

## EJP SOIL general introduction and introductions about the 10 projects from the first internal call with role of WR researchers specified

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Source of the general project summaries: [EJP SOIL Website](#)

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### EJP SOIL

The main objective of the European Joint Programme Cofund on Agricultural Soil Management (EJP SOIL) is to develop and share knowledge to enhance the contribution of agricultural soils to key societal challenges. These challenges are climate change adaptation and mitigation, sustainable agricultural production, ecosystem services provision and prevention and restoration of land and soil degradation.

EJP SOIL is established to build a sustainable European integrated research community on agricultural soils. The EJP Soil consortium unites a unique group of **26** leading European **research institutes and universities** in 21 EU-countries, Norway, Turkey and Switzerland. The consortium has secured over 80M in funding and additional budget for external calls over 5 years.

In EJP SOIL a roadmap on climate-smart sustainable agricultural soil management is developed and deployed. The EJP SOIL roadmap is based on a knowledge framework with four interacting components:

1. Knowledge development is set out in project calls with internal and external partners.
2. Knowledge sharing & transfer is framed in capacity building for young scientists, enhancing general public awareness and fostering societal understanding and appreciation of agricultural soil management and its contribution to society.
3. Knowledge harmonisation, storage & organization supports harmonised soil information and reporting practices.
4. Knowledge application deals with ways to overcome barriers for adoption of novel practices in a European context, co-developing adequate tools and providing evidence-based recommendations for EU policies.

EJP SOIL activities are carried out in interaction with stakeholders, Member States and DG AGRI. The long-term goal is to promote farmers as stewards of land and soil resources and to support policy development and deployment, in particular the Common Agricultural Policy (CAP) and climate policies. EJP SOIL addresses the following six expected impacts with targeted activities in response to societal, scientific, policy and operational challenges:

1. Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment
2. Understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon;
3. Strengthening scientific capacities and cooperation across Europe including training of young soil scientists
4. Supporting harmonised European soil information, including for international reporting
5. Fostering the uptake of soil management practices which are conducive to climate change adaptation and mitigation
6. Develop region and context-specific fertilization practices (soil, water and pedo-climatic conditions)

Actual information on EJP SOIL can be found on [www.ejpsoil.org](http://www.ejpsoil.org).

General information about EJPs can be found at [www.jointprogramming.nl](http://www.jointprogramming.nl)

