

## PROFESSIONAL SUMMARY

Experienced in terrestrial ecosystem modeling integrating geospatial data science, field, and inventory data with process-based simulations to analyze carbon, water, and nutrient cycles across scales. Proficient in model data integration, calibration to improve predictions of ecosystem productivity under changing climate and management scenarios. Proficient in Python, R, and high-performance computing for automating geospatial workflows and large-scale simulations.

## EDUCATION

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|---------------------------------------------------|------------------|
| <b>North Carolina State University</b>            | Raleigh, NC      |
| Ph.D. in Forestry and Environmental Resources     | May 3, 2025      |
| <b>Jawaharlal Nehru Technological University</b>  | Hyderabad, India |
| M. Tech in Environmental Geomatics                | August 2015      |
| B. Tech in Electrical and Electronics Engineering | May 2013         |

## TECHNICAL SKILLS

- *Programming & Data Analysis:* Python (NumPy, pandas, GeoPandas, rasterio, xarray), R, SQL
- *Geospatial Tools:* ArcGIS Pro, QGIS, GDAL, Google Earth Engine, GRASS GIS
- *Databases & Cloud:* PostgreSQL/PostGIS, AWS, Git/GitHub
- *Remote Sensing:* Landsat, Sentinel, LiDAR, canopy and land cover classification
- *Modeling & Workflows:* Process-based ecosystem models (Biome-BGCMuSo, PC2FM); model calibration, parameterization, reproducible ETL pipelines, data visualization (Plotly, Matplotlib)

## RESEARCH EXPERIENCE

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| <b>University of Missouri</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Columbia, MO                  |
| Postdoctoral Research Fellow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | September 2025 – Present      |
| <ul style="list-style-type: none"><li>• Integrating tree-ring fire-scar chronologies with ecohydrological (RHESSys) and fire-frequency (PC2FM) models to study long-term vegetation, climate, fire feedback across the eastern U.S.</li><li>• Developing geospatial datasets linking fire history with topography, climate, and vegetation structure to analyze spatial controls on disturbance regimes.</li><li>• Calibrating coupled model simulations and conducting sensitivity analyses to evaluate hydrological and biogeochemical interactions.</li><li>• Building automated Python / R workflows for data processing, model input generation, and high-performance simulations.</li></ul>                                                                                                                                                                                                                                                   |                               |
| <b>North Carolina State University</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Raleigh, NC                   |
| Graduate Research Assistant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | May 2021 – May 2025           |
| <ul style="list-style-type: none"><li>• Designed and calibrated process-based ecosystem simulations (Biome-BGCMuSo) to evaluate carbon fluxes across North American forest biomes under varying climate and management scenarios.</li><li>• Integrated remote-sensing and flux observations with model outputs to improve estimates of Net Ecosystem Productivity and related carbon-cycle metrics.</li><li>• Developed geospatial databases combining FIA, NLCD, gSSURGO, and NASA-NEX-GDDP datasets for the southeastern U.S., ensuring spatial and temporal consistency through automated quality checks.</li><li>• Applied advanced programming (Python, R, PostgreSQL/PostGIS) for large-scale spatial analysis, model automation, and input-data preparation.</li><li>• Created interactive maps and visual analytics to communicate simulation outcomes and supported collaborative publications and presentations at conferences.</li></ul> |                               |
| <b>National Remote Sensing Centre</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Hyderabad, India              |
| Project Intern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | September 2014 – October 2015 |
| <ul style="list-style-type: none"><li>• Processed multi-temporal satellite imagery to map forest fires, deforestation, and degradation across regional landscapes.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                               |

- Developed geospatial databases and automated classification workflows to assess disturbance patterns and fire incidences.
- Conducted spatial and statistical analyses to derive actionable insights from remote sensing data.
- Contributed to peer-reviewed publications through collaborative research on large-scale forest monitoring and change detection.

## GEOSPATIAL AND TECHNICAL EXPERIENCE

### Central Coffee Research Institute

Bengaluru, India

Project Scientist

June 2017 – March 2018

- Collected GPS-based field data and performed high-resolution ( $\leq 1$  m) image classification to map coffee agroforestry systems.
- Supported the generation of India's first detailed coffee canopy and land-use map through object-based image analysis integrating ground and satellite data.

### CSIR-National Geophysical Research Institute

Hyderabad, India

Project Assistant III

November 2015 – March 2017

- Developed GIS-based inundation and vulnerability mapping workflows for coastal zones using numerical model outputs and spatial datasets.
- Applied multi-criteria analysis (AHP) to evaluate and prioritize vulnerable areas in the Nicobar Islands, supporting coastal resilience planning.

## PUBLICATIONS

- **Ganjam, M.**, Baker, J.S., Aguilos, M., Merganičová, K. (2026). "Maximizing Net Ecosystem Productivity: Integrating Chronosequence Analysis and Ecosystem Modeling Across Contrasting Biomes in North America". *Frontiers in Forests and Global Change*, section Forest Growth.
- Aguilos, M., Sun, G., Bulluck, J., Shi, M., Han, X., Carter, C., Brannum, K., Middlebrough, B., Watts, J., Webb, J., Whitley, **Ganjam, M.**, Liu, N., Baniya, B., Mitra, B., Prajapati, P., Minick, K., McNulty, S., Noormets, A., & King, J. (2025). "Tree mortality provides early warning sign of ecosystem functional transition in coastal freshwater forested wetlands." *Environmental Research Letters*, 19(9), 094017.
- Fuller, M. R., **Ganjam, M.**, Baker, J. S., & Abt, R. C. (2024). "Advancing forest carbon projections requires improved convergence between ecological and economic models". *Carbon Balance and Management*.
- Reddy, C.S., Jha, C.S., **Manaswini, G.**, Alekhya, V.V.L.P., Vazeed Pasha, S., Satish, K.V., Diwakar, P. G., & Dadhwal V.K. (2017). "Nationwide assessment of forest burnt area in India using Resourcesat-2 AWiFS data". *Current Science*.
- Reddy, C.S., **Manaswini, G.**, Jha, C.S., Diwakar, P.G., & Dadhwal, V.K. (2016). "Development of national database on long-term deforestation in Sri Lanka". *Journal of the Indian Society of Remote Sensing*, 1-12.
- Reddy, C.S., **Manaswini, G.**, Satish, K.V., Sonali Singh., Jha, C.S., Dadhwal V.K. (2016). "Conservation priorities of forest ecosystems: Evaluation of deforestation and degradation hotspots using geospatial techniques". *Ecological Engineering*.
- **Manaswini, G.**, and Reddy, C.S. (2015). "Geospatial monitoring and prioritization of forest fire incidences in Andhra Pradesh, India". *Environmental monitoring and assessment*.
- Jakkula, M., Guruhappa, H., **Manaswini, G.**, & Srivastava, K. (2017). "Tsunami forces acting on ocean structures: A synthetic study". *Journal of Indian Geophysical Union*.