Prof Rachel Creamer

Project Coordinator

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Project manager

Dr Francesca Bampa
Project administrator

LANDMARK
LAND MANAGEMENT: ASSESSMENT, RESEARCH, KNOWLEDGE BASE

Collecte et harmonisation des données pour l'évaluation des fonctions écosystémiques des sols : RMQS et SOERE

Nicolas Saby[1], Benoit Toutain[1], Sebastien Drufin[1], Jean-Philippe Chenu[1], Laura Gay[1], Calypso Picaud[2], Pierre Cantelaube[2], Patrick Bertuzzi[3], Adam Csorba[4], Erika Michéli[4], Francesca Bampa[5], Rachel Creamer[5]

US Infosol, US Agroclim, US ODR,

SZIU et WUR

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DEMANDS ON OUR LAND

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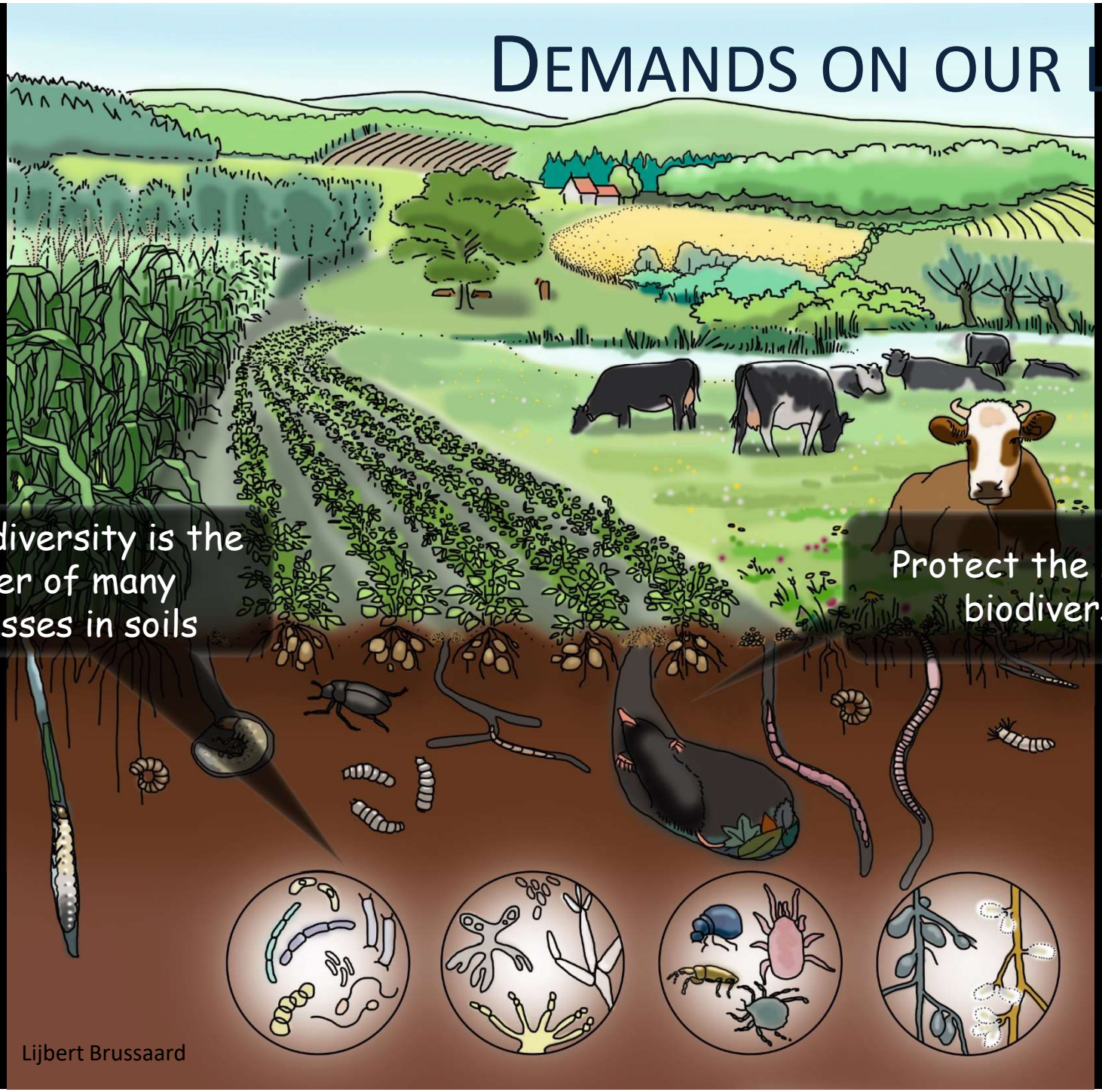

WHAT CAN OUR LAND SUPPLY?

All soils / land perform all functions…

…but different parts of the land(scape) are better at delivering different functions

ENVIRONMENTAL SCIENCE & POLICY 38 (2014) 4

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ELSEVIER

Functional land management: A framework for managing soil-based ecosystem services for the sustainable intensification of agriculture☆

Rogier P.O. Schulte[a,1,*], *Rachel E. Creamer*[a], *Trevor Donnellan*[b], *Niall Farrelly*[c], *Reamonn Fealy*[d], *Cathal O'Donoghue*[b], *Daire O'hUallachain*[a]

