RECONECT

Data Management Plan
Second Version

D7.9

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Abstract (for dissemination, 100 words)	The RECONECT Data Management Plan (DMP) provides a summary of the data collected/generated and reused in the RECONECT project. The DMP also addresses the relevant aspects of making data FAIR – findable, accessible, interoperable and re-usable, including whether and how data will be made accessible for verification and re-use, and how it will be curated and preserved.
Keywords	DMP, FAIR data

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Executive Summary

This deliverable addresses the data summary and relevant aspects of making data FAIR – findable, accessible, interoperable and re-usable, including what data the RECONECT project will collect/generate, whether and how it will be made accessible for verification and re-use, and how it will be curated and preserved.

The RECONECT project will collect raw data that will be further processed and generate model output. These data constitute the main research datasets that will be made (publicly) available. This deliverable informs the available data to date, to whom the data is accessible and where to find the data. This helps the re-usability of data for other NBS-related research and implementation.

The RECONECT project partners are the direct audience and beneficiaries of the Data Management Plan (DMP). However, depending on the accessibility of data collected, this DMP is useful for other researchers and practitioners beyond RECONECT as it indicates the type of data needed to be collected/generated to monitor, evaluate and upscale NBS.

The RECONECT Services Platform, mainly the TeleControlNet, provides services through which data from all data-suppliers and partners will be accessible for all authenticated and authorized users based on their access levels. Data collected/generated within the project are discoverable in the TeleControlNet and are uniquely identified.

This is a live document to be periodically elaborated and updated as the implementation of the project progresses and, in those situations, when significant changes occur.

Contents

List of tables

Data Management Plan (Report Second Version) - D7.9
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1 Introduction

1.1 Scope

This document describes the RECONECT Data Management Plan (DMP) that corresponds to Deliverable D7.5. The DMP:

- Provides a description of how the research data collected, processed, and generated will be handled during and after the RECONECT project.
- Describes which standards and methodology for data collection and generation will be followed, how data will be shared and be curated and preserved.

The document follows the template provided by the European Commission on DMP[1]. The DMP is delivered for the RECONECT project as it participates in the Pilot on Open Research Data in Horizon 2020.

The DMP is intended to be a living document and, as such, it will be periodically elaborated and updated as the implementation of the project progresses and in those situations when significant changes occur. In addition, Intellectual Property Rights (IPR) will be carefully considered in the DMP and addressed throughout the project duration.

1.2 Project context

RECONECT aims to rapidly enhance the European reference framework on Nature Based Solutions (NBS) for hydro-meteorological risk reduction by demonstrating, referencing, upscaling and exploiting large-scale NBS in rural and natural areas. In an era of Europe's natural capital being under increased cumulative pressure from intensive agriculture, fisheries and forestry, and urban sprawl, RECONECT will stimulate a new culture of co-creation of 'land use planning' that links the reduction of hydro-meteorological risk with local and regional development objectives in a sustainable and financially viable way.

RECONECT adopts the holistic ecosystem-based concept which is based on the premise that our ability to adapt to extreme hydro-meteorological events in a sustainable way depends on the co-evolutionary nonlinear interaction between the ever changing social, economic and cultural requirements and technical developments (which combine engineering "grey infrastructure" measures and NBS) on one side and natural processes on the other.

RECONECT will demonstrate and evaluate the multi-benefits of NBS within the RECONECT network of cases (Demonstrators and Collaborators) that cover a wide and diverse range of local conditions, geographic characteristics, institutional/governance structures and social/cultural settings to successfully upscale NBS throughout Europe and Internationally. Therefore, a sound data management strategy in the context of the RECONECT project is of high importance.

1.3 DMP and FAIR data

According to the EC guidelines[1], Research data should be FAIR, i.e., findable, accessible, interoperable and re-usable. As part of making Research data fair, a DMP documents the context in which Research data is generated, the methodologies and standards to be applied,

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[1]Guidelines on Data Management in Horizon 2020,
http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

which data will be shared/made open access, and how data will be managed, maintained and preserved, during and after project completion.

1.4 Data affected by the DMP

The main purpose of a DMP is to describe Research Data with the metadata attached to make them discoverable, accessible, assessable, usable beyond the original purpose and exchangeable between researchers. According to EC guidelines, Research data refers to information such as facts or numbers, collected to be examined and considered as a basis of reasoning, discussion, or calculation. In a research context, examples of these data include statistics, results of experiments, measurements, observations resulting from fieldwork, survey results, interview recordings and images. Research data, in the context of this DMP, do not include publications, articles, lectures, or presentations. The DMP leaves explicitly open the handling, use and curation of products like tools, software and written documents. Thus, the DMP focuses on digital data products like produced model data or observation data.

