

D7.2 Data Management Plan

Final version

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AND DROUGHT MANAGEMENT'
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Abbreviations

CC	Creative Commons
CSV	Comma-Separated Values
DDI	Data Documentation Initiative
DMP	Data Management Plan
DOI	Digital Object Identifier
EC	European Commission
EU	European Union
FAIR	Findable, Accessible, Interoperable, and Reusable
GA	Grant Agreement
GDPR	General Data Protection Regulation
GEMET	General Multilingual Environmental Thesaurus
GIS	Geographic Information System
HTTPS	HyperText Transfer Protocol Secure
IP	Intellectual Property
IR	Internal Report
ISA-Tab	Investigation/Study/Assay-Tabular
ISO	International Organization for Standardization
JSON	JavaScript Object Notation
JSON-LD	JavaScript Object Notation for Linked Data
KER	Key Exploitable Result
MeSH	Medical Subject Headings
MIxS	Minimum Information about any Sequence
NBS	Nature-Based Solutions
NetCDF	Network Common Data Form
OAI-PMH	Open Archives Initiative Protocol for Metadata Harvesting
OGC	Open Geospatial Consortium
ORCID	Open Researcher and Contributor ID

PDF	Portable Document Format
PID	Persistent Identifier
PR	Project Result
RDA	Research Data Alliance
SWG	Smart Water Grid
TBD	To be defined
TIFF	Tag Image File Format
UNESCO	United Nations Educational, Scientific and Cultural Organization
UUID	Universally Unique Identifier
WP	Work Package
XML	Extensible Markup Language

Project Partners	
WRT	Westcountry Rivers Trust lbg
LEITAT	Acondicionamiento tarrasense asociacion
GO	Global omnium medioambiente, S.L.
VIC	Fundacion de la Comunitat Valenciana
SUA	Slovenska polnohospodarska univerzita v Nitre
ECOENERGY	Civic Association Ecoenergy
EWA	Energy and water agency
NATUURPUNT	Natuurpunt
TUDELFT	Technische universiteit delft
ACONIUM	aconium GmbH
BOKU	Universitaet fuer bodenkultur wien
VIRIDIAN	Viridian Logic Ltd
WU	Wageningen university and Research
VU	Stichting vu
FIBL	Forschungsinstitut fur biologischen landbau Stiftung (associated)

TUM	Technische universitaet muenchen muenchen
IIASA	Internationales institut fuer angewandte systemanalyse
BEIA	Asociatia beia - grid institute
LIST	Luxembourg institute of science and technology
ICONS	ICONS
EQY	Euroquality SAS
WE	Water Europe

Disclaimer of Warranties

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1 Management Summary

This Data Management Plan (DMP) describes how data and other research outputs generated within WATERGRID will be managed throughout the project lifecycle and beyond. The project develops and demonstrates Smart Water Grids (SWG) using Nature-Based Solutions (NBS) at catchment scale, with the objective of supporting climate-resilient water management.

The project will generate and re-use a broad range of data, with a particular focus on modelling and monitoring data related to hydrological processes, GIS-based analyses, and the performance of NBS and SWGs. Data will be collected, processed, and analysed in the context of demonstration and validation activities, supporting the validation and potential replication of project results across different catchment contexts. In addition to data, the main research outputs comprise documents (e.g. reports, protocols, guidelines) and software developed to support modelling, monitoring, and planning activities.

Data management practices are designed in accordance with the FAIR principles. Metadata will be provided in a structured and proportionate manner, aligned with the nature of the data and research outputs and the requirements of the selected dissemination channels. Persistent identifiers will be used where inherent to the dissemination process, such as for scientific publications or repository-based outputs.

Research data and result-oriented outputs will be made openly available where feasible, while considering legal, ethical, confidentiality, and intellectual property considerations. Limited personal data, mainly professional contact details and images, may be processed and will be handled in full compliance with the General Data Protection Regulation (EU) 2016/679 (GDPR).

Quality assurance of research outputs is ensured through internal procedures, including review and testing by multiple partners, and responsibilities for data management are embedded within the project structure. Costs related to data management and FAIR compliance are covered by the Horizon Europe grant in accordance with the Grant Agreement.

This DMP is a living document and will be updated at the project's mid-term and the project end to reflect the evolution of project activities, ensuring continued compliance with Horizon Europe requirements and good practice in research data management.

2 Introduction

The present document constitutes the initial version of the Data Management Plan (DMP) of WATERGRID (short for “Nature Based Smart Water Grids for Integrated Water and Drought Management”), corresponding to Deliverable D7.2, developed under Task 7.4 ‘Data Management’ of Work Package 7 ‘Project Management’. The document follows the Data Management Plan template for EU projects (Version 1.0, 5 May 2021), commonly applied in Horizon Europe projects.

This initial DMP will be reviewed and updated twice during the course of the project. Updated versions are foreseen at Month 24 and Month 48, the latter constituting the final version of the DMP. Updates will reflect the evolution of data collection and re-use activities, as well as potential changes in legal, ethical, or data security requirements.

The dissemination level of this DMP is Public, meaning that the document will be available to the public and disseminated through relevant communication channels such as the project website of WATERGRID.

WATERGRID aims to develop and demonstrate the Smart Water Grid (SWG) concept to enable more climate-resilient water management, particularly in the context of extreme droughts. The project is framed within Integrated Catchment Management, addressing water systems at catchment scale through a holistic approach that combines hydrological processes, spatial planning, governance, and socio-economic considerations. A central element of the project is the analysis and implementation of Nature-Based Solutions (NBS) to enhance water availability, storage, and re-use. Table 1 summarizes the work package structure of WATERGRID.

Table 1: WATERGRID work plan

WP	Name	WP Lead	Key activities
WP1	Preliminary studies	SUA	Baseline assessment of demonstration sites Review and synthesis of existing NBS initiatives and evidence Catchment-scale modelling and scenario analysis Assessment of potential biophysical and economic benefits of NBS Identification of barriers and lock-in effects Development of lock-in profiles and a transferable diagnostic tool
WP2	Plan and co-design solutions	VIRIDIAN	Co-design of nature-based solutions and smart water governance at demonstration sites Development of an independent NBS verification module Advanced modelling of NBS impacts and co-benefits Design of an adaptive and scalable monitoring programme
WP3	Deploy, monitor and demonstrate SWGs	WRT	Deployment of smart water governance and monitoring at demonstration sites Collection and consolidation of monitoring data Economic feasibility and cost-efficiency assessment of SWGs Impact and resource-efficiency assessment of SWGs
WP4	Incentivise, operationalise and transfer SWGs	WU	Development of business cases for smart water governance and drought management Design of governance scripts for smart water governance uptake

			Sustainability assessment of smart water governance solutions Policy enhancement and evidence-based recommendations for SWG implementation
WP5	Validate and upscale the Project Results	TUDELFT	Adaptation and testing of project results in validation sites Iterative update and optimisation of project results after experimentation Assessment of financing mechanisms for scaling smart water governance Identification of additional replication potential and sites
WP6	Communication, dissemination and exploitation of results	ACONIUM	Communication and dissemination strategy development Project identity creation and communication implementation Exploitation strategy development and implementation Networking and synergies with related projects and initiatives
WP7	Project management	WRT	Stakeholder engagement framework and toolbox development Project management and development of coordination tools Day-to-day project management, reporting and quality assurance Data management and governance

To support these objectives, WATERGRID will generate and re-use a wide range of data for, inter alia, hybrid hydrology–GIS prioritisation modelling, hydrological water cycle modelling, and the assessment of environmental, economic, and resource-efficiency impacts of NBS and SWGs. Data on existing NBS implemented at eight sites will be analysed alongside academic literature to form an evidence portfolio, while data will also be collected on additional innovative and locally adapted NBS that will be implemented and monitored within newly designed SWGs.