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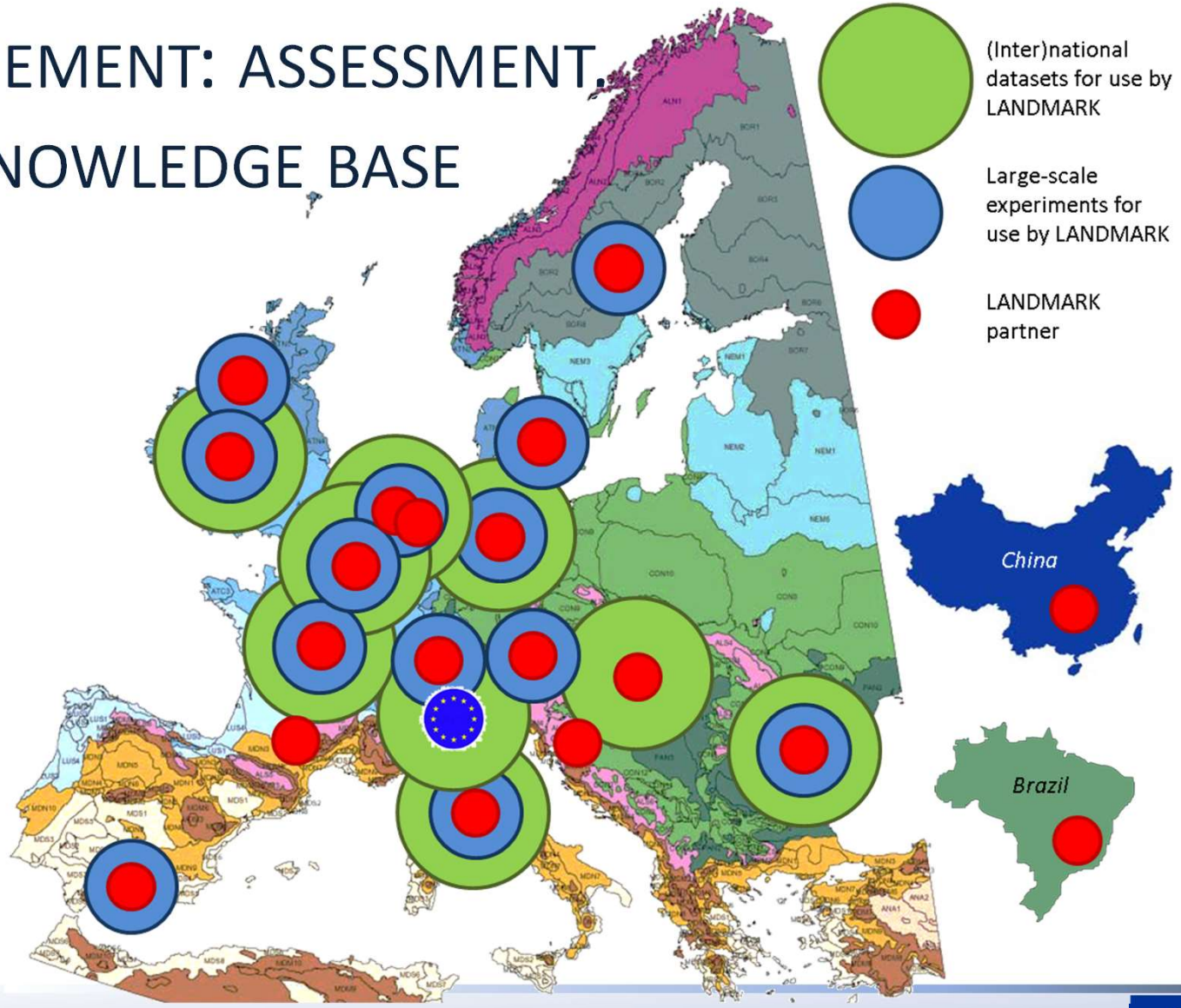
WHAT CAN OUR LAND SUPPLY?

LANDMARK

LAND MANAGEMENT: ASSESSMENT, RESEARCH , KNOWLEDGE BASE



LANDMARK OBJECTIVE

Overall objective: to quantify the supply of soil functions across the EU as determined by soil properties, land use and soil management practices.

