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VALIDATED LOCAL RISK ACTIONABLE DATA FOR ADAPTATION



# D1.4
# Climate data service gaps across the EU

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FMI, HCU

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## DEFINITIONS

### *Gap*

Within this deliverable, a gap refers to any factor that hinders local-level actors from effectively using EU-sourced data platforms in adaptation related work including planning, decision-making, and implementation.

### *Data platforms*

Data platforms are digital tools or frameworks facilitating access to climate and non-climate data, information, and services. These platforms provide users with the resources to analyse and visualise 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. **Within this deliverable, we are specifically focusing on EU-sourced data platforms.**

### *Climate services*

Climate services refer to "the transformation of climate-related data together with other relevant information — into customised 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).

### *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. (NOAA, 2016).

### *Non-climate data*

Non-climate data encompasses information not directly related to the climate system. 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. (NESP, 2024).


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# 1 Executive summary

## 1.1 Description of the deliverable content and objectives

Accelerating climate impacts at the local level create an urgent need for climate risk assessment and adaptation based on integrated climate, socioeconomic, and environmental data. Although numerous EU-sourced data platforms offering climate services are available, and the VALORADA project has confirmed both their usability and their strong potential to support adaptation when combined with local data, their uptake by local practitioners remains limited. This report examines barriers related to the accessibility, usability, and availability of EU-sourced data platforms. This task builds on T1.2 ("Gap-analysis of existing European relevant information services"), which mapped relevant EU-sourced data platforms for adaptation and assessed their current use and factors affecting the use by the demonstrators. Gaps identified in an EU-wide context are assessed and compared to the results of T1.2. An assessment of the generalisability of the gaps in the demonstrator regions is provided, and the gaps are categorised into region-specific or broader, EU-wide issues. The analysis draws on data collected through interviews with practitioners, researchers, policy domain experts and data producers and two online questionnaires: one conducted in spring 2024 and the second in summer 2025. Together, these inputs validate the T1.2 gaps at the European level and reveal additional challenges that were not captured in the demonstrator analyses. The findings give directions for improvement and priorities for future work.

## 1.2 Deviation from objectives, corrective action (if applicable)

Participant recruitment for the planned online survey resulted in a lower response rate than anticipated. To ensure sufficient input and maintain the quality of the analysis, the approach was complemented with semi-structured interviews. This adjustment proved beneficial, as the interviews generated more nuanced information and allowed for deeper exploration of participants' perspectives.

## 1.3 Major outcome

The results show that gaps in the use of EU-sourced data platforms are largely consistent across EU-wide and regional contexts, indicating persistent and systemic challenges rather than method specific effects. At the same time, their relevance and manifestation vary by context, with additional barriers identified via the interviews that are related to the science–practice interface and governance and political conditions. Although these additional factors were not systematically validated in demonstrator regions, other project results (e.g., D2.5) indicate that they are also relevant. Addressing these challenges requires improvements not only to the platforms themselves but also to collaboration, guidance, and enabling conditions in the operating environment. VALORADA contributes by providing practical tools and a co-development approach that supports data findability, capacity building, and context specific application.

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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 1.4

Adaptation draws on diverse information sources including climate projections as well as socio-economic information (IPCC, 2023; Bender et al., 2020). To support this, numerous EU initiatives provide such information through online platforms. The information is often delivered via climate services (CS). While producing locally tailored CS to meet users' specific needs would be ideal, their resource demands limit broad implementation (Swart et al., 2017). As a result, EU-sourced data platforms offer general-purpose CS for diverse user groups. Examples include Climate-ADAPT (ECA, 2024) and Copernicus Land Monitoring Service (Copernicus, 2024).

**VALORADA demonstrates that meaningful climate adaptation planning can be achieved through the combined use of local data and these European data resources, without the need for purchasing new data.** Nonetheless, awareness and uptake of CS remain limited among local authorities (Hoy et al., 2025; Celliers et al., 2021; Lacava et al., 2020). Barriers include a fragmented service landscape, inconsistent terminology, insufficient guidance, and issues with temporal or spatial resolution, which may hinder policy integration or even lead to maladaptation if misinterpreted (Hoy et al., 2025; Perrels et al., 2020; Swart et al., 2017; Lorenz et al., 2017; IPCC, 2023). These challenges inhibit the progression from data to actionable information in adaptation (Celliers et al., 2021) and there is broad agreement that CS must shift from being science-driven and user-informed to user-driven and science-informed (Street, 2016; Lourenço et al., 2016). Co-design and interdisciplinary collaboration show promise in improving the uptake and usability (Apicella et al., 2022; Neset et al., 2021; Jebeile & Roussos, 2023; Williams et al., 2020). However, deeper understanding is needed about whether these familiar barriers persist and how effectively they are being addressed.

Most existing assessments on the factors affecting use focus on individual CS platforms (Terrado et al., 2025; Bharwani et al., 2025; Apicella et al., 2022; EEA, 2018), while cross-platform analyses are rare (Swart et al., 2017; Sanderson et al., 2016). However, although developing usable climate information requires a thorough understanding of the context in which it is intended to be applied (Reveco & Mañez, 2026), cross-platform evaluations are essential to identify shared challenges, reduce duplication, and support coordinated development. Some studies exist, such as Hoy et al. (2025) on Eastern Europe, Sigel et al. (2016) on national portals, and ECA (2024) on awareness of EU-level services. The rapid evolution of CS highlights the need for continued research to keep them aligned with emerging adaptation needs.

Within this deliverable, gaps related to accessibility, availability, and usability of the EU-sourced data platforms are identified for the EU-wide scale and compared to the gaps experienced in the VALORADA demonstrator regions. For a detailed elaboration of the gaps reported by the demonstrators, refer to D1.2 (Gap-analysis of existing European relevant information services). Rather than attempting to define a single EU-wide "desired state", which is not feasible given the diversity of use cases, governance contexts, and adaptation needs across


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Europe, the analysis identifies common hindering factors in application of EU-sourced data platforms in adaptation by local authorities. By comparing findings from demonstrator regions with EU‑wide evidence, the study assesses the extent to which observed challenges are context‑specific or generalisable. Drawing on interviews and online questionnaire data, this report validates the nature and occurrence of hinderances to the use of EU-sourced data platforms and reveals additional challenges that were not captured in the demonstrator analyses.

**In summary, the T1.4 aims to do the following:**

1. Identify EU-wide gaps – hindering factors – related to the effective use of EU-sourced data platform use in local adaptation with primary focus on accessibility-, availability-, and usability-related factors.
2. Compare these EU-wide findings with the demonstrator-specific gaps from T1.2 to assess where the identified gaps coincide or differ.
3. Examine the generality of the gaps recognised in the demonstrator regions to determine which factors are locally specific and which represent broader, systemic shortcomings that require attention at the EU level.

### 2.3 How T1.4 fits the overall WP1

T1.4 ties strongly to previous work carried out in WP1, particularly T1.2. The study design in T1.2 is replicated, and its online questionnaire is used as a base for the questionnaire used in T1.4 with appropriate amendments (see Annex for both questionnaires). The results of T1.2 are compared with the findings of T1.4 to analyse the differences between demonstrator and the EU-level shortcomings and the generalisation of the demonstrator-specific gaps.

### 2.4 Report structure

The report is structured as follows: Section 3 outlines the data collection and analysis methods. Section 4 presents the results for both demonstrator regions and the EU-wide assessment. Section 5 discusses and compares these findings, and Section 6 concludes with recommendations for future.

