

**Advanced biodiversity monitoring for results-based  
and effective agricultural policy and transformation**

**Deliverable D1.3**  
**Handbook of the GIS database (Version 1.10)**

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0.3	13/10/2023	Second draft
1.0	21/11/2023	Final version
1.1	10/10/2024	Revised Chapters of the document <ul style="list-style-type: none"> <li>● The introduction includes changes made from other chapters</li> <li>● RAW Data and Data Sources include descriptions of data inputs from various sources (Copernicus and LUCAS)</li> <li>● Processed Data and Data characteristics now covers both relevant processed data and temporal and spatial characteristics.</li> </ul>
1.2		Revised Chapters of the document <ul style="list-style-type: none"> <li>● Data Storage Flow and Naming Conventions</li> <li>● Included graph showcasing the flow of data generation, storage, processing and display.</li> <li>● WebGIS has been expanded to include the connection to the Azure data storage and future plans for optimizing the platform.</li> </ul>
2.0		Integrated comments from reviewers



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## Executive summary

This deliverable aims to collect, process, and share spatiotemporal biodiversity data for multiple taxa in carbon-rich areas with a focus on the European Union. A GIS database hosted by the Consortium will generate accessible maps of habitats, species, carbon-rich regions, and carbon stocks. The database integrates data from multiple sources, supporting Work Packages 2, 3 and 4. The main deliverable for this first iteration of the GIS database handbook is a data storage solution for the collected data within the major test sites and a preliminary look at the WebGIS portal displaying the data.



## 1. Introduction

This document presents the initial version of the Data Storage Solution (DSS) in the BioMonitor4CAP project, encompassing various essential components. The DSS is designed to support the collection, integration, storage, and dissemination of biodiversity data, as outlined in the project's objective. This version includes a detailed overview of the current system while addressing future enhancements critical for upscaling data at the EU level.

Firstly, the DSS's overall structure is built on the foundation of Microsoft Azure Storage, providing a scalable and secure environment for storing biodiversity data. This document distinguishes between RAW data and processed data, ensuring that each category is stored in a manner that facilitates efficient querying and optimal storage solutions for the level of the data collected and generated. RAW data from multiple sources, including satellite imagery from the Copernicus program and field data, is stored alongside processed datasets that reflect the outputs of various analyses within the multiple tasks of WP2.

Secondly, the structure of the storage solution is designed to accommodate the project's data requirements, with specific emphasis on temporal and spatial characteristics. Given the complex nature of biodiversity monitoring at varying scales, special attention has been given to specifying the location and date of the data through the naming convention.

Additionally, this document outlines the WebGIS platform, designed to serve as a tool for visualizing and disseminating biodiversity. Currently, the platform is under development, with several functionalities already in place. The WebGIS will ultimately display a diverse array of datasets, ranging from remote sensing data to in-situ collected metrics/indicators, providing users with intuitive access to both temporal and spatial data. In its final iteration, the platform will offer tools for data reporting, supporting the goals of the BioMonitor4CAP project.

The DSS and the WebGIS platform are closely aligned with the project's Data Management Plan (DMP). This document clarifies the metadata standards and data governance policies that comply with best practices for data handling. This document aims to provide a comprehensive look at BioMonitor4CAP's data infrastructure. It not only outlines the current state of the system but also highlights the upcoming developments that will enhance the platform's functionality and ensure access to generated and compiled data within the project.



