

Ongoing initiatives for once-only publication of High-Value Datasets



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Summary / Description

This report examines the ongoing European initiatives and technical alignment efforts supporting the once-only publication of High-Value Datasets (HVDs). It focuses on environmental data-sharing frameworks, primarily those established under the INSPIRE Directive, and compares them with the data sharing requirements set out in the High-Value Datasets (HVD) Implementing Regulation adopted under the Open Data Directive.

Following the initial reporting deadline in the scope of the HVD Implementing Regulation in February 2025, the study presents a detailed preliminary analysis of environmental HVDs submitted by Member States focusing on the noise (END), marine (MSFD), and water (WFD) domains. It incorporates comparative metadata searches conducted in April and October 2025 to monitor implementation progress and track data fluctuations within the European Data Portal (EDP).

The report identifies key factors that hinder data discoverability, including inconsistent metadata practices and the heterogeneous use of keywords. It also sets out strategic recommendations, such as adopting harmonised metadata guidance and promoting the consistent use of standardised vocabularies and directive-specific keywords, to support a unified, interoperable approach to publishing environmental HVDs across Europe.

1 Introduction

This report provides an overview of European initiatives supporting the once-only publication of High-Value Datasets (HVDs), with a focus on environmental domains. It examines how existing data-sharing frameworks - particularly those established under EU environmental directives and the associated reporting obligations, including the [INSPIRE Directive](#), are being aligned with the [High-Value Datasets Implementing Regulation](#).

Adopted under the [Open Data Directive](#), this implementing regulation specifies the HVDs that public sector bodies must make available free of charge, in machine-readable formats, accessible via APIs and, where relevant, as bulk downloads, while also requiring recognised open licenses, such as Creative Commons BY 4.0 or equivalent, to govern their reuse.

The report also presents a preliminary analysis of HVDs submitted by Member States following the first reporting deadline in the scope of the HVD Implementing Regulation in February 2025, focusing on the noise, marine, and water domains. Beyond presenting statistics, it highlights both the identified good practices and the factors hindering the effective sharing and discoverability of reporting HVDs.

Building on this analysis, the report draws lessons learned and provides recommendations to facilitate the once-only publication of environmental HVDs.

The findings aim to support a coordinated effort by the European Environment Agency (EEA), European Environment Information and Observation Network (Eionet), INSPIRE, and open data communities to promote a unified, once-only approach to publishing and reusing high-value environmental datasets.

Report structure:

- Section 2 summarises major EU initiatives that support the alignment of HVD publication and environmental data sharing.
- Section 3 describes the methodology for HVD assessment in the European Data Portal.
- Section 4 details the HVD assessment results in the noise, marine and water domains, highlighting possible best practices for HVD publication.
- Section 5 provides conclusions and preliminary recommendations for consistent, efficient, and interoperable publication of HVDs across Europe.
- Annex I provides an overview of mapping between the INSPIRE spatial data themes and HVD categories.

2 European initiatives that support the once-only publication of High-Value Datasets

The European Commission has implemented several initiatives to support the once-only publication of High-Value Datasets (HVDs), aiming to enhance data accessibility and reuse across Member States as well as to reduce the reporting burden.

The HVD Implementing Regulation requires Member States to provide the Commission with a report on the measures they have carried out to implement the regulation. The first report had to be submitted by 9 February 2025, and after that every 2 years. The report has to contain the following information:

- a) a list of published high-value datasets at Member State level (and, where relevant, subnational level) with online reference to metadata
- b) persistent link to the applicable licensing conditions
- c) persistent link to the APIs, ensuring access to the High-Value Datasets.

If relevant, Member States should also inform the Commission of other aspects, such as guidance documents or data protection impact assessments. The report should also include information on the number of public sector bodies exempted in accordance with Article 14(5) of the Open Data Directive.

The reporting information under a), b) and c) described in the paragraph above can be provided through references to relevant metadata that are provided in national portals and harvested in the [European Data Portal](#).

This report is focused on High-Value datasets provision through metadata.

Several initiatives have been launched at the European level and in cooperation with national authorities to guide the HVD implementation or provide support tools. A few of them are presented in the following sections.

2.1 INSPIRE and High-Value Datasets Alignment

The following sections provide a general overview of activities to align the INSPIRE Directive with the HVD Regulation requirements and technical levels.

2.1.1 Metadata

Metadata in the scope of the INSPIRE Directive

Metadata for spatial datasets and services under the INSPIRE Directive has been implemented on the basis of the ISO 19115 standard (ISO 19115 Geographic information – Metadata) in XML encoding according to the ISO/TS 19139:2007 Geographic information - Metadata - XML schema implementation (Note: This standard is withdrawn, the new standard is ISO 19115-3:2023 Geographic information – Metadata Part 3: XML schema implementation for fundamental concepts). This implementation practice is supported by the [Technical Guidance for the implementation of INSPIRE dataset and service metadata based on ISO/TS 19139:2007](#) and widely used for catalogues in infrastructures for spatial information created by the Member States and other countries implementing the INSPIRE Directive.

Metadata in the scope of High-Value Datasets

DCAT-AP HVD

In collaboration with Member States and expert communities, such as Semantic Interoperability Community (SEMIC) and INSPIRE, the Commission has established the [DCAT-AP High Value datasets standard](#) (DCAT-AP HVD) as a common framework for describing HVD datasets. The DCAT-AP HVD extends the DCAT-AP (Data Catalog Vocabulary Application Profile) with additional metadata properties specific to High-Value Datasets, such as the HVD category. It provides guidelines for applying DCAT-AP to datasets subject to the High-Value Dataset Implementing Regulation (HVD IR).

Most HVD categories encompass geospatial datasets that are also covered by INSPIRE spatial data themes, making it essential to align INSPIRE Directive and HVD reporting requirements in order to reduce the administrative burden on Member States. In doing so, it is vital to establish a consistent workflow for

identifying, documenting and publishing these datasets so that they can be properly classified and made easily searchable and filterable through the deputed central access point, e.g., the European Data Portal (EDP).

GeoDCAT-AP

To enhance the discoverability, accessibility, and cross-sector reuse of spatial information within general data portals, the [GeoDCAT-AP](#) extension of the DCAT-AP was developed. Its primary objective is to bridge the technical gap between ISO 19115-based metadata – first and foremost those required by the INSPIRE Directive - and the DCAT-AP metadata used by open data catalogues. As a harmonisation layer, it maps complex geospatial metadata into a format that ensures consistency across diverse data systems.

The latest version of the standard ([GeoDCAT-AP 3.1.0](#)) further advances the INSPIRE mapping, providing updated paths for specific metadata elements (like spatial resolution or temporal extent) to ensure they don't lose meaning when converted from XML/ISO formats to RDF/DCAT, thus ensuring that spatial semantics are preserved and effectively communicated when shared across broader, non-spatial data ecosystems.

Note: GeoDCAT-AP 3.1.0 recommends using the `<dcats:theme>` property to reference the INSPIRE spatial data themes through the corresponding URI in the [INSPIRE theme register](#). Likewise, the use of the `<dcats:theme>` property is recommended for referencing values from controlled vocabularies, such as the [INSPIRE Priority datasets metadata codelist](#).

INSPIRE Maintenance and Implementation Work Programme - Action 2.5

The INSPIRE Maintenance and Implementation Work Programme (MIWP) 2021–2024¹ established *Actions 2.1 Need-driven data prioritisation* and *2.2 Roadmap for priority-driven implementation*, to facilitate a pragmatic and feasible implementation of the Directive that responds to tangible data needs and identified real use cases.

Following the publication of the High-Value-Datasets Regulation under the Open Data Directive, which covers a large part of the data in scope of the INSPIRE Directive, the INSPIRE MIWP 2021 – 2024 was updated with the new *Action 2.5. Alignment of INSPIRE and high-value dataset implementation* by merging the previous Actions 2.1 and 2.2.

Action 2.5 aims to align the implementation of the INSPIRE Directive with the High-Value Datasets (HVD) Regulation by maximising the reuse of INSPIRE implementation to meet HVD requirements. In doing so, it promotes a "once-only" approach to data sharing and reporting across Europe, reducing duplication of effort, improving interoperability, and increasing the efficiency of data provision. Given the importance of this Action, it is also included in the recent INSPIRE MIWP 2025–2026².

