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EDUCATION

- **August 2015 – May 2021**
 - University of Georgia (*Doctoral Degree*), Athens, Georgia, USA
 - Education Major(s): *Geography*
 - Dissertation Topic: An integrated approach to utilize multi-platform data for monitoring cyanobacterial harmful algal blooms in inland waters.
- **July 2014 – June 2015 (Continuation at UGA)**
 - National Institute of Technology, Rourkela (*Doctoral Degree*), Odisha, India
 - Education Major(s): *Earth and Atmospheric Sciences*
 - Dissertation Topic: Integrated approach of in-situ and satellite remote sensing for long-term monitoring of variability in water quality parameters of Chilika Lagoon, India.
- **August 2012 – June 2014**
 - National Institute of Technology, Rourkela (*Master's Degree*), Odisha, India
 - Education Major(s): *Mining Engineering*
 - Thesis Topic: Monitoring spatial and temporal variation of total suspended sediment in Chilika Lagoon using MODIS/Terra satellite imagery.
- **September 2008 – July 2012**
 - NM Institute of Engineering & Technology, Bhubaneswar (*Bachelor's Degree*), Odisha, India
 - Education Major(s): *Electronics & Communication Engineering*
 - Project Topic: Camera based interactive wall display.

ACADEMIC/PROFESSIONAL POSITIONS

- Assistant Research Scientist, Center for Geospatial Research, Department of Geography, University of Georgia (September 2025 – Present).
- Postdoctoral Research Associate, Center for Geospatial Research, Department of Geography, University of Georgia (January 2024 - August 2025).
- Postdoctoral Research Associate, Department of Environmental Conservation, University of Massachusetts, Amherst, (June 2021-December 2023).
- Instructor, Department of Geosciences, University of Massachusetts, Amherst (September 2022-December 2022).
- Instructor of Record, Organismic and Evolutionary Biology Graduate Program, UMass Amherst (September 2021 – December 2021).
- Teaching Assistant, Department of Geography, UGA (August 2018 - May 2021).
- Research Assistant, Department of Geography, UGA (August 2015 - May 2021).
- Project Lead, *University of Georgia, CyanoTRACKER*: NSF project.

- Project Lead, Eastern India Ecological Forecasting Group III, NASA Develop National Program, *University of Georgia* (June 2017 – August 2017).
- Project Lead, Eastern India Ecological Forecasting Group II, NASA Develop National Program, *University of Georgia* (January 2017 – March 2017).
- Project Lead, Eastern India Ecological Forecasting Group I, NASA Develop National Program, *University of Georgia* (August 2016 – November 2016).
- Member Consultant, Southeast US Ecological Forecasting Group III, NASA Develop National Program, *University of Georgia* (June 2016 – August 2016). Research Assistant, Department of Earth and Atmospheric Sciences,
- Research Assistant, Department of Earth and Atmospheric Sciences, *National Institute of Technology Rourkela*, Rourkela, India (July 2014 – June 2015).

RESEARCH INTERESTS

- Application of remote sensing (field, satellite, radar) and geospatial science in water resources, mangrove forests, vegetation, and climate change studies.
- Empirical, semi-analytical, quasi-analytical modelling and algorithm development.
- Short-and long-term impact assessment of natural hazards on inland and coastal environment.
- Application of Artificial Intelligence tools in the field of remote sensing and geospatial research.

RESEARCH SKILLS

- Satellite Image Processing (SNAP, SeaDAS, ERDAS IMAGINE, ENVI, Google Earth Engine, Microsoft Planetary Computer)
- Satellite Image Analysis and Modeling
- Programming (Python, JavaScript, MATLAB)
- Statistical Analysis (Microsoft Excel, JMP Pro, Python)
- Field Remote Sensing (Handheld Spectroradiometers: SVC-GER1500, SVC-HR1024i)
- Grant proposal write-up and review
- AI & Large Language Models (LLMs) application in academic research

PEER REVIEWED PUBLICATIONS

33. **Kumar, A.**, C.B. Maniyar, N. Tesfayi, B.K. Grunert, I.R. Fiorentino, K. Herweck, E. Hyland, B. Liu, B. Bartelme, and D.R. Mishra. 2026. Advancing CyanoHAB monitoring with hyperspectral data from NASA PACE: First results and validation. *International Journal of Applied Earth Observation and Geoinformation*, 146, 105032.
32. Shrestha, S., B. Liu, J. Li, W. Huang, M.M. Baustian, E.J. D'Sa, S. Bargu, F. Messina, I.Y. Georgiou, **A. Kumar**, A. Freeman, and S. Mize. 2026. Phytoplankton biomass dynamics in wet (2019) and dry (2023) years in lake pontchartrain estuary, louisiana from sentinel 2-msi and pace-oci observations. *Science of The Total Environment*, 1011, 181126.
31. Maniyar, C.B., K. Raviprakash, **A. Kumar**, M.A. Seferian, I.R. Fiorentino, and D.R. Mishra. 2025. Low-Cost System to Support and Expand Cyanobacterial Harmful Algal Bloom Monitoring with New-Generation Ocean Color Satellites. *ACS ES&T Water*, 5(11), 6246–6257.
30. Joshi, I., **A. Kumar**, S. Singh, S. Raulo, T. Acharyya, and D.R. Mishra. 2025. A remote sensing algorithmic framework for characterizing chromophoric dissolved organic matter in lagoon-estuarine systems. *Science of the Total Environment*, 1001, 180472.

