RAVI HANUMANTHA
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RESEARCH INTERESTS

Ecohydrology and watershed dynamics
Land cover change and hydrological response
Climate change impacts on water balance
Spatial modeling and geospatial analysis
Urban and regional water resilience
System dynamics and coupled human–natural systems

EDUCATION

Clark University, Worcester, MA
Ph.D. in Interdisciplinary Studies *(December 2024)*
Dissertation: *"Climate Change and Water Resource Modeling for Central Mexico"*
Advisors: Prof. Timothy Downs, Prof. Morgan Ruelle, Prof. Karen Frey & Prof. Marisa Mazari Hiriart
M.S. in Environmental Science & Policy *(December 2017)*
Cleveland State University, Cleveland, OH
M.S. in Chemical Engineering *(August 2003)*
Bangalore University, Tumkur, India
B.S. in Chemical Engineering *(August 1998)*

ACADEMIC APPOINTMENTS

Visiting Assistant Professor, Clark University (2024–Present)

- Teach undergraduate and graduate courses in GIS, system dynamics, and sustainability
- Develop interdisciplinary curricula integrating hydrology, spatial analysis, and climate resilience
- Supervise student research in environmental modeling and water systems

RESEARCH EXPERIENCE

Graduate Researcher – Clark University, Worcester, MA *(2015 – 2024)*

- Developed spatially explicit water balance models to quantify precipitation partitioning into evapotranspiration, runoff, and infiltration
- Analyzed hydrological impacts of land cover change and climate variability across basin scales
- Built GIS-based workflows integrating soil, slope, land cover, and climate datasets

- Applied Monte Carlo simulation and sensitivity analysis (PRCC) to evaluate system uncertainty
- Conducted groundwater vulnerability and recharge modeling using DRASTIC and related approaches
- Led interdisciplinary research linking hydrological modeling with sustainability and policy applications

PUBLICATIONS (Peer-Reviewed Journal Articles and Book Chapters)

1. Praveen, S. S., **Hanumantha, R**., Belovich, J. M., & Davis, B. L. (2003). Novel hyaluronic acid coating for potential use in glucose sensor design. Diabetes Technology & Therapeutics, 5(3), 393–399.
2. Claus Henn, B., Ogneva-Himmelberger, Y., Denehy, A., Randall, M., Cordon, N., Basu, B., Caccavale, B., Covino, S., **Hanumantha, R**., & Longo, K. (2017). Integrated assessment of shallow-aquifer vulnerability to multiple contaminants and drinking-water exposure pathways in Holliston, Massachusetts. Water, 10(1), 23.
3. Downs, T. J., Ogneva-Himmelberger, Y., Ruelle, M., **Hanumantha, R**. K., Mazari-Hiriart, M., Ramírez-Aguilar, M., & Santos-Burgoa, C. (2022). Health as a Social-technical Enterprise Anchored in Social-ecological Justice and Stakeholder Collaboration: Insights from Mexico-Lerma-Cutzamala Hydrological Region. In Handbook of Human and Planetary Health (pp. 241–264). Springer International Publishing Cham.
4. Downs, T. J., Ruelle, M., Brissett, N., **Hanumantha, R**., Mazari-Hiriart, M., Krueger, R., & Carr, E. R. (2022). An Integrative Collaborative Project Approach to Climate-Change Resilience and Urban/Regional Sustainability for the Mexico-Lerma-Cutzamala Hydrological Region. Open Journal of Civil Engineering, 12(1), 101–138.
5. Manley, E., Ogneva-Himmelberger, Y., Ruelle, M., **Hanumantha, R**., Mazari-Hiriart, M., & Downs, T. J. (2022). Land-cover change and urban growth in the Mexico-Lerma-Cutzamala Hydrological Region, 1993–2018. Applied Geography, 147, 102785.
6. Gubbi Ratna, S., Koppa Suresh, D., & **Hanumantha, R**. (2023). Identification of Groundwater Potential Recharge and Recharge Zones of Tumakuru District Using GIS. Journal of The Institution of Engineers (India): Series A, 104(4), 877–893.
7. Downs, T. J., **Hanumantha, R**., Ogneva-Himmelberger, Y., Ruelle, M., Brissett, N., & Mazari-Hiriart, M. (2023). Integrative collaborative design of research-based, climate-change resilience engineering education: Insights from México–Lerma–Cutzamala hydrological region. Science, Engineering, and Sustainable Development: Cases in Planning, Health, Agriculture, and the Environment, 1, 119.
8. Downs, T., **Hanumantha, R**., Ogneva-Himmelberger, Y., Ruelle, M., & Mazari-Hiriart, M. (2024). Illustrating climate-change resilience engineering: Conceptual design of water supply and wastewater/stormwater system for the México-Lerma-Cutzamala hydrological region.
9. **Hanumantha, Ravi**; Rathna, Suma Gubbi; Prakash, Bhavana Gubbi. Assessing groundwater vulnerability in Karnataka using the DRASTIC model and GIS-based