## 3 Data collection and analysis

The analysis draws on three inputs to examine differences and consistencies across demonstrator regions and non-demonstrator participants: survey data from the T1.2 and T1.4 questionnaires, and interview results.

### 3.1 Online questionnaires

The primary target audience of the questionnaire were actors involved in local adaptation planning and decision making, including city officials, research institutions and intermediaries. The survey was crafted to be accessible to adaptation professionals with diverse backgrounds and translated to local languages using DeepL (T1.2) and EU Survey platform's machine translation function (T1.4).

Within T1.2, an online questionnaire was shared with the municipalities and regions involved in the VALORADA project during spring 2024: Molise (Italy), Occitania (France), Central Greece (Greece), Gabrovo and Burgas (Bulgaria), and the statutory cities of Přerov and Mladá Boleslav (Czechia). In total, 91 practitioners and city officials received the survey, with respondents informed that one person could submit answers on behalf of multiple stakeholders. During this phase, 24 responses were collected. Under T1.4, the questionnaire was disseminated more widely between summer and late 2025 over approximately five months. It was shared across 26 projects, 5 newsletters, one NGO, and 3 climate adaptation networks, as well as directly with VALORADA partners' contacts and large European cities. Additional dissemination took place through a seminar, five conferences, the project newsletter, and LinkedIn. During this phase, 32 responses were collected. **In a total 56 completed surveys were collected.**

Respondents were first asked about their use of, and views on, EU-sourced data, information, and tools available via the platforms. The statements used in this section can be found in figure 4 and 5 and were formulated based on literature (e.g., Celliers et al., 2021). For each statement, respondents indicated their level of agreement on a


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four-point Likert scale ("I strongly disagree," "I disagree," "I agree," "I strongly agree"), with an additional option for "I do not know / not applicable." Each section concluded with an open-ended question allowing respondents to expand on their answers. At the end of the T1.4 survey, participants were informed about the upcoming interview process and given the option to volunteer for a follow-up interview. The T1.4 questionnaire was also used to collect data for T1.5 but allowed participants to complete only the sections relevant to their expertise.

Minor adjustments were made to the questionnaire for the second round in T1.4. The detailed question on specific data needs was removed, as it was less relevant for the EU-wide audience, and replaced with the statement "The data I need is on the platforms." In addition, the statement "The platforms offer the data in formats that I need" was omitted, as it was considered to overlap with the new statement. These changes were made to keep the survey as concise as possible. In addition, that the statement "I have a strong understanding of the information and data I need to assess climate risk" was specified in the second survey as "I have a strong understanding of the information and data I need to assess climate risk *in my region*".

## 3.2 Interviews

In total 11 interviews were conducted with researchers (5), data producers (1), policy domain experts (2) and practitioners (3). Researchers, data providers, and policy officers were identified through purposive sampling, drawing on established networks within adaptation research and data provision communities. Practitioners were recruited via the online questionnaire, in which they were given the opportunity to volunteer for the interview. All interviews took place online, were conducted in either English or Finnish, and were both recorded and transcribed. Interview lengths varied between 20 and 60 minutes. A set of guiding questions was used to guide the discussion, but the questions were kept open to allow results to extend beyond the factors identified in earlier work under D1.2. Discussion was allowed to flexibly follow the expertise and perspectives of each interviewee.

Interview data were analysed using a framework analysis method, which provides a systematic and transparent means of examining qualitative datasets to identify, describe, and interpret patterns within and across cases (Goldsmith et al., 2021; King & Brooks, 2018; Parkinson et al., 2016; Ritchie & Spencer, 1994). Data were coded into themes and sub-themes using a primarily deductive strategy informed by literature (e.g., Celliers 2021) and work carried out in T1.2, supplemented by inductive observations that emerged during engagement with the material. The analysis followed a five-step process (familiarisation, framework development, coding, charting, and interpretation). After drafting the initial framework, it was tested on the full dataset and refined as needed, then systematically applied. Each interview was analysed independently by two analysts. The process remained iterative, with minor adjustments followed by rechecking earlier data to ensure consistency.

## 3.3 Limitations

The following limitations should be kept in mind when interpreting the results. First, the online survey provides indicative insights rather than generalisable conclusions due to the small sample size and the uneven geographic distribution of the respondents. Recruiting respondents proved challenging: First, we may not have reached the target audience via our dissemination campaign since most of the contacted actors were mainly from the field of research. After observing this obstacle, we contacted several European cities directly. Secondly, our target group is relatively narrow: although many practitioners work on adaptation, not all engage with EU-sourced data resources. This was evident in the results, as only half of the participants reported using them. This limitation was addressed by conducting interviews with relevant stakeholders.

The use of AI-supported translation in the questionnaires may also have introduced minor shifts in meaning, both in how respondents understood the survey questions and in how their answers were interpreted, particularly in technically detailed or context-specific responses. Additionally, certain question formulations may have influenced how respondents judged their own expertise. For instance, terms such as "strong understanding" may not fully reflect intermediate knowledge levels.

Finally, given the rapid pace of development in the climate services (CS) domain, some platform updates or changes may have occurred after data collection and before the study was completed and therefore could not be incorporated into the analysis.


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# 4 Results: EU-wide and demonstrator gaps

This section presents the background and engagement with EU-sourced data platforms of the survey respondents, results of the two online questionnaires and interviews.

## 4.1 Background and engagement with EU-level data resources

Key characteristics of the questionnaire respondents in both the demonstrator regions and the EU wide sample are summarised in this section. **By EU-wide sample we refer to the participants outside demonstrator regions.**

*Type of organisation*

Among EU-wide respondents, research and academia form the largest group, making up nearly half of the sample, whereas this group is much smaller within the demonstrator regions (Figure 1). In contrast, respondents from demonstrator regions mainly represent by local or regional decision-making bodies, accounting for close to 50%, compared with a smaller share in the EU-wide sample. Public sector and governmental agencies are also more represented in the demonstrator regions than in the EU-wide group. Representation from civil society, the private sector, and "other" organisations remains relatively low across both samples.

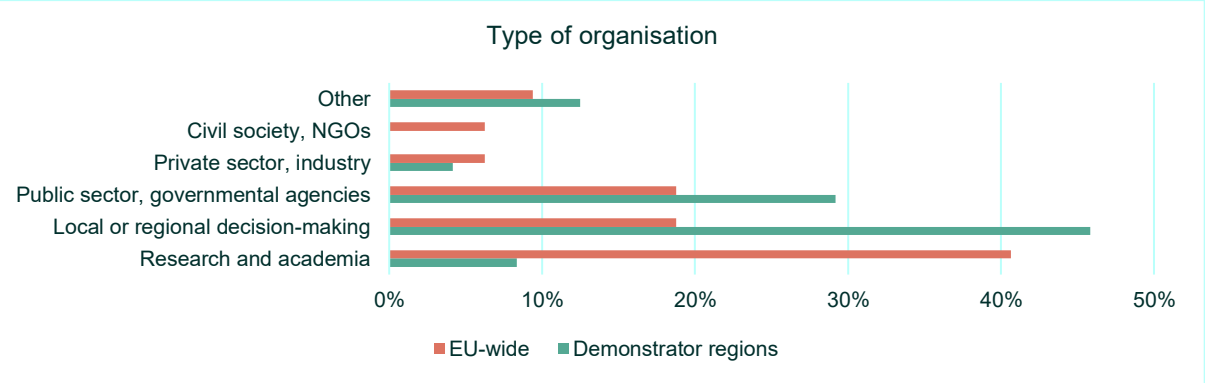



*Figure 1 Type of organisations.*

*Area of expertise*

In the demonstrator regions, "environment and ecosystems" is the most represented area of expertise (Figure 2). In the EU-wide sample, expertise is more evenly distributed, with "governance and policy" and "public services and infrastructure" representing the largest categories. Business and economy, agriculture, and human health and safety appear less commonly across both samples.