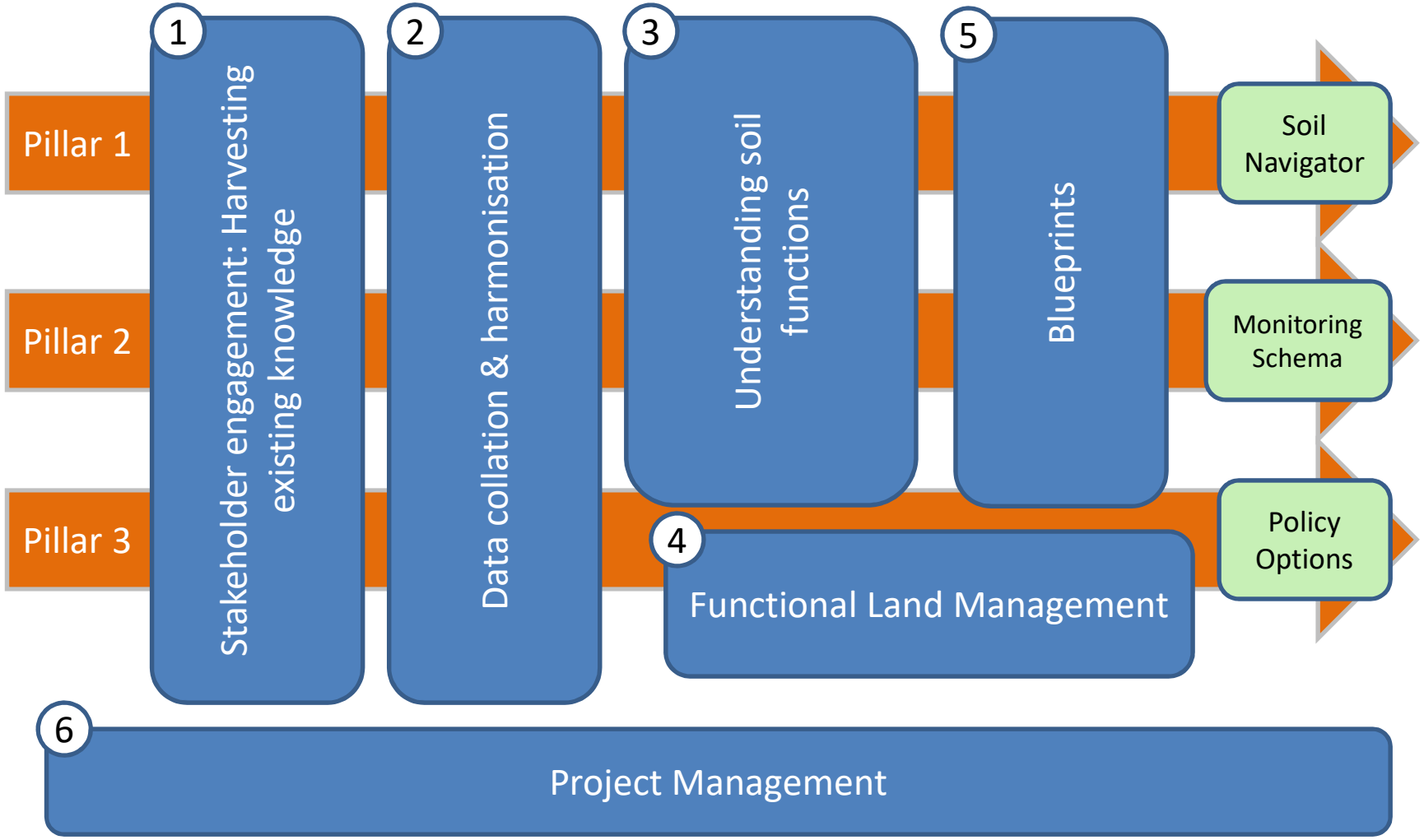
SPECIFIC OBJECTIVES

1. **Farm scale:** Develop an agricultural Decision Support Tool (DST) for soil management

2. **Country scale:** Design a monitoring scheme for Soil Functions that is applicable at regional scale, for a range of soil types, land uses and pedo-climatic zones;

3. **EU scale**: Develop a policy framework for 'Functional Land Management' at European scale that aims to optimise the sustainable use of Europe's soil resource

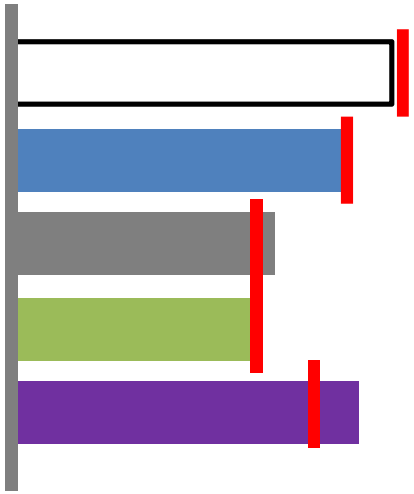
PROJECT FLOW



PILLAR 1: LOCAL SCALE – soilnavigator.eu

Permanent grasslands (cheese production) in Mediterranean North in two different fields.

October 2017, Roundtable 6, Parma, Italy. Field exercise organised by Parma University in collaboration with Emilia-Romagna Region and EIP-AGRI Operational Groups coordinators and partners (Scalabrini and Burini farms)



Recommendations:

- ☑ Buffer strips
- ☑ Nutrient management plan
- ☑ Minimum tillage
- ☑ Lime application

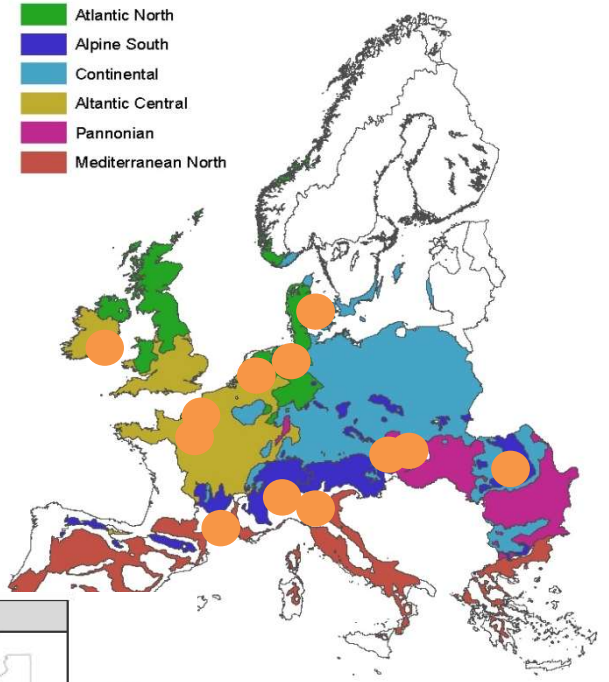
More info http://landmark2020.eu/pillars/soil-navigator-pillar1//

