

SoMMet

Water and soil are vital resources that are seriously affected by climate change and degradation. Water at the land surface, primarily in the form of **soil moisture**, is a key resource influencing agriculture, forestry, groundwater recharge, weather, climate, and greenhouse gas emissions.

The overall objective of this project is to develop novel **metrological tools** and establish a metrological foundation for soil moisture measurements on multiple lateral scales, ranging from decimetre to kilometre, ensuring the **traceability and harmonisation** of the various soil moisture measurement methods.

Point-scale methods

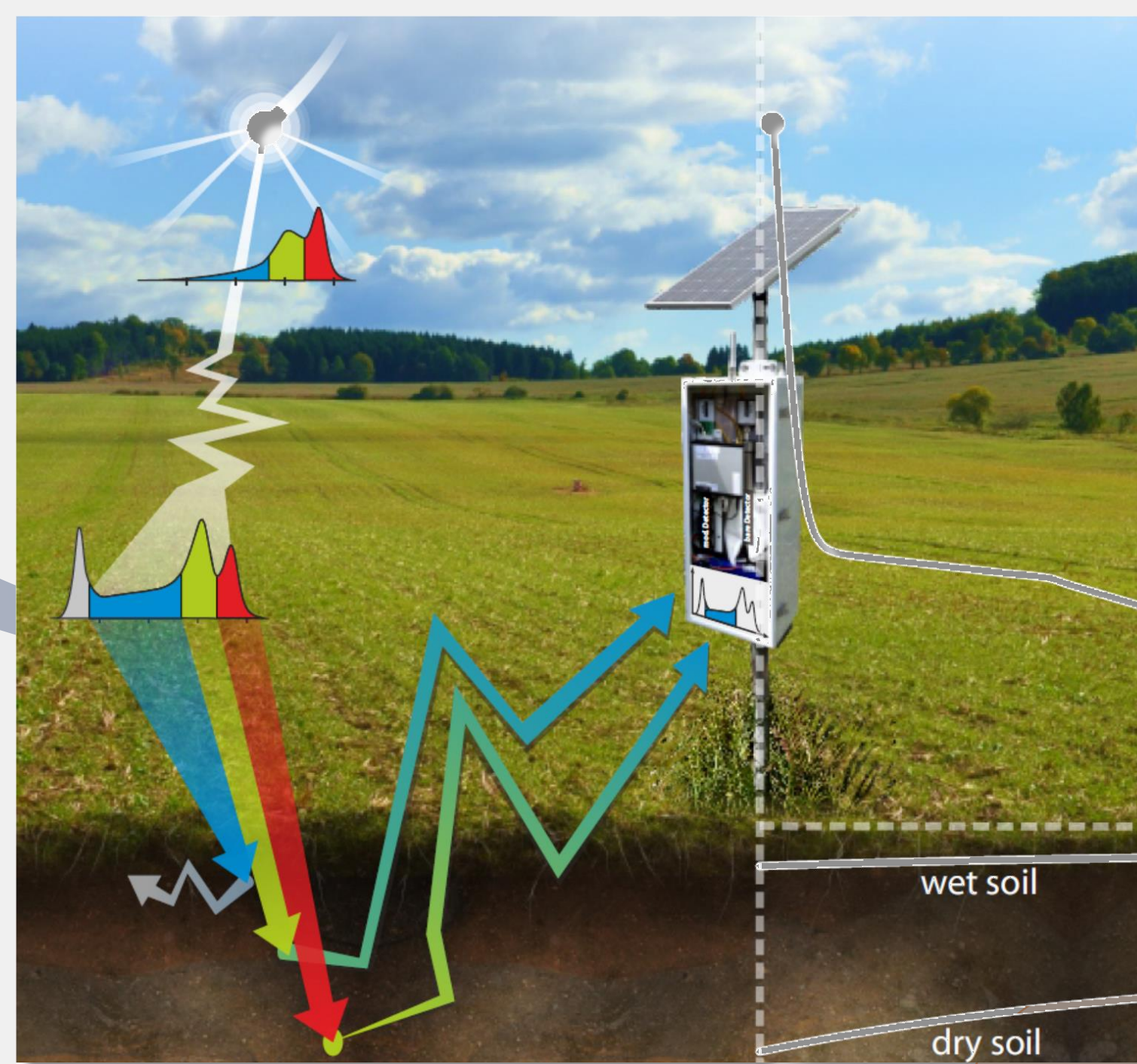


Image from I. E. Zuniga, (2022). Open Access Theses & Dissertations. 3754. https://scholarworks.utep.edu/open_etd/3754

