PRISMA 4 AFRICA

Validation data collection

Webinar day#3
04.12.2024 – 13/02/2025

Webinar agenda

Webinar DAY 1 (18.11.2024).

- Introduction of the remote sensing crop monitoring activities in the project PRISMA4Africa.
- Illustration of the variables object of the validation activities. Theory and practice of the measurement methodologies.
- PocketLAI: theory and practice. Installation on participants' smartphones (only Android OS).
- Discussion Q&A.

Webinar DAY 2 (20.11.2024).

- Digital Hemispherical Photography (DHP) with fisheye lenses on smartphones. Theory and practice. Lens fitting, photo collection and download. Pixel check with image processing software (e.g. Paint)
- Installation of Can-Eye software and calibration of smartphone lenses.
- Theory and practice of chlorophyll measurements in plant leaves.
- Discussion Q&A.

Webinar DAY 3 (04.12.2024 – 13/02/2025).

- ESU set-up campaign planning and uploading to smartphone. - PIGNATTI
- QGIS exercise to plan a field campaign survey - ROSSI
- Review of a hemispherical phots for LAI measurements. Data evaluation of sample data collected on a different site - MIRZAEI

ESU set-up campaign planning

The accuracy of remote sensing products has become a critical concern for their operational application.

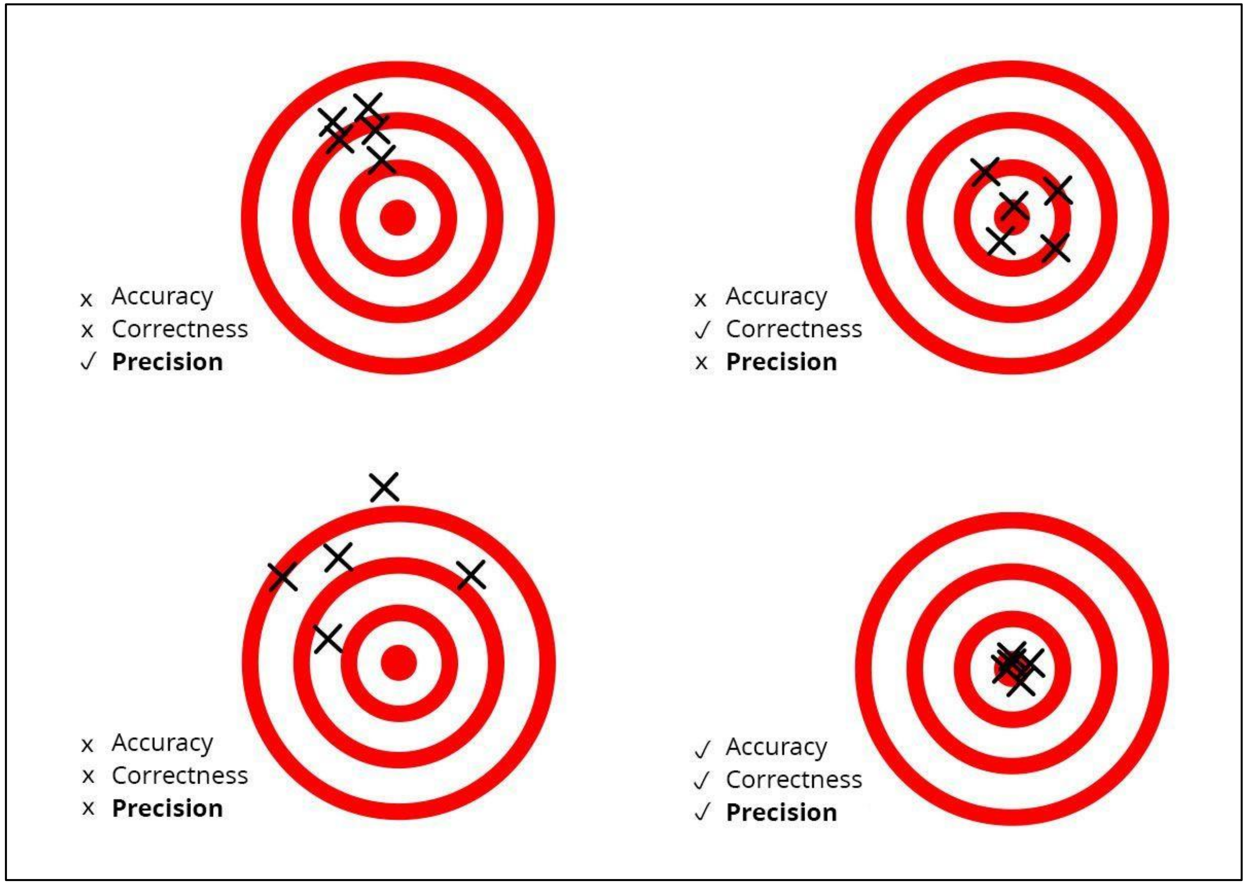
Considering the unique characteristics of remote sensing data product, related to the spatial heterogeneity, the spatial correlation, and the multi-granularity, the in situ field campaigns are essential to verify the maturity of the products (e.g. LAI, pigments map etc.).

