

# Collecting, harmonizing and compiling data on soil biodiversity, from European agricultural plots

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**EJP SOIL**  
European Joint Programme

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**INRAE**

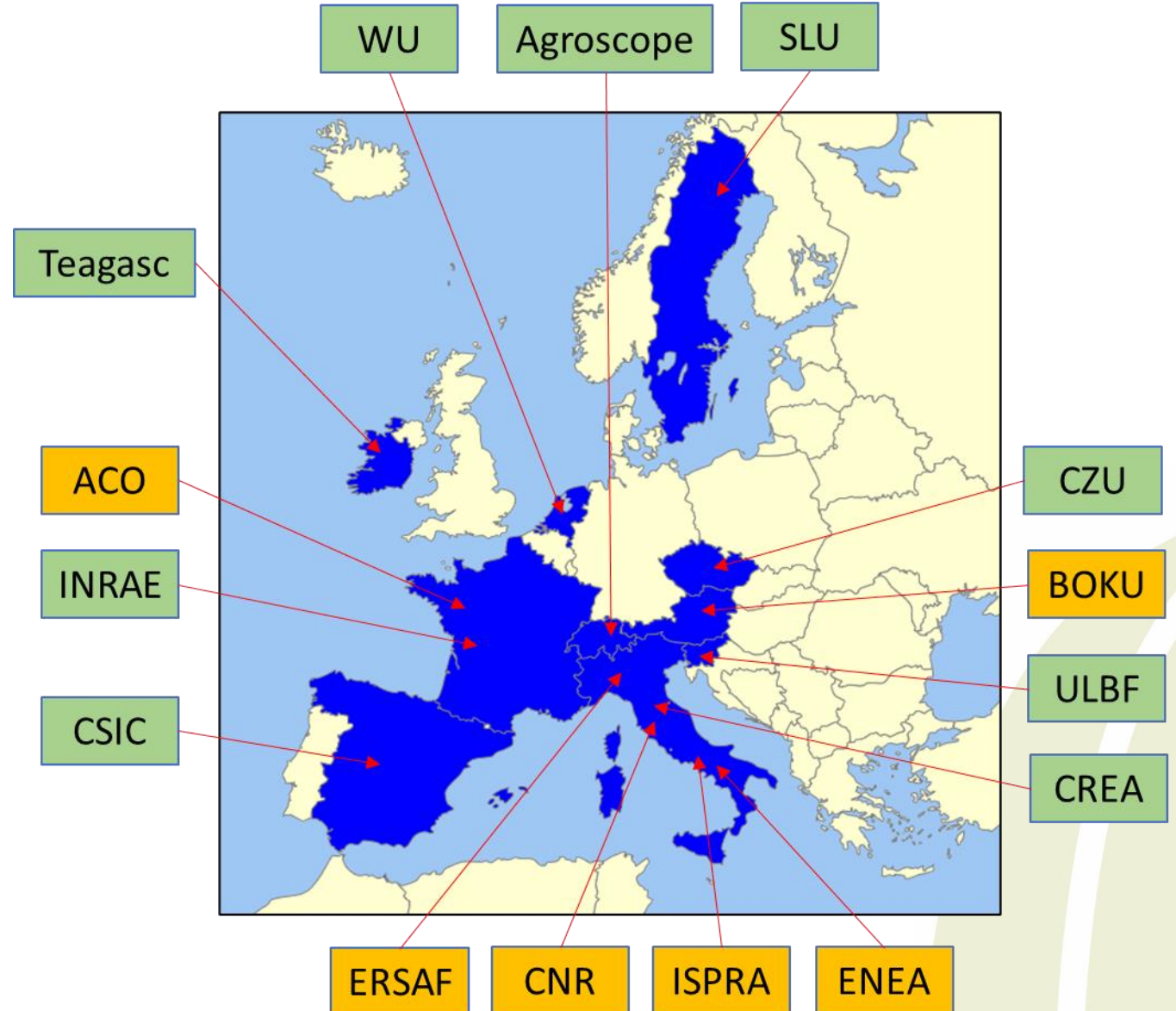
# The MINOTAUR consortium

The MINOTAUR project is a medium-size project (2M€) involving 15 Partners (9 Beneficiaries and 6 LTPs) from 10 different countries.

