

SOIL HEALTH NOW!

*Science, technology and business intelligence
for measuring, monitoring and increasing
soil health*

FULL PROGRAMME

8th, 9th, and 10th April 2025

Wageningen International Congress Centre - WICC
Wageningen, The Netherlands



The AI4SoilHealth project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101086179

TOPICS

This conference focuses on the urgent need for common soil health indicators, technology, and standards. This event aims to connect EU Agencies and Programs, researchers, farmer associations, technology leaders, and business intelligence to develop tools, protocols, standards, and datasets for measuring, monitoring, and increasing soil health across the European continent.

Specific topics of interest include:

- Soil health indicators
 - Pan-EU soil health assessment
 - In-situ measurement of soil health
 - Soil organic carbon
 - Soil-climate-agriculture
 - Technology demonstrations
 - Soil biology
 - Earth Observation data for monitoring soil health
 - Soil spectroscopy
 - eDNA and similar topics
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DISCUSSION PANELS

The Soil Health Now! Conference will feature **three expert discussion panels focusing on key challenges and opportunities in the field of soil health.** These interactive sessions will bring together diverse perspectives to foster dialogue and collaboration:

- Day 1 - The Soil Data Revolution: How Earth Observation, Spectroscopy, and AI are Changing Soil Use Forever
- Day 2 - Europe's Innovation Paradox: How Can We Turn Soil Health Research into Thriving Businesses?
- Day 3 - The Next Generation of Soil Tech: Affordable, Accessible, and Farmer-Focused

Moderators will guide the conversation, encourage **audience participation**, and help synthesize key takeaways from each panel.

ORGANIZING COMMITTEE

Beatriz Sarabia, *OpenGeoHub Foundation*
Gülten Inan, *OpenGeoHub Foundation*
Viola Coppi, *OpenGeoHub Foundation*
Ichsani Wheeler, *OpenGeoHub Foundation*
Tom Hengl, *OpenGeoHub Foundation*

Lexy Ratering, *Lenteland*
Annett Wania, *Planet*
Antonella Totaro, *Sustinn*
Koen van Seijen, *Sustinn*
Tianyu Yang, *OpenGeoHub Foundation*

Paolo di Lonardo, *Soil Benchmarks,*
University of Wageningen

KEYNOTE SPEAKERS



ANNE-SOPHIE LEROY
REGENERATIVE AGRICULTURE
EARTHWORM FOUNDATION



KAT BRUCE
FOUNDER DIRECTOR
AT NATUREMETRICS



SONIA MELLER
CO-FOUNDER AND CHIEF
TECHNOLOGY OFFICER AT DIGIT SOIL



NILS BROOThAERTS
SENIOR RESEARCHER AT JRC,
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MAARTEN VAN DAM
PARTNER AT PYMWYMIC



MADLENE NUSSBAUM
ASSISTANT PROFESSOR IN GEOSCIENCES
AT THE UNIVERSITY OF UTRECHT



ANOUK SCHOORS
INVESTMENT DIRECTOR AT THE NEST
FAMILY OFFICE



FABIO VOLKMANN
EU PARTNERSHIP MANAGER AT
SOIL HEALTH BENCHMARKS



PETE SMITH
PROFESSOR OF SOILS AND GLOBAL
CHANGE AT THE UNIVERSITY OF ABERDEEN



GEERT VAN DER VEER
FOUNDER AND MANAGING DIRECTOR
AT HERENBOEREN



TOBIAS BANDEL
CO-FOUNDER
AT THE LANDBANKING GROUP



CLAIRE CHENU
DIRECTOR OF RESEARCH AT
INRAE

HUGOTECH



EXPERT ROOM 7

EXPERT ROOM 11



07:30 - 09:00

Registrations

09:00 - 09:30

Welcome Plenary (HUGOtech)

09:30 - 10:00

Keynote: "Soil health and EU soil policies: the role of the EU Soil Observatory" by Nils Broothaerts

10:00 - 10:30

Keynote: "Machine learning for soil health - Is the horizon the limit? Flaws, potentials and future challenges." by Madlene Nussbaum

10:30 - 11:00

Keynote: "Monitoring, reporting and verification of soil health - what can we learn from the soil carbon experience" by Pete Smith (Online)

11:00 - 11:30

Coffee Break (Break Area, Ground floor)

11:30 - 12:00

Keynote by Tobias Bandel

12:00 - 12:30

Discussion Panel: The Soil Data Revolution: How Earth Observation, Spectroscopy, and AI are Changing Soil Use Forever

13:30 - 14:00

Lunch (W-Invite, Ground floor)