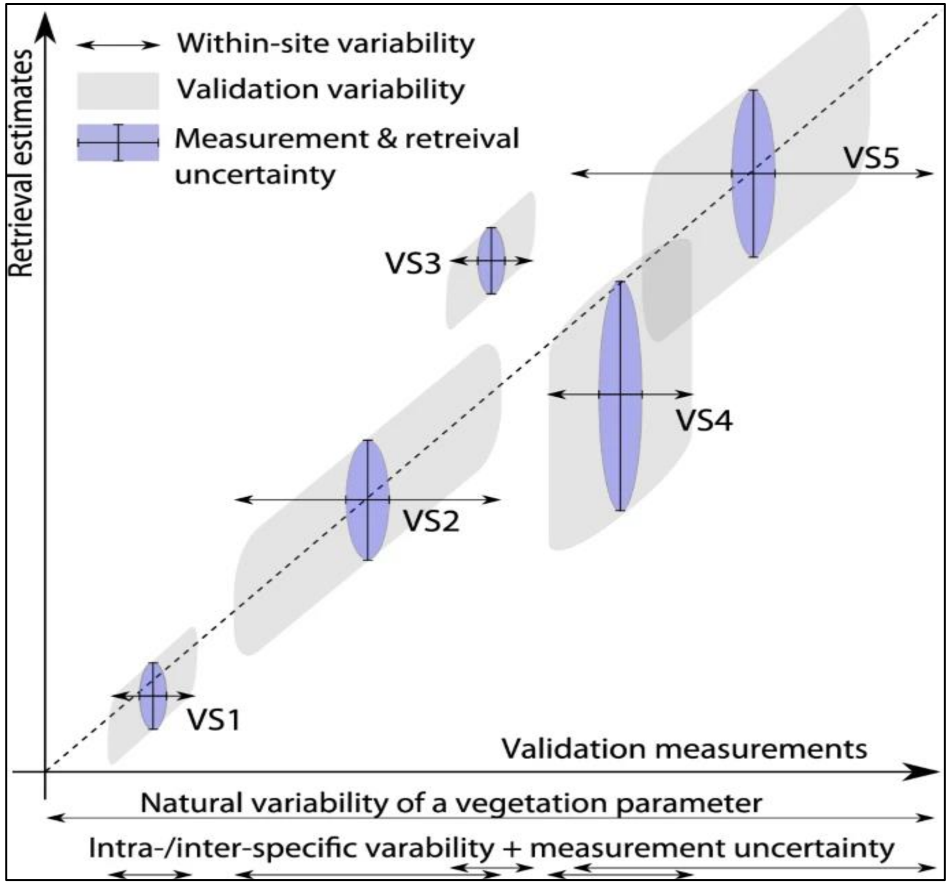
Sampling strategies estimate, through statistical procedures, the margin of uncertainty in the data obtained from samples.

It is important to choose a proper field sampling scheme that would the least amount of associated error.

ESU set-up campaign planning

The accuracy of remote sensing products has become a critical concern for their operational application.



