ANNUAL SCIENCE DAYS & 5TH GENERAL MEETING 2024

An introduction

Claire Chenu (INRAE)
Anna Besse (Wageningen UR)

EJP SOIL
European Joint Programme

EJP SOIL has received funding from the European Union's Horizon 2020 research and innovation programme: Grant agreement No 862695

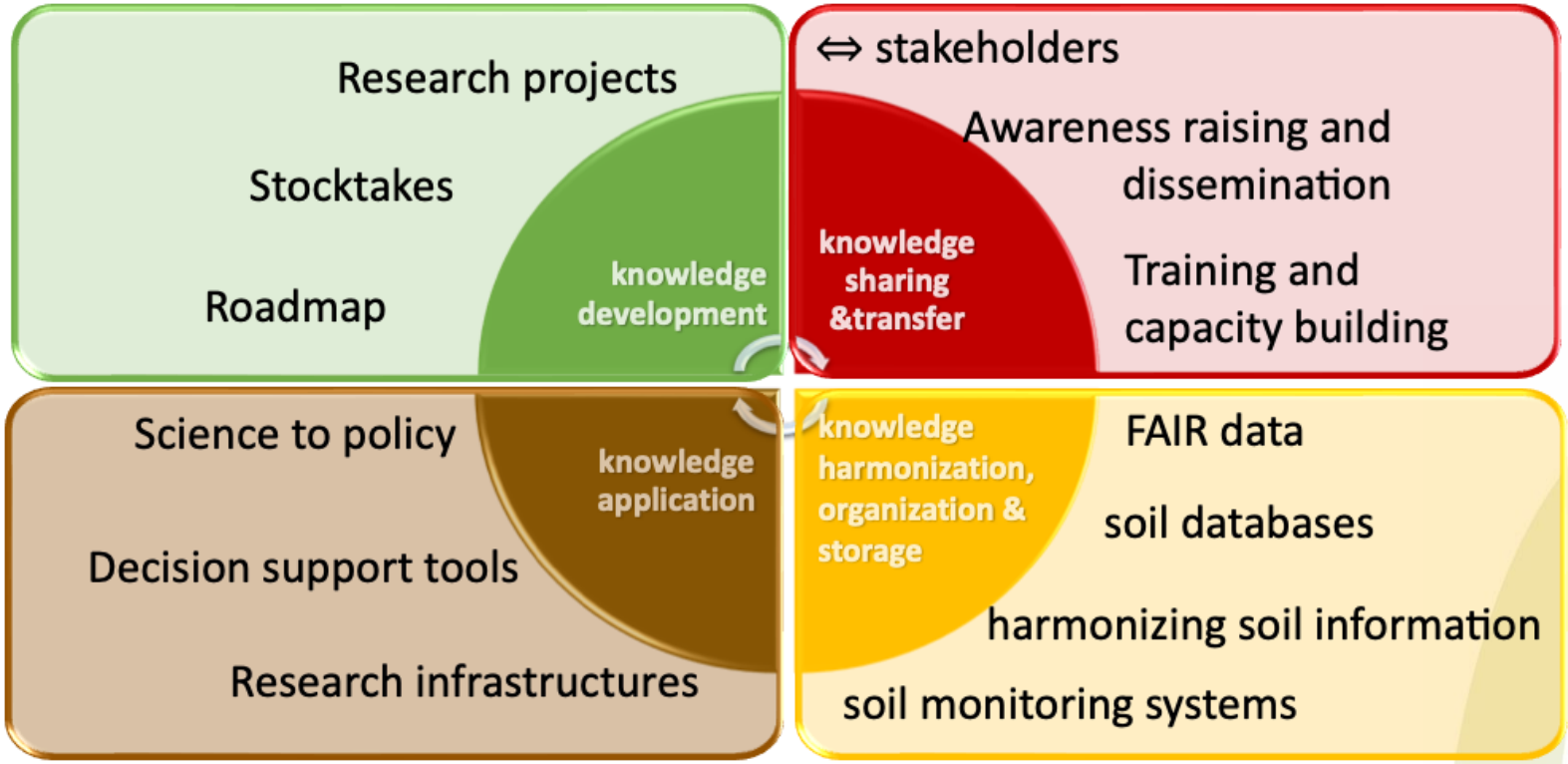
EJP SOIL: knowledge framework & expected impacts

- understanding of soil management for climate change mitigation, adaptation, sust. production & sust° environment
- understanding soil carbon sequestration and its contribution to climate change mitigation
- strengthening scientific capacities and cooperation
- supporting harmonised European soil information
- fostering the uptake of climate-smart sustainable soil management practices
- developing region-specific fertilisation practices

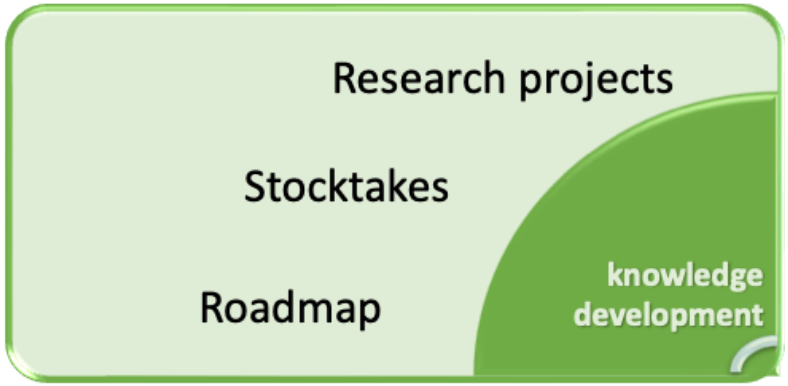
farming sector:
↗ its role as a steward of land and soil resources.
↗ its capacity to adapt to climate change and contribute to mitigation and carbon sequestration

research sector: long-term alignment and implementation of soil-related research strategies and activities at national and EU level