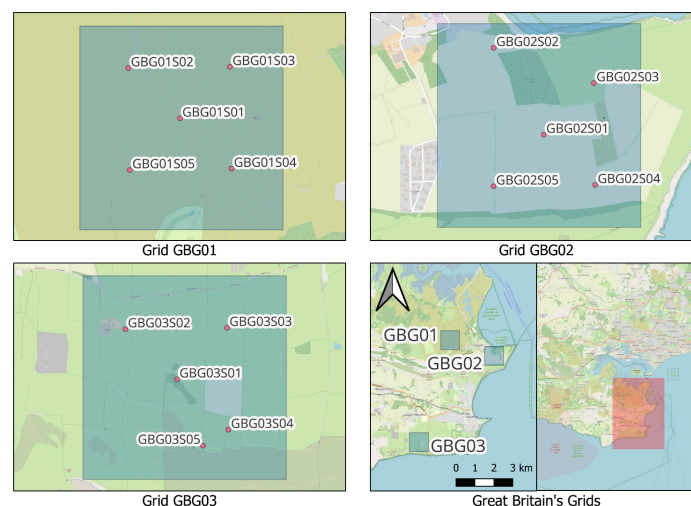
## 2. RAW Data

The Consortium originally established a collaborative platform within Google Workspace to serve as a central repository for the collection and storage of raw data generated by the Consortium's partners. As part of the designated budget within WP2, a space for raw data will be opened in Microsoft Azure Storage that allows different options for storing data (i.e., hot, cool, archive). This platform will facilitate the organization of data in a standardized format. The raw data collected includes diverse datasets from remote sensing platforms such as Copernicus and in-situ measurements from field sensors.

### 2.1 Sources of RAW Data

The Copernicus program provides satellite imagery that forms the basis of the remote sensing RAW data in the project. This program delivers earth observation data through Sentinel satellites, specifically Sentinel-1 and Sentinel-2. Sentinel-1 radar data offers information regarding the surface characteristics even under cloudy conditions. Meanwhile, Sentinel-2 multispectral imagery captures information across various wavelengths, enabling the monitoring of changes in land cover and vegetation dynamics across the landscape.

Complementing the satellite data, field sensors deployed by the Consortium partners gather in-situ measurements directly from the environment. These sensors record audio, images, soil, and eDNA data across five subsampling points placed inside a 1 km<sup>2</sup> grid square. The ideal placement of these sensors is specified in **Figure 1** (top-left image), but due to restrictions placed by the nature of the landscape, some compromises were noted across all major research sites.



**Figure 1. Example of a map depicting grids and stations in Great Britain.**

In addition to remote sensing and in-situ data, other datasets such as climate data and historical land use records will also be included as part of the raw data collection. These ancillary datasets add contextual information and serve as additional layers of information which will support analyses made in Task 2.3 and Task 2.4.



## 2.2 RAW Data Storage and Registry

The organization and storage of RAW data within the BioMonitor4CAP Consortium will be facilitated through a platform on Microsoft Azure Storage. The RAW data stored in the platform will be placed in a cold tier storage which is specifically optimized for data that is rarely accessed or modified but still requires fast retrieval. This tier offers lower storage costs and higher access costs compared to other tiers (i.e., hot tier or cool tier). Each field coordinator from all research sites will receive access to this storage space and is responsible for uploading data that adheres to a structured format.

In addition to organizing data, the project has implemented a device registry. Each in-situ data collection device used by Consortium partners is assigned a unique ID (see Chapter 4), which is recorded in a dedicated device dictionary. This registry includes metadata about each device, such as its location, type, and calibration history. The registry guarantees that all collected data can be traced back to the specific station and the time in which data was collected and be potentially linked to any identified problem with the RAW data, thereby supporting data accountability and quality control.

The data space will contain a specific folder for each country. These folders are further subdivided based on geographical regions, data types, and collection dates, which align with the project-wide naming conventions (as detailed in Chapter 4). Each country folder contains a geographical reference map depicting the grid and station locations for the respective countries (see **Figure 1**). These maps serve as a quick visual reference for field coordinators. Yearly updates are made to these maps, reflecting any new grid squared and subsampling points that are added over time.



### 3. Relevant Processed Data

The Consortium distinguishes between RAW and relevant processed data to optimise the decision support system. Microsoft Azure Storage serves as the main repository for processed data, storing it in a hot tier designed for frequently accessed or modified data. Although the hot tier incurs higher storage costs, it offers lower access costs. This decision was made to integrate the DSS with the webGIS platform, providing an interface for users outside of the Consortium.

By segregating the data based on its level of processing, this approach enables the Consortium to efficiently manage storage costs while maintaining a well-organized structure for data presentation within the WebGIS platform. Storing relevant processed data in Azure Storage ensures the availability of valuable insights and conclusions derived from the processed information, facilitating the integration and access to all of the outputs from the fieldwork campaigns and other sources of data (e.g., LUCAS dataset, SoilGrids dataset, etc.).

