

Form Data Management Plan

This form is intended for the development of a data management plan, based the data management section that formed part of your research proposal. NWO expects you to incorporate any comments received from the referees and/or the committee about the data management section in this data management plan. Please do not use any abbreviations and when referring to any website mention the complete web address.

NWO only requests storage of reusable relevant data. NWO understands 'data' to be both collected, unprocessed data as well as analysed, generated data. Under this, all forms are conceivable; digital and non-digital (for example samples, completed questionnaires, sound recordings, etc.).

For this data management plan, NWO uses a template that matches the guidelines for data management from Horizon 2020. An explanatory note can be found at the end of this document. For help with the completion of the data management plan, please contact the university library and/or ICT Department of your institute or university. If necessary, you can also contact the NWO-domain that awarded your proposal funding.

You are kindly requested to complete the plan below and submit it to NWO within four months after the awarding of funding. NWO will approve the data management plan as quickly as possible. Plans in which the data will be deposited in a national or international repository will, by definition, be approved. If necessary, NWO will call upon the help of (data) experts from your scientific discipline for the assessment. As soon as the data management plan has been approved by NWO the project can be started. The data management plan can be adjusted during the course of the research.

You should submit the completed form via the online application system [ISAAC](#). The main applicant has to submit his/her data management plan via his/her own ISAAC account. Data management plans not submitted via ISAAC will not be taken into consideration.

1 General information		
1.1	Name applicant and project number	Daniele Ragni, project IPER-MAN: Innovative PERmeable Materials for Airfoil Noise reduction, project number 15452
2 Description dataset		
2.1	Describe the data that will be collected/generated and which you find relevant for reuse.	<p>Three typologies of outputs will be expected from this project:</p> <ol style="list-style-type: none"> 1) Physical models of foams and foam inserts together with aircraft and wind turbine wings. This form of output can be stored in the laboratories of Aerospace with no additional charge. 2) Experimental and numerical raw and processed data. These two subsets have different sources but same modality of storage, part of the processed ones can be relevant for benchmarking.

	3) Softwares and algorithms. This set is very relevant since can be generated, used and referenced during and after the project timeline.
2.2 Which type and format of data are these?	The most important formats that are used are: <ol style="list-style-type: none"> 1) Raw data: binary images/text files for experimental investigations; binary solution files for computational simulations. 2) Processed data: can be transformed for both experimental and numerical investigations into text files.
2.3 For which researchers/research groups is it interesting to have these data available?	Including already the departments of AWEP, C&O ANCE and ASM, several groups in Europe including the Aeroacoustic ones in Bristol, South Hampton, Stuttgart, DLR Goettingen, Brunel and Technion Israel will be interested in referencing of the results.

3 Data storage	
During the research	
3.1 What is the volume of the data and where will the data be stored?	The data is typically stored in hard-drives which are backed up during the project timeline and kept within the AWEP department. While the amount of data can be reaching several TB, the amount to be stored can be reduced to few TBs by saving the output matrices and an example of the measurement/computational chain.
3.2 Is there currently sufficient storage capacity during the project?	Yes, several disks are available from the group.
Is there currently sufficient backup capacity during the project?	Yes, where backup is restricted to the most important information.
Describe how often and where backups of data will be made and who is responsible for this.	Current policy over the backups requires the researchers to be responsible of their own backups which are advised at the end of every numerical/experimental investigation.
If no or insufficient storage or backup capacities are available then explain how this will be taken care of.	
3.3 Describe which facilities for your data (ICT or another type, such as refrigerators or legal	At the moment facilities of storage can be improved since the data are just kept within confined boundaries for a

expertise) are already present and which are still needed.	period of about 5 years. We are proposing a change of policy to allow a more reliable and centralized use of data.
3.4 What are the expected costs? Please specify these and state an amount that is as realistic as possible. How will these costs be covered?	At the moment no additional costs are expected.

After the research

3.5 State in which existing repository the data will be stored and which type this is. If available mention the URL. If the data will not be stored in a repository then state how the data will be made findable, accessible and usable.	The data will be stored by the AWEF group in physical hard-drives. A better solution is currently on-going to use the internal facilities of 4TU.Centre for Research Data to allow for an active indexation and identification of the data [https://data.4tu.nl/repository/].
3.6 For how long can the data and (if applicable) the associated software be stored at most?	The data have a typical utilization period of max 5 years, after which it becomes obsolete if not meant for a benchmarking of computational and experimental resources.
3.7 Describe which facilities for your data and any associated software are already present and which are still needed.	At the moment the internal facilities for data storage are obsolete with respect to the centralized TU Delft ones. In this respect the group will refer to the ICT services for data management. The standardized metadata in 4TU. Research Data offers better chances of safely giving visibility to the data with references for publications. No extra-facilities are expected to be needed for the project.
3.8 What are the expected costs? Please specify these and state an amount that is as realistic as possible. How will the costs be covered?	No expected costs at the moment, since the expected storage is within the free amount for the scientific research offered by the group. The archiving costs for the research output is covered by the 4TU.Research Data cost concession for TU Delft researcher.

4 Standards and Metadata

4.1 Will a standard be used for the metadata? If yes, describe in detail which, and state in which databases these will be included.	Yes. Data will be referenced mostly in text-files explicitly mentioning formats, units and description of the most relevant quantities. A text file will be added to explain how to use the data for external purposes. Dublin Core is the current metadata standard provided by 4TU.Research
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If no, state in detail which metadata will be made to make the data easy/easier to trace and make available for reuse. Mention the database in which these metadata will be included.