EJP SOIL: knowledge framework activities



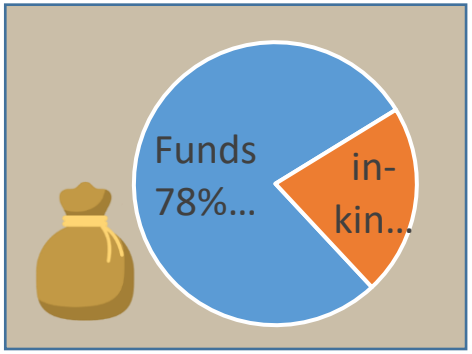
EJP SOIL: Year 4 activities and achievements

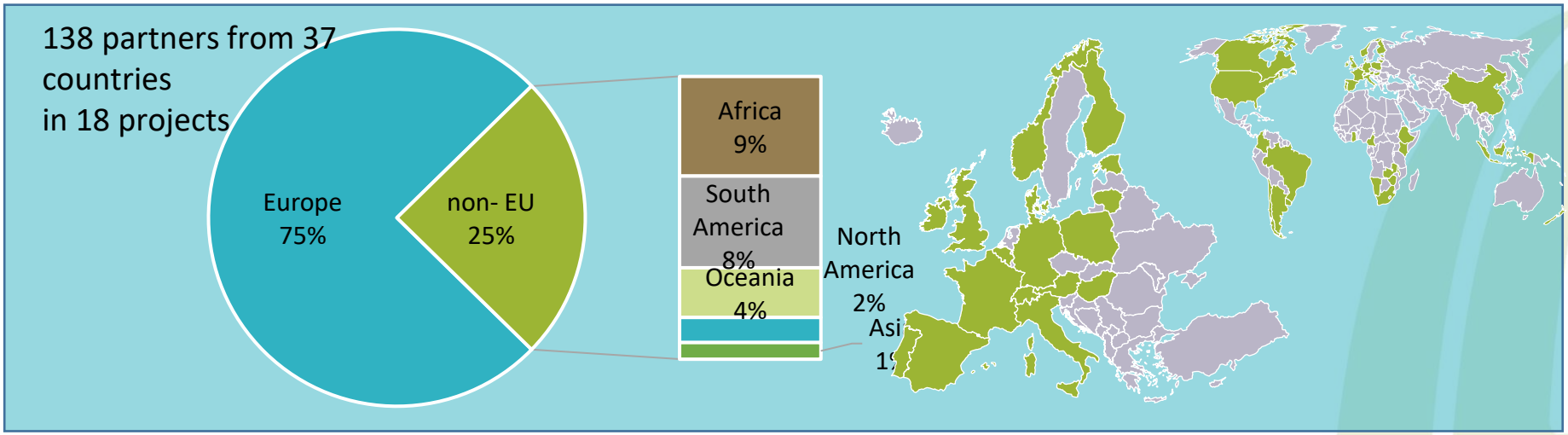


Expanding knowledge developement beyond EJP SOIL consortium

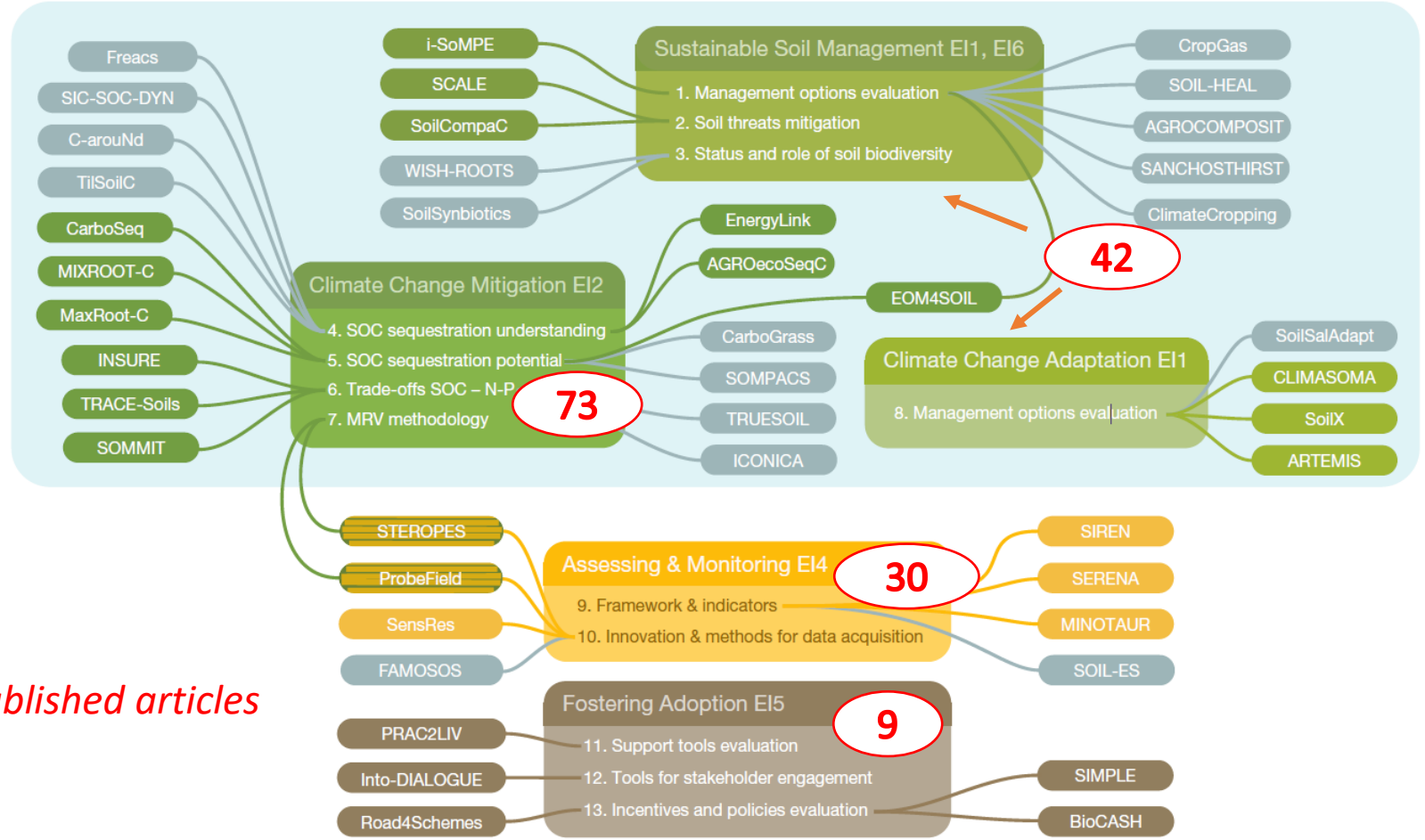
Topics in line with EJP SOIL roadmap

Towards an international research consortium on soil C





Landscape of EJP SOIL projects

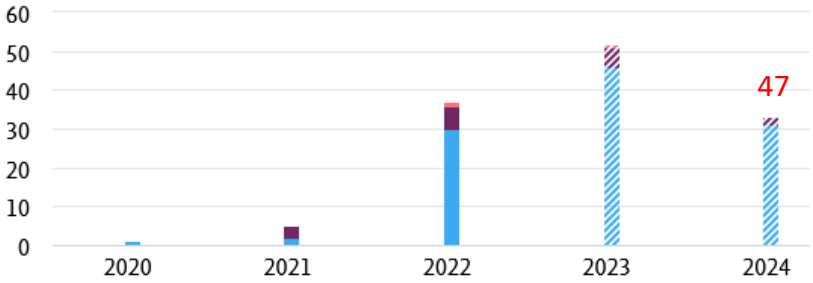


Number of published articles

Publications in high-impact journals (Scopus)

Publications by Journal quartile

Share of publications per Journal quartile by CiteScore Percentile



Incomplete year

Quartiles	Publications	Publication share (%)
Q1 (top 25%)	110	85.9
Q2 (26% - 50%)	16	12.5
Q3 (51% - 75%)	2	1.6
Q4 (76% - 100%)	0	0.0

Scopus Source	Scholarly Output
European Journal of Soil Science	17
Geoderma Regional	9
Global Change Biology	7
Agronomy	6
Remote Sensing	5

WUR Library, april 2024

EJP SOIL special issues in EJSS:

- Vol.1: 17 articles published
- Vol.2: 3 manuscripts in review (submit before June 30)

Informing the impact pathways

- understanding of soil management for climate change mitigation, adaptation, sust° production & sustainable environment
- understanding soil carbon sequestration and its contribution to climate change mitigation
- strengthening scientific capacities and cooperation
- supporting harmonised European soil information
- fostering the uptake of climate-smart sustainable soil management practices
- developping region-specific fertilisation practices

Project	EI	General theme	Topic	Outputs (extracted/ understood from the proposal)	Products (that materialize the outputs and will contribute to the outcomes)	Outcomes 1 (extracted / understood from the proposal)	Outcomes 2 (more general) (lines do not necessarily match between outcomes 1&2)	Stakeholders
SoilX	EI1	Climate change adaptation	Management options evaluation	Identifying adaptation options, related to agricultural soil management, to respond to water-related impacts of extreme weather and climate change	Manuscript draft on long-term impacts of soil/crop management on soil structure across selected pedo-climatic regions of Europe	improved understanding of spatial and temporal variability in soil-management-related adaptation benefits and potential mitigation/sustainability co-benefits	improved basis of knowledge and evidence to provide better soil management advice for both farmers and policy makers in Europe in relation to climate adaptation	regional farming communities
					10.1111/ejss.13455 Development of a soil crop model that could be used to predict consequences of sustainable mgt options when extreme events occur (Claire)		Knowledge is used to select or co-design sustainable management options	
