Ten Days
Online Training Program on
R for Soil Science

11 - 20 November 2025

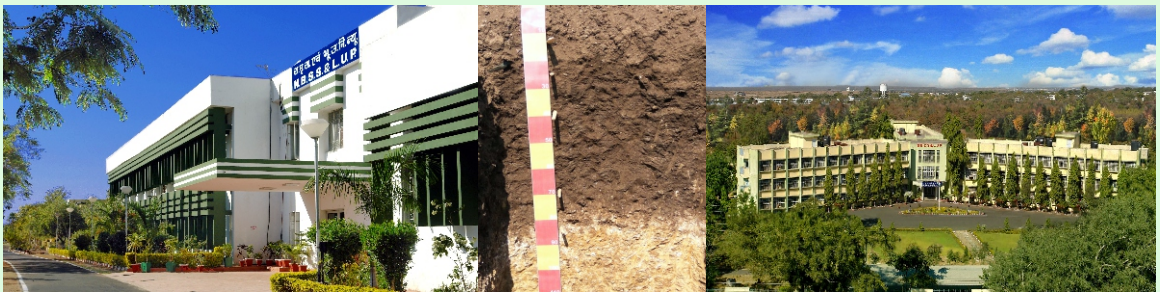
Organized by

Division of Remote Sensing Applications

ICAR-National Bureau of Soil Survey and Land Use Planning

Amravati Road, Nagpur-440 033

https://nbsslup.icar.gov.in



About the Training Program

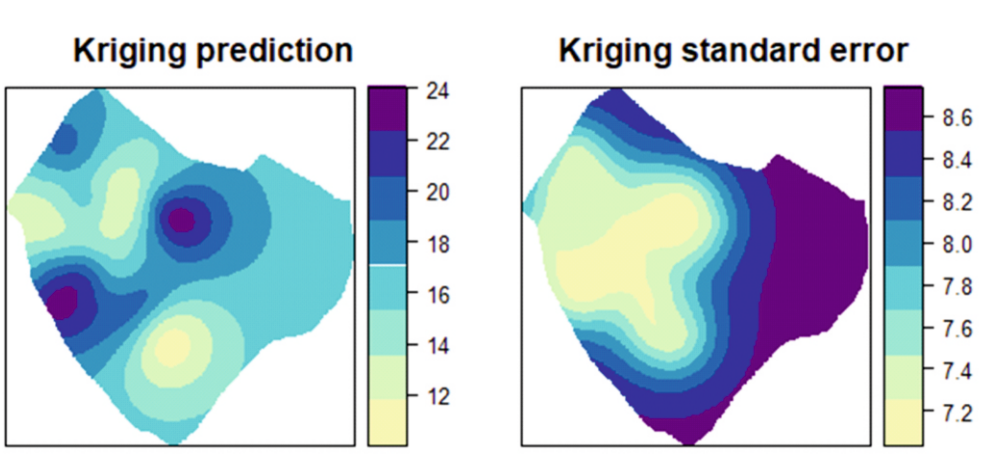
Soil science is rapidly evolving in response to the growing need for sustainable land management and precision agriculture. In this context, digital tools and data-centric approaches are becoming essential for enhancing the quality and efficiency of soil research and resource planning. Among the various tools available, R, a free and open-source statistical programming language, has emerged as a versatile and powerful platform. It is widely used across disciplines for its capabilities in data manipulation, statistical modeling, spatial analysis, and reproducible research workflows.

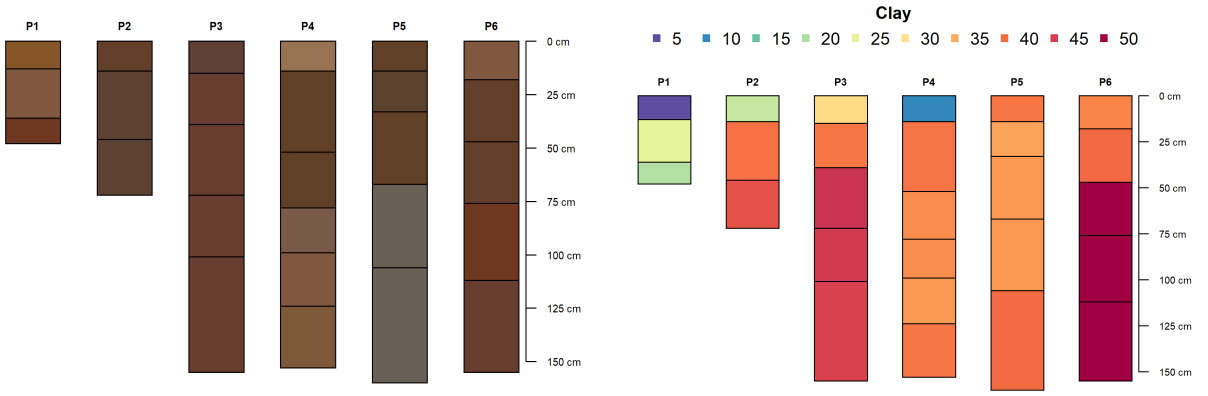
The training program titled "R for Soil Science" is designed to provide a comprehensive introduction to the use of R in the context of soil science applications. It will guide participants through the fundamentals of R programming while progressively building competence in handling and analyzing soil datasets. The curriculum integrates both theoretical concepts and hands-on exercises to ensure that participants gain practical exposure to real-world applications.