#### 3.1 Definitions of Relevant Processed Data

Relevant processed data in the context of a consortium project with multiple partners refers to the refined, transformed, and analyzed information derived from the original data provided by each partner. The partners can contribute with different types of data, including audio, video, GIS, molecular data, and soil information (see **Table 1**). The goal is to store only the processed data, excluding the RAW data, in Azure Data Storage. Processed data involves one, or a combination of the following key aspects:

1. **Data Transformation:** The raw data from each partner undergoes specific data transformations, standardization, and formatting to make it suitable for analysis and integration with other datasets.
2. **Data Analysis:** Processed data results from applying statistical and computational techniques including machine learning to extract valuable insights, patterns, and conclusions from the RAW data.
3. **Data Aggregation:** Processed data involves combining and summarizing individual data or values from multiple sources to create a more comprehensive representation of the Consortium's findings.
4. **Data Anonymization:** To maintain data privacy and adhere to ethical considerations, personally identifiable information, and other sensitive details are removed or anonymized in the processed data.
5. **Data Integration:** Processed data can be combined from multiple sources or datasets into a unified view. This process pursues to analyze or seek relationships and connections between different datasets, thus gaining deeper insights and generating knowledge on how modern monitoring approaches can make the Common Agriculture Policy more efficient and resilient.



**Table 1. Examples of relevant processed data as well as data types.**

Source	RAW Data	Processed Output Example
<b>Audio</b>	Audio recording of prolonged extent from an AudioMoth device in WAV format	CSV containing a species list identified through ML algorithms and relevant MP3 or OGG files
<b>Video</b>	Video footage from a camera trap in MP4 or VP9 format	CSV containing a species list identified through ML algorithms and relevant MP4 or VP9 files
<b>Image</b>	Images captured in JPEG/PNG format	CSV containing a species list identified through ML algorithms and relevant JPEG/PNG files
<b>GIS</b>	Spatial data layers captured from drones in RAW format	Specific Earth Observation product related to Essential Biodiversity Variables across landscapes and time
<b>Molecular data</b>	Genetic sequences collected from environmental samples in CSV format	Identified taxa from eDNA and bulk samples and associated OTU-, and ASV tables including non-identified taxa.
<b>Soil</b>	Measurements of soil properties captured in the field and laboratory reports.	Processed soil data, including aggregated soil quality indicators, soil health indices in either a GeoPackage, GeoJSON or CSV format.

In each case, the RAW data represents the initial, unprocessed information collected directly from the environment, while the relevant processed data involved applying various analytical techniques or algorithms to extract meaningful information, patterns, and eventually conclusions for biodiversity research aligned with the Consortium's objectives.

### 3.2 Temporal and Spatial Characteristics of Data

The processed data is systematically collected and displayed at the grid level, with each data point linked to the specific date it was captured. The primary focus of the WebGIS platform is to present relevant biodiversity indicators or metrics derived from each type of in-situ measurement, ensuring that users access only the most pertinent information for ecosystem monitoring.

For in-situ data collection, field coordinators across the different countries involved in the project carefully synchronized their data collection campaigns to coincide with the start of the local bird breeding season and the growing degree days. Given the variations in breeding season start times across regions, this alignment was critical for producing comparable results across diverse research sites. Sampling occurs ideally in five sampling rounds for one or two weeks. The first three sampling rounds are scheduled according to the start, mid and end of bird breeding season. In the fourth and fifth sampling rounds, the focus of monitoring activities is shifted towards insects, and their timing is defined by the approach of growing degree days.



For specific research sites where a grid-based approach is impractical, field coordinators are responsible for developing alternative experimental designs suited to the local conditions. These coordinators document the rationale behind site selection and experimental approaches, ensuring clarity and relevance in data collection while accommodating the unique ecological features of each site.

Regarding remote sensing data, a 10 km buffer zone around each sampling grid was established to capture both the immediate and surrounding landscape dynamics. Satellite imagery and other GIS data were retrieved within these buffer zones better to understand the environmental context of each area of interest. Remote sensing products were generated quarterly to capture seasonal changes, with imagery averaged across each quarter. This approach helped minimise the impact of cloud cover and seasonal variations in visibility, although winter ice in northern areas like Finland still presented challenges in certain periods.

