

## FWO DMP Template - Flemish Standard Data Management Plan

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	Jennifer Derijckere 0000-0003-4964-6868
Contributor name(s) (+ ORCID) & roles	Pieter Rauwoens (0000-0002-8226-6536) Promotor Glenn Strypsteen (0000-0002-0078-7259) Co-Promotor
Project number <sup>1</sup> & title	Project number: 1SE2923N Title: Sand exchange during engineered dune development for coastal resilience
Funder(s) GrantID <sup>2</sup>	1SE2923N
Affiliation(s)	<input checked="" type="checkbox"/> KU Leuven Provide ROR <sup>3</sup> identifier when possible: <a href="https://ror.org/05f950310">https://ror.org/05f950310</a>
Please provide a short project description	The Belgian government uses another strategy for coastal management; a soft and dynamic approach were possible in response to climate change and the associated sea level rise. In this approach, natural elements and processes are used to facilitate the development of new engineered dune areas, especially at locations where traditional dike structures protect the hinterland. However, despite the value, environmental benefits and dynamic basic function, they are not always well understood or appreciated by coastal landowners and beach users. In this project, the resilience of dune-in-front-of-a-dike as coastal protection will be accurately and quantitatively investigated by field monitoring a unique pilot site using data analysis and current state-of-the-art models. First, we want to understand and model the accretive and erosive mechanisms at the dune-in-front-of-a-dike and its ability to naturally adapt to sea level rise. Secondly, we want to determine under which circumstances permanent sand nourishment will be necessary in the future to maintain/restore the dune-in-front-of-a-dike. Lastly, we want to quantify the effectiveness of a dune-in-front-of- a-dike as a mitigation measure against sand accumulation in the built environment during strong sand transport events, also on the long term. This proposed research will providing the necessary input for the development of a framework that offers guidance for planning, accessing, designing, and implementing Nature-based Solutions.

<sup>1</sup> "Project number" refers to the institutional project number. This question is optional since not every institution has an internal project number different from the GrantID. Applicants can only provide one project number.

<sup>2</sup> 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.

<sup>3</sup> Research Organization Registry Community. <https://ror.org/>

## 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<sup>4</sup>.

Dataset Name	Description	New or Reused	Digital or Physical	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR PHYSICAL DATA
				Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
Meteorological data – Local	(WP1) – Vertical wind profiles, -direction, temperature and transport intensity are measured during non-transport and transport events. Data is recorded every second and stored on a Campbell Scientific datalogger every 20 seconds	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> .txt	<input checked="" type="checkbox"/> < 1 GB	
Meteorological data – Regional	(WP1& WP2& WP3) – Windspeed, -direction and precipitation are recorded every 10min and provided by <i>Meetnet Vlaamse Banken</i>	<input checked="" type="checkbox"/> Reuse existing data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> .txt	<input checked="" type="checkbox"/> < 100 MB	
Hydro-Meteorological data – Local	(WP1) – Measuring bouy and three measuring poles for wave conditions	<input checked="" type="checkbox"/> Reuse existing data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> other: .xlsx	<input checked="" type="checkbox"/> < 100 MB	

<sup>4</sup>Add rows for each dataset you want to describe.

	nearby the artificial test dike.						
Hydro-Meteorological data – Regional	(WP1) – Wave height, -direction, water levels and tides are recorded every 10min and provided by <i>Meetnet Vlaamse Banken</i>	<input checked="" type="checkbox"/> Reuse existing data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> .txt	<input checked="" type="checkbox"/> < 100 MB	
Transport limiting factors – Vegetation and brushwood fences	(WP1) – Plant height (m) and width (m) is measured per unit surface area (1m²). Measuring of fence height and taking photos to calculate density of fences.	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> other: .xlsx <input checked="" type="checkbox"/> other: .jpeg	<input checked="" type="checkbox"/> < 100 MB <input checked="" type="checkbox"/> < 1 GB	
Topographical data (Dune Morphology & Beach dynamics) – Dronedata	(WP1 & WP2) – Monthly drone surveys of dune and beach topography is provided by ATO (DEM, Ortho and Report)	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> other: .tfw <input checked="" type="checkbox"/> other: .tiff <input checked="" type="checkbox"/> other: .jgw <input checked="" type="checkbox"/> other: .jpg <input checked="" type="checkbox"/> other: .xslm <input checked="" type="checkbox"/> other: .xlsx <input checked="" type="checkbox"/> other: .vrt <input checked="" type="checkbox"/> other: .las <input checked="" type="checkbox"/> other: .pdf	<input checked="" type="checkbox"/> < 1 TB	
Topographical data (Dune Morphology) – RTK-GNSS	(WP1) – RTK-GNSS measurements of erosion along transects will be conducted after storms.	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> .csv	<input checked="" type="checkbox"/> < 1 GB	
AeoLIS model	(WP1) – An updated version of the process based AeoLIS model	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Simulation data	<input checked="" type="checkbox"/> .txt	<input checked="" type="checkbox"/> < 1 GB	