Five existing, demonstration sites — **Tamar (Devon & Cornwall, United Kingdom), Averbode Forest & Heath (Belgium), Bioclimatic Park (Slovakia), the City of Valencia (Spain), and the Qlejjgha dry-valley (Malta)** — cover Atlantic, Continental, Mountain and Mediterranean biogeographical regions and address diverse water scarcity challenges. In these sites, a total of 58 NBS will be implemented. Three additional validation sites — **Gelderse Poort (The Netherlands), Schwerin Lakeland (Germany), and the Danube Alluvial Zone National Park (Austria)** — will be used to validate results and demonstrate the replicability of the SWG approach.

Data-related activities will include monitoring data from NBS and SWGs, modelling outputs, and the re-use of publicly available GIS, hydrological, and socio-economic datasets, complemented by observational data collected through surveys. Throughout the project, photos and videos will be taken for communication and dissemination purposes. The project will process limited personal data, mainly professional contact details of consortium members and external stakeholders, as well as images and recordings from events where applicable. The collection of special categories of personal data is not expected.

This initial DMP is informed by input collected from the above-mentioned demonstration and validation sites through a qualitative and quantitative survey, conducted by the project partner SUA in November 2025. The respective demonstration and validation site partners described existing data about their sites as well as other expected data types and methodological approaches.

The remainder of this DMP describes the data to be collected and re-used within the project, the application of the FAIR principles, the allocation of resources for data management, the envisaged data security measures, and the relevant ethical and legal considerations.

3 Data management strategy and procedures

In accordance with the guidelines on FAIR data management in Horizon Europe, a DMP plays a crucial role in ensuring effective data management. It is therefore important to consider the types of data that are likely to be used during the project:

- (1) Data from readily available sources such as open data catalogues on relevant topics in the environmental sector or other topics relevant to the project's objectives.
- (2) Data derived from activities of project partners and external evaluators, including evaluation reports, surveys, review documents, focus group discussions, project prioritisation, technical data processing, business process development and other tasks performed to achieve the project's objectives.
- (3) Data generated with the involvement of third-party beneficiaries and use cases, such as details of projects submitted under certain circumstances, interview recordings and presentations.

3.1 Data summary

WATERGRID follows a “re-use first” and open-data-driven approach in line with Horizon Europe open science principles. Wherever possible, the project builds on existing datasets from established European, national and international sources. New data are generated only where suitable datasets are not available or where existing data do not meet the required quality, resolution or methodological requirements.

To provide a clear overview and avoid redundancy across the Data Management Plan, the main characteristics of the data generated and re-used within the individual Work Packages are summarised in Table 2. The table consolidates key information on the purpose, type and indicative scale of the datasets handled within the project and serves as a reference for the subsections below.

Table 2: Overview of data collection and re-use

WP	Main data category	Generated / Re-used	Short description	Data type	Estimated size	Personal/sensitive data	Intended access
WP1	Baseline & contextual data	Re-used	Geospatial, hydrological and environmental reference data for demonstration sites; modelling inputs	GIS, tabular, time series	Small-medium	No	Open (subject to source licences)
WP1	Modelling outputs	Generated	Scenario analyses and derived indicators for NBS potential and impacts	Quantitative, model outputs	Small-medium	No	Open
WP2	Design & verification data	Generated + re-used	Reference datasets, modelling outputs and verification results for NBS design	Quantitative, qualitative	Small	No	Open
WP3	Monitoring data	Generated	Monitoring and performance data from SWG demonstration sites	Time series, GIS	Medium	No	Partly open (aggregated)
WP4	Socio-economic & policy data	Re-used + generated	Policy, governance and economic assessment data supporting business cases	Qualitative, quantitative	Small	No	Open
WP5	Validation & scaling data	Generated	Validation results and comparative datasets for upscaling	Quantitative	Small	No	Open
WP6	Dissemination outputs	Generated	Synthesised datasets, indicators, reports, visualisations	Mixed	Small	No	Open

WP7	Project management data	Generated	Administrative, coordination and reporting data	Administrative	Small	Yes (limited)	Restricted
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Re-use of existing data

As summarised in Table 2, a substantial share of the data used in WATERGRID consists of re-used datasets originating from authoritative open data sources. These include European and national open data portals, public authorities, research infrastructures, institutional repositories and peer-reviewed scientific publications. Re-used data provide the empirical and contextual basis for analyses, modelling and assessments and contribute to avoiding unnecessary duplication of data collection.

All re-used datasets are accessed and processed in strict compliance with the applicable licences and terms of use. Licence conditions and usage restrictions are documented through metadata and respected throughout the data lifecycle.

Generation of new data

New primary data are generated only where necessary to achieve the project objectives and where suitable existing datasets are not sufficient. As indicated in Table 2, newly generated data mainly include monitoring data from demonstration activities, modelling and simulation outputs, analytical datasets and documentation produced within the project.

All newly generated and re-used datasets are harmonised and integrated for analytical and modelling purposes, including the alignment of formats, metadata structures and semantic definitions across heterogeneous data sources.

Types and formats of data

Across the Work Packages, the main data types handled within WATERGRID include structured tabular data, time series, geospatial datasets, monitoring and observational data, model inputs and outputs, and derived analytical datasets, as summarised in Table 2.

To ensure interoperability, reusability and long-term accessibility, WATERGRID prioritises the use of open, standardised and machine-readable data formats. Where possible, data are handled and published in formats such as CSV, JSON, XML, GeoJSON, NetCDF or other domain-appropriate open standards. Where data are initially available only in proprietary formats, reasonable efforts are made to convert them into open formats, provided this is technically feasible and permitted by the applicable licences. Metadata document original formats and any transformation steps applied.

Expected data volumes

Based on current planning assumptions and as indicated in Table 2, the overall volume of data handled within WATERGRID is expected to remain moderate and manageable. A significant share of the data volume results from the re-use of existing datasets, particularly geospatial and environmental data products. Newly generated data are generally smaller in size, as they mainly consist of processed, aggregated or derived datasets.

The total data volume is expected to be in the order of several tens of gigabytes over the full project duration. This estimate will be refined in later versions of the Data Management Plan in coordination with the technical and modelling partners.

Origin and provenance of data

The origin and provenance of the data used in WATERGRID are documented through metadata. Re-used data originate from established and trusted providers, including European-level open data infrastructures, national and regional open data portals, public institutions, research infrastructures and scientific repositories. Newly generated data originate from project-specific monitoring, modelling, analytical and coordination activities.

Metadata capture information on data origin, data providers, licensing conditions and relevant processing steps, ensuring transparency, traceability and reproducibility.