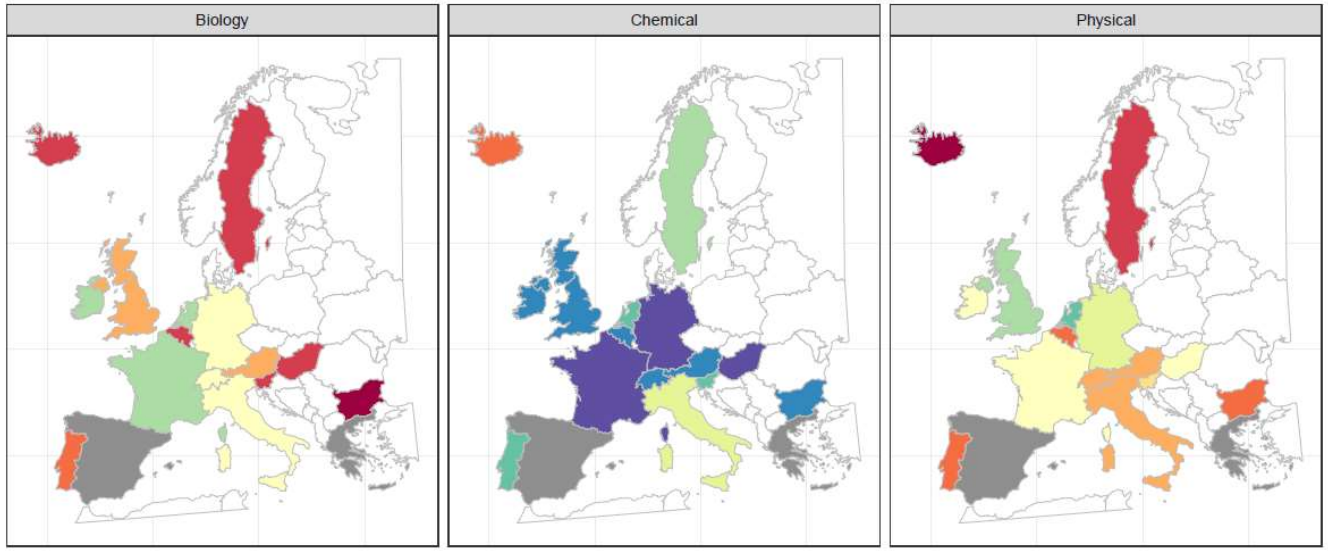
PILLAR 2: REGIONAL SCALE-MONITORING

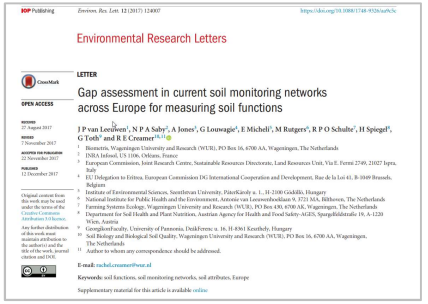
Testing **NOW** the feasibility of the monitoring design in 100 sites, spread over 6 climatic zones, 2 land uses, 2 dominant soil types/diagnostics.

Site n 1. Grassland in Villadose di Rovigo, Veneto region, Italy, April 2018

Metzger et al. (2005)







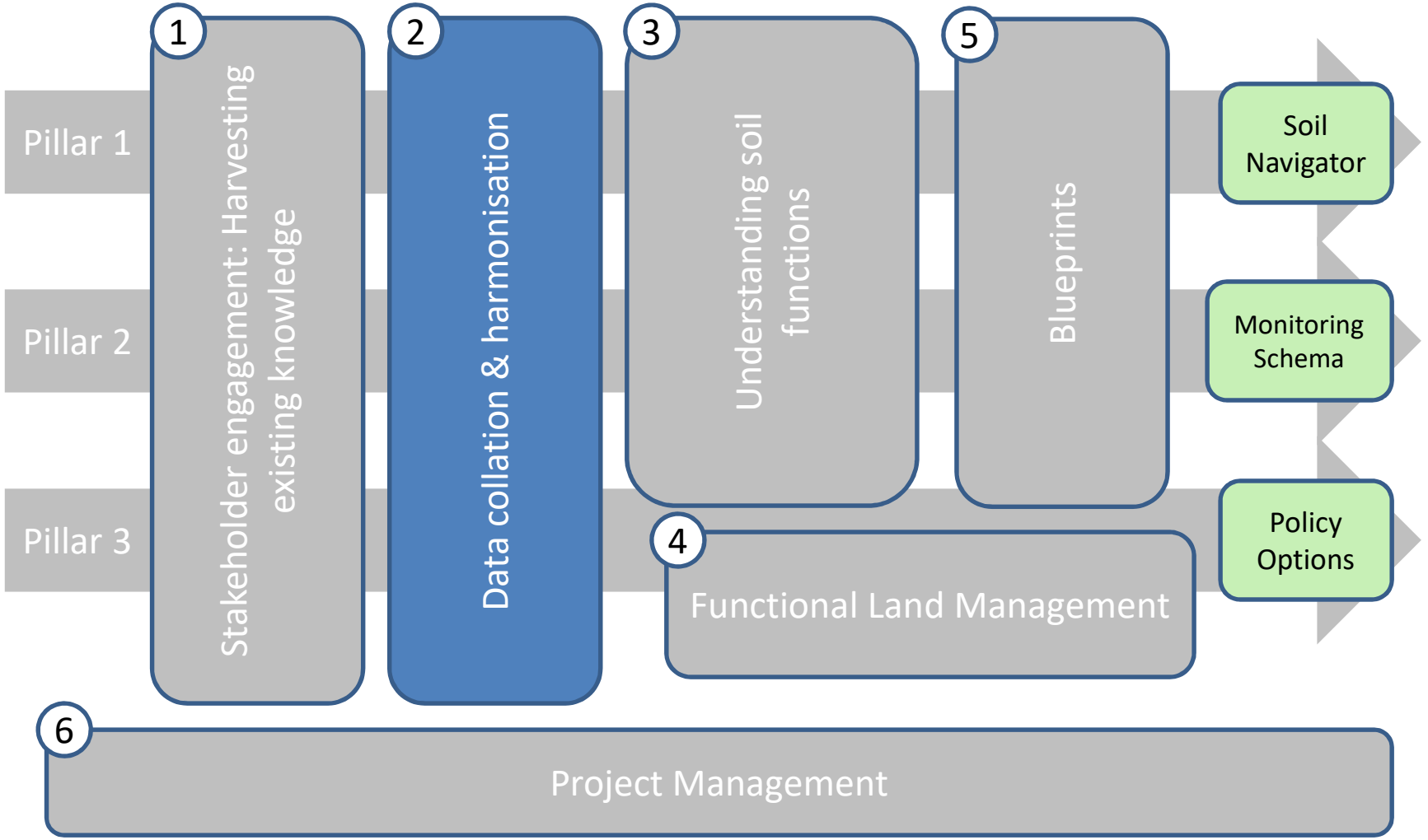
Environmental Research Letters

LETTER

Gap assessment in current soil monitoring networks across Europe for measuring soil functions