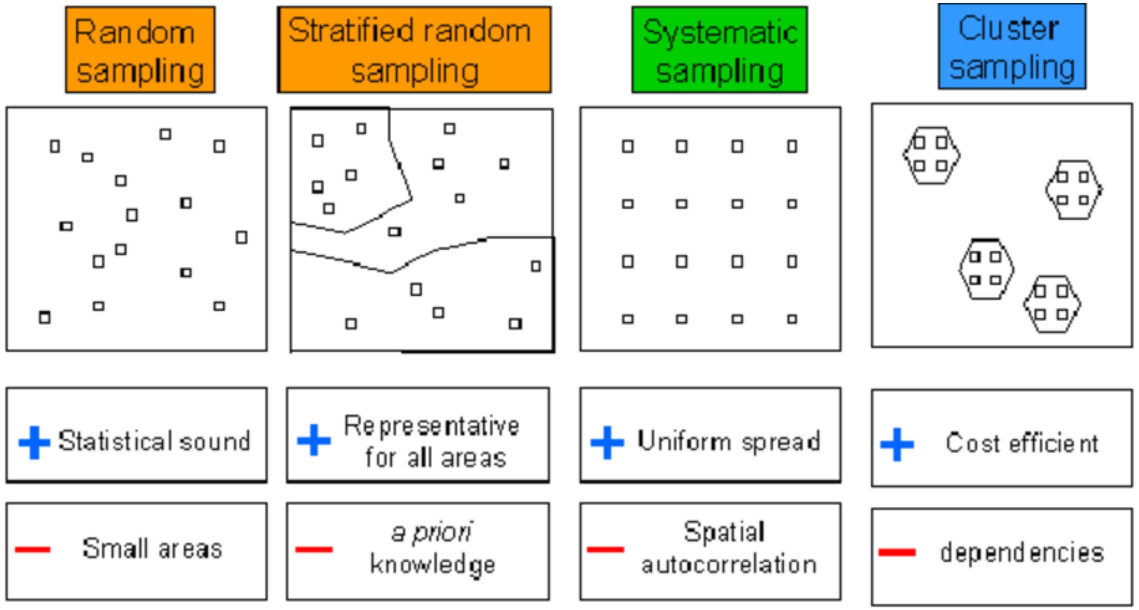


Campaign planning – *probability sampling*

Sampling approaches are expected to capture the natural variability of vegetation parameters within an area of interest, but in practice they are limited by available time and resources.

1. *Probability sampling*

includes some form of random selection in choosing the elements. Greater confidence can be placed in the representativeness of probability samples. This type of sampling involves a selection process in which each element in the population has an equal and independent chance of being selected.



Four main methods of sampling include

a. simple random;
b. stratified random;
c. systematic;
d. cluster.

Campaign planning – *random sampling*

Random sampling methods, require a very limited prior knowledge on the parameter variability space, assume that collected samples are spatially independent.

At the same time, practical constraints and failures in designing the truly random sampling scheme are often enforcing a compromise between a statistically optimal and an experimentally feasible sampling.

Therefore, the random sampling methods are less suitable for crop species rich in dense canopies like sugar cane, where omitting some important areas due to the recombination of randomness results in an undersampling

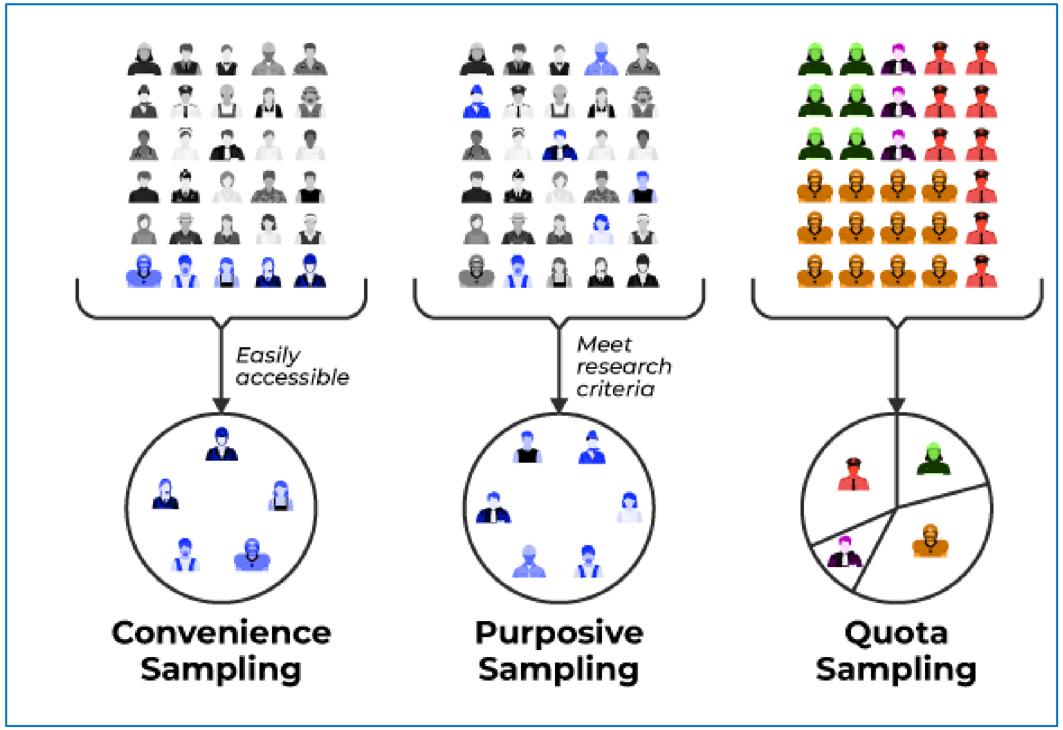
Campaign planning – *Non probability sampling*