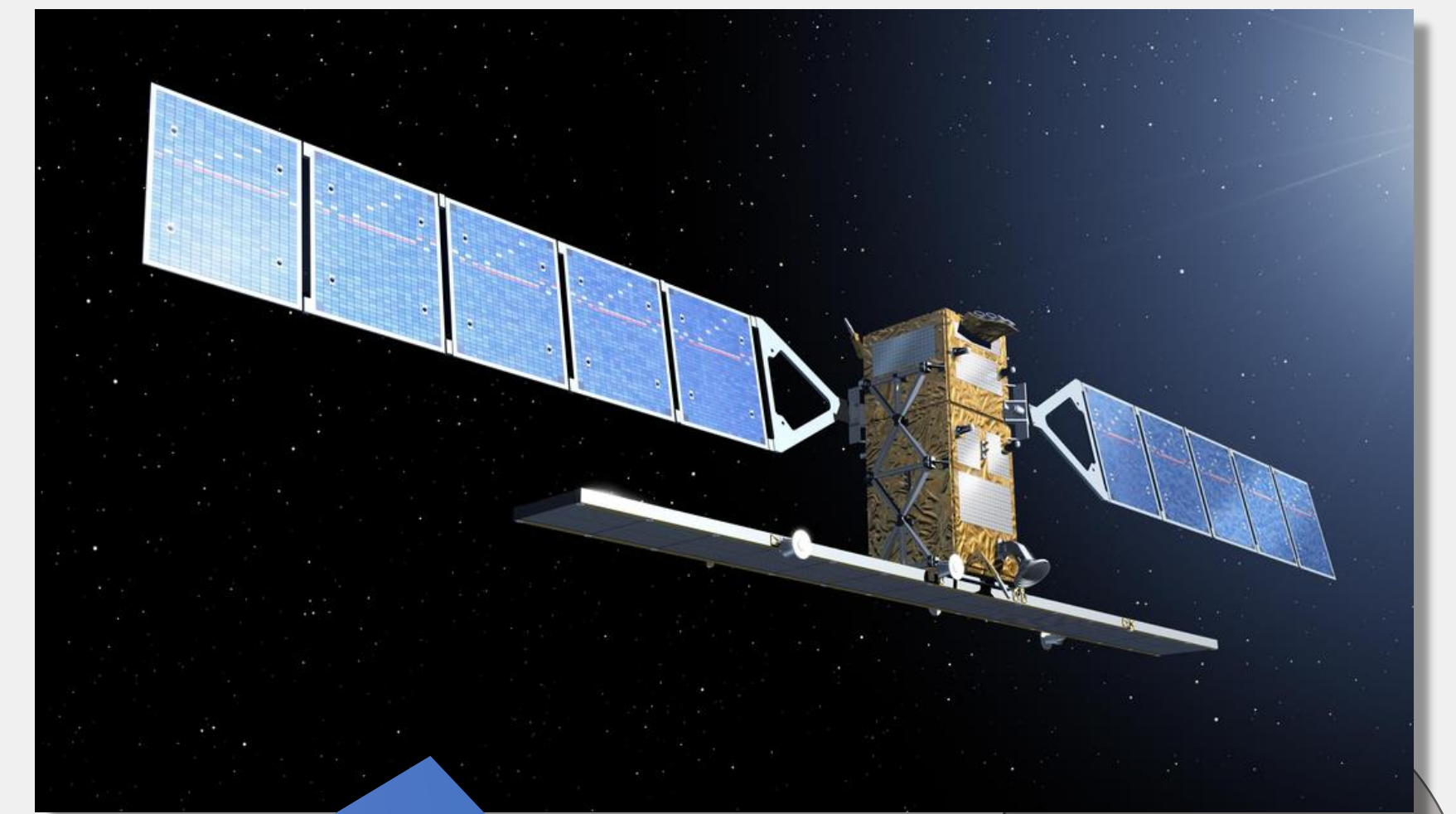
Several soil moisture observation systems exist on multiple scales

SoMMet aims to develop a multi-scale metrological system and methods for soil moisture monitoring, to reduce relative uncertainty to less than 20 %.