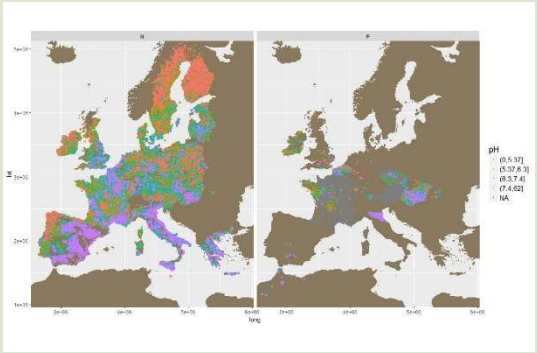
Van Leeuwen et al. 2017

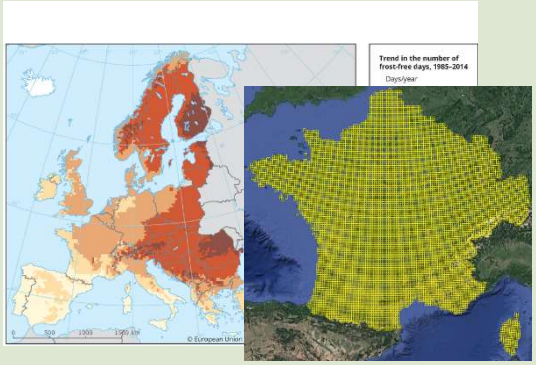
More info http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

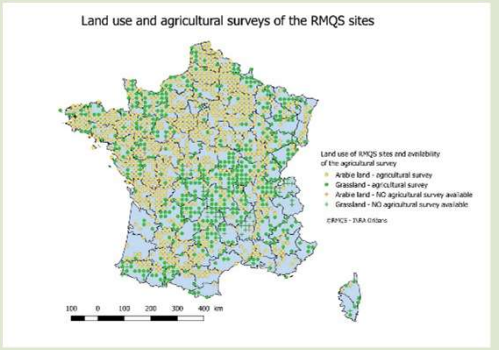

Pillar 1
Pillar 2
Pillar 3
1
Stakeholder engagement: Harvesting existing knowledge
2
Data collation & harmonisation
3
Understanding soil functions
5
Blueprints
4
Functional Land Management
6
Project Management
Soil Navigator
Monitoring Schema
Policy Options

DATA WAREHOUSE : INTEGRATED DATA FROM NATIONAL FIELD INVENTORY

Soil: Field data	Climate: gridded data	Management: Field data
• 18 K Profiles, 8 datasets • 35 K monitoring sites, 9 datasets	• Daily data European data: Agri4Cast database, 25km • French dataset: Safran, 8 km	• France : 583 sites, 160 attributes

