

WET HORIZONS

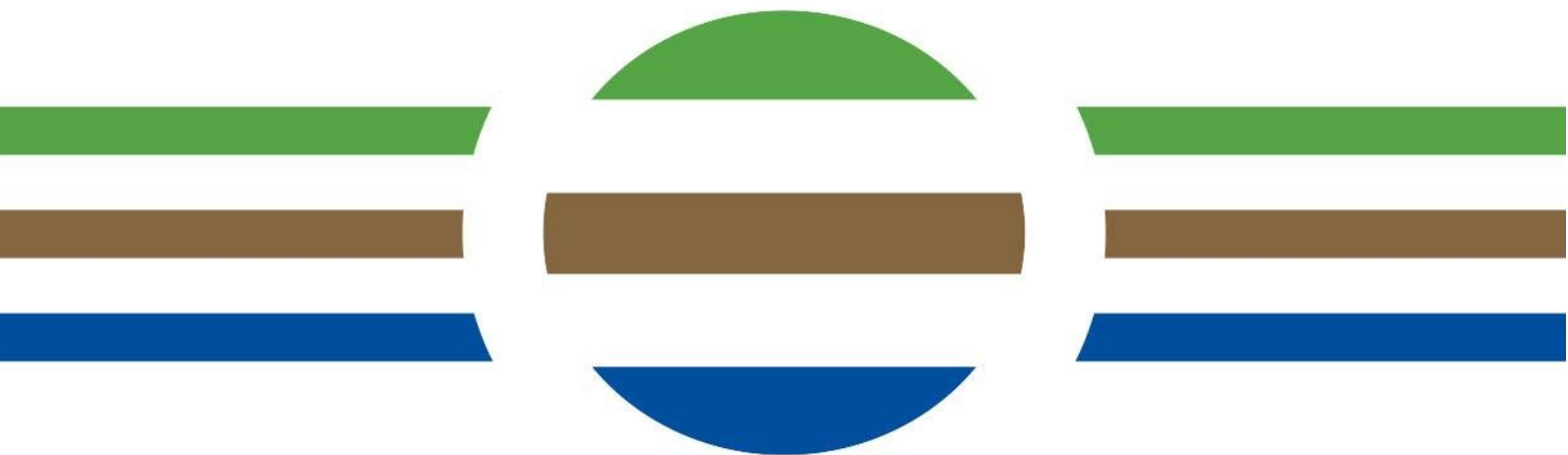
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**Data requirements ('Terms of References')
for the geospatial product delivered to end users**

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1 EXECUTIVE SUMMARY

Wet Horizons is a Horizon Europe project that aims to provide a key starting point from which to address the challenge of enhancing wetland restoration using a holistic approach. It will boost crucial wetland knowledge and help us develop sound tools and approaches to fast-track large-scale restoration action. In the context of Wet Horizons project, Wetlands International's role in **Task 1.1** is to **identify the needs and data constraints from end users to generate the geospatial outputs** for the wetlands and peatlands databases. This activity considers a constant dialogue with policymakers, nature conservation agencies and regulators before, during and after the project. These data needs will inform **Task 1.2**, whose aim is to enhance spatial and temporal mapping through the gathering, compilation and harmonisation of existing wetland datasets for Europe. This will lead to the establishment of an **interactive European peatlands database, wetlands databases for exemplar catchments, a European wetland map (GIS dataset), and a decision support system (DSS) for policymakers** that will address the various demands raised by the potential end users.

The involvement of end users has been largely determined as **one of the key components of the innovation process**. In the past, end users had a passive role in the development of a technology and were only consulted in the late stages of the innovation cycle. With the arrival of more **responsible approaches**, and towards the identification and **integration of users' needs and demands**, the engagement process should ensure that the final product meets **users' expectations to promote a wide reception and adoption of the final product**.

The development of Task 1.1 and input from end users were channelled through three different activities: a **survey, workshop and interviews**. These three inputs are characterised in **methodological terms** (Section 3) and their **results integrated to inform the data needs regarding the databases across the report** (Section 4.2). We characterise the **context and purpose in which these demands are grounded** in Section 4.2.2 and the end user's needs and their input regarding **information needs and data requirements** are summarised in Sections 4.2.3 and 4.2.4. Throughout the report, we also discuss **data-related issues and challenges** likely to arise during the development of the databases.

As part of the results and during the **need identification process**, it was possible to identify several **purposes** behind the data demands coming from a diverse set of end users including **European agencies, national governmental organisations and NGOs**. In general terms, end users manifested a wider demand and purpose on having **reliable, open access, homogenised and complete wetlands data** for a general **inventory and monitoring** of the aquatic ecosystems. When we focused on wetlands and peatlands restoration, **three main purposes** were identified for the future use of the data: *(A) the inventory of potential restoration projects at the national and European level, (B) Assessing the status of wetlands and peatlands for reporting on national or international policy commitments; (C) supporting investment, schemes trade and commodities in the context of ecosystem restoration.*

The analysis of **international conventions and policies** concerning agreements on wetlands provided complementary information on data needs for end users. We identified **the main obligation towards member states to report at the national and European level**. These are related to **habitat status and wetlands trends**, together with reporting on the **condition of biodiversity and particularly trends in wild bird species**. These reporting demands support the importance manifested by end users to have data with which to assess the **degradation status of the ecosystems** and the **necessity to monitor their condition**. Furthermore, the availability of **historical data** or even from **past centuries** would provide valuable means to **identify areas that were once wetlands** and could be restored to their former state (e.g., former floodplains now arable lands). Countries must assess the **favourable reference values for restoration actions** and to **report on the evolution** of these habitats as well.



An **average reporting period** of 3.7 years was defined for the analysed policies, with the most demanding policies requiring **annual reports on carbon emissions** in the context of **UNFCCC** and of the performance of the Strategic Plan for the **Common Agricultural Policy**. End users argued that the dynamic nature of **wetland systems, changes linked to seasonality and climate change** (e.g., droughts) and **impacts, justify the demand for annual data updates for monitoring purposes**.

Nowadays, existing databases at the EU level, such as the **Natura 2000 network maps** and **Floodplain areas**, are those most utilised by the users, with **EEA tools** widely used. At the national level, some governmental agencies (Scotland, Finland the Netherlands and Germany) rely mostly on **country-level datasets for inventory, assessment or monitoring of wetlands and peatlands**. In relation to the **main barriers and gaps** users face when accessing and using existing European and national databases, the main issues reported are **information being scattered across different databases, data being outdated, an overall lack of data and data quality issues**.

In terms of the data priorities of end users, the **most relevant wetlands and peatlands data are the extent and distribution of wetlands at a detailed level** (high spatial resolution) and with frequent updates, at least when referring to **protected areas (Natura 2000)**, and possibly **medium or low resolution at the national level or outside protected areas**. Equally important are **historical wetlands data, land-use and land-cover data, degradation status information, impacts** (e.g., drainage, horticulture, peat extraction), **restoration measures** (e.g., rewetting, revegetation), **reliable carbon emissions data, type of habitat or presence of protected species (KBA), socio-economic data, soil moisture and hydrological data** (water table depth, mean water level dynamic) and the **potential for restoration**. In general, it was reassuring to confirm that **most of the aforementioned needs could be addressed by the Wet Horizons project**. However, the availability of **historical wetlands data**, and the **degradation level or impact of threats** remains unclear.

Concerning **specific data requirements, spatial resolution, temporal resolution and data accuracy were underlined by end users as key data quality characteristics to be considered for the wetlands and peatlands platform**. In terms of **data sharing**, an **open source, transparent** tool is needed and it must **comply with existing regulations** (GDPR), where nothing should be traceable back to individuals. Similarly important are **data interoperability, data validation/traceability and data integration**, with the inclusion of **clear metadata, terminology and definitions**. It must be noted that, in the case of peatlands, the **diversity amongst definitions** in use in different parts of the world has hampered efforts to consistently identify, map and manage peatlands on a global scale¹.

During the workshop and when discussing **potential organisations that could host the wetlands and peatlands platform**, end users proposed the **European Environmental Agency as the most suitable institution to be in that role**. In this regard, input from end users highlighted the **relevance of the long-term sustainability** of the database and the necessity to **allocate appropriate resources to it**, with its integration into a well-supported program.

For the following phases of Task 1.1, the team recognise the necessity of **maintaining the active engagement** of the end users involved in the project by **sharing regular updates** and **through the annual workshops planned from 2023 until 2025**. It must be noted that maintaining the motivation and interest levels of stakeholders should be carefully addressed in the coming years.

¹ <https://www.unep.org/resources/global-peatlands-assessment-2022>

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2 INTRODUCTION

2.1 Project description

This task is a component of Wet Horizons, a Horizon Europe project that aims to provide a key starting point from which to address the challenge of enhancing wetland restoration using a holistic approach. It will boost crucial wetland knowledge and help us develop sound tools and approaches to fast-track large-scale restoration action.

Despite the efforts of previous projects that have addressed wetlands restoration, there remain important knowledge gaps due to a lack of wetland data availability and harmonisation of the existing information. This project will improve the current data from pristine, drained and rewetted peatlands, floodplains and coastal wetlands; model the effects of typical restoration measures under variable conditions; and analyse the potential socioeconomic impacts of such measures. This will enable us to choose the best pathways in wetland restoration, minimising trade-offs, including hotspot priority lists where the ecological and biodiversity benefits are greatest with minimum investment.

The Wet Horizons project will involve citizen science for data collection and will include the development of digital tools for upscaling wetland restoration, including an app for the visualisation of wetland status and a decision support system (DSS) for policymakers. The results will be available through open-access repositories to maximise their use and outreach. Figure 1 highlights the connections among the main project phases and components.

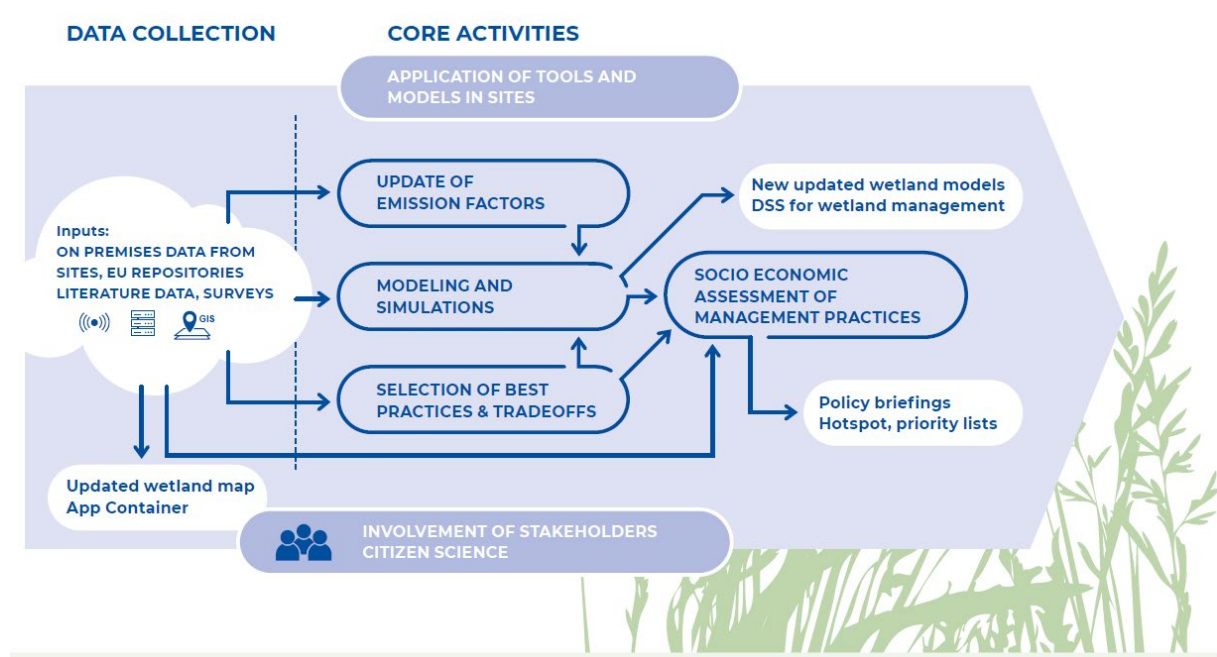


Figure 1 Explanatory diagram of main project components and relations among core activities and outputs.

