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VALIDATED LOCAL RISK ACTIONABLE DATA FOR ADAPTATION



D1.2
Gap-analysis of existing European relevant information services

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FMI

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1 Executive summary

1.1 Description of the deliverable content and objectives

The impacts of climate change at regional and local levels address the urgent need to assess risks and develop adaptation strategies, integrating climate data with socioeconomic and environmental information. Climate services have gained increasing importance in this context, with numerous resources developed at the European level. However, climate services must shift from data-centric approaches to prioritizing users' needs to foster greater adoption. Therefore, this task maps relevant European data platforms for adaptation and assesses if the demonstrators are currently utilising them and which barriers they may face. More specifically, the analysis examines barriers affecting the accessibility, usability, and availability of the European data platforms, with attention to resolution requirements and potential data gaps. In addition, the demonstrators are requested to define their optimal data and data service requirements to locate the gaps between the current and desired states.

1.2 Deviation from objectives, corrective action (if applicable)

No deviation from objectives.

1.3 Main outcome

The results indicate that less than half of the respondents use European data platforms regularly or occasionally. The most used European data platforms among respondents are Copernicus, the European Flood Awareness System (EFAS), and the European Soil Data Centre (ESDAC). Many respondents were unfamiliar with European platforms, including the data, services, and tools, which aligns with low usage. Consequently, many were unsure how to assess climate risks, utilizing the various climate and non-climate datasets. Those who use the services pointed out that the spatial and temporal resolution of the data does not meet their needs, although most did not specify the context. Furthermore, some requested more frequent data updates and more language options. The respondents also pointed out that integrating climate and non-climate data services would make using the resources more accessible. Many respondents highlighted the value of data types such as interactive tools and learning materials (e.g., Climate-ADAPT) in their work. However, they indicated they are not accessing this information through European services, which may stem from unawareness and limited guidance.

The demonstrators' limited use of European services and details provided restricts the depth of recommendations that can be provided at this stage. However, it underscores a clear need for targeted efforts to guide users on which European resources to utilize, when, and how to apply them effectively. It confirms the rationale behind the VALORADA project. Moreover, the data gaps, including temporal and spatial resolution needs, will be examined in Task 1.4 in greater depth across a broader European sample, which is more likely to reach people using European data and services. Overall, the results highlight the need for enhanced outreach and user support, a focus that the VALORADA project continues to advance.

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2 Introduction

2.1 About VALORADA

VALORADA aims to help the EU transform 150 European regions into sustainable and climate-resilient areas by 2030. It develops customizable tools for accessing and manipulating climate and non-climate data, fostering community validation and data sharing. Using a transdisciplinary approach, it analyses climate risks with local actors across five European demonstrators, integrating data from repositories like Copernicus Climate Change Data Store and local catalogues. VALORADA targets Technology Readiness Levels (TRL) 7+, creating interoperable tools for harmonizing data and assessing climate risks. It plans to scale up with 10 European regions and collaborate with other Horizon projects, enhancing data portals and capacity-building for climate services.

VALORADA's vision statement: VALORADA wants to empower European regions and cities to steer the upcoming societal transformation towards sustainable and climate-resilient development through their own actions.
VALORADA's mission statement: VALORADA will enable the integration of diverse datasets that enable merging local knowledge with climate and non-climate datasets by means of co-developed data manipulation tools and climate data.

2.2 Task 1.2

The impacts of climate change are increasingly felt at regional and local levels, creating an urgent need to identify risks and implement effective adaptation measures. Integrating climate data with socio-economic and environmental information is crucial for addressing exposure and vulnerability and developing informed adaptation strategies. (Bender et al., 2020). In this context, climate services have become increasingly important. These services refer to "the transformation of climate-related data together with other relevant information into customized products such as projections, forecasts, information, trends, economic analysis, assessments (including technology assessment), counselling on best practices, development and evaluation of solutions, and any other service related to climate that may be useful for society at large. These services include data, information, and knowledge that support adaptation, mitigation, and disaster risk management" (EC, 2015).

However, it has been argued that **climate services' relevance for policy and practice needs to be enhanced**. The climate service market has been described as "fragmented," meaning that finding an appropriate data service among the wealth of the available ones can be challenging (Hauge et al., 2017; Webb et al., 2019). Overall, awareness of climate services and their use appears limited, highlighting the need for increased outreach, awareness efforts, and research (Perrels et al., 2020; Hoffmann et al., 2020; ECA, 2024). However, reaching the target audience for adaptation-focused climate services can be challenging, as those familiar with adaptation are typically aware of available resources. At the same time, those unfamiliar with adaptation remain unaware. (Chair & Steurer, 2018.) In addition, there may be limited understanding of incorporating climate information into decision-making. The "languages" and concepts used by climate service providers and users may not match. (Perrels, 2019.)

Given the challenges, there is a growing recognition that climate services should shift from being "science-driven and user-informed" to "user-driven and science-informed" (Street, 2016; Lourenço et al., 2016), prioritizing user needs over solely focusing on data and tools (Brasseur & Gallardo, 2016; Palutikof et al., 2019). Meanwhile, working towards a better quantity and quality of databases and tools is crucial. Previously, the shortage of localized data in the European Union has challenged local and regional authorities to implement adaptation strategies, as Gancheva et al. (2020) note. Equally important is to focus on non-climate data services. For instance, Räsänen et al. (2017) found that Finnish municipalities less active in climate risk management would need assistance assessing their exposure and vulnerability to climate hazards. These municipalities could benefit from services that explain how to use information not directly related to climate (Räsänen et al., 2017).

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Given the challenges and opportunities associated with climate services, Task 1.2 aims to do the following:

1. All European data platforms, including infrastructure, tools, documentation, and linked services (e.g., Copernicus Climate and Atmosphere Data Store and Toolbox (CADS), Climate-ADAPT, outputs from Horizon 2020 projects) relevant to the demonstrators, will be mapped out. According to task 1.1, C*limate impact chains,* the regions require data on hazards such as heatwaves, wildfires, floods, droughts, water stress, and coastal erosion, alongside information on exposure and vulnerability.
2. The demonstrators' current utilization of the relevant European data platforms and the barriers encountered are analysed. One particular focus area is the (implicit) criteria for selecting data and data services.
3. Demonstrators will be requested to formulate their optimal data and data services requirements. Analysing these three sets of inputs will deliver a gap between the status quo and desired data and data services.

2.3 How T1.2 fits within the overall WP1

The results of task 1.2 will be revisited during the project on several occasions. First, task 1.4 (*Assessment of data service gaps and climate risk indicator applicability*) will collect a European-wide sample of data and data service platform gaps using the online questionnaire created in task 1.2 as a base (see Annex 1). Moreover, the mapping of the European data platforms created in task 1.2 will be used in the analysis in task 1.4 to inform respondents about the available data platforms. The results of task 1.4 will be compared to the region-specific gaps identified in task 1.2 to analyse the generalization of the region-specific gaps. Identified gaps will be divided into region-specific and impact-specific categories using the gap analysis results. Moreover, the gap analysis results will serve as a baseline in the testing phase of the data manipulation tools' applicability and guide the selection of criteria for assessing the results. The gap analysis will also provide input for task 4.2 (*Climate data downscaling*) by communicating the downscaling needs where applicable.

2.4 Report structure

The gap analysis of existing European relevant information services report consists of seven sections. The gap analysis framework and data collection methods are introduced in section three, after which the mapping of the European data platforms (section four) and the synthesis gap analysis findings are reported (section five). The synthesis gap analysis is divided into two categories: one focused on analysing gaps for users and the other on non-users of the European data platforms. Demonstrator-specific gap analyses are presented in the sixth section. The last section makes conclusions and recommendations based on the findings.

2.5 Definitions

Climate data

Climate data refers to information related to the state of the climate system, including historical and real-time data. This can include measurements of temperature, precipitation, humidity, wind speed, atmospheric pressure, and other meteorological variables. Climate data is collected from various sources, such as weather stations, satellites, and climate models, and is used to understand long-term climate trends, variability, and changes.

Non-climate data

In this report, non-climate data encompasses information not directly related to the climate system but relevant to climate services. This includes socio-demographic and economic data (e.g., population, income levels), environmental data (e.g., biodiversity, soil types), and infrastructure data (e.g., energy grids, transportation networks). Non-climate data is often used with climate data to assess impacts, vulnerabilities, and adaptation strategies.

Earth observation (EO) data

Earth observation (EO) data is information collected about Earth's surface, atmosphere, and waters through ground-based, airborne, and satellite sensors. This data, analysed to track natural and human-made environmental changes, supports various fields, such as environmental protection, urban planning, agriculture, and climate change. Europe's EO program, Copernicus, combines satellite and in-situ sensors to provide valuable information for all European citizens. (EUSPA, 2024.)

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Climate services

Climate services refer to "the transformation of climate-related data together with other relevant information — into customized products such as projections, forecasts, information, trends, economic analysis, assessments (including technology assessment), counselling on best practices, development and evaluation of solutions and any other service concerning climate that may be of use for the society at large. These services include data, information, and knowledge supporting adaptation, mitigation, and disaster risk management" (EC, 2015).

Data platforms

Climate platforms are digital tools or frameworks facilitating access to climate data, information, and services. These platforms provide users with the resources to analyse and visualize climate data, often integrating climate and non-climate data. They are designed to support various applications, from research and education to policy-making and operational planning. Examples of climate platforms include online portals, databases, and interactive tools that offer functionalities such as data downloading, mapping, and scenario analysis.

In this document, **European data platforms** refer to **European climate and non-climate data platforms and the services and tools they provide.**

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3 Methodology

3.1 Analytical framework

The gap analysis aims to identify the barriers hindering the optimal utilization of the European data platforms to unlock their full potential for climate adaptation, as described in Figure 1.

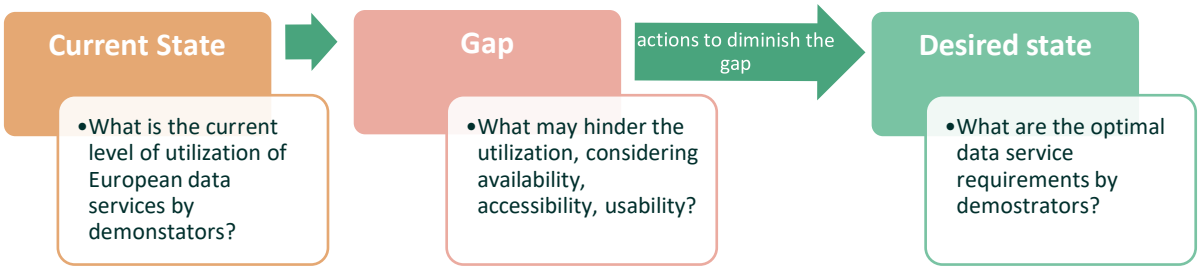


Figure 1 Gap analysis process

The gap analysis is conducted in four steps.

1. The existing European data platforms are mapped and compiled into an Excel file to create an overview of the available resources.
2. The current use of European data platforms is examined by consulting the relevant experts from the demonstrator regions. This includes evaluating the frequency of use, identifying the accessed resources, and understanding the types of content retrieved and for which purposes. The perceptions and experiences of European data platforms' **availability, accessibility, and usability** to the demonstrators are assessed. These dimensions are assessed based on resources, relevance, and content. No matter how extensive, information is unavailable if the resources to access it are lacking, it fails to meet the user's needs, or it lacks essential content.
3. The desired state is determined based on the demonstrators' optimal requirements.
4. Finally, current and desired states are compared, and the reasons for not using the platforms are assessed to locate the gap and provide recommendations for actions that could be taken to diminish it.

3.2 Data collection methods

Several data collection methods were employed to assess the usability and accessibility of the existing European climate and non-climate data and data service platforms, mainly an online questionnaire disseminated to the demonstrator regions. Adding to the primary data collection conducted within the task, our work builds on the project's previous findings. Specifically, task 2.2, *Characterisation of the Data Value Chain in each Demonstrator,* offers crucial information on the current data management practices in the regions, which supported the planning of disseminating the questionnaire and contextualizing findings in task 1.2.

Desk research

The mapping process involved identifying the most suitable locations for various data, materials, documents, and tools through desk research. The scope of the selected data platforms is broad, encompassing not only those strictly related to climate adaptation but also platforms addressing various socio-economic, ecological, and political contexts, which are essential for a comprehensive understanding of adaptation strategies.

Initially, official European websites were examined to locate climate and non-climate data portals provided by the European Commission. These portals are often linked to other European data platforms, services, and tools, funded by the EU, developed in collaboration with EU bodies or otherwise closely related to EU bodies. Additionally, outputs from EU projects were explored using CORDIS (Community Research and Development Information Service) to identify relevant ones, employing keywords such as "data platform," "data tool," and "data service" combined with "climate change adaptation" and "climate adaptation."

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Each data platform was evaluated during the desk research to determine its suitability based on several factors, including its spatial relevance, its alignment with climate risk concerns of the demonstrators, and the development stage of the platform or service, particularly in the case of Horizon projects. Once suitable European data platforms were identified, they were catalogued in an Excel file and categorized according to predefined criteria such as name, source, descriptions, languages, and content. Further details and comments were also written. Professionals in the field were consulted to assess the suitability of the categorization.

Mapping was followed by a general assessment of the platforms' content, the type of data the platform offers, language options available, and whether the platform is targeted toward a specific audience. Since available platforms cover various fields, themes, and content types, as well as datasets, data types, and resolutions, making an exhaustive and detailed analysis of the accessibility, availability, and usability is impossible and out of the scope of this deliverable. The analysis remains general and focuses on the main aspects described below in Table 1.