14:00 - 14:15

Oral Talk: "Advancing circular agriculture: The Waste4Soil Project for sustainable fertilizer development from food processing residues" by Vera Proskynitopoulou

Oral Talk: "Expanding access to soil data: SoilHive strategy to promote global collaboration" by Ester Miglio

14:15 - 14:30

Oral Talk: "Using evidence chains to predict nature's contributions to people (NCPs) under conventional and organic farming systems across Europe" by Els Dhiedt

Oral Talk: "The quality paradigm and selecting soil indicators" by David Robinson

14:30 - 14:45

Oral Talk: "Developing Robust MRV Systems for Carbon Farming: Insights from the MARVIC and Credible Projects" by H. Xu

Workshop: "Soil Health governance: tools and methods to enhance soil literacy and facilitate the decision making processes" by Annalaura Vannuccini

Oral Talk: "Probability based stratified sampling for both mapping and estimating the population parameters of the soil health indicators at field scale" by Jasmin Fetzer

14:45 - 15:00

Oral Talk: "Spatiotemporal prediction of soil organic carbon density for Europe (2000--2022) in 3D+T and its uncertainty" by Xuemeng Tian

Oral Talk: "Exploring key VNIR-SWIR bands for predicting nickel in an urban soil using eXML" by Mahsa Nakhostinrouhi

15:00 - 15:15

Oral Talk: "Mapping Soil Issues in Southwest Europe for Sustainable Land Management Solutions" by Ana Romero Freire

Oral Talk: "Monitoring Soil Resilience: A Combined STL and Autoencoder Approach to Dynamic SWRC Prediction" by Nedat Aqel

15:15 - 15:30

Oral Talk: "Pan-European mapping of ponding time as soil health indicator for absence of compaction and structure formation" by Peter Lehmann, Annett Wania

Oral Talk: "Soil health monitoring of non-agricultural areas - gaps identification" by Agnieszka Klimkowicz-Pawlas

	HUGOTECH LIVE REC	EXPERT ROOM 6	EXPERT ROOM 7	EXPERT ROOM 11 REC
15:30 - 16:00	Coffee Break (Break Area, Ground floor)			
16:00 - 16:15	Oral Talk: "Soils4Africa: a continent-wide soil information system for monitoring and assessment of soil health in Africa" by Bas Kempen		Workshop: "Optimization of sampling designs for monitoring the soil health indicators" by Tomislav Hengl	Demo Session: "A cutting-edge molecular tracking technology for microbial-based products used in agriculture" by Loredana Canfora, Eligio Malusà
16:15 - 16:30	Oral Talk: "Comparison of SOC trends from national soil monitoring networks and soil carbon maps" by Laura Sofie Harbo			
16:30 - 16:45	Oral Talk: "In-situ soil health indicators beyond physico-chemical properties" by Lur Epelde	Workshop: "Soil Sommelier" by Yasmine Cathell, Alessio Corti	Demo Session: Advancing In-Situ Soil Health Assessment and Sustainable Land Management through Soil Spectroscopy by Matteo Poggio	Demo Session: "Slakes: a free smartphone application for measuring soil aggregate stability" by Jason Ackerson
16:45 - 17:00	Oral Talk: "Enhancing Nutrient Efficiency: Adsorption and Release Kinetics of Vineyard Prunings Biochar" by Olena Dorosh			
17:00 - 17:15	Closing remark			
17:30 - 18:00	Poster Session + Drinks and Bites (W-Invite, Ground floor)			
18:00 - 18:30				
18:30 - 19:00				
19:00 - 19:30				

HUGOTECH

LIVE REC

EXPERT ROOM 7

EXPERT ROOM 11

REC

08:00 - 09:00

Registrations

09:00 - 09:30

Welcome Plenary (HUGOtech)

9:30 - 10:00

Keynote: "Creating a business case for soil health in food and ag value chains" by Anne-Sophie Leroy

10:00 - 10:30

Keynote: "Soil as an asset class" by Anouk Schoors

10:30 - 11:00

Keynote: "Soil improvement meets social innovation" by Geert van der Veer

11:00 - 11:30

Coffee Break (Break Area, Ground floor)

11:30 - 12:00

Keynote: "What lies beneath: using biodiversity to understand and measure soil health" by Kat Bruce

12:00 - 13:00

Discussion Panel: Europe's Innovation Paradox: How Can We Turn Soil Health Research into Thriving Businesses?

