



A step change for wave energy

D1.2 Data Management Plan

DMP Version a
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History of Changes		
Location	Description	Date

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Meaning / Full text
CA	Consortium Agreement
CC	Creative Commons
DMP	Data Management Plan
FAIR	Findable, Accessible, Interoperable, Reusable
GA	Grant Agreement
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
PUB	Public
R	Report
SEN	Sensitive
SEP	Standard Ethics Protocol
WP	Work Package
WPn	Work Package number
Dn.m	Deliverable number

1. Data Summary

The implementation of the Data Management Plan will establish the data sharing requirements of the WEDUSEA project and identify the open source and commercially sensitive data that will be generated. The draft Data Management Plan will be issued in M6 and revised in M45. This will be used as a guide for all project partners and associated partners throughout the remainder of the project where it will be adapted and modified to reflect the progression of the project.

Data management will conform to the requirements of FAIR (findable, accessible, interoperable, and re-usable) principles and the primary data repository will be the Horizon Results platform in Europe with input internationally to the IEA-OES Tethys Database. This will make the data Findable and Accessible, will include metadata related to the Outcomes of the project particularly in relation to industry wide relevance learnings. The standardisation of data formats within these repositories will ensure Interoperability and the application of the IEC Technical Specifications will support this standardisation. Data quality control is essential for Re-use and this will be ensured within Work Package 8. The International Electrotechnical Committee has produced a series of Technical Specifications (TS) for the use in the design and operation of marine energy converters. The IEC has also an accredited System for Certification to these Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE) The long term deployment data produced during this demonstration will be the first for a large scale wave energy converter to be used to validate the Standards. There will be a contribution to at least 6 of the current Specifications, some of which are undergoing review. This will lead to a plan for independent Certification using the IECRE System with implementation by the end of the project. (WP8: Assessment of Outcomes relevant to IEC Standards, WP9: Implementation of the Certification Plan)

WEDUSEA led by Irish Wave Energy Developer, Ocean Energy, will demonstrate a grid connected 1MW OE35 floating wave energy converter (known as the OE Buoy) at the European Marine Energy Test Site (EMEC) in Orkney, Scotland. This rigorous technical and environmental demonstration will happen over a 2-year period in Atlantic wave conditions with outcomes directly impacting policy, technical standards, public perception and investor confidence.

The project has 3 clear phases,

- Phase 1 the initial design phase leading into a Go/No Go.
- Phase 2 Demonstration in which it is expected that the baseline device will generate in excess of 1,650 MWh over the deployment.
- Phase 3 Commercialisation and Dissemination which sees the capitalisation and exploitation of the results. Ocean Energy and other consortium companies will actively exploit the results through new innovations, products and services. The results will be disseminated to feed both environmental databases and IEC electrotechnical standards.

During this project, the detailed design efforts conducted will produce detailed design data, performance estimates from computational modeling and bench testing, cost data and performance evaluation estimates at the deployment site. A set of reports will describe the data and accomplishments. Additionally, detailed raw data will be made available in electronic form.

The operational experience during the deployment offshore will also yield valuable data on access limits of the device in various weather conditions and the parameters related to offshore Operations and Maintenance and Insurance. (WP6: 2-year Deployment of 1MW OE Buoy).

The WEDUSEA project is an opportunity for extended environmental monitoring to be undertaken at a wave energy site with a device deployed. The data will be used to inform the next edition of the State of the Science produced by the IEA OES Environmental Annex. It will also provide Regulators with better data and models to reduce the uncertainty around environmental impacts of wave energy (WP7: Environmental Monitoring and Impact)

1.1. Data Volumes and Data Storage

An estimate of the volume of all the data that will be collected, acquired, and generated during the operation of the instrumentation and sensors on the OE buoy is provided here for reference. The volume of data will be dependent on the data acquisition sample rates and will vary from e.g., ten (10) samples per second (SPS) per sensor where a low sampling rate is required (for example for measurements that do not change quickly over time including pressure, temperature, humidity etc.) to higher sampling rates of 50,000 SPS i.e., 50 kSPS (or above) for fast dynamic measurements. If each acquired sample is sampled at 16-bits which is the digitiser (ADC) resolution, this equates to two (2) data Bytes per sample, corresponding to 20 Bytes per second (BPS) for the 10 SPS sample and 100 kBytes per second (kBPS) for the 50 kSPS sample.