## EJP SOIL research projects funded in the first internal call and started in February 2021.

<i>Acronym</i>	<i>Title</i>	<i>Duration</i>	<i>Project partners (coordinator - bold)<sup>1</sup></i>
CarboSeq	Soil organic carbon sequestration potential of agricultural soils in Europe	48 months	<b>Thünen</b> , INRAE, WR, BIOS, EV-ILVO, CRAW, CZU, AU, EMU, LUKE, ATK, TEAGASC, CREA, LAMMC, NIBIO, IUNG, INIAV, NPPC, ULBF, INIA, SLU, AGS, TAGEM, AFBI Linked third parties: AIS, UMFKBV, CSIC
SOMMIT	Sustainable Management of soil Organic Matter to Mitigate Trade-offs between C sequestration and nitrous oxide, methane and nitrate losses	36 months	<b>CREA</b> , INRAE, EV-ILVO, LUKE, NIBIO, INIAV, ULBF Linked third parties: BOKU, AGES, ISPRA, AIS, UMFKBV, CSIC
TRACE-Soils	Mechanisms underlying TRAdE-offs between Carbon sequestration, greenhouse gas Emissions and nutrient losses in Soils under conservation agriculture in Europe	36 months	<b>INIA</b> , INRAE, WR, AU, LAMMC, SLU, AGS Linked third party: CSIC
INSURE	Indicators for successful carbon sequestration and greenhouse gas mitigation by rewetting cultivated peat soils	36 Months	<b>LUKE</b> , AU, WR, Teagasc, NIBIO, AGS
STEROPES	Stimulating novel Technologies from Earth Remote Observation to Predict European Soil carbon	36 months	INRAE, SLU, WR, EVILVO, CZU, AU, CREA, UL, LAMMC, IUNG INIAV, INIA, AGS, TAGEM Linked third parties: <b>APT</b> , ISPRA, CNR, ERSAF
SensRes	Sensor data for downscaling digital soil maps to higher resolutions	36 months	<b>AU</b> , WR, LLAM-MC, TAGEM, AFBI
SCALE	State-of-the-art: Connectivity in soil erosion modelling and policy	12 months	<b>AU</b> , INRAE, LUKE, CREA, IUNG, ULBF, Linked third parties: BAW, SupAgro, BFW, VPO, UNIPA, AIS, CSIC
i-SomPE	Innovative Soil Management Practices across Europe	12 months	<b>CRAW</b> , CREA, AGS, INRAE, WR, EV-ILVO, CULS, AU, EMU, LUKE, vTI, MTA-ATK, Teagasc, UL, LAMMS, NIBIO, IUNG, INIAV, NPPC, ULBF, SLU, TAGEM, AFBI Linked third parties: AGES, CSIC
SIREN	Stocktaking for Agricultural Soil Quality and Ecosystem Services Indicators and their Reference Values	12 months	<b>WR</b> , SLU, INRAE, EV-ILVO, CRAW, CULS, AU, EMU, LUKE, Teagasc, CREA, UL, LAMMC, NIBIO, IUNG, INIAV, NPPC, ULBF, INIA, AGS, AFBI Linked third parties: APT, EAA, AIS
CLIMASOMA	Climate change adaptation through soil management: synthesis and ways forward	12 months	<b>EV-ILVO, AGS, WR, CREA, SLU</b>

<sup>1</sup>full names of organisations by country: *Austria*: **BIOS**: BIOS Science Austria; **AGES**: Austrian Agency for Food Security; **BAW**: The Federal Agency for Water Management; **BOKU**: University of Natural Resources and Life Sciences; **BFW**: Austrian Research Centre for Forests; **EAA**: Environment Agency Austria. *Belgium*: **EV-ILVO**: Flanders Research Institute for Agriculture, Fisheries and Food; **CRAW**: Walloon Agricultural Research Centre; **VPO**: Flemish Planning Bureau for the Environment and Spatial Development. *Czech Republic*: **CULS**: Czech University of Life Sciences. Denmark: **AU**: Aarhus University. *Estonia*: **EMU**: Estonian University of Life Sciences. *Finland*: **LUKE**: Natural Resources Institute Finland. *France*: **INRAE**: National Research Institute for Agriculture, Food and Environment; **APT**: AgroParisTech; **SUPAGRO**: Montpellier SupAgro; AgroCampus Ovest. *Germany*: **Thünen**: Johann Heinrich von Thünen Institut. *Hungary*: **MTA-ATK**: Centre for Agricultural Research of the Hungarian Academy of Sciences. *Ireland*: **Teagasc**: Teagasc – Agriculture and Food Development Authority of Ireland; *Italy*: **CREA**: Council for Agricultural Research and Economics; **CNR**: National Research Council; **ERSAF**: Regional Agency for Agriculture and Forests of Lombardy; **ISPRA**: National Institute for Environmental Protection and Research; **UNIPA**: University of Palermo. *Latvia*: **UL**: University of Latvia. *Lithuania*: **LAMMC**: Lithuanian Research Centre for Agriculture and Forestry. *Norway*: **NIBIO**: Norwegian Institute of Bioeconomy Research. *Poland*: **IUNG**: Institute of Soil Science and Plant Cultivation – State Research Institute. *Portugal*: **INIAV**: National Institute for Agrarian and Veterinarian Research I. P.. *Slovakia*: **NPPC**: National Agricultural and Food Centre. *Slovenia*: **ULBF**: University of Ljubljana; **AIS**: The Agricultural Institute of Slovenia; **UMFKBV**: University of Maribor, Faculty of agriculture and life sciences. *Spain*: **INIA**: National Institute for Agriculture and Food Research and Technology; **CSIC**: The Spanish National Research Council. *Sweden*: **SLU**: Swedish University of Agricultural Sciences. *Switzerland*: **AGS**: Agroscope; *The Netherlands*: **WR**: Wageningen Research. *Turkey*: **TAGEM**: Ministry of Agriculture and Forestry. *United Kingdom*: **AFBI**: Agri-Food and BioSciences Institute.