29. He, X., K. Andreadis, A.H. Roy, T. Langhorst, **A. Kumar**, and C. Butler. 2025. Long-term daily lake ice cover fractions for 107,257 Northern Hemisphere lakes. *Geophysical Research Letters*, 52(12), e2024GL113544.
28. Maniyar, C.B., X. Yan, G. Mai, D. Srivastava, S. Samiappan, A. Oliazadeh, **A. Kumar**, M. Kumar, and D.R. Mishra. 2025. Artificial Intelligence in Environmental Remote Sensing: Progress, way forward and key considerations. *Progress in Environmental Geography*, 4(3), 363-389.
27. **Kumar, A.**, C.B. Maniyar, I.R. Fiorentino, and D.R. Mishra. 2025. Remote Sensing of Cyanobacterial Harmful Algal Blooms: Current Trends and Future Directions. *Progress in Environmental Geography*, 4(1):131-150.
26. **Kumar, A.**, A.H. Roy, K.M. Andreadis, X. He, and C. Butler. 2024. A multi-sensor approach to characterize winter water level drawdown patterns in lakes. *Remote Sensing*, 16:947.
25. **Kumar, A.**, A.H. Roy, K. Andreadis, X. He, and C. Butler. 2024. LakeLevel Tracker: A Google Earth Engine-based web application for characterizing lake water levels. *LakeLine*, 43(4): 21-25.
24. Veerman, J., D.R. Mishra, **A. Kumar**, and M. Karidozo. 2024. Environmental drivers behind the exceptional increase in cyanobacterial blooms in Okavango Delta, Botswana. *Harmful Algae*, 137: 102677.
23. Singh, S., S. Raulo, T. Acharyya, D.R. Mishra, **A. Kumar**, A. Gopinath, P.R. Muduli, and G. Rastogi. 2024. Dynamics and source characterization of chromophoric dissolved organic matter (CDOM) in a tropical monsoon driven lagoon. *Marine Chemistry*, 265-266: 104430.
22. He, X., K. Andreadis, A.H. Roy, **A. Kumar**, and C. Butler. 2023. Developing a stochastic hydrological model for informing lake water level drawdown management. *Journal of Environmental Management*, 345: 118744.
21. Tarafdar, L., M. Mohapatra, P.R. Muduli, **A. Kumar**, D.R. Mishra, and G. Rastogi. 2022. Co-occurrence patterns and environmental factors associated with rapid onset of *Microcystis aeruginosa* bloom in a tropical coastal lagoon. *Journal of Environmental Management*, 325: 116580.
20. Gaiser, E.E., J.S. Kominoski, D.M. McKnight, C.A. Bahlai, C. Cheng, S. Record, W. Wollheim, K.R. Christianson, M.R. Downs, P.A. Hawman, S.J. Holbrook, **A. Kumar**, D.R. Mishra, N.P. Molotch, R.B. Primack, A. Rassweiler, R.J. Schmitt, and L. Sutter. 2022. Long-term ecological research and the COVID-19 anthropause: A window to understanding social-ecological disturbance. *Ecosphere*, 13: e4019.
19. Veerman, J., **A. Kumar**, and D.R. Mishra. 2021. Exceptional landscape-wide cyanobacteria bloom in Okavango Delta, Botswana in 2020 coincided with a mass elephant die-off event. *Harmful Algae*, 111: 102145.
18. Maniyar, C.B., **A. Kumar**, and D.R. Mishra. 2021. Continuous and Synoptic Assessment of Indian Inland Waters for Harmful Algae Bloom. *Harmful Algae*, 111: 102160.
17. Acharya, P., Muduli, P.R., D.R. Mishra, **A. Kumar**, V.V. Kanuri, and M. Das. 2021. Imprints of COVID-19 lockdowns on total petroleum hydrocarbon levels in Asia's largest brackish water lagoon. *Marine Pollution Bulletin*, 174: 113137.
16. Tarafdar, L., J.Y. Kim, S. Srichandan, P.R. Muduli, **A. Kumar**, D.R. Mishra, and G. Rastogi. 2021. Responses of phytoplankton community structure and association to changes in environmental drivers in a tropical coastal lagoon. *Science of the Total Environment*, 783: 146873.

15. Muduli, P.R., **A. Kumar**, V.V. Kanuri, D.R. Mishra, P. Acharya, R. Saha, A.K. Vidyarthi, and A. Sudhakar. 2021. Water quality assessment of the Ganges River during COVID-19 lockdown. *International Journal of Environmental Science and Technology*, 1-8.
14. Mishra, D.R., **A. Kumar**, P.R. Muduli, T. Acharyya, P. Acharya, S. Singh, and G. Rastogi. 2021. Landfall Season is critical to the impact of a cyclone on a monsoon-regulated tropical coastal lagoon. *Science of the Total Environment*, 770: 145235.
13. Mishra, D.R., **A. Kumar**, P.R. Muduli, S. Equeenuddin, G. Rastogi, T. Acharyya, and D. Swain. 2020. Decline in phytoplankton biomass along Indian coastal waters due to COVID-19 lockdown. *Remote Sensing*, 12(16): 2584.
12. **Kumar, A.**, D.R. Mishra, and N. Ilango. 2020. Landsat 8 virtual orange band for mapping cyanobacterial bloom. *Remote Sensing*, 12(5): 868.
11. Mishra, D.R., **A. Kumar**, L. Ramaswamy, V. Bodulla, M. Das, B. Page, and S. Weber. 2020. CyanoTRACKER: A cloud-based integrated multi-platform architecture for global observation of cyanobacterial harmful algal blooms. *Harmful Algae*, 96: 101828.
10. Miller, P., T.L. Mote, **A. Kumar**, and D.R. Mishra. 2019. Systematic precipitation redistribution following a strong hurricane landfall. *Theoretical and Applied Climatology*, 1-12.
9. **Kumar, A.**, C. Cooper, C. Remillard, S. Ghosh, A. Haney, F. Braun, Z. Conner, B. Page, K. Boyd, S. Wilde, and D.R. Mishra. 2019. Spatio-temporal monitoring of hydrilla to aid management actions. *Weed Technology*, 33(3): 518-529.
8. Miller, P.W., **A. Kumar**, T.L. Mote, F.D.S. Moraes, and D.R. Mishra. 2019. Persistent hydrological consequences of Hurricane Maria in Puerto Rico. *Geophysical Research Letters*, 46: 1413-1422.
7. Shrestha, S., I. Miranda, **A. Kumar**, M. Pardo, S. Dahal, T. Rashid, C. Remillard, and D.R. Mishra. 2019. Identifying and forecasting potential biophysical risk areas within a tropical mangrove ecosystem using multi-sensor data. *International Journal of Applied Earth Observations & Geoinformation*, 74: 281-294.
6. Mishra, D.R., L. Ramaswamy, **A. Kumar**, S. Bhandarkar, V. Boddula, and S. Narumalani. 2018. A Multi-Cloud Cyber Infrastructure for Monitoring Global Proliferation of Cyanobacterial Harmful Algal Blooms. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2018)*.
5. Page, B., **A. Kumar**, and D.R. Mishra. 2018. A novel cross-satellite based assessment of the spatio-temporal development of a cyanobacterial harmful algal bloom. *International Journal of Applied Earth Observation & Geoinformation*, 66: 69-81.
4. **Kumar, A.**, P. Stupp, S. Dahal, C. Remillard, R. Bledsoe, A. Stone, C. Cameron, G. Rastogi, R. Samal, and D.R. Mishra. 2017. A multi-sensor approach for assessing mangrove biophysical characteristics in coastal Odisha, India. Special issue of 'Remote Sensing' in *Proceedings of the National Academy of Sciences, India Section A: Physical Sciences*, 1-22.
3. **Kumar, A.**, D.R. Mishra, S. Equeenuddin, H.J. Cho and G. Rastogi. 2017. Differential Impact of Anniversary Severe Cyclones on the Water Quality of a Tropical Coastal Lagoon. *Estuaries and Coast*, 40(2): 317-342.
2. **Kumar, A.**, S. Equeenuddin, D.R. Mishra and B.C. Acharya. 2016. Remote monitoring of sediment dynamics in a coastal lagoon: Long-term spatio-temporal variability of suspended sediment in Chilika. *Estuarine Coastal and Shelf Science*, 170: 155-172.
1. Srichandan, S., J.Y. Kim, **A. Kumar**, D.R. Mishra, P. Bhadury, P.R. Muduli, A.K. Pattnaik and G. Rastogi. 2015. Interannual and cyclone-driven variability in phytoplankton communities of a tropical coastal lagoon. *Marine Pollution Bulletin*, 101(1): 39-52.

