

Ranjay Man Shrestha

Lead Research Scientist, SSAI

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EDUCATION

Ph.D., Earth Systems & Geoinformation Sciences, George Mason University (2017)

M.S., Geographic & Cartographic Sciences, George Mason University (2011)

B.S., GIS (2008), Computer Science (2007), Minor Mathematics, University of Idaho

RESEARCH EXPERIENCES

Lead Research Scientist, SSAI/NASA Goddard Space Flight Center (2018 – Present)

NASA's Black Marble Nighttime Light Science Team

Satellite-based monitoring of power outages, disaster impacts, recovery, and service disruption affecting vulnerable populations

VIIRS nighttime lights (NTL) standard product evaluation, validation, and algorithm support

Analysis of conflict, population displacement, and socioeconomic disruption using NTL

Assessment of COVID-19 impacts on economic activity using satellite-derived indicators

Evaluation of electrification program effectiveness in developing regions

Artificial light at night (ALAN) assessment in protected and natural areas (National Parks)

LANCE MODIS/VIIRS NRT Global Flood Product Science Team

Lead responsible for the development and maintenance of the Near Real-Time (NRT) VIIRS Global Flood Mapping product at LANCE.

Conducting thorough testing and fine-tuning of the water detection algorithm for enhanced accuracy and performance.

Performing rigorous scientific testing on the final flood product to ensure validation and maintain high quality standards.

Researcher, Center for Spatial Information Science and Systems (2012 – 2017)

Remote sensing of natural disaster impacts on agriculture and food security

MODIS-based flood indices for crop loss estimation and agricultural risk assessment

Geospatial web services for flood monitoring, crop loss analysis, and decision support

SMAP-based soil moisture visualization, dissemination, and analytics services

Flood inundation mapping integrated with operational web service delivery

GEOSS Components and Services Registry for geospatial resource discovery

Land cover classification of Nepal using Landsat imagery and DEM

Research Assistant, George Mason University (2008 – 2011)

Remote sensing–based crop yield estimation using crop condition profiles
NDVI–precipitation analysis by crop type and soil permeability
Greenhouse gas emissions inventory development (Fairfax County, VA)
Transit efficiency analysis via bus stop optimization
Pedestrian, bicycle, and vehicle accident analysis in Northern Virginia

PROFESSIONAL EXPERIENCES

Lead Research Scientist (2026-Present): SSAI/NASA GSFC, Greenbelt, MD

Senior Research Scientist (2022-2026): SSAI/NASA GSFC, Greenbelt, MD

Senior Scientific Programmer/Analyst (2018-2022): SSAI/NASA GSFC, Greenbelt, MD

Researcher (2012-2017): Center for Spatial Information Science and Systems, Fairfax, VA.

Research Assistant (2008 -2011): George Mason University, Fairfax, VA.

HONORS AND AWARDS

NASA Goddard 610AT/619 Excellence in Data Science and Integrity Award (2024)
NASA Group Achievement Medal - COVID Dashboard Team (2020)
SSAI Performance Award (2020,2022, 2023, 2025)
Best Student Paper Award - The 6th In't Conference on Agro-Geoinformatics (2017)
EarthServer Innovation Award, rasdaman, Germany (2013)

PROFESSIONAL SOCIETY MEMBERSHIP

American Geophysical Union (AGU)
IEEE International Geoscience and Remote Sensing Symposium (IGARSS)

SELECT PUBLICATIONS AND BOOK CHAPTERS

Full publication lists: scholar.google.com/citations?hl=en&user=A1vkKVQAAAAJ

Wang, Z., **Shrestha, R. M.**, Román, M. O., & Kalb, V. L. (2022). *NASA's Black Marble Multi-Angle Nighttime Lights Temporal Composites*. IEEE Geoscience and Remote Sensing Letters.

Wang, Z., Román, M. O., Kalb, V. L., Miller, S. D., Zhang, J., & **Shrestha, R. M.** (2021). *Quantifying uncertainties in nighttime light retrievals from Suomi-NPP and NOAA-20 VIIRS Day/Night Band data*. Remote Sensing of Environment, 263, 112557.

Shrestha, R. M., & Rahman, M. (2021). *Flood Monitoring and Crop Damage Assessment*. In *Agro-geoinformatics* (pp. 321–349). Springer.

Aggarwal, E., de Ruiter, M. C., Sangwan, K. S., Sinha, R., Buijs, S., **Shrestha, R.**, et al. (2025). *Increasing flood risk in the Indian Ganga Basin: A perspective from the night-time lights*. EGU sphere, 2025, 1–32.