2. Non-probability sampling

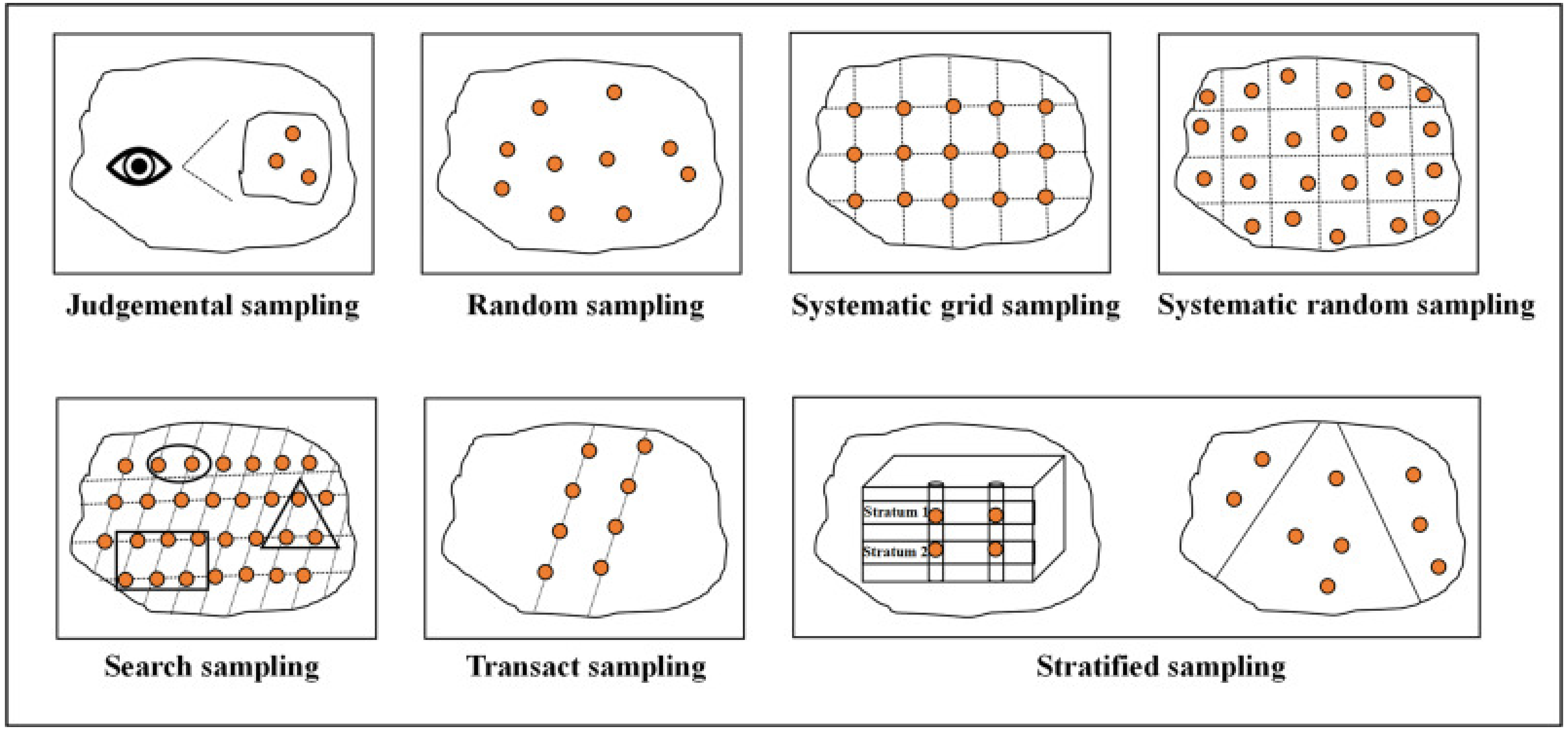
the elements that make up the sample are selected by non random methods. This type of sampling is less likely than probability sampling to produce representative samples. Even though this is true, researcher could successfully use non-probability samples.