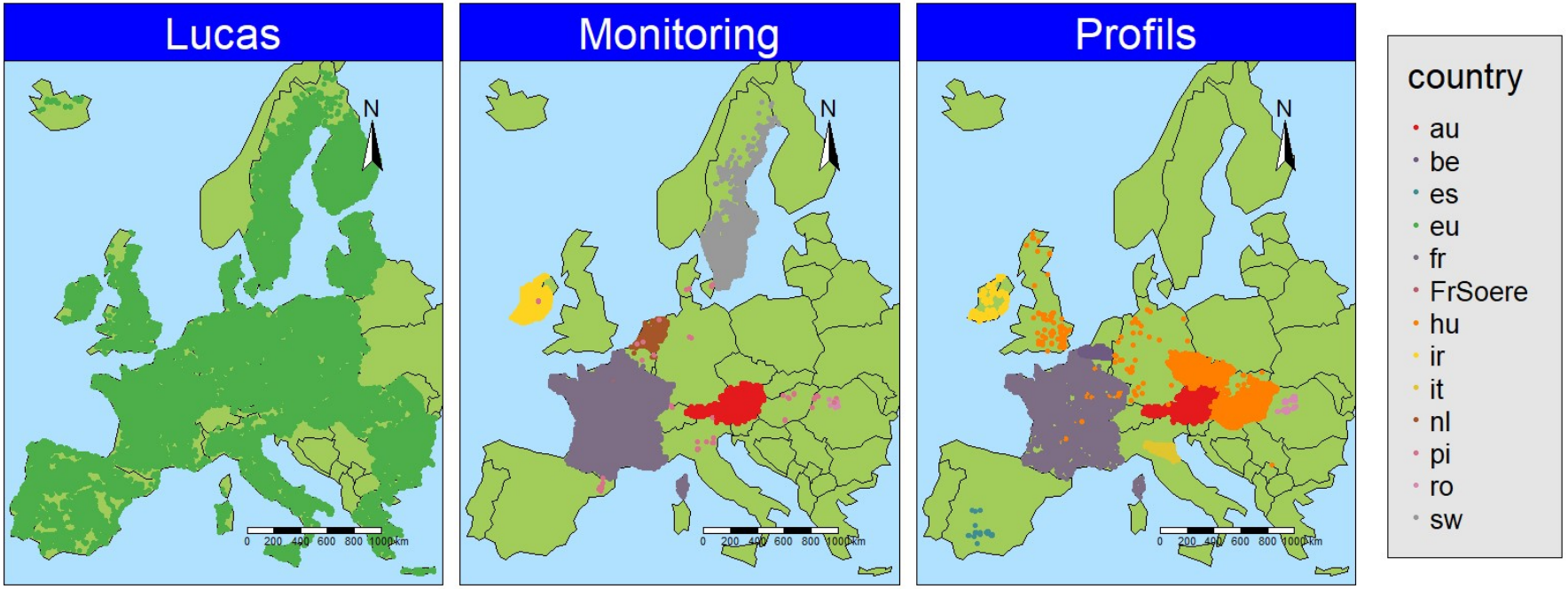


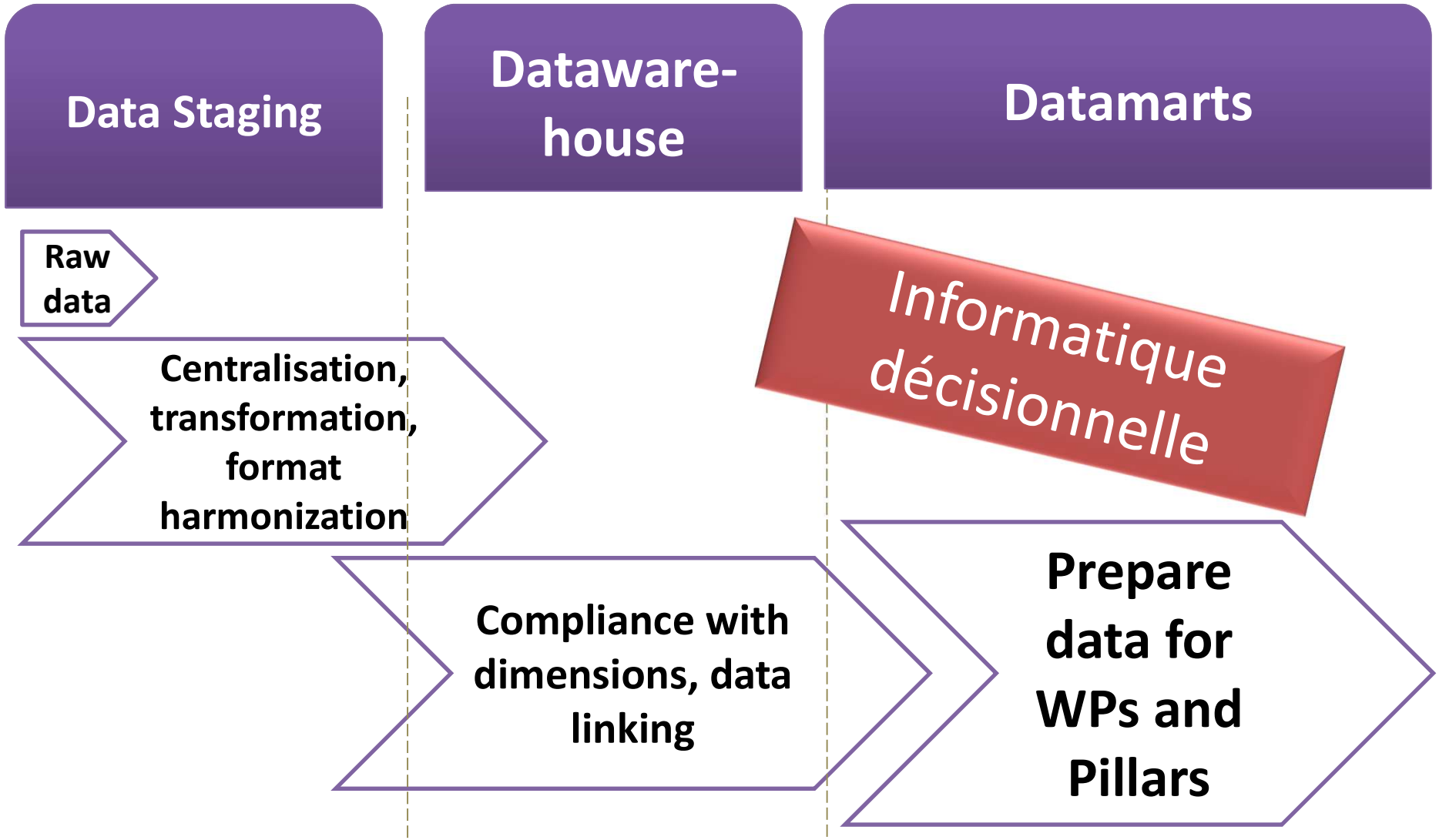


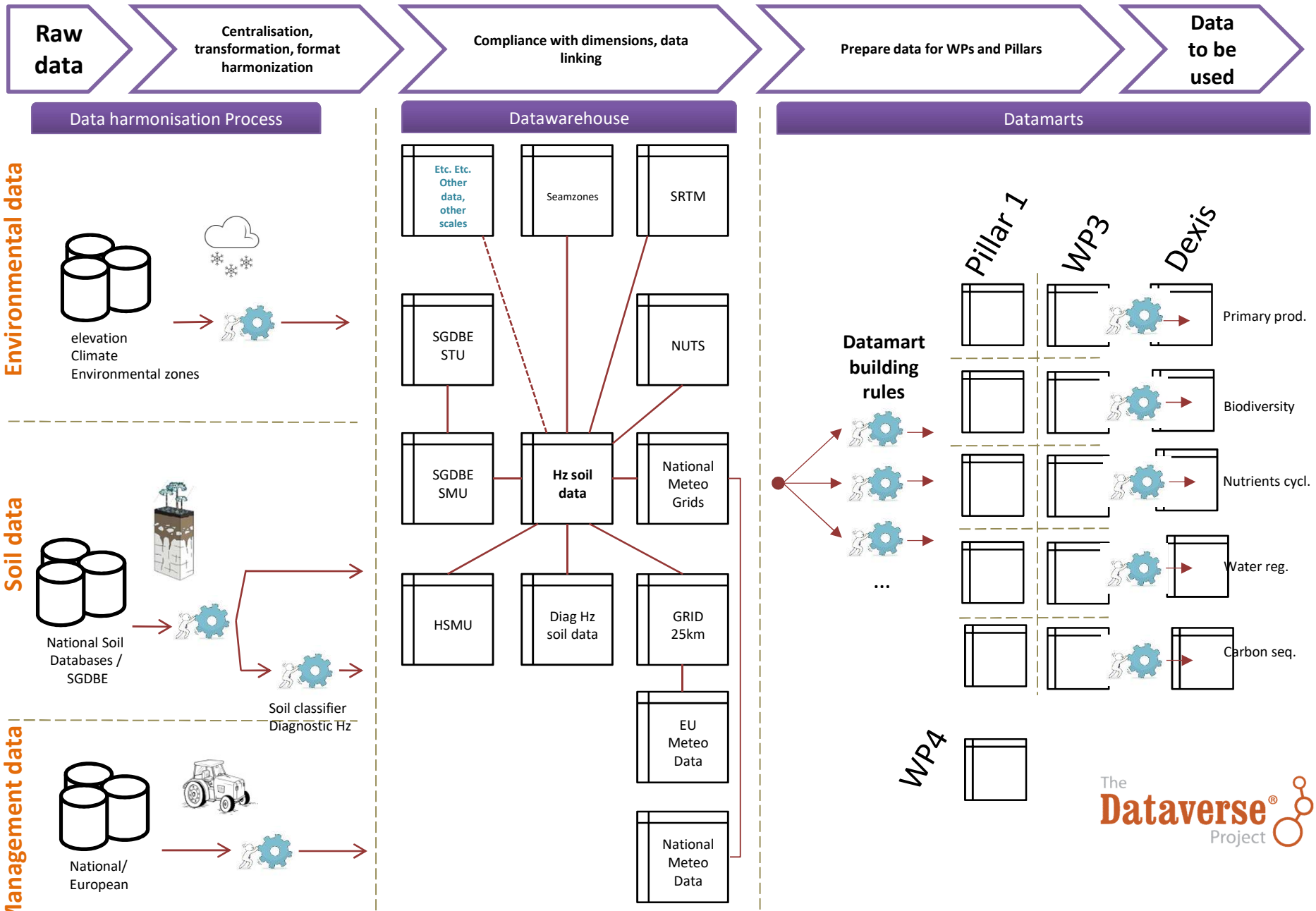


Environmental and external data (srtm, NUTS, Seamzones,…)

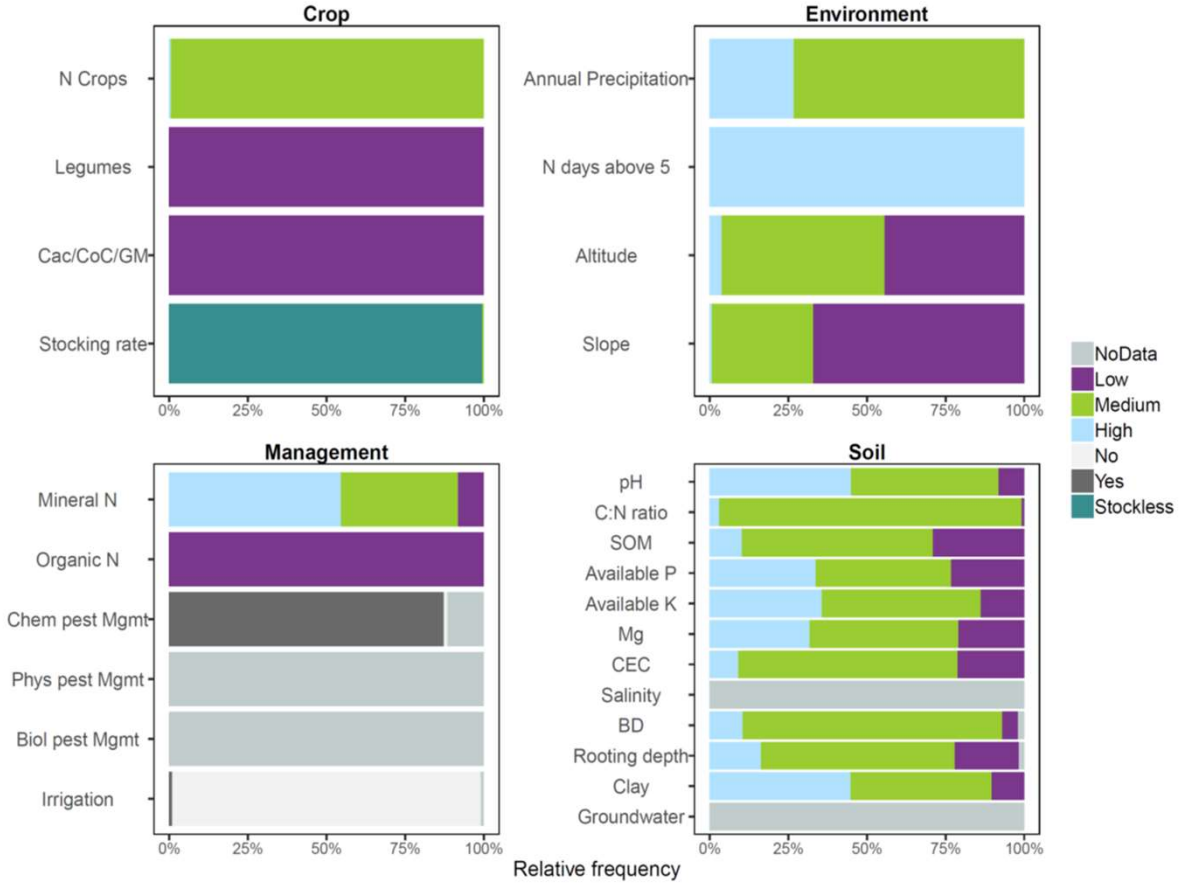
Maps of soil data




Data Staging
Dataware-house
Datamarts
Raw data
Centralisation, transformation, format harmonization
Informatique décisionnelle
Compliance with dimensions, data linking
Prepare data for WPs and Pillars