The project is coordinated by Aarhus University (Denmark) and the participant organisations for this task are the University of Greifswald (Germany), James Hutton Institute (UK), Radboud University (The Netherlands), University of Versailles Saint-Quentin-en-Yvelines (France) and Warsaw University of Life Sciences (Poland).

2.2 Geospatial outputs driven by end users' needs

Wetlands International's role in Task 1.1 is to **identify the needs and data constraints from end users to generate the geospatial outputs** for the wetlands and peatlands databases. This activity considers a constant dialogue with policymakers, nature conservation agencies and regulators before, during and after the project. These data needs will inform **Task 1.2**, whose aim is to enhance spatial and temporal mapping through the gathering, compilation and harmonisation of existing wetland datasets for Europe. This will lead to the establishment of an interactive European peatlands database, wetlands databases for exemplar catchments and a European wetland map (GIS dataset) that will address the various demands raised by the potential end users.

The involvement of end users has been largely determined as one of the key components of the innovation process. In the past, end users had a passive role in the development of a technology and were only consulted in the late stages of the innovation cycle. With the arrival of more responsible approaches, and towards the identification and integration of users' needs and demands, the engagement process should ensure that the final product meets users' expectations to promote a wide reception and adoption of the final product.

The idea of an active role for end users in product development has been addressed from different fields and knowledge streams. In human-centered design² and in connection with geospatial information, user-centered design is an essential component of the development of any geoinformation technology. From a research and innovation perspective, the users' needs are the driving force for spatial data infrastructure development; therefore, their requirements need to be defined in the initial phase of the development process. This explicitly demands that end users are introduced to the process as early as possible^{3,4}, acknowledging that without the appropriate involvement of stakeholders, the solution is likely to have a lower acceptance/application in practice⁵. This last point has been addressed through 'user-driven innovation' concept⁶, which recognised the increased ability of users to take part in innovation processes, thereby allowing them to make their demands heard and attended to, which correlates with a greater acceptance of 'open innovation'.

2.2 Report structure and content

In the Wet Horizons project, the development of Task 1.1 and input from end users were channelled through three different activities: a **survey, workshop** and **interviews**. These three inputs are characterised in methodological terms (Section 3) and their results integrated to inform the data needs regarding the databases across the report (Section 4.2). We characterise the context and purpose in which these demands are grounded in Section 4.2.2. These needs are then contextualised as nature conservation policy frameworks, project initiatives or funding opportunities for wetlands restoration and translated and used as inputs for data requirements. Regarding the specific information needs, a summary of the feedback from end users and its translation into specific data requirements are synthesised in Sections 4.2.3 and 4.2.4, where we also discuss data-related issues and challenges likely to arise during the development of the databases.

² Human-centered design is a problem-solving technique that puts real people at the center of the development process, enabling you to create products and services that resonate and are tailored to your audience's needs

³ Snoeren, G. F. I., Zlatanova, S., Cromptvoets, J. W. H. C., & Scholten, H. (2007). Spatial Data Infrastructure for emergency management: the view of the users. Paper presented at 3rd GiDM.

⁴ Cavallaro F. et al. (2014) Responsible Research and Innovation and End-Users, Report for FP7 Project "ProGRess", progress.project.eu. Scheuer, Sabrina, Pia Ferner, Yvonne Prinzellner, and Georg Aumayr. 2022. "Collection of End User Requirements and Use Cases during a Pandemic—Towards a Framework for Applied Research Projects" Information 13, no. 5: 255. <https://doi.org/10.3390/info13050255>

⁵ Scheuer, Sabrina, Pia Ferner, Yvonne Prinzellner, and Georg Aumayr. (2022). "Collection of End User Requirements and Use Cases during a Pandemic—Towards a Framework for Applied Research Projects" Information 13, no. 5: 255. <https://doi.org/10.3390/info13050255>

⁶ Wise, E., & Hoegenhaven, C. (2008). User-Driven Innovation - Context and Cases in the Nordic Region. (Innovation Policy). Nordic Innovation Centre. <http://www.nordicinnovation.net/prosjekt.cfm?id=1-4415-246>



3 METHODOLOGY

3.1 End users involvement approach

In funded national and international research programmes, scientists and stakeholders working within innovation are strongly recommended to consider the needs and expectations of stakeholders and potential users, and to involve them as research co-actors from the very first stages of project design⁷ With this in mind, and for the purpose of this task, we followed the five-step approach described in the **SWOS Service Case Handbook**⁸, a deliverable from SWOS, a Horizon 2020 project. These actions are steered by an informed and context-based understanding of users' needs in order to improve the usability of the product, which in this case will be the wetlands and peatlands databases (Task 1.2). Figure 2 illustrates the main components and steps defined by this approach.

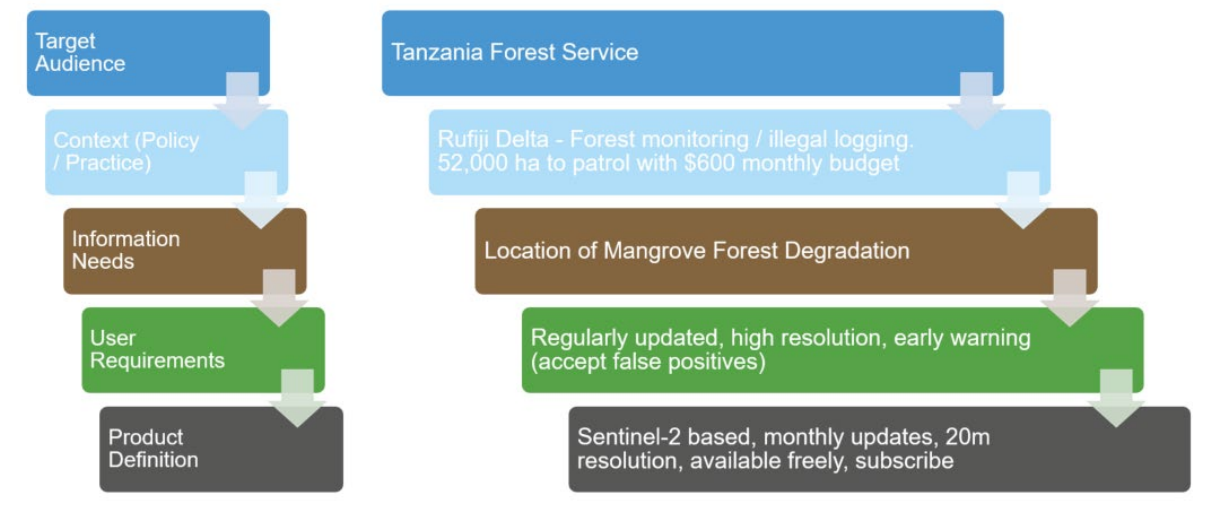


Figure 2 Examples of the type of information collected during each of the five steps of the SWOS framework. The five steps of the SWOS framework (left) and examples of the type of information collected during each of these (right)

It should be noted that the last step regarding ‘product definition’ corresponds to the activities being developed under Task 2.2, where a more detailed description of the data available will be provided.

3.1.1 Target audience and engagement

The methodology used to identify the target audience and engagement practices was tailored to the objectives and timeframe of this task, and was divided into two components: *stakeholder identification* and the *engagement process*.

⁷ L'Astorina, A., Tomasoni, I., Basoni, A. and Carrara, P. (2015). Beyond the dissemination of Earth Observation research: stakeholders' and users' involvement in project co-design JCOM 14(03), C03. <https://doi.org/10.22323/2.14030303>

⁸ Wetlands International (2018) SWOS Service Case Handbook - Satellite-based Wetland Observation Service. SWOS (H2020/ Research and Innovation action) Grant Agreement no. 642088. Deliverable number 4.13.

STAKEHOLDER IDENTIFICATION: For the identification of stakeholders, we **(1) identified a first list of organisations** that are currently working on the conservation and restoration of wetlands and aquatic ecosystems at the European or national Level. Most of these institutions are part of the **Wetlands International network**. Then, we **(2) expanded this list with contacts from project partners** contributing to this activity (UG, JHI, SRUC, UVSQ-LSCE). The next step **(3)** consisted of the ‘**snowball technique**⁹, which has been used in the context of mapping networks and relations among actors. Based on the assumption that a significant majority of actors in a network are known to each other, the approach begins by contacting a first list of stakeholders and follows a chain of contacts and references obtained from this point onwards.

When selecting the first list of core actors, we followed the considerations below:

- **Representatives of different sectors and roles within the organisations:** The participants should represent a diverse set of perspectives and functions within wetlands conservation and restoration. Including nature conservation government organisations, European agencies (policy makers, scientific advisors, spatial data managers) and NGOs (Table 2). Ideally, in the following project phases land farmers and contacts from nature-based investment communities should be contacted and asked for their input. This work could be done in connection to WP6.
- **Topic coverage:** The Wet Horizons project promotes the protection and restoration of wetlands to increase benefits related to the climate and biodiversity. The selection of participants took into consideration actors involved in the habitat and biodiversity protection, climate mitigation and carbon emissions reductions.
- **Geographical representation:** We aimed to have a balanced representation in terms of national agencies from different parts of Europe (Central and Eastern Europe, Northern Europe, Southern Europe and Western Europe).
- **Involve ‘data users’ and ‘data producers’.** During the engagement phase, the team realised the relevance of including not only data users but also data producers in order to comprehend and enrich our understanding of the existing data issues revolving around wetlands mapping. This would also enable us to include ongoing and similar initiatives being implemented by the identified stakeholders and seek synergies among the projects (see Section 4.4.1).
- **Gender equality:** When selecting our stakeholders, we aimed to maintain a balance in the proportions of male and female participants. There is a proven need for a gender dimension in research design, implementation and organisation. Many studies have shown that gender inequalities have influenced research outcomes on a large scale, with women still often neglected in research design.

ENGAGEMENT PROCESS: Regarding the engagement channels, the identified actors were contacted via email (39 identified end users). For the first activities (survey and workshop), we contacted different types of organisations (EU level, national agencies and NGOs). The goal was first to create a small group of well-engaged actors from whom to collect answers and ensure further participation in the following planned project activities.

Their participation was encouraged by sending personalised messages mentioning the link between the project activity and their function or specific role at their organisation.

As part of this task, the identified end users were encouraged to participate and engage through three different methods: a *survey*, *workshop* and *interviews*. The purpose of collecting these data during the development of these activities was to enhance the usability of the products (wetlands and peatlands database) and the alignment of datasets, product functionalities and applications that will promote ownership among the actors involved.

⁹ Atkinson R, Flint J (2001) Accessing Hidden and Hard-to-Reach Populations: Snowball Research Strategies. Social Research Update No. 33. Department of Sociology. University of Surrey (ISSN: 1360-7898). <http://sru.soc.surrey.ac.uk/SRU33.pdf> Accessed 2011 September 22.



3.1.2 Survey method

The **survey** was the first activity implemented to gather information from end users. As a team, we defined a series of considerations for the content development and to spark motivation in future database users:

- Quick survey with a duration of under 10 minutes;
- Multiple-choice questions with the possibility of adding personalised answers;
- Cover a wide range of topics related to the database's development to address different users' motivations and interests within the project setting (e.g., user roles, context, data types, data issues).

The list of selected questions is shared below and these were embedded within the four main themes of the aforementioned end users involvement approach (*target audience, policy context, information needs, data requirements*). In Annex A, the complete list of questions and possible answers is presented.

- **TARGET AUDIENCE:** understand the end users' backgrounds and roles

Q: Name and organisation

Q: How would you define your role?

- **CONTEXT (Policy/Practice):** understand policy context guiding their work and the purpose of the data needs

Q: For which policy framework or directive do you need the data?

Q: For which purpose do you use the existing data on wetlands (peatlands, floodplains, coastal wetlands)?

- **INFORMATION NEEDS:** collection of information and rank their importance

Q: Which existing wetlands databases do you use at the European and national levels?

Q: What information is relevant for your work on wetlands? *Please rate their importance below*

- **USER REQUIREMENTS:** specific data requirements entailing data quality aspects and data issues they face

Q: Which of the following data quality aspects are relevant to your work?

Q: What are the main gaps/barriers to obtain information or data relevant to your work on wetlands?

3.1.3 Interactive workshop

The **workshop** scoped the information needs and data constraints of end users and the digital tools needed to generate the geospatial outputs. A good understanding of **what** is needed and **why** it is needed was crucial to further discuss the data available and to be collected, harmonised or developed for the project during Task 1.2. In this event, the participants were policymakers, nature conservation agencies and regulators playing a role either as data users or data producers (see Table 2). The participants contributed to identifying main barriers and discussing opportunities to build the final GIS products.