The Action focuses on the three interconnected strands of activities briefly described below:

- **Data Provisioning:** Facilitating once-only identification and dissemination of datasets and services by streamlining provisions and technical guidelines for metadata documentation and publication.
- **Data Use and Impact:** Prioritising datasets that meet concrete stakeholder needs in line with HVD criteria.

¹ The INSPIRE MIWP 2021 – 2024 is available to registered users.

² The INSPIRE MIWP 2025 – 2026 is available to registered users.

- Synergies: Aligning monitoring and reporting for INSPIRE datasets and services under HVD.

These goals are pursued by:

- promoting good practices within the existing legal framework
- informing the GreenData4All initiative on potential legal adjustments
- fostering close coordination between INSPIRE and Open Data HVD networks at EU and national levels to enhance the availability, functionality, and use of open geospatial content.

A key part of the work carried out under Action 2.5 is the [ISO & GeoDCAT-AP Metadata Implementation Pilot](#). The Phase 1 of the pilot was conducted from October 2024 to June 2025, with the ultimate goal to integrate INSPIRE and HVD reporting obligations into a unified Open Data flow, centralising both INSPIRE and HVD reporting as well as dataset accessibility and re-use through the European Data Portal.

Specifically, the pilot was aimed to test and evaluate the suitability of the transformation of INSPIRE (ISO 19139-based) metadata into DCAT-based metadata using the [GeoDCAT-AP 3.0.0](#) specification and the related [XSLT transformation](#) by the [Semantic Interoperability Community](#) (SEMIC).

Nine Member States, together with the JRC and the EU Publications Office, participated in this pilot and worked together to agree on common metadata tagging, test the transformation tools (e.g., XSLT and GeoNetwork DCAT plugin) and assess the transformed metadata quality, their compliance with the INSPIRE Directive and HVD Implementing Regulation, and potential information loss during transformation.

Key outcomes of the pilot include:

1. Drafting of the [INSPIRE Good Practice on Geospatial High-Value Datasets tagging](#) endorsed at the 82nd INSPIRE MIG-T Meeting on June 27, 2025.

The Good Practice proposes the following tagging for INSPIRE HVD:

- “*High-value dataset*” free keyword, provided via <gmx:Anchor> element referencing the HVD Implementing Regulation. The corresponding encoding is illustrated below in Figure 1:

Figure 1. High-value dataset keyword encoding

```
<!-- HVD Keyword -->
<gmd:keyword>
  <gmx:Anchor xlink:href="http://data.europa.eu/eli/reg_impl/2023/138/oj">High-value dataset</gmx:Anchor>
</gmd:keyword>
```

- Thesaurus-Based HVD category keywords provided via <gmx:Anchor> element, referencing “[High-value dataset categories](#)” vocabulary. The example below (Figure 2) illustrates the related encoding:

Figure 2. Thesaurus-Based HVD category keywords provided via <gmx:Anchor> element

```
<gmd:MD_Keywords>
  <!-- Category Keyword -->
  <gmd:keyword>
    <gmx:Anchor xlink:href="http://data.europa.eu/bna/c_dd313021">Earth observation and environment</gmx:Anchor>
  </gmd:keyword>
  <!-- Optional Subcategory Keyword-->
  <gmd:keyword>
    <gmx:Anchor xlink:href="http://data.europa.eu/bna/c_f399050e">Sea regions</gmx:Anchor>
  </gmd:keyword>
  <!-- Thesaurus Reference -->
  <gmd:thesaurusName>
    <gmd:CI_Citation>
      <gmd:title>
        <gmx:Anchor xlink:href="http://data.europa.eu/bna/asd487ae75">High-value dataset categories</gmx:Anchor>
      </gmd:title>
    </gmd:CI_Citation>
  </gmd:thesaurusName>
</gmd:MD_Keywords>
```

2. Improved [XSLT](#) tool for transforming INSPIRE metadata into (Geo)DCAT-AP format.
3. Detailed documentation and implementation feedback in the dedicated [GeoDCAT-AP-pilot](#) GitHub repository.
4. A [final report from pilot Phase 1](#) summarising findings and lessons learned.

The pilot continues in 2026 (Phase 2) considering the latest release of [GeoDCAT-AP \(v.3.1.0\)](#).

2.1.2 INSPIRE spatial data themes in HVD

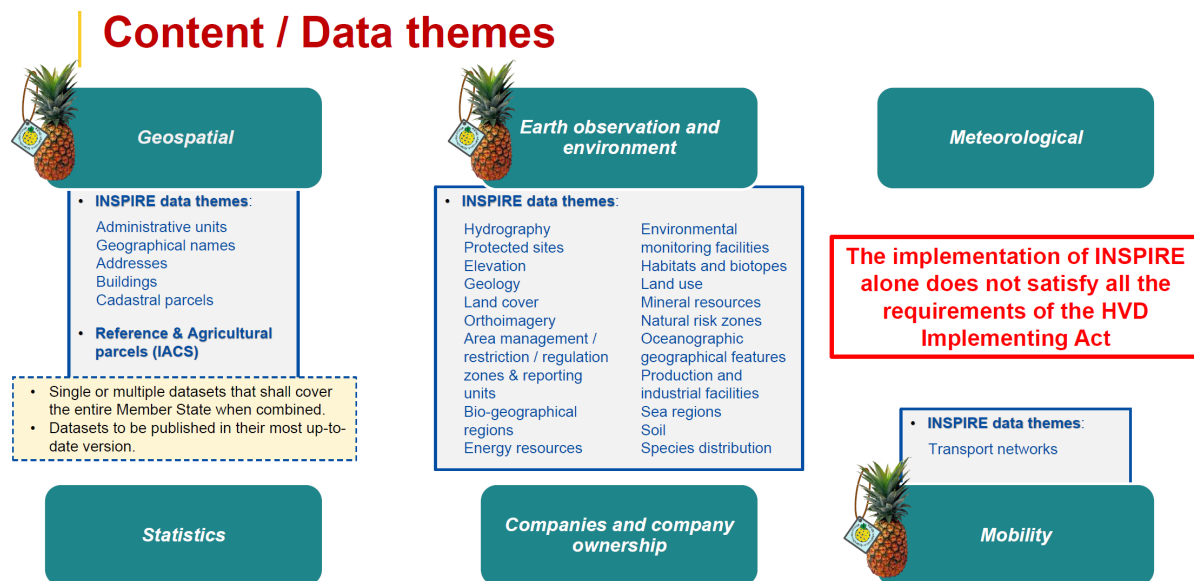
Most INSPIRE spatial data themes have been included in the HVD categories and datasets, either:

- 1) directly, through explicit inclusion in the following HVD categories:
 - Geospatial
 - Earth observation and environment
 - Mobility, or
- 2) indirectly, through HVDs that are also related to INSPIRE spatial data themes, such as environmental domains and legal acts in the HVD category Earth observation and environment, or datasets in Meteorology or Statistics.

The INSPIRE Coordinate reference systems and Geographical grid systems spatial data themes provide a common location framework and serve as the basis for spatial datasets. Those INSPIRE spatial data themes are reused in spatial high-value datasets.

The overview of mapping between the INSPIRE spatial data themes and HVD categories is provided in the Figure 3 below and in Annex I.

Figure 3. Overview of mapping between the INSPIRE spatial data themes and HVD categories



Source: [High-Value Datasets & INSPIRE, Boosting data availability and accessibility for the EU Green Deal](#)

2.1.3 INSPIRE network services – download

The High-Value Datasets Implementing Regulation requires HVDs to be made available both through Application Programming Interfaces (APIs) and via bulk download mechanisms.

The [Technical Guidance for the implementation of INSPIRE Download Services](#) defines two types of download services, the pre-defined dataset download service and the direct access download service, that inherently fulfil the two access modes required by the HVD IR, as specified below:

- The pre-defined dataset download service allows users to download entire datasets or fixed parts of them as-is, without options to query, select custom subsets, or request different encoding or coordinate reference systems. This static data provision is typically delivered via INSPIRE ATOM feeds and directly satisfies the bulk download requirement of the HVD Regulation.
- The direct access download service supports querying and extracting subsets of data, such as by spatial or temporal criteria, as well as requesting different coordinate reference systems (CRS) and output encodings/formats. Implemented using the Open Geospatial Consortium (OGC) Web Feature Service (WFS) 2.0 specification, these services are functionally similar to an API and are therefore aligned with the HVD API requirement of the HVD Regulation.

