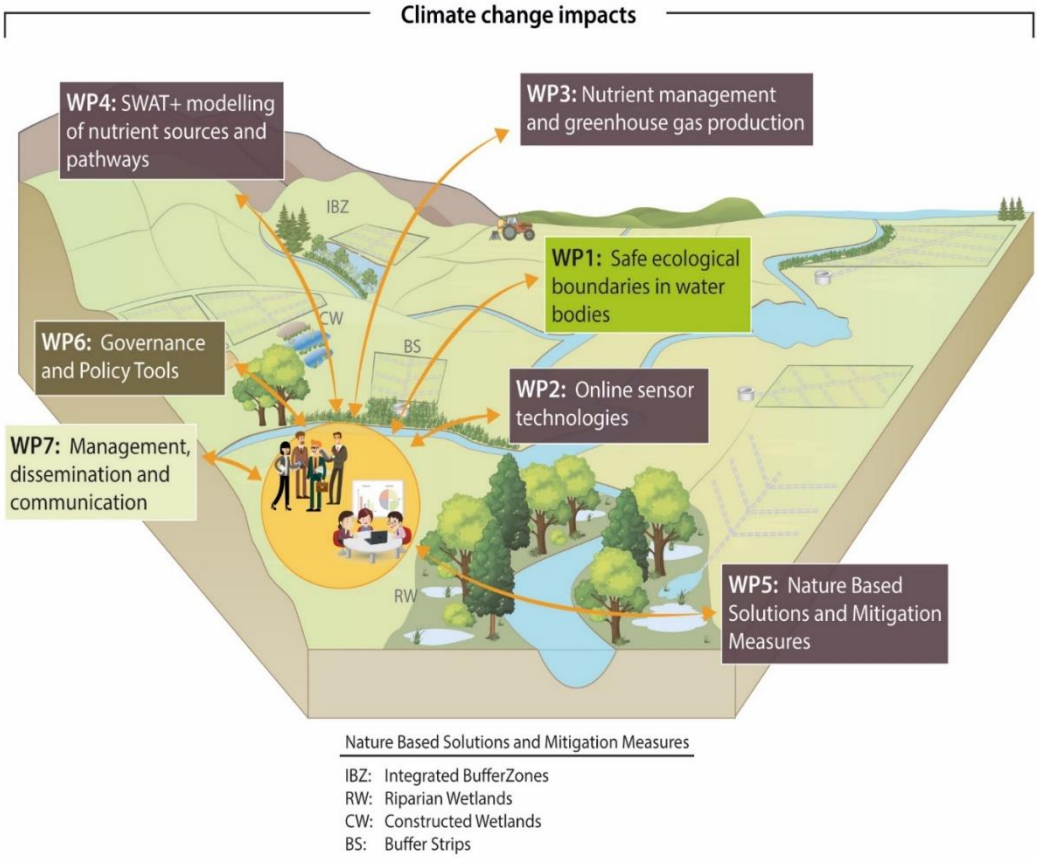

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Data Management Plan Template

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		▪

Action Number: [101060020]

Action Acronym: [NORDBALT-ECOSAFE]
Action title: [Nitrogen and phosphorus load reduction approach within safe ecological boundaries for the Nordic-Baltic region]

Participating institutes in the project :

Aarhus Universitet (AU), Denmark
Norsk Institut for Vannforskning (NIVA), Norway
Sveriges Lantbruksuniversitet (SLU), Sweden
Oulun Yliopisto (UOULU), Finland
Szkola Glowna Gospodarstwa Wiejskiegp (SGGW), Poland
Latvijas Lauksaimniecibas Universitate (LLU), Latvia
Norsk Institut for Biookonomi (NIBIO), Norway
Suomen Ymparistokeskus (SYKE), Finland

Date: [24. February 2023]

DMP version: [NORDBALT-ECOSAFE DMP-01]

1. Data Summary

NORDBALT-ECOSAFE's mission is to focus on how to set and achieve safe ecological boundaries for nitrogen and phosphorus in surface waters across the Nordic-Baltic region of Europe. Because the project takes a fact-based approach, its findings are primarily based on the collection of empirical data as well as inputs from meetings with stakeholders in the region to achieve the promised project deliverables.

Within NORDBALT-ECOSAFE we will collect and assess existing data primarily in excel format. Moreover, for model work in the project also input data in GIS-format will be used in the project.

The following data types and formats are expected

- Contact data of different user groups (spreadsheets)
- Biophysical data (qualitative and quantitative; spreadsheets, databases)
- GIS data (quantitative; shapefiles, geo data)
- General narrative data (qualitative texts) from e.g. Mentimeter questions, questionnaires, etc.

Especially in the starting phase of the project data will mainly be unstructured or only partially structured documents (e.g. texts, pdfs, spread sheets) and will be shared by NORDBALT-ECOSAFE researchers working together within a specific WP's on different topics. These data will be stored in the NORDBALT-ECOSAFE internal repository in a project channel in Teams and on a repository at Aarhus University.

