Dr. MANOJ KUMAR

E-mail: manojfri@gmail.com, kumarmanoj@icfre.org
Phone No. +91 80774 13164 (M); +91 135 222 4235/4220 (O)
Scientist and In-charge: GIS Centre, IT & GIS Discipline
Forest Research Institute, PO: New Forest
Dehradun - 248 006, Uttarakhand, India

Career Objective: To work for the sustainable development and protection of the environment

Present research and academic engagements

- Working as Scientist and In-charge: GIS Centre, Forest Research Institute (FRI), Dehradun
- Faculty for teaching subjects: 1. Remote Sensing & GIS, and 2. Industrial Pollution Control to the students of M.Sc. Environment Management and M.Sc. Forestry courses at FRI Deemed to be University, Dehradun, India.
- Course co-ordinator and faculty for teaching compulsory paper on "Computer Applications" for the students of PhD course work at the FRI Deemed to be University, Dehradun, India.
- Course co-ordinator and faculty for the EDUSAT outreach course (by IIRS/ISRO) on Remote Sensing and GIS.
- Adjunct faculty for teaching subjects Computer application in forestry, Statistics and Biometry for the State Forest Services probationers of Central Academy for State Forest Services (CASFOS), Dehradun.
- Principal Investigator (PI) for the third national communication (NATCOM) on theme "Climate change vulnerability of Indian forests" for its submission to UNFCCC, funded by UNDP-GEF-MoEF&CC, Govt. of India.
- PI of the project "Climate change vegetation modelling" funded by GB Pant Institute, Almora.
- PI of the project "Geospatial mapping of RET/NWFP species….." funded under National Mission on Himalayan Studies (NMHS), MOEF&CC, Govt. of India.
- PI of the project "Evaluation of urban riparian zones" funded under International fellowship for developing country scientists, Department of Science & Technology, Govt. of India.
- PI of the project "Forest resources and plant biodiversity" funded under National Mission for Sustaining the Himalayan Ecosystem (NMSHE), Department of Science & Technology, Govt. of India.

Professional preparation

- Expert Member of NITI (National Institution for Transforming India) Aayog, Government of India for the spatial mapping of wasteland area at the country level.
- Master Trainer on behalf of Ministry of Environment, Forest and Climate Change; Govt. of India for "Online submission and monitoring of Environmental, Forests and Wild life clearance proposal" for developmental projects.
- Master Trainer for planning and implementation of Climate Change actions on behalf of State Climate Change Centre, Uttarakhand, Dehradun.
- Qualified UGC NET (National Eligibility Test) (https://ntanet.nic.in/) for the eligibility of Assistant Professor in Indian Universities and Colleges in the subject Environmental Sciences (Dec 2012 & June 2013).
- Oracle certificate in Java programming language using Java SE6.
- Ph.D. in Forestry (Environment Management) for the thesis entitled "Analysing impacts of climate change on forest using dynamic vegetation model" from FRI Deemed to be University, Dehradun (Aug 2018).
- PG Diploma in Remote Sensing & GIS with specialisation in Forest Resources & Ecosystem Analysis from Indian Institute of Remote Sensing (IIRS), Dehradun, (ISRO, Department of Space, Government of India), (June 2014) 74% marks.
- M.Sc. Environment Management, FRI Deemed to be University, Dehradun, (2003-2005), 77% marks.
- B.Sc. Environment and Water Management, AN College, Patna, (1998-2002), 71% marks.

Professional skills (scientific abilities and working knowledge of the scientific tools)

- Arc GIS, ERDAS Imagine, ENVI, CDAT (Climate Data Analysis Tool), FRAGSTATS, MaxEnt, GARP, SAM (Spatial Analysis in Macro ecology).
- Java, Linux, FORTRAN, Fortran Simulation Translator (FST).

- Crop and vegetation models for climate vulnerability and impact assessment like IBIS, Info-Crop, WOFOST, DSSAT, DNDC, 3-PG, LANDIS-II, Biome-BGC, LPJ, JULES.
- Effective communication and leadership skills. Well versed with drafting reports, writing project proposals, organising scientific seminar/workshops. Planning, implementation and monitoring of developmental and research programmes in an effective way.