				identify context-dependent inhibiting/enabling factors for the uptake of beneficial soil management practices	Manuscript draft on Q methodological study, including comparisons across countries and stages of adoption	improved understanding of factors inhibiting and facilitating farmers' use of sustainable soil management practices and their regional variation across Europe		policy makers
				improve the evidence base on management impacts on water regulation functions of the soil and crop response	This manuscript will present outputs from measurement-informed simulation experiments conducted in T3.5 ???	improved data basis contributing to understanding of mechanisms driving soil and crop management impacts on soil structure, soil physical conditions and related abilities of the soil to buffer impacts of precipitation extremes		scientific community
					Policy brief based on stakeholder/farmers interviews and validation processes (M57)			general public
ARTEMIS	EI1	Climate change adaptation	Management options evaluation	Analysis of long-term field experiments in different regions, allowing identification of specific AE systems with the highest resilience against climatic extreme events		Improved knowledge on the resilience of specific agroecological (AE) systems to withstand climate extremes in comparison with commonly practices control	Ability of European soils to sustain more frequent extreme events to guarantee a more sustainable and climate responsive agricultural production is better understood	scientists, farmers, advisors, poliy makers
				On a regional level, identification of best AE management practices by numerical modeling and evaluation of the effect of different climatic developments on crop production and soil indicators		Improved knowledge on how different management options for AE systems affect soil services		
				Meta analysis on the European scale allowing a quantitative summary of the current knowledge on the contribution of soils to ecosystem services related to climate mitigation and sustainable agricultural production in AEs	Meta-analysis of management effects on crop yied, SOC and N2O.	Improved knowledge on trade-offs and synergies between cropyield, SOC and N2O emission across agroecosystems.		
				Specific soil related ecosystem services indicators determined together with practitioners, aiming to improve the efforts to monitor soil indicators that potentially contribute to climate change mitigation and adaptation as well as soil health at farm level		Delivered science-based practical knowledge on sustainability of AE systems to practitioners		

An open-source metadataset of running European mid- and long-term agricultural field experiments