NORDBALT-ECOSAFE is also utilizing existing water chemistry and biological indicator data from streams, rivers and lakes within the countries participating in the project. These data will be transferred to WP-partners utilizing spreadsheets and stored on the project Teams channel and repositories at the participating institute (NIVA).

Also modelling of reference conditions in the participating countries will be performed utilizing models developed in Sweden and based on input data in spreadsheets from partner countries. The outcome will be publically shared as a project deliverable on the EU portal and the project homepage (https://projects.au.dk/nordbalt-ecosafe).

NORDBALT-ECOSAFE is also looking into usage of existing riverine monitoring data from the HELCOM and OSPAR databases. These data will be made available to NORDBALT-ECOSAFE partners through WP-leaders downloading data from the official databases.

Case study data will be used in NORDBALT-ECOSAFE six river basins being modelled with the SWAT+ model for analysis and interpretation of water and nutrient cycling in river basins. These results will provide the basis for decision makers on how to reach safe ecological conditions in surface waters utilizing mitigation measures. The data generated in SWAT+ modelling will provide the indispensable basis for the fact-based approaches in NORDBALT-ECOSAFE.

The stakeholder-related data on e.g. choice of mitigation measures and governance methods will be an important element of the NORDBALT-ECOSAFE findings. Output data from stakeholder meetings will be shared within the project, and stored on the project Teams channel and at the lead partner institute in a trusted repository named 'QSTAR' at Aarhus University.

The benefits of NORDBALT-ECOSAFE data lie firstly in the downstream analysis and interpretation, which is conducive to fact-based decision making. Second, the data allow for the testing of specific scientific questions. NORDBALT-ECOSAFE data will therefore be useful for catchment managers and various stakeholders in the field of achieving safe ecological conditions in water bodies but also for scientists, policy makers and NGOs.

2. FAIR data

2.1. Making data findable, including provisions for metadata

All data sources used in the NORDBALT-ECOSAFE project will be mostly secondary data – that is extracted from either inputs from participating institutes or data extracted from public databases like HELCOM, OSPAR, national databases, etc.

All WP case study related information and results will be stored in the NORDBALT-ECOSAFE Case Study Portal on Teams. All meta-data produced will be published on the NORDBALT website (https://projects.au.dk/nordbalt-ecosafe) and stored in a trusted depository 'QSTAR' at Aarhus University.

NORDBALT-ECOSAFE WP1 will collect existing information and data on nutrient reference conditions in surface waters and ecological safe boundaries. Data collected in excel will be made public available on the website. The same will be the case with the new model data results on reference conditions in river and lakes types in the region.

NORDBALT-ECOSAFE WP2 will link to real-time water quality sensor data that will be on display via the NORDBALT-ECOSAFE website and thus be public visible. However, these primary sensor data will not be public available before published by the data owners.

NORDBALT-ECOSAFE WP4 is working with setting up the SWAT+ model in six project catchments and here input data either being GIS data or monitoring data as well as the results data from the model runs will be stored in the same case study portal and made public available on the NORDBALT-ECOSAFE website.

NORDBALT-ECOSAFE WP5 will work with production of fact sheets that will be public available on the project website. A developed framework for choosing of mitigation measures will also be made public available on the website as well as in the open access repository as ZENODO and be given a DOI. ZENODO follows the FAIR principles and guaranty 20 years lifetime from 2020.

NORDBALT-ECOSAFE WP6 will mainly produce questionnaire data from stakeholders and these will be made available in an aggregated form as meta-data on the project website.

Once WP case study data (SWAT+ model) from catchments have been analysed and results are being published data will be made available in an open access repository linked to the project website and in an open access repository like ZENODO and be given a DOI. ZENODO follows the FAIR principles and guaranty 20 years lifetime from 2020.

2.2. Making data accessible

If and how data will be made openly available depends to a large degree on the data realms and types.

Personal data to be handled in the NORDBALT-ECOSAFE project are likely to appear from WP organisations and stakeholder involvements, where we will use surveys and dialogue events to collect relevant information Following the General Data Protection Regulation (GDPR), all personal data that is collected within the project will always be kept confidentially within NORDBALT-ECOSAFE and for NORDBALT-ECOSAFE use exclusively.

Regarding primary data it is planned to make all data produced within NORDBALT-ECOSAFE publicly available. The time for open publication depends on WP progress. Data will be available after the project's end at the latest, but we will allow for embargo periods until corresponding journal articles are published. Most datasets will be published under a Creative Commons CC BY licence at Aarhus University in a trusted depository 'QSTAR'.

Should primary NORDBLAT-ECOSAFE data contain personal data, we must respect participants right to confidentiality and the need to comply with the GDPR. We will anonymise such data where it is feasible and will produce data of relevance and use for future re-analysis. The main example of this type of data is

that arising from surveys assessing stakeholders' opinions, where information about personal identities can be detached from the other variables, rendering the remaining dataset fully anonymised.