The online event “Interactive Workshop: Information needs for Wetland & Peatland Databases” took place on **7 February 2023**. The organiser was Wetlands International and the co-organisers were the University of Greifswald (Partner in the Greifswald Mire Centre) and the James Hutton Institute. The platform used was Microsoft Teams and we used [Miro Tool](#) as the interactive platform to collect feedback from the participants (Figure 3).

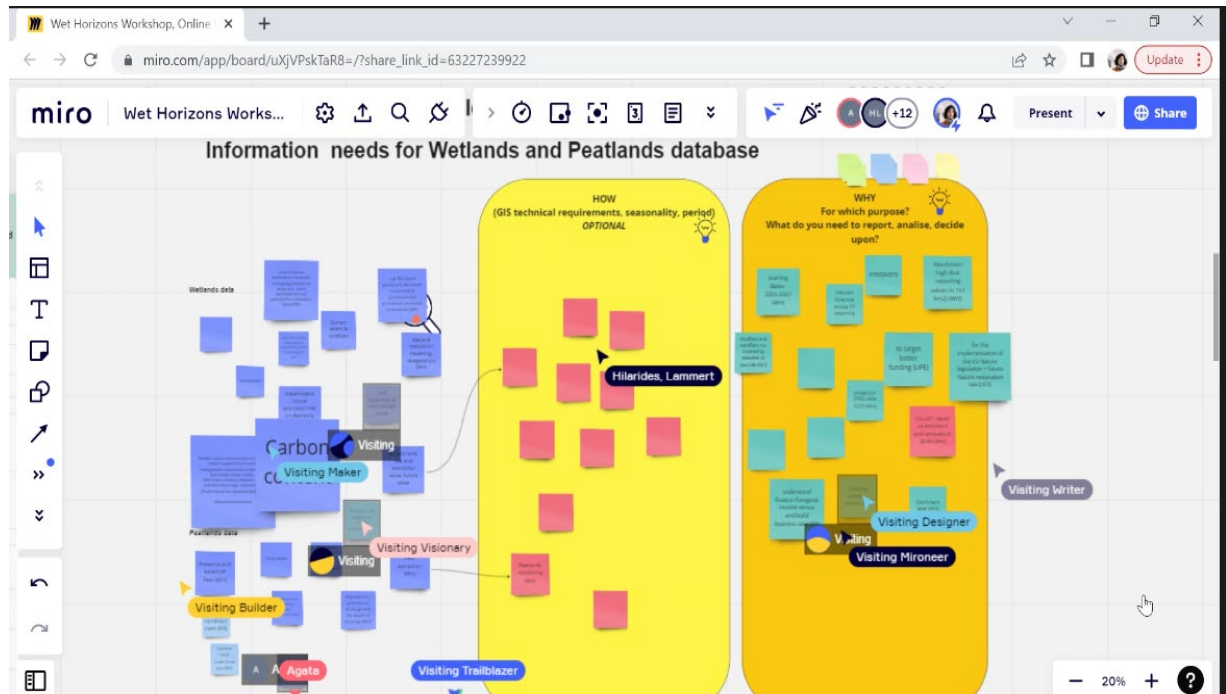


Figure 3. Screenshot taken during the interactive workshop event.

Aims and goals for interaction and engagement with the participants:

- Create a first space for all the actors to meet and discuss motivations, contributions and concerns regarding European wetlands and peatlands database;
- Interact in two different settings in order to allow different profiles of people to feel confident while providing feedback: Breakout groups, and a plenary session with possibilities of verbal or written input;
- Encourage their participation by using open communication, and a relaxed environment.

In terms of the content of the workshop, the main goals referred to the presentation of the project’s goals and activities linked to the development of the platform. The second part of the event focussed on gathering information concerning the end users’ needs. The agenda of the workshop is presented in Annex B. Table 2 provides a detailed list of the organisations that participated in the event.

3.1.4 Interviewing key stakeholders

Depending on the availability of the team, **semi-structured interviews with open-ended questions** were conducted by one or two team members to allow a more free-flowing conversation while asking pre-determined questions to the stakeholder.

In terms of **privacy and data use**, at the beginning of each interview we asked for permission to record the session and explained how the responses from the interviewees would be processed solely for the purpose of analysis of the responses and in the context of Work Package 1 of the Wet Horizons project.

A total of **seven end users** were interviewed during March and April 2023. We used two different sets of questions (Table 1) depending on whether the participants had answered the survey/attended the workshop (group 1) or were new to the project (group 2). For group 1, we tailored the list of questions using information collected beforehand during the survey and workshop, and interviewees were asked to elaborate on previous responses based on the *data context*, *information needs* and *data requirements* and with a particular focus on questions 3 and 4 from the list shown in Table 1. For group 2, we selected and adapted questions 1 and 2 from the survey (Section 3.1.2), while questions 3 and 4 were the same as those posed to group 2.

Table 1 Questions used during the interviews for the two different interviewee groups.

Topic	Interviewees (group 1 – previously engaged)	Interviewees (group 2 – new to the project)
	Introduction by the interviewee (name, organisation, role)	
Data purpose	1. Do you have specific needs to comply with your inventory, reporting, or monitoring activities on wetlands restoration?	1. For which policy framework or directive do you need the data? And for which purpose?
Information needs	The current outcomes (survey & workshop) showed that some of the most relevant wetlands/peatlands data are (in no specific order): a) Peatland type b) Land use and land cover c) Petland degradation status /restoration activities/impacts d) Reliable carbon emissions 2. Do you agree with this list? What is missing?	What type of wetlands/peatlands data is crucial for your work? Once the interviewee completed the answer, we commented on ongoing results and evaluated whether they agreed.
Data requirements	3. How should these data be presented to you? Do you have specific requirements for these data? (Follow up question 2) <i>e.g., data format, GIS data, accuracy, resolution (minimum resolution needed), data validation, regular data updates, confidentiality.</i>	
Data purpose	4. Is there any wetlands-related database that your organisation aims to develop? What are your data needs based on your own platforms? How do you think we could align both initiatives?	
Next steps	Would you like to be involved in the next steps of the Wet Horizons project?	

4 RESULTS

4.1 Identification and engagement of end users

As a result of the identification of and engagement with stakeholders with the goal of providing input on geospatial products for the Wet Horizons project, Table 2 provides information on the participant organisations, the units involved, their scope and user type and with which activities they participated (survey, workshop, interview). It can be observed that an effort to include more national agencies in the interviews was fruitful and, therefore, a more local perspective of mapping and data demands was covered by the task.

Table 2 List of stakeholders (end users) that participated during the data collection phase of Task 1.1 (Survey: S; Workshop: W; Interview: I).

Organisation	Department - Unit	Level - country	Data Profile	Participation in activities		
				S	W	I
EEA (European Environment Agency)	DIS3 - Geospatial Information Services & Copernicus Land Monitoring Service	European	Data producer	yes	yes	yes
EEA (European Environment Agency)	European Topic Centre on Biological Diversity	European	Data user	no	no	yes
FAO (Food and Agriculture Organization of the United Nations)	UN Decade on Ecosystem Restoration Monitoring task force	European	Data user	yes	yes	no
CINEA (European Climate, Infrastructure and Environment Executive Agency)	Unit D2 - LIFE Environment (Nature & Circular Economy)	European	Data user	yes	yes	no
CINEA	LIFE Programme	European	Data user	no	yes	no
DG ENV (Directorate General for Environment)	Nature Unit on the development of monitoring tools	European	Data producer/ Data user	yes	yes	yes
JRC (Joint Research Centre)	Forest Resources and Climate Unit	European	Data user	no	yes	no
JRC (Joint Research Centre)	Knowledge Centre on Earth Observation	European	Data producer/ Data user	yes	yes	no

DEFRA (Department for Environment, Food and Rural Affairs)	Soil & Peatland Science, ALPS, NETL	UK	-	yes	yes	no
Scottish government	Natural Capital	National - Scotland	Data user	yes	yes	yes
NatureScot	Peatland ACTION	National - Scotland	Data user	yes	yes	no
Nature Conservation Association (Natuurmonumenten)	Nature and Landscape	National - Netherlands	Data user	yes	yes	yes
Metsähallitus, Parks & Wildlife	Nature Conservation Management	National - Finland	Data user	no	no	yes
Tour du Valat	Land-use changes in Mediterranean wetlands	National - France	Data user/Data producer	yes	no	no
WWF Bulgaria	Regional Freshwater Program	National - Bulgaria	Data user	yes	no	yes

As a result of the **engagement efforts**, a total of **39** identified end users from **22** organisations were contacted at the beginning of the task. Of these, we either received no response or the communication stopped with 10 organisations, while the remaining **26 actors** confirmed their interest in the project and joined the activities. It is worth noting that in some cases we have more than one unit or department from the same organisation involved, and also different people from the same unit joined the activities depending on their availability (survey, workshop and interviews).

Table 2 shows that 12 end users responded to the survey, the workshop was attended by 19 people (13 end users and 6 organisers) and 7 participants were interviewed.

In order to understand the end users' profiles, motivations and concerns, during the survey we collected responses on how the participants identified themselves in connection to the roles they perform in their organisations. Figure 4 shows that **most of the participants identified themselves as spatial data managers and mapping ecosystems jointly with environmental regulators or policymakers**.

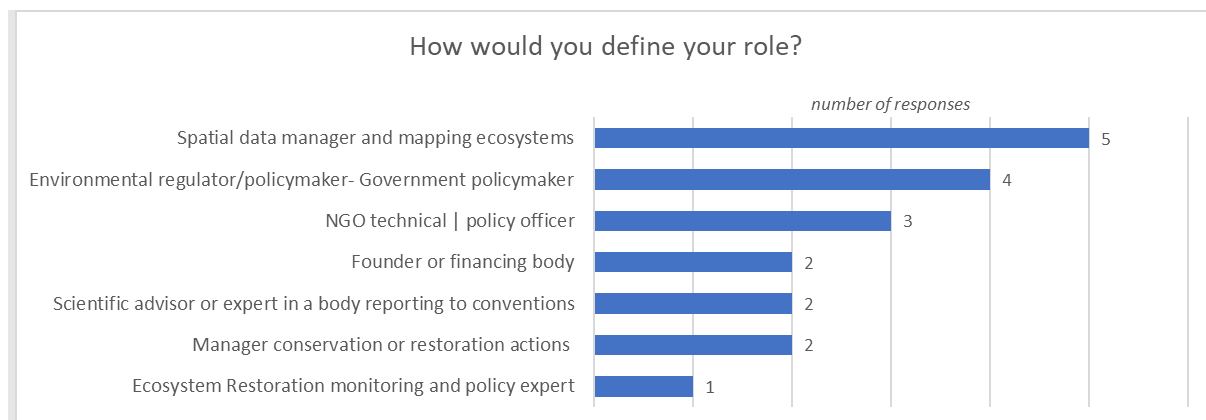


Figure 4 End users' roles.

As an input for the workshop event (February 2023), we asked the participants about groups of stakeholders or actors they considered relevant that should be involved in the project during the next phases. Their responses highlighted the need to focus on **competent authorities (EU, national level)**, as their acceptance regarding the database/data content will probably be necessary in the future. End users from the national agency from the Netherlands emphasised that key stakeholders should be involved to ensure that they **trust the data and support the subsequent actions**, and cited the example of the mistrust in the Netherlands over the ‘Stikstof crisis’¹⁰ resulting in no support for government action from most farmers. Other key user groups called to be involved in the next phases included **landowners, land managers, funders and investors, land agents and project developers** (national), **water management bodies/authorities, farmers’ organisations** and members of Eurosite¹¹. Using **citizens** and **citizen science** schemes was recommended to root the project’s sustainability in the long term.

4.1.1 Collaboration and opportunities within EU projects and additional databases

During the development of Task 1.1, we acknowledged the existence of several EU funded projects (LIFE & Horizons projects) pursuing similar objectives to Wet Horizons. In these circumstances, we were open to collaborate by understanding the overlap between the projects’ tasks and identifying possible synergies between the initiatives.

Either for the wetlands or the peatlands database, some of the projects we identified as relevant included [Care-Peat](#), [LIFE Multi-Peat](#), [Alfa-Wetlands](#), [Restore4Cs](#), [WaterLANDS](#), the [Merlin project](#) and [Rewet](#).