The RECONECT project will collect raw data that will be further processed and summarized in project deliverables and scientific publications. These raw data, underpinning the published work, constitute the main Research data sets that will be made publicly available. It is envisioned that scripts used for post-processing the raw data will also be shared. In cases where release of complete raw data sets is impossible due to, for example, privacy or personal data concerns, data will be anonymized to enable publishing.

1.5 Responsibilities

The responsible partner for the implementation of the DMP is IHE (WP7) though all WP Leaders and co-Leaders shall be involved in the compliance of the DMP. In addition, each network case lead partner is responsible for the DMP content in relation to interventions made in their study area, with the support of the case collaborating partners. The information will be gained continuously from partners in each network case and will be reported to WP leaders and co-leaders. IHE will be responsible to communicate with the WP Leaders and co-Leaders and collect the required information and update the DMP. Table 1 indicates the foreseen updates of the DMP.

Table 1. Data management plan versions

DMP version	Date	Deliverable number
First version	28 Feb 2019	D7.5
Second version	31 Aug 2021	D7.9
Third version	28 Feb 2023	D7.10
Fourth version	31 Jul 2024	D7.11

1.6 GDPR – General Data Protection Rights in the RECONECT project

The GDPR is a regulation by which the European Parliament, the Council and the European Commission intend to strengthen and unify data protection for individuals within the European Union (EU). It also addresses export of personal data outside the EU. The primary objectives of the GDPR are to give citizens back the control of their personal data and to harmonize the regulation within the EU[2].

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[2]Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data - https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31995L0046

Personal data is defined in the GDPR as any information relating to an identified or identifiable natural person also called *data subject*. An identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.

If a partner operating in the name of the RECONECT project collects personal data, information must be provided to the individual whose data it concerns so that he/she provides the consent to the processing of personal data relating to him or her. The consent should be obtained in written form after the participants have been provided with clear and understandable information on aspects such as the objectives and duration of the research, handling of personal data in the study results, voluntary participation in the activity, the possibility to withdraw the consent at any point of the process, and a contact person acting as the reference investigator in the project activity. This is further elaborated, together with the consent forms to be filled in by research participants in Deliverable 8.1 on Ethics. Therefore, the handling of personal data within the DMP will receive special attention and special efforts will be devoted to anonymize information and securing accessibility.

1.7 Structure of the document

In the next sections, we make use of the template provided by the European Commission on DMP to discuss data summary and FAIR principles. As specified in the guiding document, the DMP is intended to be a living document. As a minimum, the DMP should be updated in the context of the periodic evaluation/assessment of the project. In the following, research data will be referred to as dataset/s.

2 Data Summary

This section will specify why and how the data is used, specify the types and formats of collected/generated and re-used data, specify the origin of the data, state the expected size of the data and outline the data utility. The RECONECT Consortium will continuously specify the relevant datasets that are and will be re-used, collected/generated during the project lifetime.

2.1 Purpose of the data collection/generation

In general, the main purpose of data collection/generation in RECONECT is to assess the indicators that are selected to monitor and evaluate the impacts of NBS. Impacts are the effects/changes attributed to the NBS that are studied by the use of indicators and reflect performance towards achievement of objectives or sub-goals. Impacts need to be identified at the appropriate spatial and temporal scales, as this will guide the data collection/generation through the design of monitoring and evaluation plan. A number of indicators have been selected to monitor and evaluate the impact of NBS in 10 demonstration sites in relation to the three categories of challenges - WATER, NATURE and PEOPLE. Assessing those indicators requires a wide variety of data.

For example, to achieve a WATER-related sub-goal "Flood risk reduction", NBS intended impacts include the reduction of flood hazard and of economic vulnerability. The selected indicators to monitor these impacts could include "flood hazard" (WATER) and vulnerability indicators such as "economic damage cost" (PEOPLE), respectively. The data required to be collected/generated in that case could be time series data such as rainfall, water level and discharge (WATER), land use/cover and property value (PEOPLE).

2.2 Relation between collected/generated data and the objectives of the project

One of the goals of the RECONECT project is to demonstrate and further upscale large-scale NBS. To support this goal, it is important to develop monitoring and evaluation procedures that can be applied to different types of NBS, their local contexts and settings. There are two kinds of RECONECT monitoring activities within this framework. The first one is monitoring to assess the state of the system such as baseline monitoring before construction of NBS. The second one is monitoring to assess the performance of implemented NBS towards the achievement of the project's goals/sub-goals. In terms of the NBS evaluation work, RECONECT addresses evaluation of implemented NBS (i.e., Demonstrators A and B) and evaluation of potential benefits from NBS for areas that are subject to hydro-meteorological risk (i.e., Collaborators).