In addition to the sensors, up to six (6) digital cameras onboard the OE buoy will also be continuously operating and streaming data to a network video recorder (NVR). If we assume that each camera generates high-definition video at 6 GB per hour.

The above estimates of data volumes are summarised in the following tables. Assumptions made are 31 days per calendar month, 24 hours of operation per day and each data sample is two (2) bytes.

Table 1: Data Volumes

Measurement Type	Sampling Rate (kSPS) per sensor	Data Size (kB per second) per sensor.	Data Size (kB per minute) per sensor.	Data Size (kB per hour) per sensor	Data Size (MB per day) per sensor	Data Size (MB per week) per sensor	Data Size (MB per month) per sensor
Slow (Pseudo Static)	0.01	0.02	1.2	72	1.73	12.1	53.63
Measurement Type	Sampling Rate (kSPS) per sensor	Data Size (MB per second) per sensor.	Data Size (MB per minute) per sensor.	Data Size (MB per hour) per sensor	Data Size (GB per day) per sensor	Data Size (GB per week) per sensor	Data Size (GB per month) per sensor
Fast (Dynamic)	50	0.1	6	360	8.65	60.5	268
Measurement Type	Sampling Rate (kSPS) per sensor	Data Size (MB per second) per sensor.	Data Size (MB per minute) per sensor.	Data Size (GB per hour) per sensor	Data Size (GB per day) per sensor	Data Size (TB per week) per sensor	Data Size (TB per month) per sensor
Camera (high streaming rates)	-	-	-	6	144	1	4.5

Based on the above information, assuming we have 30 slow measuring sensors, 15 fast measuring sensors and 6 cameras, this equates to a requirement of approximately 30 TB per calendar month. This is summarised below.

Measurement Type	Quantity of sensors	Approx. Total Data Size (GB per day)	Approx. Total Data Size (TB per week)	Approx. Total Data Size (TB per month)
Slow (Static)	30	0.052	0.36-03	1.6E-03
Fast (Dynamic)	15	130	0.91	4.03
Camera (high streaming rates)	6	864	6.05	26.8

1.2. Data Processing Levels

Data products are processed at various levels ranging from Level 0 to Level 4 and where applicable Level 5. Level 0 products are raw unprocessed instrument data. At higher levels (L1 to L3), the data are further processed and converted into more useful parameters and formats. At Level 4 (L4), L3 data is further processed and integrated with additional ancillary data and met data where such data is available and applicable. Modelled data if available can also be integrated at this level. Level 5 (L5) SDPs are the final and complete set of data products to be made available for public, private and commercial use. Such data products have been fully processed, validated and quality checked. All instruments must have Level 0 Standard Data Products (SDPs); and most have SDPs at Levels 1, 2 and 3 respectively; and many have Level 4 SDPs. Level 5 Specifications for the set of SDPs to be generated are to be provided by the OE and the project partners and associated partners to ensure completeness and consistency in providing a comprehensive science data output for WEDUSEA. Details of the proposed SDP levels are summarised in the following table:

Table 2: Data Product Levels

Level	Description
Level 0 (L0)	Raw unprocessed instrument data (e.g., representing mA, mV/V etc..) as acquired and locally stored in the different file formats (e.g., json, csv, bin etc..)
Level 1 (L1)	Level 1A (L1A) - Metadata added to raw unprocessed data
	Level 1B (L1B) - Data processed to sensor units (e.g., deg C, Pa, m/s ² etc.)
	Level 1C (L1C) -Sensor calibrations (where available) applied – Output is a calibrated time series data
Level 2 (L2)	Level 2A (L2A) First level of processing (quantitative – temporal and/or spatial) – outliers flagged,
	Level 2B (L2B) Data corrected for outliers and any instrument features (e.g., systematic errors, hysteresis, DC offset, drift etc.).
Level 3 (L3)	Second level of processing (qualitative) on amalgamated Calibrated time series data
Level 4 (L4)	Data have had the greatest amount of processing applied, incorporating where appropriate ancillary data, met data, and possibly including/integrating modelled output (and measurements from multiple days).
Level 5 (L5)	Data products assigned, archived and made available for public, private, commercial use.