The INSPIRE Good Practices [Setting up an INSPIRE Download service based on the OGC API-Features standard](#) and [INSPIRE download services based on OGC SensorThings API](#) enable the creation of INSPIRE-compliant download services using OGC APIs, which inherently support the HVD API requirements set out in the HVD Regulation.

The Figure 4 below illustrates how INSPIRE download services map to the API requirements defined in the HVD Implementing Regulation (HVD IR).

Figure 4. INSPIRE download services map to the API requirements of the HVD IR

HVD: ‘Application programming interface (API)’ means a set of functions, procedures, definitions and protocols for machine-to-machine communication and the seamless exchange of data

- **Commission IR (EU) 2023/138** on High-Value Datasets:
 - Datasets to be made available through **Application Programming Interfaces (API)** AND **Bulk download**.

INSPIRed Network Service	API	Bulk download
OWS: WFS, WCS, SOS	X	X
OGC APIs: STA and OGC API-Features	X	X
ATOM Feeds		X

- **API terms of use** shall be **accompanied by API documentation** in a Union or internationally recognised open, human-readable and machine-readable format.
 - OWS: GetCapabilities responses
 - OGC APIs: Open API Documentation, landing pages, conformance declarations.
- **Additional alignment** is expected as part of the **GreenData4All** initiative

Source: [High-Value Datasets & INSPIRE, Boosting data availability and accessibility for the EU Green Deal](#)

2.1.4 INSPIRE conditions for access and use for datasets and services

The INSPIRE Metadata Regulation requires providing information on constraints related to access and use that refer to (either or both):

- a set of conditions applying to access and use,
- a set of limitations on public access.

The INSPIRE Directive doesn’t define a common licence type or specific licencing conditions. While INSPIRE Directives promotes public access and use of datasets and services, it also allows specific derogations under the Article 13 to limit public access to spatial datasets and services, where such services would adversely affect international relations, public security, national defence, confidentiality of the proceedings of public authorities, intellectual property rights, the protection of the environment to which such information relates, such as the location of rare species, etc. [more details in the INSPIRE Directive Article 13].

2.2 High-Value Datasets in the European Data Portal

The [European Data Portal](#) (EDP) plays a central role in the EU open data ecosystem by serving as a hub connecting national and EU-level public data, supporting transparency, evidence-based policymaking, and innovation across Europe. It provides access to public data from EU institutions and Member States, promoting reuse and interoperability of information to drive economic, social, and environmental benefits.

Metadata information from national catalogues is harvested daily by default (with alternative schedules negotiable) to ensure that newly published or updated datasets are promptly reflected at the EU level. Incoming metadata in non-DCAT-AP formats (such as INSPIRE ISO-19139) are automatically harmonised and converted to the latest version of the DCAT-AP standard.

The portal also offers a [Metadata Quality Assessment \(MQA\) tool](#) that helps data providers and portals evaluate their metadata against FAIR principles (Findability, Accessibility, Interoperability, and Reuse of digital assets) and receive actionable recommendations for improvement. To support metadata validation, a [DCAT-AP validation service](#) is made available.

In the context of High-Value Datasets, the portal serves both as the reporting backbone and the primary public access gateway across Europe.

Comprehensive documentation is provided to support both the publication and discoverability of HVDs, including a [data provider manual](#), a [step-by-step access guide](#), and a [High-Value Datasets Best Practices Report](#).

The portal hosts a [dedicated HVD section](#) where users can filter datasets by multiple criteria and perform advanced queries via SPARQL endpoints. Example queries and Search API usage are provided to facilitate programmatic access and analysis of datasets.

Additionally, the EDP publishes a series of [HVD data stories](#) to raise public awareness of their importance. Each story includes a visualisation note that demonstrates how these datasets can inform public discussions and highlight their practical applications and societal benefits.

2.3 GreenData4All initiative

The [GreenData4All](#) initiative is a European Commission-led effort aimed at modernising the INSPIRE Directive and aligning it with other EU data legislation, such as the Open Data Directive and the HVD Implementing Regulation. This initiative aims to facilitate the sharing of environmental geospatial data across the EU, ensuring consistency between different legal frameworks and encouraging data-driven innovation to support the European Green Deal. Furthermore, GreenData4All addresses the need for regulatory alignment by recommending changes to data-sharing governance across various regulatory frameworks. Commission adoption of the proposals for updated rules on geospatial environmental data and access to environmental information is planned for the fourth quarter of 2025.

2.4 BeOpen project

The European Commission is supporting a portfolio of projects funded under the Digital Europe Programme³ for the use of High-value datasets in the framework of the EU Open Data Directive. Among these, the BeOpen project (January 2023 – June 2025) aimed to enhance the accessibility, interoperability, and reuse of EU Public Sector High-Value Datasets to foster the development of innovative digital and AI services.

The project brought together a consortium of 17 partners from 8 EU countries and successfully empowered cities across Europe to leverage their open data by transforming it into High-Value Datasets and by creating innovative digital services based on them to address a range of critical urban challenges, including natural disaster management, road infrastructure maintenance, and public health monitoring.

BeOpen delivered tangible benefits to participating cities, establishing a strong foundation for future data-driven urban development across Europe and demonstrating that open data is key to building smarter, safer, and more sustainable cities.

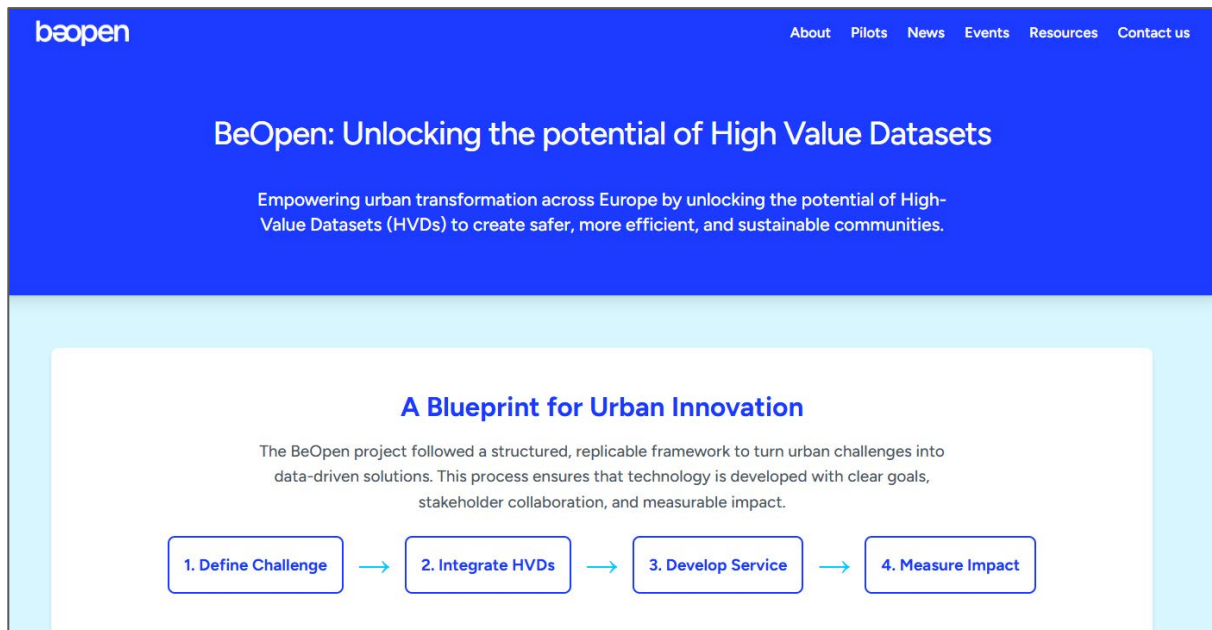
Focusing on the key areas of mobility, urban security, environment, and natural disasters, and based on the concrete experiences from its pilots, the project developed an Open Framework for boosting EU High Value Datasets from the Public Sector, addressing both the technical and the trust aspects and covering the full data pipeline from collection and quality improvement to semantic enrichment, provisioning, and publication.