In RECONECT, all monitoring and evaluation work is carried out in relation to three categories of challenges i.e., WATER, NATURE and PEOPLE. Where possible, monitoring data is being, or will be, collected and transmitted through real-time SCADA/telemetry services and also through social science surveys. These data will be used to evaluate the NBS impacts in relation to benefits, co-benefits as well as the negative effects.

2.3 Types and formats of data generated/collected

The types of data generated include:
- time series data such as precipitation/rainfall, discharge, water level, flow velocity, groundwater level and tidal variations
- GIS data such as land use/cover data, digital elevation/terrain models, slope, infrastructure data, population data and building/housing data
- Laboratory data such as dissolved oxygen, pH, biological oxygen demand and total dissolved solids

- Statistical data such as population density, age of people who visit an area, willingness to pay

These data are collected/generated using on-site sensors, remote sensors, laboratory tests, surveys and questioners, hydrodynamic models

The different data formats include XLS, XLSX, PDF, XML, WMS, GEOTIFF, vector data, and tabular data.

2.4 Existing data being re-used

A number of existing data are used in RECONECT project. However, this depends of the available existing data in each demonstration site (see D3.1 for detailed summary of existing data availability for the 10 Demonstrators). Existing data in different sites include precipitation, land use, digital elevation models, river discharge, river water level/depth, roughness coefficients, slope angle, river flow velocity, flood peak and duration, sea level, infrastructure, population, geology, cadastre, salinity, electrical conductivity, riparian habitats, mesohabitats, terrestrial habitat, vegetation along water courses, vegetation cover and growth, organic pollutants, micropollutants, water quality, types of protected animal species, numbers of native species and number of tourists

2.5 Origin of the data

Existing data originated mainly from government agencies where the demonstration sites are located. Table 2 summarizes these data origins.

Table 2. Summary of existing data origins at demonstration sites

Demonstrators	Data origins
Demonstrator A1 (Dove/Gose Elbe Estuary, Germany)	- German Weather Service - Hamburg Transparenzportal - Reinbek hydrology station - Environment, Climate, Energy and Agriculture of Hamburg
Demonstrator A2 (Odsen Coastal Area, Denmark)	- Norwegian Coastal Directorate - Hydrodynamic model results
Demonstrator A3 (Tordera River Basin, Spain)	- Catalan Meteorological Service - Landsat - River gaging stations - Hydrodynamic model results - Water Framework Directive - Copernicus
Demonstrator A4 (Portofino Regional Natural Park, Italy)	- Liguria Region - ARPAL - Portofino Natural Park Habitat - Portofino Park Authority
Demonstrator B1 (Ijssel River Basin, the Netherland)	- Royal Netherlands Meteorological Institute - Rijkswaterstaat - NDFF - INDYMO
Demonstrator B2 (Inn River Basin, Austria)	- Hydrological Service - Government Tyrol
Demonstrator B3 (Aarhus, Egå Engsø and Lystrup, Denmark)	- Danish Meteorological Institute
Demonstrator B4 (Thur River Basin, Switzerland)	- Automatic Weather Stations of Cantons - Federal and Canton stations
Demonstrator B5 (The Var Éco-Vallée, France)	- Meteo France

	-	INSEE (statistical institute)
	-	MNCA (Metropole Nice cote dAzur)
	-	AquaVar project
	-	The National Inventory of the Natural Heritage
Demonstrator B6 (Les Boucholeurs, France)	-	Meteo France
	-	INSEE (statistical institute)
	-	EMODnet
	-	The National Inventory of the Natural Heritage

2.6 Data utility

The data collected/generated through the RECONECT project are useful for project partners, other researchers, government and non-government organisations, SMEs and the general public. However, some data types may have different accessibility based on the sensitivity of information they convey.

3 FAIR data

In the following sections we provide the general strategy to adhere to the FAIR principles in the RECONECT project. We reflect on how FAIR principles can be addressed within the RECONECT ICT Platform as well as within Open data repositories.

3.1 Making data findable, including provisions for metadata

The RECONECT Services Platform is an ICT solution that combines a network of distributed data, intelligent tools and standardised web-services accessible through a centralized catalogue of network services. The Catalogue of services will support the exchange of platform data and information between project partners.