## CarboSeq

### *Title*

Soil organic carbon sequestration potential of agricultural soils in Europe

### *Summary*

Carbon sequestration in soils is a negative emission technology that can contribute to mitigate climate change. However, for European soils, a comprehensive assessment is missing on how much soil organic carbon (SOC) can be sequestered with different management options using also national data on agricultural management. The aim of CarboSeq is thus to estimate the feasible SOC-sequestration potential taking into account technical and socio-economic constraints. The project will align with the current FAO activity for a global SOC-sequestration potential map (GSOCseq). The key for SOC-sequestration is an enhanced input of biomass (e.g. crop residues) to the soil, for which a new database will be built to facilitate model runs with RothC for different management scenarios. The potential area of implementation will be developed together with all partners of CarboSeq and the national expert hubs. All partners will run RothC at national levels. The SOC-sequestration potential maps for different management options will guide policy makers to the most efficient and regional specific agricultural management options to sequester SOC for climate mitigation.

The CarboSeq project involves a consortium of 27 research institutes from 23 European countries, coordinated by Johann Heinrich von Thünen Institut from Germany. The project type is a large project with ca. 350 PM.

### *Role of Wageningen Research*

WR is leading WP5 on non-CO<sub>2</sub> greenhouse gas emissions, such as N<sub>2</sub>O and CH<sub>4</sub>, that are related to the agricultural measures. Within this WP, WR is leading WP5-T2 a Systematic assessment of SOC-sequestration measures on GHG emissions. WR further contributes by bringing in the knowledge and data collected in national projects and applying the RothC model for the Netherlands to Task WP2-T2, WP5-T1, WP9-T1 and WP9-T4.

WR contact person: Jan Peter Lesschen (Wageningen Environmental Research)

Other WR researchers involved: Thalisa Slier

Project webpage: <https://projects.au.dk/calls-research-projects/carboseq/>



## SOMMIT

### *Title*

Sustainable Management of soil Organic Matter to Mitigate Trade-offs between C sequestration and nitrous oxide, methane and nitrate losses

### *Summary*

The SOMMIT project will evaluate trade-offs and synergies between soil C sequestration, nitrous oxide, methane and nitrate losses as affected by soil management options aimed at increasing soil C storage. The integrated and interdisciplinary approach will address the main pedo-climatic conditions and farming systems in Europe, through 1) synthesis and meta-analysis of available literature and data; 2) targeted, novel measurements on key long-term experiments; and 3) simulation of long-term agro-ecological system responses to contrasting management options. Moreover, obtained data will be synthesized through a fuzzy-expert system which will allow for 4) evidence-based identification of optimal strategies for mitigation of trade-offs, and 5) effective stakeholders' involvement.

The SOMMIT project involves a consortium of 13 research institutes from 7 European countries, coordinated by the Council for Agricultural Research and Economics from Italy. The project is medium size with ca. 150 PM.

WR is not involved in this project.

Project webpage: <https://projects.au.dk/calls-research-projects/sommit/>



## TRACE-Soils

### *Title*

Mechanisms underlying TRAdE-offs between Carbon sequestration, greenhouse gas Emissions and nutrient losses in Soils under conservation agriculture in Europe

### *Summary*

Soil C sequestration in agroecosystems can promote soil quality and biodiversity, but come at a cost of increased nutrient losses and greenhouse gas emissions. Aiming to increase the predictability of such synergies and trade-offs, we will study their underlying mechanisms by reviewing literature that quantifies them under different agricultural systems and management practices. We will identify soil abiotic and biotic predictors of trade-off magnitudes, and test them in long-term experiments across a NE-SW pedoclimatic gradient in Europe. Modelling scenarios will be posed to scale-up trade-off analysis to the provincial level. Outputs of reviews, experiments and models will serve to propose a ranked list of climate-zone specific indicators and measures to assess and mitigate trade-offs.