Contribution to Scientific and Technical committees
- Member of the IUCN Commission on Ecosystem Management for the Period 2017-2020
- Member of advisory committee for the International conference on "Conservation of natural resources….", by William Research Centre, Kanyakumari, 2019.
- Member of the Scientific Board of International Institute of Chemical, Civil, Agricultural and Environmental Engineers (IICBE) (http://www.iicbe.org/editorial_board.php?cid=11)
- Member of technical committee for the International Conference on Sustainable Environment and Agriculture, October, 2014, San Diego, USA
- Technical committee member for the Asia Pacific Workshop on Forest Hydrology by APAFRI, September 2013, Dehradun
- Served Indian Society of Remote Sensing, Dehradun, IIRS, Dehradun, India (Joint Secretary for the period 2016-2018, and Member for the period 2018-2020)
- Member of technical committee for the IXth Commonwealth Forestry Congress (CFC), April, 2017, FRI, Dehradun

Important projects completed successfully related to Environment and Forests
- Technical expert for the Forest-PLUS project funded by USAID; "Develop tools, techniques, and methods for REDD+ initiatives in India" in collaboration with Tetra Tech/ARD, New Delhi.
- Nodal Officer for the State of Bihar for developing Detailed Project Report (DPR) on Forestry Interventions for Ganga Rejuvenation funded by National Mission on Clean Ganga (NMCG), Ministry of Water Resources, Govt. of India.
- Nodal Officer for implementing the project "Identification of extent of forest lands in forest fringe villages" funded by National Rainfed Area Authority (NRAA), Planning Commission, Govt. of India.
- PI of the completed research project "Assessment of Ecosystem Services imparted by forests of Uttarakhand".
- PI of the consultancy project "EIA/EMP of Chirgaon/Majhgaon (60MW) hydroelectric project" sponsored by Himachal Pradesh Power Corporation Limited, Shimla.
- Co-PI in the project "Process based forest vegetation modelling" funded by ICFRE.
- Co-PI in the project "Energy & mass exchange in Pine vegetative system (Funded by SAC-ISRO, Govt. of India, Ahmedabad)".
- Environment Management Plan & Risk Assessment for laying of the 95 Km. ATF (Aviation Turbine Fuel) pipeline; Manali to Chennai Airport; for CPCL (Chennai Petroleum Corporation Ltd., Chennai).
- Environment Management Plan & Risk Assessment for laying of the ATF (Aviation Turbine Fuel) pipeline; Devanagundi to New International Airport; Devanahalli, Bangalore for IOCL (Indian Oil Corporation Limited, Chennai).
- Environment Impact Assessment (EIA) for proposed Industrial estate at Kalsi by SIDCUL (State Industrial Development Corporation of Uttaranchal).
- Baseline study for EIA of proposed ITC unit at Haridwar in association with ERM (Environment Resources Management India Pvt. Ltd.).
- EIA study for expansion of steel plant unit of MESCO (Mideast Integrated Steels Ltd.) at Jajpur, Orissa.
- Pollution level analysis in different locations of Delhi during Deepavali festival in association with DPCC (Delhi Pollution Control Committee).
- Pollution load study of Delhi under Yamuna Action Plan Phase-II in association with TEC (Tokyo Engineering Consultants Co. Ltd., Tokyo, Japan).

Tasks executed by providing technical guidance in the capacity of technical consultant while working with University School of Environment Management, GGS IP University, Kashmere Gate, Delhi. (A Govt. consultant of Delhi Pollution Control Committee).

- Efficacy and Efficiency report of Pollution Control System (ETP/STP, Air & Noise pollution control, hazardous waste handling etc. required for the legal compliance of Delhi Pollution Control Committee) for more than 50 small scale industries and pollution monitoring of more than 100 industries.

Projects involved as team member at IRADe (Integrated Research and Action for Development), New Delhi (www.irade.org), a fully autonomous advance research institute & centre of excellence in the area of Urban Development on "Climate Change Vulnerability and Adaptation", governed Dr. Jyoti K. Parikh & Dr. Kirit Parikh.