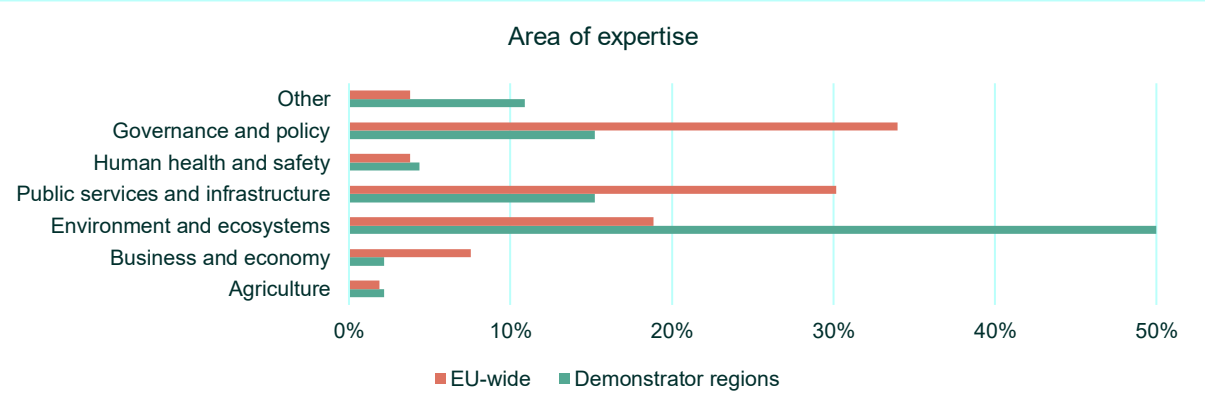



*Figure 2 Areas of expertise.*

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*Reported use frequency*

The figure 3 shows that the majority of respondents in both groups reported no use of EU-sourced data platforms in the past 12 months, with this share being higher among EU-wide respondents (59 %) compared with those from the demonstrator regions (50 %). Among demonstrator-region participants, the most common level of engagement after non-use is using the platforms once or twice every few months (38 %), which is much higher than the 13 % observed in the EU-wide sample. Conversely, EU-wide respondents more frequently indicated very limited engagement, with 22 % reporting use only once or twice in total. Regular use, monthly or weekly, is minimal across both samples, each category representing only a few percent of respondents.

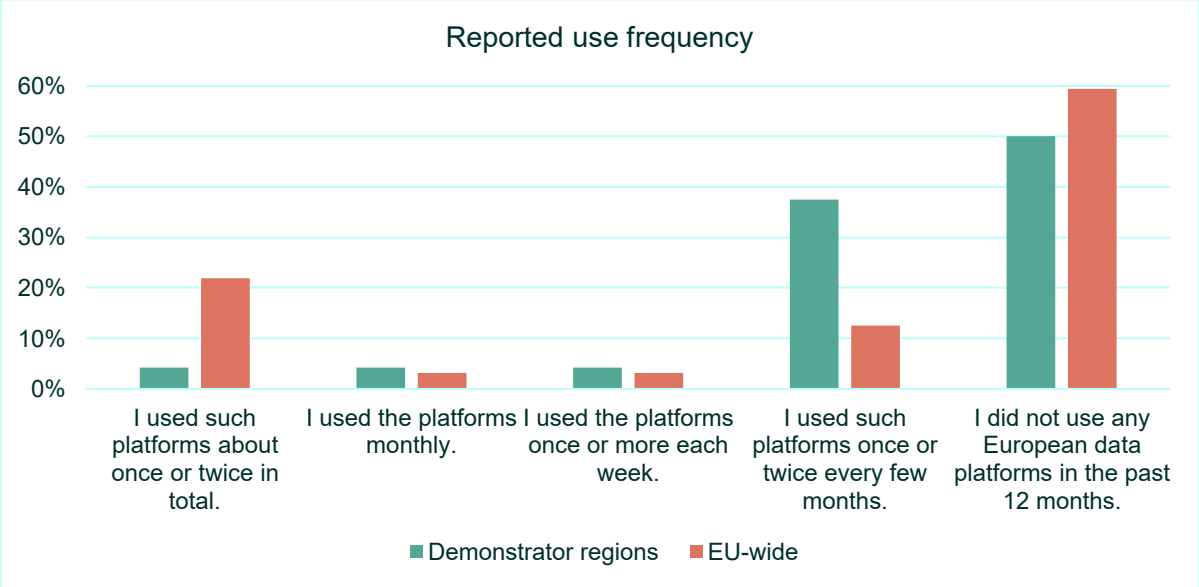



*Figure 3 Reported use frequency of EU-sourced data platforms.*

## 4.2 Gaps identified in the demonstrator regions (D1.2)

Figure 4 summarises how respondents in demonstrator regions assessed European data platforms. Uncertainty is prominent across most statements, including access restrictions, availability of local languages, platform performance, adequacy of guidance, ease of navigation, data export and format options, communication of uncertainty, metadata sufficiency, and temporal resolution, with 39–52% of respondents selecting "I don't know / not applicable." For access restrictions, availability of local language, adequacy of data formats, and communication of uncertainty, responses lean toward agreement (34–48% agree or strongly agree, 9–22% disagree or strongly disagree), whereas the remaining items display only marginal variation (not exceeding 8 %) between agreement and disagreement.

In contrast, statements on regional or local relevance, spatial resolution, available resources, understanding how to integrate climate and socioeconomic data, understanding data needs for climate-risk assessment, and familiarity with the platforms show lower uncertainty. Among these, relevance to respondents' work received most agreement with 62% of respondents selecting agree or strongly agree. For other items, responses are agreed on by a narrow majority apart from understanding on how to integrate socioeconomic data with climate data, where responses are evenly split between agreement and disagreement.

Comments from the specification section mentioned the need for more timely data, including real-time access and more frequent updates, as well as better possibilities to combine different datasets. There were also mentions of the need for higher spatial resolution and access to historical data. In addition, respondents pointed to a need for more integrated and easier-to-use services, clearer explanations of data limitations, and practical guidance on how to use and combine data. Familiarity with EU platforms and language barriers were noted as challenges.