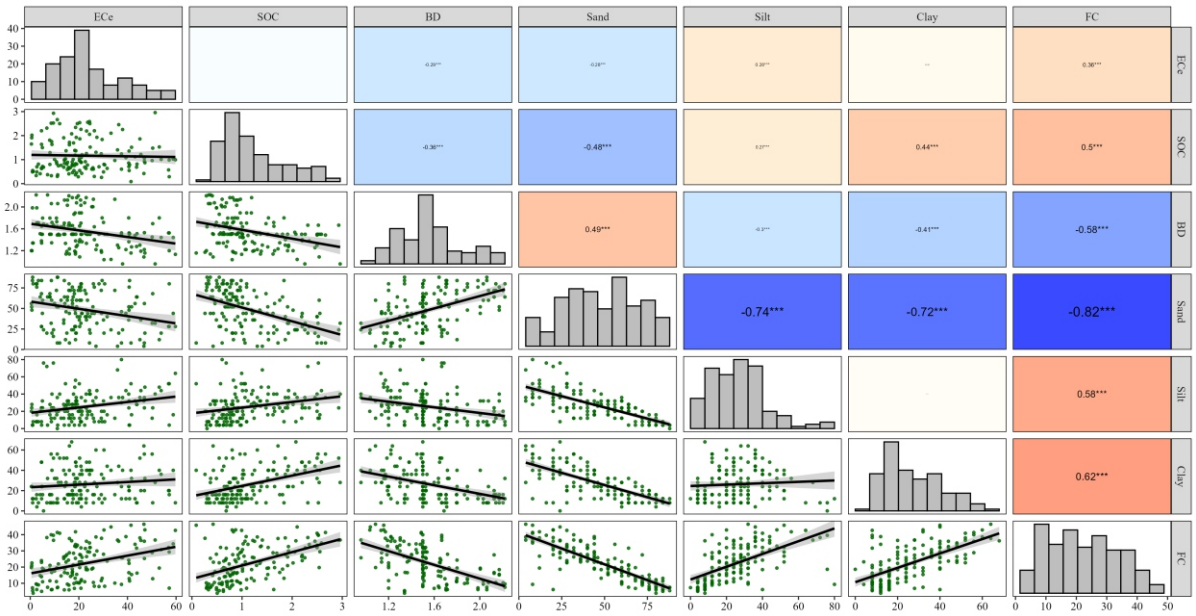
Participants will learn how to import and clean soil datasets, perform statistical and geostatistical analysis, visualize data using advanced plotting libraries like ggplot2, and conduct spatial analysis using raster and vector data. Special emphasis will be placed on reproducibility in research, with training in tools such as R Markdown for dynamic report generation. The course also includes modules on remote sensing, GIS-based soil mapping, and land evaluation—areas increasingly relevant in national and regional soil resource assessments.

