**BIJOYCHANDRA S. TAKHELLAMBAM**

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## EDUCATION

**Auburn University**, Auburn, AL — Expected Jul 2023

- Ph.D. in Biosystem Engineering (Statistics Minor) | GPA: 3.86/4.00
- Dissertation| Climate Change Implications on Rainfall Erosivity and Intensity-Duration-Frequency (IDF) Curves with Downscaled Precipitation Data over the Southeast United States

**Indian Institute of Technology** (IIT), Roorkee, India — Jun 2016

- M.Tech in Hydrology | GPA: 3.48/4.00 (Distinction)
- Thesis | Discharge estimation only using at-site stage hydrograph

**Central Agricultural University,** Imphal, India — Aug 2014

- B. Tech in Agricultural Engineering | GPA: 3.30/4.00

## RESEARCH INTERESTS

Climate impact assessment of water resources, Hydroclimatology, Hydrological and Hydraulic modeling, Hydroclimate extremes, Deep learning, Statistical analysis

## RESEARCH EXPERIENCE

*Graduate Research Assistant* | **Auburn University**, Auburn, AL — Jan 2019 – present

- Developed high-temporal resolution precipitation using in-situ and NetCDF datasets
- Developed R-package (https://github.com/bijoychandraAU/PreciTDS) for generating 15-min rainfall
- Developed the projected rainfall erosivity for the Southeast United States
- Developed projected rainfall intensity duration frequency (IDF) curves using artificial neural networks for the Southeast United States
- Uncertainty analysis of IDF curves using bootstrapping resampling technique
- Hydrological modeling i.e., Soil and Water Assessment Tool (SWAT) model
- Field data collection and laboratory analysis of soil and plant samples

*Research Associate* | **ICAR NEH-Region,** India — Aug 2017 – Nov 2018

- Developed Best Practice Management (BMPs) for a small-hilly watershed area using Watershed Erosion Prediction Project (WEPP) model
- Field and Laboratory soil textural analysis

*Junior Research Fellow* | **NIT Meghalaya**, India — Jan 2017 – Aug 2017

- Performed cost-effective combination of T-head groynes for river bank protection

*Graduate Research Assistant* | **IIT Roorkee,** India — Jul 2014 – Jun 2016

- Evaluated 1-D unsteady flow using Hydrologic Engineering Center's (CEIWR-HEC) River Analysis System (HEC-RAS) hydraulic model
- Application of HEC-RAS for estimation of unsteady flow over two rivers (Chattahoochee and Godavari).
- Weather data collection from the Weather station
- Collected River channel data river cross-sections and flow discharge rate

## TEACHING EXPERIENCE

*Teaching Assistant* | **Auburn University**, Auburn, AL Aug 2021 – Dec 2021
*Graduate Teaching Assistant (R Programming for Data Science)*

- Evaluation and preparation of assignments for the course "*R Programming for Data Science"*
- Meet for extra help and tutoring students on weekly basis reinforcing concepts and supplementing the given problem sets for 28 graduate students

*Teaching Assistant* | **Auburn University**, Auburn, AL Mar 2021

- Developed course material on Soil and Water Assessment Tool Calibration and Uncertainty Programs (SWAT-CUP) as a part of BSEN 5520/6520 – Watershed Modeling

## TECHNICAL SKILLS

**Software & Modeling** | ArcGIS; ERDAS Imagine; Hydrologic Engineering System-River analysis system (HEC-RAS); Statistical Analysis System (SAS); Soil and Water Assessment Tool (SWAT); SWAT-CUP; High performance cluster (HPC); LaTeX; Climate Data Operators (CDO); GitHub; Adobe Illustrator; Adobe photoshop; MS Office
**Programming Language** | R; Python; MATLAB; Fortran
**Language** | English (fluent); Hindi (fluent); Manipuri (native)

## PEER-REVIEWED PUBLICATIONS

1. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D., Molinari, R., 2023. Artificial neural network-empowered projected future rainfall Intensity-Duration-Frequency curves. Atmospheric Research. (Under review)

2. Kumar, H., Srivastava, P., Lamba, J., Lena, B., Diamantopoulos, E., Ortiz, B., **Takhellambam, B.**, Morata, G., Bondesan, L., 2023. A methodology to optimize site-specific field capacity and irrigation thresholds. Agricultural Water Management 286, 108385. https://doi.org/10.1016/j.agwat.2023.108385