- Natural Resource Accounting of Goa, Phase-II sponsored by Ministry of Statistics and Programme Implementation, Central Statistical Organisation, (Environment Statistics Unit), Govt. of India.
- Analysis, strategies, action plan & implementation of policy for the ecosystem of Marine National Park, Gujarat in harmony with industrial development.

Achievements and Awards

- SK Seth Prize in the field of Forestry for the year 2018 for the best research publication in the journal Indian Forester.
- Won best oral paper presentation award in Environmental & Forestry sciences during 2nd Himachal Pradesh Science Congress, 20-21 November, 2017 at Shimla; organised by Himachal Pradesh Council for Science Technology & Environment, Govt. of HP for the paper Modelling vulnerability of forests in the Indian Western Himalayan region using multi criteria analysis of indicators: a case study of Himachal Pradesh.
- Won certificate of excellence for environmental quiz organized by "The Times of India and ONGC"
- Honor of standing first in all India ranking of entrance test conducted by FRI for the admission in its different master courses.
- Stood first in environment quiz competition organised by Department of Environment & Water Management, AN College, Patna at college level.
- Felicitated by chief minister of Uttarakhand (Narayan Dutt Tiwari) for successfully organizing wildlife week in the year 2004 in association with IGNFA, WII, FRI, SCFF & Uttaranchal Forest department.

Memberships of professional organizations

- Asia Pacific Chemical, Biological & Environmental Engineering Society, Hong Kong (2000820)
- Geochemical Society, USA (188755 GS)
- Global Spatial Data Infrastructure Association, Canada
- Himalayan Geology, Wadia Institute of Himalayan Geology, Dehradun (LTSS-433/2014)
- Himalayan Young Researchers' Forum, GB Pant Institute of Himalayan Environment and Development, Almora, Uttarakhand
- Indian Association of Hydrologist, NIH, Roorkee, India (LM 1687)
- Indian Association of Soil and Water Conservationist, Dehradun, India (LM 1845)
- Indian Society of Remote Sensing, Dehradun, India (L 4241)
- Indian Water Resources Society (IWRS), IIT, Roorkee, India (LM 12-7368)
- International Association of Hydrological Sciences, Canada
- The Indian Science Congress Association, Kolkata, India (L28443)

Trainings organized on

- "Application of Remote Sensing and GIS in forest resource assessment" one-week training course for the faculties of Universities, research scholars and officers of forest departments on regular basis, conducted every year since 2017.
- "Forest mensuration and tree pruning techniques" for Department of Forest and Wild life, Government of NCT of Delhi, Haryana Forest Department, Chandigarh Forest Department and Punjab Forest Department.

- "Agroforestry: Scope for livelihood security" for Uttarakhand forest department, Haryana Forest Department, Chandigarh forest department and Punjab Forest department.
- "Urban forests: selection of species, techniques and specification" for department of forests, Chandigarh.
- "Wasteland development though plantation" for Department of forest and wild life, Government of NCT of Delhi.
- "Environmental Statistics" for Indian Statistical Services (ISS) Probationers.

Trainings/workshops attended
- One-week training course on "Hydrological modelling using RS/GIS with special reference to climate change" organized by NIH, Roorkee and The Institution of Engineers, Roorkee, India during 24-28 September, 2012.
- Two weeks ICAR short course on "Nonparametric approaches in crop modelling" at Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, India during 20-29 November, 2012.
- Two weeks training on "InfoCrop Model for yield forecasting" organized jointly by Indian Meteorological Department and CCS Haryana Agricultural University, Hisar, India during 22-30 April, 2013.
- Certificate of achievement for the Campbell Scientific Canada Eddy Covariance Training Course held at Centre for Environment Science and Climate Resilient Agriculture, IARI, New Delhi, India during 28-30 November, 2013.

