



# EU Soil Observatory



Healthy soils for healthy food, people, nature and climate  
within the European Green Deal



*Arwyn Jones, EC Joint Research Centre*

*EU Soil Observatory*


*UN World Soil Day, 4<sup>th</sup> December 2020*

Joint  
Research  
Centre

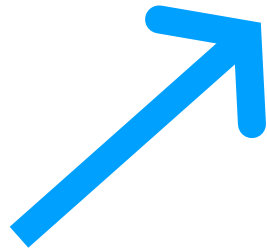
# Launch event: Technical implementation



**EU SOIL**  
OBSERVATORY

 @EU\_ScienceHub #EUsoil

# EU Soil Observatory: From ESDAC to EU-Wide Knowledge Hub



**Goal 1: EU-Wide Soil Monitoring**

# Goal 1: EU-Wide Soil Monitoring



From LUCAS (ca. 25,000 sites) to the EU Integrated Soil Monitoring (ISM) (ca. 250,000 sites)



## LUCAS SOIL

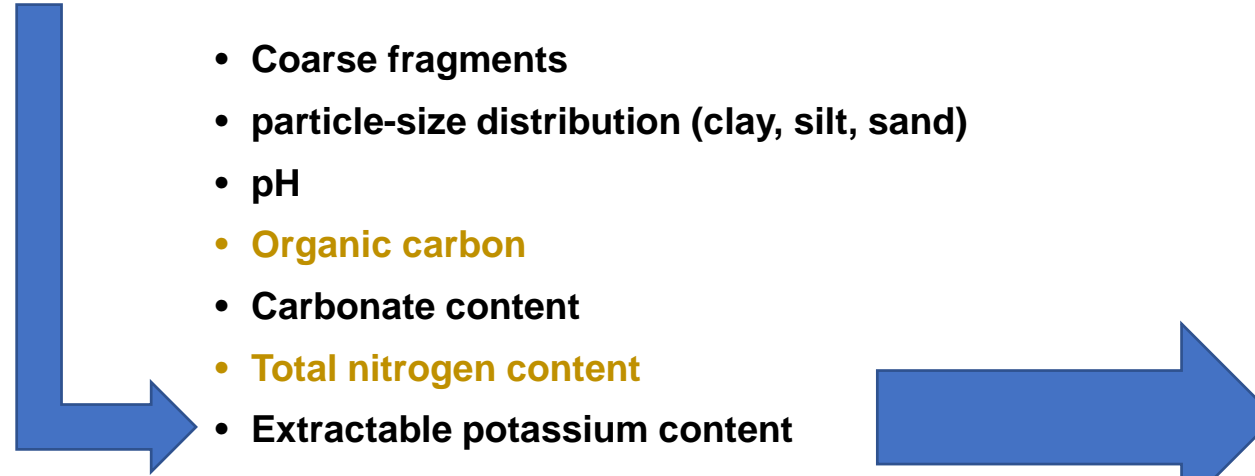
- Systematic approach for 25,000 locations across the EU
- Harmonized sampling protocol
- Standard analytical procedures to measure parameters
- Single laboratory
- Data from 2009, 2015, 2018, 2021/2022...
- EU/Regional statistics, point-based applications