The created HVDs are discoverable via the European data portal as well as via national open data portals.

³ <https://digital-strategy.ec.europa.eu/en/news/eu-funded-projects-using-high-value-datasets>

The framework and the developed digital services are highly replicable, offering a blueprint for other cities to address similar challenges and foster digital transformation, as you can see in Figure 5 below.

Figure 5. Open framework to boost EU HVDs from the Public Sector portal



2.5 GeoNetwork – metadata catalogue

Several Member States and organisations have established INSPIRE metadata, catalogue and discovery service by using GeoNetwork⁴ system that has become a vital component in numerous Spatial Data Infrastructure initiatives worldwide. Following the INSPIRE–HVD alignment, the GeoNetwork developers’ community is preparing new functionalities to directly transform INSPIRE/ISO metadata into HVD DCAT-AP and GeoDCAT-AP metadata profiles.

3 Methodology for a preliminary analysis of the environmental HVDs in the EDP

The dataset catalogue of the EU Data Portal provides multiple options for data exploration, including a search engine (accessible via the [Data tab](#)), a [SPARQL endpoint](#), and an [API endpoint](#). This investigation used all of these tools in complementary ways.

Due to its machine-readable JSON structure, which enables efficient analysis and derivation of statistical information at the dataset property level, querying the API endpoint was the most common method of investigation. The Data tab was primarily used to manually analyse individual datasets identified through the API query that were considered worthy of further investigation. The SPARQL endpoint supported more targeted searches, for example, via specific metadata properties.

The lack of clear and consistent instructions for tagging High Value Datasets relevant to a specific Directive (e.g., END, MSFD, WFD) hampered the possibility to formulate single, unambiguous queries to identify relevant data available in the EDP. In fact, since data providers or countries tend to apply their own strategy to tag and edit metadata, any direct searches - such as by specific keywords, [INSPIRE priority dataset](#)

⁴ GeoNetwork is a catalog application to share information for search and discovery. It is provided as open source. <https://geonetwork-opensource.org/>

[codelist](#) values or applicable legislation references - are ineffective. Consequently, a stepwise approach was adopted that starts with a broad, high-level search and progressively applies more specific filters to narrow down the initial broad set of results.

The applied methodology (Figure 6) consists of the following four steps:

1) Comprehensive Search:

To maximise dataset retrieval, a broad, generic search is run across all metadata fields of the High-Value Datasets on the EDP (identified using the “is_hvd=true” filter).

This step aims to identify datasets containing key terms such as “noise”, “WFD” or “MSFD” in any metadata field (including title, description, or keywords), ensuring that relevant data is retrieved regardless of its formal tagging or categorisation.

The results of the comprehensive search are then analysed - e.g., by parsing the API response - to perform an initial screening of the datasets and exclude those that are clearly irrelevant to our investigation.

Examining keywords is essential for identifying datasets that best match the search objectives. Particular attention shall also be given to the classification of datasets through the following EU-controlled vocabulary codelists:

- **High-Value Dataset categories:**

The [DCAT-AP for HVD](#) metadata profile, created to enhance the interoperability and accessibility of HVDs (see section 2 for more details), introduces the <dcatap:hvdCategory> property to specify the category of a High-Value dataset. The controlled vocabulary “[High-Value Dataset Categories](#),” maintained by the Publications Office, defines the possible values for this property.

The use of <dcatap:hvdCategory> property is mandatory: at least one value from the HVD Categories vocabulary must be provided.

If a dataset spans multiple thematic categories, the <dcatap:hvdCategory> property should be provided multiple times to indicate all relevant categories.

The DCAT-AP HVD guidelines recommend “*to annotate the High Value Datasets with the most precise concept*” available in the vocabulary.

While assigning one of the six top-level HVD thematic categories (geospatial, earth observation and environment, meteorological, statistics, companies and company ownership, and mobility) is not strictly mandatory because they can be automatically derived from the more granular concept, including both top-level and sub-level categories is advisable. This dual-tagging approach maximises semantic richness and improves data discoverability.

- **Data Theme categories:**

The DCAT-AP specification requires datasets to be classified through the <dcat:theme> property using a controlled vocabulary. In particular, at least one value must be selected from the [EU Data Theme Vocabulary](#), which provides a set of top-level thematic domains to support harmonised classification across European data portals, such as Environment, Energy, Government and public sector, and Science and technology.

This requirement applies generally to DCAT-AP dataset descriptions and does not constitute a specific requirement for High-Value Datasets.

2) Targeted Search:

Based on the analysis of the comprehensive search results, the search scope is narrowed by inspecting datasets with specific keywords or HVD categories, e.g., targeting those datasets with domain-specific HVD (sub)categories such as “noise”, or datasets with specific keywords, such as “END Directive”, “Lden”, “Lnight” and “priority datasets”.

3) SPARQL-Based Search

More focused searches are then conducted using the SPARQL endpoint to target the content of specific metadata properties, e.g., <dc:theme>.

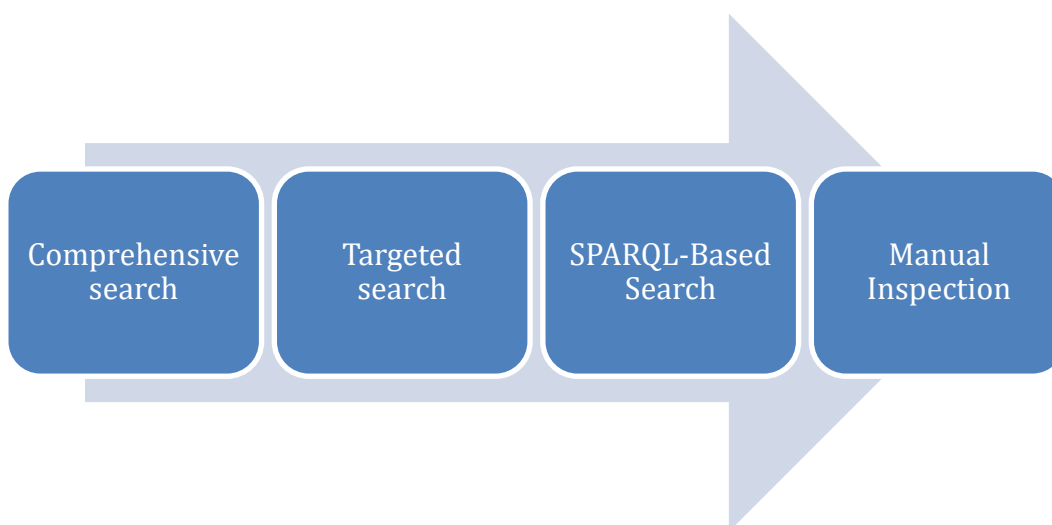
The SPARQL-based search enables the identification of the [INSPIRE Priority Datasets](#). This is done by querying the <dc:theme> element for specific values in the INSPIRE Priority dataset metadata codelist, such as <https://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/dir-2000-60> (refers to the Directive 2000/60/EC - Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (WFD)).

Although the HVD doesn't directly reference the [INSPIRE Priority datasets](#) codelist, this vocabulary provides direct references to environmental legislation and to key spatial datasets related to environmental reporting obligations. It has been established under INSPIRE to boost the provision of environmental datasets in the national spatial data infrastructures. With the overlapping scope of datasets among the EU environmental legislation, INSPIRE and HVD, it is a useful additional (optional) resource for HVD metadata tagging or search.

4) Manual inspection

By cross-referencing the results, a list of datasets is identified for which it is considered worthwhile to proceed with a manual inspection to obtain more detailed information. For instance, we can analyse titles/abstracts to identify details such as direct mentions of reporting and verify their simultaneous presence on the INSPIRE Geoportal and the EDP.

Figure 6. Methodology for a preliminary analysis of the environmental HVDs in the EDP



4 Results of the preliminary analysis of the HVDs in the EDP

Both the general overview and the results of more fine-grained queries are presented in this section.

To understand the investigation results, it's essential to consider the following caveats:

1. Results may depend on search time.

The European Data Portal's frequent (typically daily) harvesting of national catalogues can lead to fluctuations in dataset counts, even within short timeframes. To account for this variability, we conducted identical searches on multiple dates.