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**In summary, there is a high uncertainty among respondents for most items, and no clear consensus could be observed apart from relevance of the EU-sourced data platforms, which is generally rated highly. Data-related needs were received, including more timely and up-to-date data, improved options for integrating datasets, higher spatial resolution, clearer guidance on data use and limitations, and better user support.**

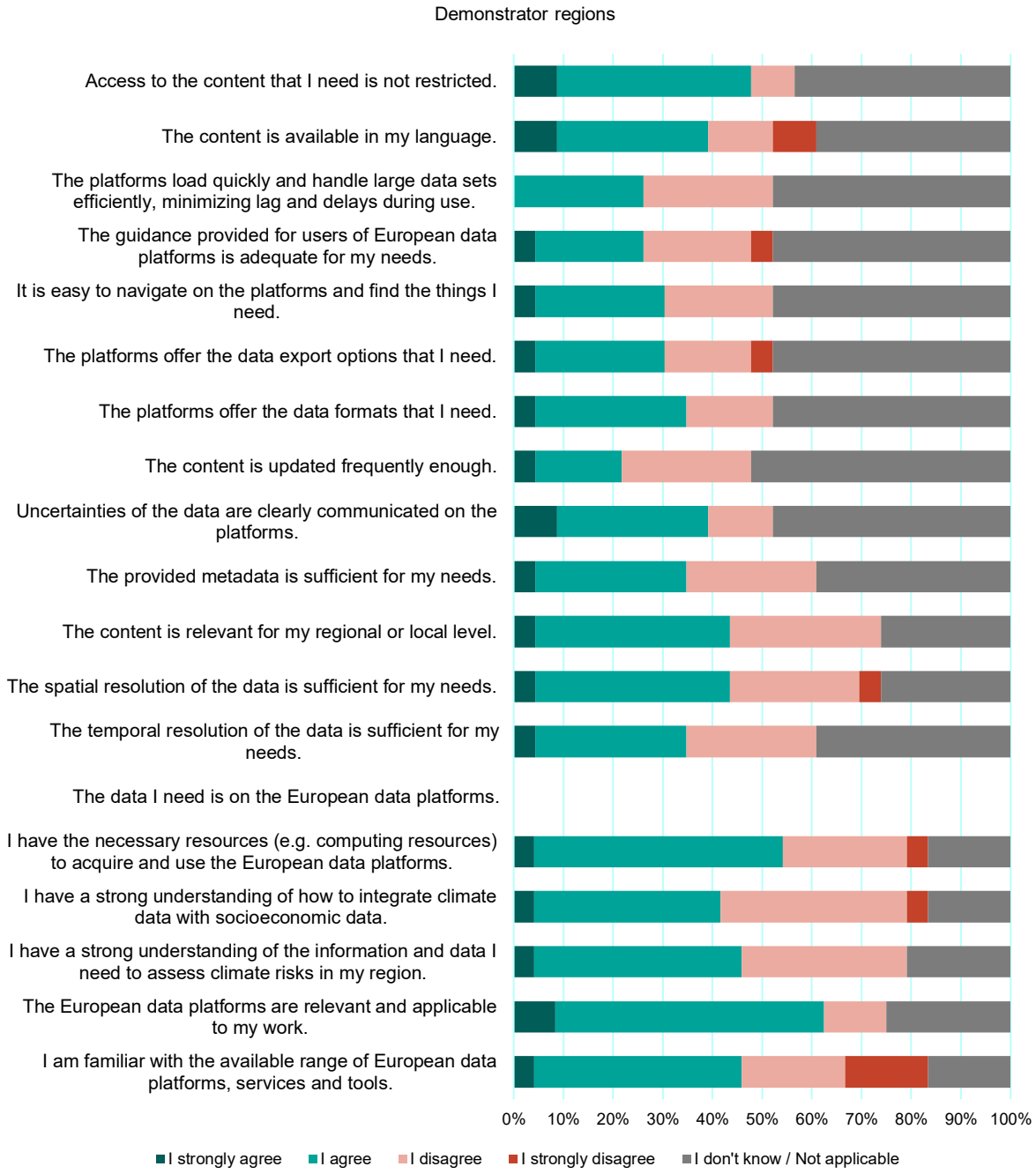



*Figure 4 Online questionnaire responses, demonstrator regions.*

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## 4.3 Gaps identified in the EU-wide assessment

EU-wide gaps are identified based on data from the online questionnaire and interviews.

***Online questionnaire***

Figure 5 presents responses from the EU wide sample. Uncertainty is high across many statements, including access restrictions, availability of local languages, platform performance, adequacy of guidance, ease of navigation, data export options, update frequency, communication of uncertainty, metadata sufficiency, local and regional relevance, spatial and temporal resolution, and whether the required data is available on the platforms, with 41–62% selecting "I don't know / not applicable." For most of these statements, responses are relatively evenly split between agreement and disagreement with difference between agreement and disagreement not exceeding 7 %. Exceptions include data export options (35% agree or strongly agree, 7% disagree), ease of access (35 % agree or strongly agree, 17 % disagree), adequacy of available data (43 % agree or strongly agree, 7 % disagree), where satisfaction is relatively higher. For spatial and temporal resolution disagreement exceeds agreement (15% agree or strongly agree, 29–36% disagree or strongly disagree).

For items related to resources, relevance and user capacities, uncertainty is lower with 6-31 % selecting "I do not know / Not applicable". Responses are relatively evenly divided regarding respondents' understanding of how to integrate climate and socioeconomic data (50 % agree or strongly agree, 44 % disagree or strongly disagree). In contrast, a majority agree that they have sufficient resources and understand which data are needed for climate-risk assessment, and relevance to respondents' work is rated positively (63% agree or strongly agree, 6% disagree or strongly disagree). At the same time, awareness of the available range of European data platforms is low, with 73% disagreeing or strongly disagreeing and 27% agreeing or strongly agreeing.

Additional inputs from survey respondents pointed to the need to improve understanding among cities and governance actors on how to use available data and tools more effectively. Respondents also identified the fragmentation of European climate services across multiple platforms as a barrier and expressed a preference for more centralised access to data across scales. At the same time, it was stated that improving the clarity and interpretability of climate information may be more important than expanding the number of available platforms.

**In summary, as with demonstrator responses, uncertainty across responses is high. Exceptions include relevance for one's work, which was rated high (63 % agree vs. 6 % disagree), and awareness on the available range of data resources with low agreement (73 % disagree vs. 27 % agree). Respondents stated the need for better understanding on how to apply data, and less fragmented, centralised access to clear and interpretable data.**