Data produced within the project will be discoverable in the RECONECT Services Platform, especially through the TeleControlNet (for more information on the TeleControlNet, see D3.3). This applies to those cases where data will be stored in the platform (for the Demonstrator and Collaborator sites where TeleControlNet will store partners' data) and for those cases where the data resides in the partners' local servers. Existing software that is used should be background information of a given partner and as such could be documented but not discoverable. A complete list of available data to date on the TeleControlNet is provided in Appendix A.

It is not envisioned for datasets to be solely discoverable in the RECONECT Services Platform. Instead, datasets can be uploaded to, for example, a project's repository accessible through the project's website, institutional (partner) repository, and/or to subject repositories selected from Open Access Infrastructure for Research in Europe (OpenAIRE). A Digital Object Identifier (DOI) may be assigned to these datasets for effective and persistent citation when it is uploaded to the repository.

For datasets, we will define naming conventions which will include the identifier of the project, unique chronological number of the dataset, dataset title, version of the dataset, and an identifier linking the WP with the deliverable/task. We will keep an internal log file containing a description of each produced dataset during the course of the project. This dataset description will be included in the metadata file associated to each dataset (refer to Section 3.3).

Currently, time series data for a Demonstrator or Collaborator site can be accessed by searching in the TeleControlNet tool, which shows the location of the site, the type of data and the type of sensor used to collect the data. However, we foresee datasets will have full descriptions containing the following main fields:

- Dataset identifier allocated in the naming convention outline above.
- Title of the dataset
- Version number
- Responsible partner
- WP
- Dataset description
- Dataset dissemination
- Format
- Expected size
- Source
- Repository (expected/actual repository to be submitted)
- Keywords

- Link to the metadata file

3.2 Making data openly accessible

The RECONECT Services Platform consists of three types of distributed services: (1) data access services, (2) generic NBS network services and (3) tools for analysis and feedback. The aim of the chosen topology is flexibility for project partners (NBS Demonstration and Collaborator clusters) and possibly later on for other users outside of the consortium to access and connect to the available services with their own data sources and tools.

Intermediate data (i.e., non-final data produced during the processing chain elaboration) will be stored in the RECONECT Services Platform but we envision to only be accessible to Consortium partners. On the other hand, final datasets, will be freely accessible also by external users. This will specifically apply to research data needed for scientific scrutiny and peer review purposes.

As already mentioned in the previous section, RECONECT will establish a long-term sustainable data platform to manage and upscale best practices through open source and freely accessible initiatives such as pan-European web-based repositories OPPLA. The datasets will follow well-established existing standards such as the INSPIRE Directive and OGS in order to secure long-term data accessibility, usage and operability. After project completion, and in case of no objection by project partners and by ensuring that anonymization is preserved (i.e., a user cannot be identified from their data), the data may be published and be accessible openly in an Open Data portal (for example in http://open-data.europa.eu) for future research.

3.3 Making data interoprable

The technologies implemented in the RECONECT project will facilitate information sharing and analysis across EU Member States through direct implementation of the INSPIRE directive, and the use of standardized procedures for information exchange and integration on WISE and GEOSS platforms.

Many of the open standards promoted by RECONECT, based on OGC formats, are also adopted by the Comité Européen de Normalisation (CEN) and the International standardization organization (ISO), working closely with CEN/TC287, ISO/TC211, but also aligned with wider IT standards, e.g., those from the Worldwide Web Consortium (W3C).

RECONECT's deployments and promotion of "Open Standards" enable users, with interfaces implementing the standard, to access data and services of many types available on a wide variety of servers. The three organizations (OGC, ISO/TC 211, CEN/TC 287) agreed ways in which XML schema for adopted standards can be managed more effectively and efficiently across these organizations.

3.4 Increase data re-use (through clarifying licenses)

This section will be updated on next iterations to provide detailed information on how data will be made useable beyond the original purpose for which it was collected, and more in detail:
- Data licensing to permit the widest reuse possible
- Data availability for re-use
- Why and for what period a data embargo is induced
- Data useable by third parties after the end of the project

3.5 Allocation of resourses

As described in the RECONECT GA Article 26, results (which include datasets) from the project are owned by the partner that generates them. Therefore, partners will be responsible for the dataset management with support of WP leaders and co-leaders, and partners involved in the development of the RECONECT Services Platform.

The real time and historical data stored in the TeleControlNet will be available for partners to access for two years after the completion of the project with clear written permission from the data owners. During this time, there will not be any active maintenance and support on the data analysis but the system will be maintained for safe and secure log-in for users to access data.