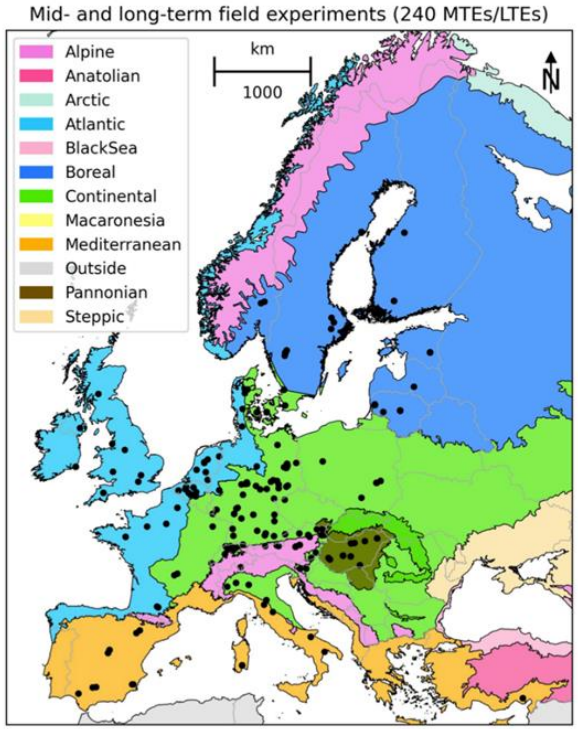


FIGURE 3 Distribution of the collected mid- and long-term field experiments across Europe with European biogeographical regions.

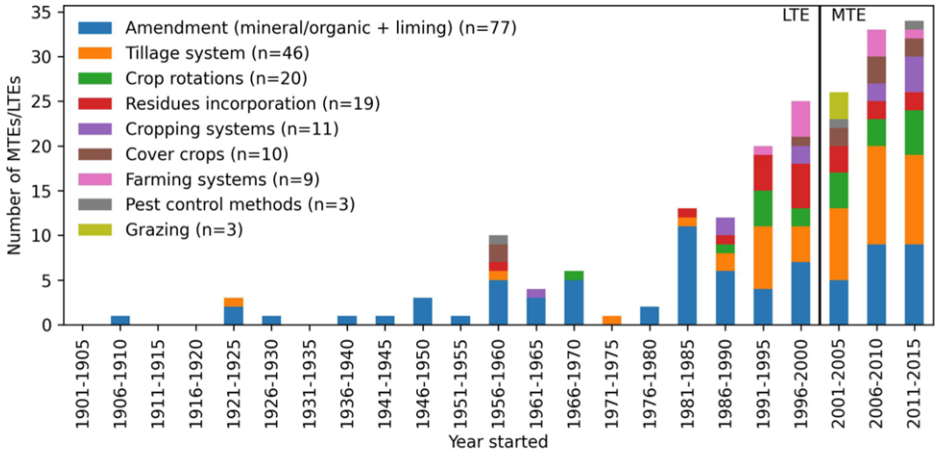
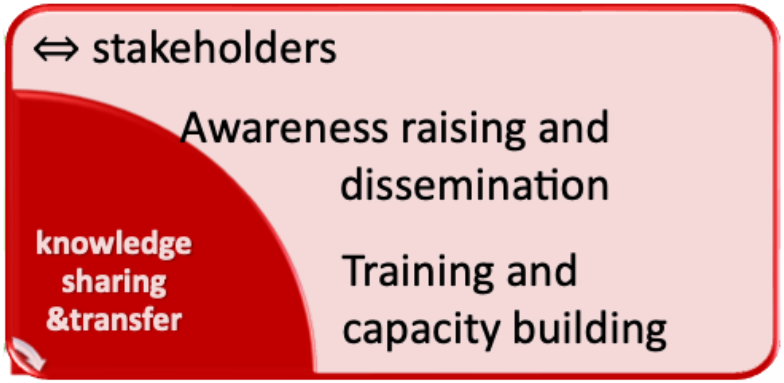


FIGURE 6 Evolution of newly started MTEs/LTEs with respect to their research themes. Note that one MTE/LTE can have several research themes (e.g. it can investigate both tillage and cover crops) and hence can be counted multiple times. The research theme about 'amendments' includes experiments that investigate mineral/organic or no fertilizer (67 MTEs/LTEs) and 10 MTEs/LTEs investigating liming.

Dommez et al. 2023, Soil Use and Management
DOI: 10.1111/sum.12978
https://lte-eu.bonares.de/experiments

EJP SOIL: Year 4 activities and achievements



EJP SOIL PhD schools

- 140 participants in 7 courses, +1 course yet to take place
- Materials on EJP SOIL Knowledge Platform
- *Some PhDs follow several courses!*

EJP SOIL partner institution		Course title
Swedish University of Agricultural Sciences, Sweden	2021	Soil Systems: Analytical methods for integrating the chemical and biophysical interface in soils
University of Palermo, Italy	2022	Soil management for sustainable agriculture
University of Latvia, Latvia	2022	From field to model: peat soil study, mapping, statistical analysis and modelling
AgroParisTech, France	2023	Ecosystem services assessment in agricultural and peri-urban areas
Aarhus University, Denmark	2023	Merging measurements and modelling in soil physics
Swedish University of Agricultural Sciences, Sweden	2023	Soil Systems: Analytical methods for integrating the chemical and biophysical interface in soils
Swedish University of Agricultural Sciences, Sweden	2024	Data management and modelling:
Thünen campus in Braunschweig, Germany	2024	Soil organic matter management

