



A Holistic Fire Management Ecosystem for Prevention, Detection and Restoration of Environmental Disasters

DRYADS D1.8 Data Management Plan

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Revision and history chart

Version	Date	Main author	Summary of changes
0.1	02/05/2022		Draft outline
0.2	13/05/2022		Adjustments after first review
1.0	31/05/2022		Final submitted version

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation	Meaning
DMP	Data management plan
FAIR	Findable, accessible, interoperable, and re-usable
IPR	Intellectual property rights
OA	Open Access
WP	Work package

1. EXECUTIVE SUMMARY

Main author of the chapter: Kemal S. Arsava and Dag Olav Snersrud, FRN

1.1 PURPOSE AND SCOPE

Data Management Plan (DMP) defines the data management life cycle for generated, collected, and processed data including results derived from the project, data received from external sources, IPR issues as well as personal data. In addition, the DMP specifies which of the data will be kept publicly available (Public access), which of the data will be restricted (Confidential), how DRYADS manages data, where the data is stored and how it is made accessible for other partners.

The goal is to have easy access to the accumulated collection of data that is being built up by all the participants and streamline the process of transforming knowledge into products and services.

The DMP is intended to be a living document, meaning that it will be updated throughout the project lifetime whenever significant changes arise.

1.2 STRUCTURE OF THE DELIVERABLE

This document is structured based on the *Guidelines on FAIR Data Management in Horizon 2020, Version 3.0, 26 July 2016*, and contains the following information.

- Executive summary
- Introduction
- Data Summary
- FAIR data
- Allocation of resources
- Data security
- Ethical aspects

1.3 APPROACH

The DRYADS Consortium will comply with the established *Open Research Data Pilot*, run by the EU framework Programme Horizon 2020, to grant open access to any publications (Green). The goal of the program is to foster access to data generated in H2020 projects. “Open access (OA) to research data” refers to the right to access and reuse digital research data under the terms and conditions set out in the Grant Agreement. Scientific publications (e.g. peer-reviewed conference papers, articles in technical magazines) will be deposited into a selected data research repository, thereby also connecting with the EU OpenAIRE repository. The choice of the most appropriate repository is still ongoing, but OpenAIRE-compliant repositories such as Zenodo [1] would be favoured.

2. INTRODUCTION

Main author of the chapter: Kemal S. Arsava, FRN

This Data Management Plan (PH) describes how the research data collected or generated will be handled during the project. It describes which methodology for data collection and generation will be followed, and how the data will be shared.

The DRYADS DMP is written in reference to Article 29.2 in the Grant Agreement called “Open access to research data”. DRYADS partners must:

- As soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications.

Moreover, the beneficiary must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.

- Ensure OA to the deposited publication – via the repository – at the latest:
 - on publication, if an electronic version is available for free via the publisher, or
 - within six months of publication (twelve months for publications in the social sciences and humanities) in any other case.
- Ensure OA – via the repository – to the bibliographic metadata that identify the deposited publication.

The bibliographic metadata must be in a standard format and must include all of the following:

- the terms “European Union (EU)” and “Horizon 2020”.
- the name of the action, acronym and grant number.
- the publication date, and length of embargo period if applicable, and
- a persistent identifier.

In order for the DRYADS DMP to meet these requirements, “green” OA routes will be adopted. “Green” OA (also referred to as self-archiving), is the upload of a final peer reviewed manuscript through an online repository. This may be possible after an embargo period set by the publisher.

The table below shows the DRYADS deliverables covering the data handling and management.

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Table 1: DRYADS deliverables for data handling and management.