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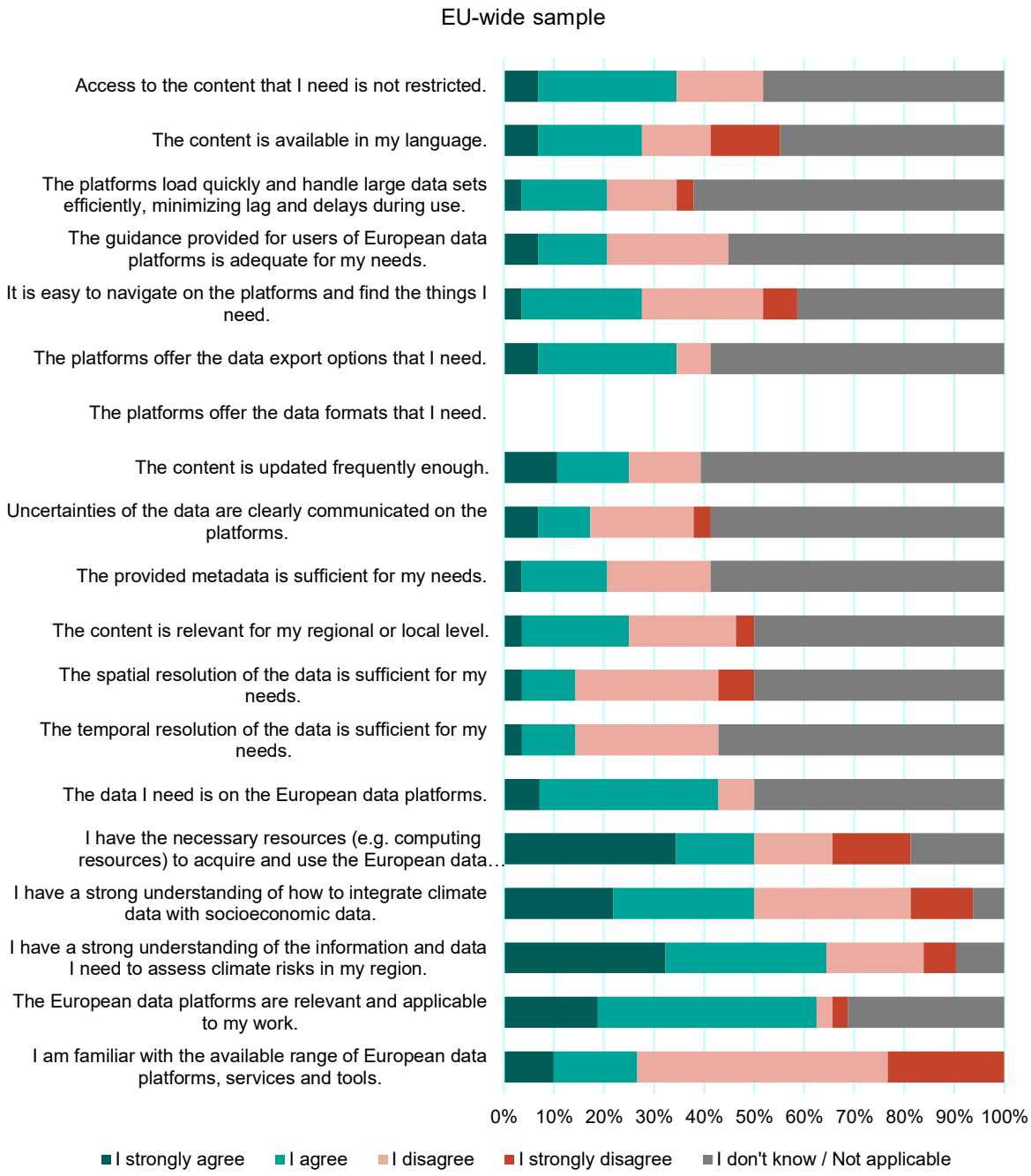



*Figure 5 Online questionnaire results, EU-wide sample.*

### *Interviews*

Three main themes emerged from the data: (1) Awareness, content, and use of EU-sourced data platforms, covering factors directly related to EU-sourced platforms; (2) Science–practice interface, addressing wider contextual factors related to interactions between research and practice; and (3) Governance and politics, reflecting even broader influences at governance and political levels.

*Awareness, content, and use of EU-sourced data platforms*

Interviewees described that the level of awareness of EU-level climate adaptation resources varies, and noted that identifying relevant datasets can be challenging, particularly when intended users, applications, and data limitations are not clearly specified. Respondents indicated that clearer guidance, concise descriptions of data


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use conditions, and more structured workflows could support use in practice and that improved access to metadata and the use of shared cloud-based infrastructure are potential facilitators of data use and collaboration. Managing data uncertainty was also mentioned as an area where additional support or guidance could be helpful. It was suggested that the Copernicus Climate Change Service user-requirements database could be extended to cover additional areas and a centralised, multi-level data catalogue bringing together EU-, national-, regional-, and local-level datasets could be established. Although some work has addressed aspects of this, coverage is partial.

EU-sourced datasets were generally characterised as providing information at national or regional scales rather than at city or site level and that EU-level data alone may not capture local specificities, while local datasets benefit from being interpreted within a broader regional or large-scale climate context. While EU-level climate model outputs can be further processed, the availability of higher resolution processing differs across countries. In some cases, national authorities provide interpreted or downscaled datasets, whereas, in others, practitioners work directly with EU-level data. The role of national intermediaries, such as national meteorological services, was mentioned as an important link between EU-level data and local use.

The availability of impact-related information was discussed: Interviewees noted that translating climate variables into decision-relevant impacts, such as economic consequences of flooding, can be challenging for local authorities without specialised expertise. At the same time, it was recognised that not all decisions require highly detailed data, and that broader trend information may be adequate for certain adaptation purposes. While very high-resolution datasets are sometimes requested for local interventions, such levels of detail may not always be necessary for effective adaptation planning.

Language, terminology, and technical skills were mentioned as factors influencing accessibility. Opportunities for interaction and clarification were valued. For data providers, understanding users' preferred delivery formats is essential to avoid producing unnecessarily complex or advanced outputs. Transparent update practices, such as version control and clear documentation of changes, were viewed as important for maintaining trust in data products. Communities of practice were highlighted as a way to sustain and share knowledge generated in projects.

*Science–practice interface*

Interviewees noted that adaptation planning draws on information produced at different timescales and by different scientific communities, which can complicate their integration. The availability of observational data for model validation and compatibility between observed and modelled variables were mentioned as ongoing challenges. Improved communication between observational and modelling communities and better interoperability between systems were seen as areas for further development.

Integrating climate data with socioeconomic and environmental information was also described as challenging, as non-climate datasets are often collected using different standards and at different spatial scales. Although climate data have become more harmonised over time, interviewees reported that vulnerability-related data remain heterogeneous, which can limit integrated assessments.

Regarding practical implementation of climate science, it was indicated that translating user needs into scientifically robust and operational outputs is complex. Users may seek clear thresholds or definitive indicators, whereas scientific outputs often express uncertainty probabilistically. At the same time, institutional priorities may focus on methodological development rather than on maintaining stable, operational products, which can affect usability for practitioners.

*Governance and politics*

Interviewees emphasised that the use of climate data is influenced by broader governance, politics, and resource conditions. Time availability, funding, institutional capacity, and competing priorities were described as factors shaping engagement with EU-level data and information. Legal and regulatory frameworks were identified as important drivers of the use, particularly where the use of climate risk information is linked to financial or compliance requirements.


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Recent EU legislation was noted as increasing attention to climate-related responsibilities, although implementation processes were described as complex and resource-intensive. The absence of common standards for applying climate data in adaptation planning means that organisations often develop their own methods, which can lead to variation in approaches and results. This was considered relevant in areas such as climate finance, where comparability and repeatability are important.

Finally, interviewees observed that while awareness of climate change has increased, adaptation may still compete with other priorities, especially at the local level. Communicating climate risks and the potential benefits of proactive adaptation, including economic aspects, was therefore seen as an ongoing area of importance across governance levels.

**To summarise, while accessibility, availability, and usability are essential for the effective use of EU-sourced data platforms in local adaptation, their uptake is equally, and in some cases more strongly, shaped by factors related to the science–practice interface and governance context. Because of this, improving the use of EU-sourced data platforms requires action not only at the platform level but also at the broader system level, including stronger collaboration between users and providers, and more supportive governance conditions.**

# 5 Discussion: Comparison and generalisability of EU-wide and demonstrator-specific gaps

*Comparison of online questionnaire results*

Given the limited sample size of the online questionnaire, the results should be interpreted as indicative rather than conclusive. In addition, 50 to 59% of respondents reported not using EU-sourced platforms in the past 12 months which means that many responses are not based on direct experience. This limits the depth of assessment, though responses from non-users still offer some indication into potential barriers to uptake.

Uncertainty (reflected in “I do not know / not applicable” responses), is present in both samples and is lower for general aspects such as resources, skills, relevance, and familiarity, suggesting that non-users are less able to assess specific platform features. Respondents from the EU-wide sample are less familiar with EU- sourced data resources than those in the demonstrator regions (73% vs. 38% disagreement), likely because involvement in VALORADA may have increased awareness of these resources among demonstrator participants. EU-wide sample reported higher confidence in their own knowledge and skills. Differences in background likely explain this pattern, as demonstrator respondents were mainly from local authorities, while EU-wide participants were more often from academia.