From Wetlands International's side, our organisation is currently part of GEO-Wetlands, a collaborative framework for international cooperation, co-designing EO solutions and community engagement. This initiative has driven the development and implementation of various international initiatives, addressing gaps and information needs, as well as the development of tools for practitioners, including the GEO-Wetlands knowledge base¹².



Figure 5 Logos of the projects which share similar objectives and focus with the Wet Horizons project.

¹² Rebelo, L.M.; Finlayson, C.M.; Strauch, A.; Rosenqvist, A.; Perennou, C.; Tottrup, C.; Hilarides, L.; Paganini, M.; Wielaard, N.; Siegert, F.; Ballhorn, U.; Navratil, P.; Franke, J.; Davidson, N. 2018. The use of Earth Observation for wetland inventory, assessment and monitoring: An information source for the Ramsar Convention on Wetlands. Ramsar Technical Report No.10. Gland, Switzerland: Ramsar Convention Secretariat.

During the survey, workshop and interviews we collected **additional initiatives** as **opportunities** that could be potentially used for the Wet Horizons project and considered during the data collection phase of Task 1.2:

- **SENCE Peatland Restoration Portal**: Scotland government funded for prioritising peatland restoration;
- **Life OrgBalt**;
- **GRASSLANDS database** (JRC): This platform is the responsibility of DG ENV and aims to monitor grasslands;
- **FERM Registry**: <https://ferm.fao.org/>;
- **UNEP-WCMC**;
- **EEA databases on Biodiversity**;
- **England Peat Map**;
- **Ecosystem Restoration Monitoring Task Force** (FAO);
- **EU Hydro**, database from EEA (Copernicus). A high-resolution layer (Sentinel 1) updated every 7 years with the objective of mapping wetlands;
- **Snow, Ice** and **Water** layer, to be improved in the coming years and updated every 2–3 years;
- **Peat scope**: A national database for Scotland will be launched in April. Spatial tool provides information on peatlands extent and distribution and where has drainage occurred;
- **Biodiversa+**.
- **Critical Site Network** Tool 2.0: Critical Sites were identified under the Wings over Wetlands project using Important Bird and Biodiversity Area data from the BirdLife database and International Waterbird Census

4.2 Information and data needs from end users

4.2.1 Existing wetland databases and current challenges

There are several existing wetlands mapping databases in Europe which aim to provide information on the location, size and characteristics of wetland ecosystems across the continent. Below we list some of the most relevant ones:

Wetlands/peatlands databases at the European level:

- **The Ramsar Sites Information Service (RSIS)** is a platform that provides information on wetlands designated as Ramsar sites under the Ramsar Convention on Wetlands. The platform includes data on the location, size and ecological features of Ramsar wetlands across Europe;
- **Natura 2000 networks maps (EU)** is a database with locations of Natura 2000 sites and related information on species and habitats of interest for the entire EU;
- **Floodplain areas (EEA)**: this dataset delineates the area that is flooded once every 100 years, assuming that flooding is unrestricted. The spatial coverage of the dataset is the EEA39 countries;
- **Global peatland database (IMCG/GMC)**: Provides an overview of the extent and state of degradation of peatlands or organic soils in 268 countries and regions of the world;
- **MedWet** is a vast collection of information on the extent, status and trends of wetlands in the Mediterranean region, coordinated by the Mediterranean Wetlands Observatory;

One of the questions included in the survey was intended to identify which of these databases were used by the end users. At the EU level, the **Natura 2000 network maps** and **Floodplain areas (EEA)** tool were the most utilised by the respondents. The interviews with key users conducted in March and April 2023 confirmed that national agencies (Scotland, Finland the Netherlands and Germany) rely mostly on **country-level datasets for inventory, assessment or monitoring of wetlands** and peatlands.

In relation to the main barriers and gaps users face when accessing and using existing European and national databases, the main issues reported were **information being scattered throughout different databases, data being outdated, a lack of data** and **accuracy problems** (Figure 6).

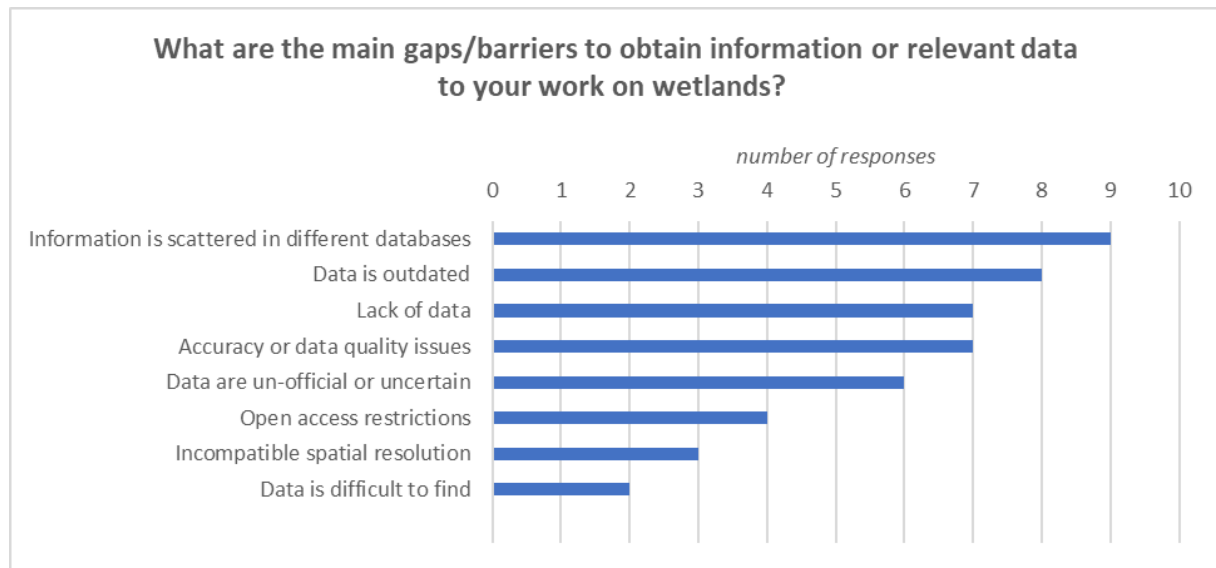


Figure 6 Main gaps and barriers to obtain wetlands data.

4.2.2 Data context: why do end users need the data?

Throughout the engagement phase and during the need identification process, it was possible to identify several **purposes** behind the data demands of a diverse set of end users that included European agencies, national governmental institutions and NGOs. A summary of these can be found in **Figure 7**.

By setting aside the focus on wetlands restoration, end users manifested a broader demand for **reliable, open-access, homogenised and complete wetlands data** for the general purposes of **inventory, assessment and monitoring** of aquatic ecosystems. Once we focused on wetlands and peatlands restoration, during the survey, workshop and interviews **three main reasons** were identified for the future use of the data: **(A) inventory of potential restorations projects at national and European levels and for monitoring purposes; (B) Assessing the status of wetlands and peatlands for reporting on national or international policy commitments; and the use of spatial data to (C) support investment, schemes trade and commodities in the context of ecosystem restoration.**

Below we present outcomes of the survey which exemplify the main motivations of end users to use the data (Figure 7).

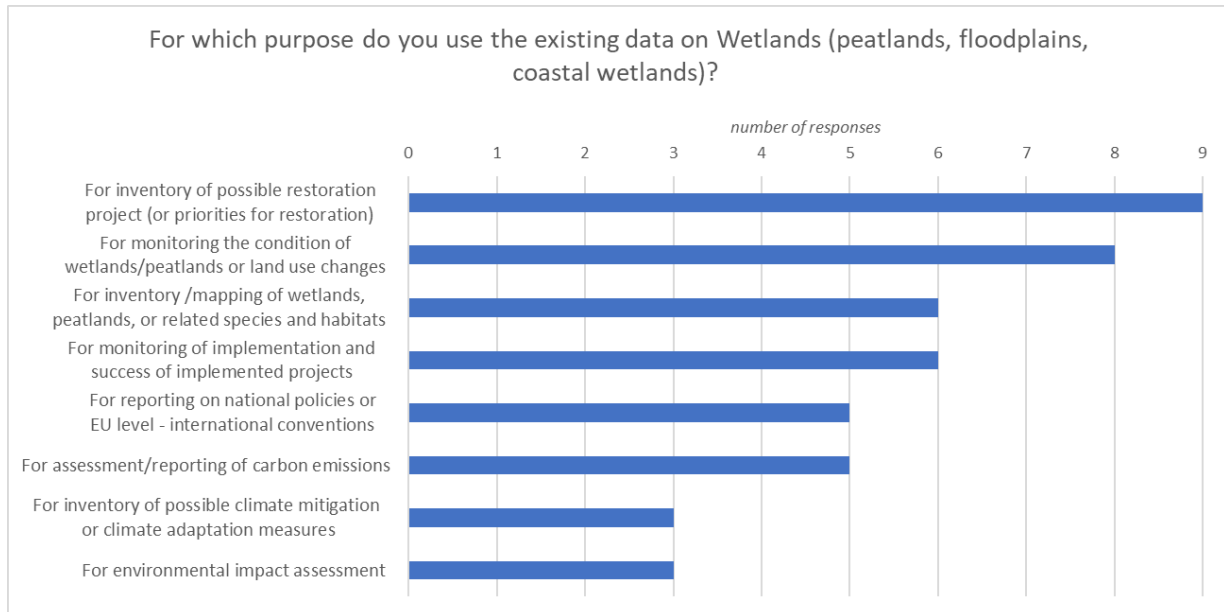


Figure 7 Purpose of the use of wetlands and peatlands data by end users.

4.2.2.1 Characterisation of the data context in connection with end users' needs

A) Wetlands data restorations projects at the national and European level: the use of spatial data is essential for planning and implementing successful wetlands restoration projects at the national level in Europe. By using remote sensing, GIS and other spatial data sources, restoration practitioners can identify and prioritise wetland restoration sites, design restoration plans that consider local conditions and factors, gather data that enable monitoring the state of wetlands as a compliance promotion tool and prioritise sites to be restored considering variables such as emissions reductions or biodiversity benefits. A number of ongoing initiatives could benefit from spatial data and GIS databases, including the European project [Biodiversa+](#) and the JRC initiatives (see Section 4.1.1) mentioned by the interviewees. Furthermore, these data could be useful to target better funding (LIFE projects).

B) Assessing the status of wetlands and peatlands for reporting on national or international policy commitments. From the survey and the interviews this appeared to be the most common reason why data are needed. This refers to commitments stated in international policies, conventions and agreements that require member states to report on the status and trends of wetlands and the measures taken to protect and manage them, to promote their conservation and sustainable use. As pointed out by the end users, these data are needed to inform the decision-making process and for policy development of several regulatory instruments such as the Habitats Directive (Article 6 and 17) and the recently proposed Nature Restoration Law.

The results of the survey highlighted the **Habitats and Bird Directive, Water Framework Directive, Common Agricultural Policy (CAP) and LULUCF** instruments as the most important ones for end users as they are concerned with reporting obligations (**Figure 8**). These findings were confirmed in the interviews with national agencies.

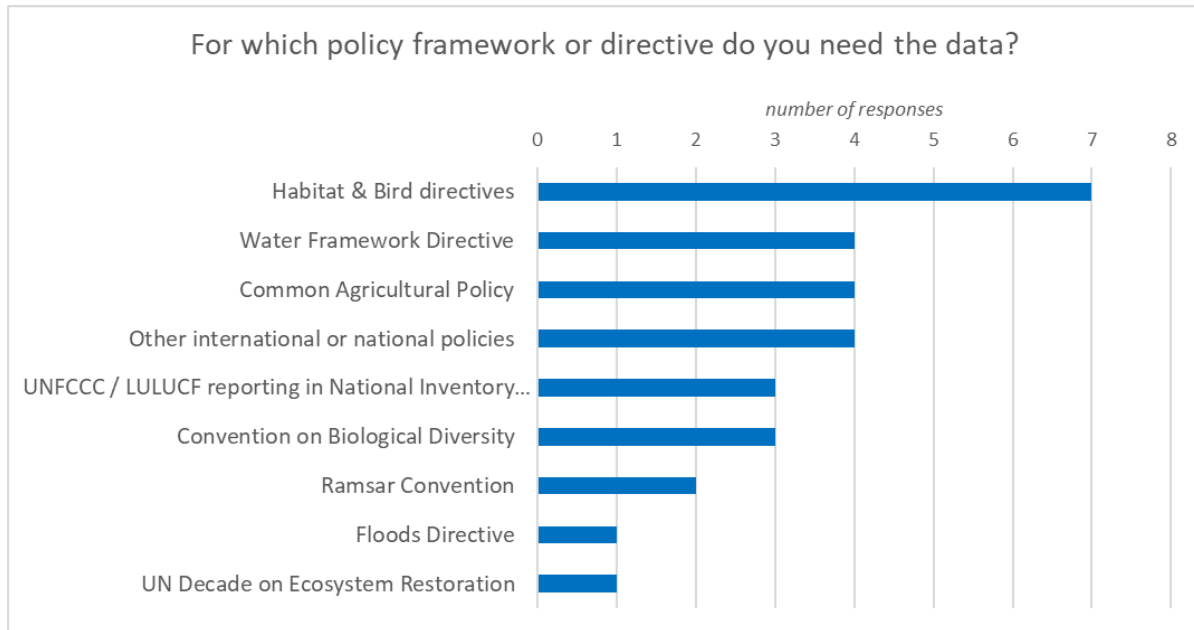


Figure 8 EU level and national policy framework steering data needs from end users.