The three main methods are:

a. Convenience;
b. Purposive;
c. Quota.



e.g. soil sampling



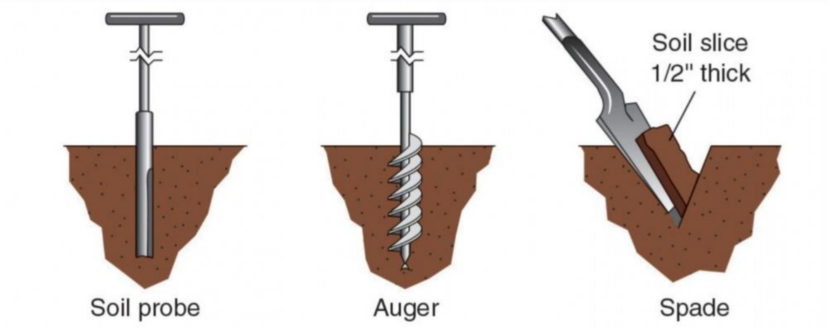


Illustration Source: IL Agronomy Handbook, Chapter 8, Pg. 93

How to sample soil

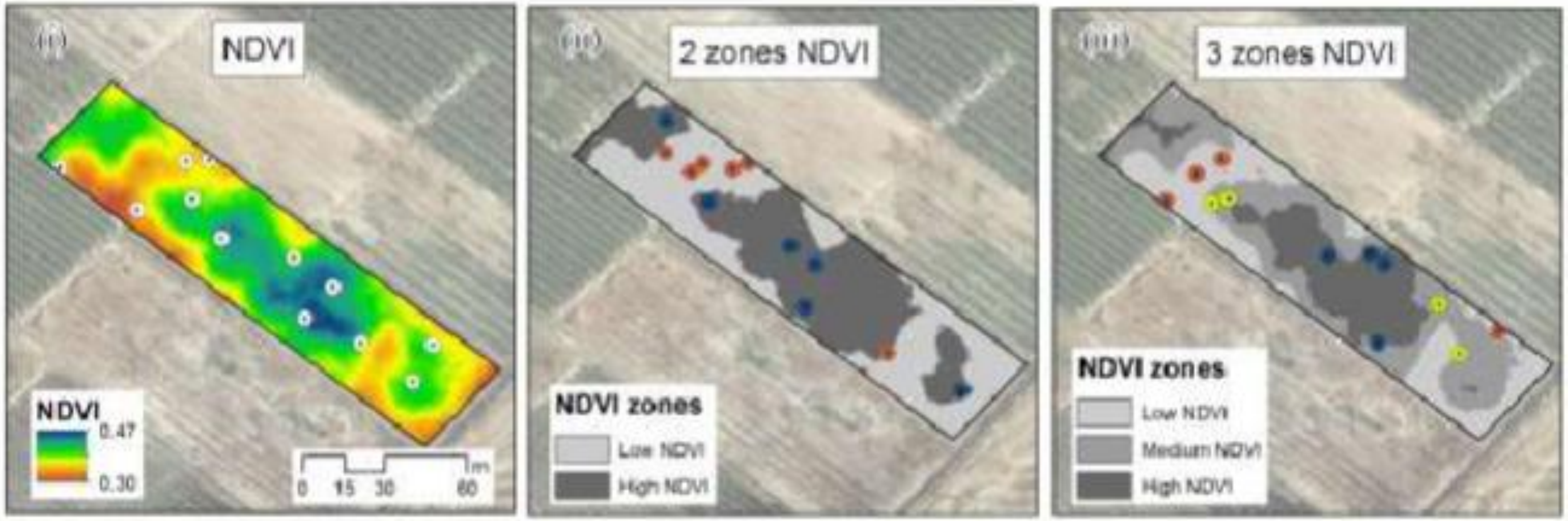
https://www.youtube.com/watch?v=3_U9Z3fy0Ig

definition of sampling points on map

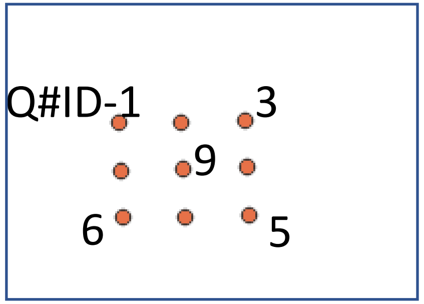
Simple random

Stratified (2 strata)

Stratified (3 strata)



