CURRICULUM VITAE
BALAJI ANANDHA RAO, PhD
Assistant Professor

ADDRESS: Department of Civil, Environmental and Construction Engineering, Box 41023, Lubbock, Texas, 79409

EDUCATION

PhD Environmental Engineering, Texas Tech University, 2010
MS Civil Engineering, Texas Tech University, 2006
BTech Chemical Engineering, Madras University, India, 2000

PROFESSIONAL EXPERIENCE

Assistant Professor, Texas Tech University	*2024-Present*
Research Scientist/ Teaching Instructor, Texas Tech University	*2018-2024*
Postdoctoral Research Associate/ Teaching Instructor, Texas Tech University	*2014-2018*
Postdoctoral Research Associate, Oak Ridge National Laboratory	*2011-2013*
Process Engineer, Petrochemical Refinery, Reliance Industries Ltd, India	*2000-2003*

RESEARCH COMMERCIALIZATION

Co-Founder, Envirostatus, LLC – A passive sampler company	*2019- Present*

CURRENT ACTIVITIES

Dr. Rao's current research areas are focused on evaluating and managing risks associated with both traditional and emerging contaminants in stormwater, sediment and wastewater systems. He is passionate about applying the principles of engineering to solve vital environmental topics, particularly related to sustainable resource management, and food-energy-water nexus.

FUNDED/*SUBMITTED* PROJECTS

- *Developing fixed-bed column models for novel adsorbents to predict the removal of emerging micropollutants [co-PI]- EPA- Submitted*
- To conduct community engaged research to empower an exposed community to take remedial action to reduce exposures. [co-PI] – NIEHS/Emory University, $1.27 M (2025-2030), Pending support
- Enhance cybersecurity in drinking water systems by building a NIST compliant framework for cybersecurity. [co-PI]- DHS, $150K (2024-2025)
- Laboratory scale evaluation of combining advanced oxidation process with sediment stabilization for beneficial use in construction. [PI]-USACE - $603K (2023-2025)
- Impacts of Nitrogen and Phosphorus Obtained from Municipal Waste Via Ion Exchange on Soil Properties and Plant Growth: Closing The Nitrogen and Phosphorus Circular Economies- [Co-PI]-NSF ERC -$639K (2023-2025)
- Application of Electrochemically Treated Sewage Sludge (EWAS) to Soils: Effects of Soil Type on Plant Growth, Nutrient Cycling, and Potential Trace Contamination-[Co-PI]-NSF ERC - $651K (2023-2025)
- EPA STAR – Assessing Perchlorate Occurrence in Ambient Waters Following the Usage of Fireworks – [Co-PI]: $2.5M (2023-2026)

- Center for Advancing Sustainable and Distributed Fertilizer Production (CASFER) – "Characterization of wastewater feed streams for CASFER phosphate recovery" – [Co-PI]: $45K (2023)
- National Institute of Health (NIH) Supplemental Diversity Proposal – "Enhancing bioremediation of groundwater co-contaminated by chlorinated volatile organic compounds (CVOCs) and 1,4-dioxane using novel macrocyclic materials" – [Key Personnel]: $57K (2023)
- Corteva (DuPont) – Studies in Support of South River VA Remedial Efforts – "Evaluation of Non-particle Related THg from Bank Management Areas South River" – [Co-PI]: $ 40K (2017-2020)
- TTU Accelerator Program for Business Startup – [Cofounder]: $ 25K (2020)
- National Science Foundation Reginal I-Corps – Envirostatus Market Survey - $5K (2021)
- SERDP ER18-1371 – "Effectiveness of stormwater controls on sediment recontamination – [Key Personnel] - $ 1.06M (2019-2023)

TEACHING EXPERIENCE

Texas Tech University *2017-Present*

- Water Resource Management (CE 5366)
- Mechanics of Fluids (CE 3305)
- Engineering Hydrology (CE 3354)
- Introduction to Environmental Engineering (CE 3309)
- Water Systems Design (CE 3372)
- Advanced Physical and Chemical Municipal Water Treatment Lab (CE 4107)