Both groups perceived the relevance of contents of the EU-sourced data platforms as high (64 % agreement in demonstrator region respondents, 63 % agreements in EU-wide sample). For statements related to content and functionalities of the platforms, demonstrator region respondents expressed greater satisfaction with content related aspects (e.g. resolution, language, metadata), whereas EU wide respondents were more satisfied with update frequency and data export options; views on access, functionality, and guidance were similar and no clear consensus could be observed.

Some differences emerge between those who reported using the platforms in the past 12 months and those who did not across the EU-wide and demonstrator samples (see Annex for full tables). Among users, demonstrator respondents report higher familiarity, better access, and greater satisfaction with content, while EU-wide users express more concerns about relevance and data resolution. Among non-users, uncertainty is high in both demonstrator and EU-side samples. Overall awareness remains low, particularly in the EU-wide sample.

*Classification of gaps identified in D1.2 into EU-wide and demonstrator categories*

When the D1.2 results are compared with the interviews results (see table 3), most gaps recognised in demonstrator regions are present also in the findings outside VALORADA regions, with a few exceptions. In D1.2, a factor is defined as a gap when half or more of the respondents disagree or strongly disagree with the statement out of respondents who did not select “I do not know / Not applicable”. Limited update frequencies of EU-sourced data platforms were mentioned as gaps by the Molise region, Burgas, and Mladá Boleslav, which was not directly mentioned by the interviewees as a widely recognised gap. In Burgas, inadequate export options and insufficient


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operational performance of the European data platforms were identified as gaps, but these issues were not raised in the interviews. Moreover, in the Central Greece region and Gabrovo municipality, responses revealed significant uncertainty, indicating a lack of awareness of the available EU-sourced data platforms, services, and resources. In the Statutory city of Přerov, uncertainty about the accessibility and usability of EU-sourced data platforms was prevalent, as well as about the sufficiency of the available content for regional needs.

*EU-level gaps not observed in demonstrator regions*

Comparison with demonstrator regions also shows that several gaps identified as EU-wide are not consistently observed at regional or local level, as some demonstrators instead report strengths in the same areas. In the D1.2, a factor is considered a strength when more than half of the respondents agree or strongly agree with the corresponding statement. In the Central Greece region, sufficient spatial resolution and adequate language options are identified as strengths, suggesting that gaps related to resolution or language availability do not apply in this case. The Burgas and Gabrovo municipalities report multiple strengths that contrast with EU-wide gaps identified elsewhere. These include familiarity with EU-sourced data platforms, a strong understanding of climate and socioeconomic data integration, sufficient resources for platform use, adequate communication of uncertainty, and positive perceptions of language options and ease of access. Similarly, the Statutory cities of Mladá Boleslav and Přerov report sufficient resources, strong understanding of data needs for climate risk assessment, and adequate guidance, data formats, and export options. This enforces the context-dependency of climate information use and show variability in how EU-sourced data platforms and resources are perceived and used across regions.

*Gaps not observed in D1.2*

Several factors identified through the interviews did not appear in D1.2, likely due to differences in data collection methods, with interviews allowing broader exploration beyond predefined factors. Within knowledge and content of EU-sourced data platforms, factors that were not captured in D1.2 relate to limitations in guidance and data availability. In the science–policy interface, gaps include interoperability challenges, lack of standardisation and availability of non-climate data, and misalignment between scientific outputs and practical needs. Within governance and politics, additional barriers concern slow policymaking, rigid project requirements, short-term decision-making, and insufficient policy guidance.

The new gaps identified in T1.4 could have been validated in the demonstrator regions, but this was not carried out due to time constraints. Nevertheless, based on earlier project work described e.g., in D2.5 (Assessment of the usability of VALORADA's tools across demonstrators), it is reasonable to assume that many of these gaps are also relevant in those contexts.

*Table 1 Comparison of the demonstrator region gaps and EU-wide gaps*

| Main theme | Sub-theme | Hindering factor, gap | Gap present in listed demonstrator regions |
|---|---|---|---|
| Knowledge and content of EU-sourced data platforms | Awareness | Lack of awareness of existing resources | Occitanie, Central Greece region, Molise, Gabrovo, Mladá Boleslav, Přerov |
| | Guidance | Unclear statements on the resource's intended audience and purpose | |
| | | Long technical documents on data-use restrictions | |
| | | Lack of structured, step-by-step workflows for applying climate data in practice | |
| | | Lack of context-specific guidance and opportunities to ask questions | |
| | Spatial and temporal resolution | Local datasets require interpretation within a broader climatic context | |
| | | Insufficient spatial resolution | Molise, Burgas, Mladá Boleslav |


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| | | | |
|---|---|---|---|
| | | Insufficient temporal resolution | Molise, Burgas, Mladá Boleslav |
| | Availability | The absence of a centralised, multi-level catalogue | |
| | | Restricted metadata access | |
| | | Insufficient metadata* | Molise, Burgas, Mladá Boleslav |
| | | Lack of long-term sustainability of project outputs | |
| | | Lack of impact data | |
| | | Insufficient version control and traceability of updates | |
| | | Inadequate export options* | Burgas |
| | | Limitations in update frequency* | Molise, Burgas, Mladá Boleslav |
| | Delivery formats | Inadequate information delivery formats | |
| | Accessibility and user capacities | Lack of local languages | Burgas |
| | | Unfamiliar terminology | |
| | | Limited user capacities (e.g., overestimation of the need for very high-resolution data, understanding data needed in climate risk assessment) | Occitanie, Molise, Burgas, Mladá Boleslav |
| | | Inadequate operational performance of the EU-sourced data platforms* | Burgas |
| Science–practice interface | Data interoperability | Inconsistent methods across timescales | |
| | | Poor interoperability | |
| | Non-climate data | Patchiness of non-climate data | |
| | | Lack of standardisation of non-climate data | |
| | | Gaps in sector-specific vulnerability data | |
| | Practical applicability | Difficulties in uncertainty communication | Molise |
| | | Misalignment between scientific and practical priorities | |
| Governance and politics | Political prioritisation and legislation | Slow policymaking | |
| | | Rigid project requirements | |
| | | Short-termism in decision-making | |
| | | Limited resources to use and acquire data from EU-sourced platforms | Molise, Mladá Boleslav |
| | Standardisation | Insufficient policy guidance on applying climate information | |

** Gap observed only in demonstrator regions*

# 6 Conclusions

In conclusion, the comparison between EU-wide and demonstrator-specific findings indicates a strong overall alignment, with most gaps identified in D1.2 also observed beyond the demonstrator regions. This convergence is notable given the different data collection methods used for the demonstrator regions and the EU-wide sample and suggests that gaps observed across both the survey and interviews represent persistent issues rather than method-specific effects. At the same time, important differences emerge, pointing to the context-specific nature of data use in climate adaptation. Some EU-level gaps are not consistently reflected in demonstrator regions, where they may instead appear as strengths. Conversely, interviews identified additional gaps, particularly related to the science–practice interface, governance, and policy, that were not captured in the survey. Together, these results suggest that while common barriers exist across contexts, their relevance and manifestation vary

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significantly, and a broader range of structural, institutional, and cross-sectoral factors shape the use of EU-sourced data platforms. As these challenges have been consistently identified in the literature over time (e.g., Hoy et al., 2022; Swart et al., 2017), the findings suggest a need to critically assess whether current platform models adequately meet end-user needs.