2. Figures are indicative, not absolute.

A single dataset may be linked to multiple keywords, HVD categories, and data theme categories. Consequently, the figures presented in the result tables should be viewed as indicative rather than absolute. To minimise this issue, we conducted a more in-depth analysis of the results, while acknowledging that some overlap may remain.

3. Dataset capture may be incomplete.

In the absence of standardised guidelines for clearly characterising environmental reporting HVDs in metadata, Member States - and even different public bodies within the same Member State - have used their own documentation approaches. This variation in metadata practices likely reduced the effectiveness of our search criteria, potentially leading to some datasets being missed.

4.1 Noise datasets

Investigation aimed to identify datasets relevant to END reporting, with a particular focus on those conforming to the latest data model, which specifies the GeoPackage format for spatial datasets.

4.1.1 Comprehensive search

The search aims to retrieve HVDs that mention either "noise" or "Environmental Noise Directive" in any metadata property, including the title, keywords, or abstract. The corresponding Data tab request and API call used for the search are provided below.

Data tab request

https://data.europa.eu/data/datasets?locale=en&is_hvd=true&query=noise+OR+%22Environmental+Noise+Directive%22

API request:

[https://data.europa.eu/api/hub/search/search?q=END%20OR%20%22Environmental%20noise%20Directive%22&filter=dataset&includes=id,title.en,description.en,modified,catalog.id,catalog.title,distributions.format.label,distributions.license&facets={\"country\": \[\],\"catalog\": \[\],\"format\": \[\],\"license\": \[\],\"categories\": \[\],\"keywords\": \[\],\"is_hvd\": \[\"true\"\],\"hvdCategory\": \[\]}](https://data.europa.eu/api/hub/search/search?q=END%20OR%20%22Environmental%20noise%20Directive%22&filter=dataset&includes=id,title.en,description.en,modified,catalog.id,catalog.title,distributions.format.label,distributions.license&facets={\)

Result Tables

The API request above was launched twice:

- on 04/04/ 2025, when it returned 151 datasets
- on 09/10/2025, when it returned 215 datasets

The main characteristics of the datasets (provenance, HVD category, data theme category, keywords) derived by inspecting the API response are summarised in Table 1, Table 2 and Table 3, respectively, for 04 April 2025, whilst the results from 09 October 2025 are shown in Table 7, Table 8 and Table 9.

The keyword table only reports English-language keywords with higher occurrences.

Note:

It is worth mentioning briefly that, following the EDP data tab, the term “provenance” is used here to mean “country of origin”, rather than referring to the RDF metadata concept of <dc:provenance>, which conversely provides information about the lineage of the datasets.

Results on 04 April 2025

Table 1. Provenance results on 04 April 2025

Provenance – 04/04/25	Occurrences
BE	32
DE	48
ES	13
NL	21
LU	19
FR	6
LT	6
AT	1
SE	2
EE	1
CZ	2
Total	151

Table 2. HVD Category results on 04 April 2025

HVD Category - 04/04/2025	Occurrences
Earth observation and environment	84
Area management/restriction/regulation zones & reporting units	22
Noise	9
Geospatial	2
Radar data	2
Elevation	1
Total	120

Table 3. Data theme Category results on 04 April 2025

Data theme Category - 04/04/2025	Occurrences
Environment	31
Health	5
Transport	2

Insights:

- Examining the RDF metadata of the datasets with “Radar data” and “Elevation” categories, we could not find any reference to the term “noise”, so there is an error from the EDP search engine (probably due to translation issues).
- Calculating the difference between the total number of datasets (151) and the number of HVD category occurrences (120) reveals that at least 31 datasets did not provide an HVD category, despite this being mandated by DCAT-AP for HVD.

- Only a small percentage of datasets use the HVD category specific to the thematic domain, i.e., noise.

Most used Keywords

The keyword analysis revealed that a significant number of high-frequency keywords are expressed in national languages, such as “Geluid”, “inspireidentifiziert”, “Lärm”, “erdbeobachtung-und-umwelt”, and “bruit”.

Some datasets use a combination of English and national-language keywords, while others rely solely on national-language terms.

The Table 4 lists the most frequent (occurrences greater than 5) English-language keywords associated with noise, the Environmental Noise Directive (END), and INSPIRE.

Table 4. Most common English-language keywords and acronyms associated with noise HVDs on 04 April 2025.

Keyword - 04/04/2025	Occurrences
LDEN	27
LNight	27
Environmental noise directive	24
directive-2002-49-ec	31
Environmental noise exposure (Noise Directive)	24
INSPIRE	23
noise	7

Most used distribution formats

The format investigation has highlighted an inconsistency in naming, with multiple variations for the same format provided in the Table 5 below:

Table 5. Observed variants of formats on 04 April 2025.

Format	Observed Variants
WMS	WMS, WMS_SRVC, ogc:wms
WFS	WFS, WFS_SRVC, ogc:wfs, ogc:wfs-1.0.0-http-get-capabilities, INSPIRE DOWNLOAD SERVICE
GeoPackage	GPKG, GeoPackage, OGC GeoPackage Encoding Standard
GML	GML, Geography Markup Language (GML), Zipped GML,GMZ
ZIP	ZIP, application/zip
www:link	www:link / www:download / www

In Table 6 , which presents the most commonly used formats, naming variants have been aggregated under a single value to facilitate analysis.

It is worth highlighting that underlying formats of the datasets labelled as Atom and Zip can be diverse - e.g., GeoPackage, GML.

Table 6. Most commonly used formats on 04 April 2025.

Formats	Occurrences
WMS	65
WFS	40
CSV	30
GML	38
GPKG	6
SHP	18
Atom	20
JSON	5
Excel	15
ZIP	15
PDF	6
TIFF	2

Results on 09 October 2025

Table 7. Provenance results on 09 October 2025

Provenance – 09/10/25	Occurrences
BE	55
DE	47
ES	35
NL	25
DK	14
LU	9
FR	8
LT	6
AT	5
EU	4
SE	2
LV	2
PT	2
EE	1
CZ	0
Total	215

A deeper examination of datasets with "EU institution" provenance revealed that they were created in the context of the BeOpen EU project (see section 2.4), which specifically targeted the creation of new digital and AI services by enabling access to high-value datasets.

The term "EU institution" to indicate provenance is misleading. Another value, e.g., "EU project", would be more accurate.

Table 8. HVD Category results on 09 October 2025

HVD Category 09/10/2025	Occurrences
Earth observation and environment	120
Area management/restriction/regulation zones & reporting units	4
Noise	14
Emissions	8
Water	6
Geospatial	4
Climate	3
Mobility	3
Hydrography	1
Waste	1
Elevation	1
Horizontal legislation	1
Statistics	1
Total	167

Table 9. Data theme Category results on 09 October 2025

Data theme Category - 09/10/2025	Occurrences
Environment	121
Health	77
Transport	50
Regions and cities	45
Population and society	17
Government and public sector	14
Science and technology	6

Insights:

- Calculating the difference between the total number of datasets (215) and the number of HVD category occurrences (167) reveals that at least 48 datasets did not provide an HVD category.
- Only a small percentage of datasets use the HVD category that is specific to the thematic domain, i.e., noise.

Most used keywords

The table below (Table 10) lists the most common English-language keywords associated with noise, the Environmental Noise Directive (END), and INSPIRE.

Table 10. Most common English-language keywords and acronyms associated with noise HVDs on 09 October 2025.

Keyword - 09/10/2025	Occurrences
LDEN	53
LNight	53
Environmental noise directive	52
directive-2002-49-ec	50
Environmental noise exposure (Noise Directive)	28
INSPIRE	27
noise	5
priority dataset	5

Most used distribution formats

The naming inconsistency, already observed in April, is confirmed. In the Table 11 below, naming variants have been aggregated into a single value. The table only shows the most used formats.

Table 11. Most commonly used formats on 09 October 2025.

Format – 09/10/25	Occurrences
WMS	81
WFS	44
CSV	43
GML	43
GeoPackage	34
Esri Shape	26
Atom Feed	20
GeoJSON	20
Excel	22
ZIP	18
PDF	6
TIFF	2

Result Charts: comparison between April and October 2025

The histograms below (Figure 7, Figure 8, Figure 9, Figure 10, and Figure 11) illustrate the comparison between search results from April and October 2025.