Dimension	Criteria
Accessibility	• language options • user authentication and restrictions
Usability	• type of data and content
Availability (content)	• (coarse) spatial relevance for demonstrators • continuity (project output or not) • whether the content is subject to a fee

Table 1 Selected criteria for assessing accessibility, availability, and usability of the European data platforms

Online survey

Using an online questionnaire, a mixed-methods approach was employed to gather quantitative and qualitative data to assess the gap. In designing the questionnaire, it was essential to balance closed and open-ended questions. Closed-ended questions allow for quick responses, while open-ended questions enable respondents to provide detailed perspectives on complex issues. However, it is crucial to consider the potential drawbacks of open-ended questions, such as lower response rates and increased dropout rates (Connor & Reimers, 2019). Therefore, while many questions were structured as closed-ended, those requiring deeper insights were designed as optional open-ended questions to ensure a comprehensive dataset. The complete survey can be found in Annex 1.

The survey was structured into four distinct sections. The first section focused on the current utilization of European climate and non-climate data platforms. Specifically, participants were asked about the frequency and purpose of their use and which content formats they used from these platforms. Following this, participants were presented with statements designed to assess the perceived availability, usability, and accessibility of the European data platforms. For each statement, respondents could express their level of agreement by selecting one of the following options: "strongly disagree," "disagree," "agree," or "strongly agree." Additionally, an "I do not know" option was provided to accommodate instances where respondents were unsure or did not use the European data platforms. After each section, respondents were allowed to elaborate on the issues. Questions were kept on a level where non-technical professionals could also provide their answers while giving GIS experts and other technical professionals the possibility of elaboration.

The optimal requirements of the respondents were surveyed similarly in the third section, where respondents were requested to assess the usefulness of formats that are provided in the European data platforms by selecting one of the following options: “not useful at all,” “somewhat useful,” “useful” and “highly useful.” The “I do not know” option and an open-ended free-text box were also provided so that respondents could further specify issues related to optimal formats. Questions regarding optimal spatial and temporal resolutions followed. Here, the respondent was requested to list any missing data or resolution alongside the purpose of the data. Lastly, respondents were invited to answer an open-ended question asking them to describe their vision of an optimal European data platform and other needs, for instance, the need for specific data manipulation, combination, and interpretation tools.

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The questionnaire was emailed to the project's local stakeholders and Earth observation (EO) partners; **95 people were invited to complete the survey**. Additionally, EO partners were asked to forward the survey to those involved in regional and local climate risk management. To increase the accessibility of the questionnaire, it was translated into local languages (French, Italian, Bulgarian, Greek, and Czech) using AI (DeepL). In an email accompanying the questionnaire, it was requested that any translation errors be reported. Before distribution, the questionnaire underwent testing to ensure its technical functionality. Additionally, feedback from five professionals in the field was sought to validate the content and functionality of the questionnaire before broader dissemination. Several reminders were sent throughout the period when the questionnaire was open, and assistance with any questions was provided. The survey was open for four weeks, with an extension period of one week. **A total of 24 responses were received**. Please note that the respondents could answer on behalf of several people, meaning one answer can represent multiple respondents working on similar tasks.

4 European climate and non-climate data platforms

The mapping comprises 52 European data platforms or project outputs offering climate or non-climate data and services. The following hazards have designated platforms: droughts (European Drought Observatory, EDO), flooding (European Flood Awareness System, EFAS), severe weather (European Severe Weather Database, ESWD), and forest fires (European Forest Fire Information System, EFFIS). More general themes were covered on platforms such as Forest Information System for Europe (FISE), Biodiversity Information System for Europe (BISE), and Water Information System for Europe (WISE). Explicitly mentioned target audiences often included policy and decision-makers, researchers, the general public, cities, regions, organizations, and regional or national authorities. Not all content was relevant to all VALORADA demonstrators, with some European data platforms offering content specific to certain demonstrator regions only.

In the Excel file, the platforms are listed with a link to the site, a short description, and additional notes. Additional notes specified, for example, if a platform is a project output or not. The continuity of platforms that are project outputs may not be guaranteed, which may affect their availability. The content of the data platforms is divided into categories: “Datasets,” “Interactive Charts,” “Interactive Maps,” and “Analysis Tools.” Available language options were also included in the mapping, which showed the scarcity of available language options, as only 27 % of all European data platforms provide language options other than English, affecting their accessibility and usability. Of the other language options, French and Italian were the most provided languages, with 25 % and 21 % shares, respectively. Greek was an option on 15 % of the European data platforms, while Czech and Bulgarian were provided only on 13 %. Furthermore, the availability of a language did not guarantee that all content was available in the language. Only a few European data platforms require registration or are subject to a fee, increasing the overall accessibility of the platforms.

The mapping is available in Annex 2.

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5 Synthesis of gap analysis

This section includes a synthesis of gap analyses for users and non-users of European data platforms. First, the respondents' background information is presented. The respondents work in various fields where climate risk management is crucial (see Figure 2). The organizational-level assessment revealed that 48 % of the respondents were in leading positions, 35 % worked as experts or specialists, and 17 % were in other groups (e.g., administrative roles). 22 % of the respondents reported explicitly working in a public authority.

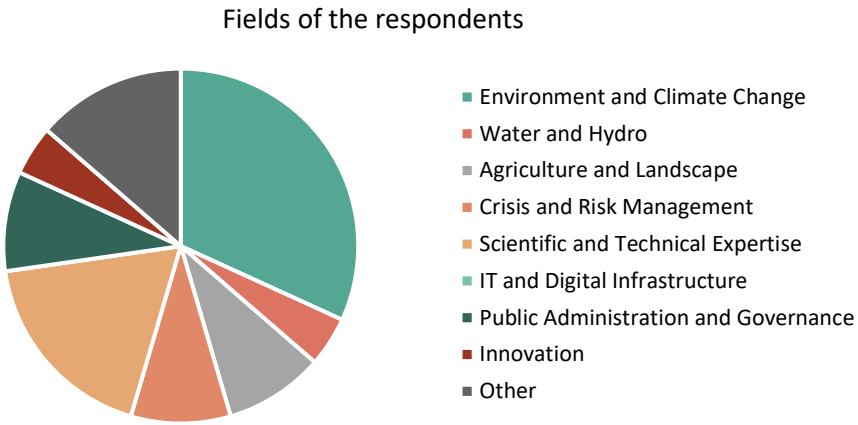


Figure 2 Fields of the respondents

As shown in Figure 3, only half of the respondents use European data platforms, of which 46 % use them regularly (at least once or twice every few months). Only 8 % of the respondents reported using the European data platforms monthly or more frequently. The limited number of respondents who use the platforms regularly constrains the level of detail achievable in the gap analysis. Consequently, the analysis primarily focuses on understanding the reasons for relatively low platform use, especially in the gap analysis on non-users responses.

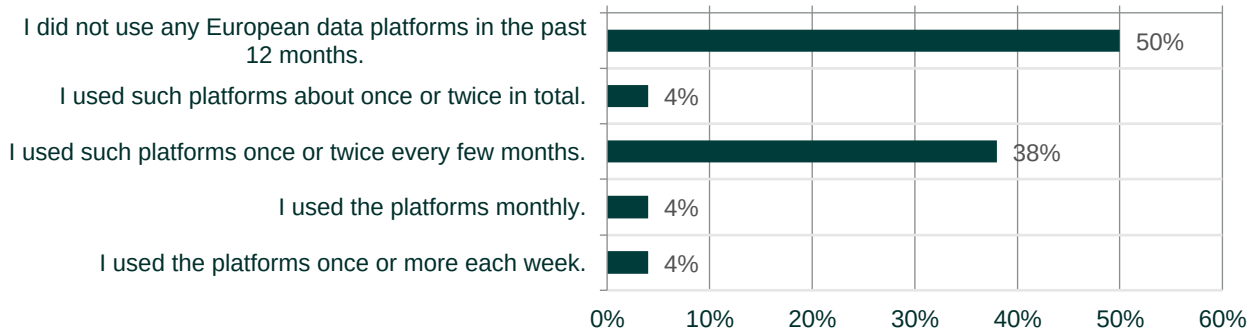


Figure 3 Frequency of use of the European data platforms

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5.1 Non-users of the European data platforms

Assessment of the non-users showed apparent gaps hindering the uptake of European data platforms. Half of the respondents agreed (42 %) or strongly agreed (8 %) that the content provided by the European data platforms is relevant and applicable to their work (see Figure 4). At the same time, the majority either strongly disagreed (33 %) or disagreed (25 %) that they were familiar with the available range of European data platforms, services, and tools, indicating a clear gap in familiarity. Moreover, 33 % disagreed that they strongly understand which data they need to assess climate risk, and 41 % disagreed that they know how to integrate climate data with socioeconomic data. **These findings confirm the initial reasons for undertaking the project: The main barriers limiting the use of European data platforms are unfamiliarity with the content, despite its perceived relevance, and the need for guidance on integrating climate and non-climate data into local initiatives.** To address this shortcoming, actions to increase awareness of the available range of European resources and to strengthen understanding of data integration are called for. Notably, 17 % to 25 % did not know the answers to the statements. Specifications addressing relevance and resources highlighted the need for timely data and unrestricted access.

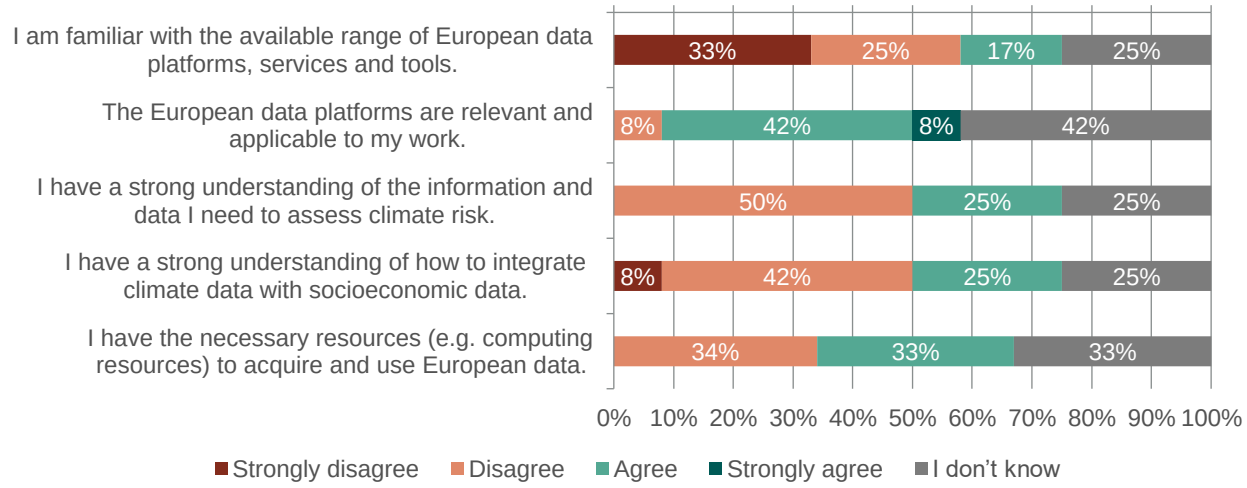


Figure 4 Relevance and resources, non-users

Respondents showed much uncertainty on the statements related to the content of the European data platforms, which is expected as they reported not using them (Figure 5). Conversely, the responses of the non-users may indicate how the content is perceived. Surprisingly, the temporal resolution and regional or local relevance, as well as temporal resolution and metadata, were seen as sufficient by 36 % of the respondents. At the same time, spatial resolution and regional or local relevance were also the statements that the most disagreed with (9 % "disagree," 9 % "strongly disagree," and 10 % "disagree," respectively).

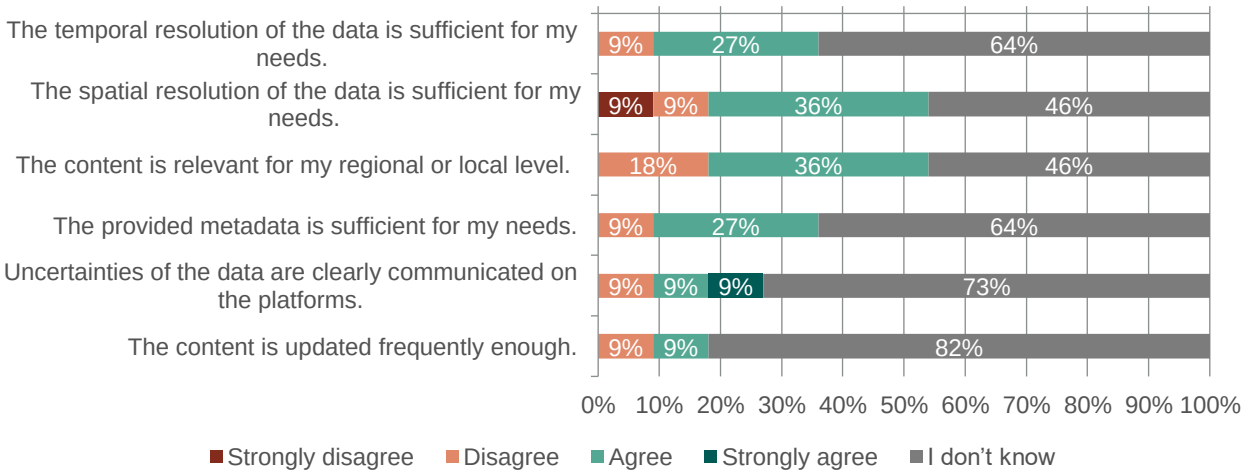


Figure 5 Content of the platforms, non-users

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The majority of the respondents (73 % to 91 %) were unsure of each statement regarding the accessibility and usability of the platforms. Respondents' views on the statements varied, as shown in Figure 6.