1.3. Deliverable Reports

A set of deliverable reports will be produced that will describe and disseminate results from the WEDUSEA project.

Content and Format

The deliverables of the project are as provided in the following table:

Table 3: Deliverable Reports

Deliverable	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D1.1	Risk Management Plan	1	OE	R	SEN	6
D1.2	Data Management Plan	1	OE	DMP	PU	6
D1.3	WP2 Design Review Summary Report and Comment Sheets	1	OE	R	SEN	8
D1.4	WP2 Implementation Plan and Deliverables for Go/No Go Submission	1	OE	R	SEN	8
D1.5	Construction Site Visit Report and	1	OE	R	SEN	15
D1.6	Post Construction Report	1	OE	R	SEN	19
D1.7	System Integration Completion Certificate and Summary Report	1	OE	R	SEN	21
D1.8	Data Management Plan Update	1	OE	DMP	PU	45
D1.9	Project Management Plan Initial Release	1	OE	R	SEN	2
D1.10	Project Management Plan Update Reporting Period One	1	OE	R	SEN	12
D1.11	Project Management Plan Update Reporting Period Two	1	OE	R	SEN	30
D1.12	Project Management Plan Update Reporting Period Three	1	OE	R	SEN	48
D2.1	Design Report for WEC Hull	2	OE	DEM	SEN	8
D2.2	Design Report for Turbine and Air Flow Control System	2	OE	DEM	SEN	8
D2.3	Design Report for Electrical Power System	2	OE	DEM	SEN	8
D2.4	Complete Design Report for Data Acquisition System	2	OE	DEM	SEN	8
D2.5	Design Report for Ancillary Systems	2	OE	DEM	SEN	8
D2.6	Design Report for Moorings & Umbilical System	2	OE	DEM	SEN	8
D2.7	Report on Site Consents and Insurance	2	OE	R	PU	8
D2.8	Complete Environmental Monitoring Plan	2	OE	R	PU	8
D2.9	Report with Marine Operations Plan	2	OE	R	SEN	8
D2.10	Report on the Plan for Commissioning and System Integration at Marshalling Site	2	OE	R	SEN	8
D2.11	Certification Plan	2	OE	R	PU	8

Deliverable	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D2.12	Business Plan and Plan to Financial Close	2	OE	R	SEN	8
D2.13	Overall Summary of Pre-procurement	2	OE	R	SEN	8
D3.1	Draft plan for the dissemination and exploitation of results	3	UNEXE	R	PU	6
D4.1	Testing of PTO system completed at IEE laboratory	4	IEE	DATA	SEN	17
D4.2	Digital twin of the OE device system and licencing model ready for integration into planning tools for future external use.	4	IEE	OTHER	SEN	17
D4.3	Completed OE35 hull delivered to the Marshalling Site	4	IEE	R	PU	18
D4.4	Completed Turbine and Air Flow Control System delivered to the Marshalling Site	4	IEE	R	PU	18
D4.5	Complete electrical power system delivered to the Marshalling Site	4	IEE	R	PU	17
D4.6	Report on the testing of the Mooring Tether	4	IEE	R	SEN	19
D5.1	Deployment Plan/Method Statement for Operations	5	OE	R	PU	21
D5.2	Moorings and Umbilical installation operations report	5	OE	R	SEN	22
D5.3	Post Install WEC Commissioning Report	5	OE	R	SEN	24
D5.4	Decommissioning Report	5	OE	R	SEN	48
D6.1	Routine Inspection Reports (M4 of Deployment)	6	GREEN	R	SEN	27
D6.2	Routine Inspection Reports (M7 of Deployment)	6	GREEN	R	SEN	30
D6.3	Routine Inspection Reports (M12 of Deployment)	6	GREEN	R	SEN	35
D6.4	Routine Inspection Reports (M18 of Deployment)	6	GREEN	R	SEN	41
D6.5	Routine Inspection Reports (M24 of Deployment)	6	GREEN	R	SEN	47
D6.6	Routine Maintenance Reports (M4 of Deployment)	6	GREEN	R	SEN	27
D6.7	Routine Maintenance Reports (M7 of Deployment)	6	GREEN	R	SEN	30
D6.8	Routine Maintenance Reports (M12 of Deployment)	6	GREEN	R	SEN	35
D6.9	Routine Maintenance Reports (M18 of Deployment)	6	GREEN	R	SEN	41
D6.10	Routine Maintenance Reports (M24 of Deployment)	6	GREEN	R	SEN	48
D6.11	Report on Operational Limits and Access Methods	6	GREEN	R	SEN	47