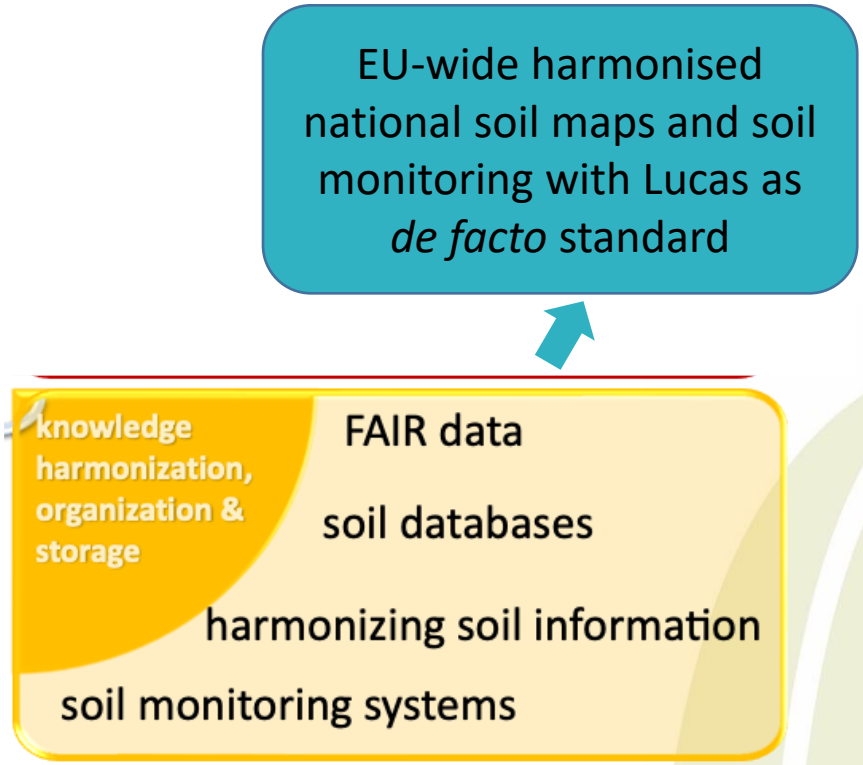
EJP SOL visiting scientist & infrastructures scheme

1-4 weeks study visit to an EJP SOIL affiliated or non-affiliated research partner, to develop joint research

- 72 participants in 7 calls 2021-2024
- *>50% - early career (PhDs, Postdocs)*

Visiting scientist	Women /men (%/%)	PhD and postdocs of total	Number of successful applications
Call 1,2 2021	50/50	80%	12
Call 3,4 2022	34/66	50%	18
Call 5, 6 2023	56/44	42%	34
Call 7 2024		38%	8

EJP SOIL: Year 4 activities and achievements



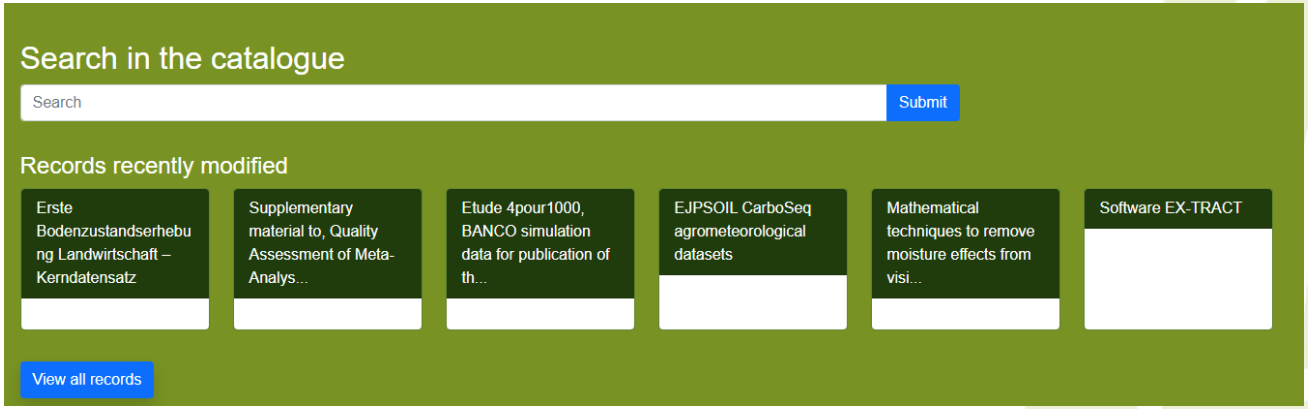
A metadata catalogue: make data findable

Contains: - Data produced in the EJP SOIL
- National datasets
- Total: 555 datasets

https://catalogue.ejpsoil.eu/

Cookbook for guidance:

https://ejpsoil.github.io/soildata-assimilation-guidance



Developing soil health indicators

EJP SOIL SIREN

Inventory of current indicator systems

EEA

Soil monitoring in Europe – Indicators and thresholds for soil health assessments - 2022

EJP SOIL MINOTAUR

Prioritizing biodiversity indicators

EJP SOIL SERENA

Common definitions, thresholds inventory/proposal

GLOBAL SOIL PARTNERSHIP

GSP ISAF soil health indicators

EJP SOIL European Joint Programme WP6

"D6.5 Guidelines for accounting and mapping agricultural soil carbon, fertility and degradation changes at different scales"