Personal data

The project involves limited processing of personal data, primarily in the context of project coordination and stakeholder engagement activities. Personal data may include names, contact details, professional roles and affiliations. No sensitive or special categories of personal data, as defined under the GDPR, are intentionally collected.

Personal data are excluded from open publication and are processed and stored only within secure, access-controlled environments, in compliance with applicable data protection regulations.

Data utility

The data generated within WATERGRID may be of interest and utility to a broad range of stakeholders beyond the project consortium. In particular, the data could

support research, policy-making, planning, investment, and implementation activities related to climate-resilient water management, Smart Water Grids (SWG), and the application of Nature-Based Solutions (NBS).

Potential external users include:

- **Research organisations and academic institutions:** They may re-use hydrological, GIS, modelling, and monitoring data for further scientific analyses, model development, or comparative studies;
- **Public authorities and policy-makers at local, regional, national, and European level:** They may use aggregated or derived data to support integrated catchment management, water planning, and climate adaptation strategies;
- **Water utilities and infrastructure operators:** They may benefit from insights into the performance, cost-efficiency, and operational aspects of SWG and NBS;
- **Investors and financial actors interested in SWG solutions:** They may use aggregated data and performance indicators to assess feasibility, risk, and potential impacts;
- **Planners, designers, constructors, and maintainers of SWG, including engineering firms and technical service providers:** They may re-use data, models, and lessons learned to support the design, implementation, and long-term operation of similar systems;
- **Local communities:** They may benefit from accessible information on water availability, ecosystem services, and the impacts of NBS in their catchments;
- **Practitioners, consultants, and advisory bodies:** They may use monitoring data to inform their evaluation and replication activities of NBS- and SWG-based water management approaches;
- **Other EU-funded projects:** They may re-use data, methodologies, or outputs for benchmarking, replication, or validation purposes.

4 FAIR data

In Horizon Europe projects, research data must be managed according to the FAIR principles to ensure their long-term value and maximum impact. FAIR data are **Findable**, **Accessible**, **Interoperable**, and **Reusable** through the use of persistent identifiers, rich and standardized metadata, openly documented workflows, and interoperable formats. By applying these principles, the project guarantees that research outputs can be discovered, accessed, validated, and re-used by the wider scientific community as well as other stakeholders. This approach supports open science objectives, enhances transparency, and strengthens the sustainability and societal relevance of project results.

4.1 Findability

Persistent identifiers

The data will be made uniquely referenceable by a persistent identifier. Typically, DOIs (Digital Object Identifiers) will be used for this purpose, which is provided by a recognised repository or a DOI issuing agency (e.g. DataCite). All published data sets will be assigned their own PID, which remains stable even when versions change and can refer to a specific version or the “latest version”.

Rich metadata

Comprehensive metadata will be provided to ensure that the data can be found and re-used. This covers descriptive, technical and administrative information.

Within WATERGRID, comprehensive metadata will be created to ensure that research data are findable, understandable and reusable by third parties. For each dataset, general descriptive metadata such as title, authors or creators, responsible institutions, abstracts, keywords and persistent identifiers (DOIs) will be provided.

To support correct interpretation and re-use, datasets will be accompanied by detailed structural and content-related metadata describing data types, variables, units of measurement, temporal and spatial resolution, applied measurement methodologies and relevant software versions. Technical metadata, including information on file formats, file sizes, checksums and versioning, will be used to ensure data integrity and traceability over time.

Administrative metadata will define legal and organisational aspects of data re-use, such as licensing conditions (e.g. CC BY 4.0), rights holders and access conditions. In addition, contextual information will be provided to describe the scientific and technical background of the data, including methodological descriptions, workflows, laboratory or measurement equipment used, quality control procedures and, where applicable, data quality indicators.

Whenever discipline-specific and standardised metadata schemas are available, these will be applied to ensure interoperability and alignment with community practices. Generic standards such as Dublin Core and the DataCite Metadata Schema will be used across WATERGRID, complemented by domain-specific standards where relevant (e.g. ISO 19115 and INSPIRE for geosciences and environmental data, MIxS and ISA-Tab for life sciences, and DDI for social sciences). In cases where no established standards exist, WATERGRID will define a project-specific metadata set based on recognised minimum metadata requirements and designed to remain compatible with internationally accepted generic standards such as those maintained by DataCite.

Search keywords

Appropriate keywords will be included in the metadata records of all WATERGRID datasets to enhance their discoverability. Keywords will be selected in accordance with recognised controlled vocabularies, where applicable, such as AGROVOC, GEMET or MeSH, as well as relevant discipline-specific taxonomies.

In addition, project-specific and domain-relevant terminology with high search relevance will be applied to accurately reflect the thematic scope of the data. This combined approach supports both automated indexing by repositories and search engines and effective discovery by human users, thereby improving the overall findability of the project's research outputs.

Harvesting and indexing of metadata

Metadata generated within WATERGRID will be deposited in repositories that provide standardised interfaces for machine-based harvesting and indexing. These repositories typically support widely used protocols and formats such as the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and schema-compatible export formats including XML and JSON-LD.

Persistent identifiers (DOIs) will be registered via DataCite, ensuring stable referencing and automated visibility of metadata in global discovery services. As a result, metadata will be machine-readable and searchable through aggregators,

search engines and domain-specific portals, including services such as Google Dataset Search, thereby significantly enhancing the findability and accessibility of the project's research outputs.

4.2 Accessibility

Throughout the project, particular attention is paid to ensuring that research data can be reliably retrieved, accessed and, where appropriate, published in accordance with the FAIR data principles and Horizon Europe open science requirements. The project follows a structured approach that distinguishes clearly between internal data management, public dissemination and long-term preservation.

Deposition in trusted repositories

The project foresees the deposition of research data in trusted repositories, in particular the EU Open Research Repository Zenodo. Zenodo is used as the primary platform for the long-term preservation and dissemination of publicly shareable datasets and project deliverables, ensuring persistent access beyond the end of the project.

To support a structured and efficient publication workflow, research data are managed using a central project-internal Data Space operated by ACONIUM. This infrastructure supports data integration, quality control, versioning and the preparation of datasets and metadata for publication. The project-internal Data Space serves as an intermediate layer and is not intended to function as a long-term public archive.

During the early phases of the project, a structured and standardised data model will be developed and applied to capture datasets and their associated metadata in a consistent and repository-ready manner. The data model is designed with a focus on compatibility with trusted repositories such as Zenodo and supports the efficient transfer of datasets and metadata to external repositories.

Dataset and file-level distinction

Within WATERGRID, a clear distinction is made between a dataset as a logical research object and the individual digital files that constitute the dataset. A dataset represents a coherent collection of research outputs that is described, curated and cited as a single entity and is typically assigned a persistent identifier, such as a

Digital Object Identifier (DOI), upon publication. A dataset may consist of one or multiple files.

Individual digital files associated with a dataset will be managed at file level to allow the handling of technical metadata, including file formats, file sizes, checksums and versioning information. This approach supports data integrity, traceability and quality assurance while maintaining a single citable dataset-level record for publication.

Additional repository-specific information, such as publication status, access conditions or embargo periods and assigned DOIs, will be recorded separately to track the deposition of datasets in Zenodo or other trusted repositories.