4.2.2.2 Wetlands and peatlands obligations from environmental policies

In Europe, there are several environmental policies and agreements that include commitments related to reporting on wetlands (Table 3). The following list does not intend to be an exhaustive list of policies which entail obligations on wetlands and peatlands, but rather identifies some of the primary instruments referred to by the end users.

Table 3 International conventions, policies and agreements concerning obligations related to wetlands and the reporting period.

Convention or EU policy instrument	Description	Commitments on wetlands	Reporting period
The Ramsar Convention on Wetlands	An intergovernmental treaty that provides the framework for the conservation and sustainable use of wetlands and their resources.	European countries that are party to the convention are required to designate wetlands and report on the status and trends of their wetlands , including their ecological character and the measures taken for their conservation and sustainable use.	The Contracting Parties meet at a Conference of the Contracting Parties (COP) to discuss policy issues and report on the activities of the previous 3 years through national reports .
The EU Water Framework Directive	European Union directive that aims to achieve good water status for all water bodies, including wetlands.	Under the WFD, member states are required to monitor and report on the status of their water bodies, including wetlands , and develop and implement river basin management plans to achieve the directive's objectives.	Progress with WFD implementation is reviewed on a six-yearly basis .

<p>The EU Habitats Directives</p>	<p>Aims to protect biodiversity by maintaining or restoring to favourable conservation status a range of habitat types and threatened species.</p>	<p>Requires member states to designate and manage protected areas, including wetlands, and report on the conservation status of species and habitats of European importance.</p> <p>Habitats Directive Articles 6 and 17.</p>	<p>Article 17 requires Member States to report every 6 years about the progress made with the implementation.</p>
<p>The EU Birds Directive</p>	<p>Imposes obligations on the member states with the aim of maintaining or restoring bird populations to sufficient levels.</p>	<p>Article 12: member states must report on particular information concerning the status and trends of wild bird species protected by this directive.</p>	<p>Member states have reporting obligations every 6 years (Article 12).</p>
<p>Convention on Biological Diversity (CBD)</p>	<p>An international treaty for the conservation and sustainable use of biodiversity. Wetlands are recognised as important ecosystems for biodiversity.</p>	<p>CBD requires parties to report on the status of wetland biodiversity within their jurisdiction.</p>	<p>Every 2 years representatives from each of the parties attend international meetings to discuss biodiversity.</p>
<p>UNFCCC (United Nations Framework Convention on Climate Change)</p>	<p>The United Nations entity tasked with supporting the global response to the threat of climate change.</p>	<p>It recognises the role of wetlands in mitigating and adapting to climate change and the importance of restoring degraded wetlands to enhance carbon sequestration.</p> <p>Parties to the Convention are required to submit annual greenhouse gas (GHG) inventory reports, national communications and biennial reports on their climate actions.</p>	<p>Annual reporting.</p>
<p>LULUCF (Land Use, Land-Use Change and Forestry Regulation)</p>	<p>Address the carbon footprint of activities related to the conversion, use and management of land and forests for both human and environmental benefits.</p>	<p>Sets a binding commitment for each Member State to ensure that accounted emissions from land use are entirely compensated by an equivalent accounted removal of CO₂ from the atmosphere through action.</p> <p>The scope will be extended from only forests today to all land uses, including wetlands, by 2026.</p>	<p>The reporting period is every 5 years.</p>
<p>Common Agricultural Policy</p>	<p>Ensures a stable supply of food, safeguards farmers' income and protects the environment.</p>	<p>In every farm at least 3% of arable land is dedicated to biodiversity and non-productive elements; wetlands and peatlands are also protected.</p>	<p>CAP legislation lays down a set of indicators that will be monitored through annual performance reports and a biannual review</p>

			of the performance of the CAP Strategic Plan.
Nature Restoration Law	A new EU law that would set specific timetables for repairing degraded rivers, wetlands, fields and forests across 1.6 million square miles stretching across the 27 member countries from Scandinavia to the Iberian and Balkan peninsulas.	The proposed Nature Restoration Law (NRL) features specific restoration targets for Europe’s degraded ecosystems, habitats and species, including wetlands , rivers, forests, grasslands and marine ecosystems. Target to restore drained peatlands under agricultural use .	

Some of the national policies identified from country-level organisations are:

- National wetland and biodiversity strategies;
- Scottish Government Climate Change Plan;
- Devolved Scottish natural capital and land use policy;
- Peatland restoration and Net Zero;
- Various national and regional policies in the Netherlands.

As a result of the analysis of international conventions, policies and agreements concerning obligations for wetlands, we identified **the main obligations for member states to report at the national and European level** are related to **habitat status and wetlands trends together with the condition of biodiversity and particularly of wild bird species**. These reporting demands support the importance manifested by end users to have data to assess the **condition of wetlands or degradation status of the ecosystems** and the necessity to monitor their condition (Table 4).

Likewise, as stated in the UNFCCC convention, parties are required to submit **greenhouse gas (GHG) inventory reports, national communications and biennial reports** on their **climate actions**. As for LULUCF (Land Use, Land-Use Change and Forestry Regulation), members need to ensure that **accounted emissions from land use are compensated**. The obligations stated in these policy instruments endorse the identification of **frequently updated and reliable carbon emissions data** to report on the national and European level obligations (Table 4).

An **average reporting period of 3.7 years** was defined for the analysed policies where the most restrictive ones were **annual reports on carbon emissions** in the context of UNFCCC and the CAP (Common Agricultural Policy), for which 3% of arable land is dedicated to biodiversity and non-productive elements. End users indicated the dynamic nature of wetlands systems and demanded **frequent data updates, at least annually, in order to monitor them**. Concerning dynamic data, it should be integrated and automatically updated (e.g., LULUCF).

c) Wetlands and peatlands data to support schemes trade and commodities in the context of ecosystem restoration

During the interviews, we identified a new and specific motivation in relation to the use of the wetlands and peatlands data for **finance and fundraising**. End users alluded to the necessity to identify opportunities for private investment into wetlands and especially peatland restoration, together with the definition of funding schemes to support restoration to target limited resources most effectively in deciding areas of opportunity for restoration.

It is worth noting that wetlands provide circa \$47.4 trillion/year worth of ecosystem services globally and support immense biodiversity, yet face widespread drainage and pollution, and large-scale wetlands



restoration is urgently needed. **Payments for ecosystem services (PES)** schemes provide a viable avenue for funding large-scale wetland restoration. Schemes around the globe differ substantially in their goals, structure, challenges and effectiveness in supporting large-scale wetland restoration. **Notable types of PES schemes providing incentives for wetland restoration include carbon markets, water quality trading, habitat stamps and wild harvesting, eco-labelling, crowdfunding and water funds**¹³.

Wetlands provide **valuable commodities** that can be **used for economic and social purposes**. Current global knowledge on wetlands agriculture interactions draws attention to case studies that provide positive examples of efforts to transition to the sustainable use of wetlands as a contribution to more sustainable agriculture¹⁴. One tangible example is ‘paludiculture’, which entails the productive use of wet and rewetted peatlands while preserving the peat soil and thereby minimising CO₂ emissions and subsidence¹⁵. With paludiculture, peatlands are kept productive under permanently wet, peat-conserving and potentially peat-forming conditions. Thus, it is a blueprint for peatland carbon farming while still producing food and energy. Co-benefits of paludiculture could contribute to the objectives of the EU Green Deal policy through the maintenance and restoration of multiple ecosystem services such as water buffering, nutrient retention, local climate cooling and habitat provision for rare species, while simultaneously permitting agricultural production. Other examples of **wetlands and peatlands commodities** include cattle for meat or dairy production, cocoa, coffee, palm-oil, soya and wood, and includes products that contain, have been fed with or have been made using these commodities such as leather, chocolate, furniture, rubber, charcoal, printed paper products and a number of palm oil derivatives¹⁶.

4.2.3 Information needs for wetlands and peatlands

The approach used for the presentation of the **information needs from end users** is framed within the Ramsar Convention framework conceptualisation that covers wetlands inventory, assessment and monitoring¹⁷;

- **Wetlands inventory:** the collection and/or collation of core information for wetland management, including the provision of an information base for specific assessment and monitoring activities needed for the inventory or mapping of wetlands, peatlands or related species and habitats. It can be used for the inventory of possible climate mitigation or climate adaptation measures, environmental impact assessment or the evaluation of investment or infrastructure proposals;
- **Wetlands assessment:** the identification of the status of wetlands and threats to them as a basis for the collection of more specific information through monitoring activities. It can support

¹³ Canning, A.D., Jarvis, D., Costanza, R., Hasan, S., Smart, J.C., Finisdore, J., Lovelock, C.E., Greenhalgh, S., Marr, H.M., Beck, M.W., Gillies, C.L., & Waltham, N.J. (2021). Financial incentives for large-scale wetland restoration: Beyond markets to common asset trusts. One Earth.

¹⁴ Ramsar Convention Secretariat (2021) Wetlands and agriculture: impacts of farming practices and pathways to sustainability. Ramsar Briefing Notes. Ramsar Convention Secretariat, Gland, Switzerland

¹⁵ “A definition of paludiculture in the CAP”. <https://europe.wetlands.org/publications/what-does-paludiculture-mean-a-definition/>

¹⁶ “The case for including wetlands in new EU rules on deforestation-free supply chains” <https://europe.wetlands.org/news/the-case-for-including-wetlands-in-new-eu-rules-on-deforestation-free-supply-chains/>

¹⁷ Rebelo, L.M.; Finlayson, C.M.; Strauch, A.; Rosenqvist, A.; Perennou, C.; Tottrup, C.; Hilarides, L.; Paganini, M.; Wielaard, N.; Siegert, F.; Ballhorn, U.; Navratil, P.; Franke, J.; Davidson, N. 2018. The use of Earth Observation for wetland inventory, assessment and monitoring: An information source for the Ramsar Convention on Wetlands. Ramsar Technical Report No.10. Gland, Switzerland: Ramsar Convention Secretariat.

an analysis to determine the conservation status of habitats or an assessment of GHG emissions. This information is required for reporting on international commitments (conventions) or national legal or policy requirements;

- **Wetlands monitoring:** the collection of specific information for management purposes in response to hypotheses derived from assessment activities, and the use of these monitoring results for management implementation. The monitoring of specific physical or biological variables will contribute to understanding the current status of the wetland. Additionally, it can assist in the evaluation of the success of implemented projects.

4.2.3.1 Information needs identified by end users

The combination of these three aforementioned information purposes is considered relevant to support decision-making processes towards potential restoration projects or priorities for restoration. Table 4 outlines the information needs raised by the end users during the whole engagement phase which included the survey, workshop and interviews.

