOF of Navnera Barrage across river Kalisindh near village-Abra, Tehsil-Digod, District-Kota, Rajesthan under Eastern Rajasthan Canal Project (ERCP) Phase-1 (A) on EPC single responsibility turnkey basis.	2019	PI
Central Public Works Division (CPWD)	Development of infrastructure of New Campus of IIM Udaipur. (SH: C/o Faculty Housing, Students Hostels, Amphitheater and Site development) Third Party Quality Assurance	Fall 2018 – 2019	Co-PI

	Proof checking of various structure design and drawing for Basai-I Multi Villages Rural Water Supply Scheme for 32 villages of block Datia and Khaniyadhana, District Datia and Shivpuri M.P.	Fall 2018 – Spring 2019	
	Proof checking and vetting of Various hydraulic and structural design and drawing for "Karanpura-I Multi Village Rural Water Supply Scheme, Distt. Umariya and Katni"	Fall 2018 – Spring 2019	

PROFESSIONAL ENGAGEMENT

Affiliations	Member, American Geophysical Union (**AGU**)
	Member, American Society of Civil Engineers (**ASCE**)
	Member, International Association for Hydro-Environment Engineering and Research (**IAHR**)
	American Statistical Association (**ASA**)
Editorial Services	Guest Editor, Frontiers in Water
	Editorial Board Member, Frontiers in Water
	Executive editor, Journal of environmental pollution and climate change
Review Services	Nature Communication; Nature Reviews, Journal of Climate, Water Resources Research, Environmental Modelling & Software, Advances in water resources, Journal of hydrometeorology, International Journal of Climatology, Scientific Reports, Scientific Data, Hydrology and Earth System Sciences, Journal of Hydrology, Earth System Dynamics, Frontiers in Earth Science, Journal of Water Resources Planning and Management Stochastic, Environmental Research and Risk Assessment, Journal of Applied Meteorology and Climatology, Journal of Earth System Science, KSCE Journal of Civil Engineering, Journal of environmental pollution and climate change, Climate Dynamics, Hydrology and Earth System Sciences, Environmental Modelling and Software, Frontiers in Water, Scientific Data, Scientific reports, and other

Administrative Responsibilities	Member, Committee for PG program in Data Science, IIT Indore, 2021 – present
	Member, Committee for PG program in Water Management, IIT Indore, 2021 – present
	Member, Counselling Committee , IIT Indore, 2019 – 2021
	Member, selection committees for various non-Teaching positions
	Member, Committee to evaluate and prepare guidelines for Online Teaching, IIT Indore 2019
	Member, Scholarship-and-eligibility committee, Indian Institute of Technology, Indore, India, 2017 – Present
	Convenor, Discipline Post-Graduate Committee (DPGC) Civil Engineering, IIT Indore, India, 2017 – 2019
	Member, Discipline Undergraduate Committee (DUGC) Civil Engineering, IIT Indore, India, 2017 – Present
	Member, 5th Convocation Committee 2017, IIT Indore
	Member, Dining Committee, IIT Indore, 2017-2018
	Member Students of IIHR (SIIHR), The University of Iowa, USA, 2013 – 2016
	Graduate Student Senate (GSS) representative for Statistics & Actuarial Science, The University of Iowa, USA, 2015 – 2016
	Assisted Prof. Gabriele Villarini with the course Hydroclimatology, The University of Iowa, USA, Spring 2015
	Tutoring in various Statistics courses, The University of Iowa, USA, Fall 2014 to 2016
	Participated in Center for Teaching Excellence (CTE) International Teaching Assistantship Program, Cornell University, USA, Fall 2013
	Presented in CTE's summer teaching symposium, Cornell

PUBLICATIONS

Journal Articles

1. Kuk-Hyun Ahn, Munir A. Nayak, 2022: Atmospheric River activities and their effects on precipitation over South Korea, *Journal of Hydrology*, 610(127886) https://doi.org/10.1016/j.jhydrol.2022.127886. [**Impact Factor = 5.72**]

2. Waqar ul Hassan, **Munir A. Nayak**, and Rosa V. Lyngwa 2021: Recent changes in heatwaves and maximum temperatures over a complex terrain in the Himalayas, *Science of the Total Environment,* 794(148706), https://doi.org/10.1016/j.scitotenv.2021.148706. [***Impact Factor = 7.96]***

3. **Munir A. Nayak** and Waqar ul Hassan, 2021: A synthesis of drought prediction research over India, *Water Security, 13(100092)*, https://doi.org/10.1016/j.wasec.2021.100092.