Deliverable	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D6.12	Report on Tether replacement operations	6	GREEN	R	PU	36
D6.13	Health and Safety Procedures report.	6	GREEN	R	PU	47
D7.1	Airborne And Underwater OE Technology Signature Report	7	EMEC	R	PU	36
D7.2	OE Technology Ecological Impact Report: Year 1	7	EMEC	R	PU	35
D7.3	OE Technology Ecological Impact Report: Year 2	7	EMEC	R	PU	47
D7.4	Environmental monitoring system design and performance analysis	7	EMEC	R	PU	47
D7.5	Results of seabird surveys and observations: Year 1.	7	EMEC	R	PU	35
D7.6	Results of seabird surveys and observations: Year 2.	7	EMEC	R	PU	47
D7.7	Overall Environmental Monitoring Analysis and Report	7	EMEC	R	PU	47
D8.1	Power Performance Assessment test report	8	UCC	R	SEN	47
D8.2	Verification report of mooring system	8	UCC	R	PU	47
D8.3	Assessment report for availability, reliability and operations: Year 1	8	UCC	R	SEN	35
D8.4	Assessment report for availability, reliability and operations: Year 2	8	UCC	R	SEN	47
D8.5	Report on contribution to International Standards	8	UCC	R	PU	47
D9.1	Report on Operations Modelling	9	INNO	R	PU	39
D9.2	Completion of Certification Plan	9	INNO	R	PU	47
D9.3	Report on the Potential for Cost Reductions	9	INNO	R	PU	47
D9.4	Report on the Potential for LCOE Reductions	9	INNO	R	PU	47
D9.5	Report with Designs and costings for future array deployments to achieve utility scale installation	9	INNO	R	SEN	47
D9.6	Report on Commercialisation Opportunities and other markets	9	INNO	R	PU	47
D10.1	Information Brochures Project M18	10	UNEXE	DEC	PU	18
D10.2	Information Brochures Project M24	10	UNEXE	DEC	PU	24
D10.3	Information Brochures Project M30	10	UNEXE	DEC	PU	30
D10.4	Information Brochures Project M36	10	UNEXE	DEC	PU	36
D10.5	Information Brochures Project M42	10	UNEXE	DEC	PU	42
D10.6	Information Brochures Project M48	10	UNEXE	DEC	PU	48
D10.7	Related scientific and technological articles (Project Month 24)	10	UNEXE	R	PU	24
D10.8	Related scientific and technological articles (Project Month 36)	10	UNEXE	R	PU	36

Deliverable	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D10.9	Related scientific and technological articles (Project Month 48)	10	UNEXE	R	PU	48
D10.10	For each asset/result, presentation “Pitch for investors” Project Month 24	10	UNEXE	R	PU	24
D10.11	For each asset/result, presentation “Pitch for investors” Project Month 36	10	UNEXE	R	PU	36
D10.12	For each asset/result, presentation “Pitch for investors” Project Month 48	10	UNEXE	R	PU	48
D10.13	Final Exploitation Plan	10	UNEXE	R	PU	48

2. FAIR data

This WEDUSEA project DMP describes the data management procedures that are followed according to the FAIR principles¹. The acronym FAIR identifies the main features that the project research data must have in order to be findable, accessible, interoperable and re-useable, allowing thus for maximum knowledge circulation and return of investment.