Duration: 36 months

Start date: 1<sup>o</sup> December 2021  
(M23)

Mid-term meeting: Rennes  
(September)



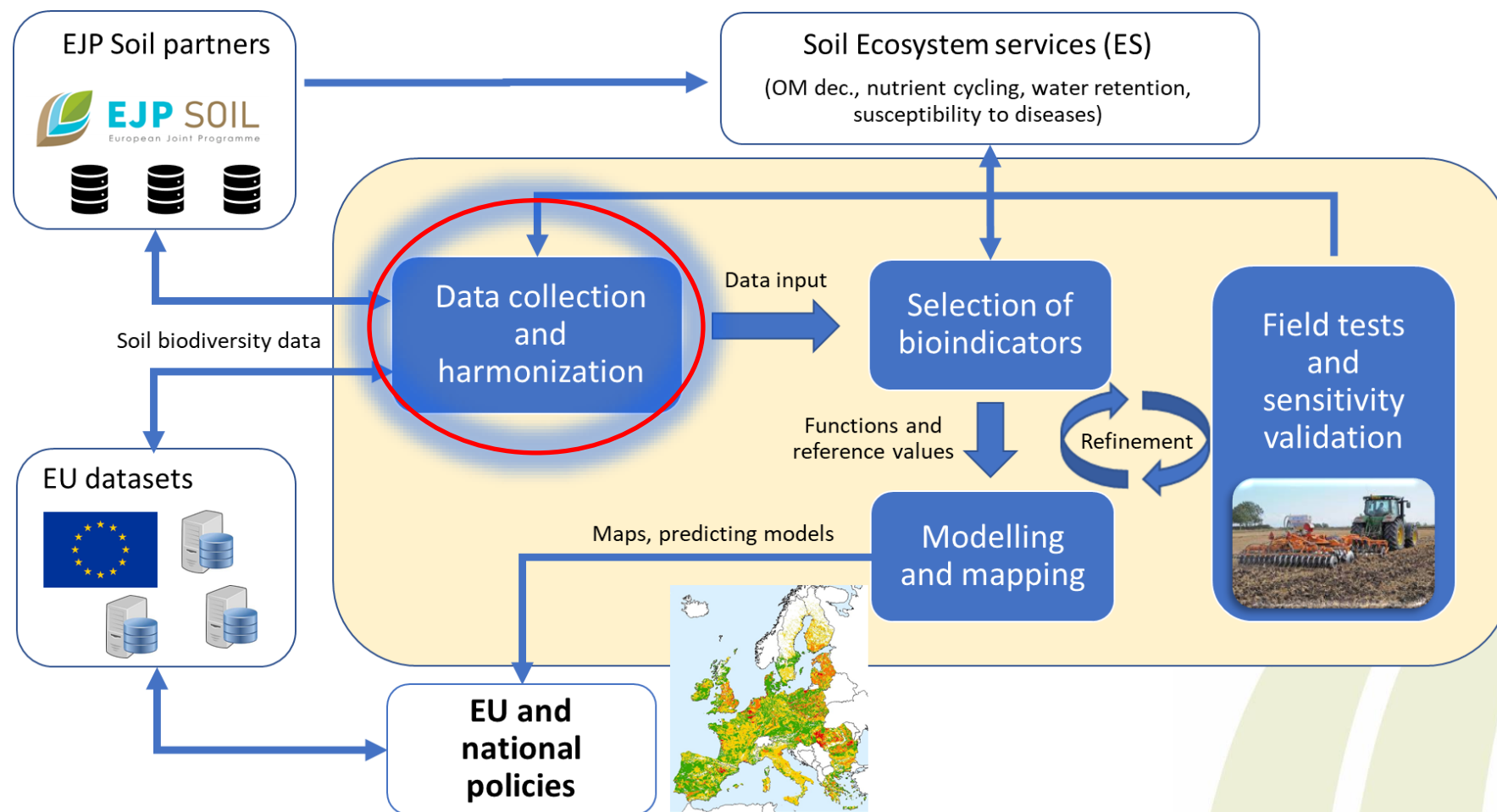
# MINOTAUR : Modeling and mapping soil biodiversity patterns and functions across Europe