Insights:

- The total number of datasets has increased, with a greater concentration in the “*Earth observation and environment*” HVD category and the “*Environment*” (ENVI) data theme category.
- The percentage of datasets that do not provide an HVD categorisation remains stable.
- It should be noted that categorisation by data theme category is much more pronounced in October than in April.
- There has been a decline in the use of the INSPIRE-theme specific category “Area Management/restrictions/regulation zones and reporting units”.

- Keyword patterns further confirm the trend towards specialisation and diversification, showing a marked increase in terms related to noise (e.g. LDEN and LNight) and different ways to reference the EU Directive 2002/49/EC.
- The use of the GeoPackage format has increased significantly.

Figure 7. Comparison of Noise HVD by country between April and October 2025

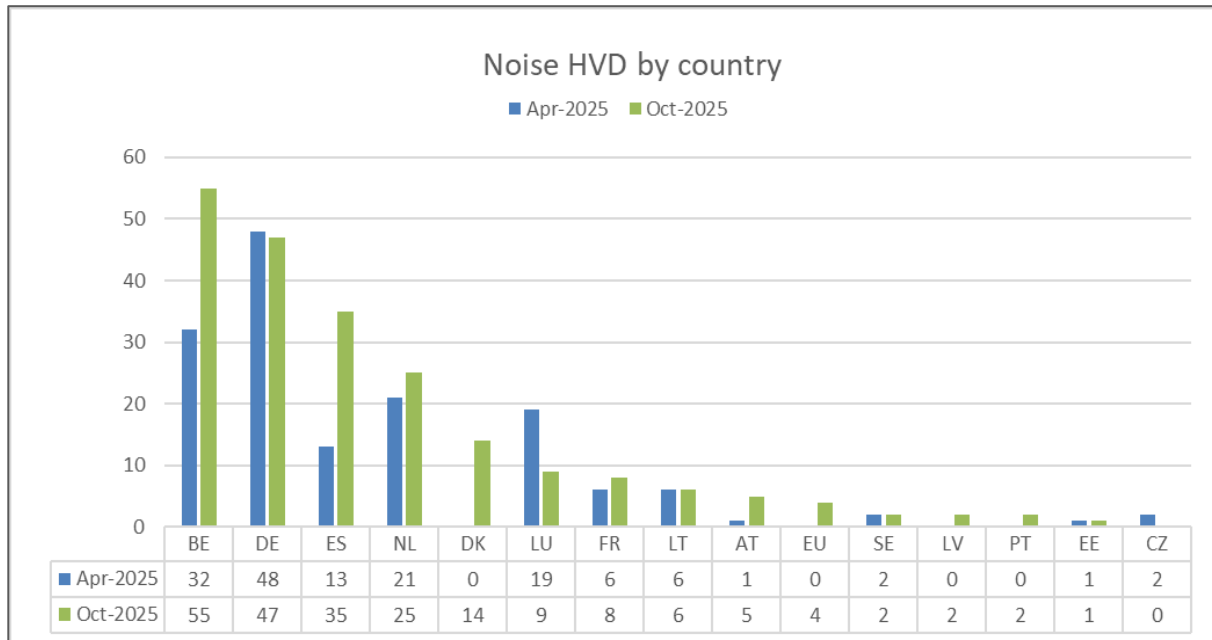


Figure 8. Comparison of Noise HVD by HVD category between April and October 2025

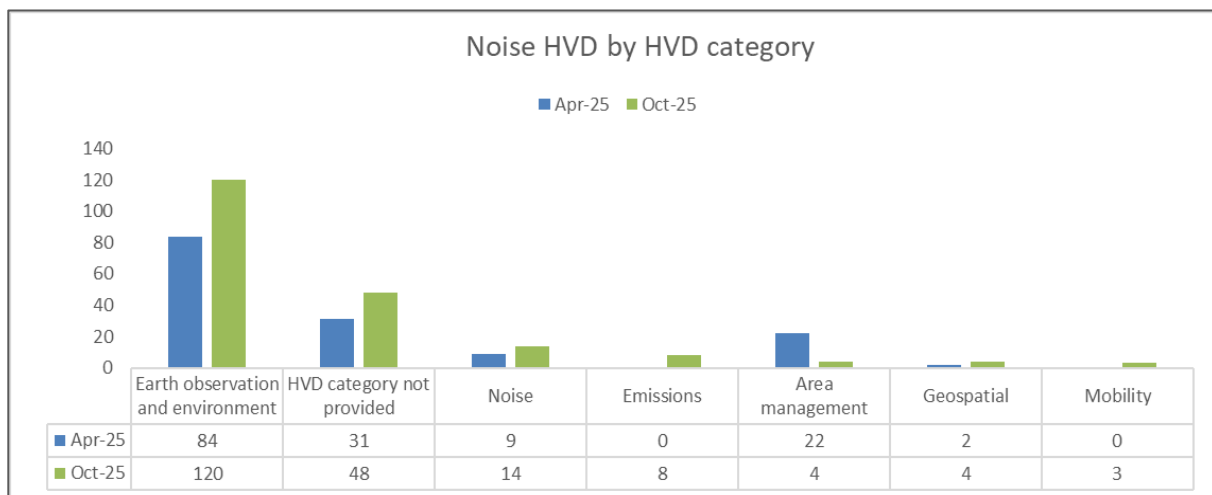


Figure 9. Comparison of Noise HVD by data theme category between April and October 2025