2.1. Making data findable, including provisions for metadata

Valid and machine readable DOIs (Digital Object Identifiers) allow other repositories to find and identify the datasets deposited by WEDUSEA. All partners and associated partners are strongly recommended to make use of DOI to make datasets produced by WEDUSEA citable for publication. The chosen data repositories need to support standard descriptive metadata to ensure datasets indexing and discoverability also by machines. The project datasets will be made visible through the OpenAIRE portal². All relevant documentation explaining data collection procedures and analysis (such as codebooks, methodologies, etc.) will be made available along with the data, to guarantee intelligibility, reproducibility, and the validation of the project findings through specific information (textual information) or code.

WEDUSEA research data will be organized in datasets, which are collections of data units with the same focus and scope. This DMP identifies the following common rules for dataset naming and versioning in order to improve data visibility, discoverability, citation and permanent online tracking. The recommended title for each dataset consists of:

¹ Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>

² <https://www.openaire.eu/>

PROJECT ACRONYM: WPn: WP title or short description of WP aims: Taskn.m: Task title or short description of specifying Task aims: additional information specifying coverage and nature of data (optional): version number (in case of revisions or updates)

Example:

WEDUSEA: WP2: Front End Engineering Design and Pre-Procurement (FEEDPP) Activity: Task2.1: Design of the Hull.: v.1

The version number of the dataset will be added at the end of the title in case of data revisions to help identifying the dataset updates especially in repositories that do not track versioning automatically.

This DMP recommends also the following rules for file naming (WPn means “work package number” Dn.m is the “deliverable number”, and ver identifies the “version number” (in case of data revisions or updates):

- For dataset file(s)
DATASET_WEDUSEA_WPn_Tn.m_coverage or other content specifications date
(YYYYMMDD)_vn.file extension
- associated to datasets, relevant documentation explaining data collection procedures and analysis (such as codebooks, users’ manuals, methodologies, etc.) are provided in the form of a human readable README file
README_WEDUSEA_WPn_Dn-m_coverage or other content specifications_date
(YYYYMMDD)_vn.file extension

Specific keywords derived, when possible, from Thesauri and controlled vocabularies will be associated to each dataset to enhance semantic discoverability.

The chosen data repositories need to support standard descriptive metadata to ensure datasets indexing and discoverability also by machines. A repository like Zenodo³ satisfies these important requirements. Metadata are assigned a DOI issued to every published record. Metadata of Zenodo are compliant with DataCite Metadata Schema minimum and recommended terms. Metadata of each record is indexed and searchable directly in Zenodo search engine immediately after publishing and sent to DataCite servers during DOI registration and indexed there.

³<https://zenodo.org/>; *Compliance with FAIR principle is described at. <https://about.zenodo.org/principles/>*

2.2. Making data accessible

WEDUSEA seeks to make research data openly available, whenever possible, to allow for dissemination and validation, and to increase the re-use potential of research results. To this purpose, all the files will be converted to standard and well-documented open formats and the datasets that will be deposited will include all relevant documentation and explanation.

During project life, data will be handled by WEDUSEA project servers which will manage the access to project partners and associated partners and their members. At the time of presentation of results in scientific peer-reviewed publications, researchers will deposit the project data that can be shared in a data repository, to guarantee their discoverability, access, and preservation beyond the project end. Such repositories support open licenses and different access levels. Finally, they adopt descriptive metadata standards as required by the OpenAIRE Guidelines and allow cross-linking between publications and the relevant datasets. The specific teams responsible for a specific dataset is responsible for the management in the repository of their choice. Zenodo can be recommended for open dissemination and preservation of research data by all research teams that do not have suitable institutional, national, or disciplinary data repositories or are not bound to use their institutional repositories.