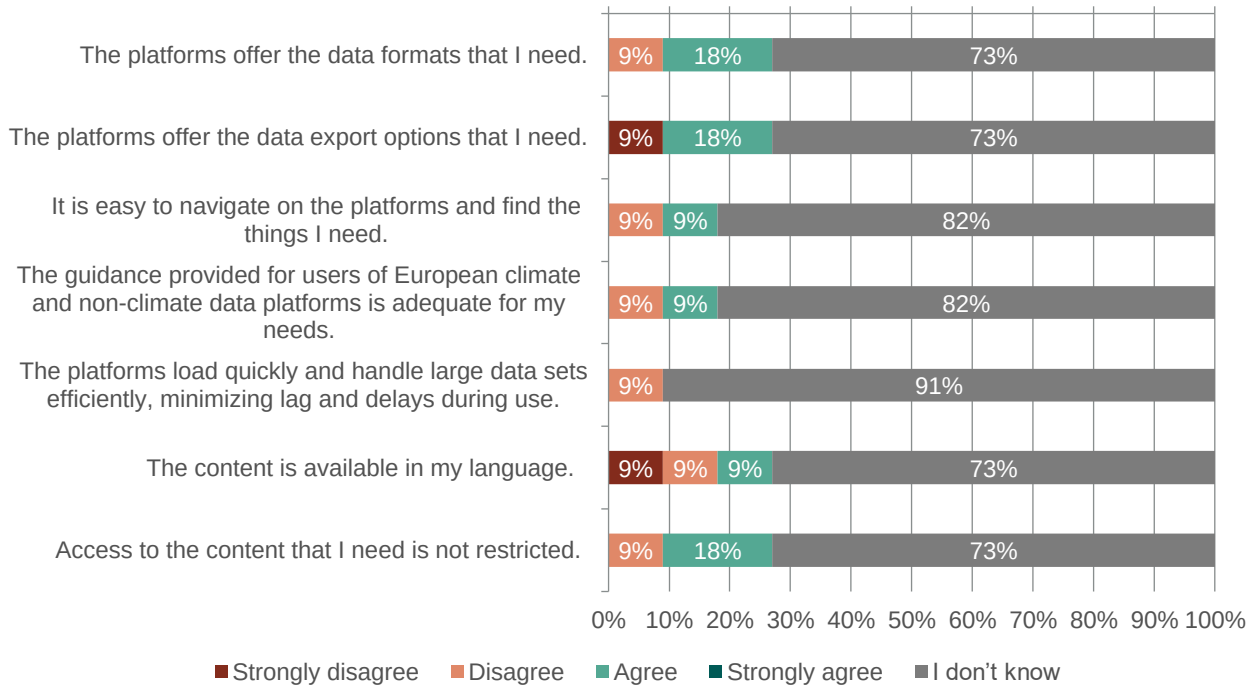


Figure 6 Accessibility and usability of the European data platforms, non-users

Despite the low uptake of the European data platforms, types of data provided by the platforms are generally perceived as useful. According to non-users, the most useful types of data are processed data, geospatial data, and interactive tools (Figure 7). Educational materials, decision-making aids, and implementation support tools ranked high. The underutilization is likely due to the unfamiliarity of the platforms, as found in the section related to relevance and resources. Furthermore, it may be attributed to users' challenges in assessing climate risks or integrating different data types. Addressing these limitations could increase the demand and effective use of these resources.

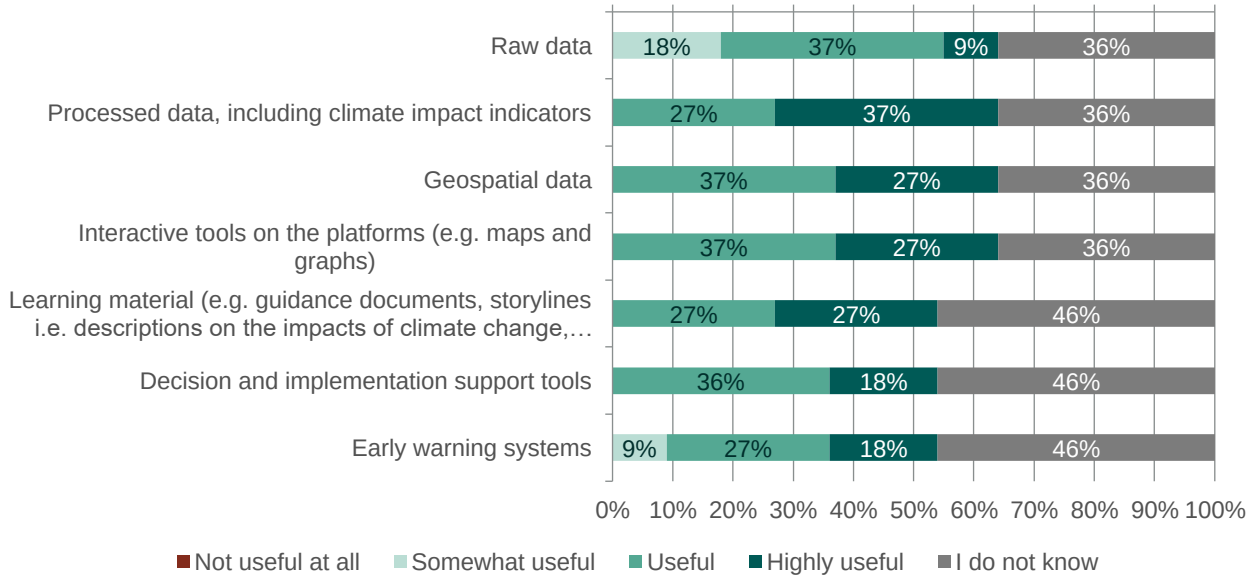


Figure 7 Usefulness of data formats, non-users

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Only a few data reported to be missing by the non-users. One respondent mentioned a need for dense network of temperature sensors on the street-level. However, implementing such localized infrastructure may fall beyond the scope of an EU-level data services. Suggestions for an EU-level data service to support urban heat island adaptation and a tool that matches appropriate datasets and tools to specific needs were also received. Non-users stated two specific requirements related to temporal and spatial resolution. These needs included a higher temporal resolution on urban heat islands and satellite thermography maps. The optimal temporal resolution for the urban heat map would be annual or heatwave period-specific; currently, the temporal resolution is five years. The optimal spatial resolution for the satellite thermography map is 5 to 10 meters. Currently, the highest resolution is 30 meters.

5.2 Users of the European Data Platforms

The current use of European data platforms that provide services and tools

The demonstrator regions mostly used the data and data services provided by Copernicus, while Climate-ADAPT, the EU's key adaptation-related platform, was mentioned only once (see Table 2). The respondents mentioned EFAS three times and ESDAC (European Soil Data Centre) two times. The use of data provided by ECMWF was also reported.

Platform, platform provider	number of respondents using the platform
Copernicus	8
European Flood Awareness System (EFAS)	3
European Soil Data Centre (ESDAC)	2
Climate-ADAPT	1
ECMWF Data Portal	1

Table 2 European data platforms used by the demonstrators

Figure 8 details the content obtained from the European data platforms by the users. The most used content is interactive maps and graphs (67 %), as well as environmental data (58 %), geospatial data (58 %) and processed data (50 %). Interestingly, none of the respondents used socio-economic data or decision and implementation support tools, even though many of them work in governing bodies. The European data platforms are used, for instance, for conducting risk analyses, supporting scientific purposes, facilitating environmental licensing and assessment, providing education and training, monitoring and preventing crisis events, and developing green infrastructure strategies.

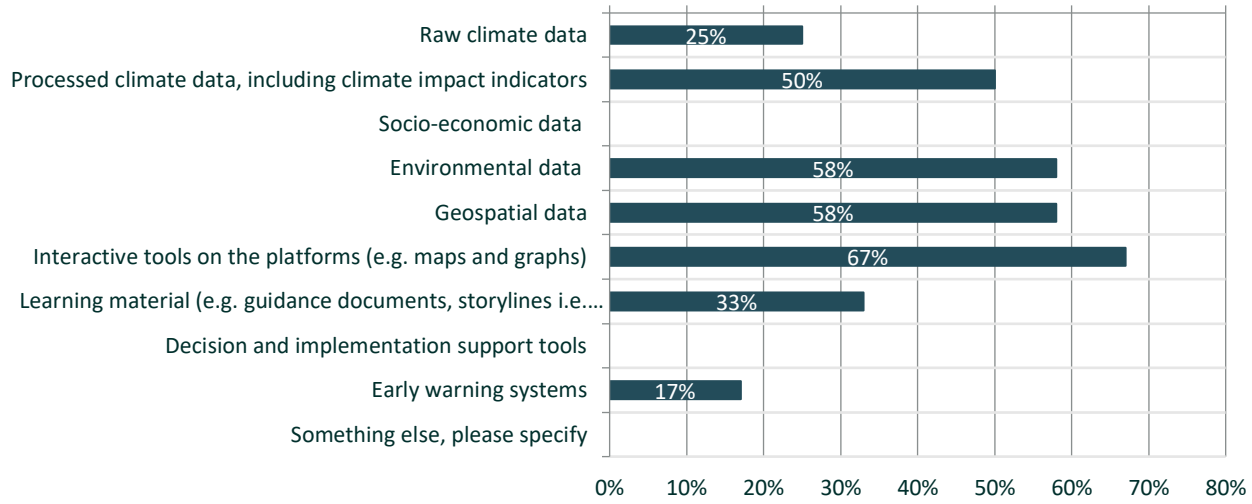


Figure 8 Which type(s) of content did you use or access via the platforms? Please select all that apply.

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Availability, accessibility, and usability of the platforms, services, and tools

Compared to non-users' responses, statements regarding relevance and resources are generally more agreed with, and the share of "I do not know" is significantly lower, which is expected (Figure 9). Unlike the non-users' results, the main barrier related to relevance and resources is a clear need for guidance on integrating climate and socio-economic data, not unfamiliarity with the European data platforms. Insufficient resources to use European data platforms limit their use as well. This suggests that more training and guidance on utilizing socioeconomic and non-climate datasets are needed. In addition, improved timeliness of the data and the possibilities of data integration were addressed in the specification section.

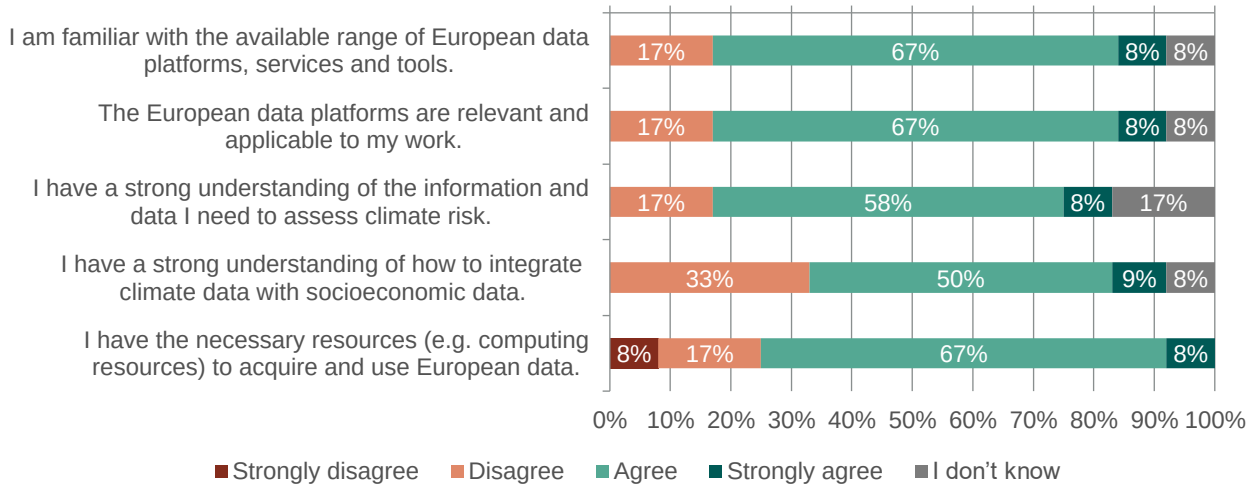


Figure 9 Relevance and resources (only respondents who reported using the European data platforms in the past 12 months)

The users are most satisfied with the communication of uncertainties, spatial resolution, and local or regional relevance of the content on the European data platforms as shown in Figure 10. Statements with higher levels of disagreement (i.e., more respondents indicating "disagree" or "strongly disagree" than "agree" or "strongly agree") **primarily concern the adequacy of update frequency, temporal resolution, and provided metadata**. However, except for the statement on temporal resolution, the difference between those expressing agreement and disagreement is marginal. The specifications emphasized the same concerns, with respondents requesting real-time data and higher update frequency. One respondent addressed the need for higher spatial resolution and historical data for climate risk assessments.

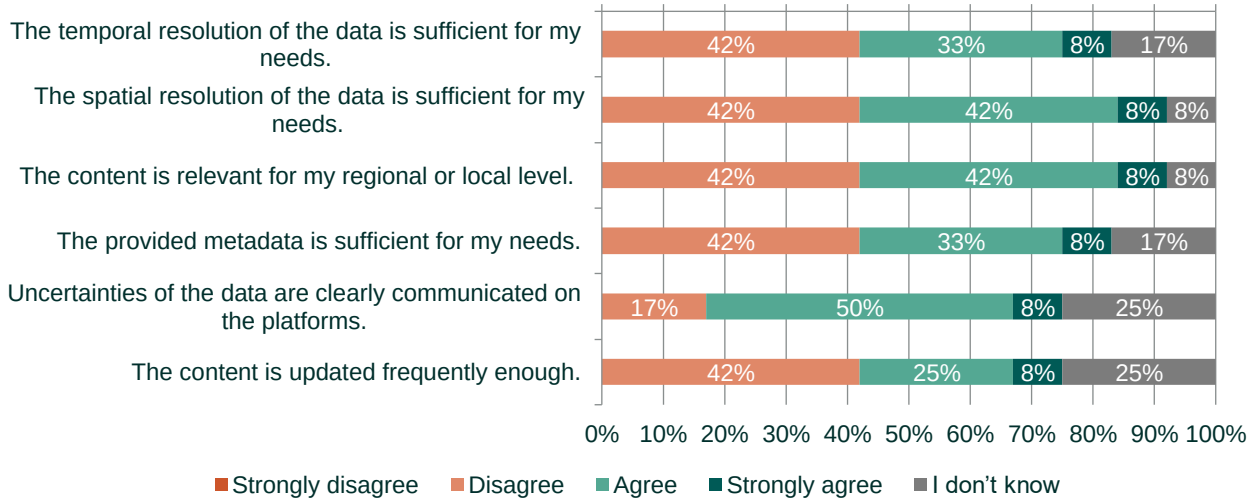


Figure 10 Content of the European data platforms (only respondents who reported using the European data platforms in the past 12 months)

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An examination of responses from platform users regarding content revealed that unrestricted access and the language options of the European data platforms were rated as the most satisfactory factors (see Figure 11). The factor seen as the most inadequate by respondents related to the content on the platforms was the adequacy of the guidance provided by the European data platforms, with 33 % of the respondents choosing “disagree” and 9 % of respondents choosing “strongly disagree.” Responses to statements on operational performance (42 % of the respondents selected “disagree,” 50 % “agree”), available data export options (33 % of the respondents selected "disagree,” 42 % “agree” or “strongly agree”) and ease of navigation (33 % of the respondents selected "disagree,” 50 % “agree” or “strongly agree”) were quite divisive. The specifications section stated that if a respondent had not been using the platforms regularly, unfamiliarity with the European data platforms made it challenging to address the statements accurately. In addition, language barriers were explicitly mentioned as a barrier.