The TRACE-Soils project involves a consortium of 13 research institutes from 7 European countries, coordinated by the National Institute for Agriculture and Food Research and Technology from Spain. The project is medium size with ca. 150 PM.

### *Role of Wageningen Research*

WR is leading WP5, which is about modelling the trade-offs of Soil C sequestration at EU scale by using data collected in WP2 and WP3. Within WP5, WR leads tasks WP5-T1 about model parameterization, WP5-T2 to find appropriate zones to implement management options for C sequestration, WP5-T3 scenario analysis. WR further participates in all other WPs by providing data for literature review.

WR contact person: Gerard Velthof (Wageningen Environmental Research)

Other researchers involved: Mart Ros, Jordy van 't Hull (Wageningen Environmental Research)

Webpage: <https://projects.au.dk/calls-research-projects/trace-soils/>



## INSURE

### *Title*

Indicators for successful carbon sequestration and greenhouse gas mitigation by rewetting cultivated peat soils

### *Summary*

Wet management with raised ground water table and flood-tolerant crops is an option to reduce peat decomposition and the related greenhouse gas emissions and water contamination from cultivated peatlands while still providing income for the farmers. However, there are sites with the risk of tradeoffs like high methane or phosphorus emissions diminishing the environmental benefits. Measurable indicators used in the selection of sites would increase the success rate of rewetting and thus the acceptability of wet agricultural management of peat soils. Experimental work together with modelling and advanced analysis of peat composition in INSURE project aims at improved understanding of controls of element cycling in rewetted ecosystems and to finding robust indicators for the tradeoffs of wet management.

The INSURE project involves a consortium of 6 research institutes from 6 European countries, coordinated by the Natural Resources Institute Finland. The project is medium size with ca. 150 PM.

### *Role of Wageningen Research*

WR is deputy lead of WP4, which aims to improve biogeochemical and hydrological modelling for rewetted peat soils. Within WP4, WR leads task WP4-T2 about combined hydrology and biogeochemical modelling with the SWAP-ANIMO model. WR contributes to dissemination activities in WP5. WR further participates in WP1-WP3 by making data available from the long-term field site at Zegveld.

WR contact person: Rudi Hessel (Wageningen Environmental Research)

Other researchers involved: Daniel van de Craats (Department of Environmental Sciences), Rob Hendriks (Wageningen Environmental Research)

Webpage: <https://projects.au.dk/calls-research-projects/insure/>



## STEROPES

### *Title*

Stimulating novel Technologies from Earth Remote Observation to Predict European Soil carbon

### *Summary*

Conventional high-detail soil maps are static and often based on obsolete data in relation to the time of use. STEROPES intends to overcome these limitations by putting the use of satellite time series forward, to test their potential to predict cropland soil organic carbon content over various pedoclimatic conditions and cropping systems across Europe. First, models will be constructed from the reflectance image spectra of optical satellite series, notably Sentinel-2 (ESA), based on a number of diversified areas for which soil organic carbon samples are already available. The second phase of the project will be dedicated to analysing the influence of various factors on SOC prediction performance: soil moisture, texture, dry vegetation due to management practices, salinity. Then, for the sites where satellite information may not enable to derive acceptable predictions, other ancillary data will be considered at a more detailed scale, using geophysical proxies to reduce the uncertainty associated with these predictions.

The STEROPES project is a consortium of 17 research institutes from 14 European countries, coordinated by AgroParisTech, France. The project is medium size with ca. 150 PM.