All partners are strongly recommended to make use of DOI to make datasets produced by WEDUSEA citable for publication. The chosen data repositories need to support standard descriptive metadata to ensure datasets indexing and discoverability also by machines. A repository like Zenodo satisfies these important requirements.

All possible and legitimate actions and strategies will be adopted to allow data sharing including:

- Obtaining explicit copyright permissions from third party data owners to be allowed to re-use, reproduce and distribute the collected data when necessary; in this case specific agreement with data owner will be sought;
- Privilege the used of standard open formats or self-descriptive formats for data intended for external users and for internal purposes;
- Providing all relevant documentation and explanation for the data and the datasets, including the procedures adopted to obtain them, versioning, and software for reading data in case of non-standardize formats.

The data will be made openly available to validate the research results immediately at the time of the publication of the corresponding scientific peer-reviewed papers, although some datasets can be made publicly available without the need of publishing a related article, but providing a full description, including quality assurance processes. If datasets are underlying data of public deliverables, an embargo period will be applied to allow full exploitation of research results by the WEDUSEA partners and associated partners. Full citation of datasets will be given in WEDUSEA dissemination means as they will be made available through institutional or public data repositories for long-term/permanent deposit will be given also in the WEDUSEA.

Using formats Open Spreadsheet and Document Editors, such as OpenOffice⁴ or LibreOffice, free .csv viewer⁵, open or free image viewers⁶ and VLC⁷ for mp3 and mpg there will be no need to use specifically tailored software to access project dataset, since prior the deposit researchers will convert the data into open formats. In case of particular software packages used in data processing, full explanation, instructions and code will be included in the deposited documentation or in specialized repositories such as GitHub⁸. Final data formats will need to be efficient and can incorporate metadata and encapsulate compression. A compressed format that is designed to support all data sizes from small to large, heterogeneous, metadata and complex datasets e.g. HDF5, NetCDF

2.3. Making data interoperable

Datasets will be described using other metadata standard or metadata based on general purpose descriptive metadata in order to ensure metadata interoperability for indexing and discoverability or will follow the convention of the hosting research data repository. All relevant documentation explaining codebooks, users' manuals, data collection procedures, processing (including software when necessary), and data quality information will be made available along with the data in order to guarantee intelligibility, reproducibility and the validation of the project findings.

2.4. Increase data re-use

There will be an emphasis on Open Science for research related results to ensure wide dissemination of the non-proprietary Project Results. Various platforms will be considered – Horizon Results and OpenAIRE are the preferred option. Met-Ocean data sets will be made fully available ensuring environmentally relevant data will be Re-usable. The Project Results will also be communicated in several International Conferences and articles published in Open Access Peer Reviewed Journals and industry magazines. The coordinator is committed to the curation of the Project Results beyond the project end, and this is ensured by using internationally available data repositories.

⁴ www.Openoffice.com

⁵ <https://csviewer.com/>

⁶ <https://www.xnview.com>

⁷ <https://www.videolan.org>

⁸ <https://github.com/>

3. Other research outputs

Data management will conform to the requirements of FAIR (findable, accessible, interoperable, and re-usable) principles and the primary data repository will be the Horizon Results platform in Europe with input internationally to the IEA-OES Tethys Database. This will make the data Findable and Accessible, will include metadata related to the Outcomes of the project particularly in relation to industry wide relevance learnings. The standardisation of data formats within these repositories will ensure Interoperability and the application of the IEC Technical Specifications will support this standardisation. Data quality control is essential for Re-use and this will be ensured within Work Package 8. Increase impact by sharing data to the scientific community and the general public at large. This data will include performance, operational, environmental, and health and safety data.

The project Expected Outcomes (EO) will prove the commercial viability of wave energy and the readiness of the technology for multi-MW deployments.

EO1: Demonstrated performance and reliability.

EO2: Improved operational knowledge, reliability, availability, and maintainability for the entire sector.

EO3: LCOE Reductions.