BOOK CHAPTER

- **Kumar, A.,** D.R. Mishra, and Sk. Md. Equeenuddin. 2019. Long-Term Analysis of Water Quality in Chilika Lagoon and Application of Bio-optical Models for Cyclone Impact Assessment. In: C. Max Finlayson, G. Rastogi, M. Suar, D.R. Mishra, and A. Pattnaik (eds.) Ecology, Conservation, and Restoration of Chilika Lagoon, India, **Springer**, Switzerland (<https://www.springer.com/gp/book/9783030334239>).

DOCTORAL DISSERTATION

- **Kumar, A.,** 2021. An integrated approach to utilize multi-platform data for monitoring cyanobacterial harmful algal blooms in inland waters. Doctoral Dissertation, University of Georgia.

MANUSCRIPTS (UNDER REVIEW/IN PREPARATION)

- **Kumar, A.** A.H. Roy, X. He, K.M. Andreadis, and C. Butler. 2026. Characterizing Winter Drawdown in Over 10,000 Northeastern and Midwestern U.S. Lakes Using Sentinel 1-SAR Derived Data. *Water Resources Research* (under review).
- **Kumar, A.,** D.R. Mishra, N. Pahlevan, T. Moore, D. Gurlin, S. Mishra. 2026. A multi-sensor cross-calibrated cyanobacteria index for Landsat 8/9-OLI, Sentinel 3-OLCI, and Envisat-MERIS. To be submitted to *International Journal of Applied Earth Observation and Geoinformation* (In preparation: submit by February 2026)
- **Kumar, A.,** Maniyar, C.B., and Mishra, D. 2026. Assessing Diurnal Variability of Cyanobacterial Blooms across Latitudinal Gradients using High-Frequency Geostationary Satellite Observations. To be submitted to *Harmful Algae* (In preparation: submit by February 2026).
- Roy, A.H., **A. Kumar,** X. He, A. Carbonneau, C. Butler, and K.M. Andreadis. 2026. Quantifying the Relationship Between Winter Lake Drawdown Patterns and Cyanobacterial Harmful Algal Bloom Development across Northeastern and Midwestern Lakes. To be submitted to *Water Resources Research* (In preparation: submit by March 2026).
- Kirtiloglu, E., **A. Kumar,** Oliazadeh, A., and D.R. Mishra. 2026. A Basin Scale CyanoHABs Drivers Analysis of an Inland Water Body by Combining Landsat OLI Data and SWAT Model. To be submitted to *Water Resources Research* (In preparation: submit by March 2026).

SOFTWARE RELEASES

- **Kumar, A.,** A. Roy, K. Andreadis, X. He, and C. Butler. 2023. A repository of winter lake drawdown characterization using satellite data and cloud computing platform (LakeLevel Tracker). Version 1.0.0; U.S. Geological Survey software release. Reston, VA. <https://doi.org/10.5066/P9ZA5I1U>
- He, X., K. Andreadis, A. Roy, **A. Kumar,** and C. Butler. 2023. A repository of hydrological modeling framework for lake drawdown management (HMF-Lake). Version 1.0.0; U.S. Geological Survey software release. Reston, VA. <https://doi.org/10.5066/P9C8BVY2>

PENDING RESEARCH GRANTS (UNDER REVIEW)

- **USGS-Georgia Water Resources Institute (GWRI) (\$266,353)** (02/01/2026 – 01/31/2029): AI-Harmonized Multi-Sensor Data Fusion for High-Resolution Monitoring and Risk Assessment of CyanoHABs in Inland Waters (**Role: PI**)

- **NASA-A.9 (ROSES 2025) (\$496,868) (08/01/2026 – 07/31/2028):** Leveraging Prithvi Foundation Model for Ecoregion-aware Modeling of Trophic Status Dynamics in waterbodies. (Role: Co-I)
- **NASA-A.7 (ROSES 2025) (\$653,845) (07/01/2026 – 06/30/2029):** HyperCyano: Multi-Sensor Integration for Genus-Level CyanoHAB Detection and Operational Water Quality Management (Role: Co-I).