3. Zhao, W., Abhishek, A., **Takhellambam, B.S,** Zhang, J., Zhao, Y., Kinouchi, T., 2023. Spatiotemporal variability of current and future sub-daily rainfall in Japan using state-of-the-art high-quality datasets. Water Resources Research 59, e2022WR03430. https://doi.org/10.1029/2022WR034305

4. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., 2022. Projected mid-century rainfall erosivity under climate change over the southeastern United States. Sci. Total Environ. 161119. https://doi.org/10.1016/j.scitotenv.2022.161119

5. **Takhellambam, B.S**., Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., 2022. Temporal disaggregation of hourly precipitation under changing climate over the Southeast United States. Sci Data 9, 211. https://doi.org/10.1038/s41597-022-01304-7

6. Kumar, H., Srivastava, P., Lamba, J., Diamantopoulos, E., Ortiz, B., Morata, G., **Takhellambam, B.S**, Bondesan, L., 2022. Site-specific irrigation scheduling using one-layer soil hydraulic properties and inverse modeling. Agricultural Water Management 273, 107877. https://doi.org/10.1016/j.agwat.2022.107877

7. Kumar, H., Srivastava, P., Lamba, J., Ortiz, B.V., Way, T.R., Sangha, L., **Takhellambam, B.S.,** Morata, G., Molinari, R., 2022. Within-field variability in nutrients for site-specific agricultural management in irrigated cornfield. Journal of ASABE 65, 865–880. https://doi.org/10.13031/ja.15042

8. Kumar, H., Srivastava, P., Ortiz, B.V., Morata, G., **Takhellambam, B.S.,** Lamba, J., Bondesan, L., 2021. Field-scale spatial and temporal soil water variability in irrigated croplands. Transactions of the ASABE 64, 1277–1294. https://doi.org/10.13031/trans.14335

## OTHER PUBLICATIONS

1. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., 2022. Projected rainfall erosivity under climate change in the southeastern united states, in: ASABE Paper No. 2200176. Presented at the Annual International Meeting, ASABE, St. Joseph, MI, p. 1. https://doi.org/10.13031/aim.202200176

2. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D., 2022. Assessment of projected change in Intensity-duration-frequency (IDF) curves for Southeastern, United States using Artificial Neural Networks., in: ASABE Paper No. 2200175. Presented at the Annual International Meeting, ASABE, St. Joseph, MI, p. 1. https://doi.org/10.13031/aim.202200175

## CONFERENCES & SEMINARS (ORAL PRESENTATIONS)

1. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D., Molinari, R., (Mar. 2023). Artificial neural network-empowered projected future rainfall intensity-duration-frequency curves over the southeast United States. Auburn University Student Research Symposium

2. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (Sept. 2022). Projected mid-century rainfall erosivity under climate change over the Southeastern US. Alabama Water Resources Conference, AL

3. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (Jul. 2022). Projected rainfall erosivity under climate change in the Southeastern United States. Annual International Meeting ASABE, Houston, TX

4. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D. (Jul. 2022). Assessment of projected change in Intensity-Duration-Frequency (IDF) curves for southeastern, United States using artificial neural networks. Annual International Meeting ASABE, Houston, TX

5. **Takhellambam, B.S.**, (Jun. 2022). Effect of climate changes on rainfall erosivity over Southeastern US, World Environmental and Water Resources Congress, EWRI, ASCE, Atlanta, GA (not attended)

6. **Takhellambam, B.S.**, (Jun. 2022). Climate change and its effect on precipitation over the Southeast United States, Environmental and ecological engineering seminar, Auburn University, AL

7. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (Mar.2022). Temporal disaggregation of hourly precipitation under changing climate over the Southeast United States. Southeastern Universities Graduate Research Symposium, Auburn University, AL

8. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (2021). Effect of climate change on rainfall erosivity in Southeastern, United States. Alabama Water Resources Conference, AL

9. Kumar, H., Srivastava, P., Lamba, J., Ortiz, B.V., Morata, G., **Takhellambam, B. S.,** (2021). Time stability in soil moisture in irrigated agricultural field. Alabama Water Resources Conference, AL

10. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (2021). Potential changes in rainfall erosivity under climate change in the southeastern United States. Annual International Meeting ASABE, Virtual

11. Kumar, H., Srivastava, P., Ortiz, B.V., **Takhellambam, B. S.**, Morata, G., Luca, B., Lamba, J. (2020). Spatiotemporal soil moisture variability in corn and cotton fields with uniform irrigation during the growing season. American Geophysical Union, Fall Meeting, Virtual

12. **Takhellambam, B. S.,** Lamba, J. (2020). Temporal disaggregation to quarterly-hour projected precipitation over southeastern USA. Finish in Five competition, Auburn University, AL

## CONFERENCES & SEMINARS (POSTER PRESENTATIONS)

1. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D. (Oct. 2022). Evaluation of projected rainfall intensity duration frequency curves over the Southeast United States under changing climate using artificial neural networks. Graduate Engineering Research Showcase, Auburn University, AL

2. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D. (Oct. 2022). Quantifying the projected rainfall intensity duration frequency (IDF) curves under changing climate for the southeast United States using artificial neural networks. Graduate Engineering Research Showcase (College of Agriculture), Auburn University, AL

3. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (Sept. 2022). Projected mid-century rainfall erosivity under climate change over the Southeastern US. Alabama Water Resources Conference, AL

4. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., Zhao, W., Kumar, H., Tian, D. (May. 2022). Assessment of projected change in intensity-duration-frequency (IDF) curves for Southeastern, United States using Artificial Neural Networks. HydroML Symposium, State College, PA

5. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (Mar.2022). Effect of climate change on reliable projected rainfall erosivity using benchmark approach over the southeastern US. Graduate Research Symposium, Auburn University, AL

6. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (Mar.2022). Projected mid-century rainfall erosivity under climate change over the Southeastern US. Southeastern Universities Graduate Research Symposium, Alabama University, AL

7. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (Mar.2022). Projected mid-century rainfall erosivity under climate change over the Southeastern US. Climate Resiliency Symposium, Auburn University, AL

8. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (Dec. 2021). Potential changes in rainfall erosivity under climate change in southeastern United States. American Geophysical Union Fall Meeting, Virtual

9. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (2021). Temporal disaggregation of hourly projected precipitation over the Southeast United States. Graduate Engineering Research Showcase, Auburn University, AL

10. **Takhellambam, B. S.,** Srivastava, P., Lamba, J., McGehee, R. P., Kumar, H., Tian, D. (2021). Stochastic generation of sub-hourly precipitation for water resource modeling under climate change over Southeastern United States. Graduate Engineering Research Showcase, Auburn University, AL

11. Kumar, H., Srivastava, P., Lamba, J., Ortiz, B.V., **Takhellambam, B. S.,** Way, T.R., Morata, G. (2021). Within-field phosphorus variability and impacts on crop yield in Alabama. Graduate Engineering Research Showcase (College of Agriculture), Auburn University, AL

12. Kumar, H., Srivastava, P., Lamba, J., Ortiz, B.V., **Takhellambam, B. S.,** Way, T.R., Morata, G. (2021). Influence of soil phosphorus on crop yield variability across the field. Graduate Engineering Research Showcase, Auburn University, AL

13. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (2021). Stochastic generation of 15-minute precipitation for water resource modeling under climate changeover Southeastern United States. Alabama Water Resources Conference, AL

14. Kumar, H., Srivastava, P., Lamba, J., Ortiz, B.V., **Takhellambam, B. S.,** Way, T.R., Morata, G. (2021). Phosphorus Variability in Delineated Irrigation Management Zones in the Crop. Alabama Water Resources Conference, AL

15. **Takhellambam, B.S.,** Srivastava, P., Lamba, J., McGehee, R.P., Kumar, H., Tian, D., (2021). Generation of high-temporal resolution precipitation for environmental assessment under climate change scenarios over the Southeastern United States. ASABE Annual International Meeting, Virtual

16. **Takhellambam, B. S.,** Lamba, J. (2021). A modified stochastic generation of high temporal resolution quarter-hour precipitation. Auburn Research symposium, Auburn University, AL

## PROFESSIONAL SERVICES

- Journal Reviewer | CATENA, Frontier in Artificial Intelligence, Modeling Earth Systems and Environment, International Soil and Water Conservation Research, Geoscientific Model Development
- Certified Reviewer for Journal of the ASABE
- Career counseling: 1 student got Ph.D. at the University of Tokyo with full assistance

