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ACADEMIC BACKGROUND

Ph.D., Agricultural and Biological Engineering, Purdue University, West Lafayette, IN, 2013

M.Tech., Hydraulics and Water Resources Engineering, Civil Engineering, Indian Institute of Technology (IIT) Madras, India, 2008

B.S., Agricultural Engineering, Kerala Agricultural University, Kerala, India, 2006

PROFESSIONAL EXPERIENCE

Assistant Professor, Aug 2016- present. Department of Agricultural and Biological Engineering, & Department of Civil and Environmental Engineering, Pennsylvania State University, University Park, PA.

Post-doctoral Research Associate, Feb 2014- Aug 2016. Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, IN.

Post-doctoral Research Assistant, Feb 2013- Feb 2014. Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, IN.

Engineering Consultant, Aug 2008- Aug 2009. L&T Ramboll Consulting Engineering limited, Hyderabad, India.

PROFESSIONAL SERVICE

Editorial Board Member, Water, Global Change Biology (GCB)-Bioenergy, International Journal of Agricultural and Biological Engineering (IJABE)

Member, American Society of Agricultural and Biological Engineers (ASABE), American Geophysical Union, American Water Resources Association,

Journal Reviewer - Transactions of ASABE, Hydrological Processes, Environmental Modelling & Software, Journal of Hydrology, Journal of Earth System Science, GCB Bioenergy, Irrigation and Drainage, Environmental Management.

Proposal Reviewer, National Science Foundation, USDA- AFRI, One Planet Fellowship, Chile National Commission for Scientific and Technological Research (CONICYT), The University of Wisconsin Water Resources Institute (WRI), Mississippi-Alabama Sea Grant Consortium, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

Scientific Committee, 2015 International Soil and Water Assessment Tool Conference, Purdue University

RESEARCH AND TEACHING ACTIVITIES

Dr. Cibin Raj's research is in the field of computational ecohydrology, specializing in application of mathematical models for quantifying ecohydrological impacts of climate and land use change, deep learning application in water quality modeling, and development of decision support tools for sustainable watershed management. He has co-authored 50 peer reviewed publications, 42 peer reviewed journal articles (7 as lead author), two book chapters, and six conference proceedings. He teaches three courses annually at Penn State- (1) Principles of Soil and Water Conservation Engineering, (2) Simulation Modeling for Water Resources Management, and (3) Computational Ecohydrology.

REFEREED JOURNAL ARCTICLES (published or in print)

1. Kleinman, P., Spiegal, S., Silviera, M., Baker, J. M., Dell, C. J., Bittman, S., **Cibin, R**., Vadas, P., Buser, M., & Tsegaye, T. (2022). Envisioning the Manureshed: Towards comprehensive integration of modern crop and animal production. *Journal of Environmental Quality*. DOI: https://doi.org/10.1002/jeq2.20382

2. Yavari, R., Zaliwciw, D., **Cibin, R**., & McPhillips, L. (2022). Minimizing environmental impacts of solar farms: a review of current science on landscape hydrology and guidance on stormwater management. *Environmental Research: Infrastructure and Sustainability*. DOI: https://doi.org/10.1088/2634-4505/ac76dd

3. Saha, G., **Cibin, R**., Elliott, H. A., & Gall, H. E. (2022). Towards a robust land suitability framework for manure management: modeling impacts and evaluating biophysical characteristics. *Journal of American Water Resources Association*. DOI: https://doi.org/10.1111/1752-1688.13008

4. Mahalingam, J., **Cibin, R**., & Sudheer, K. (2022). Reliability of hydrology and water quality simulations using global scale datasets. *Journal of American Water Resources Association*. DOI: https://doi.org/10.1111/1752-1688.13006

5. Pandara Valappil, F., Karki, R., **Cibin, R**., & Sudheer, K. (2022). Re-conceptualizing HRU threshold definition in the Soil and Water Assessment Tool. *Journal of American Water Resources Association*. DOI: https://doi.org/10.1111/1752-1688.13000

6. Iavorivska, L., Veith, T., **Cibin, R**., Preisendanz, H. E., & Steinman, A. (2021). Mitigating lake eutrophication through stakeholder-driven hydrologic modeling of agricultural conservation practices: A case study of Lake Macatawa, Michigan. *Journal of Great Lakes Research, 47*(6). DOI: https://doi.org/10.1016/j.jglr.2021.10.001