### *Role of Wageningen Research*

Wageningen Environmental Research (WENR) leads WP6 and several tasks within WP6 about data synergy: incorporating satellite imagery into spatial models. In this work package the results of the other work packages come together and are compared with an approach without these new research results or with other ancillary data. Tasks include the inventory and selection of available data, baseline DSM modelling of demo sites using satellite and other (normal) ancillary data, to apply methods developed in WP 2-5 to 2-3 demo sites separately account for all disturbing factors together at the demo, and to synergize results. WENR also actively participates in WP1 on data collection -and WP2 on soil moisture mapping with synergic use of radar (Sentinel 1) and optical data (Sentinel-2) as well as on the influence of soil moisture on SOC content prediction - regional scale.

By participating in this project, WENR aims to further the knowledge of and methods applied on using satellite imagery for soil organic carbon estimates in different regions. This will directly contribute to better or more detailed and efficient monitoring of soil organic carbon and its sequestration for mitigation of climate change and for healthier soils. By improving the resilience and health of soils they are better equipped to handle changing climatic circumstances and help towards food safety.

WR contact person: Fenny van Egmond (Wageningen Environmental Research)

Other researchers involved: Dennis Walvoort, Saskia Keesstra, Sander Mucher (Wageningen Environmental Research)

Webpage: <https://projects.au.dk/calls-research-projects/steropes/>



## SensRes

### *Title*

Sensor data for downscaling digital soil maps to higher resolutions

### *Summary*

Soil maps for large areas often fail to account for local variation in soil properties, due to their coarse resolutions. However, remote and proximal sensors can provide highly detailed soil information at a local level. We therefore propose a method to downscale large-extent soil maps using sensor data. We will test the method for agricultural fields in seven European countries, using proximal sensors, drone images and satellite images. The mapped soil properties will include soil organic carbon, soil texture and locally important soil properties. We will test drone and satellite images of bare soils and vegetated fields, and we will test the effect of fusion data from different sensors. We will also test the potential for using the downscaled soil maps in practical applications.

The SENRES project involves a consortium of 5 research institutes from 5 European countries, coordinated by Aarhus University, Denmark. The project is medium size with ca. 150 PM.

### *Role of Wageningen Research*

WR leads WP3 on unmanned aerial vehicles (UAV) sensors where WR leads task WP3-T1: UAV surveys, and task WP3-T3: RGB, RGB+ and multispectral imagery for SOC assessment. WR is deputy task leader of WP3-T4: Correlation of SOC with UAV and satellite imagery. WR participates in task WP3-T2: Test vegetated UAV images for downscaling as well as all tasks within WP0, WP1, WP2, WP4, WP5 and WP7.

Main WR contact Person: Saskia Keestra (Wageningen Environmental Research)

Other researchers involved: Sander Mûcher, Wouter Meijninger, Fenny van Egmond (Wageningen Environmental Research)

Webpage: <https://projects.au.dk/calls-research-projects/sensres/>





## SCALE

### *Title*

State-of-the-art: Connectivity in soil erosion modelling and policy

### *Summary*

SCALE is a consortium of 13 research institutes from 9 EU-countries that aims to improve the management of sediment connectivity in diverse agricultural landscapes. It composes i) current state-of-the-art of connectivity principles in modelling and legal standards, ii) data set harmonisation, iii) harmonisation of up- and downscaling methods, iv) evaluation of on- and off-site measures and connectivity elements in common modelling approaches, v) development of frameworks with mitigation measures and best management practices for stakeholders and vi) the communication of the project's output. SCALE will significantly improve the harmonisation of data sets, observation and modelling techniques in connectivity research and bridge the gap between different spatial and administrative scales.

The SCALE project is coordinated by Aarhus University, Denmark. The project is medium size with ca. 150 PM.

WR does not participate in this project.

Webpage: <https://projects.au.dk/calls-research-projects/scale/>



## i-SoMPE

### *Title*

Innovative Soil Management Practices across Europe

### *Summary*

The aim of i-SoMPE is to gather information about actual and potential innovative soil management practices (SMP) in the European context. A framework will be developed to assess SMP on their ability to enhance ecosystem services and the suitability within specific farming systems, including ecological and socio-economic barriers. i-SoMPE consists of a comprehensive stocktake executed by 23 partner countries, using a surveying approach. With the gathered data, context specific thematic maps will be provided to guide policy makers to the most efficient innovative SMPs as climate-smart sustainable tools.