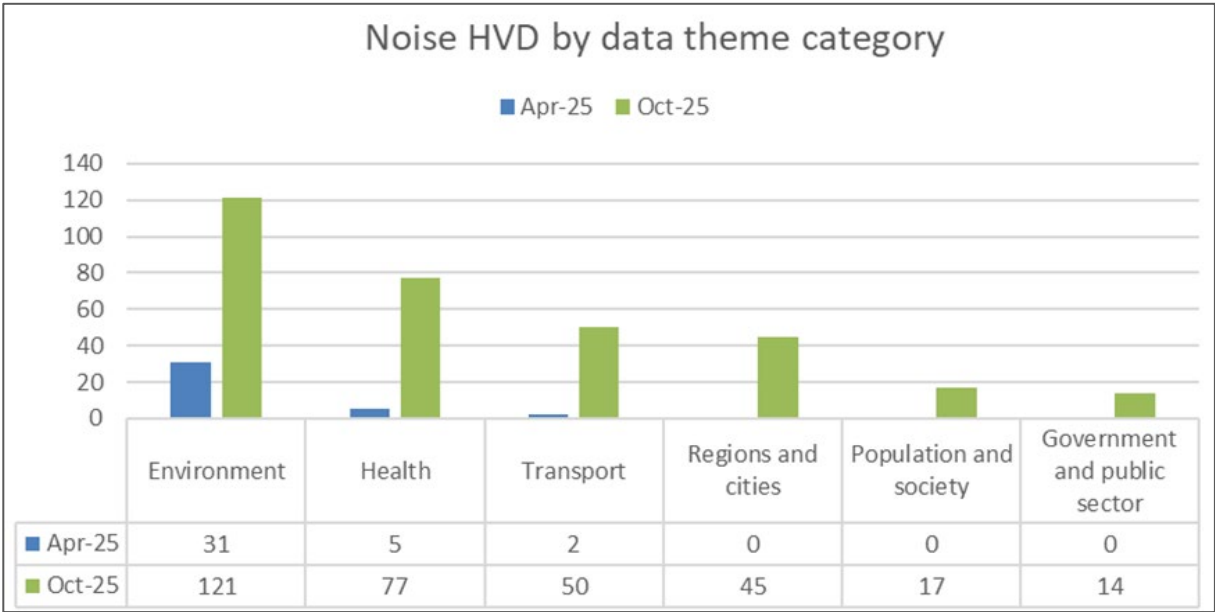


Figure 10. Comparison of Noise HVD by formats between April and October 2025

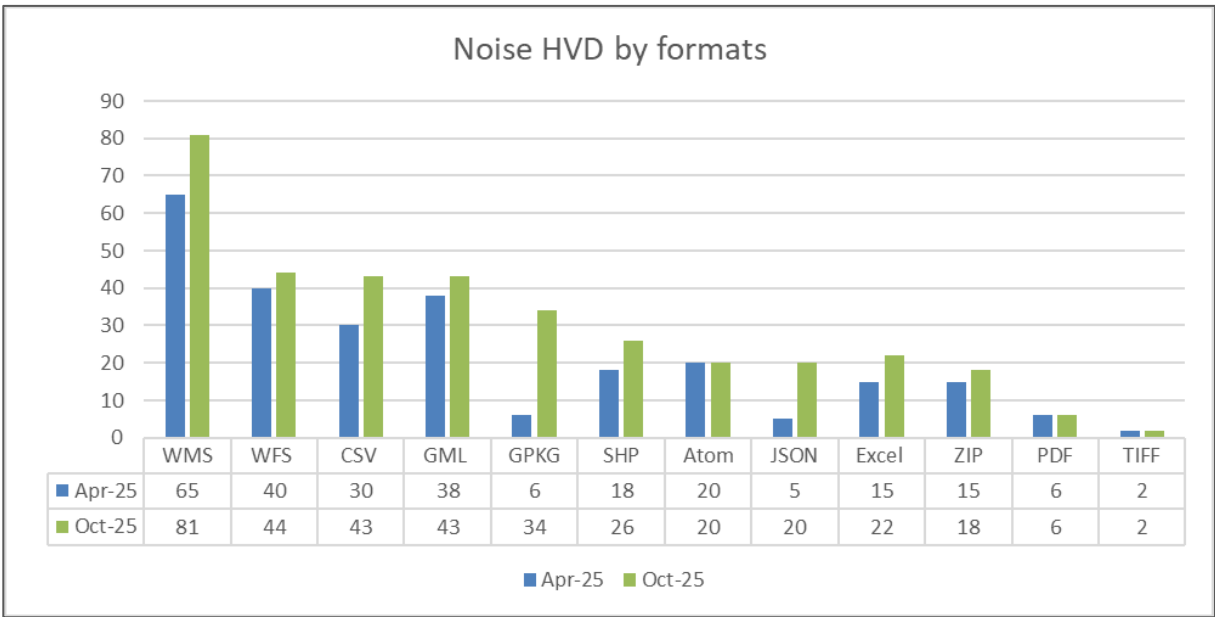
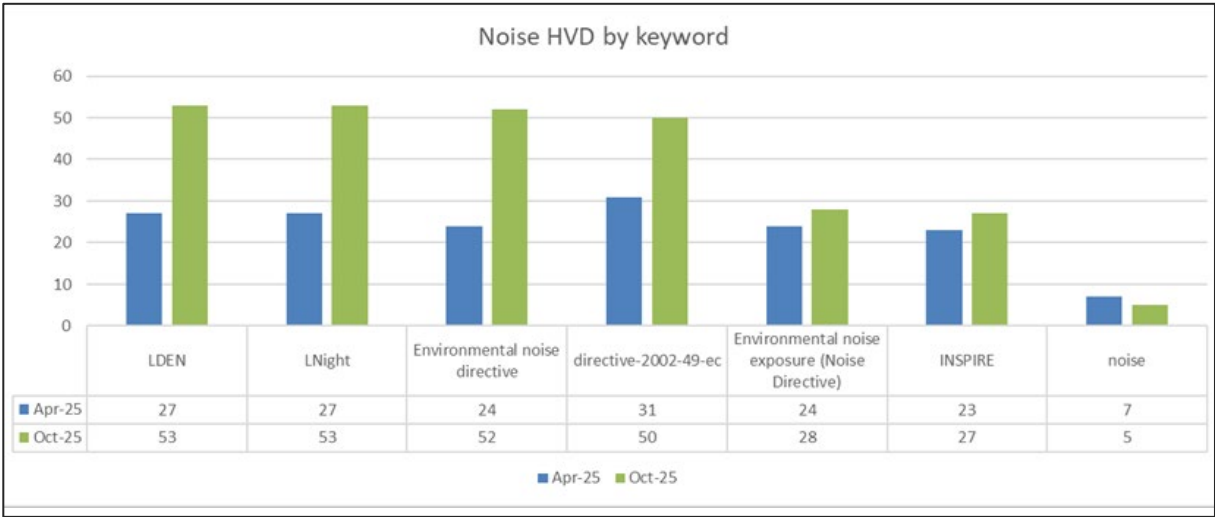


Figure 11. Comparison of Noise HVD by keywords between April and October 2025



4.1.2 More in-depth analysis - April 2025

Based on the results of the comprehensive search (API-based), more in-depth analysis was then carried out, mostly using the Data tab and the SPARQL endpoint on EDP, aimed to identify END reporting GeoPackage data related to the reporting cycle 2020 - 2025.

Datasets in GeoPackage format

As END reporting spatial datasets are in GeoPackage format, we deepened our investigation for format="GeoPackage".

Out of the six datasets found by the comprehensive search, only one, published by Germany, was related to the latest END reporting model.

Considering, however, that the countries could have delivered the GeoPackage files via bulk download, we also inspected datasets in the application/zip and ATOM formats.

Of the 20 datasets found, only one, published by Sweden, was related to the latest END reporting model. Both the German and the Swedish datasets were END reporting GeoPackage files (DF4_8 strategic noise maps) provided as a bulk download in ZIP files via an ATOM feed. You can find the search results in Table 12 below.

Table 12. Number of END reporting in GeoPackage format by country

Country	Nr of datasets
Germany	1
Sweden	1
Total	2

END Directive (2002/49) keyword

Looking into datasets with a keyword that directly mentions the **END Directive (2002/49)** yielded the results shown in the Table 13 below.

Table 13. Number of datasets referencing the END Directive (2002/49) by country

Country	Nr of datasets
Belgium	27
Netherlands	4
Total	31

Upon reviewing the dataset titles, it was found that the Belgian datasets are END data, but in a different format from the current GeoPackage, reflecting previous reporting cycles.

The [4 datasets from the Netherlands](#) are END reporting GeoPackage (DF4_8 strategic noise maps), available as bulk downloads in zip files via ATOM.

These datasets do not appear in format-based search (see 4.1.2.1) because the format information is missing from the metadata.

Looking more closely at these 4 datasets, we found that:

- They're also present in the INSPIRE Geoportal
- Their datasets metadata contain the keyword "priority datasets"

The screenshots below show the HVD from the Netherlands in the EDP (Figure 12), in the EDP Viewer (Figure 13) and in the INSPIRE Geoportal (Figure 14), respectively.

Figure 12. HVD from the Netherlands in the EDP, in the EDP catalogue

The screenshot displays the 'Datasets' search results page in the EDP catalogue. On the left, there are filters for 'High-Value Dataset' (set to 'Yes'), 'Provenance' (set to 'Netherlands'), 'Keywords' (set to 'Directive 2002/49/EC'), 'Data scope' (set to 'National Data'), and 'Catalogues' (set to '- Any -'). The main area shows 'Datasets found (4)' sorted by 'Relevance'. The results list four datasets, all from the 'National Georegister of the Netherlands':

- Noise agglomeration municipalities, Lden and Lnight, 2021 (INSPIRE)**: Noise map 2021 of the Dutch agglomeration municipalities. The map shows the noise load during the night (Lnight) and 24 hours (Lden), within an agglomeration, which is caused by: road traffic, rail traffic, industry a...
- Noise pollution on major roads, Lden and Lnight, 2021 (INSPIRE)**: Noise map 2021 of the major Dutch national and provincial roads. The map shows the noise load during the night (Lnight) and 24 hours (Lden). This noise map fulfils the requirements of the Environmental Managemen...
- Noise pollution major airports (Schiphol), Lden and Lnight, 2021 (INSPIRE)**: Noise map 2021 for major Dutch airports (Schiphol). The map shows the noise load during the night (Lnight) and 24 hours (Lden). This noise map fulfils the requirements of the Aviation Act resulting from the European...
- Noise pollution major railways, Lden and Lnight, 2021 (INSPIRE)**: Noise map 2021 of the major Dutch railways. The map shows the noise load during the night (Lnight) and 24 hours (Lden). This noise map fulfils the requirements of the Environmental Management Act resulting from t...

Each result includes a 'WMS WFS UNKNOWN' status bar and the 'National Georegister of the Netherlands' logo.