JOURNAL PAPERS UNDER PREPARATION/REVIEW

1. Cesar, G; **Rao, B.;**…. Particle size-based evaluation of stormwater control measures in reducing solids, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). *Under revision, Water Research journal*
2. Sanchez , A.; **Rao, B.;**…Method development for analysis of microplastics and tire wear particles in stormwater runoff. *Submitted to Water, Air and Soil journal*

SELECT PEER REVIEWED PUBLICATIONS (Total publications = 28; Citations 1200+; H Index 17 (Google Scholar)]- Balaji Anandha Rao - Google Scholar

1. Abaie, E., Kumar, M., Garza-Rubalcava, U., **Rao, B.,** Sun, Y., Shen, Y., & Reible, D. (2024). Chlorinated volatile organic compounds (CVOCs) and 1, 4-dioxane kinetics and equilibrium adsorption studies on selective macrocyclic adsorbents. *Environmental Advances*, *16*, 100520.
2. Hussain, T., Athanasiou, D., **Rao, B.**, Bejar, M., Rakowska, M., Drygiannaki, I., ... & Reible, D. D. (2024). Sediment recontamination potential and biological impacts of hydrophobic organics from stormwater in a mixed-use watershed. *Science of The Total Environment*, *906*, 167444
3. Ziaei, H., **Rao, B.**, Wood, T. V., Garza-Rubalcava, U., Alborzi, A., Zhou, H., ... & Reible, D. (2023). Assessment and Management of Mercury Leaching from a Riverbank. *Toxics*, *11*(2), 179.
4. **Rao B**, Reible D, Athanasiou D, Lou HH, Zhao R, Fang J, Drygiannaki I, Millerick K, Barragan N, Pagnozzi G. Environmental Impacts of Hurricane Harvey on the Neches-Brakes Bayou River System in Beaumont, Texas. *Environmental Management.* 2022 Nov 15:1-1.
5. Fang J, Zhao R, **Rao B,** Rakowska M, Athanasiou D, Millerick K, Wei S, Lei X, Lou HH, Reible DD. Removal of polycyclic aromatic hydrocarbons from water using Mn (III)-based advanced oxidation process. *Journal of Environmental Engineering.* 2021 Mar 1(3):04021002.

6. Bland GD, **Rao B,** Reible D. Evaluating the transport of Hg (II) in the presence of natural organic matter through a diffusive gradient in a thin-film passive sampler. *Science of The Total Environment.* 2020;749:141217.
7. Drygiannaki I, **Rao B,** Dawson JA, Rakowska M, Reible DD, Hayman NT, Rosen GH, Colvin MA, Chadwick DB, Pitt R, Otto M. Assessing sediment recontamination from metals in stormwater. *Science of The Total Environment.* 2020 Oct 1;737:139726.
8. **Rao, B**.; Simpson, C.; Lin, H.; Liang, L.; Gu, B. Determination of Thiol Functional Groups on Bacteria and Natural Organic Matter in Environmental Systems. *Talanta*. 2014, 119, 240-247
9. **Rao, B**.; Wang, W.; Qingsong, C.; Anderson, T. A.; Gu, B. Photochemical Transformation of the Insensitive Munitions Compound 2,4-Dinitroanisole. *Science of Total Environment*, 2012 443, 692-699
10. **Rao, B**.; Estrada, N; Mangold, J.; Shelly, M.; Gu, B.; Jackson, W. A. Perchlorate production by photodecomposition of aqueous chlorine. *Environ. Sci. Technol.*, 2012, 46, 11635-43
11. **Rao, B**.; Hatzinger, P. B.; Böhlke, J. K.; Sturchio, N. C.; Andraski, B.; Frank D. Eckardt.; Jackson, W. A. Natural Chlorate in the Environment: Application of a New IC-ESI/MS/MS Method with a $Cl^{18}O_3^-$ Internal Standard. *Environ. Sci. Technol.* 2010, *44,* 8429-8434.
12. **Rao, B.**; Anderson, T. A.; Orris, G. J.; Rainwater, K. A.; Rajagopalan, S.; Sandvig, R. M.; Scanlon, B. R.; Stonestrom, S. A.; Walvoord, M. A.; Jackson, W. A. Widespread Natural Perchlorate in Unsaturated zones of the Southwest United States. *Environ. Sci. Technol.* 2007, *41*, 4522-4528