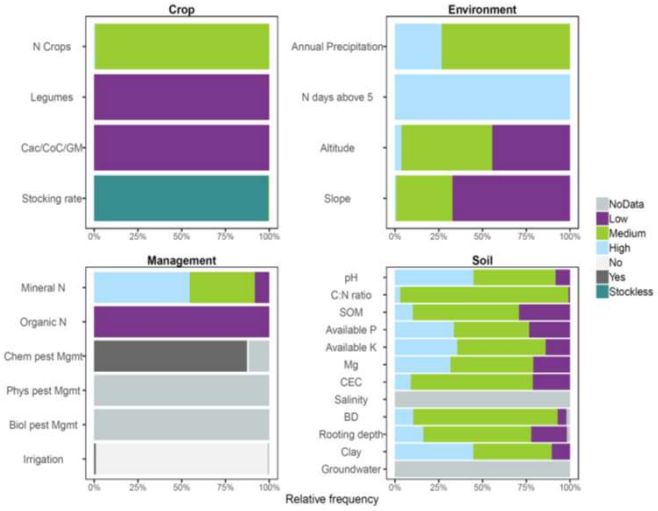

Raw data
Centralisation, transformation, format harmonization
Compliance with dimensions, data linking
Prepare data for WPs and Pillars
Data to be used
Data harmonisation Process
Datawarehouse
Datamarts
Environmental data
elevation
Climate
Environmental zones
Soil data
National Soil Databases / SGDBE
Soil classifier
Diagnostic Hz
Management data
National/ European
Etc. Etc. Other data, other scales
Seamzones
SRTM
SGDBE STU
NUTS
SGDBE SMU
Hz soil data
National Meteo Grids
HSMU
Diag Hz soil data
GRID 25km
EU Meteo Data
National Meteo Data
Datamart building rules
...
Pillar 1
WP3
Dexis
Primary prod.
Biodiversity
Nutrients cycl.
Water reg.
Carbon seq.
WP4
The Dataverse® Project

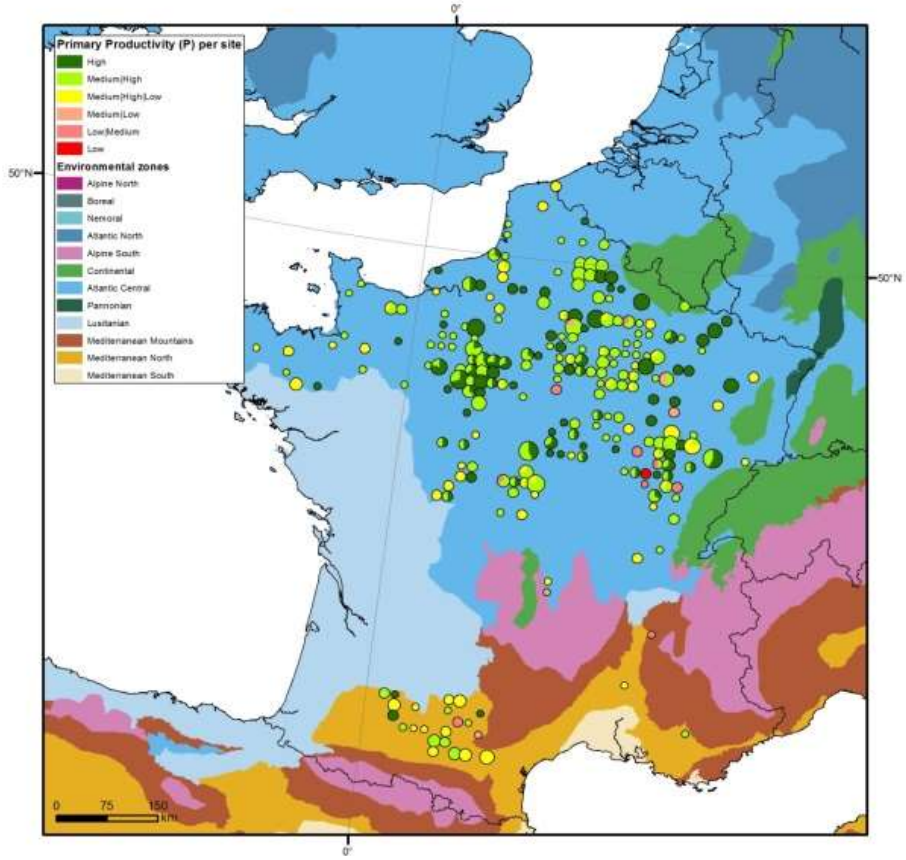
Exemple de la Production Primaire



Sandén, T., Trajanov, A., Spiegel, H., Kuzmanovski, V., Saby, N.P.A., Picaud, C., Henriksen, C.B., Debeljak, M., 2019. Development of an Agricultural Primary Productivity Decision Support Model: A Case Study in France. Frontiers in Environmental Science 7. https://doi.org/10.3389/fenvs.2019.00058

Exemple de la production primaire





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Conclusions

- Processus de collecte et d'harmonisation :
  le chemin est long et semé d'embuches
  - Beaucoup de données et hétérogènes => équipe pluridisciplinaire (3 US!)
  - Compréhension de la demande complexe des modélisateurs => interactions chronophages
  - Disponibilité des fournisseurs
- Un entrepôt de données encore à valoriser !

Conclusions SOERE

- Le moins = temps nécessaire à l'harmonisation trop long pour une utilisation optimale dans le cadre du projet
- Le plus = une jeu de données harmonisées RMQS / SOERE
- Une valorisation possible = un data paper?

MERCI !

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Aurélia Michaud, Sabine Houot et Camille Resseguier (Versailles)
Aurélia Michaud et Denis Montenach (Colmar))