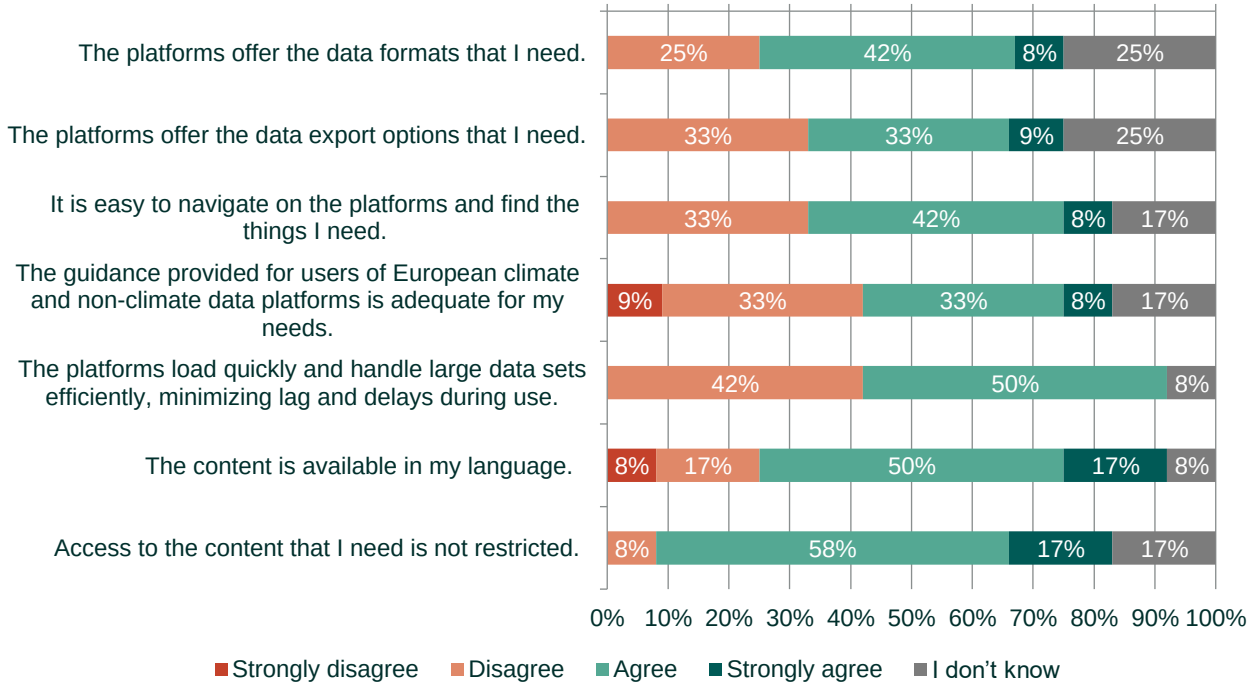


Figure 11 Accessibility and usability of the European data platforms (respondents who reported using the European data platforms in the past 12 months)

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Optimal requirements for European platforms, services, and tools

Among the users of the European data platforms, the most useful data formats are interactive tools, processed data, and geospatial data. Raw data is perceived as the least useful format with decision and implementation support tools. See Figure 12.

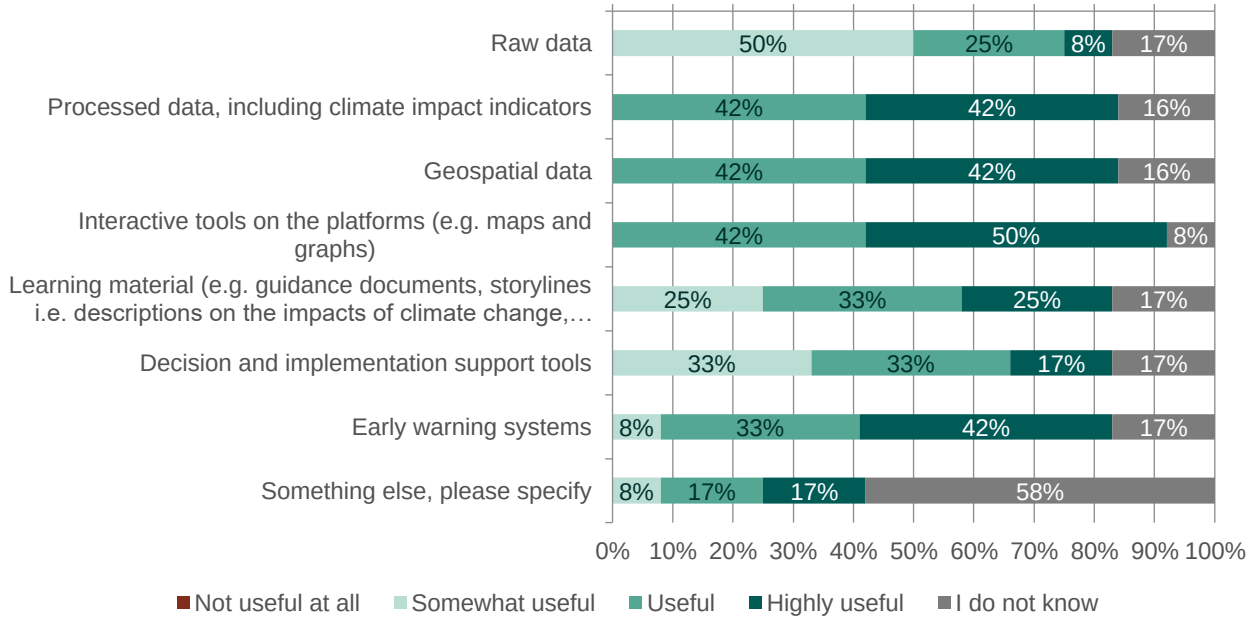


Figure 12 Usefulness of data formats (respondents who reported using the European data platforms in the past 12 months)

When asked if any data is missing or if there are spatial or temporal resolution needs, only a few specifications were received from the users of the European platforms. Data for mountain sites above 1200 m was reported missing in the Molise region. Regarding temporal resolution needs, more timely data on Land Copernicus was requested. The current temporal resolution for land data from Copernicus varies, with some datasets last updated in 2014. It was suggested that, ideally, all data should be up-to-date as of 2022 or later. The more specific use for the data was not specified. When it comes to spatial resolutions, requests for data with a spatial resolution of 1 x 1 km and 3 cm were made, revealing a possible gap between the current technological capabilities and the users' expectations, as achieving a resolution as high as 3 cm is unrealistic due to technological and practical limitations. On the other hand, respondents requesting a resolution of 3 cm may have misinterpreted the units and intended to specify a resolution of 3 km. Here, the use and purpose of the data were not specified.

Some expressed a desire for more integrated services or comprehensive platforms that would allow quicker access to multiple climate and non-climate datasets than what is currently available. Others expressed a need for real-time, interactive data and alert capabilities to better anticipate climate risks. The importance of higher-resolution data and better communication of limitations was also emphasized, along with the need for guidance on combining climate data with socioeconomic insights in an easy-to-understand way. Increasing awareness of the data services among local government departments, potentially with training for relevant staff, was recommended.

5.3 Limitations

The following limitations should be considered when interpreting the results. While this study focused on demonstrator-specific issues—generalization of the gaps will be addressed separately in Task 1.4—some demonstrator regions have only a small number of individuals working in climate adaptation, as found in Task 2.2, meaning that only a few responses were gathered. Nevertheless, multiple experts collaborated on a single questionnaire in some instances, resulting in more respondents than individual responses. Additionally, not all regions use the European data platforms referenced in the study, as found in task 2.2. This may explain the relatively low responses concerning more specific needs or data resolution.

Furthermore, there is a possibility of translation nuances due to the usage of AI in the translation process, both in how respondents interpreted the questions and how we understood their responses. These nuances could influence the

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precise meaning of certain answers, particularly when dealing with technical or contextual information. The phrasing of some survey questions may also have influenced the way respondents assessed their expertise: Questions that asked respondents to indicate whether they had a "strong understanding" of a particular subject may not have fully captured moderate or adequate levels of knowledge, potentially limiting the granularity of the data on expertise.

The timing of the survey also posed challenges. The target group, comprised mainly of professionals working in climate adaptation, was highly occupied, and the survey coincided with a particularly busy period in the VALORADA project. This may have influenced the details of the responses provided.

6 Gap analyses by demonstrator

This section identifies and categorizes the demonstrator-specific gaps and areas that require further attention. It identifies strengths and shortcomings in current systems and processes and points to areas where improvements are needed to enhance the effectiveness and accessibility of data, tools, and platforms. When half or more respondents perceive a particular issue or statement as a concern, it is classified as a "gap." When it comes to strengths, if more than half of the respondents agree or strongly agree on a statement, it is categorized as a "strength." **Data and data resolution needs addressed by the respondents are at the end of each section.** A summary of the demonstrator-specific gaps is at the end of the section.

6.1 Occitanie region

According to tasks 1.1 and 2.2, the region faces significant climate change impacts, including rising temperatures, altered precipitation patterns, droughts, and heatwaves, especially near the Mediterranean. These challenges are part of broader national climate issues, which France addresses through its National Climate Change Adaptation Plan. To mitigate urban heat islands, local responses include increasing urban greenery, water features, and permeable surfaces. The region is also improving its data governance to support climate adaptation, with strategic objectives and audits underway, particularly for Geographic Information System (GIS) data.

The current use of European data platforms that provide services and tools

Four answers were received from respondents working on climate-related projects, tasks, and agriculture in this region. All respondents indicated they did not use European data platforms in the past 12 months. As a result, their responses primarily address the reasons for not using the European data platforms.

Availability, accessibility, and usability of the platforms, services, and tools

Regarding **relevance and resources**, the main barrier is the unfamiliarity with the available range of European data platforms, with all respondents either strongly disagreeing (3) or disagreeing (1). However, two respondents think these would be relevant and applicable to their work. At the same time, three respondents disagreed that they understood the information and data needed to assess climate risks or how to integrate climate data with socioeconomic data. One respondent also stated that they do not have the necessary resources to acquire and use European data, while one believes they do, and the rest are unsure.

Since the respondents do not use European platforms, it is understandable that there was much uncertainty regarding **content**. Only three responses were obtained from this section onward. The potential barriers recognized in the section include limitations in spatial resolution (one respondent "strongly disagrees"), regional and local relevance (one respondent "disagrees"), and communication of the uncertainties (one respondent "disagrees"). These may be potential reasons for not using the platforms, in addition to major limitations related to relevance and resources. Yet, one "agree" response was also given to statements on temporal resolution, spatial resolution, and regional and local relevance. All respondents selected the option "I do not know" in **accessibility and usability**-related statements, which is expected as they do not use European data platforms.

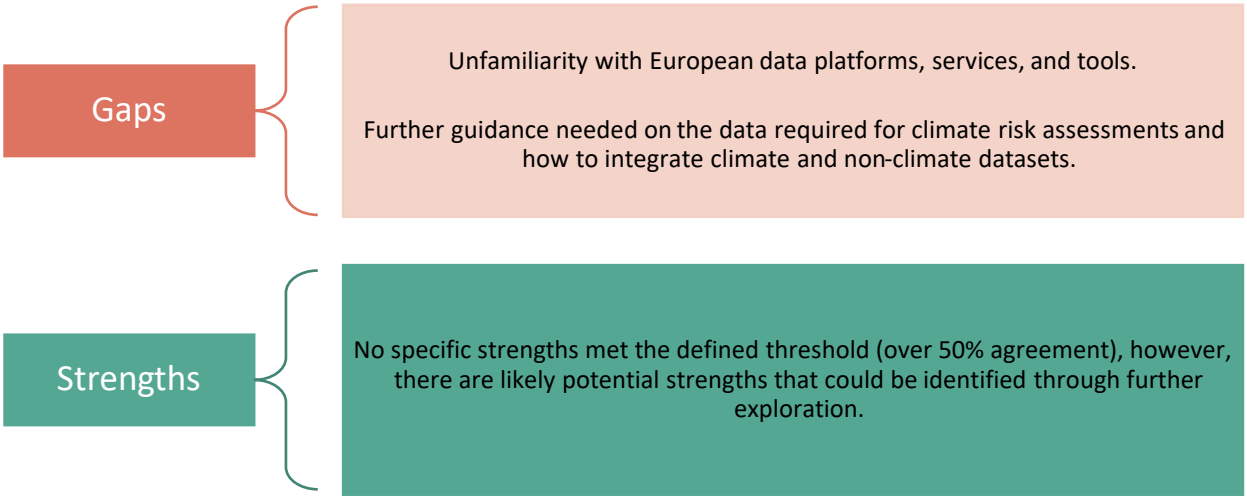
Optimal requirements for European platforms, services, and tools

There was also much uncertainty when questioned about the optimal requirements for the data types. However, one respondent indicated that processed data, geospatial data, interactive tools, and learning material from the European level are highly useful for them. However, as noted initially, they are not obtaining this information. The raw data and decision and implementation tools were also considered useful, and early warning systems were considered somewhat

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useful. One respondent pointed out that current satellite thermography data has a spatial resolution of 30 meters max, while the optimal resolution would be 5 to 10 meters.