PAST RESEARCH GRANT PROPOSAL CONTRIBUTION

- NASA (\$625,633) (07/01/2023 – 06/30/2026): Synoptic assessment and spatio-temporal characterization of rapidly evolving CyanoHAB in large freshwater systems (Role: Brainstorming ideas and writing the proposal).
- National Park Service (NPS) (\$60,000) (04/01/2023 – 09/30/2024): CESU-Remote sensing to characterize threat of cyanobacterial blooms on Bull Sluice Lake within the CHAT watershed (Role: Prepared preliminary satellite-based results).
- Georgia Water Resources Institute (GWRI) (\$55,299) (03/01/2019 – 02/29/2020): Developing an effective and targeted monitoring system for tracking harmful algal blooms across Georgia (Role: Assisted in writing the proposal).
- NASA DEVELOP (09/12/2016-04/01/2017): A multi-sensor approach to enhance the prediction of mangrove biophysical characteristics in Chilika Lagoon and Bhitarkanika Wildlife Sanctuary, Odisha, India (Role: Assisted in writing the proposal).
- Ohio Water Resources Center (OWRC) (November 2020): National Institutes for Water Resources (NIWR) State Water Resources Research Institute 104 (b) Grant Program (Role: Proposal Reviewer)

RESEARCH EXPERIENCE

- **(January 2024-Present) Postdoctoral Research/Assistant Research Scientist: Synoptic Assessment and Spatio-Temporal Characterization of Rapidly Evolving CyanoHABs in Large Freshwater Systems:** This project is funded by NASA and aims to develop high temporal resolution CyanoHABs products for inland waters in the United States using a multi-modal and multi-sensor data streams for characterizing rapidly evolving cyanobacterial harmful algal blooms (CyanoHABs) in large freshwater systems. This study will integrate data from Terra/Aqua-Moderate Resolution Imaging Spectroradiometer (MODIS), Envisat-Medium Resolution Imaging Spectrometer (MERIS), Sentinel's Ocean and Land Color Instrument (OLCI) sensors, and GOES-ABI (Geostationary Operational Environmental Satellite - Advanced Baseline Imager) to characterize the extremely rapid changes of cyanobacteria blooms, including their dramatic vertical and horizontal migrations. The primary research questions focus on understanding how CyanoHABs develop and vary spatiotemporally in large freshwater systems and identifying the factors that control their spatiotemporal evolution. My role in this project is to process and analyze multi-sensor satellite data, cross-calibration of CyanoHAB models across sensors, develop a cloud-based pipeline for real-time processing of GOES-ABI data, lead the field work and laboratory analysis, prepare the annual reports, present the results at annual conferences, and lead the peer review publication papers from this research. Recently, I presented preliminary results from this project at "American Geophysical Union 2024 conference in Washington, D.C." and preparing the first manuscript from this work to be submitted to "Harmful Algae" journal. I have also presented results from this work at "American Geophysical Union 2025 conference in New Orleans, LA" in December 2025.
- **(June 2021- December 2023) Postdoctoral Research: Rethinking Lake management for invasive plants under future climate: Sensitivity of lake ecosystems to winter water level**

drawdowns: This project was funded by Climate Adaptation Science Center (CASC). The project used remote sensing data, validated with on-the-ground water level and cyanobacteria data collected by partner organizations and citizen scientists, to identify winter drawdown lakes and prevalence of cyanobacteria blooms throughout the Northeast and Upper Midwest US. My role in this project was to work directly with state and federal partners to compile existing hydrology and cyanobacteria data, process and analyze remote sensing data (along with PhD student), draft annual reports, lead quarterly meetings with partners, conduct cross-region webinars and regional workshops to share models and solicit feedback. I have presented results from this project in multiple conferences including “American Geophysical Union Fall Meeting 2021 conference”, “Northeast Aquatic Biologist Conference-2022”, “North American Lake Management Society Conference-2022, and “National Water Quality Monitoring Conference-2023”. I have also published a peer reviewed journal article in “Remote Sensing” which highlights winter drawdown pattern in MA lakes using multi-sensor satellite data. In addition, I have published a magazine article “LakeLine Magazine” which featured lake water area and water level dashboard tool for monitoring water level fluctuation in our partner lakes using Sentinel 1-SAR data. I am also preparing a comprehensive winter drawdown manuscript under this project which is related to statewide drawdown patterns across eight States (MA, MN, MI, WI, CT, NH, VT, ME) and it is planned for submission in the “Water Research” Journal.

- **(August 2015 – May 2021) Ph.D. Dissertation: An Integrated Approach to Utilize Multi-platform Data for Monitoring Cyanobacterial Harmful Algal Blooms in Inland and Coastal Waters:** My dissertation was focused on the use of in-situ data and multiple new and past satellite sensors towards developing remote sensing models for detection, quantification, and monitoring of Cyanobacterial Harmful Algal Blooms (CyanoHABs) in inland lakes and Coastal Lagoons. I used multispectral satellite data (ENVISAT-MERIS, Sentinel 3-OLCI, Sentinel 2-MSI, Landsat 8-OLI) and in-situ remote sensing data for modeling purposes. For model calibration and validation, I used in-situ cyanobacteria cell counts, phycocyanin concentration, chlorophyll-a concentration and near simultaneous in-situ reflectance and satellite derived reflectance data. My research demonstrated solutions for spatial, temporal, spectral, and radiometric resolution limitations associated with use of a single satellite sensor through cross-calibration and synchronous use of multiple satellite data, fill the data gap, and focus on product continuity instead of sensor dependency. The results and products from this study will help in accurate, inexpensive, and rapid quantification and monitoring of CyanoHABs by identifying their occurrence, extent, intensity, and duration, which is needed for issuing public health alerts in advance and minimizing their negative economic and environmental impacts by timely informing the water resource managers.
- **(June 2020 – June 2021) A multi-sensor assessment of landscape-wide cyanobacteria bloom in Okavango Delta, Botswana in 2020:** This work was focused on analyzing the exceptional cyanobacteria bloom in Okavango Delta in 2020 that coincided with mass elephant die-off event in that region. I processed Sentinel 2 and Landsat images of entire delta region to produce a landscape-wide cyanobacteria index map from both satellites and guided my student to produce a four-year (2017-2020) time-series of cyanobacteria indices. This work was published in “Harmful Algae” Journal.
- **(May 2019 – June 2021) A cloud-based approach for continuous monitoring of cyanobacterial harmful algal blooms using Sentinel 3-OLCI data:** This was a collaborative work with a visiting student intern from India to create a Google Earth Engine dashboard for near real time detection and monitoring of cyanobacteria bloom in inland and coastal waters across globe using Sentinel 3-OLCI data. I presented this work at “ASPRS-PECORA21:ISRE38” conference in Baltimore, USA. This work was published in “Harmful Algae” journal.