13:00 - 14:00

Lunch (W-Invite, Ground floor)

14:00 - 14:15

Oral Talk: "An intergenerational Soil Carbon Registry for Europe" by Ichsani Wheeler

Workshop part 1: "Harmonization of soil point data" by Xuemeng Tian and Davide Consoli

Oral Talk: "Soil water repellency in natural and semi-natural habitats is influenced by carbon and prokaryotic communities" by Anne-Cathrine Storgaard Danielsen

14:15 - 14:30

Oral Talk: "Potential soil biodiversity indicators for soil health assessment" by Lucas Gomes

Workshop part 2: "Preparation of environmental covariate layers" by Xuemeng Tian and Davide Consoli

Oral Talk: "Benchmarking soil organic carbon (SOC) concentration provides more robust soil health assessment than the SOC/clay ratio at European scale" by Chris Feeney

14:30 - 14:45

Oral Talk: "How to use microbial data as soil health indicators - experiences from Denmark" by Sebastian Gutierrez

Workshop part 3: "ML modeling pipeline for soil property prediction" by Xuemeng Tian and Davide Consoli

Oral Talk: "Symbiotic microorganisms as a tool for recovering soil health in heavily polluted sites" by Mario Paniagua-López

14:45 - 15:00

Oral Talk: "Fertilize to feed the crop or build soil health?" by Anne Hoek van Dijke

Workshop 4: "Generation of spatial prediction maps" by Xuemeng Tian and Davide Consoli

Oral Talk: "Influence of cover crops on the enzymatic activity of vineyards in a semi-arid climate (SANCHOSTHIRST project)" by Juan Pedro Martín Sanz

15:00 - 15:15

Oral Talk: "Bridging the Gap: A Multilevel Approach to Soil Health Assessment across Various Land Uses" by Niklas Schmücker

Oral Talk: "Soil monitoring: standardised protocols for the assessment of biodiversity and ecosystem services [Soil Health and Restoration Evaluation; SHARE protocols]" by Giles Ross -

DAY 2 - WEDNESDAY, APRIL 9

HUGOTECH

LIVE REC

EXPERT ROOM 7

EXPERT ROOM 11

REC

15:15 - 15:30

Oral Talk: "High resolution soil quality products for Europe" by Laura Poggio

Workshop part 4: "Generation of spatial prediction maps" by Xuemeng Tian and Davide Consoli

Oral Talk: "Soil-X-Change: Fostering cross-border knowledge exchange and co-creation on sustainable soil and farm management" by Barbara Pápai

15:30 - 16:00

Coffee Break (*Break Area, Ground floor*)

16:00 - 16:15

Oral Talk: "A commercial-scale embodiment of in situ VisNIR reflectance spectroscopy for commercial-scale soil C MRV: The Yard Stick promise made real" by Jason Ackerson

16:15 - 16:30

Oral Talk: "Promising Preliminary Spectral prediction of Soil health Indicators in the Soils4Africa Project" by Nondumiso Zanele Sosibo

Workshop: "Accessing and using Soil Health Data Cube" by Yu-Feng Ho

Workshop: "Soil spectroscopy as a near real time tool to monitor soil health indicators" by Tomislav Hengl

16:30 - 16:45

Oral Talk: "A Physics-Based Spectroscopic Approach for Rapid Estimation of Soil Properties Essential to Soil Health: Particle Size Distribution and Water Retention Curves" by Sarem Norouzi

16:45 - 17:00

Oral Talk: "Tracing the Roots of Land Degradation: EO-Based Identification of Climate and Anthropogenic Drivers" by Mustafa Serkan Isik

17:00 - 17:15

Oral Talk: "SOILCRATES: SOil Innovation Labs: Co-Regenerating And Transforming European Soils" by Emiel Elferink

17:15 - 17:30

Closing remark

18:00- 19:00

19:00 - 19:30

Dinner (*W-Invite, Ground floor*)

19:30 - 20:00

	HUGOTECH LIVE REC	EXPERT ROOM 7	EXPERT ROOM 11 REC
08:00 - 09:00	Registrations		
09:00 - 09:30	Welcome Plenary (<i>HUGOtech</i>)		
09:30 - 10:00	Keynote: "The mother of all solutions is the soil" by Maarten van Dam		
10:00 - 10:30	Keynote: "Monitoring Soil Health in the framework of the future EU soil directive: lessons learned and recommendations from the EJP SOIL" by Claire Chenu		
10:30 - 11:00	Keynote: "Farmer-Led Transformation: Regenerating Soils and Building a Resilient European Food System" by Fabio Volkmann		
11:00 - 11:30	Coffee Break (<i>Break Area, Ground floor</i>)		
11:30 - 12:00	Keynote: "Soil Health monitoring from perspective of an entrepreneur" by Sonia Meller		
12:00 - 13:00	Discussion Panel: "The Next Generation of Soil Tech: Affordable, Accessible, and Farmer-Focused"		
13:00 - 13:30	Closing Remarks (<i>HUGOtech</i>)		
13:30 - 14:30	Lunch (<i>W-Invite, Ground Floor</i>)		
15:00- 19:00	<p>Field Excursion to 't Gagel Farm</p> <p>Departure time from the conference venue is 15:00</p>		