Access conditions and data categories

Datasets that do not include sensitive, confidential or legally restricted information will be made openly available through OpenAIRE-compliant repositories under standard open licences. These datasets will be accompanied by rich metadata and documentation to support discovery, access and re-use.

Datasets subject to legal, ethical or contractual restrictions, including personal data, industry-owned content or data subject to licensing constraints, will not be made openly available. Such datasets will be stored exclusively within controlled environments as part of the project's data management infrastructure. Even in these cases, metadata describing the datasets will remain openly accessible to ensure transparency and discoverability.

Where appropriate, derived, aggregated, anonymised or synthetic datasets may be shared publicly to support partial re-use while protecting legitimate interests and complying with applicable regulations.

Persistent identifiers and metadata availability

During internal data management, each dataset will be assigned a unique internal identifier to ensure unambiguous identification. Upon publication in a trusted repository, a persistent identifier in the form of a DOI will be assigned by the repository and used for external referencing. Metadata associated with all datasets, whether openly accessible or restricted, will remain openly available. This ensures that information on the origin, content, provenance and access conditions of the datasets remains findable, even if the underlying data cannot be accessed.

dataset – logical and citable representation of a research dataset, including descriptive and administrative metadata

dataset_file – individual digital files belonging to a dataset, described at file level for integrity and preservation purposes

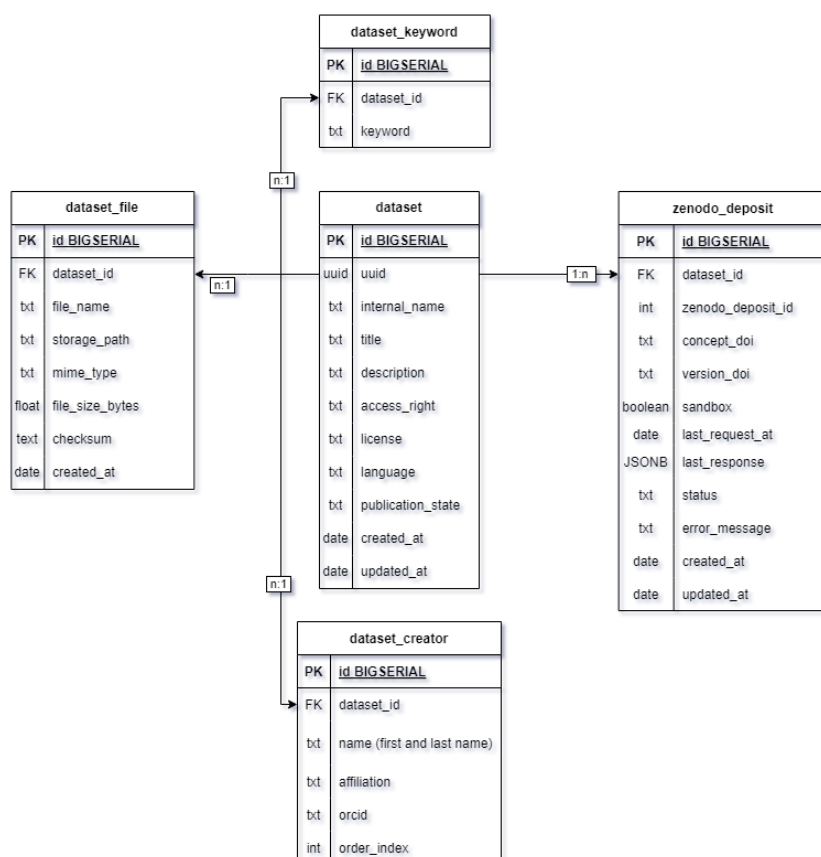
dataset_creator – authors and contributors associated with the dataset

dataset_keyword – keywords assigned to the dataset to support discovery

zenodo_deposit (optional) – repository deposition record used to document and track the publication of a dataset in Zenodo, including deposit identifiers, DOI assignment, deposition status and access or embargo information, and the link between the internal dataset record and the repository entry.

An illustrative example of a possible internal data model is shown in Figure 1. The figure is provided for explanatory purposes only and does not represent a final or fixed implementation.

Figure 1: WATERGRID internal data model (draft)



The schema in the Data Space created is designed to make it as easy as possible to publish data on the EU Open Research Repository Zenodo. However, other EU Open Research Repositories could also be supported.

Repository identifiers

During the internal data management phase, each dataset will be assigned a universally unique identifier (UUID) to ensure unambiguous identification. Upon publication in a trusted repository such as Zenodo, the dataset will be assigned a Digital Object Identifier (DOI) by the repository. The DOI resolves to the corresponding digital object and replaces the internal UUID for external referencing, with metadata updated accordingly.

Openly available datasets

The project follows the Horizon Europe open science requirements and aims to make research data as openly available as possible, while ensuring compliance with legal, contractual, ethical and technical constraints. The guiding principle applied throughout the project is “as open as possible, as closed as necessary”. All decisions regarding data access and openness are documented and governed by the project’s data governance procedures.

All datasets that do not include sensitive, confidential, or legally restricted information will be made openly available in an OpenAIRE-compliant repository (e.g. Zenodo or an institutional equivalent). These datasets will be published under an open licence (such as CC BY 4.0), accompanied by rich metadata, persistent identifiers (DOIs), versioning information, and detailed documentation to enable findability, interoperability, and re-use.

Datasets accessible only in a controlled environment (Data Space)

Certain datasets will be accessible exclusively within a secure and controlled Data Space operated as part of the project’s data management infrastructure managed by ACONIUM. For clarity, the term “Data Space” is used consistently throughout this DMP to refer to the controlled internal data management environment of the project. This controlled environment builds on the same underlying database and data management framework described above, but applies stricter access control mechanisms where required.

Such restrictions apply to datasets that are subject to legal, ethical or contractual constraints, including data containing sensitive attributes, industry-owned content

or information subject to obligations under the GDPR. The Data Space ensures appropriate access control, authentication and authorisation mechanisms, as well as compliant data-processing workflows. Even where access to the underlying data is restricted, metadata describing these datasets will remain openly accessible in order to support the FAIR principles and enable discovery.

Datasets restricted due to licence or contractual limitations

Some datasets provided by external partners or data suppliers may only be used **for the duration of the project** or under specific licensing conditions. These datasets cannot be shared openly due to contractual agreements, intellectual-property protection, or use restrictions imposed by the data owners. In such cases, only derived, aggregated, or anonymised outputs may be shared publicly, and the licensing restrictions will be explicitly stated in the metadata and data governance documentation.

Datasets that cannot be published

A subset of project data will not be openly released due to one or more of the following reasons:

Legal restrictions

- Personal data or indirectly identifiable information, covered by the GDPR
- Confidential or ethically sensitive content
- Export-control regulations or comparable legal constraints

Contractual restrictions

- Data subject to non-disclosure agreements
- Industry-provided datasets with limited re-use rights
- Proprietary datasets for which no permission for redistribution has been granted

Intentional scientific or IP-related restrictions

- Data temporarily withheld due to planned scientific publications or patenting activities
- Embargo periods to allow dissemination through peer-reviewed articles

- Protection of the legitimate interests of individual beneficiaries, in accordance with the Horizon Europe Grant Agreement, in particular Article 13
- Data, constituting IP background or confidential information, in accordance with Articles 9 and 10 of the WATERGRID Consortium Agreement. The IP background is indicated in Annex 1 of the Consortium Agreement and new background can be added by the project partners at any time.