	will be available, including detailed feedback mechanisms between sand trapping and vegetation growth.						
XBeach model	(WP1 & WP2) – Modelling of dune and beach erosion.	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Simulation data	<input checked="" type="checkbox"/> other: .m <input checked="" type="checkbox"/> other: .mat	<input checked="" type="checkbox"/> < 1 GB	
Riegl Scan Dataset	(WP2) – In the period 2017-2018, for nearly a year, a Riegl®VZ-2000 terrestrial LiDAR scanned a 400m wide stretch of the beach at Mariakerke.	<input checked="" type="checkbox"/> Reuse existing data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> other: .laz	<input checked="" type="checkbox"/> < 1 TB	
Topographical data (Beach dynamics) – RTK-GNSS	(WP2) – Six cross-shore profiles will be measured biweekly at minimum and more frequently during several spring-neap tide cycles by GPS-GNSS beach field monitoring	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> .csv	<input checked="" type="checkbox"/> < 100 MB	
Sandflux – Permanent	(WP3) – A permanent sand trap will be installed on the dike to measure sand flux.	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Physical	<input type="checkbox"/> Observational			Kg (depending on wind velocity)
Sandflux – MWAC	(WP3) – During strong transport events, we will deploy Modified Wilson and Cook (MWAC) or Sherman type sand traps across the respective dune-type areas. The	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Physical	<input checked="" type="checkbox"/> Observational			Kg (depending on wind velocity)

	sand traps will be exposed to the wind for tens of minutes depending on transport intensity. Samples will be taken from the trapped sand and sand surface to determine particle size distribution						
Ad-hoc photographic Dataset	(WP3) – Before and after (and if possible, during) heavy wind conditions, an area of 100m (50m on each side of the sandtrap) will be photographed. The promenade and tram tracks, where the sand trap is being located, will be once photographed in detail, afterwards only the places with sand will be mapped.	<input checked="" type="checkbox"/> Generate new data	<input checked="" type="checkbox"/> Digital	<input checked="" type="checkbox"/> Observational	<input checked="" type="checkbox"/> other: .jpeg	<input checked="" type="checkbox"/> < 1 GB	

***GUIDANCE:***

*DATA CAN BE DIGITAL OR PHYSICAL (FOR EXAMPLE BIOBANK, BIOLOGICAL SAMPLES, ...). DATA TYPE: DATA ARE OFTEN GROUPED BY TYPE (OBSERVATIONAL, EXPERIMENTAL ETC.), FORMAT AND/OR COLLECTION/GENERATION METHOD.*

*EXAMPLES OF DATA TYPES: OBSERVATIONAL (E.G. SURVEY RESULTS, SENSOR READINGS, SENSORY OBSERVATIONS); EXPERIMENTAL (E.G. MICROSCOPY, SPECTROSCOPY, CHROMATOGRAMS, GENE SEQUENCES); COMPILED/AGGREGATED DATA<sup>5</sup> (E.G. TEXT & DATA MINING, DERIVED VARIABLES, 3D MODELLING); SIMULATION DATA (E.G. CLIMATE MODELS); SOFTWARE, ETC.*

*EXAMPLES OF DATA FORMATS: TABULAR DATA (.POR, . SPSS, STRUCTURED TEXT OR MARK-UP FILE XML, .TAB, .CSV), TEXTUAL DATA (.RTF, .XML, .TXT), GEOSPATIAL DATA (.DWG, . GML, ..), IMAGE DATA, AUDIO DATA, VIDEO DATA, DOCUMENTATION & COMPUTATIONAL SCRIPT.*

*DIGITAL DATA VOLUME: PLEASE ESTIMATE THE UPPER LIMIT OF THE VOLUME OF THE DATA PER DATASET OR DATA TYPE.*

*PHYSICAL VOLUME: PLEASE ESTIMATE THE PHYSICAL VOLUME OF THE RESEARCH MATERIALS (FOR EXAMPLE THE NUMBER OF RELEVANT BIOLOGICAL SAMPLES THAT NEED TO BE STORED AND PRESERVED DURING THE PROJECT AND/OR AFTER).*

<sup>5</sup> These data are generated by combining multiple existing datasets.

