Second year of PhD in Sustainable Agricultural and Forestry Systems and Food Security

XXXVIII° CYCLE PNRR

University of Naples Federico II - Department of Agricultural Sciences, Division of Agricultural, Forest and Biosystems Engineering

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'Adding hyperspectral information to better estimate soil erodibility in Campania (southern Italy)'
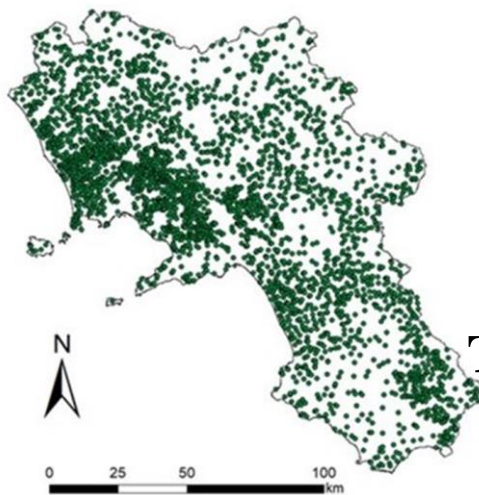
Dott.ssa Caterina Mazzitelli

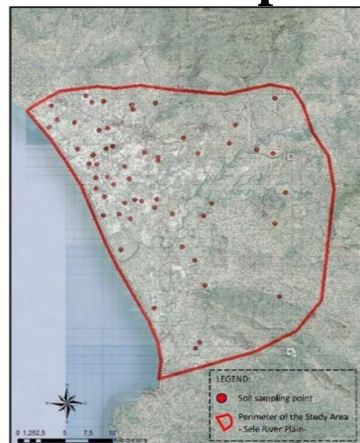EARTH OBSERVATION FOR SOIL PROTECTION AND RESTORATION

06–07 March 2024 | ESA-ESRIN | Frascati (Rome), Italy

The goal of this study is to estimate the soil erodibility (K) from soil physical and chemical properties retrieved from spectral measurements in the vis-NIR-SWIR ranges (350–2500 nm) carried out in the entire region of Campania (southern Italy), as well as in two target areas of this region.
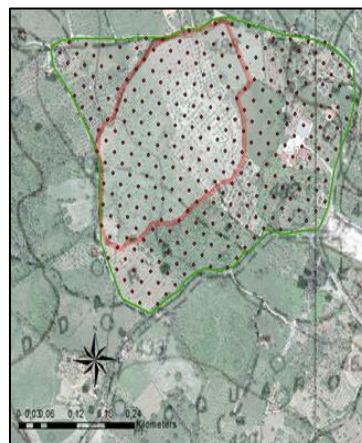
Campania Region
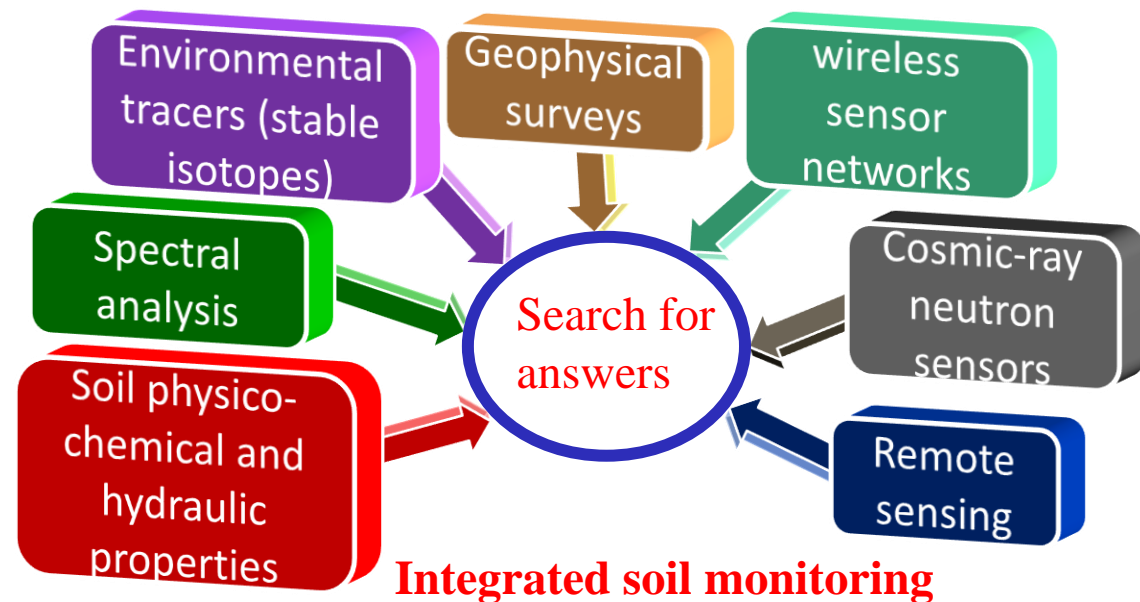