In all such cases, comprehensive metadata describing the restricted datasets will be made openly available. Where feasible, synthetic datasets or appropriately aggregated data will be shared to support transparency and enable partial re-use without compromising legal, contractual or ethical obligations.

Mixed access strategy

For several work packages, a mixed approach will be applied:

- Metadata: fully open
- Processed / aggregated data: open or shared under mild restrictions
- Raw data: restricted or available only via the secure Data Space
This ensures compliance with FAIR principles while protecting sensitive or high-volume datasets.

Ensuring reproducibility

Even when full datasets cannot be published, the project will ensure reproducibility by providing:

- detailed methodologies and processing workflows,
- software and code (open when possible),
- access mechanisms for authorised researchers through the Data Space,
- alternative datasets (e.g., synthetic or anonymised versions) where appropriate.

Data accessibility: summary

The project will make all non-restricted data openly available and will clearly justify any access limitations. Reasons for restricted access will be explicitly categorised as **legal**, **contractual**, or **intentional (scientific/IP)**, and all datasets — open or closed — will remain discoverable through openly accessible metadata. This approach ensures full compliance with Horizon Europe requirements and supports sustainable, responsible, and FAIR-aligned data governance.

Free access protocol

Publicly available WATERGRID datasets and metadata will be accessible through free and standardised access protocols. Data deposited in OpenAIRE-compliant repositories such as Zenodo will be accessible via persistent identifiers (DOIs) and standard web-based protocols (e.g. HTTPS), without technical or financial barriers for users.

Metadata will additionally be accessible through machine-readable and interoperable protocols such as OAI-PMH and standardised metadata formats, enabling automated harvesting and indexing by external services. This ensures long-term, standardised and unrestricted access to openly available research outputs in line with Horizon Europe and FAIR requirements.

Access restrictions

WATERGRID will not impose access restrictions on datasets and deliverables that are designated for public release. This unrestricted access is possible because the consortium will only publish datasets that comply with legal and ethical requirements and that pose no undue privacy, confidentiality or intellectual property risks.

Access to datasets that cannot be accessed freely, should that situation arise, will be granted exclusively within the controlled Data Space, in accordance with predefined access roles and authentication procedures defined by the data controller.

User tracking

WATERGRID will not implement user-level tracking for individuals who access and download open project data. For restricted datasets stored within the Data Space, access logs may be maintained for security, auditing and compliance purposes, in line with applicable data protection regulations.

Data access committee

Neither the General Assembly nor the Executive Board of WATERGRID has identified the need for establishing a data access committee. While the project foresees the handling of datasets that are subject to legal, ethical or contractual restrictions, these datasets are not intended to be made available under controlled or conditional access to third parties. Personal data and other sensitive datasets are excluded from sharing from the outset and will not be released upon request, irrespective of the purpose of the request.

As a result, no case-by-case evaluation or approval of access requests is foreseen, and a data access committee is therefore not required. This policy does not preclude access to data by the funding authority, where such access is requested in accordance with the Horizon Europe Grant Agreement and applicable data protection and security regulations.

Open license for metadata

The WATERGRID consortium will ensure that all metadata describing publicly available datasets and other research outputs is openly accessible without restriction, preferably licensed under a public domain dedication such as the one of Creative Commons (CC0).

Availability and findability duration

The data published by WATERGRID will remain accessible via the WATERGRID public Data Space accessible through the project website after the project ends. A decision will be taken at a later point of time on how long the website and the Data Space will remain accessible. It is foreseen this period to be at least two years. In addition, data and deliverables will remain available and findable for at least five years after the end of the project if uploaded to Zenodo.

Metadata associated with each dataset will remain openly available in all repositories even if the underlying data are no longer hosted, ensuring that information on origin, content, and access conditions is preserved for reference purposes.

4.3 Interoperability

WATERGRID will ensure data interoperability by adopting established, community-endorsed data standards, controlled vocabularies and metadata schemas that are widely recognised in the relevant scientific and technical domains. Research data will be stored and published in open, machine-readable and interoperable formats

(e.g. CSV, JSON, XML, NetCDF or other domain-appropriate standards). Metadata will follow generic standards such as the DataCite Metadata Schema and Dublin Core, complemented by discipline-specific standards where available.

Interoperability best practices promoted by initiatives such as OpenAIRE and the Research Data Alliance (RDA), as well as relevant domain communities, will be applied when structuring, documenting and annotating data and metadata. This approach supports data exchange and re-use both within and across disciplines.

Where established controlled vocabularies or ontologies exist (e.g. GEMET, AGROVOC, MeSH, INSPIRE or ISO/OGC standards), these will be re-used to ensure semantic consistency and cross-disciplinary interoperability. In cases where project-specific vocabularies or ontologies are required, they will be clearly documented, versioned and openly published. Where appropriate, mappings to widely used ontologies will be provided to facilitate semantic integration and enable re-use, refinement or extension by third parties.

All datasets will include qualified references to related resources, such as other datasets generated within the project, previously published research outputs, external reference datasets and relevant scientific publications. These references will use persistent identifiers (e.g. DOIs, ORCID identifiers) to ensure stable, machine-actionable links between datasets, workflows, publications and software. This approach maximises interoperability, transparency and long-term reusability of the project's research outputs.

4.4 Reusability

Documentation for data analysis validation

WATERGRID will provide structured and standardised documentation to enable validation of data analysis and facilitate data re-use by third parties. Each dataset will be accompanied by a README file describing the purpose and scope of the data, data collection methods, processing steps, quality control procedures, and any data cleaning or transformation applied.

Where relevant, additional documentation such as codebooks and detailed variable descriptions will be provided. This includes clear definitions of variables, units of measurement, temporal and spatial resolution, and information on missing or derived values. For model outputs and analytical results, the documentation will describe the underlying methodologies, assumptions and parameter settings to support transparency and interpretability.

Scripts, software and workflows used for data processing and analysis will be documented and, where possible, made available alongside the datasets. This approach supports reproducibility, enables validation of results and ensures that WATERGRID datasets can be understood, verified and re-used in line with the FAIR data principles.

Open license for data

The WATERGRID consortium commits to making its data openly available under the Creative Commons licences, promoting free and wide re-use of project outputs. This holds for data and metadata alike.

Documentation of data provenance

The provenance of data generated within the project will be thoroughly documented using appropriate and widely accepted standards. Metadata and accompanying documentation will record the origin of the data, including data creators, collection methods, processing steps, software and tools used, versioning information and quality control procedures.

Where applicable, provenance information will follow recognised metadata standards and community practices to ensure transparency, traceability and reproducibility. This approach enables users to understand how data were generated and processed and supports validation and re-use of the project's research outputs in line with the FAIR data principles.

Data quality assurance processes

Within WATERGRID, data management and quality assurance responsibilities are clearly defined in accordance with the data governance structure described in the project proposal (see data management and governance diagram in Section 6 'Allocation of resources'). The project coordinator is responsible for the overall supervision of data management activities and for ensuring compliance with the DMP and the FAIR data principles.