Publications
- Singh RK, Drews M, De la sen M, Srivastava PK, Trisasongko BH, **Kumar M**, Pandey MK, Anand A, Singh SS, Pandey AK, Dobriyal M, Rani M, Kumar P (2021) Highlighting the compound risk of COVID-19 and environmental pollutants using geospatial technology. Scientific reports 11:8363. https://doi.org/10.1038/s41598-021-87877-6
- Singh RK, Sinha VSP, Joshi PK, **Kumar M** (2021) A multinomial logistic model-based land use and land cover classification for the South Asian Association for Regional Cooperation nations using Moderate Resolution Imaging Spectroradiometer product. Environment, Development and Sustainability 23:6106–6127. https://doi.org/10.1007/s10668-020-00864-1
- Dhyani S, Murthy IK, Kadaverugu R, Dasgupta R, **Kumar M**, Gadpayle KA (2021) Agroforestry to Achieve Global Climate Adaptation and Mitigation Targets: Are South Asian Countries Sufficiently Prepared? Forests 12,303. https://doi.org/10.3390/f12030303
- **Kumar M**, Kalra N, Singh H, Sharma S, Rawat PS, Singh RK, Gupta AK, Kumar P, Ravnidranath (2021) Indicator-based vulnerability assessment of forest ecosystem in the Indian Western Himalayas: An analytical hierarchy process integrated approach. Ecological Indicators 125:107568. https://doi.org/10.1016/j.ecolind.2021.107568
- Kumar P, Singh SS, Pandey AK, Singh RK, Srivastava PK, **Kumar M**, Drews M et al (2020) Multi-level impacts of the COVID-19 lockdown on agricultural systems in India: The case of Uttar Pradesh. Agricultural Systems. https://doi.org/10.1016/j.agsy.2020.103027
- Singh RK, **Kumar M**, Drews M, Sen MDL, Singh SS, Pandey Ak, Srivastava PK, Dobriyal M, Rani M, Kumar P, Kumar M (2020). Short term statistical forecasts of COVID-19 infections in India. IEEE Access.
- Haq SM, Calixto ES, **Kumar M** (2020) Assessing Biodiversity and Productivity over a Small-scale Gradient in the Protected Forests of Indian Western Himalayas. Journal of Sustainable Forestry. https://doi.org/10.1080/10549811.2020.1803918
- Singh RK, Sinha VSP, Joshi PK, **Kumar M** (2020) Mapping of agriculture productivity variability for the SAARC nations in response to climate change scenario for the year 2050. In: Remote Sensing and GIScience, Springer Nature, Switzerland.
- Olokeogun OS and **Kumar M** (2020) An indicator based approach for assessing the vulnerability of riparian ecosystem under the influence of urbanization in the Indian Himalayan city, Dehradun. Ecological Indicators 119-106796. https://doi.org/10.1016/j.ecolind.2020.106796
- **Kumar M** and Singh H (2020) Agroforestry as a Nature-Based Solution for Reducing Community Dependence on Forests to Safeguard Forests in Rainfed Areas of India. In: Nature-based Solutions for Resilient Ecosystems and Societies. Springer Nature.
- Singh RK, Sinha VSP, Joshi PK, **Kumar M** (2020) Modelling Agriculture, Forestry and Other Land Use (AFOLU) in response to climate change scenarios for the SAARC nations. Environmental Monitoring and Assessment. https://doi.org/10.1007/s10661-020-8144-2
- Rawat AS, Kalra N, Singh H, **Kumar M** (2020) Application of vegetation models in India for understanding the forest ecosystem processes. Indian Forester 146(2):93-100. DOI: 10.36808/if/2020/v146i2/151208
- **Kumar M**, Kalra N, Ravindranath NH (2020) Assessing the response of forests to environmental variables using a dynamic global vegetation model: An Indian perspective. Current Science 118(5):700-701