EUSO

EU MISSIONS SOIL DEAL FOR EUROPE

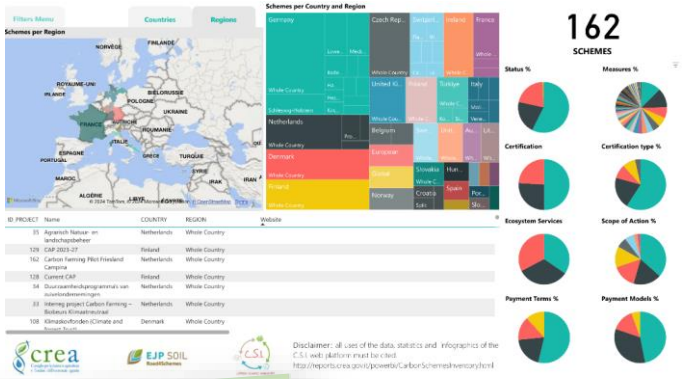
BENCHMARKS & AI4SOIL projects

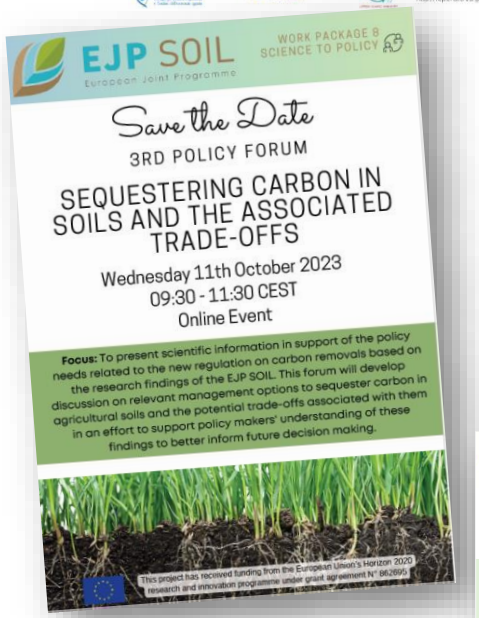
EU Soil

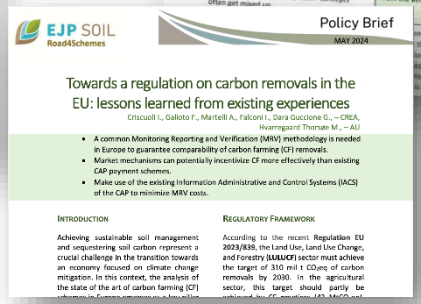
Soil parameters	Soil Quality Indicator	Frequency	Depth and scale	Costs
SOC	SOC/SOCexp (∅SML).	Can be measured every 5 y since not that expensive but changes will only be detected after 10 y or more	Topsoil and subsoil /Field	10 to 30 € for mesuring SOC
	SOC/SOCmax (∅SML).	10 y	Topsoil and subsoil /Field	50 to 80 € for mesuring SOC stocks (bulk density)
	Delta SOC content (∅SML).	10 y	Topsoil and subsoil /Field	
	Delta SOC Stock (∅SML).	10 y	Topsoil and subsoil /Field	
Nutrients	total N (⊕SML)	10 y	Topsoil/Field	10 to 25 €
	available P (⊕SML)	5-10 y	Topsoil/Field	10 to 40 € (usually done with other nutrients)
	P stocks (∅ SML)	10 y	Topsoil and subsoil /Field	10 to 80 € (usually done with other macro-nutrients)

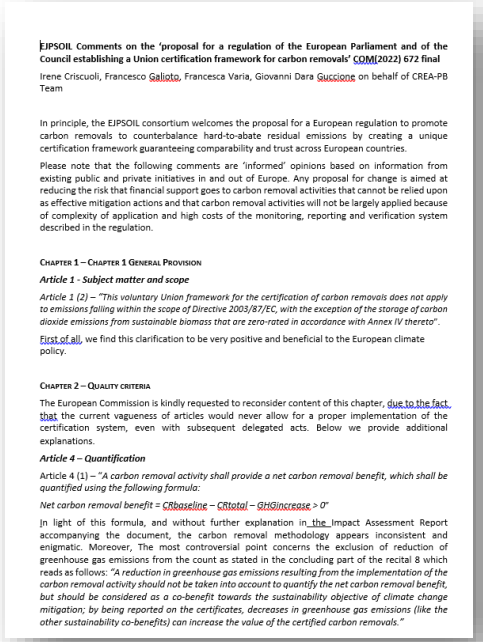
EJP SOIL: Year 4 activities and achievements

EU Carbon removals certification framework








EJPSOIL Comments on the 'proposal for a regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals' COM(2022) 672 final

Irene Criscuoli, Francesco Gallioto, Francesca Varia, Giovanni Dara Guccione on behalf of CREA-PB Team

In principle, the EJPSOIL consortium welcomes the proposal for a European regulation to promote carbon removals to counterbalance hard-to-abate residual emissions by creating a unique certification framework guaranteeing comparability and trust across European countries.

Please note that the following comments are 'informed' opinions based on information from existing public and private initiatives in and out of Europe. Any proposal for change is aimed at reducing the risk that financial support goes to carbon removal activities that cannot be relied upon as effective mitigation actions and that carbon removal activities will not be largely applied because of complexity of application and high costs of the monitoring, reporting and verification system described in the regulation.

Chapter 1 – Chapter 1 General Provision

Article 1 - Subject matter and scope

Article 1 (2) – "This voluntary Union framework for the certification of carbon removals does not apply to emissions falling within the scope of Directive 2003/87/EC, with the exception of the storage of carbon dioxide emissions from sustainable biomass that are zero-rated in accordance with Annex IV thereto".

First of all, we find this clarification to be very positive and beneficial to the European climate policy.

Chapter 2 – Quality criteria

The European Commission is kindly requested to reconsider content of this chapter, due to the fact, that the current vagueness of articles would never allow for a proper implementation of the certification system, even with subsequent delegated acts. Below we provide additional explanations.

Article 4 – Quantification

Article 4 (1) – *"A carbon removal activity shall provide a net carbon removal benefit, which shall be quantified using the following formula:*

Net carbon removal benefit = CRbaseline – CRtotal – GHGincrease > 0"

In light of this formula, and without further explanation in the Impact Assessment Report accompanying the document, the carbon removal methodology appears inconsistent and enigmatic. Moreover, The most controversial point concerns the exclusion of reduction of greenhouse gas emissions from the count as stated in the concluding part of the recital 8 which reads as follows: *"A reduction in greenhouse gas emissions resulting from the implementation of the carbon removal activity should not be taken into account to quantify the net carbon removal benefit, but should be considered as a co-benefit towards the sustainability objective of climate change mitigation; by being reported on the certificates, decreases in greenhouse gas emissions (like the other sustainability co-benefits) can increase the value of the certified carbon removals."*

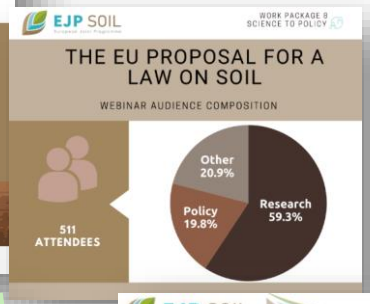
DG CLIMA
CRCF Experts group

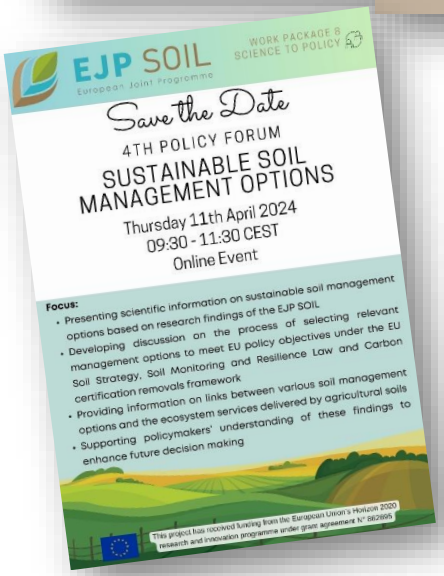
2nd meeting of the Carbon Removals Expert Group
Carbon Farming: mapping of certification methodologies