Data generation, documentation and primary quality control are the responsibility of the respective work package leaders and data providers. They ensure that data are collected, processed, validated and documented in line with agreed standards, methodologies and project guidelines. The coordinating partner supports consistency across work packages and oversees the implementation and regular updating of the DMP throughout the project lifecycle.

To ensure high data and documentation quality, a set of quality assurance measures will be applied across the project. These include the use of standardised templates for datasets and documentation, systematic version control for data and code, and defined internal review procedures. Key project documents and datasets will undergo an at least two-reviewer process prior to internal approval or public release.

5 Other research outputs

In the case of WATERGRID, a series of research outputs will be created, most of which will be made publicly available and will comply with the FAIR principles. These outputs (Table 3) are effectively the official deliverables of the project (both internal and external) as well as other outputs such as the project website and future scientific publications, as set out in Annex 1 of the GA.

Table 3: WATERGRID research outputs

Name	Type	Responsible partner	Description	Dissemination level
WATERGRID project website	Website	ACONIUM	Project website of WATERGRID with information on project progress, events and publications, developed within WP6. URL: https://watergrid.eu/	Public
Dissemination events	Event, personal communication	ALL PARTNERS	Online and offline events for the presentation and dissemination of project results such as webinars, workshops, lectures and panel discussions.	Public
Scientific publications	Document	ALL PARTNERS	Scientific articles, presenting the project results and published in peer-reviewed journals.	Public
IR1.2 Beta – Evidence portfolio (PR1)	Document	WRT	Beta version of the Evidence portfolio on the resource efficiency, cost effectiveness, social and environmental contribution of NBS and of the SWG approach for drought and water management.	TBD
IR1.3 Diagnostic tool (PR5.1)	Document (complemented by maps and datasets)	WU	Tool for the identification of the 'lock-in' profiles of the WATERGRID demonstration and validation sites.	TBD
IR1.4 Lock-in profiles of the 8 sites	Document (complemented by maps and datasets)	WU	Assessment of infrastructural, institutional, behavioural, and economic barriers for the implementation of NBS/SWG at the WATERGRID demonstration and validation sites.	TBD

IR2.1 Plan for additional NBS for demonstration sites	Document	BOKU	Plan for additional NBS implementation and overview of the SWG for each demonstration site	TBD
IR2.2 Beta version – Monitoring programme (PR4)	Document	LIST	Beta version of the monitoring programme for the design, implementation and maintenance of SWGs, enabling the assessment of water, socio-economic and environmental SWG impacts.	TBD
IR3.1 SWGs Economic feasibility report	Document	TUM	Evaluation of the economic feasibility and cost efficiency of the 5 SWGs at the demonstration sites.	TBD
IR3.2 Impact and resource efficiency report	Document (complemented by datasets)	LIST	Assessment of the impact and resource efficiency of combined NBS and SWG at demonstration sites.	TBD
IR4.1 Beta - Business cases (PR5.2)	Document	VU	Beta version of the collection of business cases for the SWG and drought management, including templates for contracts that government authorities can make with landowners whose land will be impacted by the implementation of NBS.	TBD
IR4.2 Beta - Governance scripts (PR5.3)	Document	VU	Beta version of the set of administrative capacities and coordination patterns, including desirable attributes for the actors involved as well as the strategies for coordination between these to smoothen the uptake of NBS and SWG approaches.	TBD
IR4.3 Beta - method for sustainability assessment (PR5.4)	Document	TUM	Beta version of the method for sustainability assessment of SWGs, including models for the relationship between natural capital and economic development.	TBD

IR4.4 Final - Business cases (PR5.2)	Document	VU	Collection of business cases for the SWG and drought management, including templates for contracts that government authorities can make with landowners whose land will be impacted by the implementation of NBS.	TBD
IR5.1 Report for PRs optimisation	Document	WRT	Rules and recommendations for the improvement of project results, based on feedback from the experiments at the demonstration and validation sites	TBD
IR6.1 Beta - Exploitation strategy, including the library of KERs	Document	ICONS	Beta version of the strategy for commercial and non-commercial exploitation of project results, including a replication roadmap.	TBD
IR7.1 Beta - Engagement toolbox (PR5.5)	Document	FIBL	Beta version of the stakeholder engagement framework tailored to the specific environmental, social, and governance contexts of each demonstration and validation site.	TBD
IR7.2 Final - Engagement toolbox (PR5.5)	Document	FIBL	Stakeholder engagement framework tailored to the specific environmental, social, and governance contexts of each demonstration and validation site.	TBD
IR7.3 Progress report n°1	Document	WRT	Report on project progress and related project management activities, covering the first project year.	Sensitive
IR7.4 Progress report n°2	Document	WRT	Report on project progress and related project management activities, covering the third project year.	Sensitive
D1.1 Specificities and requirements for	Document	SUA	Summary of collected data and information on demonstration and validation sites.	Public

implementation and monitoring NBS				
D2.1 Platform's user manual and guides, open-source license and technical documentation (incl. for the Design App and Digital Twin) (PR3)	Document	VIRIDIAN	User manual and guides, open-source license, installation documentation and technical documentation for future developers for a platform for the creation and verification of NBS/SWGs, and water flow management support.	Public
D2.2 Protocols & standards for the design, operation, maintenance of SWG (PR2)	Document	BOKU	Step-by-step guide for all actors of the value chain to design, operate and maintain SWGs, also detailing how stakeholders from public and private entities (e.g., farmers/landowners) should engage in the decision-making about SWGs.	Public
D2.3 Quantified benefits of the NBS for all demonstrators	Document (complemented by datasets)	VIRIDIAN	Qualification and quantification of non-water co-benefits relevant to each demonstration site, such as ecosystem services, health, air quality or aesthetics.	Public

D2.4 Monitoring programme, standards and protocols for future application (PR4)	Document	LIST	Monitoring programme for the design, implementation and maintenance of SWGs, enabling the assessment of water, socio-economic and environmental SWG impacts.	Public
D3.1 SWG deployment report on the 5 demonstration sites	Document (complemented by maps and datasets)	WRT	Report the on starting conditions, plan, activity, achievements and challenges of each demonstration site.	Public
D4.1 Operationalisation toolkit (PR2)	Document	WU	Operationalisation toolkit with business cases governance scripts and sustainability assessment methods for SWG and drought management.	Public
D4.2 First policy brief (PR6)	Document	WE	Policy brief with evidence-based recommendations for the promotion of NBS in EU water management.	Public
D4.3 Second and third policy briefs (PR6)	Document	WE	Policy brief with evidence-based recommendations for the promotion of NBS in EU water management.	Public
D5.1 Final version of the Evidence portfolio (PR1)	Document (complemented by datasets)	WRT	Evidence portfolio on the resource efficiency, cost effectiveness, social and environmental contribution of NBS and of the SWG approach for drought and water management.	Public

D5.2 Long-term financing plans for SWGs	Document	EWA	Long-term financial plans and consolidated recommendations for replication of SWGs.	Public
D5.3 Report on identified replication potential	Document	LEITAT	Report on identified replication potential in other regions and communities within Europe and beyond.	Public
D6.1 Communication and dissemination strategy	Document	ACONIUM	Communication and dissemination strategy, tailored to specific target groups and detailing appropriate dissemination methods to each project result.	Public
D6.2 Communication and dissemination strategy update	Document	ACONIUM	Communication and dissemination strategy, tailored to specific target groups and detailing appropriate dissemination methods to each project result.	Public
D6.3 Final exploitation strategy	Document	ICONS	Strategy for commercial and non-commercial exploitation of project results, including a replication roadmap.	Public
D6.4 Report on networking activities	Document	WE	Report on networking activities with other projects and initiatives.	Public
D7.1 Management toolbox, including a	Document	EQY	Toolbox for technical and scientific management.	Sensitive