### 3.3 Metadata File

To support users in effectively understanding and utilizing the processed data, a comprehensive metadata file accompanies each dataset. This metadata file not only serves as a detailed guide for data interpretation but also includes a catalog of species identified through various data sources. By adhering to a structured approach, the metadata file provides users with the context and technical details required to work with the data accurately and effectively. The key components of the metadata file include:

- **File Description:** Each metadata file begins with a concise description of the processed dataset. This section includes an explanation of the naming convention applied, clarifying the identifiers used in the dataset for easier reference and interpretation.
- **Data Type and Format:** The metadata explicitly states the types of data present in the processed dataset. This includes categorization into audio, video, GIS, and tabular data, providing a clear breakdown of the dataset contents and their formats to aid with compatibility and usability across different applications.
- **Data Source:** Detailed information on the devices used for data collection is included in this section. Examples include pan traps, AudioMoth recorders, and eDNA metabarcoding tools. When applicable, consortium partners' device IDs for field equipment are noted to enable tracking and cross-referencing of data back to specific devices, which supports data quality assurance and accountability.
- **Processing Steps:** This section outlines the key processing steps taken to refine, transform, and analyze the raw data. Information about any software, algorithms, or machine learning tools used during data processing is included here. This detail ensures transparency in data handling and allows users to replicate or understand the methodological approach.
- **Keywords:** Relevant keywords and descriptive tags are added to each metadata file to facilitate search and discovery within the Azure Storage and WebGIS platforms. These



keywords describe the dataset's content, focus, and purpose, improving navigability and supporting specific queries.

The Consortium is currently working on defining the specific biodiversity indicators for inclusion in this project, as outlined in Task 1.2, *Review on Farmland Biodiversity Indicators*. Once finalized, these indicators will be incorporated into the metadata file to provide a summarized statistic accessible through the WebGIS platform, enhancing data usability for end-users seeking biodiversity insights.



## 4. Data Storage Flow & Naming Conventions

To ensure data accessibility and cost efficiency with a long-term perspective, a distinction between RAW data and relevant processed data has been established, as outlined in previous chapters. Both types of data are stored within Microsoft Azure Blob Storage, which serves as the primary storage solution. The **Cool Tier** is designated for RAW data due to its lower cost for infrequently accessed information, while the **Hot Tier** is used for relevant processed data that requires frequent access. The pricing for data storage per terabyte is presented in the table below followed by some characteristics of the storage tiers:

**Table 2. Microsoft Azure Storage Tiers pricing and characteristics.**

Tier	Price per TB per month	Access Frequency	Latency	Data Retrieval Costs	Primary Use Case
<b>Hot</b>	18.2	Frequent	Lowest	None	Frequently accessed data, such as running applications or websites.
<b>Cool</b>	9.27	Infrequent	Low	Low	Data accessed less frequently, like backups or older files needed occasionally.
<b>Archive</b>	1.67	Rarely	High	High	Long-term storage for rarely accessed data like compliance records or archival logs.

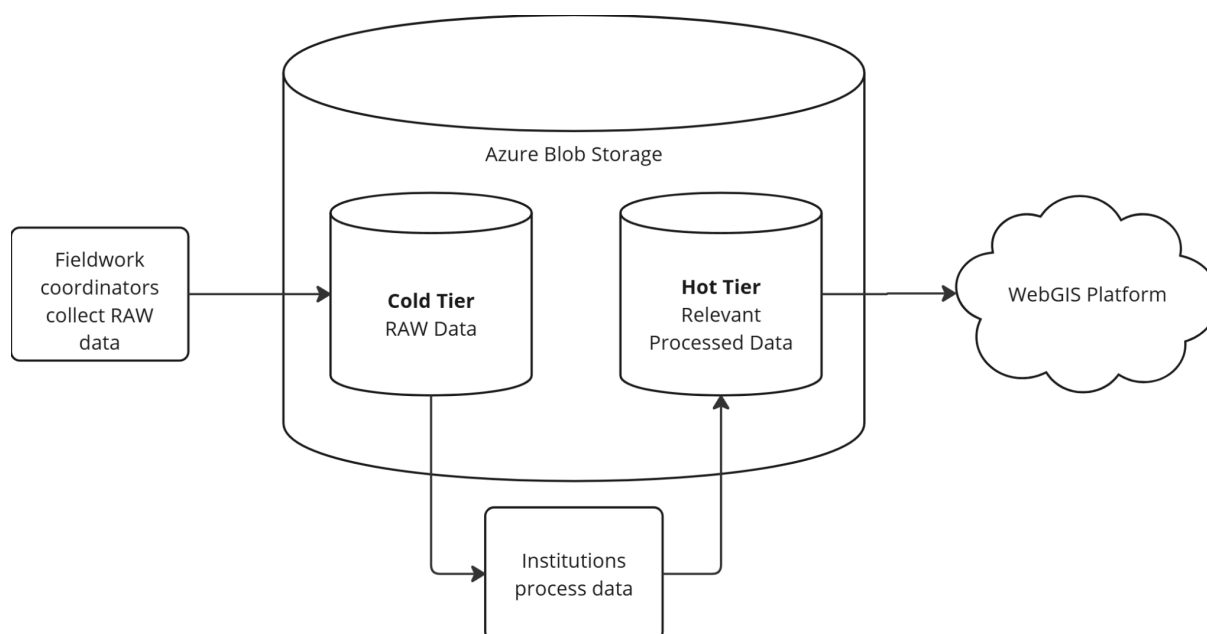
The Consortium partner, DLG, is responsible for covering the costs of the storage solution, while S4G manages the storage operations. A budget of €20,000 has been allocated to support this storage infrastructure across the Consortium. Assuming a linear increase in storage in both tiers, the budget will allow the Consortium to store up to **164 TB** of data by the end of the project with 10% allocated to the hot tier (16.4TB) and 90% to the cool tier (147.6 TB), while staying within the €20,000 budget. If these numbers don't increase, the archive storage option can be discussed in order to preserve the data for years to come.