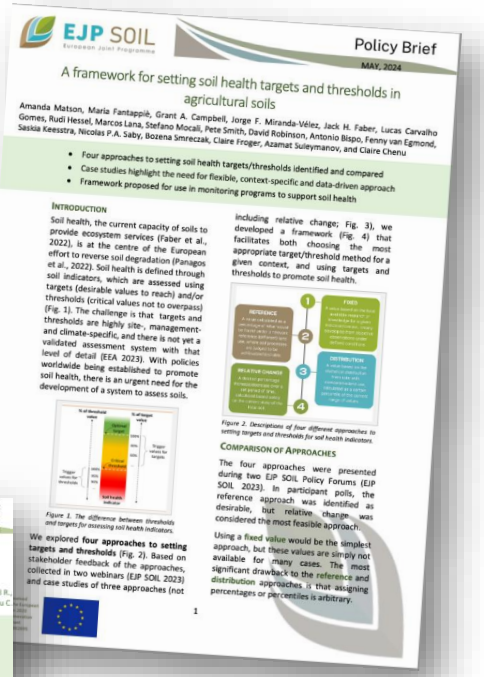
21-22 June 2023 Brussels

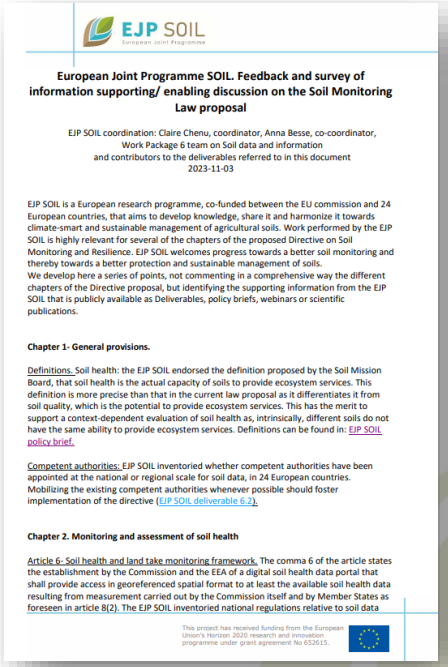
https://ejpsoil.eu/science-to-policy
http://reports.crea.gov.it/powerbi/CarbonSchemesInventory.html

EU Soil Monitoring Directive proposal









- Citations of EJP SOIL in policy documents
- EJP SOIL experts involved at national scale
- Collaboration DG-ENV WP6

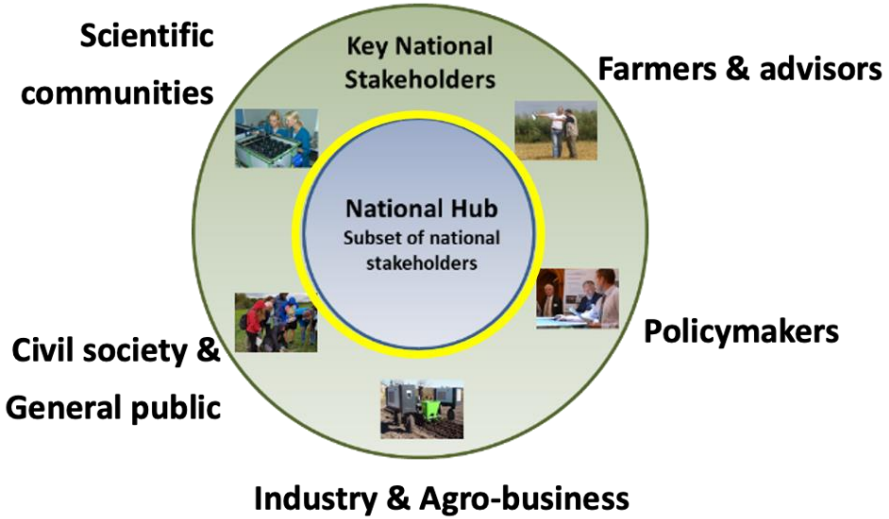
EJP SOIL: knowledge framework & expected impacts

- understanding of soil management for climate change mitigation, adaptation, sust. production & sust° environment
- understanding soil carbon sequestration and its contribution to climate change mitigation
- strengthening scientific capacities and cooperation
- supporting harmonised European soil information
- fostering the uptake of climate-smart sustainable soil management practices
- developing region-specific fertilisation practices

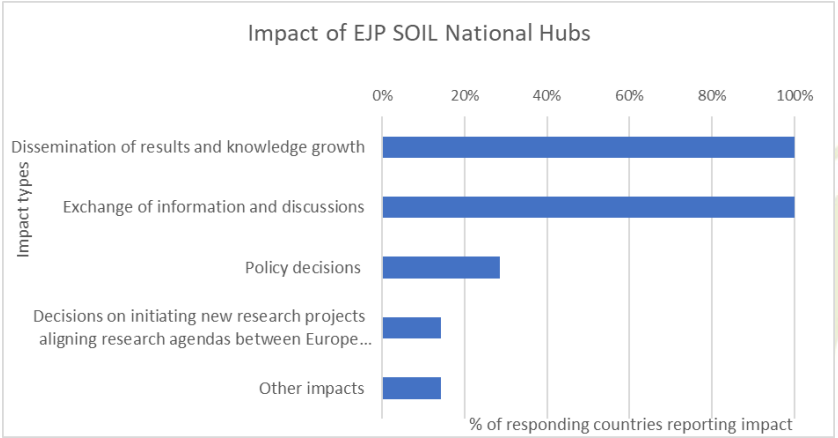
farming sector:
↗ its role as a steward of land and soil resources.
↗ its capacity to adapt to climate change and contribute to mitigation and carbon sequestration

research sector: long-term alignment and implementation of soil-related research strategies and activities at national and EU level

