Winter School In Geospatial Science and Technology (Level 1)

10– 31 January 2022
In Online Mode

at

Department of Natural Resource Management, College of Forestry, University of Agricultural and Horticultural Sciences (UAHS),Shivamogga, Ponnampet, Karnataka, India

सत्यमेव जयते

Department of Science & Technology
Govt. of India

Organized by

Department of Natural Resource Management, College of Forestry, University of

Agricultural and Horticultural Sciences (UAHS),Shivamogga, Ponnampet, Karnataka, India

Supported by

National Geospatial Program, Department of Science and Technology, Government of India, New Delhi

Patron

Dr. Manjunatha K. Naik, Hon'ble Vice Chancellor, University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka

Principal Investigator

Dr. Ravikumar D, Assistant Professor, Department of Natural Resource Management, College of Forestry, UAHS

Co-Investigators

- Dr. G.M.Devagiri, Professor and Head, Department of Natural Resource Management, College of Forestry, UAHS
- Dr. Shoba S, Assistant Professor, Department of Natural Resource Management, College of Forestry, UAHS
- Dr. Anil Kumar Khaple, Assistant Professor (CT), Department of Natural Resource Management, College of Forestry, UAHS

University of Agricultural and Horticultural Sciences (UAHS), Shivamogga

University of Agricultural and Horticultural Sciences (UAHS), Shivamogga is a young and the only integrated farm university in the state of Karnataka having teaching programmes in agriculture, horticulture and forestry in four degree and two diploma colleges, 16 master's degree programmes, 7 doctoral degree programmes, 13 research stations, four KVKs and two extension units. This university was established in 2013 covering 7 districts of Karnataka, viz., Shivamogga, Chikkamagalur, Udupi, Dakshina   Kannada, Kodagu, Davanagere and Chitradurga located in four agro-climatic zones viz. Central Dry, Southern Transitional, Hill and Coastal Zones representing diversity of landscapes ecosystem that includes Western Ghats. Visit us on https://www.uahs.edu.in/

College of Forestry, Ponnampet

College of Forestry, Ponnampet has come a long way since its humble beginning in 1985, and is located in one of the most diverse landscapes of the World, Western Ghats, a Biodiversity Hot Spot and UNESCO World Heritage site. The college is now one of the highly ranked forestry education institution in the country affiliated to University of Agricultural and Horticultural Sciences, Shivamogga. The pioneering and successful journey over the past 35 years of forestry education through teaching, research and extensions activities have been rewarded with A** accreditation by ICFRE. The alumni of our college have excelled in diverse fields. Amongst our alumni, 13 IFS Officers, 12 Assistant Conservator of Forests, 83 Range Forest Officers and more than 100 Deputy Range Forest Officers have joined the Karnataka Forest Department. Visit us on: https://uahs.edu.in/education/cof/

Department of Natural Resource Management (NRM)

The Department of Natural Resource Management (NRM) is one of the core departments of College of Forestry, Ponnampet. The department has highly qualified teaching faculty and well-equipped laboratories under Soil Science, Forest Engineering lab, RS and GIS, Biofuel unit etc. to meet the UG and PG teaching and research needs. The faculty under NRM are offering courses on Remote Sensing and GIS applications in Forestry at both UG and PG level. The faculty of the department are involved in many National and International collaborative research projects related to application of RS and GIS technology for Natural resource mapping and management. In addition, the college has a central instrumentation laboratory which is being used by students for post graduate and doctoral research work. Visit us on: https://www.uahs.edu.in/education/cof/

What is the Summer/Winter Schools (Level 1)Capacity Building Program in Geospatial Science and Technology ?

Recently knowledge has been identified as the most important driving factor for India's sustainable economic growth. India has adopted a new information regime for sustainable economic growth through its 'Digital India' program to support good governance, sustainable development goals and empowerment of its citizens. Over the last three decades, the widespread adoption of geospatial technologies into various sectors have proven to be an effective enabler to meet these challenges. The capacity building program initiatives of the National Geospatial Program (NGP) erstwhile Natural Resource Data Management System (NRDMS) Department of Science and Technology, Government of India to develop national capacity for geospatial science and technology development through diverse programs in collaboration with various partner organizations adaptation capacity of geospatial science and technology at across the country. The objective of the program is to build knowledge and various levels of governance in collaboration with academia and user agencies. The three week Summer/ Winter School in Geospatial technology is being conducted at two levels– Level 1 and Level 2.The 21-day summer/winter school in Geospatial Science and Technology (Level 1) supported by the Natural Resource Data Management System of the Department of Science and Technology, Government of India focuses on developing knowledge and capacity building in geospatial technologies through the use of open source geospatial software.

Who can apply?

Faculty members, scientist, technologist, researchers from academia, national institutes of research, smart city cells, municipal corporations and other government departments, personnel from non government organizations are eligible to apply. Only 2-3 seats at each centre are reserved for research scholars.