Interviews generated concrete suggestions to address the gaps. For data producer side, more effective use may be supported by concise summaries of data-use restrictions, and expansion of the Copernicus user-requirements database to other domains. Improving awareness and findability through a centralised, multi-level catalogue and easier access to metadata and cloud storage, may also facilitate use. In addition, more creative and context-tailored information delivery could help save resources. Across all stakeholders, strengthened collaboration is essential. It can improve shared understanding of data needs, including when existing information is sufficient. National intermediaries play a key role in facilitating this process. Finally, legislation, financial incentives, and common standards for combining and interpreting climate data are identified as important enabling conditions. Some of these challenges are already being addressed through ongoing initiatives such as science-based standards and related efforts under Climateurope2.

VALORADA contributes to addressing the gaps. The Catalogue provides a resource for intermediaries and practitioners to identify and organise relevant indicators and data sources, supporting data findability and awareness at both local and EU levels. Dashboards as a tailored and co-produced resource assist demonstrator regions in adaptation by supporting decision-making, communication, and climate risk analysis in appropriate and accessible format. In addition, Jupyter Notebooks were developed to support capacity building for local practitioners and intermediaries and can contribute to lack of guidance in application of data. The project also demonstrates a co-development approach that can facilitate stronger collaboration among stakeholders when applied in other contexts. If applied to other contexts, project findings highlight the importance of an enabling operational environment and the central role of local values, as articulated in the Data Valorisation Framework.

## Disclaimer on the Use of Generative AI

Microsoft Copilot (Generative AI) was used to support the editing and refinement of language in this deliverable. The use of this tool was limited to improving clarity and readability; content, analysis, and conclusions are solely the responsibility of the author.

## References


Apicella, L., De Martino, M., & Quarati, A. (2022). Copernicus User Uptake: From Data to Applications. ISPRS International Journal of Geo-Information, 11(2), 121. https://doi.org/10.3390/ijgi11020121

Bender, S., Cortekar, J., Groth, M., & Sieck, K. (2020). Why there is more to adaptation than creating a strategy. Handbook of Climate Services, 67-83. https://doi.org/10.1007/978-3-030-36875-3_5

Bharwani, S., Williamson, K., & Butterfield, R. (2025). Measuring what matters: Building impact pathways to actionable information for the weADAPT platform. Climate Services, 38, 100574. https://doi.org/10.1016/j.cliser.2025.100574

Celliers, L., Costa, M. M., Williams, D. S., & Rosendo, S. (2021). The 'last mile' for climate data supporting local adaptation. Global Sustainability, 4, e14. https://doi.org/10.1017/sus.2021.12

Copernicus Land Monitoring Service. (2024). A method to combat the Urban Heat Island effect. https://land.copernicus.eu/en/use-cases/a-method-to-combat-the-urban-heat-island-effect/a-method-to-combat-the-urban-heat-island-effect [Accessed 23.3.2026]

European Commission: Directorate-General for Research and Innovation. (2015). *A European research and innovation roadmap for climate services*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/702151.

European Court of Auditors (ECA). (2024). Special report 15/2024: Climate adaptation in the EU Action not keeping up with ambition. https://www.eca.europa.eu/ECAPublications/SR-2024-15/SR-2024-15_EN.pdf

Geiger, T., Röösli, T., Bresch, D. N., Erhardt, B., Fischer, A. M., Imgrüth, D., Kienberger, S., Mainetti, L., Mühlbacher, G., & Spiekermann, R. (2024). How to provide actionable information on weather and climate impacts?–A summary of strategic, methodological, and technical perspectives. Frontiers in Climate, 6. https://doi.org/10.3389/fclim.2024.1343993




The project has received funding from the Horizon Europe Framework Programme under grant agreement No 101112837

Golding, N., Lambkin, K., Wilson, L., Troch, R. D., Fischer, A. M., Hygen, H. O., Hama, A. M., Dyrrdal, A. V., Jamsin, E., Termonia, P., & Hewitt, C. (2025). Developing national frameworks for climate services: Experiences, challenges and learnings from across Europe. Climate Services, 37, 100530. https://doi.org/10.1016/j.cliser.2024.100530

Hoy, A., Swartling, Å. G., Ustrnul, Z., Wypych, A., Nevmerzhytska, A. V., & Leander, E. (2024). Too much, yet not enough? Assessing climate tool users' perceptions, needs and access constraints. Regional Environmental Change, 25(1), 6. https://doi.org/10.1007/s10113-024-02338-w

IPCC. (2023). Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, 184 pp., doi: 10.59327/IPCC/AR6-9789291691647.

Jebeile, J., & Roussos, J. (2023). Usability of climate information: Toward a new scientific framework. WIREs Climate Change, 14(5), e833. https://doi.org/10.1002/wcc.833

Lacava, T., Papalia, L. B., Paradiso, I. F., Proto, M., & Pergola, N. (2020). On the barriers limiting the adoption of the Earth Observation Copernicus data and services and their integration with non-conventional (e.g. citizen) observations: The EU CoRdiNet project contribution. (Nos EGU2020-18649). Copernicus Meetings. EGU2020. https://doi.org/10.5194/egusphere-egu2020-18649

Lehtinen, E. & Naumanen, H. (2024). D1.2 Gap-analysis of existing European relevant information services. VALORADA.

Lorenz, S., Dessai, S., Forster, P. M., & Paavola, J. (2017). Adaptation planning and the use of climate change projections in local government in England and Germany. Regional Environmental Change, 17(2), 425–435. https://doi.org/10.1007/s10113-016-1030-3

Lourenço, T. C., Swart, R., Goosen, H., & Street, R. (2016). The rise of demand-driven climate services. *Nature Climate Change*, *6*(1), 13-14. https://doi.org/10.1038/nclimate2836

National Environmental Science Program (NESP). (September 2024). Understanding data inputs for a climate risk assessment. NESP_KB-Guide_Climate-science-risk-and-assesmnents_FA.pdf

National Oceanic and Atmospheric Administration (NOAA). (2026, May 15). *Climate data monitoring*. https://www.noaa.gov/education/resource-collections/climate/climate-data-monitoring [Accessed 19.5.2026]

Neset, T.-S., Wilk, J., Cruz, S., Graça, M., Rød, J. K., Maarse, M. J., Wallin, P., & Andersson, L. (2021). Co-designing a citizen science climate service. Climate Services, 24, 100273. https://doi.org/10.1016/j.cliser.2021.100273

Perrels, A., Le, T. T., Cortekar, J., Hoa, E., & Stegmaier, P. (2020). How much unnoticed merit is there in climate services?. *Climate Services*, *17*, 100153. https://doi.org/10.1016/j.cliser.2020.100153

Reveco-Umaña, C., Máñez Costa, M. (2026). Valuing climate information in context. *npj Urban Sustain* **6**, 72. https://doi.org/10.1038/s42949-026-00395-0

Sanderson, H., Hilden, M., Russel, D., & Dessai, S. (2016). Database support for adaptation to climate change: An assessment of web-based portals across scales. Integrated Environmental Assessment and Management, 12(4), 627–631. https://doi.org/10.1002/ieam.1755

Sigel, M., Fischer, A., Zubler, E., & Liniger, M. (2016). Dissemination of climate change scenarios – a review of existing scenario platforms. Technical Report MeteoSwiss, 257, 88 pp.

