FWO DMP Template - Flemish Standard Data Management Plan

Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO's e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following link.

1. General Project Information	
Name Grant Holder & ORCID	**Ellen Desie https://orcid.org/0000-0002-5947-9517**
Contributor name(s) (+ ORCID) & roles	**Karen Vancampenhout - 0000-0002-9159-7011** **Lars Vesterdal - 0000-0003-0309-3735** **Bruno De Vos - 0000-0001-9523-3453**
Project number [1] & title	**1292824N - Boosting carbon stability in forest soils: the role of soil biota in climate-smart management**
Funder(s) GrantID [2]	**FWO - 1292824N**
Affiliation(s)	☐ **KU Leuven** ☐ ~~Universiteit Antwerpen~~ ☐ ~~Universiteit Gent~~ ☐ ~~Universiteit Hasselt~~ ☐ ~~Vrije Universiteit Brussel~~ ☐ ~~Other:~~ ROR identifier KU Leuven: 05f950310
Please provide a short project description	Rising atmospheric CO2 concentrations call for urgent action to develop strategies for negative emissions, including nature-based solutions. The role of forests in climate change mitigation is widely recognized as forests can store vast amounts of carbon both above- and belowground. However, many forest ecosystems are affected by environmental pressures, and are at risk of becoming sources of CO2. As a consequence, EU countries are setting up large networks to monitor forest soil carbon stocks and assess potential losses and gains. This effort is crucial in understanding emissions and sequestration in forests, but only monitoring stocks is of little help in determining what forests are of risk of turning from a sink into a source, nor do they provide avenues for management to enhance carbon stabilization in forests in the future. There is a growing body of literature that pinpoints soil biota as the missing link between forest management and carbon stabilization. In this project, I aim to identify changes in carbon stability and to disentangle the drivers of such changes, while specifically taking into account the role of soil biota relative to edaphic factors, climate change and management, in order to ultimately optimize climate-smart-management and boost C stability.

[1] "Project number" refers to the institutional project number. This question is optional. Applicants can only provide one project number.

[2] Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used.

2. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data [3].

				Only for digital data	*Only for digital data*	*Only for digital data*	*Only for physical data*
Dataset Name	Description	New or Reused	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
Soil Fauna Network	Available: soil fauna 1997, C stocks, eDNA 1997 and 2024 Archived: soil samples 1997 Collected by 2025: soil fauna 2023 and 2024, C stocks and stability 2023	☒ Generate new data ☒ Reuse existing data	☒ Digital ☒ Physical	☐ Audiovisual ☒ Images ☐ Sound ☒ Numerical ☐ Textual ☐ Model ☐ Software ☐ Other:	Excel, drive folder with pictures	☒ < 1 GB	Soil samples (100 g)
Soil Biodiversity Observatory	Available: humus, soil, site, forest type description, texture, pH, CEC+BS, TON, Cpom, Cmaom, Ctotal,	☐ Generate new data ☒ Reuse existing data	☒ Digital ☒ Physical	☐ Audiovisual ☒ Images ☐ Sound ☒ Numerical ☐ Textual ☐ Model ☐ Software ☐ Other:	Excel, drive folder with pictures	☒ < 1 GB	Soil samples (100 g)

[3] Add rows for each dataset you want to describe.

	Crespiration, earhtworm data, mesofauna to taxonomic group, microbial community composition and diversity						
Functional trait data	Collected by 2024: traits of soil biota form BETSI	☐ Generate new data ☒ Reuse existing data	☒ Digital ☒ Physical	☐ Audiovisual ☐ Images ☐ Sound ☒ Numerical ☒ Textual ☐ Model ☐ Software ☐ Other:	Excel	☒ < 1 GB	
Workshop forest managment	survey	☒ Generate new data	☒ Digital	☒ Numerical ☒ Textual	Excel survey	☒ < 1 GB	