- **(August 2015 - Present) “CyanoTRACKER” a National Science Foundation Project:** This is a multi-cloud framework to integrate community observations and remote sensing measurements for early detection of cyanobacterial harmful algal blooms in inland waterbodies of Georgia, USA (now worldwide). My responsibility in this project is to process and analyze the remote sensing data for cyanobacterial harmful algal bloom detection, quantification, and monitoring. I also maintain CyanoTRACKER social media platforms (Twitter and Facebook) and share satellite derived maps in near real time. I presented this work at “AAG-2019 Conference” in Washington D.C. and won the best student paper presentation award. We published our five years of work under this project in “Harmful Algae” journal.
- **(July 2020 - May 2021) COVID-19 Anthropause impact on coastal waters of Georgia:** This is a part of collaborative work between group of people from Long Term Ecological Research (LTER) to evaluate impacts of pause in anthropogenic activities in coastal environments during COVID-19 lockdown. I worked on producing satellite based NO₂ maps for entire United States and Spatio-temporal maps of colored dissolved organic matter along Georgia Coast. The work was published in “Ecosphere” journal.
- **(May 2020 – July 2020) COVID-19 lockdown impact assessment on coastal waters of India:** This was a collaborative work with researchers from Indian universities and management agencies to evaluate impacts of COVID-19 lockdown on nutrients load and phytoplankton productivity along coastal waters of India. I produced satellite based total suspended sediments and chlorophyll-a maps for entire Indian coast and also generated long-term time series of precipitation and surface runoff for entire India. This work was published in “Remote Sensing” journal.
- **(August 2019-September 2020) Comparative study of impacts of seasonal hurricanes on water quality of Asia’s largest brackish water lagoon:** This is a collaborative work with researchers from Indian universities and management authorities of Chilika Lagoon, India. Under this project, I created satellite-based models to prepare spatio-temporal maps of total suspended sediments, chlorophyll-a, and water transparency. I also created time-series of precipitation and surface runoff to isolate hurricanes impacts. This work was published in “Science of the Total Environment” journal.
- **(January 2019 – December 2019) Landsat 8 virtual orange band for cyanobacteria bloom study in Lake Erie:** This work was related to my dissertation chapters in which I utilized a novel Landsat 8-OLI virtual orange band (which is used for cyanobacteria bloom detection and quantification) to calibrate remote sensing models and prepare spatio-temporal maps of phycocyanin (a cyanobacteria pigment) concentration in Lake Erie. I also compared the results of Landsat 8-OLI and Sentinel 3-OLCI derived phycocyanin maps. This work was published in “Remote Sensing” journal.
- **(June 2018 - August 2018) Persistent hydrological consequences of Hurricane Maria in Puerto Rico:** This project was part of my research assistantship at University of Georgia during Summer-2018. I extracted pre-and post-Hurricane magnitude and extent data from various MODIS biophysical products including Gross Primary Productivity (GPP), Leaf Area Index (LAI), and NDVI. Also, I produced Sentinel 3-OLCI based total suspended sediment maps pre-and post-Hurricane Maria and extracted data for comparison. This work was published in “Geophysical Research Letters” journal.
- **(August 2017 – June 2018) A multi-sensor approach for monitoring cyanobacterial harmful algal blooms along freshwater-marine continuum:** This was a collaborative work with one of my lab-mate in which we captured the spatio-temporal variability of cyanobacteria bloom in Lake Okeechobee and St. Lucie River Estuary, Florida using Landsat 8 and Sentinel 2 satellite data. I presented this work at “Ocean Optics XXIV Conference” in Dubrovnik, Croatia.

- **(September 2017 - November 2017) NASA DEVELOP Project to assess Sea level rise and develop optimal green infrastructure plans to restore mangrove habitat and enhance coastal resiliency:** As a team member, I analyzed 30 years of Landsat data to quantify mangrove spatial extent near Miami Beach and isolate the impacts of severe weather events such as Hurricanes. I presented this work at “AGU-2017 Conference” (under selected topics for live telecast worldwide) in New Orleans, USA.
- **(June 2017 – August 2017) NASA DEVELOP Project to forecast mangrove biophysical parameters and land cover change in Bhitarkanika along east-coast of India:** I was the team lead of this project where I utilized long-term (20 years) time-series data of mangroves biophysical parameters (GPP, LAI, Chl-a), rainfall, and temperature data to forecast the mangrove biophysical parameters up to year 2050. I also guided my team members to forecast landcover change in the study site for 2050 using IPCC projected climate data. This work was published in “International Journal of Applied Earth Observation & Geoinformation” journal.
- **(June 2017-July 2017) Ocean Optics Project at Darlington Marine Center, University of Maine, Maine:** I was selected among one of the 20 students worldwide to receive an intensive one-month ocean color remote sensing training funded by NASA. During this training I worked on a collaborative project with other two members in my team to utilize multi-platform data to derive inherent and apparent optical properties in Oligo-to-Mesotrophic waters. I presented this work at “Ocean Sciences Meeting-2018” in Portland, Oregon.
- **(January 2017 - March 2017) NASA DEVELOP Project to study the long-term trend in mangroves biophysical parameters and land-cover change along east-coast of India:** I was the team lead of this project where I extracted long-term (20 years) data on mangroves biophysical parameters including Gross Primary Productivity, Leaf Area Index, Chlorophyll-a, and Evapotranspiration from Terra/MODIS based biophysical models developed in the previous term of this project. I also guided team members in landcover classification and change detection. I presented this work at “AGU-2017 Conference” in New Orleans, USA.
- **(September 2016 – November 2017) NASA DEVELOP Project to develop multi-sensor biophysical models for Bhitarkanika and Chilika mangrove forests along east-coast of India:** I was the team lead for this project and developed mangroves gross primary productivity, leaf area index, and chlorophyll-a models using Terra/MODIS and Landsat 8-OLI surface reflectance data. I performed cross-calibration between MODIS and OLI derived vegetation index to derive consistent products from both sensors. This work was published in “Proceedings of the National Academy of Sciences” journal.
- **(June 2016 – August 2016) NASA DEVELOP Project to utilize satellite and proximal remote sensing for mapping the spatio-temporal distribution of hydrilla (a submerged aquatic vegetation) in southeast United States:** I was the only team member with remote sensing expertise on this project and lead the team to successful completion of this project. I created Landsat 8-OLI based light attenuation model and integrated it with bathymetry data to detect and map hydrilla in Lake Thurmond, Georgia-South Carolina. I lead this work to publication in “Weed Technology” journal. I also provided output from this project to NASA Earth Observatory team to prepare image of the day map.
- **(August 2015 – June 2016) Differential Impacts of anniversary severe cyclones on a tropical coastal lagoon:** This research at University of Georgia was extension of my previous master’s thesis work on water quality of Chilika Lagoon. I analyzed differences in impacts of two severe cyclones (Phailin and Hudhud) which made landfall on same date but one year apart near Chilika. I used Terra/MODIS based total suspended sediment and chlorophyll-a models to prepare spatio-temporal maps pre-and post-cyclones. Also, I used NASA Giovanni web tool to extract precipitation and surface runoff data for watershed to evaluate differential impacts of two

cyclones. I went to India to present this work at meteorological conference “TROPMET-2016” where I won the best poster presentation award. Later, this work was published in “Estuaries and Coasts” journal.