In terms of secondary data, i.e. data gathered from outside the project, openly accessible publication will depend on agreements with data providers. In case raw data will be kept confidential, at least aggregated summaries of these data will be available through NORDBALT-ECOSAFE deliverables or publications. During the lifetime of the project these data, will be accessible for project partners via the NORDBALT-ECOSAFE Teams channel.

All datasets will be documented with publicly available metadata, e.g. in the project website and in a trusted repository at Aarhus University. The website will be hosted for the time period of the project and two years after project closure.

As far as we can evaluate right now, most of the NORDBALT-ECOSAFE data will be collected in spreadsheets, as text files or as geo data and therefore do not need any specific software or documentation to allow further use.

2.3. Making data interoperable

Data produced in the project will be processed and stored in established software applications to allow widest re-use as possible. Should there be any special format of data, the use of it will be documented alongside an accompanying software if necessary.

As outlined above most of the metadata from NORDBALT-ECOSAFE will be in excel format. Data for SWAT+ model will be stored either in excel format or QGIS format with a documentation of published data regarding methods used for sampling, analysis, units, data cleaning and quality assurance, etc. will be included as readme files and information pages following the data.

2.4. Increase data re-use

Meta-data published within NORDBALT-ECOSAFE may be re-used by people related to the areas covered by the project consortium: persons working in ecology and other environmental sciences, catchment managers, social scientists, as well as politicians and a variety of other stakeholders. A documentation of published data regarding methods used for sampling, analysis, units, data cleaning and quality assurance, etc. will be included as readme files and information pages following the data.

For any dataset requiring a licence we suggest to use the Creative Commons Attribution 4.0 International (CC BY 4.0) that allows sharing and adapting data provided appropriate credit and indication if changes were made. For datasets we recommend the Open Data Commons Attribution License (ODC-By) that allows users to share, create derived data and adapt the data as long as attribution is given to the creator.

As the full scope of data generated and used in NORDBALT-ECOSAFE still needs to be evaluated, we might add other licence recommendations later on including all relevant data quality assurances.

As stated above, primary data will be made available as soon as data analysis allows, after the end of the project at the latest. If the publication of results (i.e. through journal articles) is not finalised by then, data will be made available under an embargo.

Publication of secondary data depends on the specifications from data providers and will be amended here at a later stage.

3. Other research outputs

The SWAT+ model setup in the six project catchments will be made public available for re-use in in an open access repository like ZENODO and be given a DOI. ZENODO follows the FAIR principles and guaranty 20 years lifetime from 2020.

4. Allocation of resources

As far as assessable right now, the only costs that will be incurred in terms of data management are related to the server(s) required to run the NORDBALT-ECOSAFE website and the working time needed to setup, maintain and evolve this system. These costs were already foreseen in the project budget of the coordinator. The costs of eventual data management in the different project Work Packages are foreseen in the budget for the lead of each project deliverable.

Costs for open access publications in scientific journals lie in the responsibility of partners' budgets.

Data management within NORDBALT-ECOSAFE lies in the hands of partners and the coordinator. The DMP will be updated in the framework of the periodic reporting and whenever there are major changes in data handling. The coordinator from AU will monitor the proper implementation of the DMP.

Additionally, AU will host the NORDBALT-ECOSAFE website for at least 2 years after the project's end.

5. Data security

For internal data exchange and storage until data are made accessible on a public domain, NORDBALT-ECOSAFE is using the Teams channel system and/or a depository at Aarhus University (AU) 'Qstar'. The data centre at AU complies with the strict European data protection regulations.

6. Ethics

Ethics are described in Annex 1 of the NORDBALT-ECOSAFE Description of Action (part B). The NORDBALT-ECOSAFE project coordinator has the overall responsibility for the ethical management of the project.

In terms of consent for data sharing and long-term preservation of personal data, NORDBALT-ECOSAFE will both collect and process personal data in the form of surveys, recorded interviews/meetings or related transcripts. Participants' personal data will be stored and handled confidentially and data will be stored in specifically designated parts of secure servers at AU.

Whenever personal data is concerned, NORDBALT-ECOSAFE will seek fully informed consent in advance of the data collection for any activities. This consent must be given voluntarily by the participants in line with the GDPR. Even though NORDBALT-ECOSAFE favours written consent (i.e. via signing a consent form or informal emails), in several cases oral consent will be the means of choice, for example from virtual meetings. The latter is also true for speakers at NORDBALT-ECOSAFE webinars that will be made available for the public on the project website.

Any published outcomes of the interviews or stakeholder roundtable analyses will report only aggregated summaries of the data and by no way will it be possible from the results to personally identify any of the participants.

Personal data (from inside and outside the project) will be kept in different forms that allow the identification of individuals for no longer than is necessary for the purposes of the NORDBALT-ECOSAFE project and its subsequent outputs. After this period these data will be anonymised or destroyed. Within four years after end of the project, all personal data will have been destroyed.

7. Other issues

None.