Soil health indicators:
carbon stock, soil water storage, GW recharge transit time

Ecosystem services assessment:
(e.g. drought and flood effects)

Two experimental fields in Campania:
Sele River plan   **MFC basin**

Environmental tracers (stable isotopes)

Geophysical surveys

wireless sensor networks

Spectral analysis

Search for answers

Cosmic-ray neutron sensors

Soil physico-chemical and hydraulic properties

Remote sensing

Integrated soil monitoring

Activities in Portici

Grain size analysis
Hydrometer method
% of sand silt and clay
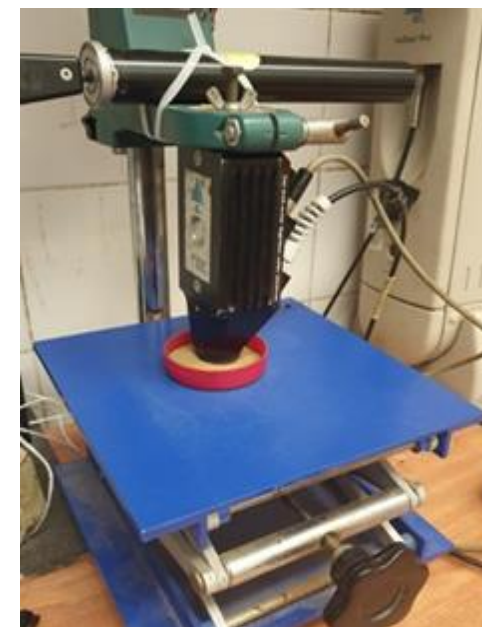
Determination of BD
Core drilling method