spatial analysis, Discover Water (2026). https://doi.org/10.1007/ s43832-026-00341-2 *(In-Press)*

10. **Hanumantha**, **Ravi;** Morgan Ruelle, Varalakshmi S, Yelena Ogneva-Himmelberger, Marisa Mazari-Hiriart, Karen Frey, Timothy J Downs, Assessing Water Security under Climate Change in the Mexico–Lerma–Cutzamala Region through System Dynamics Modeling, Sustainable Water Resource Management (2026), DOI:10.1007/s40899-026-01327-7
11. **Hanumantha, R.**, Y.Ogneva-Himmelberger, M.Ruelle, M.Mazari-Hiriart, K.Frey, and T. J.Downs. 2026. "A Spatially Explicit Water Balance Model for Assessing Recharge Sensitivity to Climate and Land Cover Change in Central Mexico." Hydrological Processes40, no. 3: e70473. https://doi.org/10.1002/hyp.70473.

TEACHING EXPERIENCE

Instructor on Record, Clark University (2021–2024)

- Designed and taught courses integrating climate modeling, system dynamics, and spatial analysis
- Introduced students to data-driven environmental modeling workflows

Teaching Assistant, Clark University (2018–2023)

- Supported courses in environmental science and sustainability
- Mentored students in research design and geospatial analysis

COURSES TAUGHT

- Introduction to GIS
- System Dynamics: Climate Change and Resource Modeling
- Sustainable Development, Assessment, and Planning
- Cities, Regions, Health, and Climate Change
- Environmental and Social Justice Studio

MENTORING

- Supervised graduate thesis on water conservation and system dynamics modeling
- Mentored undergraduate research on groundwater recharge (peer-reviewed outcome)
- Advised student research presentations and conference participation

TECHNICAL SKILLS

- Programming: R, Python
- Geospatial: ArcGIS, QGIS, Google Earth Engine
- Modeling: System dynamics (Vensim), hydrological modeling frameworks
- Data: Climate datasets (CMIP, remote sensing), spatial analysis
- Methods: Monte Carlo simulation, sensitivity analysis, statistical modeling

INDUSTRY EXPERIENCE

- Lead Scientist, General Electric (2002–2015)
- Led R&D projects in materials science, sensors, and energy systems
- Applied design of experiments, regression, and data-driven optimization
- Developed patented technologies in lighting, sensing, and battery systems
- Mentored junior scientists and interdisciplinary teams

PROFESSIONAL SERVICE

- Peer Reviewer, System Dynamics Society (since 2022)
- Mentor for undergraduate and graduate research

Conferences & Others:

1. Energy transfer in KY_3F_{10} phosphor, 210th Electro Chemical Society Meeting – Cancun, Mexico (29 October - 3 November 2006), Abstract #2164 & Abstract #2180
2. Controlling Particle Size and Luminescence in Mn^{4+} Activated K_2SiF_6; 227th Electro Chemical Society Meeting, Chicago, May 24-28, 2015, ECS Meeting Abstracts, Volume MA2015-02 -Abstracts 228, 1576-1576
3. 15th Graduate Multidisciplinary Conference, April 17, 2017, Higgins University Center, Clark University.

SELECTED PATENTS & GE INTERNAL PUBLICATION

- Gas Sensor and Method of Making – Patent No. *8739604*
- Mercury-Free Discharge Compositions for Lamps – Application No. *20060132043*
- Moisture-Resistant Phosphor Compositions – Application No. *US20160376499A1*
- High-Power Sodium-Ion Battery Solid Electrolyte Fabrication – Application No. *WO2015130316A1*

PROFESSIONAL SERVICE & LEADERSHIP

- Active peer reviewer for System Dynamics Society since 2022.
- Served as a mentor for undergraduate and graduate student research projects.

Professional references available upon request.