Table 4 *Input provided by end users regarding information needs during the survey, workshop and interviews.*

INFORMATION NEEDS IDENTIFIED BY END USERS	
<i>Inventory data (baseline information)</i>	
TYPE OF DATA	INPUT DATA USER
Peatlands extension	<ul style="list-style-type: none"> • <i>Presence and extent of peat.</i>
Soil properties	<ul style="list-style-type: none"> • <i>Depth of peat.</i>
	<ul style="list-style-type: none"> • <i>Soil moisture;</i> • <i>Is the soil only peat or clay/sand combined with peat?</i>
Peatlands type	<ul style="list-style-type: none"> • <i>It depends only on rainwater?</i>
Hydrological data	<ul style="list-style-type: none"> • <i>Water table depth.</i>
Socio-economic data	<ul style="list-style-type: none"> • <i>Stakeholders and socio-economic data;</i> • <i>Information on deprivation.</i>
Land ownership and management	<ul style="list-style-type: none"> • <i>Add links to management authority/organisation;</i> • <i>Identify management plans;</i> • <i>Protected area status.</i>
Habitats and conservation status	<ul style="list-style-type: none"> • <i>Good characterisation and classification of the habitats.</i>
Biodiversity	<ul style="list-style-type: none"> • <i>Is the area a KBA (Key Biodiversity Area)?</i> • <i>Some of the parameters in Ramsar’s RSIS could be used.</i>
<i>Assessment and monitoring data</i>	

<p>Degradation Status</p>	<ul style="list-style-type: none"> • Indicate whether it is natural or influenced by human management; • Identify extraction activities, level of degradation, condition class; • There is a huge gap in the knowledge of historical peatlands that have been drained in the last 1 or 2 centuries for different purposes; • Land data that can support a 'Landscape ecological system analysis' (LESA), a standardised approach to assess a system prior to implementing restoration or conservation initiatives.
<p>Historical data</p>	<ul style="list-style-type: none"> • Mention if the site has been exploited/extracted in the past; • Past activities and land use are key to restoration (EEA); • Information dating back 50–60 years (EEA); • Historical data are difficult to find but very important for restoration (EEA); • Historical peatlands that have been drained in the last 1 or 2 centuries for different purposes. • Information shape file or layer of former floodplains of the Danube and its tributaries (WWF).
<p>Land use and Land cover</p>	<ul style="list-style-type: none"> • Horticulture, extraction, managed grasslands on peaty soils, intact peatlands, etc.
<p>Restoration priorities</p>	<ul style="list-style-type: none"> • Maps showing priority areas for restoring or conserving wetlands, including spatial prioritisation of biodiversity and ecosystem services in partner countries and mire regions.
<p>Reliable carbon emission data</p>	<ul style="list-style-type: none"> • To reduce footprint from nature management, restoration activities and potentially carbon credits.
<p>Cost/benefits</p>	<ul style="list-style-type: none"> • Ecosystem services such as flood water retention, drought water supply options, etc. • Economic value, future value; • The platform must steer action towards optimal restoration and management sites based on the balance of costs and co-benefits; • Co-benefits of restoration initiatives (socio-economic, biodiversity, etc.); • Capacity to look forward and include predictive models: What happens if a certain area is restored? What are the benefits, co-benefits? What are the costs (including maintenance, inflation, etc.).
<p>Restoration measures</p>	<ul style="list-style-type: none"> • Wetland restoration measures: rewetting, revegetation; • Indicate restoration potential; • Data needed for rewetting of an area under agriculture: information about drained peatland and knowledge of the past of the wetland (EEA); • Visualisation of restoration initiatives (where? How successful?).
<p>Best practices</p>	<ul style="list-style-type: none"> • Inclusion of non-spatial information on peatland restoration: What are the best practices? What works and what does not?

Additional input from interviews with end users regarding information needs (Table 4).

- **Importance of an EU level wetlands and peatlands database to standardise reporting methodologies:** *“There is a need to fill gaps in data coming from countries: We still see that many countries don’t have complete inventories of their own wetlands, some assessments are still purely based on expert opinions. There is a Habitats Directive and a Nature Restoration Law is being proposed where countries have to make an assessment of the condition of these habitats. Up until now, it was not possible to do this assessment in a standardised way” (EEA);*
- *“...If we only create new layers in Copernicus it is not going to be enough. **There is not much use of these tools by the national authorities because they are complicated to use.** Also, the frequency of updates is too low. To fill this gap, we need to concentrate on specific targets, e.g., provide information for Habitats Directive reporting. In the same way, we need to engage with end users to see what they want to receive. **We need to use the platform as a connection between users and developers”** DG ENV;*
- **Historical data are needed for restoration, monitoring and reporting purposes:** wetland maps, historical photos and historical ecological data can help identify areas that were once wetlands and could be restored to their former state (e.g., former floodplains now arable lands). In this regard, one of the end users claimed: *..In Hungary, 25% of the whole territory was covered by floodplains, now 90% of the former floodplain area is located behind of the protection dykes so the flooding is not happening. After the **flood protection intervention, area has been drained and now used as arable land** (not very productive one). This is the **most suitable area for floodplain restoration** and the area for which we will need the historical data” (WWF)*

In the context of the Birds and Habitats Directive, to report on quantitative parameters, such as area and distribution of wetlands, measurements of these variables are needed. Countries must assess favourable reference values and report on the evolution of these habitats. The member states need to observe when these main habitats declined or disappeared to compare today’s distribution with the historical distribution. For some countries it is very difficult to analyse these values in the past. Major declines in recent years happened in the 1950s and 1960s (EEA).

Figure 9 shows the results of the survey regarding the assessment of the importance of wetlands and peatlands data by end users.

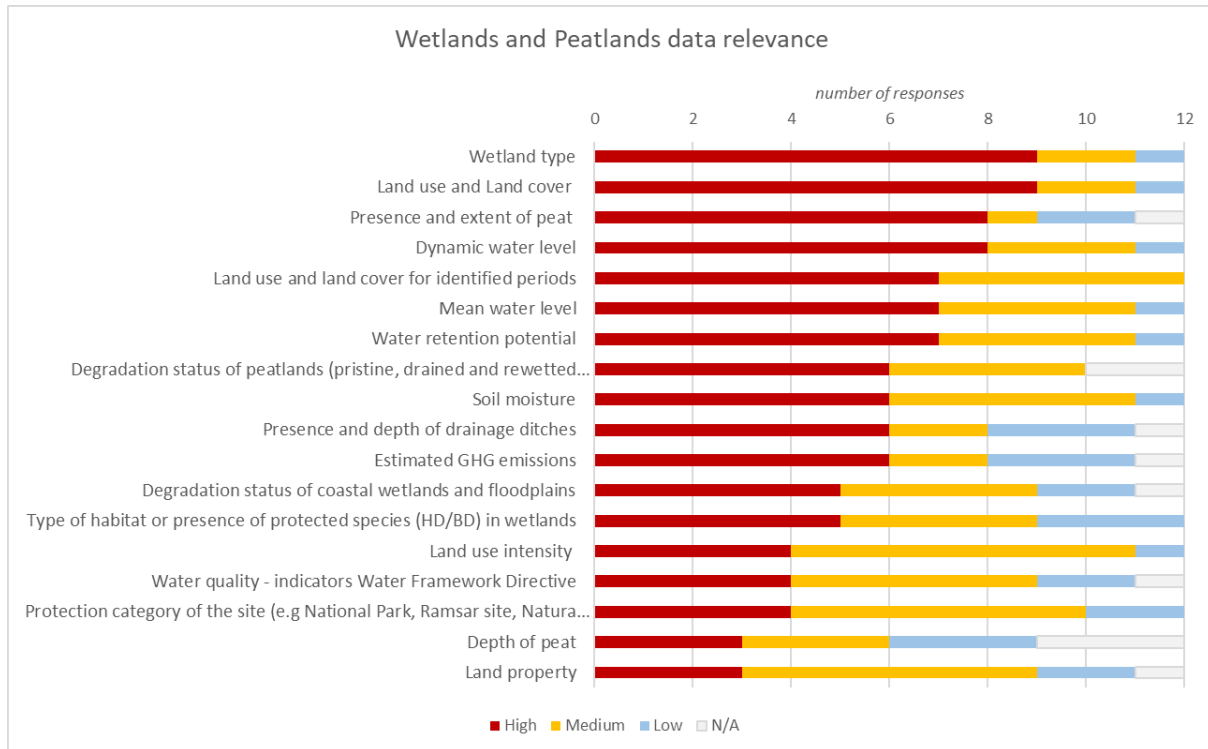


Figure 9 Results of assessment of data relevance concerning wetlands and peatlands.

4.2.3.2 Summary of information needs and its prioritisation

The survey, workshop and interviews provided a clear overview of the most pressing issues and relevance of the data highlighted by the end users. Table 5 classifies the information requires as 'high' or 'medium–low' priority.

Table 5 Summary of information needs on wetlands and peatlands and highlighted as relevant by end users.

CATEGORY	SUMMARY INFORMATION NEEDS WETLANDS AND PEATLAND DATA
HIGH PRIORITY	
Wetlands type	Wetlands type.
Peatlands area, distribution and type	Presence and extent of peat.
	Peatlands type.
Degradation level	Identify degradation status of peatlands and wetlands.
Historical data	Information for past land cover and land uses dating back 50–60 years.

	Information shape file or layer of former floodplains (e.g., Danube and its tributaries) for CEE region. Historical data of the area (aerial images, maps, ancillary information).
Impacts on wetlands and peatlands	Identify different types of impacts (e.g., drainage, ditch creation) and include activities such as horticulture, peat extraction, managed grasslands and potential for restoration.
Carbon emissions	Reliable carbon emission data to inform effective decision-making process.
Data on restoration projects	Provide data for ongoing restoration measures (rewetting and revegetation) including successful and unsuccessful restoration measures.
Soil data	Depth of peat.
	Soil moisture and soil type.
Hydrology	Water table depth; Mean water level; dynamic water level.
Habitat type, status and biodiversity	Habitat type and current conservation status or key habitats.
	Based on biodiversity characteristics, enable the assessment if an area qualifies as a KBA.
Socio-economic	Socio-economic data (demographic, gender, education, poverty, etc.); Information on corruption levels.
MEDIUM–LOW PRIORITY	
Land ownership	Land ownership: inform governmental or non-governmental management organisations.
Land management	Land management: inform on the type of management plans for the wetland.
Hot spots for restoration	Priority areas for restoration and conservation of wetlands at the European level. Provide visualisation of restoration projects or initiatives; Information on potential for restoration.
Costs and co-benefits	Provide information to support decision-making process on wetlands restoration, considering costs and co-benefits.
Conservation and restoration schemes	

	Carbon credits, payment for ecosystem services Develop the data in a way that aligns with existing schemes, such as carbon markets.
Ancillary data	Ancillary information on wetlands restoration best practices.

4.2.4 Wetlands and Peatlands data requirements from end users

4.2.4.1 Data quality and data characteristics

Some of the aspects to be considered when addressing data requirements from the stakeholder's perspective were as follows:

Data quality: End users require high-quality data to ensure accurate and reliable analysis. This includes data that are up-to-date, complete and accurate. Quality data are essential to ensure that decisions made based on GIS analysis are consistent.

Data quality elements describe a certain aspect required for a dataset to be used and accurate. GIS data have different components pertaining to their quality. As defined by the [International Organization for Standardization \(ISO\)](#), these components include the following:

Table 6 Description of data quality aspects

Data quality aspect	Description
Completeness	The presence or absence of features, their attributes and relationships in a data model.
Logical consistency	A degree of adherence to pre-established rules of a data model's structure, attribution and relationships as defined by an organisation or industry. Many industries follow standards that are reflected in a geospatial data model as value domains, data formats, and the topological consistency of how the data are stored.
Thematic accuracy	The accuracy of attributes within features and their appropriate relationships.
Spatial accuracy	The accuracy of the position of features in relation to Earth.
Temporal quality	The quality of temporal attributes and temporal relationship of features.
Data usability	Adherence of a dataset to a specific set of requirements related to a use-case.

Data Formats: End users require data in a format that can be easily accessed and used within the GIS software. This includes data in file formats such as Shapefile, GeoJSON or KML.

Data Sources: Access to a variety of data sources. This includes both internal data sources, such as data collected by the organisation, and external data sources such as government data, satellite imagery and social media data.

Data Integration: This involves the ability to join data from different sources based on location and other attributes and providing users with a unified view of these data.

Data Visualisation: Ability to visualise data in a way that is easy to understand and interpret. This includes the ability to create maps, charts and other visualisations that convey the data in a clear and concise manner.

Data Security: End users require data that are secure and protected from unauthorised access. This includes implementing data access controls, data encryption and other security measures to protect sensitive data.

4.2.4.2 Data requirements of end users

In general terms, the main topics raised by end users as relevant for the overall implementation of the platform were as follows:

- **DATABASE HOST:** During the workshop held in February 2023 and interviews, participants commented and even voted during the interactive session on what could be the modality for hosting the wetlands and peatlands database.