Deliverable Name	Dissemination Level	Submission Date
D1.8 - Data Management Plan	Public	31.05.2022
D1.1 - DRYADS Privacy, Ethical, Legal and Data Reporting V1	Confidential	30.10.2022
D1.6 - DRYADS Privacy, Ethical, Legal and Data Reporting V2	Confidential	30.10.2023
D1.7 - DRYADS Privacy, Ethical, Legal and Data Reporting V3	Confidential	31.05.2025

3. DATA SUMMARY

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The DRYADS DMP aims to provide a methodology for managing the data generated and collected during the project and to optimise access to and re-use of research data. Data generated during the project can be divided into the following groups:

- Data generated by project partners during the execution and analysis of the Use Cases. This dataset consists of compiling raw data provided by project partners in the format of agreed metrics.
- Data collected from partners during the project. This consists primarily of raw data collected via individual questionnaires.
- Data collected from publications and public deliverables.

The consortium will follow the relevant regulation issued by the European Union (2016/679) [2] and all personal data will be treated as sensitive. After the completion of the final report only anonymized and/or non-identifiable data will be retained.

The data collection serves the aim to maximise the impact of the three preceding objectives, namely to:

- strengthen the wildfire fighting by developing and validating effective operative and design solutions addressing current and future challenges in all phases of a wildfire (Prevention and preparedness, detection and response, restoration and adaption);
- evaluate and demonstrate the feasibility of the developed DRYADS Ecosystem;
- promote knowledge sharing across the European Commission, and other stakeholders in the wildfire fighting.

The consortium will protect specific datasets that may include proprietary data linked to IPR issues.

3.1 DATA FILE FORMAT

In order to be able to distinguish and easily identify data sets, each data set will be assigned with a unique name.

All data files produced, including emails, must include the term “DRYADS”, followed by file name which briefly describes its content, followed by a version number, followed by the short name of the organisation which prepared the document. For example, the first version of this document is called “DRYADS D1.8 Data Management Plan v1 FRN”.

Each dataset that will be collected, processed or generated within the project will be accompanied by a brief description. The description file will be given a suitable name to ensure that it is easy to find and that it cannot be misinterpreted, as to which dataset the description belongs. The description will also clarify who owns the data, how anyone inside the consortium can use it or spread it and how anyone outside the consortium can use it.

The file formats explained below will be used since they comply with standards and they are widely used.

- Microsoft Office for text-based documents (or any other compatible version). doc, .docx, .xls, .xlsx, .ppt, .pptx. Where larger datasets need to be dealt with, .csv and .txt file formats will be used.
- For statistical purposes, other formats include. RData (R), .SAV (SPSS), .mat (matlab).
- Illustrations and graphic design will make use of Microsoft Visio (Format: .vsd), Photoshop (Format: different types possible, mostly .png), and will be made available as .jpg, and .tiff files.
- MP3 or WAV for audio files.
- QuickTime Movie or Windows Media Video for video files.

Data formats may be migrated when new technologies become available and are proved robust enough to ensure digital continuity and continued availability of data.

3.2 RE-USE ANY EXISTING DATA AND HOW

While it is envisaged that most data collected will be OA (green) and widely disseminated, some results of the project may need to be protected due to IP rights. Regarding the exploitation of results, there currently is no plan to exploit the information other than in the sense of maximizing the joint available information between partners. In the Consortium Agreement (CA) section 8.2 there is an option to exploit jointly owned data between partners via request to the partners under fair and reasonable use. Based on the implementation of the project and the collaboration between the partners, an action plan to exploit the generated data could be developed.

3.3 DATA STORAGE AND SHARING

The project has four main data storage and sharing facilities according to the type of data and its intended accessibility.

- **Private:** Stored locally on organisational networks and assets, subject to institutional back up practices. The data that falls in this category is not bound to follow the guiding rules stated in this document.
- **Consortium:** FRN will host a common space on web by means of the commercial platform, which is secure, robust and accessible to all project partners. Consortium data will be uploaded to this cloud storage for simple, secure access for all partners from within a web browser. Data is maintained with regular offsite backups.
- **Public:** The project website (<https://dryads-project.eu/>) managed by ACCELI, will be the first point of contact for public dissemination. It will host project technical reports and other materials such as events, blog articles, images, videos, links to partner organisations and related projects. Re-useable data sets will be deposited in an open data repository selected by the task leaders during the delivery of the relevant work packages. The choice of the most appropriate repository is still ongoing.