Q#ID

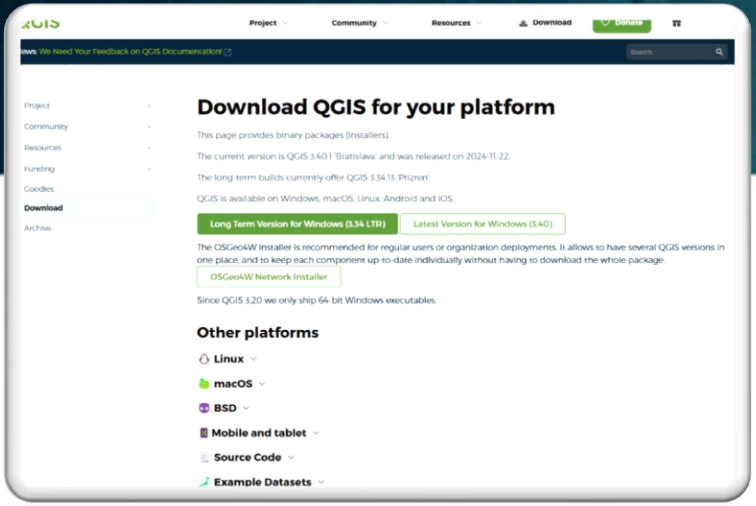


Basic info requested
Date
Lat, Long
Quadrat ID
Point ID
Crop type
Crop variety
Crop height

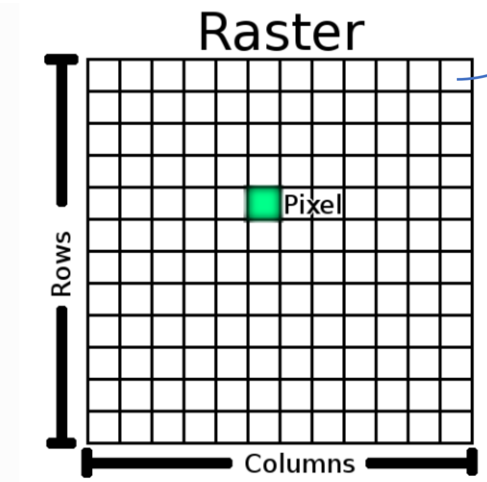
Install QGIS

Qgis Download Link:

https://www.qgis.org/download/



A Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced databases.