EO4: Reinforced industry supply chain.

EO5: Attraction of investment by achieving a low risk profile.

The following Additional Outcomes (AO) will benefit the industry at a larger scale by removing and mitigating some barriers to commercial success.

AO1: Permitting and Marine Spatial Planning advances and enhanced knowledge.

AO2: Contribution to IEC standards will mature the industry while also reducing the risk profile for investors.

AO3: Overall contribution to reducing the risk associated with wave energy.

4. Allocation of resources

The use of free services for many of the core components of data management are essential in maintaining a long-term preservation of the data. The WEDUSEA project is intended to be a long-term effort that functions after the project end with the support of an established community of energy researchers.

In Work package 8 Task 8.3 Data Archiving will use the Data Management Plan as input and create a database to store all the data generated by the SCADA and DAQ systems and made available after a Quality Assurance process. It will be designed to allow partner access to the data locally and remotely throughout the duration of the project. This database will be the source of data for Task 8.4

The Coordinator is committed to the curation of the Project Results beyond the project end and this is ensured by using internationally available data repositories.

5. Data security

Each of the WEDUSEA partners and associated partners is responsible for the security of the data stored in computers, laptops, intranets or hard-drives accessible through institutional password periodically modified according to national law provisions for data security and protected by regularly updated antiviruses. None of the project data will be left inadvertently available.

All the research materials stored in computers are subject to regular backup to safeguard them from accidental losses and protected using password and systems are protected through firewalls.

Long term preservation of public data is ensured by the chosen data repositories that have specific preservation policies. For example, Zenodo policy ensures that the items will be retained for the lifetime of the repository and in case of closure, best efforts will be made to integrate all content into suitable alternative institutional and/or subject based repositories. Backups of the data will be kept for two years after the project is completed. Handling of sensitive data is described Section 6.

6. Ethics

6.1. General Data Protection Regulation (GDPR)

The WEDUSEA project is fully compliant with the General Data Protection Regulation (GDPR) regulations laid out in Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons regarding the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (20) and respects regulations on intellectual property rights (IPR) (24).

Database access will be fully anonymous. If a user wishes to use WEDUSEA, they will be required to register an account. The user must provide their email address and a password and grant their consent that their email address be processed and used for account-related communications and management. In addition, data on the type of user (i.e., industry, research, etc.) will be logged to provide the Consortium with key statistics on data access by final users. The user is free to revoke their consent at any time, which would lead to the deletion of their account.

6.2 Sensitive Data

Sensitive data is data that is either private or confidential and includes personal user data. The proper management of sensitive data is imperative to maintain the individual privacy and remain in compliance with both EU and international regulations.

In order to ensure sensitive data is properly managed, data that is considered sensitive should first be identified. Any response data captured via these stakeholder and expert interviews are considered sensitive data and will be treated responsibly and securely. In addition, feedback from users on the Data Management Tool and on any training event, are also considered sensitive data. Thus, for the WEDUSEA project, the main ethical and privacy issues with sensitive data arise from ensuring the data remains private and that proper consent is obtained before the data is shared or published in any way. Further insights will be provided in upcoming deliverables that will provide details of the initial data collection as well as of the informed consent procedure.

Annex 1 - List of Project Partners

No.	Legal Name	Short Name	Country
1	New Wave Technologies	OE	IE
2	INNOSEA FR	INNO	FR
3	Advanced Simulation Technologies SL	AST	ES
4	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.	IEE	DE
5	University College Cork – National University of Ireland	UCC	IE
6	Gavin and Doherty Geosolutions Ltd	GDG	IE
7	Exceedence Ltd	EXCEED	IE
8	Wood PLC	WOOD	IE
9	Hydro Group UK	HYDRO	UK
10	European Marine Energy Centre Ltd	EMEC	UK
11	Longitude Consulting Engineers Ltd	LON	UK
12	University of Exeter	UNEXE	UK
13	Innosea Ltd	INNOLtd	UK
14	Green Marine UK Ltd	GREEN	UK

WEDUSEA Project Partners