Quality Plan & Ethics requirement				
D7.2 First version of the Data Management Plan (DMP)	Document	ACONIUM	Plan for the management of re-used and collected data, ensuring compliance with FAIR principles and GDPR.	Public
D7.3 Second version of the Data Management Plan (DMP)	Document	ACONIUM	Plan for the management of re-used and collected data, ensuring compliance with FAIR principles and GDPR.	Public
D7.4 Final version of the Data Management Plan (DMP)	Document	ACONIUM	Plan for the management of re-used and collected data, ensuring compliance with FAIR principles and GDPR.	Public
PR3.1 Design app	Software	VIRIDIAN	Mobile/desktop application for the facilitation of NBS/SWGs creation and verification.	Public
PR3.2 Digital twin	Software	BEIA	An application for NBS and SWG management, which processes and analyses real-time monitoring data.	Public

It should be noted that Table 3 reflects the status-quo at the submission of the first version of the DMP. As soon as additional research outputs are planned or there is more clarity on the already planned outputs, for instance, regarding their dissemination level (the ones with status TBD) or the details on peer-reviewed scientific articles, this will be included in the next version of the DMP (D7.3).

5.1 FAIR research outputs

It should be noted that many of the research outputs of WATERGRID are still under development at this early stage of the project. Hence, the current version of the Data Management Plan (DMP) aims to provide a preliminary overview. Many of the decisions on the most appropriate management strategies for these outputs will be made at a later stage.

In general, the rules and procedures for making research outputs Findable, Accessible, Interoperable and Reusable will be the same as for data, which were described above in Section 4. In the following only the deviating rules and procedures as well as those applicable only to research outputs (documents and software) are described, which the WATERGRID consortium has already agreed upon.

Persistent identifiers

In general, research outputs other than data generated within WATERGRID will not systematically be assigned persistent identifiers. Persistent identifiers will be used only where they are inherent to the dissemination channel.

In particular, scientific publications, if produced within the project and published in peer-reviewed journals, will be assigned Digital Object Identifiers (DOIs) as part of the standard publishing process. Other research outputs, such as reports, guidelines, tools, or protocols, will primarily be disseminated through project channels or reporting mechanisms and will not necessarily receive persistent identifiers, unless published through platforms or repositories that automatically assign them.

Rich metadata

Where research outputs are shared beyond the project consortium, appropriate and proportionate metadata will be provided to support identification, understanding, and discovery. For research outputs other than data, the project

will mainly generate documents (e.g. reports, guidelines, protocols, policy briefs) and software, as outlined above.

For project documents, metadata will be provided through a standardised project document template, which includes the following elements:

- Document title;
- Document subtitle;
- Date of creation/version date;
- Dissemination level;
- Full project name ('NATURE-BASED SMART WATER GRIDS FOR INTEGRATED WATER AND DROUGHT MANAGEMENT');
- Grant agreement number (NO. 101180636);
- Funding call (HORIZON-CL6-2024-BIODIV-02);
- EU funding disclaimer;
- Project duration (From September 2025 to August 2029);
- Project website (www.watergrid.eu);
- Document number;
- Work package;
- Task;
- Version;
- Version date;
- Contributors;
- Reviewers;
- Type of deliverable;
- Review status;

- Action requested;
- Document history;
- List of abbreviations;
- List of WATERGRID project partners;
- Disclaimer of warranties.

These elements provide essential descriptive and administrative metadata, enabling users to identify the origin, context, and responsibility for each document. While no formal disciplinary metadata standard applies to such documents, the consistent use of this template ensures structured and harmonised metadata across all document-based outputs.

For software outputs, metadata will be provided in line with commonly accepted software documentation practices, such as descriptive information on functionality, versioning, authorship, and usage conditions, as supported by the chosen development and dissemination platforms. At a later stage of the project a decision will be made on which metadata standard to use for the software research outputs.

Unrestricted availability

While the project supports the principles of open science and aims to make research outputs openly available wherever possible, not all research outputs will be published in open access.

In particular, the following documents will not be made openly available:

- IR7.3 Progress report n°1
- IR7.4 Progress report n°2
- D7.1 Management toolbox, including a Quality Plan and Ethics requirements

These documents are internal management and reporting documents, containing information related to financial data, project coordination, risk management, ethical safeguards, and data protection measures. Making these documents publicly available could expose internal workflows, security-related information, and organisational arrangements that are not intended for public dissemination.

Interoperability

To ensure a high level of interoperability all non-confidential WATERGRID documents, reports and presentations (see Table 2 with research outputs above) will be published in the same format (.pdf). For other types of outputs only widely accepted formats will be chosen.

Quality assurance processes

Quality assurance of research outputs within WATERGRID will be ensured through internal review and testing procedures proportionate to the nature of each output. Each research output, including documents and software, will be subject to review or testing by at least two reviewers or testers, who were not directly involved in its development.

For document-based outputs, this process includes consistency checks, completeness, and compliance with project templates and requirements. For software outputs, quality assurance will include functional testing, verification of intended use, and appropriate documentation.

Further quality assurance provisions are defined in the project's Management toolbox, which features a Quality Plan.

6 Allocation of resources

Making data and research outputs FAIR: cost estimation and coverage

WATERGRID has allocated appropriate resources to ensure that research data and other research outputs are managed in line with the FAIR principles and Horizon Europe open science requirements. Costs related to FAIR data management primarily comprise technical infrastructure and personnel resources and are integrated into the overall project budget.

Technical resources mainly relate to the development, operation and maintenance of the project-internal data management infrastructure, including hosting, data storage, backup solutions and basic security measures. This infrastructure supports internal data handling, quality control and preparation of datasets for publication, as described in Section 3.2. All technical costs are covered by the project budget.

Personnel resources are allocated to data management activities such as data curation, documentation, metadata creation, quality assurance and the preparation of datasets and associated documentation for publication in open-access repositories. These activities are carried out by existing project staff within the respective work packages and are covered within the approved project resources.

No additional costs are expected for long-term archiving and publication, as research data and other outputs intended for public release will be deposited in trusted repositories such as Zenodo, which do not charge fees for data deposition. All FAIR-related costs are therefore covered within the project's approved budget.

Costs related to making research data and other research outputs FAIR within WATERGRID are covered through the project budget, in line with the provisions of the Grant Agreement and the applicable eligibility rules.

These costs include resources for data management activities, documentation and metadata creation, quality assurance, repository deposition and long-term preservation, as well as efforts related to the preparation and dissemination of research outputs. Data management tasks are integrated into the respective work packages and tasks and are reflected in the allocation of personnel time and operational resources.

No separate or additional funding beyond the Horizon Europe grant is foreseen for FAIR-related activities.