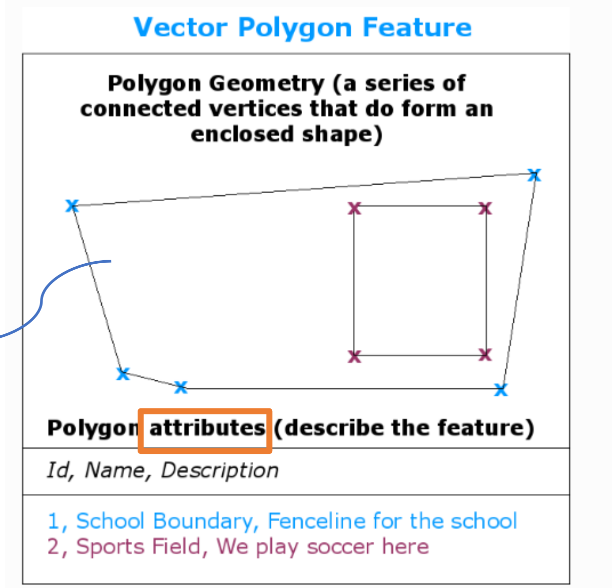


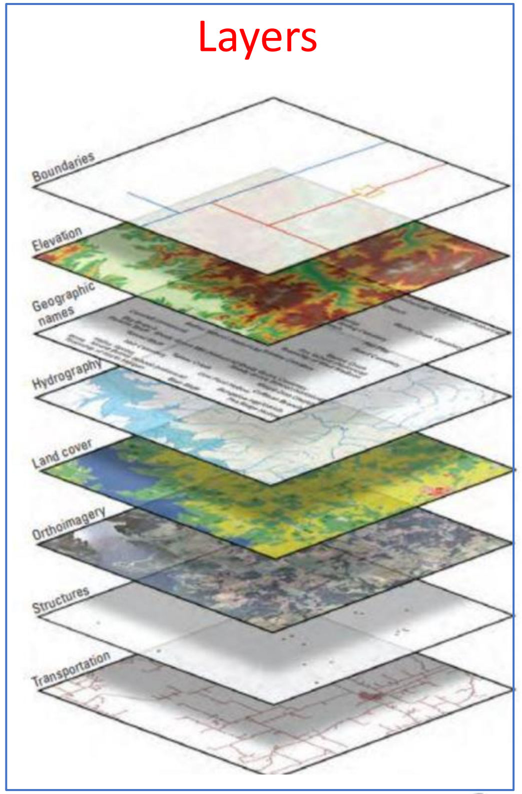
Digital Number

- Integer : 6
- Decimal/Float : 6.2

3 geometric primitive

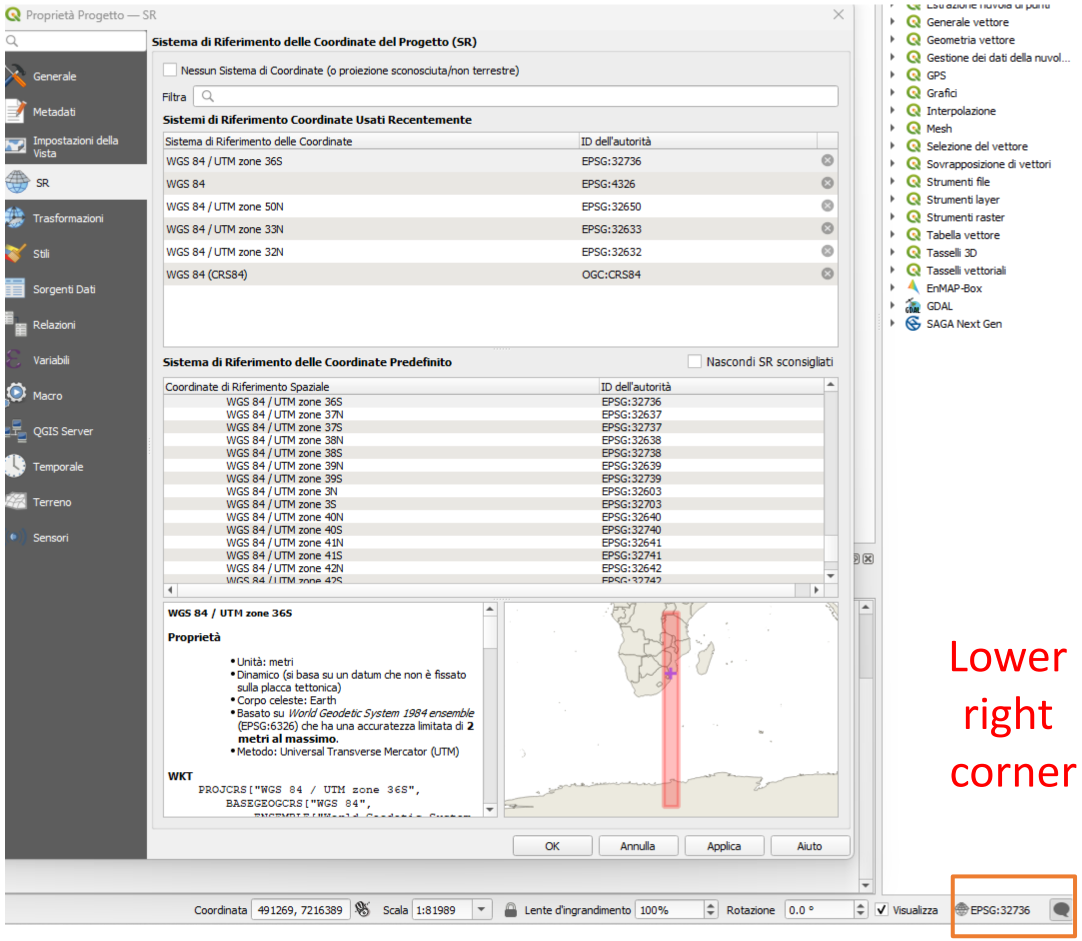
- Point
- Line
- Poligon





Reference system (RS)