EJP SOIL National Hubs: a new instrument for national stakeholders' consultation & science - policy interface



- Soil needs are stakeholder and region specific: no one size fits all
- EJP SOIL NHs are a good foundation for Soil Mission mirror groups



NHs are established in all 24 EJP SOIL countries

EJP SOIL
European Joint Programme

Policy Brief
December, 2023

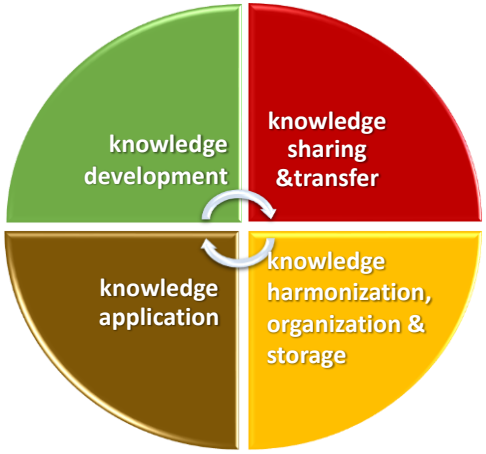
Successful stakeholder participation to address soil needs.

Saskia Visser, Claire Chenu, Anna Besse, Niels Halberg and Teresa Pinto Correia

- Soil needs are stakeholder and region specific.
- The implementation of the EU's Mission Soil, the EU Soil Strategy for 2030 and the future Soil Monitoring and Resilience Directive needs to recognize this broad spectrum of soil needs.
- We recommend formalizing the stakeholder participation to address soil needs by setting up national hubs.
- Effective national hubs are 'owned by an authority' and have as an objective to i) inform national policy makers on soil challenges and policy needs; ii) debate policy proposals and their implementation and iii) provide feedback on anticipated impact of proposed policies.

Synergy with other initiatives/entities and EU Mission Soil & projects

Objectives of this week



- Inform each other of results / achievements / ongoing activities
- Learn : science, data management, etc
- Synthesizing results, reflect on major cross-cutting issues and elaborating main messages
- Position our activities in relation to the soils policy context
- Strengthen our network, prepare the future

MONDAY 10/6 – morning meetings and plenary afternoon opening			
9:00	Registration for first attendees (going to morning meetings)		
9:30 am	Project meetings, NCR/PCR meeting		
12:00pm	Registration + lunch		
1:00 pm	Opening of the event by Claire Chenu and Anna Besse		
1:30 pm	Welcome by organizing partner LAMMC		
1:35 pm	Presentation by a representative from the Lithuanian Ministry of Agriculture		
1:50 pm	Keynote speech "Soil futures - emerging drivers and needs of soil management and soil services" by EJP SOIL Advisory Board Chair Katharina Helming:		
2:30 pm	Coffee break		
3:15 pm	Breakout sessions GROUP A		
	A1: Carbon sequestration at national and European scale and effects of policy and socio-economic factors	**A2**: Leveraging different approaches in the development of farmer-friendly tools or sustainable soil practices and schemes	**A3**: Implementing Open Science in EJP SOIL
5:15 pm	Keynote speech by WWF Professor of Agroecology and Sustainable Landscapes at Groningen University Pablo Tittonell		
5:55 pm	End of day 1		

TUESDAY 11/6 – project breakout sessions			
9:00 am	Breakout session GROUP B (part 1)		
	B1: C-sequestration and trade-offs	**B2**: External organic matters for circular economy	**B3**: Indicators for soil ecosystem services
10:15 am	Coffee break		
11:00 am	Breakout session GROUP B (part 2)		
	B1: C-sequestration and trade-offs	**B2**: External organic matters for circular economy	**B3**: Indicators for soil ecosystem services
12:00 pm	lunch		
1:15 pm	Breakout session GROUP C (part 1)		
	C1: C-sequestration, roots and amendments	**C2**: Soil biodiversity and ecosystem services	**C3**: Sustainable soil management	**C4**: Innovation and methods for data acquisition
2:15 pm	Coffee break		
2:45 pm	Breakout session GROUP C (part 2)		
	C1: C-sequestration, roots and amendments	**C2**: Soil biodiversity and ecosystem services	**C3**: Sustainable soil management	**C4**: Innovation and methods for data acquisition
3:45 pm	Poster session with guided tours through "Poster islands"		
5:30 pm	End of poster session with drinks		

Wednesday 12/6 – WP breakout sessions + field trip			
9:00	Parallel workshops		
	Science to Policy workshop	Science to Advisors workshop	National Coordinators session
10:30 am	Short coffee break		
10:50 am	Young scientists summarize poster session + awards for best posters		
11:35 am	Walk to train station, lunch on train transport to field trip		
2:00 pm	Field trip and social dinner		
11:00 pm	End of day 3 (estimated arrival back in Vilnius)		

Thursday 13/6 – plenary ASD/GM closing	
9:00 am	Plenary opening: introduction of themes
9:15 am	Session on **Carbon Sequestration** theme with input from projects, policymaker and possibly stakeholders + discussion with audience
10:45 am	Coffee break
11:15 am	Session on **Monitoring Soil Health** theme with input from projects, policymaker and possibly stakeholders + discussion with audience
12:45 pm	Lunch
1:45 pm	Session on **Sustainable Management** theme with input from projects, policymaker and possibly stakeholders + discussion with audience
3:15 pm	Closing session on EJP SOIL follow-up
4:00 pm	OFFICIAL END OF ASD/GM 2024 and coffee break
4:30 pm	Invite only: Implementation of the EU Soil Monitoring Directive in Member States: approach and challenges (discussion session, co-organised with EJP SOIL programme owners)
6:00 pm	End of day 4

Contribution wanted / online questionnaires:

- Prioritization of the knowledge gaps to focus on for sustainable agricultural soils by 2050 (WP7)
- Strategic agenda for agricultural research in Europe 2025-2035 (WP2)


Have a productive and friendly week !