The main identified gaps and perceived strengths



6.2 Central Greece region

Tasks 1.1 and 2.2 show that the Central Greece Region is experiencing significant climate change impacts, including rising temperatures, shifting precipitation patterns, and increased soil erosion, particularly in mountainous areas like Central Pindus. These changes and heightened risks of drought, heatwaves, and more frequent forest fires strain the region's electricity supply and threaten biodiversity and water resources. Coastal erosion also poses a significant challenge, particularly for the tourism sector. In response, climate adaptation efforts focus on water management, biodiversity protection, and mitigating erosion. The region's data governance framework for climate adaptation is under development.

The current use of European data platforms, services, and tools

Five respondents working in hydro economy, environment, and spatial planning provided answers from this region. Among them, three had not used any European data platforms in the past 12 months, one had used these platforms only once or twice, and one had used them once or twice every few months. The respondents specified using at least Copernicus and the European Flood Information System (EFAS) for environmental licensing and research. The type(s) of content used or accessed via the platforms included processed climate data (1), environmental data (1), geospatial data (1), learning material (1), and interactive tools on the platforms (2). One respondent specified that interactive maps with levels are essential to their work.

Availability, accessibility, and usability of the platforms, services, and tools

There was much uncertainty regarding **relevance and resources, with three to four respondents selecting "I do not know" for each statement apart from one** *(I have the necessary resources to acquire and use European data*). However, most statements were agreed with, except for statements directly on relevancy and resources, where one of the respondents pointed out that the European data platforms are irrelevant to their work, and two respondents do not have the resources needed to utilize them.

There was also much uncertainty regarding the **content** as four respondents were unsure whether the temporal resolution was sufficient, uncertainties were communicated clearly, and the content was updated frequently enough. Most claims regarding the content were perceived positively. The only negative aspects that stood out were relevance (one respondent chose the option "disagree") and the lack of sufficient metadata (1). The **accessibility and usability**-related aspects were either uncertain (3 respondents) or perceived as sufficient (2 respondents). The only exception was that one reported a lack of guidance, with one respondent selecting "strongly disagree." In additional comments, one

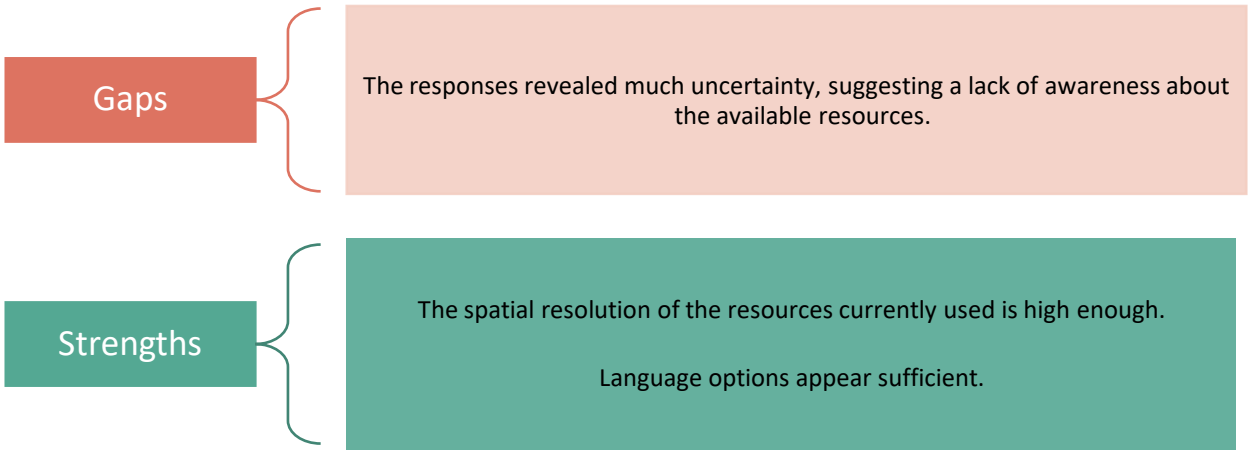
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respondent highlighted the need to become more familiar with the European data platforms since they had used only one platform for a short period.

Optimal requirements of the demonstrators for European climate and non-climate data platforms

While only three of the five respondents felt they knew enough about the data formats to respond about their usability, these three did perceive most data formats as useful or highly useful. One respondent clarified that the reason for the uncertainty is the limited use of the platforms, making it difficult to give comprehensive information. A higher spatial resolution was also brought up. The optimal resolution was not specified, nor was the use of the data. In additional comments, one respondent emphasized the need for appropriate tools to effectively address issues such as environmental licensing and protection, and one respondent addressed a need for geomorphological maps on catchments and rivers. It was also suggested that the European data services should be familiar to the local actors, and training should be provided for relevant local government department staff.

The main identified gaps and perceived strengths



6.3 Molise region

According to tasks 1.1 and 2.2, the Molise region faces significant climate change impacts, including rising temperatures, more frequent droughts, increased wildfires, and sea level rise, threatening its agriculture, water resources, and coastal areas, especially along the Adriatic coast. Italy's broader climate challenges, such as melting glaciers and extreme weather, also affect the region. Despite some meteorological data infrastructure, the region lacks comprehensive data governance. Local adaptation planning relies on datasets from regional civil protection networks and national sources but faces barriers like limited resources, technological challenges, and the need for skilled personnel.

The current use of European data platforms, services, and tools

In total, four respondents were reached from the Molise region. The respondents' professions covered the fields of research and administration. Two of the respondents worked specifically with biodiversity-related themes. Only two respondents use the European platforms regularly, once or twice every few months. The platforms in question are data provided by the European Environment Agency (EEA), Copernicus Data Store, and Copernicus Geoportals, and used for general research and to study and monitor coastal areas. Processed data (2) and environmental data (2) were the most used types of content, with raw climate data (1), geospatial data (1), interactive tools (1), and learning material (1) also used.

Availability, accessibility, and usability of the platforms, services, and tools

Regarding **relevance and resources**, two respondents stated that they were familiar with the available range of the platforms provided by the EU, and three answered that the platforms were relevant and applicable to their work. However, only one respondent stated they strongly understood the data required for climate risk management. All the

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respondents indicated that they needed more information on how to combine socio-demographic and climate data. Furthermore, only two respondents stated they had the resources to use the platforms.

Perceptions of the **platforms' content** were divisive; statements regarding the sufficiency of temporal resolution, relevancy of the content on a local level, sufficiency of metadata, and communication on uncertainties were agreed by two respondents and disagreed by the other two. Out of the statements, spatial resolution and update frequency were the factors the respondents were least satisfied with, with three of the respondents disagreeing.

Accessibility and usability issues proved to be the main weaknesses of the platforms according to the region, potentially indicating a key reason for the lack of platform adoption besides the irrelevance and inapplicability of the European platforms for one's work, as stated by one respondent. Only one respondent indicated that the content is available in their language and that access to it is not restricted. All the other statements are disagreed or strongly disagreed with, apart from one respondent selecting the option "I do not know" on each statement.

Optimal requirements for European platforms, services, and tools

Out of the given formats, processed data was stated to be the most useful (three respondents selected "highly useful") and raw data the least (three respondents selected "somewhat useful"), which may reflect the insufficient resources to use the European platforms as found in the question regarding relevance and resources. However, none of the formats were stated to be "not useful at all." The section designated for specifications addressed the need for time series data. Moreover, data on mountain sites above 1200 m above sea level were completely missing. Regarding resolutions, the need for spatial resolution of 1 x 1 km and temporal resolution of 20 years was addressed. However, the use of the data and the current resolution were not specified. awareness about the data required for climate risk assessments and how to integrate climate and non-climate datasets.

The main identified gaps and perceived strengths

Gaps

- Unfamiliarity with European platforms, services, and tools.
- Limited resources to use and acquire European data.
- Further guidance needed on the data required for climate risk assessments and how to integrate climate and non-climate datasets.
- Some users perceived the temporal and spatial resolutions as insufficient, and highlighted limitations in update frequency, metadata, and communication of uncertainty.

Strengths

- The European data platforms are perceived as highly relevant and applicable to their work, although the specific gaps require more attention.

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6.4 Burgas municipality

Background information

According to tasks 1.1 and 2.2, The Burgas municipality faces local climate challenges, primarily from intense rainfall leading to floods, infrastructure damage, and sewage overflow, with additional risks from rising temperatures, droughts, and fires affecting nearby wetlands. The municipality is involved in EU climate adaptation projects, aiming to improve resilience through enhanced monitoring, public awareness, and collaboration with European experts.

The current use of European data platforms, services, and tools

Three answers were received from this region. Two respondents mentioned using the platforms once or twice every few months, and one mentioned using them once or more weekly. The respondents specified that at least Copernicus data platforms, platforms with early warning systems, EFAS, ESMWF, “etc.” are being used.

When asked about the purpose of the platforms, two respondents highlighted their use in analysing data to evaluate the potential for integrating platform data into specific activities carried out by experts at the Municipality of Burgas, as well as assessing the feasibility of integrating metadata into the city's intelligent local systems. The use of the platforms for monitoring and prevention to reduce the risk of flooding and other crisis events was also stated. The platforms support risk analysis through historical data, environmental assessments, and integrated geological analyses. The data types in use include raw climate data (1), processed climate data (3), environmental data (2), geospatial data (2), interactive tools on the platforms (3), and early warning systems (2).

Availability, accessibility, and usability of the European platforms

Concerning **relevance and resources**, all respondents were familiar with the available European data platforms. Apart from one respondent who chose the option “I do not know”, the platforms are relevant to their work. The resources are also sufficient to acquire and use the European data platforms. Understanding of the data needed to assess climate risks (1 respondent disagreeing) or how to integrate climate data with socio-economic data (1 respondent disagreeing) could be enhanced.

Many limitations regarding the **platforms' content** were pointed out. These limitations relate to temporal and spatial resolution, local relevance, metadata, and update frequency of the European data platforms, with two respondents disagreeing with the teach statement and one respondent choosing the option “I do not know.” The only factor the respondents were satisfied with is how the uncertainties are communicated. Regarding the platforms' **accessibility and usability**, what stood out most was the lack of content available in the local language. One respondent also addressed this as a significant limiting factor in the additional comments. Furthermore, some perceived the data formats (1), export options (2), navigation and findability (1), guidance provided (2), and operational performance (2) of the European data platforms as insufficient.

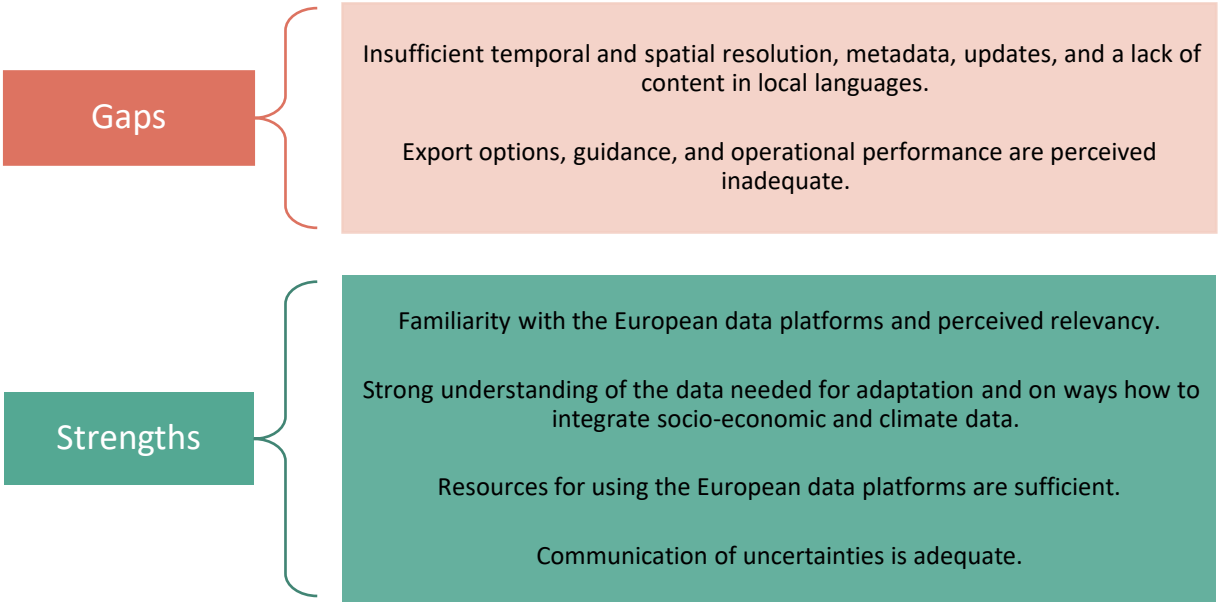
Optimal requirements of the demonstrators for European climate and non-climate data platforms

The respondents identified several data formats as highly useful, including early warning systems, interactive tools, geospatial data, and processed data, with two to three respondents selecting “highly useful.” Raw data is perceived as “somewhat useful” by all respondents, while learning material and decision support tools both had two respondents selecting the option “somewhat useful” and one respondent selecting “highly useful.”

One respondent emphasized the need for European platforms to be unified with real-time, interactive data capable of providing early warnings and alerts before climate crises. Another respondent highlighted the importance of having more integrated real-time data, higher resolution capabilities, and unified alerting systems for extreme changes in key parameters—ideally accessible with a single click rather than navigating multiple platforms. They also mentioned a need for resolution as fine as 3 cm, although they did not specify the dataset. The resolution of 3 cm is not technically achievable, which may suggest a mismatch between user expectations and technical capabilities. However, the respondent may have misinterpreted the units and meant to specify a resolution of 3 km. The specifications section also highlighted the need for accurate and timely data on the European data platforms.

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The main gaps identified and perceived strengths



6.5 Gabrovo municipality

According to tasks 1.1 and 2.2, the municipality is grappling with rising temperatures, droughts, and warmer winters, affecting forests, urban ecosystems, and public health. Despite efforts to reduce CO2 emissions and integrate climate adaptation measures, there is no formal structure for managing climate data. While the municipality uses GIS and environmental data platforms and is engaged in EU projects to improve climate resilience, more effective data governance, expert training, and cross-sector communication are needed to enhance its climate adaptation capabilities.