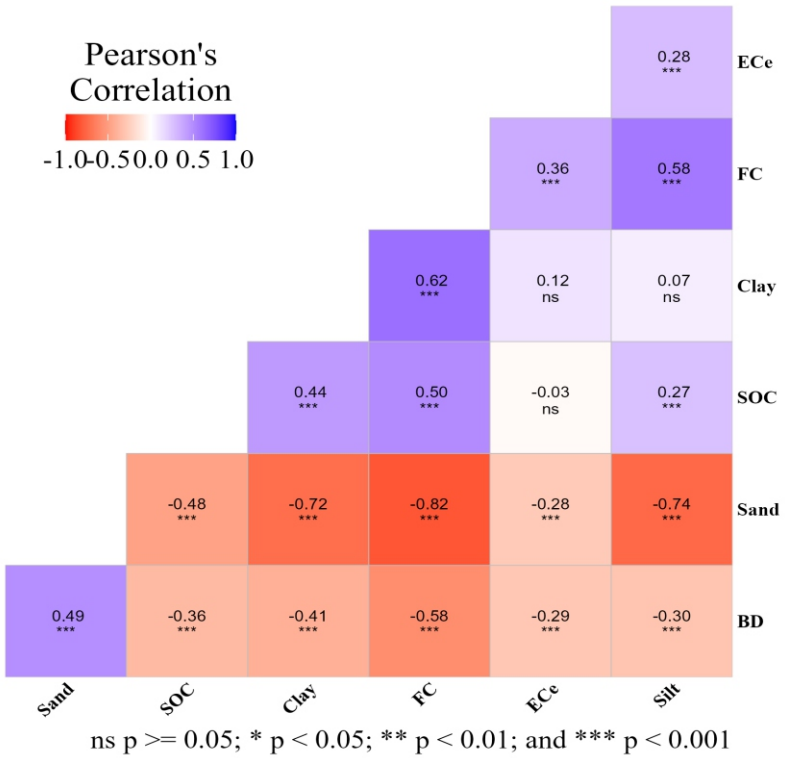
This ten-day online training will include interactive lectures, demonstrations, assignments, and live coding sessions led by experienced faculty and domain experts. It aims to develop the capability of participants to conduct advanced soil data analysis independently, enabling them to contribute to data-driven decision-making in soil health monitoring, land resource inventory, and agricultural planning.

This program seeks to bridge the gap between soil science and data science by equipping soil professionals with the skills to leverage R for impactful research and policy formulation in land use and management.









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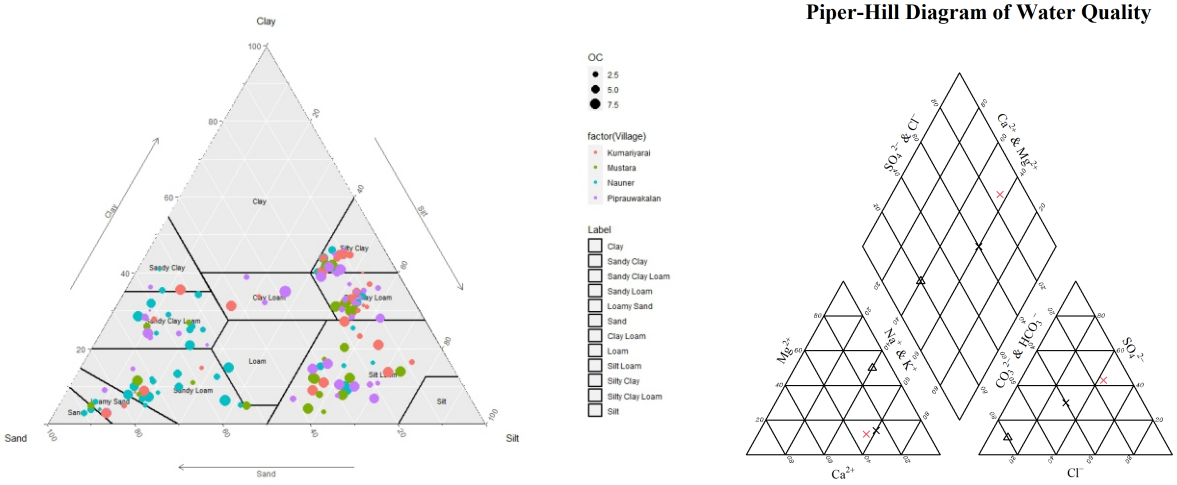


Objectives

- To introduce the fundamentals of R programming and its applications in soil science.
- To develop skills in data analysis and visualization specific to soil data.
- To demonstrate spatial analysis and mapping techniques using R.
- To encourage reproducible research practices among soil scientists.

Course Contents

1. ***Introduction to R and R Studio***
    - Installation and setup
    - Basic data types and operations
2. ***Data Manipulation in R***
    - Importing and cleaning soil data
    - Data wrangling using tidyverse
3. ***Descriptive and Inferential Statistics***
    - Summary statistics
    - Correlation, regression, and ANOVA
4. ***Soil Data Visualization***
    - Graphs and plots using ggplot2
    - Advanced visualization techniques
5. ***Basics of Remote Sensing and GIS***
6. ***Spatial Data Handling***
    - Introduction to spatial data structures
    - Raster and vector data analysis
    - Basic mapping with R
7. ***Geostatistics in Soil Science***
    - Variogram analysis
    - Kriging and interpolation methods