Street, R.B. (2016). Towards a leading role on climate services in Europe: A research and innovation roadmap. Clim. Serv. 1, 2–5. https://doi.org/10.1016/j.cliser.2015.12.001

Swart, R. J., de Bruin, K., Dhenain, S., Dubois, G., Groot, A., & von der Forst, E. (2017). Developing climate information portals with users: Promises and pitfalls. Climate Services, 6, 12–22. https://doi.org/10.1016/j.cliser.2017.06.008

Terrado, M., Baulenas, E., Versteeg, G., Bojovic, D., & Doblas-Reyes, F. J. (2025). Users' awareness and expectations from the climate change adaptation digital twin. Environmental Science & Policy, 173, 104236. https://doi.org/10.1016/j.envsci.2025.104236

Williams, D. S., Máñez Costa, M., Kovalevsky, D., van den Hurk, B., Klein, B., Meißner, D., Pulido-Velazquez, M., Andreu, J., & Suárez-Almiñana, S. (2020). A method of assessing user capacities for effective climate services. Climate Services, 19, 100180. https://doi.org/10.1016/j.cliser.2020.100180

## Annex

*Online questionnaire spring 2024 (T1.2)*

Mandatory questions are marked with a star *



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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 EU-sourced data 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 EU-sourced data platforms, services, and tools


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- How often did you use EU-sourced data 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 EU-sourced 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 EU-sourced data platforms, services and tools.
- The EU-sourced 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.


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Content of the platforms *

- 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).

*Online questionnaire summer 2025*

**The Use of Climate Risk Indicators and EU-sourced data platforms**

**You can change the survey language using the menu in the upper right corner.**

**This survey is for people working with tasks related to local or regional climate risk management, climate adaptation, or related fields. The aim of the survey is to gain understanding about your experiences and needs when using data, tools, and services from EU-sourced data platforms. We are also interested in how you use climate risk indicators and how well they work for you.**

**Your input is important, even if some questions do not fully apply to your work. Please answer with as much detail as possible and give concrete examples.**

The survey is part of the EU-funded VALORADA project, which aims to empower European regions and cities to lead societal and systemic transformations and enhance access to climate and non-climate data.

Completing the survey will take about **5-10 minutes.** 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 of the survey will be used in publications from the project, but it will not be possible to identify individual survey respondents.

**We plan to publish a research article based on the results. If you are interested in being acknowledged in that article, please contact Enni Lehtinen (enni.lehtinen@fmi.fi) or Saara Korjonen (saara.korjonen@fmi.fi) from the Finnish Meteorological Institute.** Send us an email also in case of any questions or further information.

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By clicking "I accept" you confirm that you have read and accepted the information given above and the privacy policy.

- I accept.

### Background information

* In which country do you live?

* Which of the following best describes the type of organisation you work for?

- Research and academia
- Local or regional decision-making
- Public sector, governmental agencies
- Private sector, industry
- Civil society, NGOs
- Other

* Which of the following best describes your area of expertise?

- Agriculture
- Business and economy
- Environment and ecosystems
- Public services and infrastructure
- Human health and safety
- Governance and policy
- Other

* How many years of working experience with climate risk management activities or similar do you have?

- no experience
- less than 1 year
- 1-2 years
- 3-5 years
- 6-10 years
- more than 10 years

* In your opinion, which climate risks are the most visible in your region?

- Increased temperature
- Extreme heat waves
- Changes in precipitation
- Flooding (extreme heavy precipitation, short term)
- Drought
- Coastal erosion
- Coastal flooding
- Other
- I don't know

## The use of EU-sourced data platforms, services, and tools

* Here by **EU-sourced data platforms,** we mean online environments like the Copernicus Climate Data Store, European Flood Awareness System (EFAS), and Climate-ADAPT, which provide access to climate and non-climate data, services, and tools.

How often did you use EU-sourced data platforms as part of your work during the past ca. 12 months?

- I did not use any EU-sourced 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.


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| | Which platform(s) did you use?<br><br>List them to this column. | For which purposes did you use the platforms?<br><br>For instance, for educational purposes or for environmental licensing. | Which type(s) of content did you use or access via the platforms?<br><br>For instance, raw climate data or decision support tools. |
|---|---|---|---|
| | * QuestionPlatform 1 | * QuestionUse purpose | * QuestionTypes of content |
| | QuestionPlatform 2 | QuestionUse purpose | QuestionTypes of content |
| | QuestionPlatform 3 | QuestionUse purpose | QuestionTypes of content |

If you use more than three platforms, specify them, their use purposes and types of content used here.

Factors affecting the use and selection of the EU-sourced data platforms

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

Relevance and resources

| | I strongly disagree | I disagree | I agree | I strongly agree | I don't know / Not applicable |
|---|---|---|---|---|---|
| *I am familiar with the available range of EU-sourced data platforms, services and tools. | | | | | |
| *The EU-sourced data platforms are relevant and applicable to my work. | | | | | |
| *I have a strong understanding of the information and data I need to assess climate risks in my region. | | | | | |
| *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 the EU-sourced data platforms. | | | | | |

Content of the EU-sourced data platforms

| | I strongly disagree | I disagree | I agree | I strongly agree | I don't know / Not applicable |
|---|---|---|---|---|---|
| *The data I need is on the EU-sourced data platforms. | | | | | |


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| | I strongly disagree | I disagree | I agree | I strongly agree | I don't know / Not applicable |
|---|---|---|---|---|---|
| *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. | | | | | |

Accessibility and usability of the platforms

| | I strongly disagree | I disagree | I agree | I strongly agree | I don't know / Not applicable |
|---|---|---|---|---|---|
| *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 EU-sourced data platforms is adequate for my needs. | | | | | |
| *The platforms load quickly and handle large data sets efficiently, minimizing lag and delays during use. | | | | | |
| *The content is available in my language. | | | | | |
| *Access to the content that I need is not restricted. | | | | | |

### Use of climate risk indicators

**A climate risk indicator** refers to a numerical value depicting a state or development of a certain entity related to climate risks, e.g., number of people living in flood-prone areas or land surface temperature.

* Does your organisation have a defined set of climate risk indicators? For example, as part of a local climate strategy or regional or national climate guidance documents.

- Yes
- No


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- I am not sure

Questions related to the climate risk indicators are not included here. See D1.5 (Synthesis on the most commonly used indicators, their performance and inconsistencies, and tackling potential problems).

We would like to hear from you!

* If you are open to a short interview on the topics of this survey in late 2025, simply leave your email below. The registration here is not binding. No preparation needed – just your thoughts.

- Yes, I'll write my email address below.
- No, not this time.
- Your email address for contacting:

Thank you

For any questions or further information, please contact Enni Lehtinen (enni.lehtinen@fmi.fi) or Saara Korjonen (saara.korjonen@fmi.fi).

Use this section for any additional thoughts, specifications, or other relevant



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*Figure 6 Synthetised responses of both those who reported using the EU-sourced data platforms and those who did not. Separated based on the group (EU-wide survey, demonstrator regions). (For the following list of potential reasons please let us know to what extent each statement is true for you. On the scale "Strongly disagree", "Disagree", "Agree", "Strongly agree", "I don't know")*






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*Figure 7 Respondents who reported **not using** the EU-sourced data platforms during the past 12 months: For the following list of potential reasons please let us know to what extent each statement is true for you.*






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*Figure 8 Respondents who reported **using** the EU-sourced data platforms during the past 12 months: For the following list of potential reasons please let us know to what extent each statement is true for you.*






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