The i-SoMPE project involves a consortium of 25 research institutes from 23 European countries, coordinated by Walloon Agricultural Research Centre, Belgium. The project type is a stocktaking with ca. 40 PM.

### *Role of Wageningen Research*

WR participates in WP3 and will collect data on innovative soil management practices by the execution of surveys with relevant Dutch stakeholders.

Main WR contact person: Janjo de Haan (Wageningen Plant Research)

Webpage: <https://projects.au.dk/calls-research-projects/i-sompe/>



## SIREN

### *Title*

Stocktaking for Agricultural Soil Quality and Ecosystem Services Indicators and their Reference Values

### *Summary*

The SIREN project will make an inventory of indicator systems for assessing soil quality and ecosystem services, as currently used by Member States associated in the EJP SOIL and beyond. SIREN will identify and review the national frameworks and chains from soil properties via soil functions to soil ecosystem services and the indicators of soil quality state and functions plus their reference values across pedo-climatic conditions for the main agricultural production systems in the EU. Also, SIREN will identify if these have been translated into policy options and implementation, and into directions and guidance on land management. SIREN will particularly stocktake the array of reference values for SOC, soil quality, soil biodiversity and degradation risk, the associated target values of indicators, and identify knowledge gaps and development needs.

The SIREN project involves a consortium of 24 research institutes from 20 European countries, coordinated by Wageningen Research, the Netherlands. The project type is a stocktaking with ca. 40 PM.

### *Role of Wageningen Research*

Jack Faber from WR is the overall coordinator and supervises the SIREN activities. WR takes task leadership of T2 Stocktaking EU Member States current use of indicators for soil quality and ecosystem services; T4 Evaluation and synthesis; T5 Data management; and T6 Communication. WR is deputy task leader for T1, which develops a framework relating soil quality to ecosystem services. WR will participate in all other tasks.

Main WR contact person: Jack Faber (Wageningen Environmental Research)

Other researchers involved: Chantal Hendriks, Paul Römken, Peter Kuikman (Wageningen Environmental Research), Joeke Postma, Marjoleine Hanegraaf (Wageningen Plant Research)

Webpage: <https://projects.au.dk/calls-research-projects/siren/>



## CLIMASOMA

### *Title*

Climate change adaptation through soil management: synthesis and ways forward

### *Summary*

Soil management and cropping systems to enhance soil quality are often proposed as key ways to support the sustainable adaptation of EU agriculture to climate change. Many long-term field trials quantified the impact of specific management practices on soil quality and crop performance. However, syntheses targeting practitioners and policy-makers that support them to draw quantitative and context-specific conclusions concerning the efficacy of management practices as climate adaptation tools are lacking. CLIMASOMA will directly contribute to an alignment of research strategies connecting agricultural management, soil quality and climate adaptation potential through its summary of the literature, its meta-analysis and its identification of knowledge gaps.

The CLIMASOMA project involves a consortium of 5 research institutes from 5 European countries, coordinated by the Flanders Research Institute for Agriculture, Fisheries and Food, Belgium. The project type is a stocktaking with ca. 40 PM.

### *Role of Wageningen Research*

WR is deputy lead of WP1 mapping of existing projects, databases and stakeholder networks. Within WP1, WR takes leadership for task WP1-T2 Summary of socio-economic and policy context. WR is deputy lead of task WP1-T3 Publication of network map to the EJP soil website and transfer of relevant existing data to CLIMASOMA database. WR participates in WP5 Communication & dissemination.

Main WR contact person: Jan Hassink (Wageningen Plant Research)

Other researchers involved: Jan Verhagen and Sinead O'Keeffe (Wageningen Plant Research)

Webpage: <https://projects.au.dk/calls-research-projects/climasoma/>