7. Gunn, K.M., Buda, A. R, Gall, H. E., **Cibin, R**., Kennedy, C. D., & Veith, T. Integrating daily CO2 concentrations in Topo-SWAT to examine climate change impacts in a karst watershed. *Transactions of ASABE, 64*(4). DOI: doi: 10.13031/trans.13711

8. Jiang, F., Drohan, P. J., **Cibin, R.**, Gall, H. E., White, C., & Veith, T. (2021). Reallocating Crop Rotation Patterns Improves Water Quality and Maintains Crop Yield. *Agricultural Systems, 187*. DOI: https://doi.org/10.1016/j.agsy.2020.103015

9. Saha, G., **Cibin, R**., Elliott, H. A., & Gall, H. E. (2021). Development of a Land Suitability Framework for Sustainable Manure Utilization: A Case Study in Western Pennsylvania. *Transactions of ASABE, 64*(1). DOI: doi: 10.13031/trans.14000

10. Jiang, F., Gall, H. E., Veith, T., **Cibin, R**., & Drohan, P. J. (2020). Riparian buffer effectiveness as a function of buffer design and input loads. *Journal of Environmental Quality*.

11. Spiegal, S., Kleinman, P., Endale, D., Bryan, R., Goslee, S., Meinen, R., Flynn, C., Baker, J., Browning, D., McCarty, G., Bittman, S., Carter, J., Cavigelli, M., Duncan, E., Gowda, P., Li, X., Ponce-Campos, U., **Cibin, R**., Silveira, M., Smith, D., Arthur, D., & Yang, Q. (2020). Manuresheds: Tools to recycle nutrients for the sustainable intensification of agriculture. *Agricultural Systems, 182*, 102813.

12. Malone, R. W., Herbstritt,, S., Ma, L., Richard, T. L., **Cibin, R**., Gassman, P., Zhang, H., Karlen, D., Hatfield, J., Obrycki, J., Helmers, M., Jaynes, D., Kaspar, T., Parkin, T., & Fang, Q. X. (2019). Corn stover harvest and N losses in central Iowa. *Science of the Total Environment, 663*, 776-792.

13. Neupane, R. P., Ficklin, D. L., Knouft, J. H., Ehsani, N., & **Cibin, R**. (2019). Hydrologic responses to projected climate change in ecologically diverse watersheds of the Gulf Coast, United States. *International Journal of Climatology, 39*(4), 2227-2243.

14. **Cibin, R**., Chaubey, I., Sudheer, K. P., White, M., Arnold, J. G., & Helmers, M. J. (2018). Improved filter strip representation in SWAT model to simulate energy crop filter strips. *Transactions of the ASABE, 61*(3), 1017-1024.

15. Krishnan, N., **Cibin, R**., Chaubey, I., & Sudheer, K. (2018). Parameter estimation of SWAT and quantification of consequent confidence bands of model simulations. *Environmental Earth Sciences, 77*(12), 469-485.

16. Femeena, V. P., Sudheer, K. P., **Cibin, R**., & Chaubey, I. (2018). Spatial optimization of cropping pattern for sustainable food and biofuel production with minimal downstream pollution. *Journal of Environmental Management, 212*, 198-209.

17. Gall, H. E., Schultz, D., Veith, T., Goslee, S., Mejia, A., Harman, C., **Cibin, R**., & Patterson, P. H. (2018). The effects of disproportional load contributions on quantifying vegetated filter strip sediment trapping efficiencies. *Stochastic Environmental Research and Risk Assessment, 32*(8), 2369-2380.

18. Feng, Q., Chaubey, I., **Cibin, R**., Engel, B., Sudheer, K. P., & Volenec, J. (2018). Perennial biomass production from marginal land in the Upper Mississippi River Basin. *Land Degradation & Development, 29*(6), 1748-1755.

19. Guo, T., **Cibin, R.**, Chaubey, I., Gitau, M., Volenec, J., Srinivasan, R., Kiniry, J. R., & Engel, B. (2018). Evaluation of bioenergy crop growth and the impacts of bioenergy crops on streamflow, tile drain flow and nutrient losses in an extensively tile-drained watershed using SWAT. *Science of the Total Environment, 613–614*, 724-735.

20. Gassman, P. W., Kling, C. L., Panagopoulos, Y., **Cibin, R**., Chaubey, I., Valcu, A., Wolter, C. F., & Schilling, K. E. (2017). Assessment of bioenergy cropping scenarios for the Boone River watershed in North Central Iowa, United States. *Journal of the American Water Resources Association, 53*(6), 1336-1354.