## Expected outcomes

1. Proposing **functional indicators** of soil biodiversity in relation to soil ecosystem services by connecting to existing projects and national programs;
2. Sourcing data from previous projects and commercial soil analyses to **produce maps** of the current values and/or levels of these indicators at the EU scale to identify regional differences;
3. Providing for **climate responses and sensitivities** of soil biodiversity indicators on the basis of archived soil analysis;
4. Identifying **thresholds and target values** for biodiversity indicators and identification of policy instruments to address and enhance soil quality where appropriate with measures and actions.

# The MINOTAUR project

MINOTAUR aims to provide models, maps and policy-relevant indicators with validated reference values for monitoring soil biodiversity and associated functions.



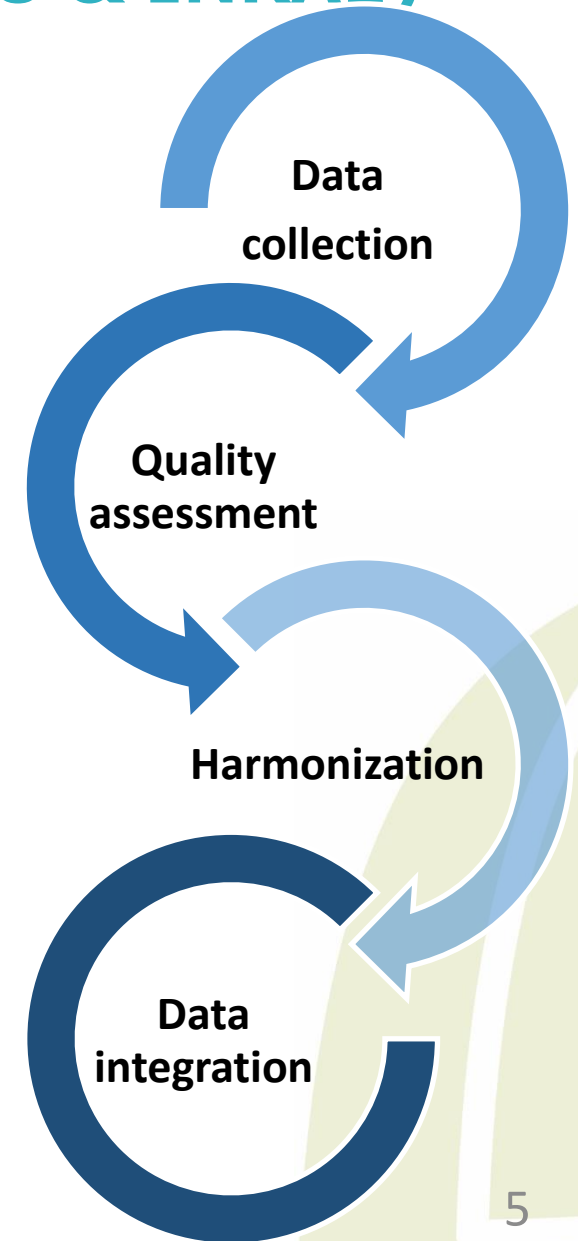
The project will collaborate with relevant international soil biodiversity networks and programs to harmonize and integrate soil biodiversity data and contribute to support long-term harmonized EU soil information.