The current use of European data platforms, services, and tools

Four responses were received from this region. The respondents work in various fields, including infrastructure, environmental management, and landscape architecture. One had not used European data platforms in the past 12 months; two used such platforms once or twice every few months, and one used the platforms monthly. European platforms utilized by the respondents included Climate-ADAPT and the European Soil Data Centre (ESDAC) for information and training, the development of a Green Infrastructure Development Strategy, and a Disaster Early Warning System. The datatypes used included raw climate data (1), processed data (1), socio-economic data (1), environmental data (2), geospatial data (2), interactive tools (2), learning material (3), and early warning systems (1). In addition, one respondent specified using statistics.

Availability, accessibility, and usability of the platforms, services, and tools

The availability, accessibility, and usability of the European platforms were generally perceived as satisfactory. The only aspects that stood out regarding **relevance and resources** were limited familiarity, understanding of the data needed to assess climate risks, and the resources to acquire the data, with one respondent disagreeing with these statements. All respondents agreed that the content of the European platforms is relevant and applicable to their work and that they know how to integrate socioeconomic and climate data.

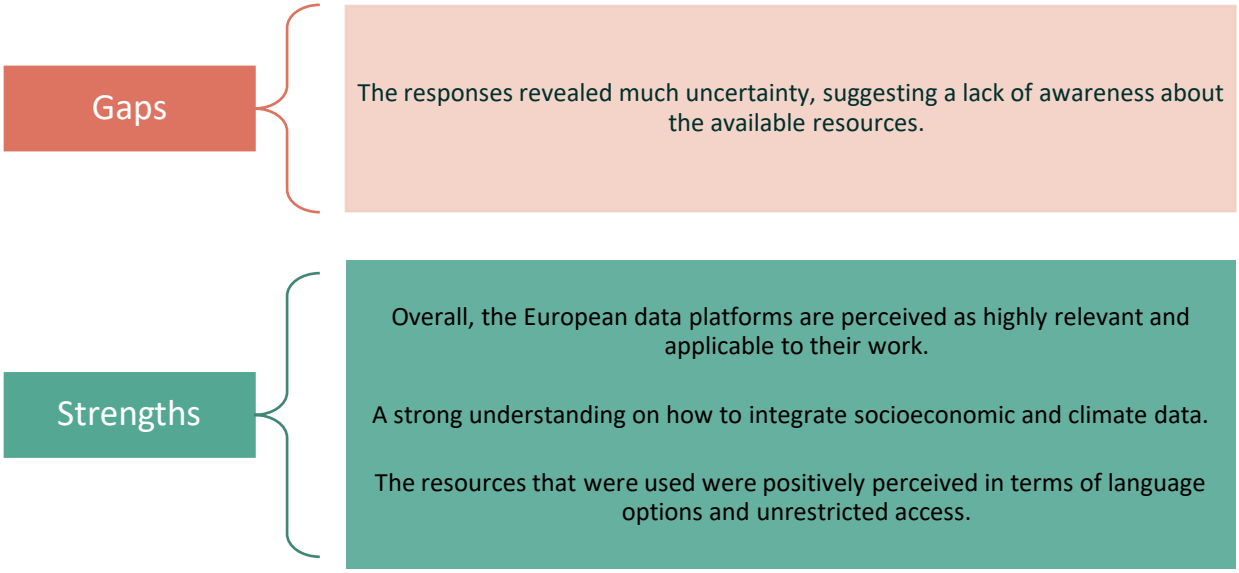
All in all, respondents were satisfied with the content, accessibility, and usability of the European data platforms, with statements on available language options and unrestricted access being the most agreed upon. Two respondents perceived the **platforms' content** as sufficient (agree), and two chose the option “I do not know.” The same applied to the statements regarding the **accessibility and usability** of the platforms, apart from statements related to available language options and whether access to the content is restricted, where one respondent chose the option “I do not know” and one “strongly agreed” on both statements.

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Optimal requirements for European platforms, services, and tools

No specific needs for the European platforms regarding the spatial and temporal resolutions were addressed, nor was any data reported missing. The most useful data formats for the region include processed data, geospatial data, interactive tools such as maps and charts, learning material, and early warning systems. Raw data and decision and implementation support tools were also considered useful but not currently used.

The main gaps identified and perceived strengths



6.6 Statutory city of Mladá Boleslav

According to tasks 1.1 and 2.2, the city faces significant local climate challenges, including heat waves, drought, and flash floods, which have led to rising tropical days, lower crop yields, increased water demand, and infrastructure risks. To enhance resilience, the city plans to expand green spaces, improve water management, and focus on renewable resources. However, its data governance framework, critical for climate adaptation, is underdeveloped. Key data stakeholders include the municipality, which lacks IT architects and data analysts and relies heavily on external providers. This was reflected in the gap analysis results, as only two respondents were reached.

The current use of European data platforms, services, and tools

Two respondents from this region answered the questionnaire. They are leading in the local environmental and energy sector governing bodies. One of the respondents indicated that they are not using the platforms, while the other uses European platforms once or twice every few months. The respondents using the European data platforms specified that they use Land Copernicus, ESDAC, and EFAS for information and educational purposes, and the content obtained included environmental data and interactive tools. Despite reporting that they do not currently use European data platforms, one respondent still answered questions related to platform usage. This may suggest a potential interest in using these platforms in the future or using other data resources. The respondent would use interactive maps (e.g., drought) to plan the housing areas' greening. The content the respondent reported to obtain would be raw climate data and environmental data.

Availability, accessibility, and usability of the platforms, services, and tools

Regarding **relevance and resources**, the respondent using the European data platforms indicated unfamiliarity with the available range of European data platforms and pointed out a lack of resources to acquire and use European data. In general, the region does not have sufficient funding allocated to climate adaptation measures, as found in task 2.2, which may also affect the resources available for using European data platforms. Concerning the **platforms' content,** the

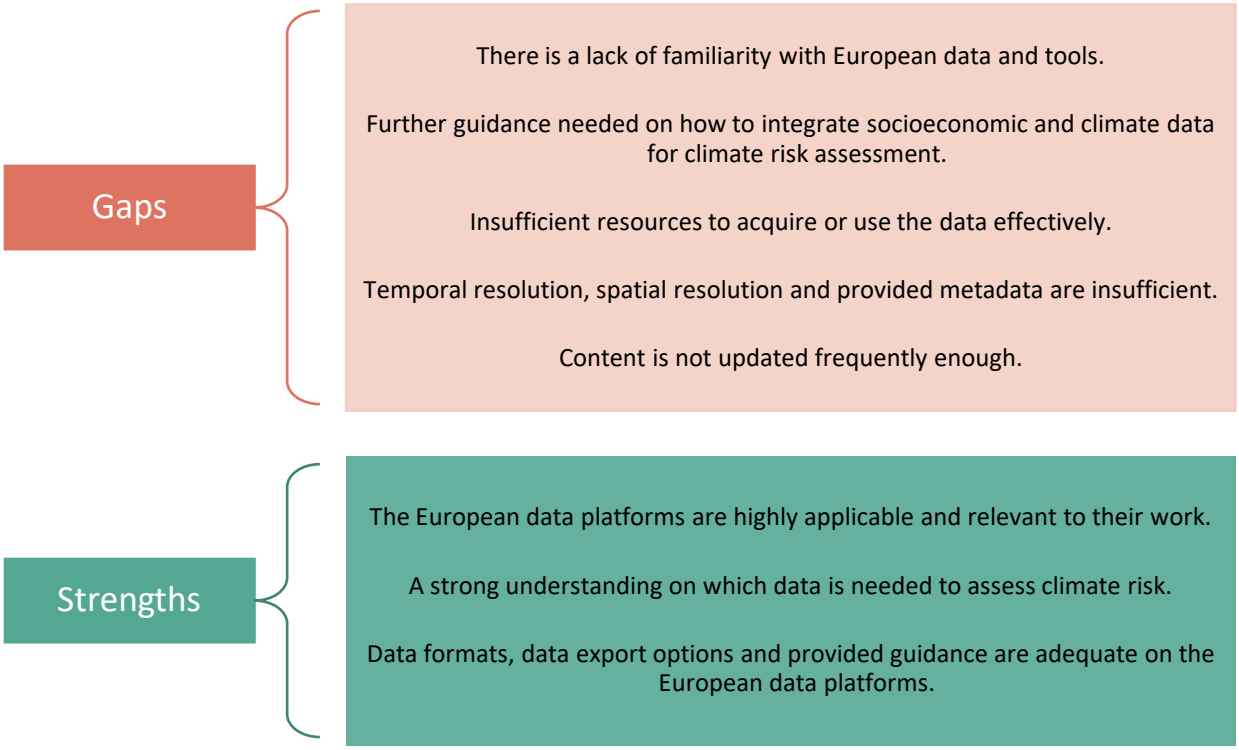
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respondent indicated that the data's temporal resolution is insufficient and has not been updated frequently enough. However, the data in question was not specified. The **accessibility and usability** of the platforms, on the other hand, were perceived positively.

Optimal requirements for European platforms, services, and tools

When questioned about the **optimal requirements** for the data formats, the most useful data were interactive tools and early warning systems ("highly useful"). In contrast, processed data, geospatial data, learning materials, and decision-making and implementation tools were regarded as useful. Respondents perceived raw data as somewhat useful. The respondents did not mention using these in questions about current use. This may suggest that while, for instance, learning materials are perceived as needed to support local climate risk management, this content may not reach those involved in it. Furthermore, the respondents who reported not using the European data platforms specified that they knew little about the topic. In additional comments, the respondent using the European data platforms wished that Land Copernicus would have up-to-date leakages everywhere as of 2022. Currently, the most recent information for some content is from 2014.

The main gaps identified and perceived strengths



6.7 Statutory City of Přerov

The city faces significant climate challenges, particularly vulnerability to extreme temperatures, droughts, and flash floods, threatening infrastructure, public safety, and environmental stability. To address these, the city plans to enhance its resilience by increasing vegetation, improving energy and waste management, and expanding the use of renewable resources. However, the city lacks robust data governance structures for effective climate change adaptation.

The current use of European data platforms, services, and tools

As found in task 2.2, the city does not have many dedicated data management specialists, with only a few GIS specialists. In the gap analysis, a single respondent is designated to represent the entire region. The region itself explicitly affirmed this representation. The respondent works in an administrative role and does not use the platforms. Therefore, no input on the current use, such as platforms, types of data, or use of data, was gathered.

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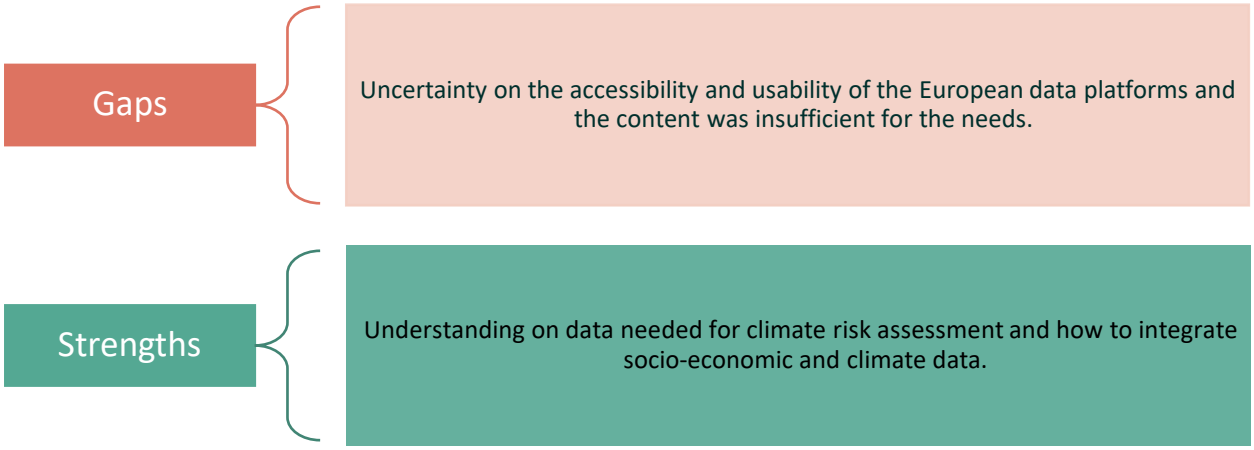
Availability, accessibility, and usability of the platforms, services, and tools

The administration's role was also shown in responses related to statements on **relevance and resources,** where the respondent disagreed with only the statement, "The European data platforms are relevant and applicable to my work." Responses indicated that the respondent is familiar with the available range of European data platforms, feels familiar with the data required in climate risk assessment, and has sufficient resources. Moreover, since the respondents do not use the European platforms, no responses on the **content, accessibility, or usability of the European platforms** were received.

Optimal requirements for European platforms, services, and tools

No responses were received for the European platforms' spatial or temporal resolution requirements. Furthermore, the respondent could not indicate the usefulness of different data types. This may be due to the respondent's role, although the understanding of the climate risk assessments was stated in the section covering the relevance and resources of the European platforms. However, the need for an EU-level data service for heat island adaptation was addressed.

The main gaps identified and perceived strengths



6.8 Summary of demonstrator-specific gap analyses

Demonstrator	The perceived strengths	The identified gaps
Occitanie region	• No specific strengths met the defined threshold of "strength" (over 50% agreement); however, there are likely potential strengths that could be identified through further exploration.	• Unfamiliarity with European data platforms, services, and tools. • Further guidance needed on the data required for climate risk assessments and how to integrate climate and non-climate datasets
Central Greece region	• The spatial resolution of the resources currently used is precise enough. • Language options appear sufficient.	• The responses revealed significant uncertainty, suggesting a lack of awareness of the available resources.
Molise	• The European data platforms are perceived as highly relevant and	• Unfamiliarity with European platforms, services, and tools.