CRNS methods



Satellites



Horizontal scale

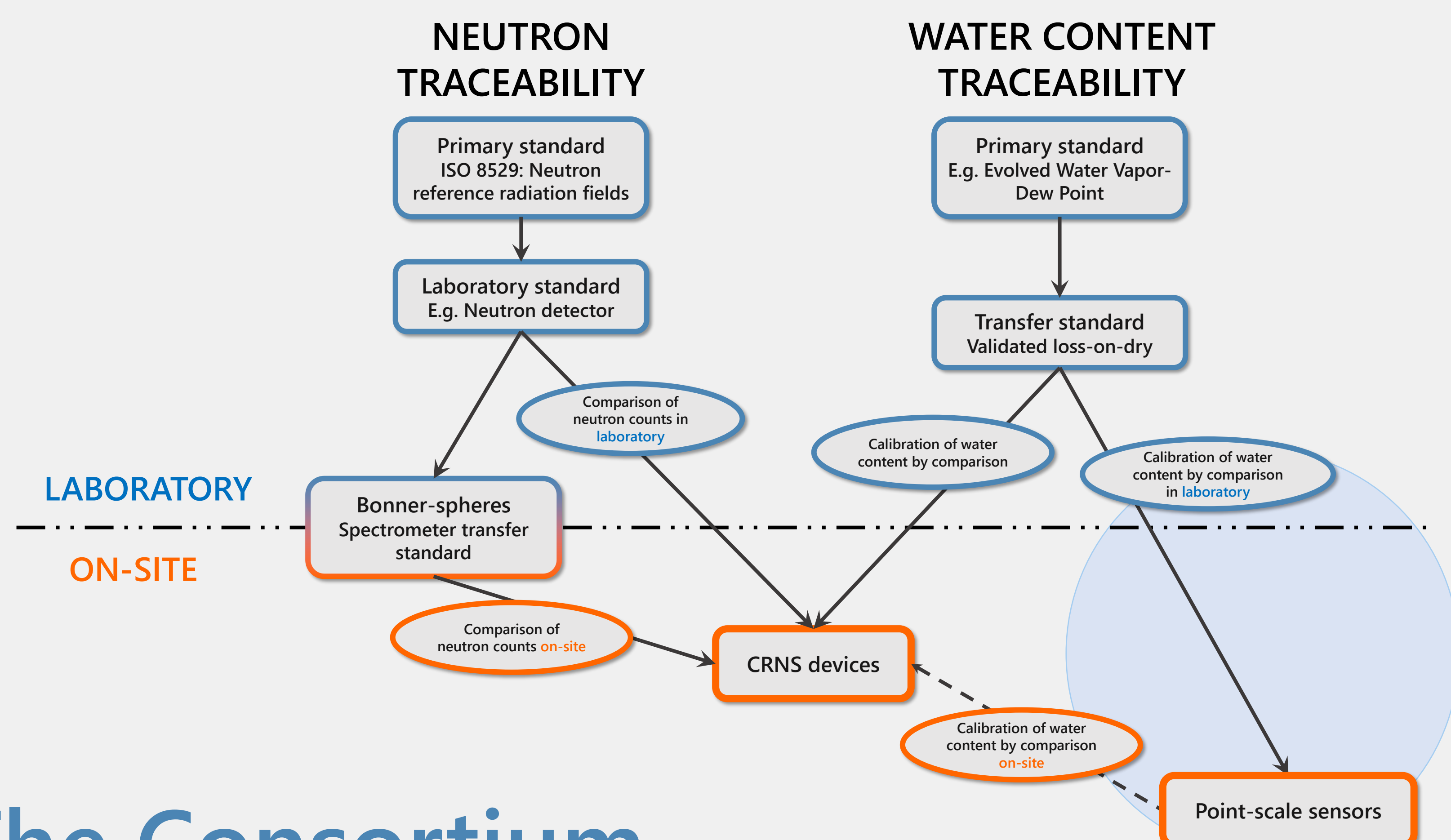
$(10^{-1} - 10^1)$ m

$(10^2 - 10^3)$ m

$(10^3 - 10^4)$ m

Objectives

1. To develop a metrological framework, including primary and secondary transfer standards, under laboratory conditions. (WP1)
2. To develop new validation practices for cosmic-ray neutron sensing (CRNS) methodology for use in outdoor conditions. This includes the application and validation of neutron transport models benchmarked on the test field sites. (WP2)
3. To investigate the constraints and accuracy of soil moisture measurement methodologies using intercomparison campaigns on local and remote sensing. (WP3)
4. To develop a cross-disciplinary harmonisation system on the medium sub-kilometre-scale and the establishment of metrological traceability of soil moisture measurements using point-scale sensors and satellite measurement technique. (WP4)
5. To cooperate with user communities to define design criteria for emerging and future hydrological and meteorological/climatological soil moisture networks using the combination of point-, intermediate- and large-scale methods. (WP5)



Benefit to manufacturers

The calibration procedure developed in this project will allow manufacturers of hydro-meteorological equipment to certify the performance of their instruments based on standard procedures, in application such as weather monitoring, forecasting, and precision farming.

Hydroinnova, USA



Finapp, Italy



StyX Neutronica, Germany



The Consortium

- SoMMet Test field sites
- Apulian Tavoliere site
 - Bondeno site
 - Marquardt site
- SoMMet Consortium
- PTB
 - CIEMAT
 - CMi
 - DTI
 - INRIM
 - IRSN
 - JV
 - SMU
 - TUBITAK
 - CNR
 - CTU
 - JAPAN
 - PoliMI
 - UFZ
 - UHEI
 - UNIBO
 - UP DE
 - UKCEH



PROJECT PARTNERS:



SUPPORT & STAKEHOLDERS:



SoMMet: Soil Moisture Metrology.

A European project to improve measurements of soil moisture

<https://www.sommet-project.eu>

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