- **(June 2013 -July 2015) Long-term spatio-temporal variability of suspended sediment in Chilika using Terra/MODIS:** This research was part of my master’s thesis work. I developed Terra/MODIS-based total suspended sediment (TSS) model for Chilika Lagoon using multi-year in-situ data. The model was validated in USA, Brazil, and China water bodies as well before creating a long-term (14 years) spatio-temporal maps of TSS in Chilika to capture seasonal and interannual variability and isolating severe weather impacts such as cyclones. I also used NASA Giovanni web-interface to download precipitation, surface runoff, and wind data. I presented this work at “ISPRS TC VIII Conference-2014” in Hyderabad, India. Later, this work was published in “Estuarine Coastal and Shelf Science” journal.

CONFERENCE PRESENTATIONS/POSTER

30. **Kumar, A.,** C. Maniyar, and D.R. Mishra. 2025. Bridging Temporal Gaps: Cross-sensor Assessment of GOES-ABI, MODIS & VIIRS for Diurnal Monitoring of CyanoHABs. **American Geophysical Union Fall Meeting**, 15-19 December 2025, New Orleans, LA, USA.
29. **Kumar, A.,** C. Maniyar, B. Grunert, N. Tesfayi, I. Fiorentino, K. Herweck, E. Hyland, B. Liu, Bradley Bartelme, and D.R. Mishra. 2025. Adapting CyAN Framework to Hyperspectral Data: Enhanced CyanoHAB Detection and Monitoring Using NASA’s PACE Satellite. **American Geophysical Union Fall Meeting**, 15-19 December 2025, New Orleans, LA, USA.
28. Maniyar, C.B., **A. Kumar,** K. Raviprakash, and D.R. Mishra. 2024. Low-cost Sensor to Strengthen CyanoHAB Monitoring with New Gen Ocean Color Satellites for Underrepresented Regions. **ASPRS Mid-South Regional Conference**, 25-27 April 2025, Oak Ridge, TN.
27. **Kumar, A.,** C. Maniyar, and D.R. Mishra. 2024. High-Frequency Monitoring of Cyanobacterial Harmful Algal Blooms in Large Inland Waters Using Geostationary Satellite Data. **American Geophysical Union Fall Meeting**, 9-13 December 2024, Washington, DC.
26. Maniyar, C., K. Raviprakash, **A. Kumar,** and D.R. Mishra. 2024. CyanoSense 2.0: Low-cost Wireless Sensor Network for Real-time Monitoring of Cyanobacterial Harmful Algal Blooms in Smaller Water Bodies. **American Geophysical Union Fall Meeting**, 9-13 December 2024, Washington, DC.
25. Maniyar, C., D.R. Mishra, G. Mai, N. Pahlevan, and **A. Kumar.** 2024. Advancing Satellite Monitoring of Early-stage Cyanobacterial Harmful Algal Blooms using Inherent Optical Properties and Machine Learning. **American Geophysical Union Fall Meeting**, 9-13 December 2024, Washington, DC.
24. He, X., K. Andreadis, T. Langhorst, A.H. Roy, and **A. Kumar.** 2024. DeepIce: A deep-learning reconstructed lake ice cover reanalysis dataset for lakes in the Northern Hemisphere. **American Geophysical Union Fall Meeting**, 9-13 December 2024, Washington, DC.
23. He, X., K. Andreadis, C. Butler, **A. Kumar,** and A.H. Roy. 2024. Estimating 40-year daily lake ice cover under the climate change for northern temperate lakes. **Northeast Aquatic Biologists Conference**, 14-16 February 2024, Fairlee, Vermont.
22. He, X., K. Andreadis, C. Butler, **A. Kumar,** and A.H. Roy. 2023. Estimating 40-year daily lake ice cover for 980,000 lakes in the Northern temperate zone. **American Geophysical Union Fall Meeting**, 11-15 December 2023, San Francisco, CA.