### 4.1 Data Flow

The data flow for this project begins with field coordinators in each country, who are responsible for collecting various types of data, such as environmental DNA (eDNA), soil samples, pan traps, audio recordings, and drone imagery. These raw data are uploaded to **Cold Storage** (Cool Tier) in Microsoft Azure Blob Storage, where they are stored according to a predefined naming convention. This ensures consistency and easy access for future processing, while maintaining a cost-efficient storage solution for the raw, infrequently accessed data.



Once the raw data is stored in the Cold Storage, it is then transferred to partner institutions for processing. These institutions transform the raw data into **relevant processed data**, which is then moved to **Hot Storage** (Hot Tier) within the same cloud infrastructure. The Hot Tier is designed for data that needs to be accessed frequently, making it the ideal location for processing data that will be used for analysis, visualizations, and further applications.



The processed data is subsequently integrated into the webGIS platform, where it will be made available for visualization and download. This platform allows users to interact with the data and access the information necessary for further analysis. The WebGIS platform serves as the central hub for processed data, enabling the Consortium to easily retrieve and analyze the data for various environmental and ecological purposes.

## 4.2 Naming Convention

In line with the Consortium's pursuit to collect and manage biodiversity data, the DSS has been designed, following a hierarchical approach that aligns with the data collection process. This structure organizes the data logically and systematically, ensuring seamless storage and retrieval. The hierarchical order follows the progression from broad geographical regions to specific data collection points, establishing a clear and organized data framework for effective data management and research insights.

1. **Countries Level:** At the highest level of the DSS, data is organized based on countries or geographical regions. Each country is represented as a separate entity within the data storage system. This division ensures that biodiversity data collected from distinct geographical areas can be easily segregated and accessed. The ISO-alpha2 code nomenclature is used for naming each country as well as the country name recognized by the UN Standard country or area codes for statistical use (e.g., Finland: FI, Portugal: PT).