FIELD EXCURSION TO 'T GAGEL FARM

The field excursion to 't Gagel farm on the final day of the public Conference offers a unique opportunity to **experience regenerative agriculture in practice**. This community farm, located in Lochem, Netherlands, serves as a European model for regeneration, with a mission to facilitate life through agriculture. The farm is part of the **Lenteland network**, emphasizing the active role of the community surrounding the farm. Participants will have a chance to see firsthand how the farm operates as a community enterprise and a model of regenerative agriculture. The experience will provide a practical perspective on the theoretical concepts discussed during the Conference.

What to expect during the excursion:

Regenerative Agriculture Focus: The farm's core mission is to facilitate life through agriculture, focusing on ecological, social, and economic benefits. This approach results in vital, pesticide-free food, a thriving community, and healthy soil.

Community Involvement: 't Gagel is a community farm where the surrounding community plays an active role. Individuals can become co-owners by purchasing certificates, investing in the farm, and supporting regenerative agriculture for future generations. This model ensures that farmland is available for future generations and supports the growth of other Lenteland farms in the Netherlands.

ERF Residency Program: The farm has an ERF (**Eat, Reconnect, Farm**) residency program, which brings together talented apprentice farmers, artists, and cooks to develop a new food culture. This program highlights the farm's role as a learning space.

Lenteland Farm: As a Lenteland farm, 't Gagel emphasizes community involvement, offering vegetable subscriptions and opportunities to become co-owners. The community aspect ensures both farmers and consumers are part of a regenerative future.

The field excursion to 't Gagel farm is designed to be an immersive and educational experience, highlighting the importance of community-driven, regenerative agricultural practices for the future of soil health. It provides a tangible link between the scientific and technological aspects of soil health and the practical application of these methods in a farm setting.



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POSTER SESSIONS

SOILCRATES Living Lab Ireland, Lena Madden

Soil Degradation in Europe under Changing Land Use and Climate, David Robinson, Panos Panagos, Mehdi H. Afshar, Amirhossein Hassani, Pasquale Borrelli, Dani Or, Nima Shokri

Soil Fertility & Rotations: Evaluating the Efficacy of Organic Amendments on Crop Productivity, Environmental Outcomes and Risk Management, Stephanie Race

Standardized metabarcoding pipeline for soil microbiome analysis on MinION platform, Fabio Fracchetti

Optimizing nutrient cycling within a soil health assessment framework: A modelling approach, Yizan Li

Dense temporal multispectral radiometry as a proxy for soil health assessment, Vlatko Galic

Towards a Climate-Resilient Production System with the Soil-Plant Digital Twin based on STEMMUS-SCOPE Model, Yijian

Unveiling the State and Wishes for Soil Health Education in Europe, Divya Pandey

Agroforestry for Soil Health, Ranjith Udawatta and Darshani Kumaragamage

Testing EO products as building blocks for Soil Health Indicators: the AI4SoiHealth pilot site in Boermarkte Zijen (Netherlands) Lexy Ratering Arntz, Piers Holden, Annett Wania, Pierre Guillevic, Jannes Schenkel, Durk Bakker, Gerko Brink

Multiple soil map comparison highlights challenges for predicting topsoil organic carbon concentration at national scale, Chris Feeney

Integrated Multi-Sensor Data Preparation Framework for Climate-Specific Peatland Degradation Monitoring, Harsha Vardhan Kaparathi

Exploring the Ecological Footprint of Technology-Critical Elements: The Case of Neodymium in Soils, María Higuera Valdivia

Mapping the potential soil water repellency in Denmark, Lucas Gomes

Effects of soil, climatic, and anthropogenic drivers on the abundance, richness, and diversity of soil microbial communities: A European perspective, Patrik Heintze

RapidCrops: A pan-European label dataset for large-scale crop classification, Piers Holden, Annett Wania

Advancing Toward Predictive Soil Salinity Mapping Across the EU, Mohammad Aziz Zarif

Novel, laboratory-independent device to measure extracellular enzymatic activity in soils, Jasmin Fetzer

Impacts of reduced tillage in woody crop systems on soil carbon sequestration in surface and subsurface soils under semiarid Mediterranean conditions, Cristina Fernández-Soler