Data, enabling the findability and accessibility of research data in the data archive. The additional documentation file improves the interoperability and reusability of the deposited data files.

5 Making data available

5.1 Are the data, or a part of these, available for reuse after the Open Access project?

If so, please describe in a concrete manner when and how the data will be made available.

If not, please explain why the data are not suitable and/or available for reuse.

Yes, after the partners agree with its public release. Periodical review and depositing of finished data sets and publication of data underlying paper publications, will be determined.

5.2 If data are only made available after a certain period then please state the reason for this.

If part of the data cannot be made (directly) available then please state the part concerned.

The period might vary with the needed time for the legal party to agree on the data release. However, an agreement for the IP protection policy has already been drafted within the project.

5.3 Are there any conditions for the reuse of the data?

If so, are these conditions defined in a consortium agreement?

Once the data is released, the conditions of reuse will entail referencing of the work.

Explanatory note for this form

Sometimes it is simpler and cheaper to regenerate exactly the same data than to store the existing data. In some cases, regenerating data will be less privacy-sensitive than storing it. These can be acceptable reasons for not archiving this type of data for the long-term. The RDNL checklist provides a guideline for selecting the data that can be eligible for archiving.

1 Algemene informatie

Fill in the name of the project leader and the project number allocated by NWO.

2 Omschrijving dataset

- 2.1 Describe the data and documents that will be archived after the research and will be made available for reuse. State whether these data lie at the basis of publications. Which documentation will be archived that is important for making reuse of the data possible, such as methodology (codebooks, metadata) or persons involved (study subjects, researchers)?
- 2.2 Which type and format data will be stored? NWO understands 'data' to be both collected, unprocessed data as well as analysed, generated data. This can be in all (combinations of) conceivable formats; digital and non-digital (for example samples, completed questionnaires, sound recordings, etc.).

3 Data storage

During the research

- 3.1 Make a realistic estimation of the final volume of the data that will be archived and the necessary storage capacity and state where you plan to store the data during the research. In the case of digital data, NWO prefers data to be stored during the research in the central storage centre of your institution, for example the ICT department and/or the university library.
- 3.2 It is important that there is storage capacity, and in the case of digital data, also a backup of your data. An automatic backup by the ICT Department is safer than a manual backup. Storage of data on laptops, hard disks or external media is in general risky and will therefore, in principle, not be accepted by NWO. If external services are used then you must ensure that no conflicts of interest arise with the policy of research partners or co-financiers and with the policy of your department or institute, for example about the security of sensitive data. Take into account the security of data; these can be physical measures (for example, a burglar alarm and a safe for the storage of data) or logical access checks (such as passwords, pin codes, passes and biometric characteristics).
- 3.3 Describe which facilities are already present for your data and which are still needed. In the case of ICT, think about data storage capacity, bandwidth for data transport and calculation power for data processing. The ICT department, the university library or research support service at your institution can help you to draw up this description.

- 3.4 Make a realistic estimation of the costs that will be made and state an amount that is as realistic as possible. Important factors that determine the costs are:
- a. the type of data;
 - b. the capacity needed for storage and backup;
 - c. the amount of manual work for allocating metadata and drawing up other documentation such as code books and queries used in the statistical package;
 - d. the extent to which the data needs to be made secure;
 - e. the hiring of external data management and other expertise.

After the research

The data should preferably be stored for the long term in a national or international data repository. If this is not possible then the data should be stored by the institutional repository. Contact the intended data repository or archive in good time about the available file formats and necessary metadata, for example.

- 3.5 International guidelines are available for the sustainable storage of data. Of these, the international Data Seal of Approval has the simplest set of criteria. State at which existing repository the data will be stored and what type this is (for example an institutional repository or a standard repository in your discipline). Trusted Digital Repositories with a quality mark include repositories with a Data Seal of Approval, DIN-31644-, ISO- 16363- or WDS/ICSU certification. An overview of existing repositories with Data Seal of Approval can be found in this [list of repositories](#).

According to the Netherlands Code of Conduct for Scientific Practice, raw data must be stored for a period of at least 10 years. A longer period is certainly recommended.

- 3.6 Make use of sustainable software to make reuse possible. When doing this consider the following points:
1. Work with preferred file formats that are not limited to specific software, e.g. CSV for spreadsheets.
 2. Carefully document which version of which software the data have been produced in; just as the exact settings of equipment in some disciplines.
 3. Use of software standardly used within the discipline.
 4. Document the exact syntax queries in the case of statistics software, for example.
- 3.7 Describe which facilities (ICT or another type such as refrigerators or legal expertise) are already present for your data and which are still needed. In the case of ICT think about data storage capacity, bandwidth for data transport and calculation power for data processing. The ICT department, the university library or research support service at your institution can help you to draw up this description.

4 Standards and metadata

To make data findable and readable in the future and to be able to interpret it the data collection must be provided with descriptive information in the form of metadata. The most widely used standards can be compared with each other, such as the standardised metadata of the Dublin Core standard, SNOMED CT and the Data Documentation Initiative.

5 Beschikbaar stellen van data

For data to be shared with third parties it is important that the necessary software or other tools needed are available for reuse. In addition it is advisable to determine which conditions a research group that wants to obtain access to your data must satisfy. Examples of this are agreements that will be made concerning methodology, publications, the access period, availability of data, the costs (handling fee), copyright aspects, etc.

- 5.3 State whether embargoes, licences, commercial objectives or other conditions have been imposed on the reuse of the data. If applicable: have these been recorded in a consortium agreement?