8. ***Soil Quality and Land Capability Analysis***
    - Index computation
    - Multi-criteria evaluation
9. ***Time-Series and Trend Analysis***
    - Long-term soil monitoring data analysis
    - Trend detection methods
10. ***Reproducible Reporting***
    - R Markdown and report generation
11. ***Hands-on Case Studies and Discussions***

Target Participants

- Scientists and technical officers working in soil survey and land use planning
- Research scholars and postgraduate students in soil science and allied disciplines
- Officers from ICAR institutes and state agricultural universities

Training Time

- Afternoon (2:00 PM to 5:00 PM)

Training Methodology

- Live online lectures and demonstrations
- Hands-on practical sessions
- Interactive discussions and Q&A
- Assignments and case study presentations

How to Apply

- Interested candidates should fill the online application form through the given Google Form https://forms.gle/BjmDf5tgf384tQ897
- Selected candidates will be informed by mail
- For any further queries write to Course Directors through Email

Resource Persons

Experienced scientists and faculty members from ICAR-NBSS&LUP and guest experts specializing in R and spatial data analysis.

Expected Outcome

Participants will gain confidence in using R for analyzing and visualizing soil data, perform basic to intermediate spatial analysis, and prepare reproducible analytical reports. This training will strengthen their capability to support evidence-based soil management and planning.

Registration fees

- ₹ 1000/- for students and research scholars (1000+18% GST=1180)
- ₹ 2000/- for scientists, researchers, faculty members, and working professionals from public organizations (2000+18% GST=2360)
- ₹ 5000/- for participants from private industries (5000+18% GST=5900)

Contact

Chief Patron

Dr. N. G. Patil, Director
ICAR-National Bureau of Soil Survey and Land Use Planning
Amravati Road, Nagpur-440 033

Patron

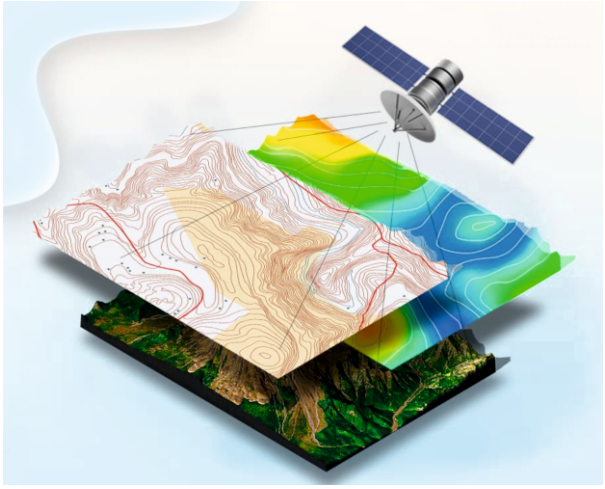
Dr. G.P. Obi Reddy, Principal Scientist & Head, Division of RSA
ICAR-National Bureau of Soil Survey and Land Use Planning
Amravati Road, Nagpur-440 033

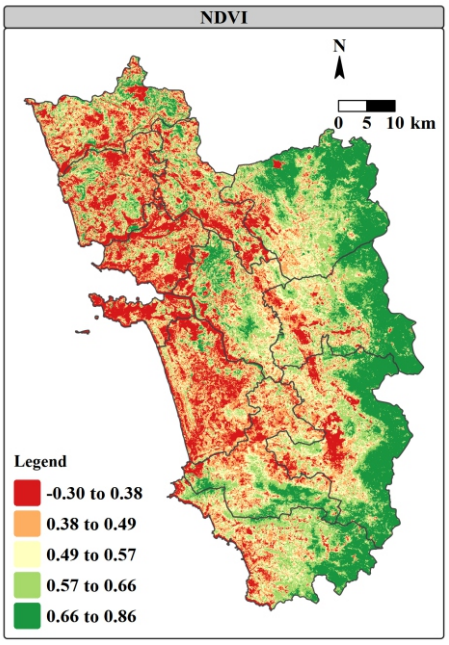
Course Directors

Dr. Bappa Das, Senior Scientist (Agricultural Physics)
Division of Remote Sensing Applications
ICAR-National Bureau of Soil Survey & Land Use Planning
Amravati Road, Nagpur – 440033, Maharashtra, India
Mobile: 9013563887

Dr. Nirmal Kumar, Senior Scientist (Agricultural Physics)
Division of Remote Sensing Applications
ICAR-National Bureau of Soil Survey & Land Use Planning
Amravati Road, Nagpur – 440033, Maharashtra, India
Mobile: 8830531997

Website : https://icar-nbsslup.org.in/





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