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	applicable to their work, although the specific gaps require attention.	• Limited resources to use and acquire European data. • Further guidance needed on the data required for climate risk assessments and how to integrate climate and non-climate datasets. • Some users perceived the temporal and spatial resolutions as insufficient and highlighted limitations in update frequency, metadata, and communication of uncertainty.
Burgas municipality	• Familiarity with the European data platforms and perceived relevancy. • Strong understanding of the data needed for adaptation and on ways to integrate socio-economic and climate data. • Resources for using the European data platforms are sufficient. • Communication of uncertainties is adequate.	• Insufficient temporal and spatial resolution, metadata, updates, and a lack of content in local languages. • Export options, guidance, and operational performance are perceived to be inadequate.
Gabrovo municipality	• Overall, the European data platforms are perceived as highly relevant and applicable to their work. • A strong understanding of how to integrate socioeconomic and climate data. • The resources that were used were positively perceived in terms of language options and unrestricted access.	• The responses revealed much uncertainty, suggesting a lack of awareness about the available resources.
Statutory city of Mladá Boleslav	• The European data platforms are highly applicable and relevant to their work. • A strong understanding on which data is needed to assess climate risk. • Data formats, data export options and guidance provided are adequate on the European data platforms.	• Unfamiliarity with European platforms, services, and tools. • Further guidance is needed on integrating socioeconomic and climate data for climate risk assessment. • Insufficient resources to acquire or use the data effectively. • Temporal resolution, spatial resolution, and provided metadata are insufficient. • Content is not updated frequently enough.
Statutory city of Přerov	• Sufficient resources to use the European data platforms. • Understanding data needed for climate risk assessment and how to integrate socio-economic and climate data.	• Uncertainty about the accessibility and usability of the European data platforms and if the content is sufficient for the needs in the region.

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7 Conclusions and Recommendations

The main finding of the gap analysis is the relatively low utilization of the European data platforms despite their perceived relevancy. The findings align with previous conclusions made by ECA (2024). For instance, our and ECA's results show that Climate-ADAPT, Europe's primary climate adaptation platform aggregating adaptation-focused data, services, and tools, was not utilised. The underutilization of Climate-ADAPT and other European data platforms can be attributed to a lack of familiarity with the content, which may be due to the abundance of available resources (e.g., Webb, 2019). Accessibility-related aspects may also limit uptake, as the review of existing European resources showed that fewer than one-third of platforms provide language options other than English. Moreover, users require more precise guidance on which resources to use, where to find them, when to use them, and how to integrate European climate and non-climate data and services into local initiatives. Creating clear guidelines that link relevant resources—climate and non-climate datasets—to specific needs could greatly assist practitioners, as also recommended by Hoffman et al. (2020), Espinosa et al. (2020), and Nightingale et al. (2019). While developing such guidelines and educating users is beyond the scope of this task, it remains a crucial aspect for future efforts, confirming the overall objectives of the VALORADA project. Additionally, users identified barriers related to temporal and spatial resolution, update frequency, and usability, all needing further attention. These will be explored in greater detail in Task 1.4, where a European-wide sample will be gathered. The recommended actions outlined below aim to address the main areas needing further attention within the VALORADA project and, more broadly, offer insights for climate service developers. Many of the actions align closely with the steps planned for the project, further validating the rationale for their uptake.

1. Increase familiarity with European data, services, and tools

Actions are needed to increase familiarity with European data platforms and the resources they provide, from datasets to learning materials and decision-support tools, especially among non-users. Enhancing awareness of the available resources can encourage their broader adoption. Relevant European data platforms could be presented to the stakeholders in detail, for instance, via the capacity-building program of the VALORADA project or direct communication. The results of this task, including the mapping of European data platforms compiled into an Excel file, serve as a resource to guide future efforts.

2. Provide tailored guidance material on when, how, and which resource to utilize

Since merely raising awareness of available resources is not enough, it is essential to address the uncertainty surrounding the data needed or accessible for climate risk management sustainably. The VALORADA project has taken, and will take, steps to mitigate this shortcoming, including developing the data catalogues and running the capacity-building program. However, continuing actions on this matter are called for. Future initiatives could assess local needs in more detail to co-create guidance material on when, how, and which European data, services, and tools to apply. This could simplify identifying and utilizing the most relevant European resources when they are applicable. For instance, while task 1.3 identifies climate risk indicators for local stakeholders and outlines the required data, future initiatives could enhance this process. Need for more content in local languages was also addressed.

3. Address spatial and temporal resolution needs and other data requirements

Nearly half of the respondents indicated that spatial resolution, temporal resolution, and local relevance are inadequate, while some request more frequent data updates. However, as the respondents specified only few specific needs (which can be found from "Optimal requirements for European platforms, services, and tools" for each region), offering comprehensive recommendations at this stage is not feasible. Closer collaboration between providers and users could help to understand the needs and determine if specific data requires downscaling or can be downscaled. This could help set realistic expectations, as the highest resolutions are not always necessary or feasible (due to technical and financial limitations) for understanding and addressing the risks. In Task 1.4, detailed data requirements must be reported alongside their corresponding resources to link the needs with the relevant resources, enabling potential improvements.

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Annex 1 Online survey

Mandatory questions are marked with a star *

Local Needs with European Data for Climate Adaptation

Thank you for your interest, your response matters!

This survey aims to understand your experiences and needs regarding climate and non-climate data, services, and tools provided by European platforms. The goal is to identify the gaps between current and desired states, ultimately enhancing the potential for these platforms.

The survey is part of the VALORADA (Validated Local Risk Actionable Data for Adaptation) project, which aims to empower European regions and cities to lead societal and systemic transformations and enhance access to climate and non-climate data.

Here we refer to:

Data platform: An online environment such as the Climate Data Store from Copernicus and Climate-ADAPT that provides access to climate and non-climate data, services, and tools.
Climate data: Information about climatic conditions – e.g. temperature, rainfall, extreme events.
Non-climate data: Information needed to complement climate data, such as economic, social, or environmental data, or guidance on assessing climate risks.

Completing the survey will take about 10-20 minutes. You may choose to skip a question or stop the survey at any time, if you wish. You will not be asked to provide your name and your participation is anonymous. The data collected will be available only to the partners of the VALORADA project, and not shared with external parties. Results and analysis of the survey will be used in products and publications from the project, but it will not be possible to identify individual survey respondents. We sincerely appreciate your participation and efforts.

For any questions or further information, please contact Henna Naumanen (henna.naumanen@fmi.fi) or Enni Lehtinen (enni.lehtinen@fmi.fi) from the Finnish Meteorological Institute.

By clicking "I accept" you confirm that you have read and understood the information given above. *

Background information

- Which VALORADA region or city do you represent? *

- Molise, Italy
- Occitania region, France
- Region of Central Greece, Greece
- Gabrovo municipality, Bulgaria
- Burgas municipality, Bulgaria
- Statutory city of Přerov, Czechia
- Statutory city of Mladá Boleslav, Czechia
- Other, please specify

- What is your job title/role?

The current use of European data platforms, services, and tools

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- How often did you use European platforms that offer climate and non-climate data, services, and tools as part of your work during the past ca. 12 months?

For instance, use of such platforms can include accessing guidance documents and analysis tools via Climate-ADAPT and the European Environmental Agency websites. Also, it can include accessing interactive maps, raw data, and indicators in the Copernicus Data Store, the European Drought Observatory, the European Soil Data Centre (ESDAC), and the European Flood Awareness System (EFAS), among other platforms. *

- I did not use any European data platforms in the past 12 months.
- I used such platforms about once or twice in total.
- I used such platforms once or twice every few months.
- I used the platforms monthly.
- I used the platforms once or more each week.

- Please specify the platforms you used.

- For what purposes did you use the platforms?

- Which type(s) of content did you use or access via the platforms? Please select all that apply.

- Raw climate data
- Processed climate data, including climate impact indicators
- Socio-economic data
- Environmental data
- Geospatial data
- Interactive tools on the platforms (e.g. maps and graphs)
- Learning material (e.g. guidance documents, storylines i.e. descriptions on the impacts of climate change, online seminars and workshops)
- Decision and implementation support tools
- Early warning systems
- Something else, please specify

- If you wish, specify your use of European data and data service platforms.

Factors affecting the use and selection of the European climate and non-climate data platforms

There are many reasons why some users might or might not decide to use European climate and non-climate data platforms.

- For the following list of potential reasons please let us know to what extent each statement is true for you.

(“Strongly disagree”, “Disagree”, “Agree”, “Strongly agree”, “I don’t know”)

Relevance and resources *

- I am familiar with the available range of European data platforms, services and tools.
- The European data platforms are relevant and applicable to my work.
- I have a strong understanding of the information and data I need to assess climate risk.
- I have a strong understanding of how to integrate climate data with socioeconomic data.
- I have the necessary resources (e.g. computing resources) to acquire and use European data.

- If you wish, elaborate on the issues related to relevance and resources.

Content of the platforms *

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- The temporal resolution of the data is sufficient for my needs.
- The spatial resolution of the data is sufficient for my needs.
- The content is relevant for my regional or local level.
- The provided metadata is sufficient for my needs.
- Uncertainties of the data are clearly communicated on the platforms.
- The content is updated frequently enough.

- If you wish, elaborate the issues related to the content of the platforms.

Accessibility and usability of the platforms *

- The platforms offer the data formats that I need.
- The platforms offer the data export options that I need.
- It is easy to navigate on the platforms and find the things I need.
- The guidance provided for users of European climate and non-climate data platforms is adequate for my needs.
- The platforms load quickly and handle large datasets efficiently, minimizing lag and delays during use.
- The content is available in my language.
- Access to the content that I need is not restricted.

- If you wish, elaborate the issues related to accessibility and usability of the platforms.

Optimal requirements of the demonstrators for European climate and non-climate data platforms

European climate and non-climate data platforms provide information and data in a range of different formats (e.g. the type of raw data, maps, or online seminars).

- Please tell us how useful these formats are for you. *

("Not useful at all", "Somewhat useful", "Useful", "Highly useful")

- Raw data
- Processed data, including climate impact indicators
- Geospatial data
- Interactive tools on the platforms (e.g. maps and graphs)
- Learning material (e.g. guidance documents, storylines i.e. descriptions on the impacts of climate change, online seminars and workshops)
- Decision and implementation support tools
- Early warning systems
- Something else, please specify

- If you wish, specify.

Next questions are targeted for those working with climate data sets. Otherwise, move to the next section.

- Have you noticed that some climate or non-climate data is completely or partially unavailable for your city / region? If yes, which data is missing?

- If you have encountered spatial resolution limitations in your work, please specify

- The data and its (their) use
- The current spatial resolution(s)
- The resolution(s) you consider optimal

- If you have encountered temporal resolution limitations in your work, please specify

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- The data and its (their) use
- The current temporal resolution(s)
- The resolution(s) you consider optimal

- If you wish, vision how the EU-level data services could support climate change adaptation practices and policy-making in your city/region. Feel free to use your imagination.

End of the survey

Thank you very much for your time and effort.

Please use this section for any additional thoughts, observations, specifications, or other relevant comments.
For any questions or further information, please contact Henna Naumanen (henna.naumanen@fmi.fi) or Enni Lehtinen (enni.lehtinen@fmi.fi).

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Annex 2 Mapping of European data platforms

Mapping of European climate and non-climate data platforms			Type of content							
A platform providing data services and tools for adaptation	**Link**	**Description**	**Datasets**	**Interactive Charts**	**Interactive Maps**	**Analysis Tools**	**Reports**	**Examples on (other) type of content platform provides**	**Language options (English, French, Italian, Bulgarian, Czech and Greek)**	**Comments (e.g. Horizon 2020 project, access restricted)**
ARSINOE	ARSINOE Project	The ARSINOE project leverages a Systems Innovation Approach (SIA) and the Climate Innovation Window (CIW) to co-create and implement integrated, cross-sectoral climate change adaptation solutions that address the complex, interconnected challenges of modern societies.	1	1		1		Knowledge Graph (SustainGraph), data catalogue	English	Ongoing Horizon 2020 project. Several other tools under development (Cascading impacts and permutable services modelling tool, System Dynamics Modelling (SDM) tool, Traffic Impact Assessment Model, Distributed Hybrid Modelling for Climate Resilience Analysis,

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Biodiversity Information System for Europe (BISE)	https://biodiversity.europa.eu/	The Biodiversity Information System for Europe (BISE) is a single entry point for data and information on biodiversity in the EU. Bringing together facts and figures on biodiversity and ecosystem services, it links to related policies, environmental data centres, assessments and research findings from various sources. It is being developed to strengthen the knowledge base and support decision-making on biodiversity.	1	1	1	1	1	case studies	English	
CDP Open Data Portal	https://data.cdp.net/	Collection of datasets going as far back as 2011 on climate-related risks and opportunities, emissions, mitigation, adaptation, energy, and water in cities, states, and regions worldwide. Data in the portal is provided by the cities and regions involved.	1		1		1		English	
CLIMAAX	https://www.climaax.eu/project/	The CLIMAte Risk and Vulnerability Assessment Framework and Toolbox (CLIMAAX) is a four-year project under Horizon Europe. It aims to enhance regional climate and emergency risk management plans by	1			1	1		English	Ongoing Horizon 2020 project.

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		offering financial, analytical, and practical support. By contributing to the harmonization and consolidation of climate risk assessment practices, CLIMAAX will create a lasting impact on future European initiatives.								
Climate Transparency Reports	https://www.climate-transparency.org/	Climate Transparency is a global partnership aimed at accelerating climate action in G20 countries by promoting transparency. It unites leading climate experts to create a reliable, comprehensive, and comparable assessment of G20 climate performance. The annual Climate Transparency Report, released before the G20 Summit, provides accessible information on key areas like mitigation and climate finance, along with detailed fact sheets for each G20 country.					1		English	
Climate4impact	IS-ENES3 C4I-Search (climate4impact.eu)	The Climate4impact climate data portal aims to enhance the use of climate research data for climate change impact modellers, consultants, and other users.	1						English	Horizon 2020 project output. Registration is required for the full range of services.