3.6 Data security

In the development of the RECONECT Services Platform, we will explicitly deal with security issues from a technical perspective. Security and privacy issues are also addressed from the management perspective. An important aspect concerning data security is related to personal data. In RECONECT, the following categories of data may be generated (e.g., by use of questionnaires):

i)   personal status (e.g., age and gender),
ii) socio-economic data (e.g., city of residence, social status, marital status and income category),
iii) social network data, and
iv) domain related data.

Such data will be stored in a project database managed by the project coordinator. Each project participant will have secured web access to the previously anonymized data, which will have been automatically checked for consistency, homogeneity and completeness.

3.7 Ethical aspects

The information in this section has already been covered in the context of the ethics review, ethics section of the DoA, and ethics deliverable D8.1.

Appendix A – List of available data on the TeleControlNet

Site	Location description	Data	Unit	Log interval (sec)[1]	Measure start
DA3	Fogars de la Selva (Can Simó)	Flow	m³/s	300	31/08/2019
DA3	Fogars de la Selva (Can Simó)	Precipitation	mm/h	300	31/08/2019
DA3	Fogars de la Selva (Can Simó)	Water level	cm	300	31/08/2019
DA3	Montseny (la Llavina)	Flow	m³/s	300	31/08/2019
DA3	Montseny (la Llavina)	Water level	cm	300	31/08/2019
DA3	Sant Celoni	Flow	m³/s	300	31/08/2019
DA3	Sant Celoni	Precipitation	mm/h	300	31/08/2019
DA3	Sant Celoni	Water level	cm	300	31/08/2019
DA3	Fogars de la Selva (Pont Eiffel)	Flow	m³/s	300	31/08/2019
DA3	Fogars de la Selva (Pont Eiffel)	Water level	cm	300	31/08/2019
DA4	Mulini San Fruttuoso	Precipitation	mm		30/10/2019
DA4	Mulini San Fruttuoso	Relative humidity	%		01/05/2013
DA4	Mulini San Fruttuoso	Temperature	°C		30/10/2019
DA4	Mulini San Fruttuoso	Wind direction	deg		30/10/2019
DA4	Mulini San Fruttuoso	Wind speed	km/h		30/10/2019
DA4	Mulino del Gassetta	Precipitation	mm		14/01/2020
DA4	Mulino del Gassetta	Relative humidity	%		14/01/2020
DA4	Mulino del Gassetta	Temperature	°C		14/01/2020
DA4	Mulino del Gassetta	Wind direction	deg		14/01/2020
DA4	Mulino del Gassetta	Wind speed	km/h		14/01/2020
DA4	Portofino	Precipitation	mm		16/12/2019
DA4	Portofino	Relative humidity	%		16/12/2019
DA4	Portofino	Temperature	°C		16/12/2019
DA4	Portofino	Wind direction	deg		16/12/2019
DA4	Portofino	Wind speed	km/h		16/12/2019
DA4	San Fruttuoso	Water level	cmMSL		05/11/2019
DA4	Paraggi	Water level	cmMSL		14/01/2020
DB1	Deventer	Water level	cmNAP	600	31/12/2018
DB1	Doesburg brug	Water level	cmNAP	600	31/12/2018
DB1	IJssel Marle	Surface water level (Wijhe)	cmNAP		30/11/2018
DB1	Kampen	Water level	cmNAP	600	31/12/2018
DB1	Keteldiep	Water level	cmNAP	600	31/12/2018
DB1	Olst	Discharge	m³/s	600	31/12/2018
DB1	Olst	Volume	m³	86400	31/12/2018
DB1	Olst	Water level	cmNAP	600	31/12/2018
DB1	Wijhe	Water level	cmNAP	600	31/12/2018
DB1	Zutphen	Water level	cmNAP	600	31/12/2018