21. Panagopoulos, Y., Gassman, P. W., Kling, C. L., **Cibin, R**., & Chaubey, I. (2017). Assessment of large-scale bioenergy cropping scenarios for the Upper Mississippi and Ohio-Tennessee River Basins. *Journal of the American Water Resources Association, 53*(6), 1355-1367.

22. Wang, R., Bowling, L., Cherkauer, K. A., **Cibin, R**., Her, Y., & Chaubey, I. (2017). Biophysical and hydrological effects of future climate change including trends in CO2, in the St. Joseph River watershed, Eastern Corn Belt *Agricultural Water Management, 180*, 280-296.

23. **Cibin, R**., Chaubey, I., Muenich, R. L., Cherkauer, K. A., Panagopoulos, Y., Gassman, P. W., & Kling, C. L. (2017). Influence of bioenergy crop production and climate change on ecosystem services. *Journal of the American Water Resources Association, 53*(6), 1323-1335.

24. Kling, C. L., Chaubey, I., **Cibin, R.**, Gassman, P. W., & Panagopoulos, Y. (2017). Policy implications from multi-scale watershed models of biofuel crop adoption across the Corn Belt. *Journal of the American Water Resources Association, 53*(6), 1313-1322.

25. Feng, Q., Chaubey, I., Engel, B., **Cibin, R**., Sudheer, K. P., & Volenec, J. (2017). Simulating establishment periods of perennial bioenergy grasses in the soil and water assessment tool (SWAT) model. *Transactions of the ASABE, 60*(5), 1621-1632.

26. Feng, Q., Chaubey, I., Engel, B., **Cibin, R**., Sudheer, K. P., & Volenec, J. (2017). Marginal land suitability for switchgrass, Miscanthus and hybrid poplar in the Upper Mississippi River Basin (UMRB). *Environmental Modelling & Software, 93*, 356-365.

27. Song, J., Gramig, B., **Cibin, R**., & Chaubey, I. (2017). Integrated Economic and Environmental Assessment of Cellulosic Biofuel Production in an Agricultural Watershed. *BioEnergy Research, 10*(2), 509-524.

28. Pignotti, G., Rathjens, H., Cibin, R., Chaubey, I., & Crawford, M. (2017). Comparative Analysis of HRU and Grid-Based SWAT Models. *Water, 9*(4), 20.

29. Liu, Y., **Cibin, R**., Bralts, V. F., Chaubey, I., Bowling, L. C., & Engel, B. A. (2016). Optimal selection and placement of BMPs and LID practices with a rainfall-runoff model. *Environmental Modelling & Software, 80*, 281–296.

30. Athira, P., Sudheer, K., **Cibin, R**., & Chaubey, I. (2016). Predictions in ungauged basins: an approach for regionalization of hydrological models considering the probability distribution of model parameters. *Stochastic Environmental Research and Risk Assessment, 30*(4), 1131–1149.

31. **Cibin, R**., Trybula, E., Chaubey, I., Brouder, S. M., & Volenec, J. J. (2016). Watershed-scale impacts of bioenergy crops on hydrology and water quality using improved SWAT model. *GCB Bioenergy, 8*(4), 837–848.

32. Her, Y., **Cibin, R**., & Chaubey, I. (2015). Application of parallel computing methods for improving efficiency of optimization in hydrologic and water quality modeling. *Applied Engineering in Agriculture, 31*(3), 455–468.

33. Feng, Q., Chaubey, I., Her, Y. G., **Cibin, R**., Engel, B., Volenec, J., & Wang, X. (2015). Hydrologic and water quality impacts and biomass production potential on marginal land. *Environmental Modelling & Software, 72*, 230–238.

34. Trybula, E. M., **Cibin, R**., Burks, J. L., Chaubey, I., Brouder, S. M., & Volenec, J. J. (2015). Perennial rhizomatous grasses as bioenergy feedstock in SWAT: parameter development and model improvement. *GCB Bioenergy, 7*(6), 1185–1202.

35. **Cibin, R**., & Chaubey, I. (2015). A computationally efficient approach for watershed scale spatial optimization. *Environmental Modelling & Software, 66*, 1–11.