## WP2 : Data collection and harmonization (BOKU & INRAE)

**T2.1: Identification of data sources and definition of data policy**

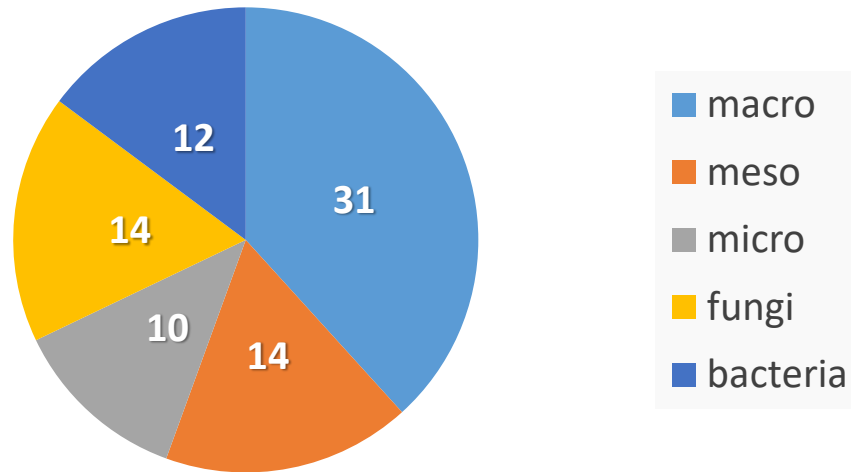
**T2.2: Selection and harmonization of data**