## Future expansion within the EUSO

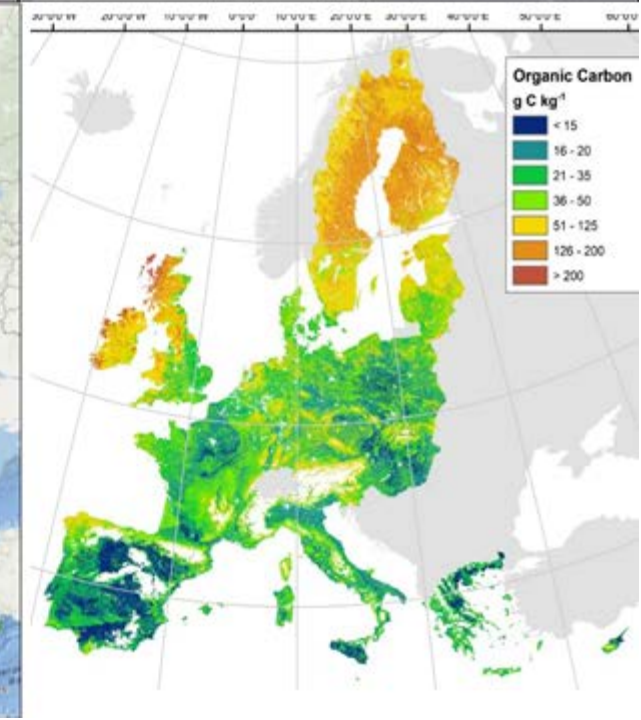
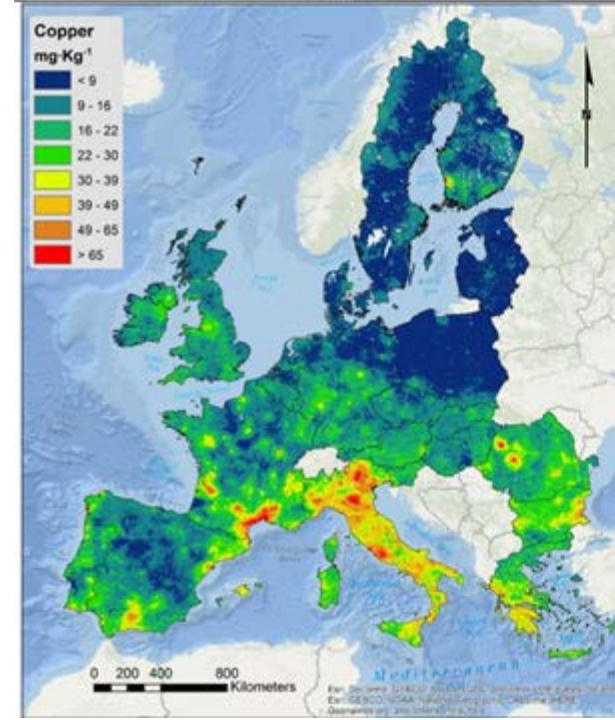
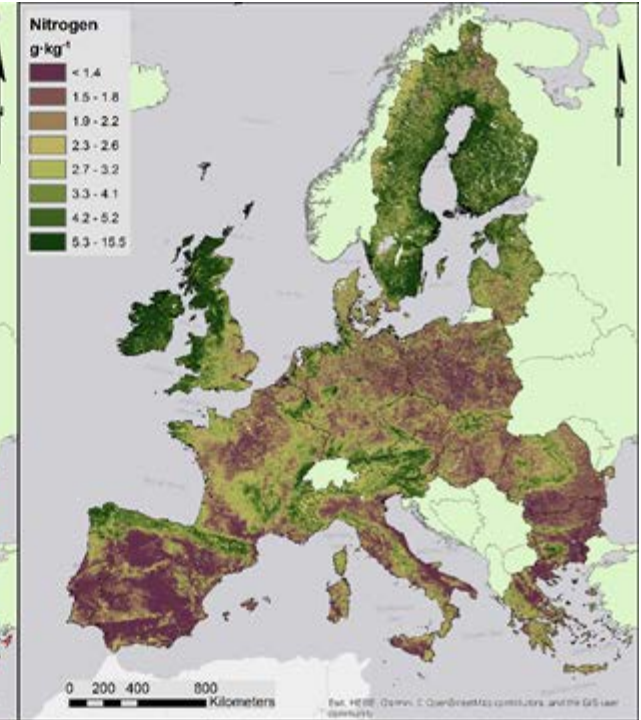
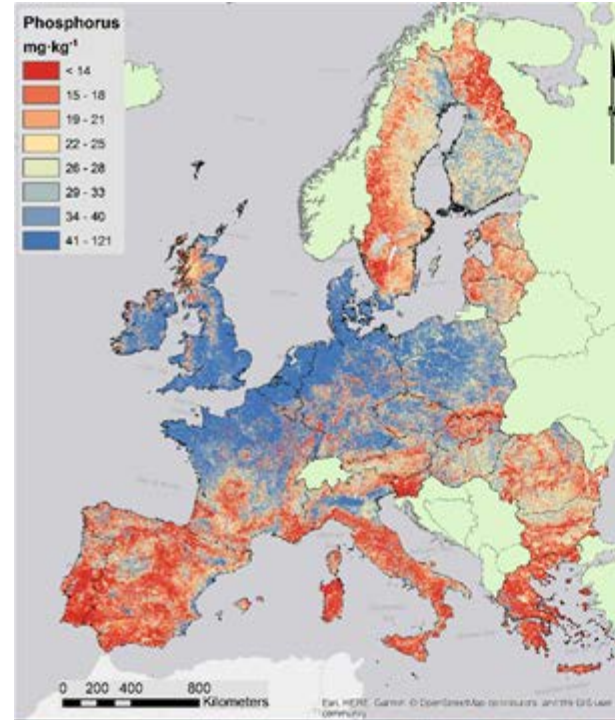
- Systematic approach for ca. 250,000 locations across the EU
- Full integration of National soil monitoring systems