36. **Cibin, R**., Athira, P., Sudheer, K., & Chaubey, I. (2013). Application of distributed hydrological models for predictions in ungauged basins: a method to quantify predictive uncertainty. *Hydrological Processes, 28*(4), 2033–2045.

37. Kasiviswanathan, K., **Cibin, R**., Sudheer, K., & Chaubey, I. (2013). Constructing prediction interval for artificial neural network rainfall runoff models based on ensemble simulations. *Journal of Hydrology, 499*, 275–288.

38. Gramig, B. M., Reeling, C. J., **Cibin, R.**, & Chaubey, I. (2013). Environmental and economic tradeoffs in a watershed when using corn stover for bioenergy. *Environmental Science & Technology, 47*(4), 1784–1791.

39. Hoque, Y. M., **Cibin, R**., Hantush, M. M., Chaubey, I., & Govindaraju, R. S. (2013). How do land-use and climate change affect watershed health? a scenario-based analysis. *Water Quality, Exposure and Health, 6*(1-2), 19–33.

40. **Cibin, R**., Chaubey, I., & Engel, B. (2012). Simulated watershed scale impacts of corn stover removal for biofuel on hydrology and water quality. *Hydrological Processes, 26*(11), 1629–1641.

41. Athira, P., Sudheer, K., **Cibin, R**., & Chaubey, I. (2010). A multi-criterion based approach to quantify predictive uncertainty of distributed hydrologic models when applied to ungauged basins. *Advances in Geosciences, 23*, 75–88.

42. **Cibin, R**., Sudheer, K., & Chaubey, I. (2010). Sensitivity and identifiability of stream flow generation parameters of the SWAT model. *Hydrological Processes, 24*(9), 1133–1148.

Book Chapters

43. Ale, S., Femeena, P. V., Mehan, S., & **Cibin, R**. (2019). *Environmental Impacts of Bioenergy Crop Production and Benefits of Multifunctional Bioenergy Systems*. Bioenergy with Carbon Capture and Storage: Using Natural Resources for Sustainable Development (pp. 195-217.). San Diego, CA: Academic Press, Elsevier Inc.. Peer-reviewed/refereed.

44. Chaubey, I., **Cibin, R**., & Feng, Q. (2016). *Precision Conservation for Biofuel Production. Precision conservation: Geospatial techniques for agricultural and natural resources conservation* (pp. 253-283). Madison, WI: American Society of Agronomy and Crop Science Society of America, Inc. Peer-reviewed/refereed.

Conference Proceeding

45. Jiang, F., Gall, H. E., Veith, T., Cibin, R., & Drohan, P. J. (2019). Assessment of riparian buffers' effectiveness in controlling nutrient and sediment loads as a function of buffer design, site characteristics and upland loadings. (pp. 11). St. Joseph, MI: ASABE.

46. Saha, G., Cibin, R., Elliott, H. A., Gall, H. E., Shortle, J. S., & Abler, D. G. (2018). Geospatial Landscape Analysis for Livestock Manure Management in Western Pennsylvania. (pp. 12). St. Joseph, MI: ASABE.

47. Cibin, R., Muenich, R. L., Chaubey, I., & Cherkauer, K. A. (2016). Ecosystem services evaluation of futuristic bioenergy based land use change and their uncertainty from climate change and variability. (pp. 3). St. Joseph, MI: ASABE.

48. Rathjens, H., Cibin, R., Chaubey, I., Srinivasan, R., & Arnold, J. (2016). Linking regional climate simulations and hydrologic models for climate-change impact studies: a data processing framework. (pp. 3). St. Joseph, MI: ASABE.

49. Muenich, R. L., Omani, N., Cibin, R., Chaubey, I., & Srinivasan, R. (2016). The future of ecosystem services in the Upper Mississippi River Basin. (pp. 3). St. Joseph, MI: ASABE.

50. Cibin, R., Sudheer, K., & Chaubey, I. (2008). Global sensitivity analysis of distributed hydrologic models. (pp. 9). St. Joseph, MI: ASABE.

Report in Scholar Sphere

Saha, G., & **Cibin, R.** (2020). ArcGIS-based Toolboxes to Identify Suitable Areas for Sustainable Manure Management. DOI: doi:10.26207/99tk-sn24

Iavorivska, L., Gall, H. E., **Cibin, R**., & Veith, T. (2020). Expanding the Soil and Water Assessment Tool (SWAT) for modeling the transport of contaminants of emerging concern in agricultural watersheds. DOI: doi:10.26207/ftjf-3302