**T2.3: Data integration and identification of knowledge gaps**

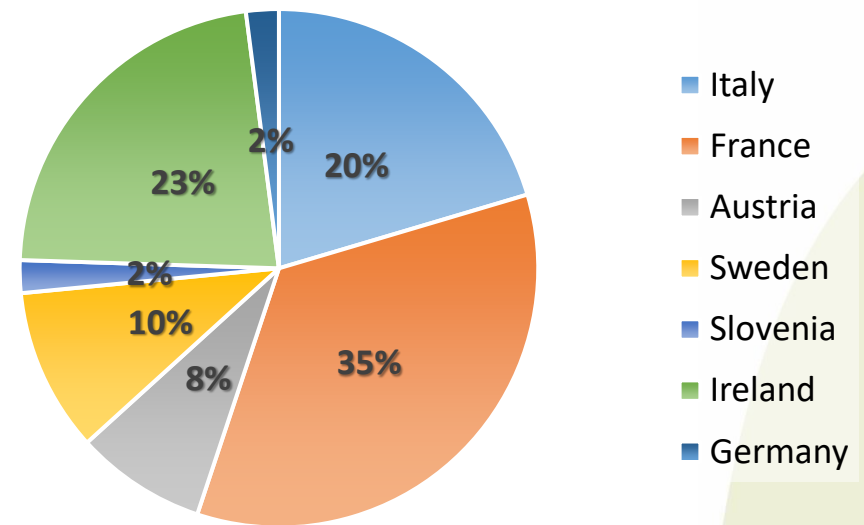


# Task 2.1: Identification of data sources and definition of data policy

Soil biodiversity groups

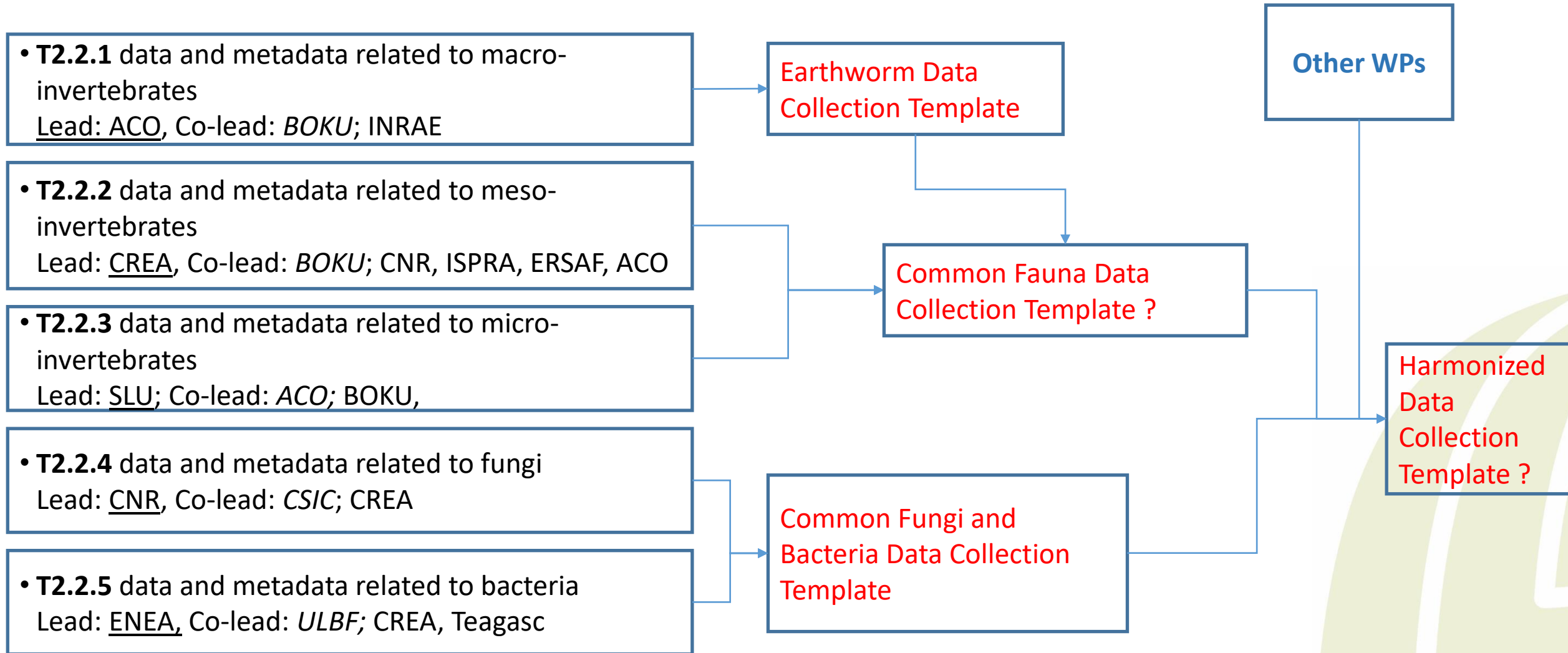


Total of 49 data sources



## T2.2: Selection, quality assessment and harmonization of data

(Lead: INRAE, Co-lead: BOKU, Contributors: ACO, CNR)





## T2.2: Selection, quality assessment and harmonization of data

(Lead: INRAE, Co-lead: BOKU, Contributors: ACO, CNR)

Template for the Minotaur database is composed of :

### References

Lists  
Geographical informations  
Observation level informations

### Metadata → 9 excel sheets

Scope, Study, Agriculture, Soil, Bacteria, Fungi, Microfauna,  
Mesofauna, Macrofauna

### Data → 7 excel sheets

Bacteria , Fungi, Common Bacteria and Fungi, Microfauna,  
Mesofauna, Macrofauna, Observation data (for micro,  
meso and macrofauna)



# T2.2: Selection, quality assessment and harmonization of data

(Lead: INRAE, Co-lead: BOKU, Contributors: ACO, CNR)