DB2	Runoff plot 1	Ice cont. S1 TW	%	03/07/2019
DB2	Runoff plot 1	Water co. S1 TW	%	03/07/2019
DB2	Runoff plot 1	Density S1 TW	kg/m^3	03/07/2019
DB2	Runoff plot 1	SWE S1 TW	mmWS	03/07/2019
DB2	Runoff plot 1	C_LF S1 TW	pF	03/07/2019
DB2	Runoff plot 1	C_HF S1 TW	pF	03/07/2019
DB2	Runoff plot 2	Ice cont. S2 TW	%	03/07/2019
DB2	Runoff plot 2	Water co. S2 TW	%	03/07/2019
DB2	Runoff plot 2	Density S2 TW	kg/m^3	03/07/2019
DB2	Runoff plot 2	SWE S2 TW	mmWS	03/07/2019
DB2	Runoff plot 2	C_LF S2 TW	pF	03/07/2019
DB2	Runoff plot 2	C_HF S2 TW	pF	03/07/2019
DB2	Runoff plot 3	Ice cont. S3 TW	%	03/07/2019
DB2	Runoff plot 3	Water co. S3 TW	%	03/07/2019
DB2	Runoff plot 3	Density S3 TW	kg/m^3	03/07/2019
DB2	Runoff plot 3	SWE S3 TW	mmWS	03/07/2019
DB2	Runoff plot 3	C_LF S3 TW	pF	03/07/2019
DB2	Runoff plot 3	C_HF S3 TW	pF	03/07/2019
DB2	Runoff plot 4	Ice cont. S4 TW	%	03/07/2019
DB2	Runoff plot 4	Water co. S4 TW	%	03/07/2019
DB2	Runoff plot 4	Density S4 TW	kg/m^3	03/07/2019
DB2	Runoff plot 4	SWE S4 TW	mmWS	03/07/2019
DB2	Runoff plot 4	C_LF S4 TW	pF	03/07/2019
DB2	Runoff plot 4	C_HF S4 TW	pF	03/07/2019
DB2	Rain gauge	Temp TW	c	03/07/2019
DB2	Rain gauge	Feuchte TW	%rF	03/07/2019
DB2	Rain gauge	Temp. 0cm TW	°C	03/07/2019
DB2	Rain gauge	Temp. -10cm TW	°C	03/07/2019
DB2	Rain gauge	Snow depth TW	cm	03/07/2019
DB2	Rain gauge	Ubat TW	V	03/07/2019
DB2	Rain gauge	Niederschlag TW	mm	03/07/2019
DB2	Rain gauge	Niederschlagsintensität TW	mm/min	03/07/2019
DB2	z6-06738 Soil moisture sensor	Battery percent	%	05/08/2020
DB2	z6-06738 Soil moisture sensor	Battery voltage	mV	05/08/2020
DB2	z6-06738 Soil moisture sensor	Soil temperature (40 cm)	°C	05/08/2020
DB2	z6-06738 Soil moisture sensor	Water Content (40 cm)	m^3/m^3	05/08/2020
DB2	z6-06738 Soil moisture sensor	Soil temperature (25 cm)	°C	05/08/2020
DB2	z6-06738 Soil moisture sensor	Water content (25 cm)	m^3/m^3	05/08/2020
DB2	z6-06738 Soil moisture sensor	Soil temperature (15 cm)	°C	05/08/2020
DB2	z6-06738 Soil moisture sensor	Water content (15 cm)	m^3/m^3	05/08/2020
DB2	z6-06738 Soil moisture sensor	Soil temperature (10 cm)	°C	05/08/2020

DB2	z6-06738 Soil moisture sensor	Water content (10 cm)	m³/m³	05/08/2020
DB2	z6-06738 Soil moisture sensor	Soil temperature (5 cm)	°C	05/08/2020
DB2	z6-06738 Soil moisture sensor	Water content (5 cm)	m³/m³	05/08/2020
DB2	z6-06738 Soil moisture sensor	Reference pressure	kPa	05/08/2020
DB2	z6-06738 Soil moisture sensor	Logger temperature	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Battery percent	%	05/08/2020
DB2	z6-06739 Soil moisture sensor	Battery voltage	mV	05/08/2020
DB2	z6-06739 Soil moisture sensor	Soil temperature (40 cm)	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Water Content (40 cm)	m³/m³	05/08/2020
DB2	z6-06739 Soil moisture sensor	Soil temperature (25 cm)	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Water content (25 cm)	m³/m³	05/08/2020
DB2	z6-06739 Soil moisture sensor	Soil temperature (15 cm)	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Water content (15 cm)	m³/m³	05/08/2020
DB2	z6-06739 Soil moisture sensor	Soil temperature (10 cm)	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Water content (10 cm)	m³/m³	05/08/2020
DB2	z6-06739 Soil moisture sensor	Soil temperature (5 cm)	°C	05/08/2020
DB2	z6-06739 Soil moisture sensor	Water content (5 cm)	m³/m³	05/08/2020
DB2	z6-06739 Soil moisture sensor	Reference pressure	kPa	05/08/2020
DB2	z6-06739 Soil moisture sensor	Logger temperature	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Battery percent	%	05/08/2020
DB2	z6-06740 Soil moisture sensor	Battery voltage	mV	05/08/2020
DB2	z6-06740 Soil moisture sensor	Soil temperature (40 cm)	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Water Content (40 cm)	m³/m³	05/08/2020
DB2	z6-06740 Soil moisture sensor	Soil temperature (25 cm)	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Water content (25 cm)	m³/m³	05/08/2020
DB2	z6-06740 Soil moisture sensor	Soil temperature (15 cm)	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Water content (15 cm)	m³/m³	05/08/2020
DB2	z6-06740 Soil moisture sensor	Soil temperature (10 cm)	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Water content (10 cm)	m³/m³	05/08/2020
DB2	z6-06740 Soil moisture sensor	Soil temperature (5 cm)	°C	05/08/2020
DB2	z6-06740 Soil moisture sensor	Water content (5 cm)	m³/m³	05/08/2020
DB2	z6-06740 Soil moisture sensor	Reference pressure	kPa	05/08/2020
DB2	z6-06740 Soil moisture sensor	Logger temperature	°C	05/08/2020
DB2	z6-06741 Soil moisture sensor	Battery percent	%	09/07/2020