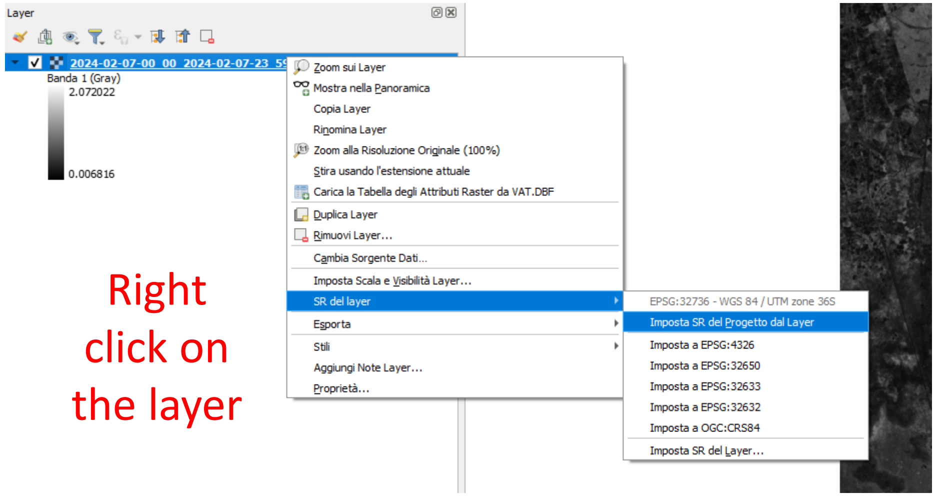
Project RS



Lower right corner

- Layer RS

Projection on the fly



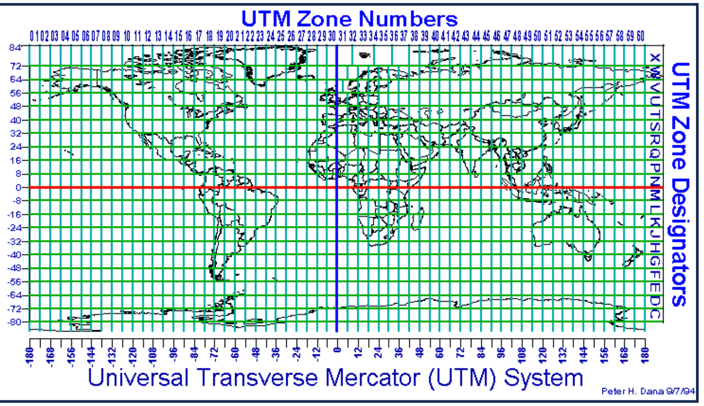
Right click on the layer

Wgs84 UTM

60 Zones

N

S



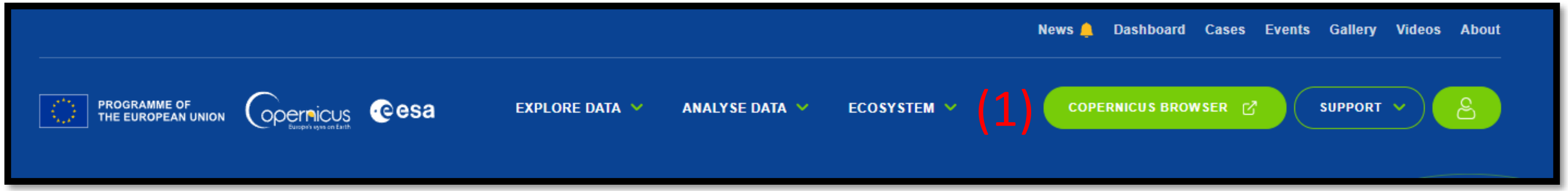
Copernicus Dataspace Ecosystem

S2 Portal Link:

https://dataspace.copernicus.eu/

Custom Script Link:

https://raw.githubusercontent.com/sentinel-hub/custom-scripts/master/sentinel-2/lai/script.js



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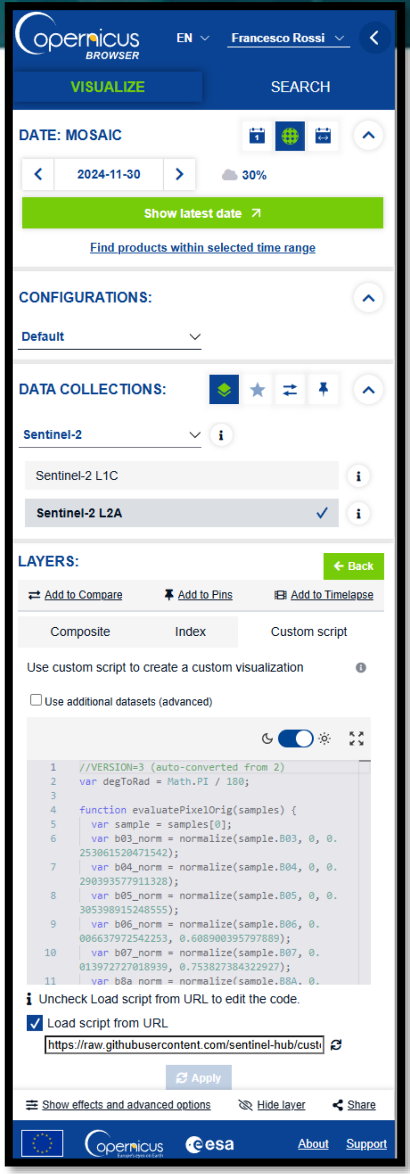

Mission Planning

Google My Maps : https://google.com/intl/it/maps/about/mymaps/

(1) Export as KML