As a result, they highlighted the importance of having a **common platform between EU and national authorities (DG ENV)**. Remarks on the difficulties national environmental agencies face with developing their own platforms were present as well. In reference to the commitment from international conventions, EU policies and national instruments, end users claimed “*we need to provide a common tool that allows countries to conduct their own habitat assessments*”.

When discussing a potential organisation that could host the platform, end users mentioned that the host should be a governmental organisation able to host the platform for a long period of time. The platform also needs to dovetail with decision makers, so it was said that this could be an EU agency. **In that context, the European Environmental Agency was considered the most suitable institution to play the role**, perhaps using the existing [WEkEO platform](#).

- **ADDRESSING REPORTING NEEDS:** this would **provide information for different reporting needs**. It is important to consider different indicators from the different conventions and mechanisms. In that sense, the platform should be **aligned with local (national, subnational) needs**.
- **GEO-SCOPE:** including non-EU countries.

MAINTAINCE & RESOURCES: Long-term sustainability is very important... “*It shouldn’t become just a project output*” but rather be integrated into a long-term program and process. For the **maintenance of the platform** resources should be allocated. The server capacity and energy use need to be considered.

Following the interaction with end users during the three activities (survey, workshop and interviews), a summary of their input regarding specific data requirements is provided in Table 7.

Table 7 Input from end users on data requirements for wetlands and peatlands.

TOPIC	DATA REQUIREMENTS WETLANDS AND PEATLANDS
DATA QUALITY	
Spatial resolution	<ul style="list-style-type: none"> • Country-level data (low–medium resolution); • Data at the level of Natura 2000 sites (high resolution); • High resolution for protected areas (Pas); • Medium resolution for areas outside Pas; • Spatial resolution is more important than temporal resolution; • There could be some benefits in a central tool if the resolution works for everybody and for specific decision makers in countries (national); • National agencies working with biogeographical regions (e.g. “boreal region”). • Improved resolution of existing spatial data (national).
Temporal resolution	<ul style="list-style-type: none"> • Wetlands are dynamic systems, so we need frequent data updates. • The information could be modelled; it is not necessary to have images all the time; • At least every year we need to have monitoring with images. • Regular data update of dynamic data. Integrate and update these data (automatic updates possible, e.g., for LULUCF).
DATA CHARACTERISTICS	
Data collection and sources	<ul style="list-style-type: none"> • Ideally, the tool should be a combination of remote-sensing data with ground truthing. • Database integrates remote-sensing and non-spatial data.
Data ownership	<ul style="list-style-type: none"> • Open-source database; • Data should be owned by an entity that ensures public access. Personal data could be extremely difficult to enter in the system if they refer to beneficiaries of projects. There are strict regulations with GDPR; • Data are confidential: nothing should be indicated that can be traced back to individuals (GDPR).
Data interoperability and sharing	<ul style="list-style-type: none"> • Integrates data across states, data providers, etc. Simplifying various processes/guidelines related to data. Data openness and sharing are encouraged. It should have easily accessible, downloadable information.
Data validation/traceability	<ul style="list-style-type: none"> • Data source: To indicate where the data is coming from and the methodology for collection
	<ul style="list-style-type: none"> • Data validation: How and who verified the data
Data integration	<ul style="list-style-type: none"> • Clear metadata, terminology definitions and harmonising mapping criteria
	<ul style="list-style-type: none"> • State wetland definition used. Would be good to link it to the Ramsar classification (it would help for the UN Decade as that classification covers all possible aquatic and transitional ecosystems).
	<ul style="list-style-type: none"> • It should be an integrating platform that improves data consistency across the region and add value (e.g. social and economic benefits)

<p>Usability</p>	<ul style="list-style-type: none"> • The platform must be <i>intuitive and easy to use for non-experts</i> for their specific use case(s)
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Additional input from end users (organisations) supporting outputs on data requirements:

- **Informing data quality for accurate interpretation:** The users should be informed of aspects related to data quality. At this moment countries are investing in different means of data collection, using different criteria and thresholds. There is a need to increase alignment for the correct interpretation of data to conduct assessments of national reports (EEA).
- **Spatial resolution and distribution of wetlands:** Limitations of remote sensing to deliver information at a small scale. *“Having access to more detailed data on spatial distribution of wetlands is one of the gaps we have at EU level. Currently we need to use what we have from countries or rely on the Corine landcover classification to be able to play on a larger scale”*. For National agencies, both national and regional perspectives are important. Smaller landowners could have several very small patches of wetlands across their land and a tool that cannot detect these would be useless in countries such as Scotland (Scottish Government). In Finland, they work outside protected areas and need to know where peatlands are and in what state they are in order to restore them... *“The level of resolution defines if the data is usable”*.
- **Detecting degradation by monitoring changes:** We need to be able to monitor changes over time. One of the main priorities is to recognise when impacts and degradation are taking place (DG ENV). In Finland, national agencies performed peatland restoration and restoration monitoring methods through remote sensing and there are several ongoing projects. They are also focusing on bird-rich areas.

Although mapping of land cover and land uses is one of the most common uses of EO data, there are still challenges in **assessing the current status and changes in wetlands** over time. Monitoring historical trends and changing patterns of wetlands are complicated by the **lack of medium-to-high-resolution data**, in particular **prior to 2000**¹⁸

- **Remote sensing, ground-truthed data and citizen science approach:** Ground truthing refers to data collected “on location.” Concerning the data collection of on-site data, one end user (DG ENV) proposed: *“e.g. the database could provide images (e.g. land-cover type) and the countries interact with it by providing expert assessments and corrections to the data. This process would ensure the inclusion of ground data”*. In remote sensing, it is especially important to relate image data to real features and materials on the ground. The collection of ground-truthed data enables the calibration of remote-sensing data and aids in the interpretation and analysis of what is being sensed.

¹⁸ Rebelo, L.M.; Finlayson, C.M.; Strauch, A.; Rosenqvist, A.; Perennou, C.; Tottrup, C.; Hilarides, L.; Paganini, M.; Wielaard, N.; Siegert, F.; Ballhorn, U.; Navratil, P.; Franke, J.; Davidson, N. 2018. The use of Earth Observation for wetland inventory, assessment and monitoring: An information source for the Ramsar Convention on Wetlands. Ramsar Technical Report No.10. Gland, Switzerland: Ramsar Convention Secretariat.

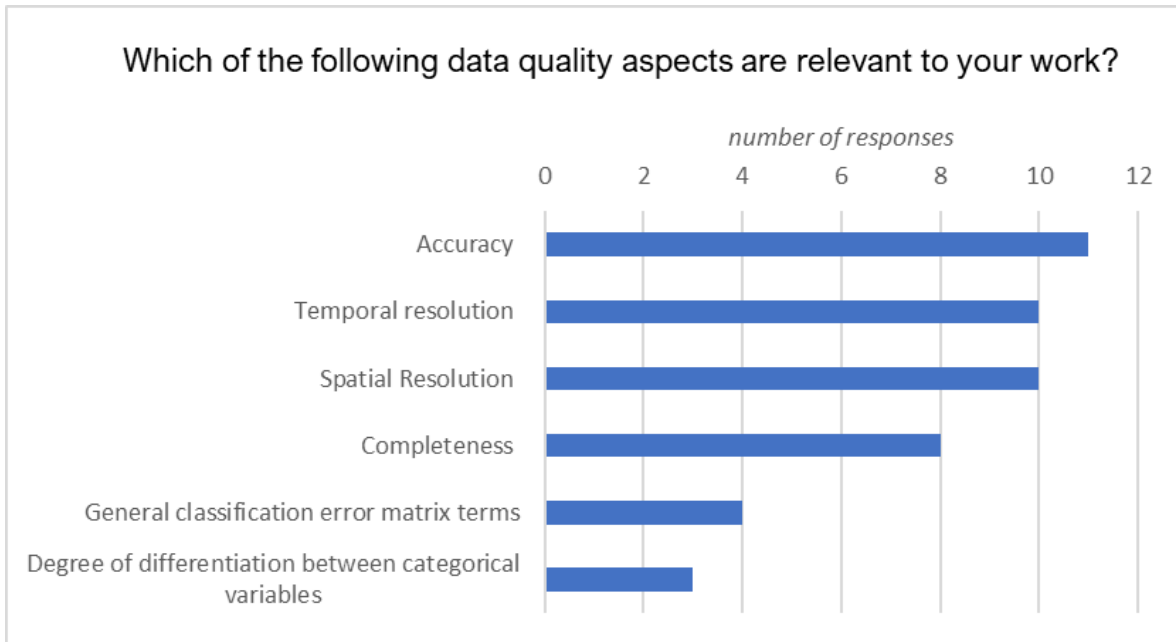


Figure 10 Relevance of data quality aspects according to end users.

Concerning **specific data requirements** of data quality aspects, the **accuracy, temporal resolution and spatial resolution** were underlined by end users as **essential to their work**.

4.2.4.3 Summary of data requirements and its prioritisation

The results from the survey, workshop and interviews provided a clear overview of the most pressing issues and the data highlighted as most relevant by the end users. Table 8 highlights the information identified as required with either a high or medium priority.

Table 8 Summary of data requirements on wetlands and peatlands and highlighted as relevant by end users.

TOPIC	SUMMARY OF DATA REQUIREMENTS
HIGH PRIORITY	
Spatial resolution	High-spatial-resolution data for protected areas in combination with more coarse-resolution data to investigate large areas outside protected areas.
Temporal resolution	Frequent data updates are essential to continuously monitor the development of natural systems. Data users would like to have at least annual updates. For dynamic data, automatic updates to comply with policy reporting should be possible (e.g., LULUCF).
Accuracy	Ranked in the survey as important.
MEDIUM PRIORITY	

Data collection and sources	Database integrates remote-sensing data, ground-truthing data and non-spatial data.
Data ownership	Data sharing must comply with existing regulations (GDPR). Nothing should be traceable to individuals.
Data interoperability and sharing	Simplify data interoperability and make it easy to share and download data.
Data validation/traceability	Ensure reliable and transparent data sources and data traceability.
Data integration	Include clear metadata, terminology and definitions. Suggested to use Ramsar classification for global harmonisation of different classifications.
Usability	User-friendly platform aiming for a simple tool.

5 CONCLUSIONS

During the engagement phase and at the EU level we recognised a **genuine interest from the parties** involved to join in with the project activities, highlighting the **relevance of the theme and priority in their agendas**, but we also realised that many of these organisations **are currently developing projects or databases pursuing similar wetlands restoration objectives to Wet Horizons** (EU funded projects: LIFE & Horizons projects). Thus, we acknowledge the **need to collaborate** by understanding the overlap between projects tasks and looking for synergies between these initiatives. At the national scale, end users manifested their interest in the initiative, although a few agencies raised concerns on **how the existing data from countries would be used and integrated** into the wetlands and peatlands database.

Regarding end users' profiles, the results showed that **most of the participants identified themselves as spatial data managers and mapping ecosystems and/or environmental regulators and policymakers**. During the workshop, the participants emphasised the importance of further engaging with key user groups such as **landowners and land managers, funders and investors, land agents and project developers**, (national) **water management bodies/authorities, farmers' organisations** and members of Eurosite¹⁹, and encouraged the involvement of **citizens** and citizen science schemes to ensure increase the long-term sustainability of the project.

During the **need identification process**, it was possible to identify several **purposes** behind the data demands coming from a diverse set of end users including European agencies, national governmental organisations and NGOs. By setting aside the focus on wetlands restoration, end users manifested a wider demand and purpose on having **reliable, open access, homogenised and complete wetlands data** for a general **inventory and monitoring** of the aquatic ecosystems.

When we focused on wetlands and peatlands restoration, during the survey, workshop and interviews **three main purposes** were identified for the future use of the data: *(A) the inventory of potential restoration projects at the national and European level, (B) Assessing the status of wetlands and peatlands for reporting on national or international policy commitments; (C) supporting investment, schemes trade and commodities in the context of ecosystem restoration*. For the latter, end users claimed the necessity to identify opportunities for **private investment into wetlands and especially for peatland restoration**, together with the definition of **funding schemes to support restoration**, targeting limited resources most effectively in deciding areas of opportunity for restoration. This is in line with one of the key recommendations from the Global Peatlands Assessment (2023)²⁰ and the use of blended finance to combine **public and private sector funding to scale-up the conservation, restoration and sustainable management of peatlands** using carbon and other ecosystem market mechanisms.