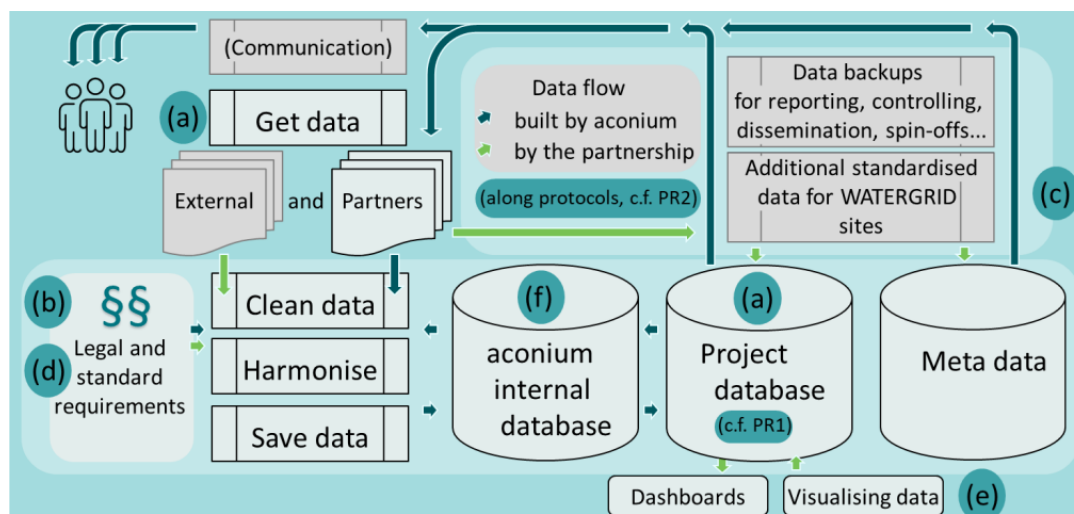
Responsibilities in data management

Data management within WATERGRID is coordinated by ACONIUM, in line with the data management and governance structure defined in the project proposal. ACONIUM is responsible for the operation of the central project data infrastructure, the harmonisation of data management procedures and the coordination of FAIR data practices across the consortium, including the implementation and regular updating of the Data Management Plan.

The generation, documentation and primary quality control of data remain the responsibility of the respective work package leaders and data providers. ACONIUM supports and coordinates these activities to ensure consistency, compliance with FAIR principles and long-term accessibility of the project's research data and outputs.

Figure 2 provides an overview of the WATERGRID data management processes and responsibilities.

Figure 2: WATERGRID data management processes and responsibilities



Long-term preservation of data and research outputs

Long-term preservation of research data and other project outputs is ensured through the use of trusted, sustainable open-access repositories and clearly defined data governance procedures, as described earlier in this Data Management Plan. Public research data and related research outputs intended for long-term preservation are deposited in established EU-compliant repositories such as Zenodo or other EU Open Research Repositories. These repositories provide long-term archiving, persistent identifiers (DOIs), metadata preservation and stable access beyond the end of the project.

The project website will serve as a dissemination and access point by providing descriptive information and persistent links to research outputs hosted in external repositories. It does not function as a long-term data archive. Internal data management during the project will be supported by a central project-internal Data Space operated by ACONIUM, which facilitates data integration, quality control and preparation for publication, but will not replace external repositories for long-term preservation.

Decisions on which data are to be preserved long-term, published openly or retained under restricted access are governed by the project's data governance structure and will be made in accordance with legal, contractual, ethical and scientific considerations. Metadata describing all datasets remain openly

accessible, even if the underlying data cannot be retained indefinitely. Costs related to long-term preservation are largely covered by repository services and existing project resources, as outlined above. Data security provisions, including secure storage, access control, data recovery and the handling of sensitive data, are described in detail in Section 7 (Data security).

7 Data security

WATERGRID will apply appropriate technical and organisational measures to ensure the security of research data throughout the entire data lifecycle. These measures will be proportionate to the sensitivity, confidentiality and legal status of the data processed within the project and will comply with applicable EU and national regulations, including the General Data Protection Regulation (GDPR).

Data processed within the project will be handled in secure digital environments implementing role-based access control, authentication mechanisms and encrypted data transfer protocols. Access rights will be granted strictly on a need-to-know basis and will be regularly reviewed.

The project-internal Data Space operated by ACONIUM will serve as the secure environment for data preparation, integration, quality control and curation. This infrastructure will implement technical safeguards including controlled access management, user authentication, version control and regular backup procedures. Sensitive or restricted data will be stored exclusively within controlled environments and will not be exposed to public access.

Internal collaborative workspaces used by the consortium will apply secure authentication procedures and permission-based access management. Data exchanges between partners will take place via encrypted communication channels.

Regular backup mechanisms will be implemented to prevent data loss. Recovery procedures will ensure the restoration of data in the event of technical failure or accidental loss.

Security measures will be periodically reviewed and adjusted where necessary to ensure continued protection of project data against unauthorised access, alteration, loss or disclosure.

8 Ethics

Ethical and legal issues with impact on data sharing

Ethics and legal considerations related to data mainly cover the collection and processing of personal data and can therefore have an impact on data sharing. In particular, this concerns professional contact details as well as images (photos and videos) of consortium members and external stakeholders. Such data will be processed in accordance with the General Data Protection Regulation (EU) 2016/679 (GDPR) and relevant national legislation. Other ethics and legal considerations and measures are explained in the Management toolbox, part of D7.1.

As mentioned in previous sections, WATERGRID will not implement user-level tracking for individuals who download/use project data or other research outputs, thereby avoiding privacy and ethical concerns related to data sharing.

The WATERGRID consortium is committed to adhering to the highest ethical and legal standards, when it comes to privacy and fundamental rights. In order to facilitate compliance, the present DMP provides a non-exhaustive list of international and European legal documents, which apply in all countries relevant for the project, for project partners to carefully consult:

- Universal Declaration of Human Rights
- International Covenant on Civil and Political Rights
- UNESCO Universal Declaration on Bioethics and Human Rights
- EU Charter on Fundamental Rights
- European Convention for the Protection of Human Rights and Fundamental Freedoms
- The General Data Protection Regulation (GDPR) of the EU
- The Data Protection Directive (1995/46/EC) and the Directive on Privacy and Electronic Communications (2002/58/EC)

Ethical safeguards, data protection measures, and related responsibilities are further defined in the project's Management toolbox, which includes ethics requirements.

Informed consent

WATERGRID will involve human participants through interviews, surveys, focus groups, site visits and stakeholder engagement activities. Prior to any data collection, informed consent will be systematically obtained from all participants.

The consent procedure will ensure that participants are clearly informed about the purpose of the data collection, the categories of data concerned, the intended use of the information, the expected duration of storage and their rights as data subjects under the GDPR. Participation will be entirely voluntary and may be withdrawn at any time without negative consequences.

Where feasible, personal data will be anonymised or pseudonymised at the earliest possible stage of processing. Data handling will follow the principle of data minimisation and storage limitation, meaning that only data strictly necessary for the defined research purposes will be collected and retained, and personal data will be securely deleted once they are no longer required.

Where required under the Horizon Europe Grant Agreement, personal data may need to be transferred to the funding authority. In such cases, data subjects will be informed accordingly and provided with the applicable privacy statement of the European Commission. The privacy statement can be accessed via the following link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/ftp/privacy-statement_en.pdf



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