4. FAIR DATA

Main author of the chapter: Ellen Synnøve Skilbred, FRN

DRYADS has committed to participating in the “Pilot on Open Research Data in Horizon 2020” voluntarily. According to the guiding principles to make data FAIR, which states that the data should be:

- **Findable:** data should have a unique, persistent ID, that is located in a resource that is easy to find and documented with meaningful metadata.
- **Accessible:** data should be instantly retrievable using common methods and protocols. It is important to say that the respective metadata should be accessible even if the data is not.
- **Interoperable:** data should be presented in widely recognised formats, vocabularies, and languages.
- **Re-useable:** data should be given with a clear and accessible data usage license, having a variety of precise and relevant characteristics.

4.1 MAKING DATA FINDABLE, INCLUDING PROVISIONS FOR METADATA

Publications, presentations, reports and public deliverables will be available on the DRYADS website. Each file will be assigned with a unique name, in the format described in section 3.1.

Datasets that will be available for the consortium members in the common web space must be clearly named to identify its content and also always associated with a description of the data. This descriptive document is even more important if the data set

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is disseminated publicly on the project website or other repositories. Public data sets that are generated within the project will also be provided with a Digital Object Identifier (DOI) so that it is findable, accessible, and citable.

Metadata are an essential part of larger datasets to be findable, accessible and interoperable.

- For spatial data (GIS datasets etc. and other maps) the quality of metadata will be ensured by following the INSPIRE metadata guidelines (<https://inspire.ec.europa.eu/file/1557/download?token=UaQBcRvQ>). This will automatically ensure compliance to ISO 19115 and its XML encoding ISO 19139.
- For scientific publications the bibliographic info will follow the standard form of DRYADS as outlined in chapter 2.
- Other resources must be accompanied by the description described in 3.1.

4.2 MAKING DATA OPENLY ACCESSIBLE

The data that is collected and used in this project will be stored in share folders which are available to all partners. Non-partners will also be allowed access to this if requested. This will ensure that the data is openly accessible for all parties, which is stated as a necessity in the grant agreement. It is also stated in the grant agreement that under some conditions, confidentiality is required for a period. In addition, it allows for beneficiaries to request to extend this period further if necessary. Information marked as confidential will not be publicly available until the confidentiality expires, and as a Horizon 2020 project, the data will be published for all partners to see in the end.

4.3 MAKING DATA INTEROPERABLE

Data will be collected and shared in a standardised way using a standard format for that data type. Data file formats are given in section 3.1. The data will be given in English, using formal and broadly applicable language.

4.4 INCREASE DATA RE-USE (THROUGH CLARIFYING LICENSES)

Licenses assigned to data can help the reusable principle in FAIR data management. They will be applied through the online data repositories when depositing the data there. The H2020 guidelines, an efficient way to enable re-use by third parties is to attach a Creative Commons Zero (CC0) or a Creative Commons Attribution (CC BY) to the data. There are many other license types with less restricted openness such as Share-alike or Non-commercial (see <https://creativecommons.org>). The decision on making data publicly available and the decision on which license that is to be applied should be taken by the Consortium. It should be noted that some journal publication policies may contain “embargo” content terms. For protected data, re-use will be limited within the project partners.

5. ALLOCATIONS OF RESOURCES

Main author of the chapter: Ellen Synnøve Skilbred, FRN

Data management, including making the data FAIR, will be part of the WP1. Part of the overall WP1 budget has been allocated to data management activities, and RISE Fire Research AS will be responsible for data management.

Costs related to OA to research data are eligible as part of the Horizon 2020 grant (if compliant with the Grant Agreement conditions).

6. DATA SECURITY

Main author of the chapter: Ellen Synnøve Skilbred, FRN

During the project, datasets will be stored on the responsible partner's storage system. Every partner is responsible for ensuring that their data related to the project are stored safely and securely, and in full compliance with European Union data protection laws.