- Singh RK, Sinha VSP, Joshi PK, **Kumar M**. (2020) A Multinomial logit-based land use and land cover classification for the SAARC nations using MODIS product. Environment, Development and Sustainability.
- Singh H, Kumar N, **Kumar M**, Singh R (2020) Modelling habitat suitability of western tragopan (*Tragopan melanocephalus*) a range-restricted vulnerable bird species of the Himalayan region, in response to climate change. Climate risk management. https://doi.org/10.1016/j.crm.2020.100241
- Pokhriyal P, Rehman S, Areendran G, Raj K, Pandey R, **Kumar M**, Sahana M, Sajjad H (2020) Assessing forest cover vulnerability in Uttarakhand, India using analytical hierarchy process. Modeling Earth Systems and Environment. https://doi.org/10.1007/s40808-019-00710-y
- Singh H, Yadav M, Kumar N, Kumar A, **Kumar M** (2020) Assessing adaptation and mitigation potential of roadside trees under the influence of vehicular emissions: A case study of *Grevillea robusta* and *Mangifera indica* planted in an urban city of India. PLoS ONE 15(1): e0227380. https://doi.org/10.1371/journal.pone.0227380
- Gupta AK, Negi M, Nandy S, **Kumar M**, Singh V, Petrosillo I, Valente D, Pandey R (2019) Mapping socio-environmental vulnerability to climate change in different altitude zones in the Indian Himalayas. Ecological Indicators. https://doi.org/10.1016/j.ecolind.2019.105787
- **Kumar M**, Kalra N, Khaiter P, Ravindranath NH, Singh V, Singh H, Sharma S, Shahryar R (2019) PhenoPine: A simulation model to trace the phenological changes in *Pinus roxburghii* in response to ambient temperature rise. Ecological Modelling 404:12-20
- **Kumar M**, Padalia H, Nandy S, Khaiter P, Kalra N (2019) Does spatial heterogeneity of landscape explain the process of plant invasion? A case study of Hyptis suaveolens from Indian Western Himalaya (2019). Environmental Monitoring and Assessment. https://doi.org/10.1007/s10661-019-7682-y
- **Kumar M**, Savita, Kushwaha SPS (2019) Managing the forest fringes of India: A national perspective for meeting the sustainable development goals. In Sustainability perspectives: Science, Policy and practice, Strategies for Sustainability (Eds. Khaiter PA and Erechtchoukova MG). Springer Nature, Switzerland.
- **Kumar M**, Singh MP, Singh H, Dhakate PM, Ravindranath NH (2019) Forest working plan for the sustainable management of forest and biodiversity in India. Journal of Sustainable Forestry. https://doi.org/10.1080/10549811.2019.1632212
- Singh P, Kaur A, Pamposh, **Kumar M** (2019) Integration of scientific approaches to the conservation and management practices of Manipur Brow-antlered deer in India. Indian Journal of Forestry (Accepted)
- **Kumar M**, Padalia H, Singh H (2019) Remote sensing for mapping invasive alien plants: Opportunities and Challenges. In book Forest Invasive Species. Indian Council of Forestry Research and Education, Dehradun.
- **Kumar M**, Savita, Singh H, Pandey R, Singh MP, Ravindranath NH, Kalra N (2018) Assessing vulnerability of forest ecosystem in the Indian Western Himalayan region using trends of net primary productivity. Biodiversity and Conservation. https://doi.org/10.1007/s10531-018-1663-2
- Kalra N and **Kumar M** (2018) Simulating the Impact of Climate Change and its Variability on Agriculture. In Climate Change and Agriculture in India: Impact and Adaptation. Pp 21-28. https://doi.org/10.1007/978-3-319-90086-5_3
- Savita, Mathur PK, Sharma LK, **Kumar M** (2018) Forestry Interventions for Ganga rejuvenation: A geospatial analysis for prioritising sites. Indian Forester, 144 (12): 1127-1135
- Pandey R, Alatalob JM, Thapliyal K, Chauhan S, Archied KM, Gupta AK, Jha SK, **Kumar M** (2018) Climate change vulnerability in urban slum communities: Investigating household adaptation and decision-making capacity in the Indian Himalaya. Ecological Indicators 90: 379–391
- **Kumar M**, Rawat SPS, Singh H, Ravindranath NH, Kalra N (2018) Dynamic forest vegetation models for predicting impacts of climate change on forests: An Indian perspective. Indian journal of forestry 41 (1) 1-12.
- Savita, **Kumar M**, Kushwaha SPS (2018) Forest resource dependence and ecological assessment of forest fringes in rainfed districts of India. Indian Forester, 144 (3) : 211-220.
- Singh H, Verma A, **Kumar M**, Sharma R, Gupta R, Kaur M, Negi M, Sharma SK (2017) Phytoremediation: A Green Technology to Clean Up the Sites with Low and Moderate Level of Heavy Metals. Austin Biochemistry. Austin Biochem. 2(2): 1012
- Singh H, Savita, Sharma R, Sinha S, **Kumar M**, Kumar P, Verma A, Sharma SK (2017) Physiological functioning of *Lagerstroemia speciosa* L. under heavy roadside traffic: an approach to screen potential species for abatement of urban air pollution. 3 Biotech. 7:61