21. **Kumar, A.**, A.H. Roy, K. Andreadis, X. He, and C. Butler. 2023. A multi-sensor cloud-based tool for monitoring cyanobacterial harmful algal blooms in small waterbodies. **13th National Monitoring Conference**, 24-28 April 2023, Virginia Beach, VA.
20. Roy, A.H. X. He, **A. Kumar**, K. Andreadis, and C. Butler. 2023. Winter lake drawdowns: prevalence, hydrologic characteristics, and ability to meet management guidelines. **Northeast Aquatic Biologists Meeting**, 15-17 February 2023, Plymouth, MA.
19. Deeds, J. and **A. Kumar**. 2023. The evolution of lake habitat assessments: Finding the missing link. **Northeast Aquatic Biologist Conference**, 15-17 February 2023, Plymouth, MA.
18. He, X., K. Andreadis, A.H. Roy, and **A. Kumar**. 2022. A hydrological modeling framework for assessing winter drawdown lakes management. **American Geophysical Union Fall Meeting**, 12-16 December 2022, Chicago, IL.
17. **Kumar, A.**, A.H. Roy, K. Andreadis, and X. He. 2022. An integrated multi-sensor cloud-based framework to characterized winter water level drawdown of lakes and reservoirs. **North American Lake Management Society Conference**, 14-17 November 2022, Minneapolis, MN.
16. **Kumar, A.**, A.H. Roy, K. Andreadis, C. Butler, and X. He. 2022. A cloud-based framework to characterize winter water level drawdown of lakes in the northeast United States using satellite remote sensing. **Northeast Aquatic Biologists Conference**, 2-4 March 2022, Portland, ME.
15. **Kumar, A.**, A.H. Roy, K. Andreadis, C. Butler, C.J. Gleason, and X. He. 2021. A multi-sensor cloud-based framework to characterize winter water level drawdown of lakes and reservoirs in northeast United States. **American Geophysical Union Fall Meeting**, 13-17 December 2021, New Orleans, LA, USA.
14. He, X., K. Andreadis, **A. Kumar**, C. Butler, C.J. Gleason, A.H. Roy. 2021. Assimilation of satellite data in a hydrological model to improve the water level estimation in winter drawdown lakes, Massachusetts. **American Geophysical Union Fall Meeting**, 13-17 December 2021, New Orleans, LA, USA.
13. Maniyar, C., **Kumar, A.** and D.R. Mishra. 2020. Web-based Interactive Approach for Continuous Monitoring of Indian Inland and Estuarine Waterbodies for Harmful Algal Blooms. **National Symposium on Remote Sensing for Environment Monitoring and Climate Change Assessment: Opportunities and Challenges**, Indian Society of Remote Sensing (ISRS) and Indian Society of Geomatics (ISG), Virtual, December 2020.
12. **Kumar, A.** and D.R. Mishra. 2020. COVID-19 Lockdown affected nutrient load and phytoplankton production in Indian Coastal Waters. **Marine Sciences Student Research Symposium-2020** (Zoom presentation), University of Georgia, Athens, GA, USA.
11. **Kumar, A.** and D.R. Mishra. 2019. A multi-sensor approach for monitoring cyanobacterial harmful algal blooms in a large subtropical lake. **Coastal and Estuarine Research Federation (CERF)-2019**, November 03-07, 2019, Mobile, Alabama, USA.
10. **Kumar, A.**, C. Maniyar, and D.R. Mishra. 2019. A cloud-based approach for continuous monitoring of cyanobacterial harmful algal blooms using Sentinel 3-OLCI data. **ASPRS-PECORA21:ISRE38**, October 06-11, 2019, Baltimore, Maryland, USA.
9. Mishra D., **A. Kumar**, G. Rastogi, and S. Narulmalani. 2019. A multi-sensor technique for monitoring cyanobacterial harmful algal blooms in freshwater lake and brackish water lagoon. **IEEE Geoscience and Remote Sensing Society (IGARSS)**, July 28-August 2, 2019, Yokohama, Japan.
8. **Kumar A.**, Mishra, D.R., L. Ramaswamy, and V.K. Boddula. 2019. CyanoTRACKER: A multi-cloud cyber infrastructure for monitoring global proliferation of cyanobacterial harmful algal blooms. **AAG Annual Meeting**, April 3-7, 2019, Washington, DC.

7. **Kumar, A.,** D.R. Mishra, and B. Page. 2018. Adapting current state of art: A multi-sensor approach for monitoring cyanobacterial harmful algal blooms along freshwater-marine continuum. **Ocean Optics XXIV**, October 7-12, 2018, Dubrovnik, Croatia.
6. **Kumar, A.,** D.R. Mishra, B. Lamb, and B. Liu. 2018. Multi-platform sensor data fusion for estimating the inherent and apparent optical properties in Oligo-to-Mesotrophic waters. **Ocean Sciences Meeting**, February 11-16, 2018, Portland, Oregon.
5. **Kumar, A.,** D.R. Mishra, R. Bledsoe, C. Cameron, S. Dahal, C. Remillard, A. Stone, and P. Stupp. 2017. A Multi-Sensor Approach to Enhance the Prediction of Mangrove Biophysical Characteristics in Chilika Lagoon and Bhitarkanika Wildlife Sanctuary, Odisha, India. **AGU Fall Meeting**, December 11-15, 2017, New Orleans.
4. **Kumar, A.,** C. Cooper, S. Ghosh, A. Haney, F. Braun, Z. Conner, and D.R. Mishra. 2017. Utilizing NASA Earth Observations and Proximal Remote Sensing for Mapping the Spatio-Temporal Distribution of Hydrilla verticillate. **AAG Annual Meeting**, April 5-9, 2017, Boston, Massachusetts.
3. **Kumar, A.,** D.R. Mishra, S. Equeenuddin, and G. Rastogi. 2016. Tale of two cyclones: Differential Impact of Phailin and Hudhud on Chilika Lagoon. **National Symposium on Tropical Meteorology: Climate Change and Coastal Vulnerability**, Odisha, India, December 18-21, 2016.
2. **Kumar, A.,** D. Mishra, and Sk. Equeenuddin. 2016. Differential impact of anniversary severe cyclones on a tropical coastal lagoon. **AAG Annual Meeting**, March 29 – April 2.
1. **Kumar, A.,** S. Equeenuddin, D.R. Mishra, and B.C. Acharya. 2014. Variability of total suspended sediment in Chilika Lake during Phailin using MODIS/Terra. **ISPRS TC VIII Mid-Term Symposium** on “Operational Remote Sensing Applications: Opportunities, Progress and Challenges” 9-12 December, 2014-Hyderabad, India.

AWARDS & SCHOLARSHIPS/FELLOWSHIPS

- Darwin Teaching Fellowship-2021 (\$4600): University of Massachusetts, Amherst, MA, USA
- Outstanding teaching assistant award-2021 (Recognition Award): University of Georgia, USA
- Best-paper presentation award-2020 (Recognition Award): ISRS and ISG, India
- Summer Doctoral Research Fellowship-2019 (\$3500): University of Georgia
- AAG-2019 RSSG Student Illustrated Paper award (1st Place) (\$300): AAG-2019, Washington, DC.
- Foreign travel assistance award (\$1200): Ocean Optics conference-2018, Dubrovnik, Croatia.
- Early career scientist travel award (\$500): Ocean Sciences Meeting-2018, Portland, Oregon.
- Selected among 20 students worldwide for Ocean Optics training (Summer-2017), funded by NASA.
- DEVELOPers of the term (Recognition Award): NASA DEVELOP (Fall-2017) among 102 participants.
- AGU Fall-2017 conference travel award (\$1400): NASA DEVELOP National Program.
- AAG-2017 conference travel award (\$1700): NASA DEVELOP National Program.
- Best Poster Presentation Award (Recognition Award): National Symposium on Tropical Meteorology: Climate Change and Coastal Vulnerability. Bhubaneswar, Odisha, India, December 18-21, 2016.