How to apply?

1.Interested candidates should fill the online application form through the weblink available on http://dst-iget.in.
2.Selected candidates will be informed by mail.
3.For any further queries write to dst-iget@bvieer.edu.in or call on +91-20-24375684/24362155.
4.Address all queries to PI through Email.

Important Information

Last date for registration : 31 October 2021

Dates of the program: 10 - 31 January 2022

Mode of conduct: Online

Number of Seats: 25

Registration Fees: Nil

Patron: Dr. Manjunatha K. Naik, Hon'ble Vice Chancellor, University of Agricultural and Horticultural Sciences, Shivamogga.

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Grading and Certification

Participants will be assessed based on assignments completed during the course, a mini project are expected to complete, active participation during the training program as well as attendance.

Note: Participants must ensure that they have a laptop and a strong internet connection. purposes

Infrastructural Facilities

Well-equipped geospatial laboratory facility available at the institute

Fig 1: College of Forestry

Fig 2: Classroom

Fig 3 & 4: GIS Lab

Program schedule for Winter School in Geospatial Science and Technology (Level 1)
10 – 31 January 2022

Date	Time	Topic	Resource Person and Affiliation
		Day 1	
	09:30 – 10:45	Inauguration	
	10:45 – 11:00	**Tea Break**	
	11:00 – 12:00	Introduction of the Participants	NRM Team
10.01.2022	12:00 – 14:00	Geospatial Science and Technology: What, Why, How?	NRM Team
	14:00 – 15:00	**LUNCH**	
	15:00 – 17:00	Hands on Session 1: Acquisition of free satellite data from Bhuvan, USGS, ESA, acquiring toposheets from SOI	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
		Day 2	
	09:15 – 09:30	Feedback Analysis	NRM Team
	09:30 – 11:30	Introduction to Data types in Geospatial Science	NRM Team
11.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Understanding scales and projections	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 2: Introduction to QGIS interface and functions, Working with projections using QGIS	NRM Team

	17:00 – 17:30	Filling of Feedback forms	
		Day 3	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Understanding about Data Quality	NRM Team
12.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Hands on Session 3: Georeferencing of toposheets	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 4: Satellite image registration	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
		Day 4	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Digital Cartography	NRM Team
13.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Hands on Session 5: Map preparation	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 5: Map preparation	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
		Day 5	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Introduction to Database	NRM Team
14.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Database	NRM Team

	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 6: Data exploration and Working with attribute tables	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
15.01.2022		**Day 6**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Spatial Analysis	NRM Team
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Spatial Analysis	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 7: Working with queries	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
16.01.2022		**Day 7**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Introduction to Global Navigation Satellite Systems (GNSS)	Dr. Girish S Pujar, Rural Development and Watershed Monitoring Division, National Remote Sensing Centre, ISRO, Hyderabad.
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	GNSS Applications	Dr. Girish S Pujar, Rural Development and Watershed Monitoring Division, National Remote Sensing Centre, ISRO, Hyderabad.

	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 8: Collecting coordinates from the Google earth: KML generation, Elevation analysis	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
		Day 8	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Basics of Remote Sensing	NRM Team
17.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Basics of Remote Sensing	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Physics of Remote Sensing	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
		Day 9	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Elements of visual interpretation	NRM Team
	11:30 – 12:00	**Tea Break**	
18.01.2022	12:00 – 13:30	Image Quality Assessment and Statistical Evaluation	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 9: Intro to SAGA and image interpretation	NRM Team
	17:00 – 17:30	Filling of Feedback forms	

		Day 10	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Image rectification and restoration: Radiometric correction, Atmospheric effects and correction	Ms. Vaishali Vasudeva, Research Fellow Wildlife Institute of India
	11:30 – 12:00	**Tea Break**	
19.01.2022	12:00 – 13:30	Image rectification and restoration: Geometric correction, Intensity interpolation	Ms. Vaishali Vasudeva,Research Fellow Wildlife Institute of India
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	<u>Hands on Session 10</u>: Understanding the image (histogram)	Ms. Vaishali Vasudeva, Research Fellow Wildlife Institute of India
	17:00 – 17:30	Filling of Feedback forms	
		Day 11	
	09:15 – 09:30	Feedback Analysis	
20.01.2022	09:30 – 11:30	Introduction to image enhancements: • Contrast enhancements • Band rationing • Spatial filtering	Dr. Akhlaq Amin Wani, Division of Natural Resource Management, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Benhama, Ganderbal J&K
	11:30 – 12:00	**Tea Break**	