DB2	z6-06741 Soil moisture sensor	Battery voltage	mV		09/07/2020
DB2	z6-06741 Soil moisture sensor	Soil temperature (40 cm)	°C		09/07/2020
DB2	z6-06741 Soil moisture sensor	Water Content (40 cm)	m^3/m^3		09/07/2020
DB2	z6-06741 Soil moisture sensor	Soil temperature (25 cm)	°C		10/09/2020
DB2	z6-06741 Soil moisture sensor	Water content (25 cm)	m^3/m^3		10/09/2020
DB2	z6-06741 Soil moisture sensor	Soil temperature (15 cm)	°C		10/09/2020
DB2	z6-06741 Soil moisture sensor	Water content (15 cm)	m^3/m^3		10/09/2020
DB2	z6-06741 Soil moisture sensor	Soil temperature (10 cm)	°C		10/09/2020
DB2	z6-06741 Soil moisture sensor	Water content (10 cm)	m^3/m^3		10/09/2020
DB2	z6-06741 Soil moisture sensor	Soil temperature (5 cm)	°C		10/09/2020
DB2	z6-06741 Soil moisture sensor	Water content (5 cm)	m^3/m^3		10/09/2020
DB2	z6-06741 Soil moisture sensor	Reference pressure	kPa		09/07/2020
DB2	z6-06741 Soil moisture sensor	Logger temperature	°C		09/07/2020
DB2	z6-06742 Soil moisture sensor	Battery percent	%		05/08/2020
DB2	z6-06742 Soil moisture sensor	Battery voltage	mV		05/08/2020
DB2	z6-06742 Soil moisture sensor	Soil temperature (40 cm)	°C		05/08/2020
DB2	z6-06742 Soil moisture sensor	Water Content (40 cm)	m^3/m^3		05/08/2020
DB2	z6-06742 Soil moisture sensor	Soil temperature (25 cm)	°C		05/08/2020
DB2	z6-06742 Soil moisture sensor	Water content (25 cm)	m^3/m^3		05/08/2020
DB2	z6-06742 Soil moisture sensor	Soil temperature (15 cm)	°C		05/08/2020
DB2	z6-06742 Soil moisture sensor	Water content (15 cm)	m^3/m^3		05/08/2020
DB2	z6-06742 Soil moisture sensor	Soil temperature (10 cm)	°C		05/08/2020
DB2	z6-06742 Soil moisture sensor	Water content (10 cm)	m^3/m^3		05/08/2020
DB2	z6-06742 Soil moisture sensor	Soil temperature (5 cm)	°C		05/08/2020
DB2	z6-06742 Soil moisture sensor	Water content (5 cm)	m^3/m^3		05/08/2020
DB2	z6-06742 Soil moisture sensor	Reference pressure	kPa		05/08/2020
DB2	z6-06742 Soil moisture sensor	Logger temperature	°C		05/08/2020
DB3	Egå, Jernbanebroen (Inlet)	Flow	l/s	900	28/02/2019
DB3	Egå, Jernbanebroen (Inlet)	Volume	m^3	86400	28/02/2019
DB3	Egå, Jernbanebroen (Inlet)	Water level	mDVR90	900	28/02/2019
DB3	Egå, Lystrupvej	Flow	l/s	60	30/04/2021
DB3	Egå, Lystrupvej	Oxygen concentration	mg/l	60	30/04/2021
DB3	Egå, Lystrupvej	Oxygen saturation	%	60	30/04/2021
DB3	Egå, Lystrupvej	Water level	mDVR90	60	30/04/2021
DB3	Egå, Lystrupvej	Water temperature	°C	60	30/04/2021