SELECT CONFERENCE PRESENTATIONS AND POSTERS

1. **Rao, B** et al**.** Evaluation of laboratory based Advanced Oxidation Process (AOP) for treatment of contaminated dredged sediments for beneficial use in construction. Battelle Sediment Conference, Jan 2025.
2. **Rao, B.** et al. Removal of PFAS by stormwater BMPs in active and former DoD facilities. June 2021, SERDP PFAS conference, San Pedro, CA
3. **Rao, B** et al. Development and Application of Monitoring Tools to Characterize Sediment Contamination due to Stormwater and Performance Evaluation of Engineered Source Controls. November 2020, SETAC, SciCon2
4. **Rao, B.;** Bland, G.; Reible, D. Assessing Mercury Bioavailability with Diffusive Gradient in Thin-film Samplers (DGTs) - Part 1. *Ninth International Conference on Remediation and Management of Contaminated Sediments* was conducted January 9-12, 2017, in New Orleans, Louisiana.
5. **Rao, B.;** Simpson, C.; Lin, H.; Liang, L.; Gu, B. Profiling mercury binding thiol groups in natural organic matter and methylating bacteria using fluorescent spectroscopy. (2013) Platform Presentation, Society of Environmental Toxicology and Chemistry, 2013, Nashville, Tennessee, November 17-21.
6. **Rao, B;** Wei Wang; Baohua, Gu. Photochemical Degradation Rates and Mechanisms of Insensitive Munitions-2, 4-dinitroanisole. 243rd ACS National Meeting & Exposition, 2012, San Diego, California.
7. **Rao, B**; Hatzinger, P. B.; Böhlke, J. K.; Sturchio, N. C.; Andraski, B.; Eckardt, F. D.; Jackson, W. A. Natural Occurrence of Chlorate in Environmental Samples determined using Ion Chromatography coupled with Tandem Mass Spectrometry (IC-ESI-MS/MS) and $Cl^{18}O_3^-$ as Internal Standard. *SERDP-ESTCP*, 2010.

8. **Rao, B**.; Hatzinger, P. B.; Jackson, W. A.; Böhlke, J. K.; Gu, B.; Sturchio, N. C. Understanding Natural Perchlorate Formation by Ozone and UV-Oxidation of Aqueous Cl Species. Platform Presentation, *Goldschmidt: Earth, Energy and the Environment*, 2010.
9. **Rao, B**.; Jackson, W. A.; Böhlke, J. K.; Hatzinger, P. B.; Gu, B.; Sturchio, N. C. (2010) Mechanism of Perchlorate Formation with UV and Ozone in Relation to the Isotopic Composition of Natural Perchlorate. Platform Presentation, *Seventh International Conference on Remediation of Chlorinated and Recalcitrant* Compounds, 2010.
10. **Rao, B**.; Jackson, W. A.; Mangold, J.; Redder, A.; Kang, N. (2008) Understanding the Mechanism of Perchlorate Formation in the Environment through Natural Processes. Platform Poster, *SERDP-ESTCP*, December 2-4.

BOOK CHAPTERS

1. Reible, D., **Rao, B.**, Rasporic, K. Addressing the water challenges of the Llano Estacado with new sources. *Under review.*

PROFESSIONAL SERVICES

- Member and contributor to Texas Produced Water Consortium
- *Journal Editor:*
  Invited co-editor for a special topic in *Frontiers in Sustainable Food Systems*
- *Journal Reviewer:*
  Environmental Science & Technology, Desalination, Journal of Environmental Engineering
  Water Air and Soil Pollution, Water, Environmental Chemistry and Toxicology,
  Atmospheric Environment
- *Ad-hoc Proposal and Project Reviewer:*
  Strategic Environmental Research and Development Program- Environmental Security Technology Certification Program (SERDP-ESTCP), National Science Foundation (NSF)
  U.S. Geological Survey (USGS)
- *Other Activities:*
  Invited speaker in Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Texas Tech University (TTU) Chapter.
  Participated in an invited discussion panel titled “Environment” conducted by the College of Architecture Student Chapter at TTU.
  Committee organizer for Young Evolving Scientist Seminar Series (YESSS) while in Oak Ridge National Laboratory