- **Kumar M** (2013) Thar deserts, Rajasthan deserts, and Darling river. In Biomes & Ecosystems: An Encyclopedia. Salem Press: A Division of EBSCO Publishing Ipswich: New Jersey, USA (ISBN: 978-1-4298-3813-9).
- **Kumar M** (2010) Book "Soil and Water as Indicators of Resource Condition", Publisher: Academic Publishing GmbH & Co. KG, Germany (ISBN: 978-3-8484-1278-5)
- Book "Forest resource dependence and ecological assessment of forest fringes in rainfed districts of India" published by Forest Research Institute, Dehradun in 7 volumes (ISBN: 978-81-929285-4-8)
- Ram N., Kumar P., **Kumar M.**, Singh L. (2012) Undergrowth studies in different Teak plantations of central tarai forest division (Haldwani), Uttarakhand. Journal of science information. 3:14-24.
- **Kumar M**, Singh MP, Singh H, Khaiter PA (2013) Assessing water regulatory services provided by forests of Uttarakhand: proposed meta-modelling framework. (In the proceeding of international workshop on water and forests: beyond traditional forest hydrology, 23-25 September, 2013 held at FRI, Dehradun, India, organized by FRI, APAFRI and Korea, Forest Research Institute, Republic of Korea.

Teaching experiences

- Permanent faculty of Forest Research Institute University, Dehradun (http://www.fridu.edu.in/) for teaching students of M.Sc. Environment Management and M.Sc. Forestry on various aspects of environment and forests, since April 2010. Courses taught includes Industrial Pollution Control, Forest Biometry, Forest Management, Application of Remote Sensing and GIS for Environment and Forest Management.
- Adjunct faculty for teaching State Forest Services probationers of Central Academy for State Forest Services (CASFOS), Dehradun (http://dfe.gov.in/) for the subjects: Forest Biometry and Statistics, Environment and Ecology, Application of modern tools and technology, Computer Sciences, Remote Sensing and GIS.
- Taught undergraduate students of B.Sc. "Environment & Water Management" course at Department of Environment & Water Management, Millat College, Darbhanga, India.

Address for correspondence
GIS Centre, IT&GIS Discipline
Forest Research Institute,
PO: New Forest, Dehradun - 248 006
Uttarakhand, India
Phone No. : +91 80774 13164 (Mobile), +91 135 222 4235/4220 (Office)
E-mail   : manojfri@gmail.com, kumarmanoj@icfre.org

Personal details

Name	:	Manoj Kumar
Date of Birth	:	20th January 1979
Gender	:	Male
Father's Name	:	Er. Girija Nandan Singh
Languages known	:	English, Hindi, German (basic)

References:

1. Dr. Naveen Kalra	2. Prof. Dr. SPS Kushwaha	3. Dr. M.P. Singh
Principal Scientist (Rtd.) and Ex-Head Division of Agriculture Physics Indian Agriculture Research Institute, Pusa, New Delhi - 110012, India	Senior Scientist and Ex-Dean Indian Institute of Remote Sensing, a unit of ISRO, Kalidas Road, Dehradun - 248001, India	IFS and Director, Institute of Wood Science and Technology, 18th Cross Rd, Kodandarampura, Malleshwaram, Bengaluru - 560 003, India
Phone: +1 (647) 563-7153	Phone: +91 94111 06224	Phone: +91 89877 90012
E-mail: drnkalra@gmail.com	E-mail: spskushwaha@gmail.com	Email: mpsinghifs1989@gmail.com

Declaration: I declare that the above particulars are correct to the best of my knowledge and belief.

(Manoj Kumar)