By looking at **(geo)data needs for policy instruments at national and European levels**, outcomes of the survey highlighted the **Habitats and Bird Directive, Water Framework Directive, LULUCF** and the recently proposed **Nature Restoration Law** as the most important regulatory instruments because they entail **reporting obligations**. These findings were confirmed by the interviews with national agencies. As pointed out by end users, these data are also needed to inform the **decision-making process** and for **policy development**.

As a result of the analysis of international conventions, policies and agreements concerning obligations on wetlands, we identified **the main obligation towards member states to report at the national and European level**. These are related to **habitat status and wetlands trends**, together with reporting on

¹⁹ <https://www.eurosite.org/>

²⁰ UNEP (2022). Global Peatlands Assessment – The State of the World's Peatlands: Evidence for action toward the conservation, restoration, and sustainable management of peatlands. Main Report. Global Peatlands Initiative. United Nations Environment Programme, Nairobi.



the **condition of biodiversity and particularly trends in wild bird species**. These reporting demands support the importance manifested by end users to have data with which to assess the **degradation status of the ecosystems** and the **necessity to monitor their condition**. Furthermore, the availability of **historical data (dating back 50–60 years)** or even from **past centuries** (spatial data, wetland maps, historical photos, historical ecological data) would provide valuable means to **identify areas that were once wetlands** and could be restored to their former state (e.g., former floodplains now arable lands). Countries must assess the **favourable reference values for restoration actions** and to **report on the evolution** of these habitats as well.

Likewise, as stated in the UNFCCC convention, parties are required to submit **greenhouse gas (GHG) inventory reports, national communications and biennial reports** on their **climate actions**. With regard to LULUCF (Land Use, Land-Use Change and Forestry Regulation), members need to ensure that **accounted emissions from land use are compensated**. The obligations stated in these policy instruments endorse the identification of **frequently updated and reliable carbon emissions data** accounted at the national and European levels.

An **average reporting period of 3.7 years** was defined for the analysed policies, with the most demanding policies requiring **annual reports on carbon emissions** in the context of UNFCCC and the CAP (Common Agricultural Policy), for which 3% of arable land should be dedicated to biodiversity and non-productive elements. End users argued that the dynamic nature of wetland systems and changes linked to seasonality justified the demand for frequent data updates, with **annual updates requested for monitoring purposes**. Concerning dynamic data, this should be integrated into the platform and automatically updated.

Overall, the importance of an EU level wetlands and peatlands database to standardise reporting methodologies was defined as a **crucial element at the EU level (EEA)**. It was pointed out that **many countries do not have complete inventories of their wetlands**, and some assessments are still purely **based on expert opinion**. Additionally, the users should be **informed of aspects related to data quality for accurate data interpretation** because countries use different criteria and thresholds to conduct the assessments for national reports.

Nowadays, existing databases at the EU level, such as the **Natura 2000 network maps and Floodplain areas**, are those most utilised by the users, with **EEA tools** widely used. At the national level, some governmental agencies (Scotland, Finland, the Netherlands and Germany) rely mostly on **country-level datasets for inventory, assessment or monitoring of wetlands and peatlands**. In relation to the **main barriers and gaps** users face when accessing and using existing European and national databases, the main issues reported are **information being scattered across different databases, data being outdated, an overall lack of data and data quality issues**.

In terms of the data priorities of end users, the **most relevant wetlands and peatlands data are the extent and distribution of wetlands at a detailed level** (high spatial resolution) and with frequent updates, at least when referring to **protected areas (Natura 2000)**, and possibly **medium or low resolution at the national level or outside protected areas**. Equally important are **historical wetlands data, land-use and land-cover data, degradation status information, impacts** (e.g., drainage, horticulture, peat extraction), **restoration measures** (e.g., rewetting, revegetation) and **future potential for restoration**. Although the identification of **reliable carbon emissions data** as a need by end users was equally prioritised, specific data requirements on this were difficult to assess because of the limited participation of end users with this profile. However, the end users consulted indicated the relevance here of data pertaining to the **type of habitat or presence of protected species (KBA), socio-economic data, soil moisture and hydrological data** (water table depth, mean water level dynamic). In general, it was reassuring to confirm that **most of the aforementioned needs can at least be partially addressed by the Wet Horizons project**. However, the availability of **historical wetlands data**, and the **degradation level or impact of threats** remains unclear.

There was a less frequent mention of needs identified by end users in connection to **land management and land property, costs and co-benefits of restoration and ancillary information on best conservation and restoration practices.**

Concerning **specific data requirements, spatial resolution, temporal resolution and data accuracy were underlined by end users as key data quality characteristics to be considered for the wetlands and peatlands platform.** For national agencies, both national and regional perspectives were considered important. For example, when small landowners have **several small patches of wetlands** in their land **the tool should be able to detect these data.** In Finland, agencies **work outside protected areas** and need to know the location of peatlands in these areas and their current state in order to restore them. Bourgeau-Chavez *et al.* (2021)²¹ emphasised that **peatland mapping needs fine-resolution EO data** (higher than 30-m resolution) combined with **sufficient ground-truthing data** (peat depth, bulk density and carbon content) to validate the maps. The end users amplified the importance of the **combination of remote sensing and ground-truthed data.**

In terms of **data sharing**, an **open source, transparent** tool is needed and it must **comply with existing regulations** (GDPR), where nothing should be traceable back to individuals. Similarly important are **data interoperability, data validation/traceability** and **data integration**, with the inclusion of clear metadata, terminology and definitions. It must be noted that, in the case of peatlands, the **diversity amongst definitions** in use in different parts of the world has hampered efforts to consistently identify, map and manage peatlands on a global scale (Global Peatlands Assessment, 2023). In terms of the **usability of the tool**, end users remarked that a user-friendly platform would increase its broader acceptance and use.

During the workshop and when discussing **potential organisations that could host the wetlands and peatlands platform**, end users proposed a governmental organisation that could host the database for a longer period. The platform needs to dovetail with decision makers so this could be an EU agency. In that context, the **European Environmental Agency** was pointed out **as the most suitable institution to be in that role.** In this regard, input from end users highlighted the **relevance of the long-term sustainability** of the database and the necessity to **allocate appropriate resources to it**, with its integration into a well-supported long-term program recommended.

For the following phases of Task 1.1, the team recognise the necessity of **maintaining the active engagement** of the end users involved in the project by **sharing regular updates** and **through the annual workshops planned from 2023 until 2025.** It must be noted that maintaining the motivation and interest levels of stakeholders should be carefully addressed in the coming years.

²¹ Bourgeau-Chavez, L.L., Endres, S., Battaglia, M., Miller, M., Banda, E., Laubach, Z. et al. (2015). Development of a bi-national Great Lakes coastal wetland and land use map using three-season PALSAR and Landsat imagery. *Remote Sensing* 7(7), 8655–8682. DOI: 10.3390/rs70708655. <https://www.mdpi.com/2072-4292/7/7/8655>.



ANNEX A. SURVEY QUESTIONS

Survey: Information needs for Wetland database

(Multiple choice)

- Email
- Your name
- For which organisation do you work for?

1. How would you define your role?

- Environmental regulator/policymaker
- Manager conservation or restoration actions
- Scientific advisor or expert in a body reporting to conventions
- Spatial data manager and mapping ecosystems
- Founder or financing body
- NGO technical | policy officer
- Land manager
- Other

2. For which policy framework or directive do you need the data?

- Habitat & Bird directives
- Water Framework Directive
- Floods Directive
- Common Agricultural Policy
- Ramsar Convention
- UNFCCC / LULUCF reporting in National Inventory Reports
- Convention on Biological Diversity
- Other international or national policies (please specify below)
- My work does not relate to policy frameworks
- Other

3. Which existing wetlands database do you use at the European and National levels?

- Global peatland database (IMCG/GMC)
- Natura 2000 network maps (EU)
- Peatland map of Europe (Tannenberg et al. 2021)
- PeatLand Europe (JRC)
- Floodplain areas (EEA)
- MedWet (Mediterranean wetlands)
- Other international, national or sub-national wetland database (please specify below)

4. For which purpose do you use the existing data on Wetlands (peatlands, floodplains, coastal wetlands)?

- For reporting towards EU / Int. conventions in specific forms
- For reporting on national legal or policy requirements
- For inventory/mapping of wetlands, peatlands, or related species and habitats
- For inventory of possible climate mitigation or climate adaptation measures
- For inventory of possible restoration project (or priorities for restoration)
- For monitoring the condition of wetlands/peatlands or land use changes
- For assessment/reporting of GHG emissions
- For environmental impact assessment
- For evaluation of investment or infrastructure proposals
- For monitoring of implementation and success of implemented projects
- Other

5. What information is relevant for your work on wetlands? Please rate their importance below (High-Medium-Low or N/A)

- Wetland type
- Presence and extent of peat (presence/absence)
- Depth of peat
- Type of habitat or presence of protected species (HD/BD) in wetlands
- Protection category of the site (e.g National Park, Ramsar site, Natura 2000)
- Presence and depth of drainage ditches
- Land use and Land cover
- Land use intensity
- Land use over time for identified periods
- Degradation status of coastal wetlands and floodplains
- Degradation status of peatlands (pristine, drained and rewetted peatlands, since when drained)
- Estimated GHG emissions
- Soil moisture
- Mean water level

- Dynamic water level
- Water retention potential
- Water quality - indicators Water Framework Directive
- Land property

6. Which of the following data quality aspects are relevant to your work?

- Temporal resolution (imagery of the same area at different periods of time)
- Spatial Resolution (the amount of spatial detail in an observation)
- Accuracy (degree to which information on a map matches real-world values)
- Completeness (presence or absence of features, their attributes, and relationships in a data model)
- General classification error matrix terms
- Degree of differentiation between categorical variables
- Other

7. What are the main gaps/barriers to obtain information or relevant data to your work on wetlands?

- Lack of data
- Open access restrictions
- Information is scattered through different databases
- Data is difficult to find
- Data format is incompatible to your working environment
- Data are un-official or uncertain
- Incompatible spatial resolution
- Accuracy or data quality issues
- Data is outdated
- Data is static – remains unchanged after it is collected
- Other

8. Are you aware of conflicting objectives and goals for wetland or peatland restoration (so called trade-offs) and to what extent it plays a role in your work? We particularly focus on biodiversity-climate trade-offs in Wet Horizons.

An example of such a trade off would be a moderate rewetting of peatland so the conditions become optimal for e.g., meadow birds and extensive mowing is still possible, but it does not reduce GHG emissions such that significant carbon losses occur. Another example is that peatland is flooded, with the creation of shallow, stagnant water, to satisfy needs of single species or for water retention, and although results in the reduction of carbon dioxide emissions are achieved, it results in large methane emissions, at least in the short term.

- I am not aware of it
- I am aware but it does not play a role
- I am aware and it plays a moderate role
- I am aware and it plays a substantial role
- I am aware but the carbon footprint of a project is not assessed
- I am aware and trade-offs are being considered in decisions/assessments
- Other

9. Would you like to participate in a follow-up interview?

- Yes
- No
- Maybe

10. Is there anything else you would like to share with us?

ANNEX B. WORKSHOP AGENDA

Time	Agenda	Presenter/ Participant
10:00 – 10:15	Welcome, the aim of the Workshop and quick round introduction attendees	Hans Schutten: Wetlands International
10:15 – 10:30	Presentation: Wet Horizons project: enhancement of temporal and spatial mapping - Q&A	Alexandra Barthelmes: University of Greifswald Rebekka Artz Alessandro Gimona: The James Hutton Institute
10:30 – 10:45	Presentation: Information needs from end-users & preliminary results survey - Q&A	Lammert Hilarides & Sonia Mena: Wetlands International
10:45 – 11:15	WORKING GROUP SESSIONS Breakout groups: How do you envision an EU wetland and peatland databases portal? (brainstorming session) <i>Barriers & Opportunities</i>	Facilitates: Wetlands International Online tool: Miro
11:15 – 11:25	<i>Break: 10 minutes</i>	
11:25 - 11:35	Presentation: Key aspects involving Wetlands and Peatlands mapping	Greifswald Mire Centre
11:35 - 12:10	INTERACTIVE SESSION All participants involved What information is needed and why? CANVAS Information needs: WHAT HOW WHY	Facilitates: James Hutton Institute & Wetlands International Online tool: Miro
12:10 - 12:25	Wrap-up session – closing remarks	James Hutton Institute & Wetlands International
12:25 - 12:30	Next steps	Wetlands International