GUIDANCE:
The data description forms the basis of your entire DMP, so make sure it is detailed and complete. It includes digital and physical data and encompasses the whole spectrum ranging from raw data to processed and analysed data including analysis scripts and code. Physical data are all materials that need proper management because they are valuable, difficult to replace and/or ethical issues are associated. Materials that are not considered data in an RDM context include your own manuscripts, theses and presentations; documentation is an integral part of your datasets and should described under documentation/metadata.
RDM Guidance on data

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type.	BETSI database https://portail.betsi.cnrs.fr/ **DOI**:10.13140/2.1.1814.0481
Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.	☐ Yes, human subject data; provide SMEC or EC approval number: ☐ Yes, animal data; provide ECD reference number: ☐ Yes, dual use; provide approval number: ☒ No Additional information:
Will you process personal data[4]? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).	☐ Yes (provide PRET G-number or EC S-number below) ☒ No Additional information:
Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.	☐ Yes ☒ No If yes, please comment:
Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)? If so, please explain to what data they relate and what restrictions are in place.	☒ Yes ☐ No If yes, please explain: if BETSI of TRY databases are used they should be referred to.

[4] See Glossary Flemish Standard Data Management Plan

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain to what data they relate and which restrictions will be asserted.	☒ Yes ☐ No If yes, please explain: Some of the data of the soil fauna network is property of INBO (Institute for Forest and Nature Research, Belgium) but can be used in the context of this project.

3. Documentation and Metadata	
Clearly describe what approach will be followed to capture the accompanying information necessary to keep **data understandable and usable**, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded). *RDM guidance on documentation and metadata*.	**Findable:** - **Keywords: soil fauna network, soil ecology, forest management** - **Accessible: metadata are shared within KU Leuven** - **Interoperable: controlled vocabularies** - **Reusable: each column is described in detail with mentioning the methodology in the metadata file**

Will a metadata standard be used to make it easier to **find and reuse the data**? If so, please specify which metadata standard will be used. If not, please specify which metadata will be created to make the data easier to find and reuse. *REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.*	☐ Yes ☒ No If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used: If no, please specify (where appropriate per dataset or data type) which metadata will be created: For documentation and Metadata purposes, we will make use of: At project level: A README file will be provided for each of the WPs. We will use KU Leuven's template. For each WP, a protocol is provided. At data level: For each WP, a data dictionary will be provided

4. Data Storage & Back-up during the Research Project	
Where will the data be stored? *Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.*	☐ Shared network drive (J-drive) ☒ Personal network drive (I-drive) ☒ OneDrive (KU Leuven) ☐ Sharepoint online ☐ Sharepoint on-premis ☐ Large Volume Storage ☐ Digital Vault ☐ Other:

How will the data be backed up? *WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?*	☒ Standard back-up provided by KU Leuven ICTS for my storage solution ☐ Personal back-ups I make (specify) ☐ Other (specify) A back-up is provided via automatic version management of the files in OneDrive, maintaining up to 100 versions per file. A second copy will be kept on my personal within the secure KU Leuven environment. Automatic version management of the files occurs when storing data in the KU Leuven datacenters. Version management is done using "snapshot" technology, where the previous versions of the changed files are kept online in a snapshot on the same storage system. A mirror (an exact copy) of the data is provided in the second ICTS data center for “business continuity” or “disaster recovery” purposes; a file is copied to the second data center as soon as it is written to a drive. ICTS can put the copy online within an hour in case of disaster with the primary storage.
Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.	☒ Yes ☐ No All KU Leuven personnel has access to 2 TB of data storage on OneDrive. As the estimated sizes of the datasets
How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons? *CLEARLY DESCRIBE THE MEASURES (IN TERMS OF PHYSICAL SECURITY, NETWORK SECURITY, AND SECURITY OF COMPUTER SYSTEMS AND FILES) THAT WILL BE TAKEN TO ENSURE THAT STORED AND TRANSFERRED DATA ARE SAFE.* *Guidance on security for research data*	Due to the personal nature of OneDrive, files that you do not explicitly share are not accessible to anyone else. As such, a separate folder will be created and encrypted for this dataset. Only the PI and registered collaborating researchers will have access to this folder via the encryption key. KU Leuven network drive, specifically L-drive. The KU Leuven network drives are incorporated within secured KU Leuven environments, are password-protected (including smartphone-based multi-factor identification) and are only accessible by registered collaborating researchers. Only the PI can request access to the network drive for study personnel.
What are the expected costs for data storage and backup during the research project? How will these costs be covered?	OneDrive for Business is free for staff and students of KU Leuven. The Department of Movement Sciences provides our research group (Physical Activity, Sports & Health) with an Ldrive. As such, costs will be covered by the department.