## HONORS & AWARDS

- Outstanding Research Paper Award, The Southeastern Universities Graduate Research Symposium, The University of Alabama 2023
- Auburn University's Outstanding Doctoral Student Award 2023
- Member Alpha Epsilon honorary society 2023

- Winner Graduate Research Showcase Poster competition, AU, AL 2022
- Winner Boyd-Scott Graduate Research Award, Houston, TX 2022
- Winner Graduate Research Paper Award, AABFEIO, ASABE, Houston, TX 2022
- Registration waiver for Annual International Meeting (ASABE), Houston, TX 2022
- Registration waiver for HydroML symposium, Penn State University, PA 2022
- Travel Fellowship, Graduate Student Council, Auburn University, AL 2022
- Travel Grant, NSF-Funded HydroML conference, Penn State University, PA 2022
- Travel Grant, American Geophysical Union (AGU) Fall Meeting, Virtual 2021
- Selected 5-day Waterhackweek workshop, University of Washington, Virtual 2020
- Indian Council of Agricultural Research National Eligibility Test (ICAR-NET), India 2018
- Merit fellowship, Ministry of Education, India 2014-16
- Mr. Fresher, IIT Roorkee, India 2014
- Graduate Aptitude Test in Engineering (GATE), All India Rank 19, India 2014
- Second in Intensive training program on science communication, India 2013
- Merit fellowship, Northeastern Council, India 2010-14
- State Merit Scholarship, Government of Manipur, India 2010-14
- Indian Oil Merit Scholarships Scheme for secondary education, India 2008-10
- Dakshana Foundation Scholarship, IIT-JEE Coaching Program, Guwahati, India 2008
- Selected combined annual training camp for National Cadet Corps, India 2007
- National Cadet Corps-A certificate 2007
- Jawahar Navodaya Vidyalaya Samiti Scholarship, Ministry of Education, India 2003-10

## MEMBERSHIPS

- American Society of Agricultural and Biological Engineers (ASABE)
- American Geophysical Union (AGU)
- American Water Resources Association (AWRA)
- Association of Agricultural, Biological, and Food Engineers of Indian Origin (AABFEIO)
- Alabama Section of the American Water Resources Association
- American Society of Civil Engineers (ASCE)

## TECHNICAL TRAININGS

- Grant Writing for Beginner, Office of University Writing, Auburn University 2020
- 1-day workshop on Modelling Fate and transport of Soil-Water Pollutants, IIT-Roorkee 2016
- Application of GIS in Soil and Water Conservation Engineering NAARM, India 2014
- 12-day Technical Exposure to Research Institutes and Industry, Bhubaneswar, India 2013
- Intensive Training Programme on Science Communication at CSIR- NEIST, Jorhat, India 2013

## LEADERSHIP & VOLUNTEER

- Volunteer for Exam Proctoring, Auburn University, AL 2022-23
- Volunteer for Commencement ceremonies, Auburn University 2022
- Volunteer for assisting moderator at Alabama Water Resources Conference, AL 2022
- Volunteer for Gator-Byte (Water quality) Testing at Chewacla river 2022
- Abstract Review Committee of Research: Symposium, Auburn University, AL 2022
- Review committee for Frank Sturm Memorial Fellowship, Auburn University, AL 2022-23
- Volunteer for Engineering Day, Auburn University, AL 2022-23
- Volunteer in Creek Cleanup for Parkerson Mill, Auburn University, AL 2022
- Volunteer in A Tree Planting Event, Office of Sustainability, Auburn University, AL 2022
- Graduate Senator Council Senator, Auburn University, AL 2021- 2023

- Data analysis for detection of COVID cases, Manipur, India 2021
- Organized a 1-day webinar for Guide to study abroad, Virtual 2021
- Volunteer as lawnmowers cleaner (fundraising) ASABE, Auburn University, AL 2019-22
- Volunteer as manager for Annual Technical Festival, IIT Roorkee, India 2015
- Volunteer for hostel mess management for University Hostel, CAU, India 2013-14

## REFERENCES

Dr. Puneet Srivastava, Professor
Associate Dean for Research & Associate Director of Maryland Agricultural Experiment Station
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