- Graduate Research Fellowship, Department of Earth and Atmospheric Sciences, National Institute of Technology Rourkela, India (2014).
- Institute Silver Medal (Recognition Award) for being Topper of Master's batch (2012-14), National Institute of Technology Rourkela, India (2014).
- Graduate Research Fellowship, Department of Mining Engineering, National Institute of Technology Rourkela, India (2012).

OCCASIONAL REVIEWER FOR PEER REVIEWED JOURNALS

- Remote Sensing
- Remote Sensing of Environment
- ISPRS Journal of Photogrammetry and Remote Sensing
- Water Research
- International Journal of Remote Sensing
- Agricultural and Forest Meteorology
- Sensors
- Drones
- Remote Sensing Letters
- Water Science and Engineering
- Journal of the American Water Resources Association

Reviewer profile page link (<https://publons.com/researcher/1316047/abhishek-kumar/peer-review/>).

COURSES TAUGHT (TEACHING ASSISTANT/ INSTRUCTOR)

- Field & Lab Methods in Remote Sensing (GEOG4460/6460: Graduate Level), Department of Geography, UGA (Fall-2025) (Role: Instructor)
- Remote Sensing & Image Interpretation (GEOG 426/626: Undergrad/Grad Level), Department of Geosciences, University of Massachusetts, Amherst (Fall-2022) (Role: Instructor)
- OEB-Proseminar (ORGEVBI 697B-01: Graduate Level), Organismic and Evolutionary Biology Graduate Program, UMass Amherst (Fall-2021) (Role: Instructor of Record)
- Remote Sensing of Environment (GEOG4350/6350: Graduate Level), Department of Geography, UGA (Fall-2018, Fall-2019, and Fall-2020) (Role: Teaching Assistant)
- Field Remote Sensing (GEOG4460/6460: Graduate Level), Department of Geography, UGA (Fall-2017, Fall-2018, Fall-2019, and Fall-2020) (Role: Teaching Assistant)
- Digital Image Analysis (GEOG4450/6450: Graduate Level), Department of Geography, UGA (Spring-2019 and Spring-2021) (Role: Teaching Assistant)
- Introduction to Landform Lab (GEOG1113L: Undergraduate Level) Department of Geography, UGA (Spring-2020) (Role: Instructor of Record)

GUIDED STUDENTS (GRADUATE THESIS)

- Nancee Uniyal (Graduate Student, Department of Geography, University of Georgia) (Role: Advisory Committee Member)
- Nathan Tesfayi (Graduate Student, Department of Geography, University of Georgia) (Role: Advisory Committee Member)

- Bente Vrijzen (Graduate Student, Erasmus University Rotterdam, Rotterdam, Netherlands) (Role: Mentor)
- Chintan Maniyar (Graduate Student, Indian Institute of Remote Sensing, ISRO, India & University of Georgia) (Role: Mentor)
- Elif Kiyak (Graduate Student from Turkey) (Role: Mentor)

OTHER ACTIVITIES

- Invited as a guest lecturer by Department of Marine Sciences at Berhampur University, India for an International Workshop entitled “Satellite and Geospatial Technologies for Marine and Coastal Research”, organized by International Science Committee (ISC), Scientific Committee on Oceanic Research (SCOR) in December 2025.
- Served as NASA DEVELOP Science Advisor (Summer 2025 term, Ohio Disasters), Athens, Georgia.
- Organized a CyanoHAB session (proposed session) for inland lakes at 13th National Water Quality Monitoring Conference, Virginia Beach, and evaluated submitted abstracts to that session (April 2023).
- Invited as a guest lecturer to present my research in the Guest Lecture Series organized by the Department of Geosciences at University of Massachusetts, Amherst (April 2023).
- Provided Google Earth Engine and ArcGIS training to 20 undergraduate students (UMass, Amherst) who volunteered for satellite data extraction in our winter lake drawdown project. Some students also received class credit for their work.
- Served as diversity, equity, inclusion, and justice committee member at UMass Amherst (September 2021- May 2022).
- Invited as a guest lecturer to share my research related to remote sensing of cyanobacterial harmful algal blooms in the Odum School of Ecology, University of Georgia (Spring 2017).
- Participated in organizing a workshop for creating awareness about harmful algae bloom at Oconee County High School, Watkinsville, Athens, Georgia (September-2016).
- Provided satellite image processing training to NASA DEVELOP participants.
- Provided satellite image processing and atmospheric correction training to students from Hobart and William Smith Colleges, New York.
- Provided satellite image processing training to students from Creighton University.
- Volunteered flood mapping using satellite data for Cloud to Street Company.

NEWS ARTICLES & MEDIA HIGHLIGHTS

- Provided materials to prepare news article (Mongabay) on cloud-based tool for detecting cyanobacterial harmful algal blooms in India’s waterbodies (<https://india.mongabay.com/2022/02/new-tool-enables-early-detection-of-cyanobacterial-blooms-in-indias-waterbodies/>).
- Provided materials and satellite maps related to cyanobacteria blooms to prepare monthly newsletter in European Cooperation in Science and Technology on our CyanoTracker project (<https://cyanocost.files.wordpress.com/2018/10/cyanonews-issue-10-sep-oct-2018.pdf>).
- Provided materials related to Cyanobacterial Harmful Algal Blooms to NASA Landsat Science team to prepare special issue article (<https://landsat.gsfc.nasa.gov/article/satellites-on-toxic-algae-patrol/>).

- Provided materials to NASA Earth Observatory team to prepare image of the day map for hydrilla (<https://earthobservatory.nasa.gov/images/89385/mapping-a-tenacious-invader-in-lake-thurmond>).
- Provided satellite map to prepare CyanoTRACKER news article (<https://news.uga.edu/new-system-detects-toxic-algae/>).

WEBSITE LINKS

- Google Scholar (<https://scholar.google.com/citations?user=3CurrjUAAAAJ&hl=en>)
- LinkedIn (<https://www.linkedin.com/in/abhishek-kumar-49348b143/>)
- ResearchGate (https://www.researchgate.net/profile/Abhishek_Kumar412)
- Web of Science (<https://www.webofscience.com/wos/author/record/1632442>)
- Geography Department UGA (<https://geography.uga.edu/directory/people/abhishek-kumar-0>)