5. Data Preservation after the end of the Research Project	
Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...). *Guidance on data preservation*	☒ All data will be preserved for 10 years according to KU Leuven RDM policy ☐ All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans ☐ Certain data cannot be kept for 10 years (explain)
Where will these data be archived (stored and curated for the long-term)? *Dedicated data repositories are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the interactive KU Leuven storage guide.*	☒ KU Leuven RDR ☐ Large Volume Storage (longterm for large volumes) ☐ Shared network drive (J-drive) ☐ Other (specifiy): Digital data: The generated research data, metadata and documentation necessary to reuse the data will be transferred to the K-drive (LVS network drive) for long-term data archiving, managed by KU Leuven ICTS with automatic back-up procedures.
What are the expected costs for data preservation during the expected retention period? How will these costs be covered?	Given the expected size of the database of less than 1 GB, costs for long-term storage are estimated to be 0.

6. Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project? Please explain per dataset or data type which data will be made available. *NOTE THAT 'AVAILABLE' DOES NOT NECESSARILY MEAN THAT THE DATA SET BECOMES OPENLY AVAILABLE, CONDITIONS FOR ACCESS AND USE MAY APPLY. AVAILABILITY IN THIS QUESTION THUS ENTAILS BOTH OPEN & RESTRICTED ACCESS. FOR MORE INFORMATION: HTTPS://WIKI.SURFNET.NL/DISPLAY/STANDARDS/INFO-EU-REPO/#INFOEUREPO-ACCESSRIGHTS*	☐ Yes, as open data ☐ Yes, as embargoed data (temporary restriction) ☒ Yes, as restricted data (upon approval, or institutional access only) ☐ No (closed access) ☐ Other, please specify: All digital data will be made available in a restricted access repository.
If access is restricted, please specify who will be able to access the data and under what conditions.	Scientific researchers will have to motivate why they want access to the data: What topic are you studying? How is the data linked to your research domain? Why do you think you need this data? Which question/problem will the data help with? What do you expect the data to provide you with? We will always ask to give credit to the original data creators when the data it is being used by other researchers.
Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain per dataset or data type where appropriate.	☐ Yes, privacy aspects ☐ Yes, intellectual property rights ☐ Yes, ethical aspects ☐ Yes, aspects of dual use ☐ Yes, other ☒ No If yes, please specify:
Where will the data be made available? If already known, please provide a repository per dataset or data type.	☒ KU Leuven RDR ☐ Other data repository (specify) ☐ Other (specify)

When will the data be made available?	☒ Upon publication of research results ☐ Specific date (specify) ☐ Other (specify)
Which data usage licenses are you going to provide? If none, please explain why. *A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENCE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENCE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENCE THAT MIGHT PROHIBIT THAT.* *Check the RDR guidance on licences for data and software sources code or consult the License selector tool to help you choose.*	☒ CC-BY 4.0 (data) ☐ Data Transfer Agreement (restricted data) ☐ MIT licence (code) ☐ GNU GPL-3.0 (code) ☐ Other (specify)
Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here. *INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.*	☒ Yes, a PID will be added upon deposit in a data repository ☐ My dataset already has a PID ☐ No A DOI will be available through RDR, but is not yet available
What are the expected costs for data sharing? How will these costs be covered?	RDR is free for KU Leuven personnel, hence, no costs are expected for data sharing.

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	**Ellen Desie**

Who will manage data storage and backup during the research project?	**Ellen Desie**
Who will manage data preservation and sharing?	**Ellen Desie**
Who will update and implement this DMP?	**Ellen Desie**