## Study description

Field order	Name	<b>Management description</b>	
Field order	Name	Field order	Name
1	<u>ID_Field</u>	1	<u>ID_Field</u>
2	<u>ID_Subsample</u>	2	<u>ID_Subsample</u>
3	Observation_level	3	Observation_level
6	<u>Longitude</u>	4	<u>Date subsample collection</u>
7	<u>Latitude</u>		
8	Altitude		
10	Study_Landuse	5	Farming_system
11	Experimental_type		
12	Total_Experiment_duration		
13	Experiment_duration_mean		
14	Date_start_experiment		

## Soil description

Field order	Name	Definition
1	<u>ID_Field</u>	Identification of the plot. The format is Country code(2 alpha-code ISO3166)_Site name_ number of the field.
2	<u>ID subsample</u>	Identification of the subsample. The format is Country code(2 alpha-code ISO3166)_Site name_ number of the field_field methodology_number of subsample.
3	Observation_level	If reported data are referred to : the sample the subsample
4	<u>Date subsample collection</u>	Date of organism /biological sampling. Standard format is according to ISO 8601: YYYY-MM-DD. Any level of precision (year (Y), month (M) or day (D)) is possible.
5	Soil_type_WRB	The soil type according the World Reference Base for soil resources (WRB).
6	WRB_version	Date of WRB version
7	Soil_taxonomy_version	If you used the soil taxonomy to name the soil, indicate the date of the version you used.
8	Soil_type_in_soil_taxonomy	The soil type according the soil taxonomy
9	Name_local_soil_classification	If you name the soil according a local soil classification, indicate the name of this classification
10	Soil_type_in_a_local_classification	The soil type according the local classification

# T2.2: Selection, quality assessment and harmonization of data

(Lead: INRAE, Co-lead: BOKU, Contributors: ACO, CNR)