4. Rosa V. Lyngwa and **Munir A. Nayak**, 2021: Atmospheric river linked to extreme rainfall events over Kerala in August 2018. *Atmospheric Research*, 253(105488), https://doi.org/10.1016/j.atmosres.2021.105488. [**Impact Factor = 5.37**].

5. Waqar ul Hassan and Munir **A. Nayak**, 2020**:** Global teleconnections in droughts caused by oceanic and atmospheric circulation patterns, *Environmental Research Letters*, 16(014007), DOI: https://doi.org/10.1088/1748-9326/abc9e2**.** [**Impact Factor = 6.80**]

6. **Munir A. Nayak**, Mary K. Cowles, Gabriele Villarini, and Burhan ul Wafa, 2020 : Bayesian hierarchical models for the frequency of winter heavy precipitation events over the central United States: The role of atmospheric rivers, *Water Resources Research,* 56 (11) ,DOI: https://doi.org/10.1029/2020WR028256 [**Impact factor = 5.20**]

7. **Munir A. Nayak** Jonathan D. Herman and Scott Steinschneider, 2018: Balancing flood risk and water supply in California: Policy search integrating short-term forecast ensembles with conjunctive use. *Water Resources Research*, 54(7557–7576), doi: https://doi.org/10.1029/2018WR023177 **[Impact factor = 5.20]**

8. **Munir A. Nayak** and Gabriele Villarini, 2017: Remote sensing-based charactarization of rainfall during atmospheric rivers over the central United States. *Journal of Hydrology,* 556(1038 – 1049), http://dx.doi.org/10.1016/j.jhydrol.2016.09.039 **[Impact factor = 5.72]**

9. **Munir A. Nayak** and Gabriele Villarini, 2017: A long-term perspective of the hydroclimatological impacts of atmospheric rivers over the central United States. *Water Resources Research,* 53(1144–1166), doi:10.1002/2016WR019033 **[Impact factor = 5.2]** ***Featured in Water Resources Research***

10. Nancy A. Barth, Gabriele Villarini and **Munir A. Nayak**, 2017: Mixed populations and annual flood frequency estimates in the western United States: The role of atmospheric rivers. *Water Resources Research,* 53(257–269), doi: 10.1002/2016WR019064 **[Impact factor = 5.2]**

11. **Munir A. Nayak** and Mark A. Turnquist, 2016: Optimal Recovery from Disruptions in Water Distribution Networks. *Computer-Aided Civil and Infrastructure Engineering*, 31(566–579). doi: 10.1111/mice.12200. **[Impact factor = 11.77]**

12. **Munir A. Nayak** and Gabriele Villarini, 2016: Evaluation of the capability of the Lombard test in detecting abrupt changes in variance. *Journal of Hydrology*, 534(451–465), doi: http://dx.doi.org/10.1016/j.jhydrol.2016.01.016. **[Impact factor = 5.72]**

13. **Munir A. Nayak,** Gabriele Villarini, and A. Allen Bradley, 2016**:** Atmospheric Rivers and Rainfall during NASA's Iowa Flood Studies (IFloodS) Campaign. *Journal of Hydrometeorology*, 17:257–271, doi: http://dx.doi.org/10.1175/JHM-D-14-0185.1. **[Impact factor = 4.35]**

14. Danielle Touma, Moetasim Ashfaq, **Munir A. Nayak**, Shih-Chieh Kao, and Noah S. Diffenbaugh, 2015: A multi-model and multi-index evaluation of drought characteristics in the 21st century. *Journal of Hydrology*, 526:196–207, doi: 10.1016/j.jhydrol.2014.12.011. **[Impact factor = 5.72]**

15. **Munir A. Nayak,** Gabriele Villarini, and David A. Lavers, 2014: On the skill of numerical weather prediction models to forecast atmospheric rivers over the central United States. *Geophysical Research Letters*, 41:4354–4362, doi: 10.1002/2014GL060299. **[Impact factor = 4.79]**