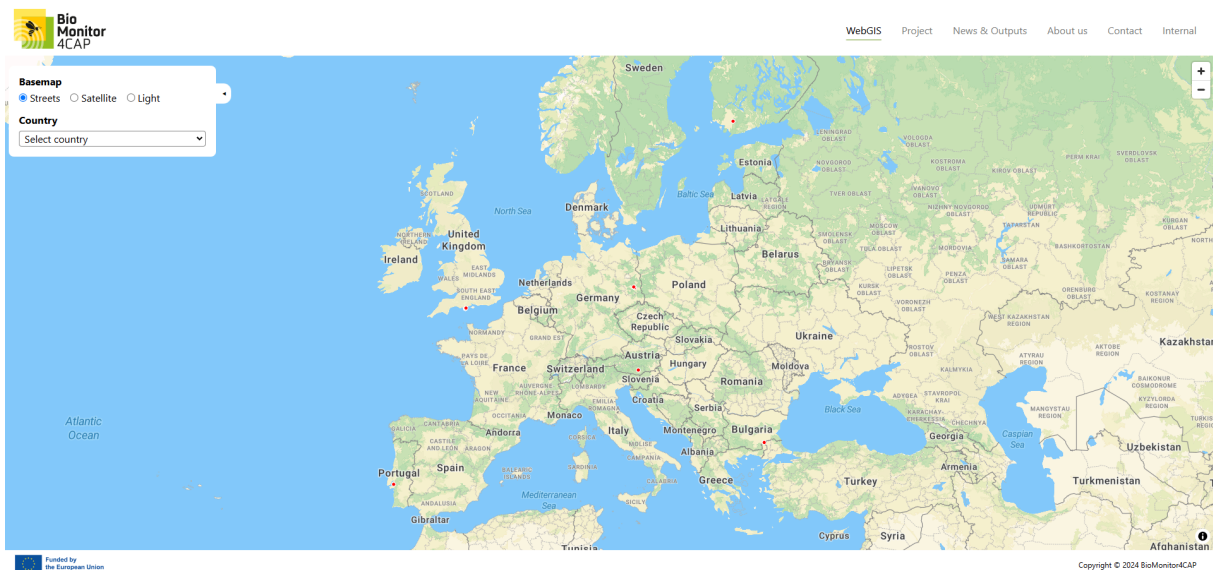
2. **Institution Level:** In certain countries, multiple entities will assume responsibility for the compilation of data from multiple national grids. To tell these data collections apart, we'll add the agreed-upon initials for each institution after the ISO-alpha2 code for the country. For example, data collected in Portugal by Food 4 Sustainability, will then be abbreviated as **PTF4S**.
3. **Grid Level:** Moving one level down, the DSS partitions the data into individual grids of ideally one by one kilometer or study areas within each country. Grids represent distinct locations where data collection activities take place. This division enables researchers to focus on a specific region at a more localized scale. Individual names have been given to each plot as well as a unique identifier which starts with the capital letter **G** followed by **01** and ends at the *n*th grid.
4. **Station Level:** Further down the hierarchy, the Data Storage Structure classifies data according to specific measuring stations established within each grid. Stations are designated points within the grids where biodiversity data is systematically recorded. The naming of each station is accomplished by using the ISO-alpha2 code, followed by the unique identifier of the grid, followed by the capital letter **S**, and the unique identifier for each station. For example, a measuring station in Great Britain's Purbeck grid would be named **GBG09S01**.
5. **Devices Level:** At the lowest level of the hierarchy data is organized based on the devices employed during data collection at each measuring station. The AudioMoth device, Pan Trap system, eDNA samples, and soil biochemistry samples are included in the first iteration of this naming convention. Each device has received a reduced name. The naming of devices starts with the capital letter **D** and is followed by the unique identifier that ranges from 01 to the *n*th device. For example, an audio measurement recorded in Germany's Spreewald is then named **DEG03S09D01**.
6. **Date of Data Collection:** To optimize data querying, the date is incorporated into the naming convention by arranging it in the "year-month-day" format. By doing this, we establish a clear chronological order that simplifies searching for specific data points within a range or on a specific day. An example of data collected in Portugal would be **PTG02S07D03\_20230802**. For data that was collected in a period of time, the start date would come first, followed by the end date. Thus, the previous example would change to **PTG02S07D03\_20230802\_20230810**.

To ease the storing of data, maps were generated for each site in which the naming conventions for each grid and station were outlined. A set of dictionaries and auxiliary documents were also provided to ensure the correct use of the naming conventions and the identifications for all of the known devices. Important to note is that each country will increase the amount of active grids that they have for data collection throughout the project's lifespan.



## 5. WebGIS Platform

The initial development of the WebGIS platform was a collaborative effort between Medianet and S4G, which began with configuring the domain name within BioMonitor4CAP's website URL. This effort culminated in the establishment of the official WebGIS platform domain. The next step was integrating Azure Storage with the website, enabling the retrieval and display of stored data upon user request. For the initial display of collected data, S4G utilized the grid and station information established in Deliverable 3.1, "Guideline for Trial Implementation."