## Method Bacteria description

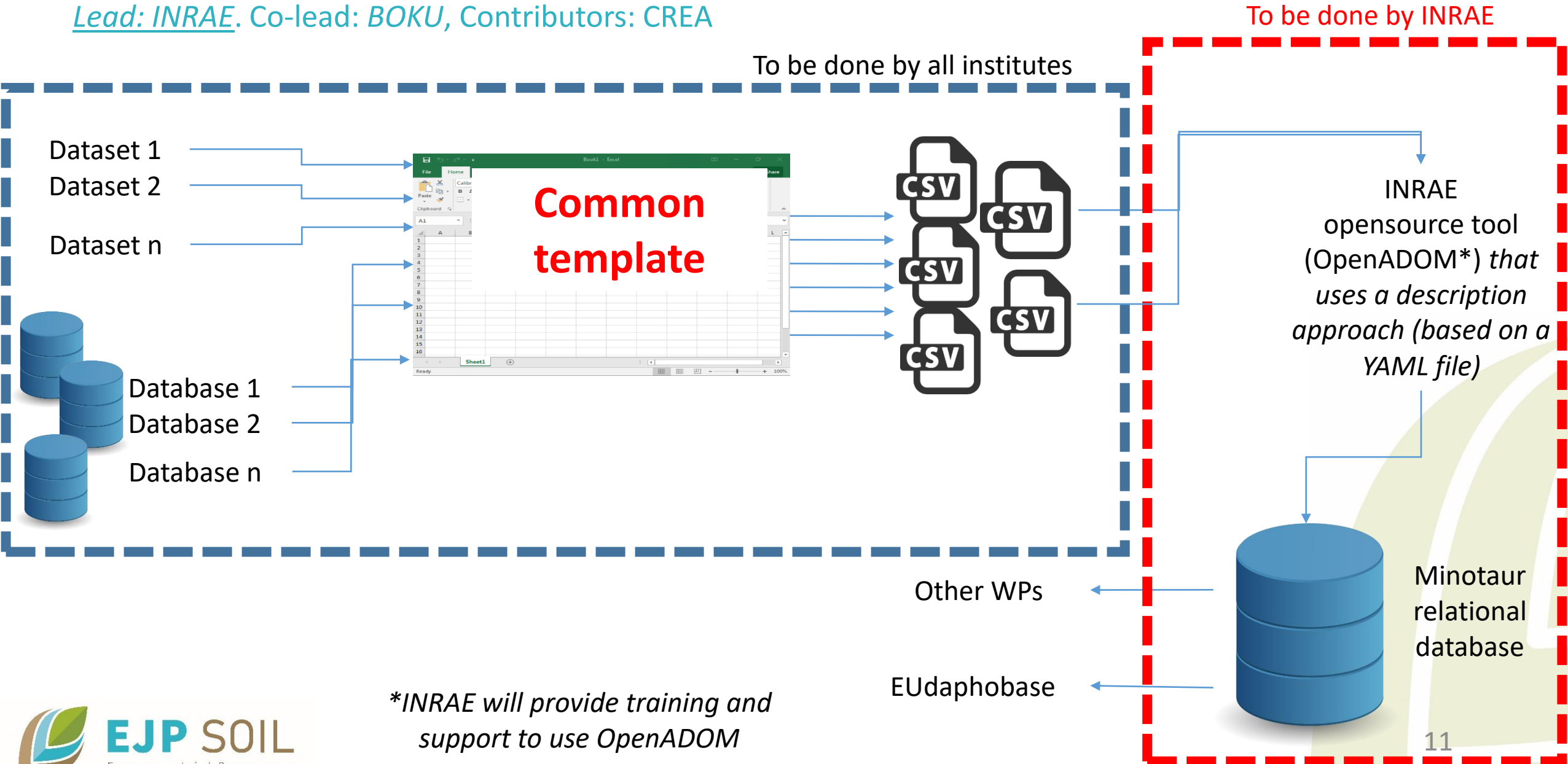
Field order	Name	Definition
1	<u>ID_Field</u>	Identification of the plot. The format is Country code(2 alpha-code ISO3166)_Site name_ number of the field.
2	<u>ID_Subsample</u>	Identification of the subsample. Depending on sample design, subsample may refer to a biological replicate; biological replicates are generally obtained by combining 3-6 subsample replicates (following for example the LUCAS sampling scheme). The format is Country code(2 alpha-code ISO3166)_Site name_ number of field_field methodology_ number of subsample
3	Observation_Level	If reported data are referred to : the sample the subsample
4	<u>Date_Subsample_Collection</u>	Date of organism /biological sampling. Standard format is according to ISO 8601: YYYY-MM-DD. Any level of precision (year (Y), month (M) or (D)) is possible.
6	Bacteria_Soil_Subsample_Mass	Mass of each subsample for bacteria DNA extraction
7	Bacteria_Sampling_Methodology	Indicate the methodology to collect soil sample Soil_core Spade
8	Bacteria_Sampling_Methodology_ISO	Indicate if possible the ISO for the used sampling methodology
9	Bacterial_Methodology_Class	Please indicate if a sequencing or a fingerprinting (i.e. T-RFLP, DGGE) methodology was used Sequencing T-RFLP DGGE

## Data bacteria description

Field order	Name	Definition
1	<u>ID_Field</u>	Identification of the plot. The format is Country code(2 alpha-code ISO3166)_Site name_ number of the field.
2	<u>ID_Subsample</u>	Identification of the subsample. Depending on the sample design, subsample may refer to a biological replicate; biological replicates are generally obtained by combining 3-6 subsample replicates (following for example the LUCAS sampling scheme). The format is Country code(2 alpha-code ISO3166)_Site name_ number of the field_field methodology_ number of subsample.
3	Observation_level	If reported data are referred to : the sample the subsample
4	<u>Date_subsample_collection</u>	Date of organism /biological sampling. Standard format is according to ISO 8601: YYYY-MM-DD. Any level of precision (year (Y), month (M) or day (D)) is possible.
5	Bacteria_Fisher_Alpha	Bacteria Fisher Alpha
6	Bacteria_Richness_Index	Richness Index for bacteria community
7	Bacteria_Chao1_Index	Chao1 Index of bacteria community
8	Bacteria_Shannon_Index	Shannon Index for bacteria
9	Bacteria_Shannon_Index_logbase	Indicate the logarithm base used for Shannon index calculation
10	Bacteria_Simpson_Index	Simpson Index for bacteria community
11	Bacteria_Ace_Index	Ace index for bacteria community
12	Bacteria_Inverse_Simpson_Index	Inverse Simpson Index community
13	Bacteria_Evenness_Index	Evenness index of bacteria community