# Goal 1: EU-Wide Soil Monitoring

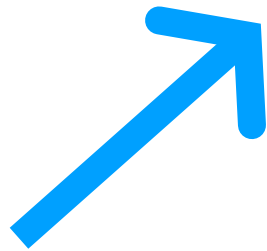
From monitoring chemical, physical and biological soil properties to modelling the spatial distribution of soil properties in the EU



- Coarse fragments
- particle-size distribution (clay, silt, sand)
- pH
- **Organic carbon**
- Carbonate content
- **Total nitrogen content**
- **Extractable potassium content**
- **Phosphorous content**
- Cation exchange capacity
- Electrical conductivity
- Heavy Metals
- Multispectral properties
- Pesticides (90 substances)
- Neonicotinoid insecticides
- **Fungicides (e.g. copper in soils)**
- Herbicides
- Antibiotics
- Soil Biodiversity



# EU Soil Observatory: From ESDAC to EU-Wide Knowledge Hub



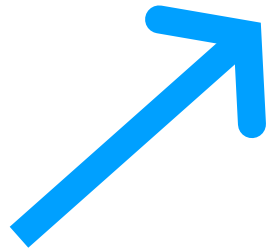
**Goal 1: EU-Wide Soil Monitoring**

Expanding the already existing databases in ESDAC by integrating the data and knowledge available in MS in a fully shared and integrated system: From LUCAS Soil to an Integrated Soil Monitoring System for the EU

# EU Soil Observatory: From ESDAC to EU-Wide Knowledge Hub



**Goal 1: EU-Wide Soil Monitoring**



**Goal 3: Monitoring of soil related policies**

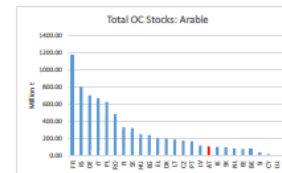
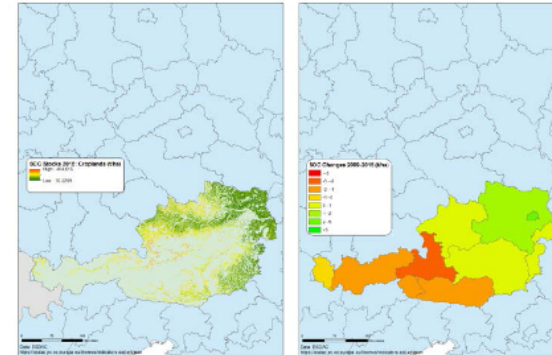
Support to policy implementation: Monitoring and indicators for the EU Soil Thematic Strategy

# A EU Soil Indicator Dashboard: Indicators for Policy Options and Reporting



- EU Soil Thematic Strategy
- Common Agricultural Policy
- Zero Pollution Action Plan
- Circular Economy Action Plan
- Farm to Fork Strategy
- Climate Action
- EU Biodiversity Strategy
- SDG's Goals and Targets
- .....