**Figure 2. BioMonitor4CAP's platform in its initial iteration.**

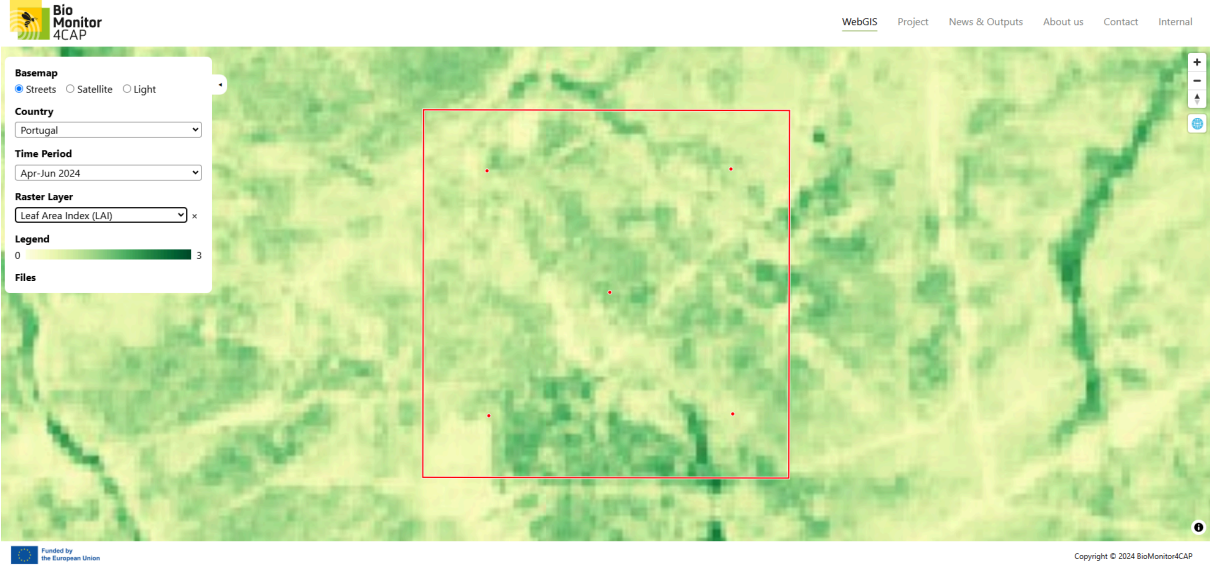
For the platform's technical mapping and location services, MapTiler was selected as the cloud solution. MapTiler provides a versatile suite of tools and services for creating interactive and customizable maps. In its initial iteration, the WebGIS platform supports foundational features, including interactive base layers with default background maps, satellite imagery, and geographical borders (see Figure 2). The platform processes all spatial information in the Web Mercator projection (WGS84). Additionally, geocoding capabilities have been integrated, allowing the conversion of location-based data into coordinates for precise mapping. The platform also includes data visualization tools to highlight the grids and stations where data collection has occurred across various years (see Figure 3).

Future updates to the WebGIS platform include the integration of a data upload form, which will allow Consortium members to upload processed data directly to the system. This feature will automate the generation of file names based on predefined options selected in the form, ensuring consistent naming conventions. Uploaded files will be appropriately stored in the Hot Tier of Azure Storage, facilitating alignment between processed data from various institutions within the consortium and the data displayed on the platform.

Additionally, the platform will regularly update the list of displayed grids and stations as data collection campaigns conclude. This enhancement will enable Consortium members to identify



fieldwork locations and query the data available for download. These updates will improve the platform’s usability and ensure it remains a comprehensive tool for managing and analyzing project data.



**Figure 3. Example of the WebGIS platform displaying grids and data collection plots.**

As data collection increases and relevant processed data is harmonized and uploaded to Azure Storage, additional enhancements will be introduced. Planned features include integrating land cover maps, biophysical indicators, and radiometric indices, alongside other relevant earth observation products such as the LUCAS dataset and SoilGrids. These spatial layers, guided by the findings of Deliverable 1.2, “Review on Farmland Biodiversity Indicators,” will deepen insights into the relationships between ground-truth data and spatial layers, supporting more robust analyses.