DRYADS may process proprietary or confidential data such as financial reports and market analyses, and the data management plan will be revised accordingly, to address any ethical issues that arise during the project's lifecycle.

Data files that are not publicly available will be transferred via secure connections. For information on how this will be done, see section 6.3 in the *DRYADS Quality Assurance Plan*.

Computerized data (hard disk drives) used for data storage, will be destructed according to existing methods for permanent and irreversible destruction of the data (i.e. full disk overwriting and re-formatting tools).

The DRYADS consortium will establish which partner(s) will assume the role of the data controller. This partner(s) will be responsible for liaising with their National Data Protection Agencies, as required by the applicable law. Since research activities will take place in different Member States, the national data protection legislation of the selected countries will be reviewed and notifications about the processing activities will be filed to the concerned National Data Protection Authorities.

7. ETHICAL ASPECTS

Main author of the chapter: Ellen Synnøve Skilbred, FRN

The DRYADS project consortium commits to undertake its research in accordance with the Responsible Research and Innovation (RRI) principles as well as in conformity with generally accepted ethical principles for scientific research, embodied e.g. in ALLEA (All European Academies)'s European Code of Conduct for Research Integrity. All activities shall avoid plagiarism, fabrication, falsification, or other research related misconduct. The whole project will strictly follow the ISO 27001 (for information security management) recommendations.

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The technologies that will be developed and deployed in DRYADS will ensure the protection of private data. Individuals who participate in the trials of the project, will be asked to provide DRYADS with their informed consent regarding their participation. In order to protect their privacy rights, a number of best practice principles will be followed, including that no data will be collected without the explicit informed consent of the individuals under observation, and no data collected will be sold or used for any purposes other than the current project. All the rights of the data subjects e.g., right to object, right of access, and right to rectify, erase or block will be ensured. All personal data stored during the pilot trials will be completely and irreversibly anonymised and will be erased at the completion of the DRYADS Project.

A data minimisation policy will be adopted at all levels of the project and will be supervised by a designated responsible at each site. This will ensure that no data which is not strictly necessary to the completion of the current study will be collected. Any shadow (ancillary) personal data obtained during the course of the research will be immediately cancelled. However, the plan is to minimize this kind of ancillary data as much as possible. Special attention will be paid to complying with the Council of Europe's Recommendation R(87)15 on the processing of personal data for police purposes, Art.2: *The collection of data on individuals solely on the basis that they have a particular racial origin, particular religious convictions, sexual behaviour or political opinions or belong to particular movements or organisations which are not proscribed by law should be prohibited.*

A more detailed description of secure handling of personal and private data will be given in deliverable D1.1 DRYADS Privacy, Ethical, Legal and Data reporting.

REFERENCES

- [1] "zenodo," [Online]. Available: <https://zenodo.org/>.
- [2] 2022. [Online]. Available: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32016R0679>.



A Holistic Fire Management Ecosystem for Prevention, Detection and Restoration of Environmental Disasters

The Members of the DRYADS Consortium:

Short Name	Country	Short Name	Country	Short Name	Country
FRN	NO	INNOV	CY	DCNA	AT
Jotne	NO	FI	EL	IFR	AT
BAM	DE	GBD	BE	FGK	AT
Capgemini Eng.	FR	EFB	EL	BFG	AT
DH	ES	LAMMC	LT	STRESS	IT
USAL	ES	OneSeven	DE	ACaMIR	IT
SQD	BE	VIPO	NO	Sorrento	IT
CARTIF	ES	WAS	NO	PUI	FR
UdG	ES	CBS	DK	FAFCYLE	ES
NCSR	EL	K3Y	BG	DdA	ES
SIMAVI	RO	MAGG	IT	TUC	EL
OvGU	DE	NOA	EL	MAICH	EL
ADR	EL	MEWF	RO	DAAC	EL
CERTH	EL	ASFOR	RO	NTUST	TW
8bells	CY	SMURD	RO	DTU	DK
ACCELI	CY	JOAFG	AT		

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