pH
LLG pH-meter
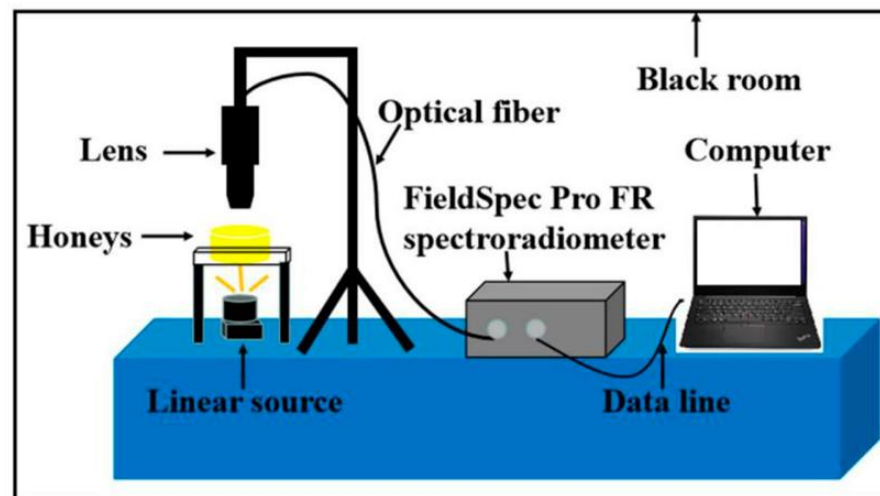
Organic Carbon
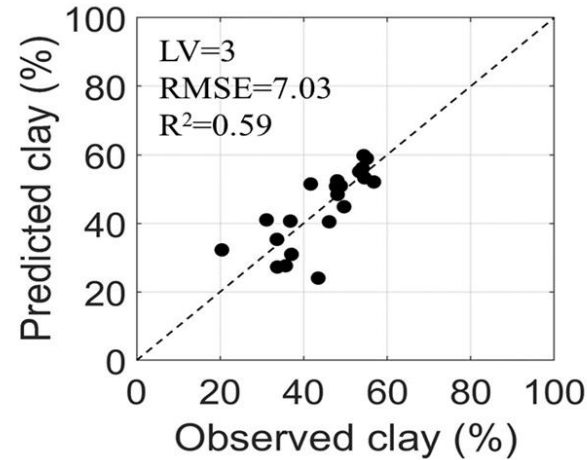Walkley – Black method
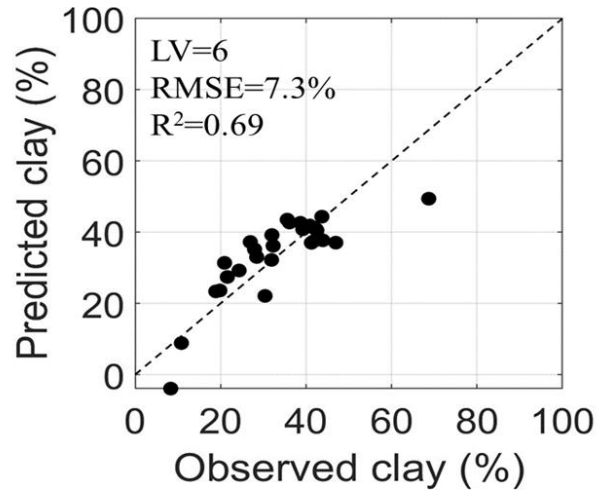
Activities in Tel-Aviv

Hyperspectral measurements
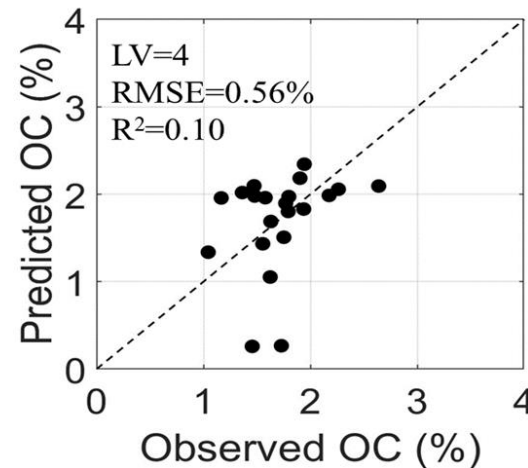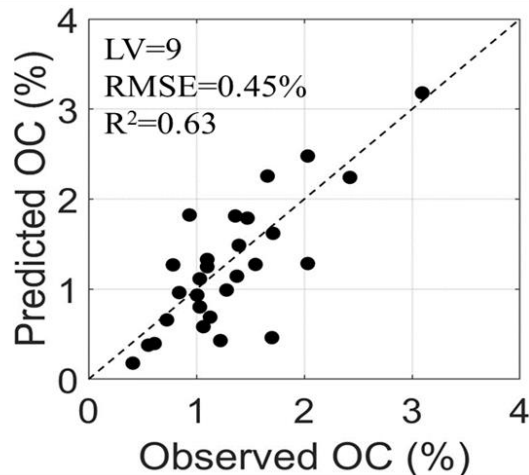Spectroradiometer ASD
FieldSpecPRO

We used the Partial Least Square Regression to estimate Clay and Organic Carbon

Sele River Plan

MFC2

Graphs show the predicted Clay and OC on some soil samples in each data set. The prediction performance was evaluated in terms of root mean squared error (RMSE) and coefficient of determination (R^2). Preliminary findings indicate that our spectroscopic database provided useful information to predict soil properties which are used to compute soil erodibility.