## 6. Appendix

### Naming conventions for countries, grids, stations, and devices

The naming conventions for the different levels of organization within the DSS can be found in the next tables:

Appendix 1: Countries of Research Sites

country_name	country_code	UN_M49
Finland	FI	246
Germany	DE	276
Austria	AT	040
Portugal	PT	620
Bulgaria	BG	100
GreatBritain	GB	826

Appendix 2: Active device names in research stations

device_id	device_name	device_name_short
1	AudioMoth	am
2	eDNA_sample	edna
3	Soil_sample	soil
4	Pan_trap	pan
5	Drone	uav
6	Camera_Trap	cam

Appendix 3: Grid codes within each country and their extensions for 2023

id	left	top	right	bottom	grid_id	grid_code
1	454141.47	5179109.11	455141.47	5178109.11	1	ATG01
2	444969.54	4632872.81	445969.54	4631872.81	1	BGG01
7	445969.54	4632872.81	446969.54	4631872.81	2	BGG02
5	630453.57	6719286.68	631453.57	6718286.68	1	FIG01
99	429220.97	5749727.70	429720.97	5749227.70	1	DEG01
302	435220.97	5744227.70	435720.97	5743727.70	2	DEG02
20	570380.13	5606309.04	571380.13	5605309.04	3	GBG03
29	572380.13	5611309.04	573380.13	5610309.04	1	GBG01
44	574380.13	5610309.04	575380.13	5609309.04	2	GBG02
14	516358.72	4296760.03	517358.72	4295760.03	1	PTG01



## Appendix 3: Station codes and their respective geographic locations for 2023

id	Longitude	Latitude	station_id	station_code
0	14.0612	51.8395	4	DEG02S04
1	14.0588	51.8410	5	DEG02S05
2	14.0612	51.8410	1	DEG02S01
3	14.0636	51.8410	3	DEG02S03
4	14.0611	51.8425	2	DEG02S02
5	13.9744	51.8892	4	DEG01S04
6	13.9719	51.8907	5	DEG01S05
7	13.9744	51.8907	1	DEG01S01
8	13.9768	51.8907	3	DEG01S03
9	13.9743	51.8922	2	DEG01S02
10	14.4122	46.7572	2	ATG01S02
11	14.4092	46.7572	1	ATG01S01
12	14.4128	46.7564	3	ATG01S03
13	14.4103	46.7553	4	ATG01S04
14	26.3416	41.8481	2	BGG01S02
15	26.3494	41.8467	3	BGG01S03
16	26.3449	41.8445	1	BGG01S01
17	26.3411	41.8422	5	BGG01S05
18	26.3487	41.8419	4	BGG01S04
19	26.3521	41.8402	5	BGG02S05
20	26.3534	41.8461	2	BGG02S02
21	26.3618	41.8449	3	BGG02S03
22	26.3566	41.8425	1	BGG02S01
23	26.3597	41.8389	4	BGG02S04
24	23.4037	60.5847	9	FIG01S09
25	23.4018	60.5862	7	FIG01S07
26	23.3983	60.5856	2	FIG01S02
27	23.3994	60.5832	11	FIG01S11
28	23.3995	60.5847	4	FIG01S04
29	23.4026	60.5854	8	FIG01S08
30	23.4011	60.5867	6	FIG01S06
31	23.3983	60.5850	5	FIG01S05
32	23.3990	60.5853	1	FIG01S01
33	23.3993	60.5856	3	FIG01S03
34	23.4019	60.5842	10	FIG01S10



id	Longitude	Latitude	station_id	station_code
35	-2.0016	50.5989	2	GBG03S02
36	-1.9945	50.5989	3	GBG03S03
37	-1.9963	50.5937	5	GBG03S05
38	-1.9945	50.5944	4	GBG03S04
39	-1.9981	50.5966	1	GBG03S01
40	-1.9769	50.6474	2	GBG01S02
41	-1.9698	50.6474	3	GBG01S03
42	-1.9769	50.6429	5	GBG01S05
43	-1.9698	50.6429	4	GBG01S04
44	-1.9734	50.6452	1	GBG01S01
45	-1.9436	50.6405	2	GBG02S02
46	-1.9367	50.6389	3	GBG02S03
47	-1.9438	50.6344	5	GBG02S05
48	-1.9367	50.6344	4	GBG02S04
49	-1.9402	50.6367	1	GBG02S01
50	-8.8129	38.8173	2	PTG01S02
51	-8.8128	38.8113	5	PTG01S05
52	-8.8090	38.8143	1	PTG01S01
53	-8.8052	38.8173	3	PTG01S03
54	-8.8052	38.8113	4	PTG01S04