<p>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.</p>	<ul style="list-style-type: none"> <li>- (Hydro-) Meteorological data – Regional <a href="https://meetnetvlaamsebanken.be/">https://meetnetvlaamsebanken.be/</a></li> <li>- Riegl Scan Dataset TU Delft NETID</li> <li>- Hydro-Meteorological data – Regional Living lab Raversijde</li> </ul>
<p>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, please describe these issues further and refer to specific datasets or data types when appropriate.</p>	<input checked="" type="checkbox"/> No
<p>Will you process personal data<sup>6</sup>? If so, briefly describe the kind of personal data you will use. Please refer to specific datasets or data types when appropriate. If available, add the reference to your file in your host institution's privacy register.</p>	<input checked="" type="checkbox"/> No
<p>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.</p>	<input checked="" type="checkbox"/> No

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<sup>6</sup> See Glossary Flemish Standard Data Management Plan

<p>Do existing 3<sup>rd</sup> party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)?</p> <p>If so, please explain to what data they relate and what restrictions are in place.</p>	<input checked="" type="checkbox"/> No
<p>Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use?</p> <p>If so, please explain to what data they relate and which restrictions will be asserted.</p>	<input checked="" type="checkbox"/> No



### 3. Documentation and Metadata

<p>Clearly describe what approach will be followed to capture the accompanying information necessary to keep <b>data understandable and usable</b>, 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).</p>	<p>The collected and analysed data, along with associated scripts, are stored in (OneDrive-) folders that are labelled to indicate the type of data and the relevant work package to which they belong. Each file or folder is labelled with the corresponding measurement date. A ReadMe file that describes the organization and content of the MATLAB scripts is included. In addition, each file contains clear in-line comments that provide documentation for the code. The data acquisition parameters, processing steps, and script structures are currently described in OneNote.</p>
<p>Will a metadata standard be used to make it easier to <b>find and reuse the data</b>?</p> <p>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.</p> <p><i>REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.</i></p>	<p><input checked="" type="checkbox"/> No</p> <p>If no, please specify (where appropriate per dataset or data type) which metadata will be created:</p> <p>This PhD-project is being conducted within the <i>Living lab Raversijde</i>, in this <i>Living lab</i> multiple projects of different universities and companies are carried out. Data will be stored conform the standard determined by <i>Living lab</i>.</p>

#### 4. Data Storage & Back-up during the Research Project

Where will the data be stored?	<ul style="list-style-type: none"> <li>- Local desktop file storage on the researcher's personal KU Leuven network drive.</li> <li>- Local desktop file storage on the shared KU Leuven network drive.</li> <li>- Cloud-based storage on KU Leuven OneDrive for Business.</li> <li>- External hard drives.</li> </ul>
<p>How will the data be backed up?</p> <p><i>WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS? DESCRIBE THE LOCATIONS, STORAGE MEDIA AND PROCEDURES THAT WILL BE USED FOR STORING AND BACKING UP DIGITAL AND NON-DIGITAL DATA DURING RESEARCH.<sup>7</sup></i></p> <p><i>REFER TO INSTITUTION-SPECIFIC POLICIES REGARDING BACKUP PROCEDURES WHEN APPROPRIATE.</i></p>	Local desktop file storage, with automated backups on the researcher's personal KU Leuven network drive and regular backups on the shared network drive and the external hard drives.
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.	<input checked="" type="checkbox"/> Yes <ul style="list-style-type: none"> <li>- Local desktop file storage on the researcher's personal KU Leuven network drive.</li> <li>- Local desktop file storage on the shared KU Leuven network drive.</li> <li>- Cloud-based storage on KU Leuven OneDrive for Business.</li> <li>- External hard drives.</li> </ul>
<p>How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?</p> <p><i>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. <sup>7</sup></i></p>	This project does not involve the use of sensitive personal data. However, access to both cloud and ICTS based storage solutions is restricted to authorized personnel with proper credentials that are centrally managed. This ensures that unauthorized access through legal means is not possible.
What are the expected costs for data storage and backup during the research project? How will these costs be covered?	If expenses arise, a portion of the allocated FWO project budget may be utilized. Nevertheless, there is currently no anticipation of such expenses.