DB3	Egå, Lystrupvej	Battery voltage	V	60	30/04/2021
DB3	Egå, Lystrupvej	Air temperature	°C	60	30/04/2021
DB3	Egå, Lystrupvej	Water level	mDVR90	60	30/04/2021
DB3	Egå, Lystrupvej	Water temperature	°C	60	30/04/2021
DB3	Egå, Hovmarksparken	Flow	l/s	60	30/04/2021
DB3	Egå, Hovmarksparken	Oxygen concentration	mg/l	60	30/04/2021
DB3	Egå, Hovmarksparken	Oxygen saturation	%	60	30/04/2021
DB3	Egå, Hovmarksparken	Water level	mDVR90	60	30/04/2021
DB3	Egå, Hovmarksparken	Water temperature	°C	60	30/04/2021
DB3	Egå, Hovmarksparken	Battery voltage	V	60	30/04/2021
DB3	Egå, Hovmarksparken	Air temperature	°C	60	30/04/2021
DB3	Egå, Hovmarksparken	Water level	mDVR90	60	30/04/2021
DB3	Egå, Hovmarksparken	Water temperature	°C	60	30/04/2021
DB3	Egå, Egå Engsø (Outlet)	Flow	l/s		28/02/2019
DB3	Egå, Egå Engsø (Outlet)	Volume	m^3	86400	28/02/2019
DB3	Egå, Egå Engsø (Outlet)	Water level	mDVR90	900	28/02/2019
DB3	Risskov	Precipitation (Forecast)	mm		11/04/2019
DB3	Risskov	Air pressure	hPa		10/04/2019
DB3	Risskov	Air pressure (Forecast)	hPa		11/04/2019
DB3	Risskov	Air temperature	°C		10/04/2019
DB3	Risskov	Air temperature (Forecast)	°C		10/04/2019
EC1	Poda/Kamchia	Water level	mMSL		15/12/2020
EC1	Velichkovo/Kamchia	Water level	mMSL		16/12/2020
EC1	Dalgopol town	Water level	mMSL		16/12/2020
IC1	Upper Dhammaraja Gate	Water level	mMSL		30/11/1999
IC1	Dhammaraja Gate	Water level	mMSL		23/11/2018
IC1	ATG101	Water level	mMSL		23/11/2018
IC1	Krung Thep 2	Water level	mMSL		25/11/2018
IC1	Rabibadhana Nong Suea	Water level	mMSL		25/11/2018
IC1	Lam Luk Ka Klong8	Water level	mMSL		25/11/2018
IC1	Rabibadhana West Section	Water level	mMSL		25/11/2018
IC1	Future Park Rangsit	Water level	mMSL		25/11/2018
IC1	Liab Khlong 13	Humidity	%		23/11/2018
IC1	Liab Khlong 13	Barometric pressure	hPa		25/11/2018
IC1	Liab Khlong 13	Precipitation 10 minutes	mm		27/11/2018
IC1	Liab Khlong 13	Precipitation 1 hour	mm		25/11/2018
IC1	Liab Khlong 13	Precipitation last 24 hour	mm		25/11/2018
IC1	Liab Khlong 13	Precipitation day	mm		25/11/2018
IC1	Liab Khlong 13	Solar radiation	W/m^2		25/11/2018
IC1	Liab Khlong 13	Air temperature	°C		25/11/2018
IC1	Rangsit Khlong 7	Humidity	%		25/11/2018

Data Management Plan (Report Second Version) - D7.9
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IC1	Rangsit Khlong 7	Barometric pressure	hPa	25/11/2018
IC1	Rangsit Khlong 7	Precipitation 10 minutes	mm	27/11/2018
IC1	Rangsit Khlong 7	Precipitation 1 hour	mm	25/11/2018
IC1	Rangsit Khlong 7	Precipitation last 24 hour	mm	25/11/2018
IC1	Rangsit Khlong 7	Precipitation day	mm	25/11/2018
IC1	Rangsit Khlong 7	Solar radiation	W/m^2	25/11/2018
IC1	Rangsit Khlong 7	Air temperature	°C	25/11/2018

[1]Most datasets do not have the same log interval, which might be because of sensor malfunction or logging issues from local data storages to TeleControlNet.