16. **Munir A. Nayak** and Subimal Ghosh, 2013: Prediction of extreme rainfall event using weather pattern recognition and support vector machine classifier. *Theoretical and Applied Climatology*, 114:583–603, doi: 10.1007/s00704-013-0867-3. **[Impact factor = 3.20]**

Conference Proceedings

1. Munir A. Nayak, 2021, *Accepted*: Delineating atmospheric river induced flooding over the Himalayan mountain range. *The 8th International Conference on Flood Management, Iowa City, Iowa, USA*

2. Waqar Ul Hassan and Munir A. Nayak, 2021. *Accepted*: Hotspots of extreme compound drought and heatwaves: Role of feedback and climate oscillation, *European Geosciences Union General Assembly, 19–30 April 2021, Online*

3. Rosa Vellosa Lyngwa and **Munir Ahmad Nayak**, 2020, *Accepted*: Quantitative study of atmospheric rivers in the Indian subcontinent, *European Geosciences Union General Assembly, 19–30 April 2021, Online*

4. Rosa Vellosa Lyngwa and **Munir A. Nayak**, 2020: Contribution of Arabian Sea to the Mumbai Flood of July 2005, Roorkee Water Conclave, India.

5. Waqar Ul Hassan and **Munir A. Nayak**, 2020: A Copula based risk analysis of Hydrological extreme events in India: Droughts and Wet periods, Roorkee Water Conclave, India.

6. Rosa Vellosa Lyngwa and **Munir Ahmad Nayak**, 2019: Impacts of integrated water vapor anomalies on extreme precipitation events, 8th APHW International Conference on Emerging Technologies in Urban Water Management, India.

7. Waqar ul Hassan and **Munir A. Nayak**, 2019: Long-term hydro-climatic variability for Madhya Pradesh water resource systems, *8th APHW International Conference on Emerging Technologies in Urban Water Management*, India.

8. **Munir A. Nayak**, Jonathan Herman, and Scott Steinschneider. 2017: Balancing flood risk and water supply in California: Policy search combining short-term forecast ensembles and groundwater recharge. *American Geophysical Union Fall Meeting*, San Diego, California, USA

9. Brianna Pagán, Moetasim Ashfaq, **Munir A. Nayak**, Deeksha Rastogi, Steven Margulis, and Jeremy Pal 2017 Atmospheric river influence on the intensification of extreme hydrologic events over the Western United States under climate change scenarios. *European Geosciences Union General Assembly, 23–28 April 2017, Vienna, Austria.*

10. **Munir A. Nayak,** Scott Steinschneider and Jonathan D. Herman 2017: Forecast-informed reservoir management with groundwater injection for managing tradeoffs between flood risk and water supply in California. *At the 9th Annual Biological and Environmental Engineering Research Symposium, Cornell University USA*

11. **Munir A. Nayak,** Kate Cowles and Gabriele Villarini 2016: Modelling the number of winter season extreme precipitation events over the central United States. *At the Workshop on Bayesian Environmetrics, March 31 – April 2, 2016, Columbus, OH, USA.*

12. Nancy Barth, Gabriele Villarini and **Munir A. Nayak** 2015: Mixed populations and annual flood frequency estimates in the western United States, The role of atmospheric rivers. *American Geophysical Union Fall Meeting,* San Francisco*,* California.

13. **Munir A. Nayak,** Gabriele Villarini, David A. Lavers and A. Allen Bradley, 2014: Characterization of the Rainfall Associated with Atmospheric Rivers during the Ifloods Campaign over the Central United States. *American Geophysical Union Fall Meeting,* San Francisco*,* California.

14. **Munir A. Nayak,** Gabriele Villarini, and David .A. Lavers, 2013: On the skill of numerical weather prediction models to forecast atmospheric rivers over the central United States. *American Geophysical Union Fall Meeting*, San Francisco, California.

15. Danielle Touma, **Munir A. Nayak,** Shih-Chieh Kao, and Moetasim Ashfaq, 2013: Changes in drought characteristics of the 21st century CMIP5 climate projection. *European Geosciences Union General Assembly 2013,* Vienna, Austria.

16. **Munir A. Nayak,** and Makarand C. Deo, 2010: Wind speed prediction by different computing techniques. *Proceedings of Fourth International Conference on Water Observation and Information System for Decision Support BALWOIS,* Ohrid, Republic of Macedonia.