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Climate-ADAPT	Discover the key services, thematic features and tools of Climate-ADAPT (europa.eu)	Support Europe in adapting to climate change by helping users access and share data and information on expected climate change in Europe, current and future vulnerability of regions and sectors, EU, national, and transnational adaptation strategies and actions, adaptation case studies and potential options, and tools that support adaptation planning.	1	1	1	1	1	Regional Adaptation Support Tool, Adaptation Dashborad, workshops, seminars, case studies, etc.	English, French, Italian	The main European platform for adaptation.
Climate Innovation Window	Climate Innovation Window - Climate Innovation Window	Portal for finding and sharing innovations that support climate change adaptation.						information on innovations	English	Output of the BRIGAID project.
Copernicus Atmosphere Monitoring Service (CAMS) Portal	Home | Copernicus	Quality controlled and consistent data on fire activity, air quality and health, solar energy, CO2 emissions and climate forcing.	1	1	1	1	1		English	
Copernicus Climate Change Service (C3S) Portal	Copernicus	Information on past, present, and projected future climate conditions, along with tools to facilitate strategies for both mitigating and adapting to climate change.	1	1	1	1	1	case studies	English	
Copernicus Emergency Service (CEMS)	Copernicus Emergency Management Service - Mapping | COPERNICUS EMERGENCY MANAGEMENT SERVICE	Mapping service in cases of natural disasters (e.g., floods, earthquakes, landslides, severe storms, fires), human-made			1				English	On-demand mapping of natural hazards, human-made

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		emergency situations and humanitarian crises globally.								emergency and humanitarian crises only for authorized users.
Copernicus Land Monitoring Service (CLMS) Portal	Copernicus Land Monitoring Service	The CLMS offers geographical information on changes on land cover, ground motion, land use, water cycle and vegetation state, earth surface energy variables.	1		1			use cases	English	
Copernicus Space Data Ecosystem (CDSE) Portal	Copernicus Data Space Ecosystem | Europe's eyes on Earth	The Copernicus space data ecosystem offers extensive satellite data and services to support global monitoring of environmental changes, fostering innovation and informed decision-making across various sectors.	1		1	1		cloud-based data infrastructure for data processing and storing, Earth observation satellite data	English	
Copernicus The Climate and Atmosphere Data Store and Toolbox (CADS)	Climate Data Store	The Copernicus Climate Change Service (C3S) Climate Data Store (CDS) provides access to various climate-related data, including observational data from ground-based instruments, satellites, other sources, reanalysis data, and environmental and climate model projections.	1	1	1			Cliamte Data Store, C3S Atlas, case studies, Python tools, training	English	

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CORDIS (Community Research and Development Information Service)	CORDIS | European Commission (europa.eu)	Results of European funded projects are provided in CORDIS.						project descriptions and outputs	English, French, Italian	
Destination Earth	About – DestinE Platform	Destination Earth is a key initiative by the European Commission aimed at creating a precise digital twin of the Earth to observe and simulate natural events, hazards, and their associated human activities.	1		1				English, French	
Disaster Risk Management Knowledge Centre (DRMKC)	About - European Commission	The European Commission Disaster Risk Management Knowledge Centre integrates existing scientific multi-disciplinary knowledge and co-develops innovative solutions for existing needs. Activities of the EC DRMKC support the translation of complex scientific data and analyses into usable information and provides science-based advice for DRM policies.		1	1		1	INFORM, Risk Data Hub	English, French, Italian, Bulgarian, Czech, Greek	
DRMKC Risk Data Hub	DRMKC Risk Data Hub (europa.eu)	The DRMKC Risk Data Hub is a multi-hazard geo-portal created to connect science and policy at various levels, promoting collaboration between researchers and stakeholders. It also	1	1	1	1	1	several relevant databases, e.g., FFEM Database (flood fatalities from the Euro-Mediterranean	English	Part of the Disaster Risk Management Knowledge Centre (DRMKC).

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		offers insights into the methodologies used for risk assessment and provides access to related publications.						region), ESCB - Physical Risk statistical indicators		
Earth Online	Earth Online	Earth Online provides updates and information on the European Space Agency's Earth observation initiatives. The website features details on ESA's Earth observation data, along with the satellite missions and instruments used to collect this data.	1	1	1	1	1	Earth observation data, workshops, tools	English	
EEA Geospatial Data Catalogue	EEA geospatial data catalogue (europa.eu)	The EEA Geospatial Data Catalogue provides an extensive and integrated repository of geospatial data, data services and feature catalogs.	1		1			geospatial data	English	
EJAtlas	Ej Atlas	An online platform that documents and catalogues social conflict around environmental issues, with a focus on cases where environmental concerns intersect with social and human rights issues.			1		1		English, French	
EU Mission on Adaptation to Climate Change Tools Database	Tools (europa.eu)	The EU Mission on Adaptation to Climate Change tools database offers access to up-to-date and reliable tools tailored to various stages of adaptation planning and implementation,			1	1		several relevant tools, e.g., Climate Resilient City tool (CRCTool), Social Vulnerability Index tool	English	

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		ensuring confidence in selecting the most suitable tools for specific needs.						(SVI), Thermal Assessment tool		
EU Open Data Portal	The official portal for European data | data.europa.eu	The EU Open Data Portal offers a broad selection of open datasets and promotes transparency and collaboration.	1			1	1	courses, guiding documents, learning material, podcasts	English, French, Italian, Bulgarian, Czech, Greek	
EUMETNET Data	Homepage - Eumetnet	EUMETNET is a consortium of 33 European National Meteorological Services that facilitates collaborative programs among its members. These programs cover various meteorological activities, including observing systems, data processing, basic forecasting products, research and development, and training.	1	1	1	1	1	training	English	
EUMETSAT User Portal	Data Catalogue | EUMETSAT - User Portal	Data and products from EUMETSAT's satellites play a crucial role in weather forecasting and are instrumental in monitoring environmental conditions and tracking climate change.	1					Earth observation satellite data	English	
EUNIS	EUNIS -Welcome to EUNIS Database	EUNIS, the European Nature Information System, consolidates data from various European		1	1		1		English	

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		databases and organizations into three interconnected modules focusing on sites, species, and habitat types.								
EURO-CORDEX	EURO-CORDEX	EURO-CORDEX is the European segment of the CORDEX initiative, generating ensemble climate simulations using a variety of dynamical and empirical-statistical downscaling models. These models are driven by multiple global climate models from the Coupled Model Intercomparison Project Phase 5 (CMIP5).	1					climate simulations using downscaling models	English	
European Atlas of the Seas	European Atlas of the Seas (europa.eu)	The European Atlas of the Seas provides a comprehensive resource with over 275 map layers on various marine and coastal topics, allowing users to explore, create, and share customized maps.			1				English, French, Italian, Bulgarian, Czech, Greek	
European Centre for Medium-Range Weather Forecasts (ECMWF) Data	Forecasts | ECMWF	ECMWF provides global forecasts, climate reanalyses, and specific datasets through various channels, including web access and broadcasting, using ensemble predictions to depict likely weather scenarios for informed decision-making.	1	1	1		1	educational material, guidance documents, reports	English	

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European Climate Data Explorer (ECDE)	European Climate Data Explorer (europa.eu)	The European Climate Data Explorer (ECDE) offers interactive access to a wide range of climate indices from the Copernicus Climate Data Store (CDS), aligned with the European Environment Agency's priorities, allowing users to explore data by relevant themes and sectors.	1					data by theme	English, French, Italian	
European Drought Observatory (EDO)	EDO map (copernicus.eu)	The European Drought Observatories (EDO), part of the Copernicus Emergency Management Service, provides drought-relevant information and early-warning for Europe.	1		1	1	1	also early warnings	English	
European Environment Agency (EEA) Data	https://www.eea.europa.eu/en	Collects and validates data from reliable sources to analyze trends and produce policy-relevant analyses on environmental and climate topics.	1	1	1		1	data hub, country fact sheets	English, French, Italian, Bulgarian, Czech, Greek (mainly in English)	
European Environment Information and Observation Network (Eionet)	European Environment Information and Observation Network — Eionet Portal (europa.eu)	Data portal of the EEA comprising of data, knowledge and advice to policy makers.	1				1		English	
European Flood Awareness System (EFAS)	Home | Copernicus EMS - European Flood Awareness System	The European Flood Awareness System (EFAS) is one service of the Copernicus Emergency	1	1	1	1	1	training	English	Real time-forecast and products only available to

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		Management Service (CEMS), and provides support for measures against floods in Europe. Focus is on large trans-national river basins.								EFAS partners and EFAS third party partners. Over 30 day old material available to all.
European Forest Fire Information System (EFFIS)	EFFIS - Welcome to EFFIS	EFFIS provides information on the full cycle of wildfires (ranging from pre-fire conditions to post-fire damages) for the Europe.	1	1	1	1	1	Wildfire Risk Viewer, Current Situation Viewer, Long-term fire weather forecast	English	
European Severe Weather Database (ESWD)	https://www.eswd.eu/	Collects and provides detailed and quality-controlled information on severe convective storm events over Europe.	1		1				English, French, Italian, Bulgarian, Czech, Greek	
European Soil Data Centre (ESDAC)	https://esdac.jrc.ec.europa.eu/	Offers comprehensive soil data including composition, moisture levels, and erosion rates.	1		1		1	publications and documents	English	
European Spatial Planning Observation Network (ESPON)	https://www.espon.eu/about	ESPON offers territorial analyses, data, and maps to underpin EU development policies, especially Cohesion Policy, with evidence. Assist public authorities in benchmarking their region or city, identifying challenges and opportunities, and shaping future development policies accordingly.	1		1		1	workshops	English	Analyses are adjusted based on specific needs and locations.

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Eurostat Database	Home - Eurostat (europa.eu)	The official European statistical office, including data such as population distribution, density, regional economies, industry types, employment rates, and economic performance indicators.	1	1	1	1	1	also economic data	English, French, Italian, Bulgarian, Czech, Greek	
Forest Information System for Europe (FISE)	Forest Information System for Europe (FISE) (europa.eu)	FISE is a forest knowledge base providing data sets and information on European forests.	1		1	1	1	country fact sheets	English	
GEOSS Portal	Welcome - GEOSS (geoportal.org)	The GEOSS Portal is an online interface for discovering and accessing global Earth observation data from various sources. It connects numerous observing systems and services to enhance Earth monitoring, support Sustainable Development Goals, and facilitate disaster risk reduction.	1		1		1	Earth observation data	English, French	
Global Disaster Alert and Coordination System (GDACS)	GDACS - Global Disaster Alert and Coordination System	GDACS provides real-time access to disaster information and coordination tools to address information gaps immediately following major disasters, with guidance and standards.			1	1	1	disaster alerts	English	Some of the content is restricted.
HARMONIA	http://harmonia-project.eu/about/	HARMONIA aims to support urban stakeholders by providing a resilience assessment platform that helps them				1	1		English	Ongoing Horizon project. Piloting cities from the same

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		understand and measure the impacts of the climate change. The platform leverages satellite and auxiliary data to create a user-friendly knowledge base, offering detailed information down to the neighborhood and street level.								countries as the demonstrators.
IMPETUS	Impetus - Turning climate commitments into action - Climate Impetus	IMPETUS focuses on building resilience by engaging local citizens, policymakers, and businesses at demonstration sites across Europe. The initiative analyzes solutions, enhances knowledge, and develops adaptation measure packages that other communities can adopt as pathways toward a climate-neutral and sustainable future.	1		1	1	1	includes AI assistant for adaptation	English	Ongoing Horizon 2020 project.
Knowledge4Policy	Knowledge for policy (europa.eu)	Knowledge4Policy (K4P) is a platform providing policymakers with high-quality, relevant, and scientifically robust knowledge, featuring tailored content, a comprehensive knowledge database, and an evolving online community for collaboration between	1	1	1	1	1		English, French, Italian, Bulgarian, Czech, Greek	

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		scientists and policy makers.								
Marine Information System for Europe (WISE Marine)	WISE Marine (europa.eu)	WISE Marine offers access to comprehensive data and information regarding Europe's seas, covering their current conditions, environmental pressures, and strategies for conservation and protection.	1	1	1	1	1		English	
REACHOUT	Home - Reachout	The REACHOUT project is advancing user-oriented climate services to support the Green Deal. Research partners, climate service providers, and city stakeholders are co-developing services for seven EU city hubs. These services help cities analyze climate hazards, set climate resilience goals, and choose adaptation actions. This "Triple-A toolkit" leverages existing tools and services.				1	1		English, Italian, Greek	Ongoing Horizon 2020 project.
REGILIENCE	Regilience - Regional Pathways to Climate Resilience	The project creates, collects, disseminates, and promotes tools and scientific insights to help European regions identify and address climate-related risks.				1	1	maladaptation self-assessment tool, climate adaptation funding overview tool	English	Ongoing Horizon 2020 project.
Senses Toolkit	https://climatescenarios.org/toolkit/	The SENSES toolkit modules help you understand and					1		English	More specific modules on finance and

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		communicate climate change scenarios. The modules utilize visualizations in an explanatory or exploratory way.								policy making are under development.
TransformAr	Knowledge Centre – TransformAr	TransformAr is an EU-funded project aimed to develop and demonstrate solutions and pathways to achieve rapid and far-reaching transformational adaptation (TA) across the EU. The project will combine cross-sectoral and multi-scale innovation packages, as the combination of solutions and pathways, to support regions and communities in their societal transformation towards climate change resilience.				1	1	playbook for transformational adaptation	English	Ongoing Horizon 2020 project.
Water Information System for Europe (WISE)	WISE Freshwater (europa.eu)	Data and information on the state of Europe's seas and freshwaters, detailing environmental pressures and suggesting actions for their protection and conservation.	1	1	1		1	flood risk assessments, country fact sheets	English	
WEkEO Portal	Copernicus and Sentinel data at your fingertips | WEkEO	WEkEO serves as the EU Copernicus DIAS reference service, providing comprehensive access to environmental data, virtual processing	1		1	1		cloud-based data infrastructure for data processing and storing, access	English	More advanced computing plans are subject to a fee.

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		environments, and expert user support. The service caters to diverse user groups.						to Copernicus data		

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