<sup>7</sup> Source: Ghent University Generic DMP Evaluation Rubric: <https://osf.io/2z5g3/>

## 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...).	All data will be retained for at least five years.
Where will these data be archived (stored and curated for the long-term)?	Data will be archived on the local desktop file storage on the shared KU Leuven network drive and within <i>Living lab Raversijde</i> .
What are the expected costs for data preservation during the expected retention period? How will these costs be covered?	If expenses arise, a portion of the allocated FWO project budget may be utilized. Nevertheless, there is currently no anticipation of such expenses.

## 6. Data Sharing and Reuse

<p>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.</p> <p><small>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 &amp; RESTRICTED ACCESS. FOR MORE INFORMATION: <a href="https://wiki.surfnet.nl/display/standards/info-eu-repo/#INFOEU-REPO-ACCESSRIGHTS">HTTPS://WIKI.SURFNET.NL/DISPLAY/STANDARDS/INFO-EU-REPO/#INFOEU-REPO-ACCESSRIGHTS</a></small></p>	<p><input checked="" type="checkbox"/> Yes, in a restricted access repository (after approval, institutional access only, ...) The metadata will be publicly accessible. The real data will be available, but only upon request through the supervisor or <i>Living lab Raversijde</i>.</p>
<p>If access is restricted, please specify who will be able to access the data and under what conditions.</p>	<p>The metadata will be publicly accessible. The real data will be available, but only upon request and approval by the supervisor or <i>Living lab Raversijde</i>.</p>
<p>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.</p>	<p><input checked="" type="checkbox"/> No</p>
<p>Where will the data be made available? If already known, please provide a repository per dataset or data type.</p>	<p>Data will be made available through <i>Living lab Raversijde</i>.</p>
<p>When will the data be made available? <small>THIS COULD BE A SPECIFIC DATE (DD/MM/YYYY) OR AN INDICATION SUCH AS 'UPON PUBLICATION OF RESEARCH RESULTS'.</small></p>	<p>Once the main results of the project are published, the information will become accessible.</p>

<p><b>Which data usage licenses are you going to provide? If none, please explain why.</b></p> <p><i>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.</i></p> <p><i>EXAMPLE ANSWER: E.G. "DATA FROM THE PROJECT THAT CAN BE SHARED WILL BE MADE AVAILABLE UNDER A CREATIVE COMMONS ATTRIBUTION LICENSE (CC-BY 4.0), SO THAT USERS HAVE TO GIVE CREDIT TO THE ORIGINAL DATA CREATORS."</i><sup>8</sup></p>	<p>In order to ensure proper attribution and credit to the original creators of the data, it is important to include a citation to the previously published paper when reusing the data.</p>
<p><b>Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here.</b></p> <p><i>INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.</i></p>	<p><input checked="" type="checkbox"/> Yes If yes: DOI</p>
<p><b>What are the expected costs for data sharing? How will these costs be covered?</b></p>	<p>Although it is anticipated that data publication will not incur any costs, if necessary, a portion of the allocated FWO project budget may be used to cover any expenses that arise.</p>

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<sup>8</sup> Source: Ghent University Generic DMP Evaluation Rubric: <https://osf.io/2z5g3/>

## 7. Responsibilities

Who will manage data documentation and metadata during the research project?	The PhD-student, Jennifer Derijckere, bears the responsibility for the data documentation & metadata.
Who will manage data storage and backup during the research project?	The PhD-student, Jennifer Derijckere, bears the responsibility for data storage & back up during the project.
Who will manage data preservation and sharing?	The PhD-student, Jennifer Derijckere, and its supervisor, Prof. Pieter Rauwoens, share the responsibility for ensuring data preservation and sharing.
Who will update and implement this DMP?	The PhD-student, Jennifer Derijckere, bears the overall responsibility for updating & implementing this DMP.