## T2.3: Data integration and identification of knowledge gaps

Lead: INRAE. Co-lead: BOKU, Contributors: CREA



## T2.3: Data integration and identification of knowledge gaps

Lead: INRAE. Co-lead: BOKU, Contributors: CREA

### • OpenAdom is a Database & a web interface

### • The web interface is used :

- to manage metadata
- for publication of data in database
- to view and download data
- for data access management

### • Different data visualization tools are available.

### • This solution is:

- flexible by allowing different types of data
- easily accessible by the users/scientists

Minotaur data types

Tags

- Fungi
- Biological data
- Bacteria
- Data
- Soil
- Mesofauna
- methodology
- Scope
- Study
- Macrofauna
- Earthworms
- Microfauna
- Fauna data
- Agriculture

Category	Sub-category	Biological data	Data empty	Download	
Data Fungi	Fungi	Biological data	Data empty	Download	
Data Bacteria_fungi	Bacteria	Data	Fungi	Data empty	Download
Metadata Soil	Soil	Data empty		Download	
Data mesofauna	Mesofauna	Biological data	Data empty	Download	
Metadata Fungi	Fungi	methodology	Data empty	Download	
Metadata Scope	Scope	Data empty		Download	
Metadata Study	Study	Data empty		Download	
Data macrofauna	Macrofauna	Biological data	Earthworms	Data empty	Download
Data Microfauna	Biological data	Microfauna	Data empty	Download	
Data observation	Fauna data	Biological data	Data empty	Download	
Metadata mesofauna	Mesofauna	methodology	Data empty	Download	
Data Bacteria_fungi	Bacteria	Data	Fungi	Data empty	Download
Metadata macrofauna	Macrofauna	methodology	Data empty	Download	
Metadata microfauna	methodology	Microfauna	Data empty	Download	
Metadata Agriculture	Agriculture	Data empty		Download	
Metadata Bacteria_fungi	Bacteria	Fungi	methodology	Data empty	Download

**Filter by group**

Minotaur references

Tags

- Agriculture
- Localization
- Soil
- Scope
- Macrofauna
- Fungi
- Bacteria

Category	Sub-category	Total rows	Download
Crop categories	Agriculture	Total rows	Download
Site name	Localization	Data empty	Download
Indicate the texture of the soil	Soil	Total rows	Download
Methodology to assess the pH	Soil	Total rows	Download
Isr metadata agriculture	Agriculture	Data empty	Download
European Zone	Localization	Total rows	Download
Scale project	Soil	Total rows	Download
Study landuse	Soil	Total rows	Download
The type of cropping system	Agriculture	Total rows	Download
type of agriculture	Agriculture	Data empty	Download
Grazing method	Agriculture	Total rows	Download
Tillage method	Agriculture	Total rows	Download
Tillage season	Agriculture	Total rows	Download
Tillage system	Agriculture	Total rows	Download
Drainage system	Agriculture	Total rows	Download
Irrigation type	Agriculture	Total rows	Download
irrigation type	Agriculture	Total rows	Download

**Filter by context**

## Conclusion - Current situation

- **Few points on some templates still waiting for validation**
- **The template description manual is currently being validated by the partners**
- **Collection of data in progress (but no data yet !!!)**
- **First version of the DB (with OpenAdom) proposed and presented**
- **Urgent need of data to start implementaing the DB and the interface !**