Soil organic carbon stocks<sup>4</sup>

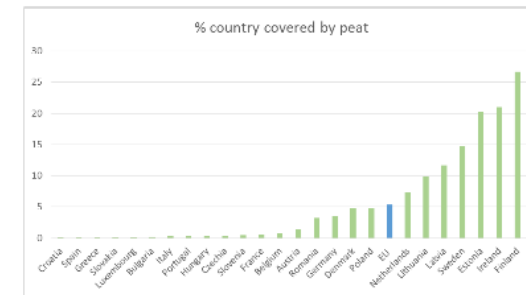


Cumulative soil organic carbon stocks – arable (Mt): **115.4**

Cumulative soil organic carbon stocks – grassland (Mt): **64.2**

Change in arable stocks 2009-2015 (Mt): **0.280**

Change in grassland stocks 2009-2015 (Mt): **-0.054**



<sup>4</sup> Panagos et al 2020. Soil-related indicators to support agri-environmental policies

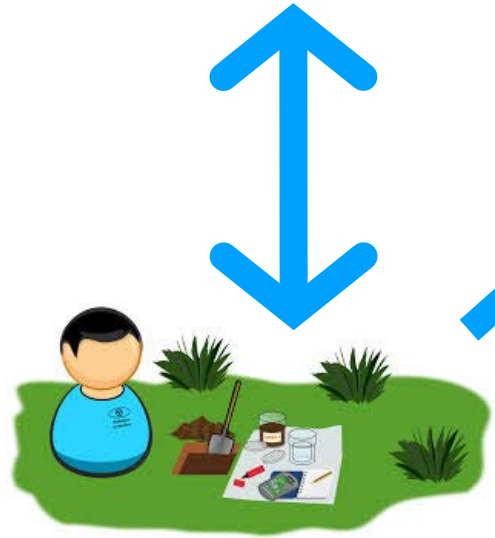
<sup>5</sup> Tanneberger et al 2017. The peatland map of Europe. DOI: 10.19189/MaP.2016.OMB.264



# EU Soil Observatory: From ESDAC to EU-Wide Knowledge Hub



**Goal 4: Support to Research & Innovation**



**Goal 1: EU-Wide Soil Monitoring**



**Goal 3: Monitoring of soil related policies**

Support to policy implementation: Monitoring and indicators for the EU Soil Thematic Strategy

# Goal 4: Support to Research & Innovation

- Pesticide and antibiotic residues
- Soil biodiversity (DNA-based approach)
- Antibiotic-resistance genes
- Micro-plastics



# EU Soil Observatory: An open and inclusive Forum

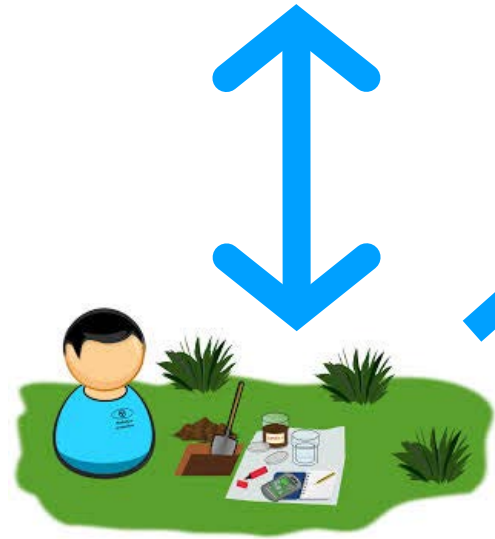


**Goal 4: Support to Research & Innovation**



**Goal 3: Monitoring of soil related policies**

Support to policy implementation: Monitoring and indicators for the EU Soil Thematic Strategy



**Goal 1: EU-Wide Soil Monitoring**



**Goal 2: A stronger European Soil Data Centre**



**Goal 5: Provide an European Soil Forum**

# The Forum: Scientific Debate & Citizen Engagement



- Inclusive and open to all stakeholders:
  - Relevant Commission Services
  - European Agencies
  - International Organizations
  - Member States representatives
  - Farming Associations
  - Industry representatives
  - NGO's
  - Interested citizens
- Setup of dedicated **Working Groups** addressing specific scientific and policy questions
- Issue scientific papers, policy support reports and assessments
- Citizen Engagement and Awareness Raising activities



# Conclusions

- The **EU Soil Observatory** fills a gap by providing the **policy relevant and harmonized EU-wide soil data and indicators** in support of the new **European Green Deal** and the **Mission on Soil Health and Food**
- Integrate **JRC and National soil monitoring activities** in a coherent and fully shared joint system
- It provides an **open and inclusive Forum** for discussion
- **Kick-off meeting** will be organized during the **first quarter of 2021**
- Stay tuned on the next steps on the dedicated web site:  
**<https://ec.europa.eu/jrc/en/eu-soil-observatory>**

Thank you for your attention!



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