Integrated Membrane-Based Treatment of Digestate for Soil Amender Production: A Life Cycle Assessment Approach, Vera Proskynitopoulou

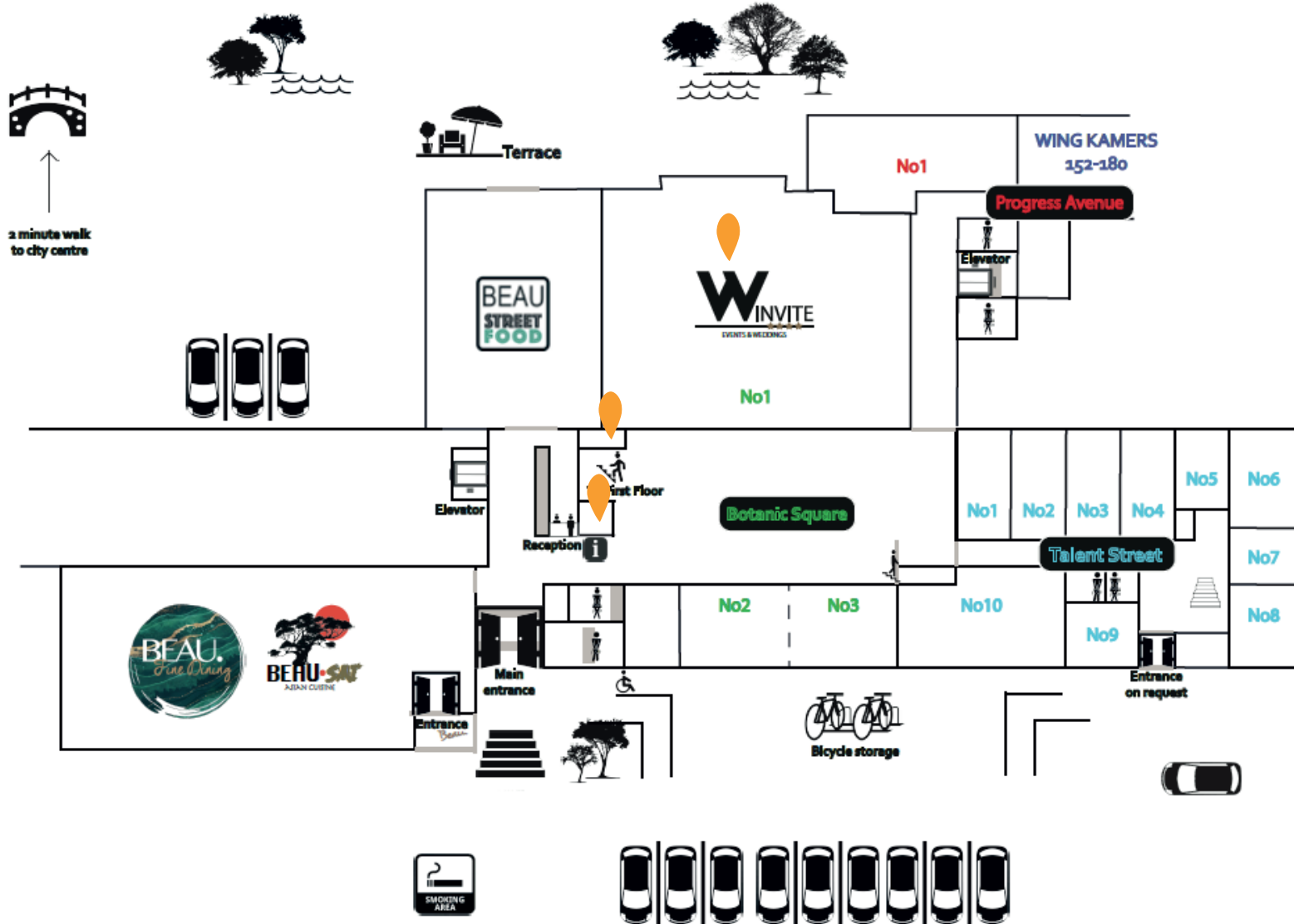
Soil health trends in Europe, Ali Sakhaee

Effect of cover crop management on enzymatic activity in olive groves and vineyards in Sardinia, Javier González Canales

Novel diagnostic tools for studying the dynamics of soil biological properties under different grazing systems, Lur Epelde, Sonia Meller, Lexy Ratering Arntz, Asier Uribeetxebarria, Jasmin Fetzer

From conventional to organic: modelling the effects of changes in soil organic carbon on soil hydraulic properties, Maud van Soest

Remote Sensing-Based Framework for Differentiating between Natural and Drained Peatlands in Europe, Miriam Gross-Schmoelders



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