	12:00 – 13:30	Introduction to image enhancements: • Principal Components Analysis • Vegetation Indices (NDVI, SAVI, NBR, mNDWI)	Dr. Akhlaq Amin Wani, Division of Natural Resource Management, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Benhama, Ganderbal J&K
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	<u>Hands on Session 11:</u> Working with images – subsetting and mosaicking Using enhancements	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
21.01.2022		**Day 12**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Image classification • Introduction: Parametric and non-parametric method • Supervised classification: LULC classification levels, Stage involved in classification, Maximum Likelihood Classifier, neural networks, and random forests etc. • Unsupervised classification methods, K-means clustering and ISODATA	Dr. Sarnam Singh, Professor and Dean School of Ecology and Environment Studies, Nalanda University
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Image classification • Hybrid classification and Knowledge based classification by incorporating ancillary data in the classification process • Validation of classification: Error matrix and Kappa statistics	Dr. Sarnam Singh, Professor and Dean School of Ecology and Environment Studies, Nalanda University
	13:30 – 14:30	**LUNCH**	

	14:30 – 17:00	Hands on Session 12: Extracting information for satellite image using unsupervised classification	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
22.01.2022		**Day 13**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Hands on Session 13: Extracting information for satellite image using supervised classification	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Hands on Session 13: Extracting information for satellite image using supervised classification	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 14: Accuracy assessment	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	17:00 – 17:30	Filling of Feedback forms	
23.01.2022		**Day 14**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Digital change detection	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change

	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Hands on Session 14: Change detection with SAGA	Dr. Sanjay Babu, Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 14: Change detection with SAGA	Dr. Sanjay Babu, (Consultant (Forestry) Ministry of Environment, Forest and Climate Change
	17:00 – 17:30	Filling of Feedback forms	
		Day 15	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Introduction to Google earth engine: Introduction, Code editor, Accessing EO datasets	Ms. Sneha Pandey, Wildlife Institute of India, Dehradun
	11:30 – 12:00	**Tea Break**	
24.01.2022	12:00 – 13:30	Introduction to Google earth engine: Visualization and analysis of remote sensing images	Ms. Sneha Pandey, Wildlife Institute of India, Dehradun
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Understanding Terrain Data Hands on Session 15: Terrain analysis	Mr. Chintan Nanda, Haryana Space Applications Centre (HARSAC), Hisar
	17:00 – 17:30	Filling of Feedback forms	
25.01.2022		**Day 16**	

	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Introduction to WebGIS and WebGIS application	Mr. Manjunath GeoVista Software Solutions Pvt.Ltd , Bangalore
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Hands on Session 16: Understanding Geoserver	Mr. Manjunath GeoVista Software Solutions Pvt.Ltd , Bangalore
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Hands on Session 17: Exercise on Spatial data analysis	Mr. Manjunath GeoVista Software Solutions Pvt.Ltd , Bangalore
	17:00 – 17:30	Filling of Feedback forms	
27.01.2022		**Day 17**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Applications of geospatial technologies: • Applications on RS/GIS in planning (urban/rural) with specific case studies highlighting detailed methodology (advanced) Applications of RS/GIS in climate studies with specific case studies highlighting detailed methodology (advanced)	Dr. Girish S Pujar Rural Development and Watershed Monitoring Division National Remote Sensing Centre, ISRO, Hyderabad.
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Applications of geospatial technologies: Applications of RS/GIS in natural resource management (forest, wildlife/ agriculture/ watershed) with specific case studies highlighting detailed methodology (advanced)	Dr. Arjun G. Koppad , Natural Resource Management College of Forestry, Sirsi, Karnataka

	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Applications of geospatial technologies: • Advances in RS/GIS • Use of RS/GIS in SDGs, social sector, development of geospatial indicators	Dr. Girish S Pujar, Rural Development and Watershed Monitoring Division National Remote Sensing Centre, ISRO, Hyderabad.
	17:00 – 17:30	Filling of Feedback forms	
28.01.2022		**Day 18**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Initiation of project topic selection: Possible minor projects to be done by the participants	NRM Team
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Initiation of project topic selection: Possible minor projects to be done by the participants	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Working on Project	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
29.01.2022		**Day 19**	
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Working on Project	NRM Team
	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Working on Project	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Working on Project	NRM Team

	17:00 – 17:30	Filling of Feedback forms	
	Day 20		
	09:15 – 09:30	Feedback Analysis	
	09:30 – 11:30	Presentation by participants	NRM Team
30.01.2022	11:30 – 12:00	**Tea Break**	
	12:00 – 13:30	Presentation by participants	NRM Team
	13:30 – 14:30	**LUNCH**	
	14:30 – 17:00	Final Exam (Objective type)	NRM Team
	17:00 – 17:30	Filling of Feedback forms	
	Day 21		
	09:15 – 09:30	Feedback Analysis	
31.01.2022	09:30 – 11:30	Grading and certification	NRM Team
	11:30 – 12:00	**Tea Break**	
	12:00 – 14:00	Final Feedback and Valedictory	NRM Team