Figure 13. HVD from the Netherlands in the EDP, in the EDP viewer

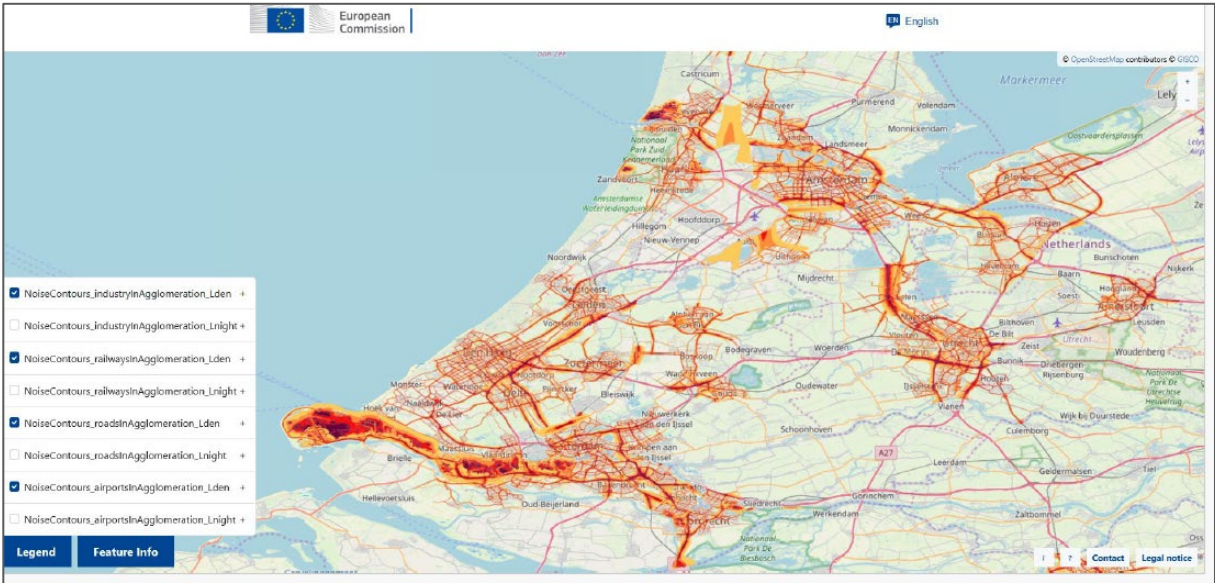
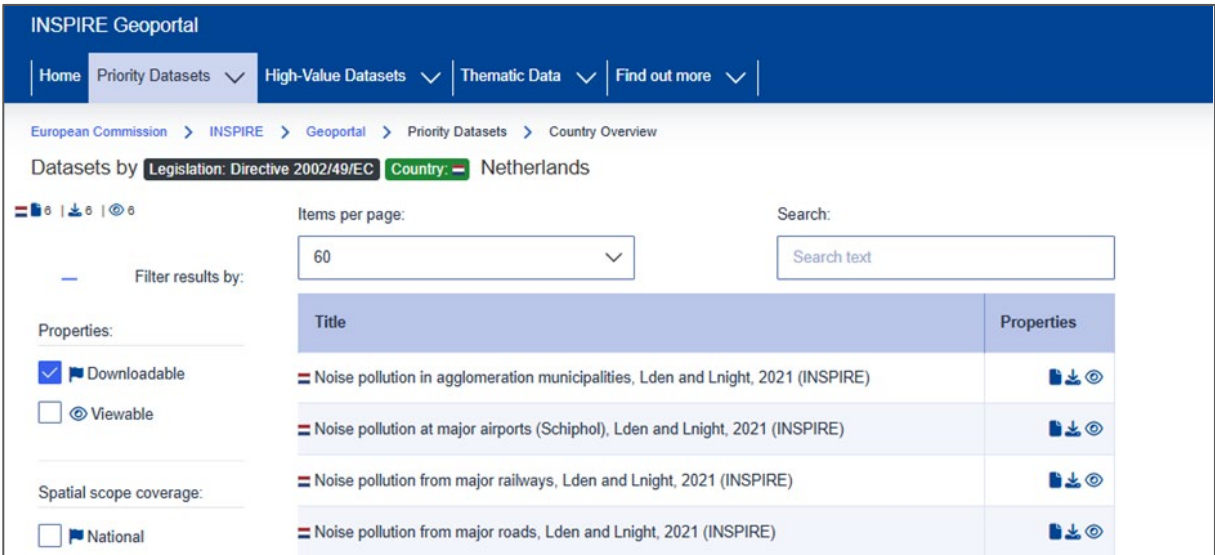


Figure 14. HVD from the Netherlands in the EDP, in the INSPIRE geoportal



Investigation on the HVD category “noise”

The aim of this more in-depth analysis was to identify which countries have used the noise HVD category and for which datasets. The result of the [query](#) is provided in Table 14 below:

Table 14. Number of datasets in the Noise HVD category by country

Country	Nr of datasets
Spain	8
Luxemburg	1
Total	9

Upon inspecting the dataset titles, we find that these are indeed END reporting datasets, but they're not geospatial data, as Spain datasets are END DF2 (competent authority information) and DF3 (noise limit values information), and the Luxembourg dataset is END DF2. It should be noted that only two of these nine datasets are classified using both the Earth observation and environment and noise HVD categories.

Noise AND INSPIRE

Find below in Table 15 the results of the [query](#) looking for datasets that mention both “noise” and “INSPIRE” in any of the metadata properties.

Table 15. Number of datasets mentioning Noise and INSPIRE by country

Country	Nr of datasets
Germany	42
Netherlands	21
Luxembourg	18
Belgium	15
Sweden	1
Total	97

END as INSPIRE Priority Datasets

The following queries aim to identify END defined according to the INSPIRE Priority Datasets either by searching for the keyword “Priority Dataset” or by checking for the corresponding INSPIRE metadata codelist value. The latter method can only be carried out using a SPARQL query.

Search by keyword

The following [query](#) searches noise datasets by keyword=“priority dataset”.

All 15 datasets returned are from Luxembourg (Table 16). A quick manual examination of the dataset titles shows that they are INSPIRE AM GMLs.

It is noted that the “priority dataset” did not appear in the list of the most used keywords of the comprehensive search inspection. This can be due to the different day on which this Data tab-based query was launched.

Table 16. Number of datasets retrieved using the Keyword “Priority Dataset” by country

Country	Nr of datasets
Luxembourg	15

SPARQL-based search

The following SPARQL query searches (Figure 15) in the <dcat:theme> for the INSPIRE Priority dataset metadata codelist value <https://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/dir-2002-49>

Figure 15. code of SPARQL query searching INSPIRE Priority dataset metadata codelist value in the <dc:theme>

https://data.europa.eu/sparql

```
1 PREFIX dcat: <http://www.w3.org/ns/dcat#>
2 PREFIX dct: <http://purl.org/dc/terms/>
3 PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
4 PREFIX foaf: <http://xmlns.com/foaf/0.1/>
5 PREFIX r5r: <http://data.europa.eu/r5r/>
6 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
7 PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
8
9 SELECT DISTINCT ?datasetURI ?language ?catalog
10 WHERE {
11   ?datasetURI a dcat:Dataset ;
12             dct:language ?language ;
13             dcat:theme <http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/dir-2002-49> ;
14             r5r:applicableLegislation <http://data.europa.eu/eli/reg_impl/2023/138/oj> .
15
16   OPTIONAL { ?catalog dcat:dataset ?datasetURI . }
17 }
18 ORDER BY ?datasetURI
```

Results are provided in Table 17 below:

Table 17. Results of SPARQL query searches in the <dc:theme> for the INSPIRE Priority dataset metadata codelist value

Country	Nr of datasets
Netherlands	4
Luxemburg	5

The datasets from the Netherlands are the Strategic Noise maps GeoPackage datasets from END DF4_8 reporting already mentioned in section 4.1.2.2, while those from Luxembourg are noise END GML datasets harmonised according to the INSPIRE AM data theme.

4.1.3 More in-depth analysis – October 2025

The queries already run in April were re-executed.

The results are provided below.

Datasets in GeoPackage format

Insights on noise datasets in GeoPackage format

Out of the 34 datasets found, 29 are from the 2022 END reporting (Table 18)

- 26 published by Belgium
- 3 published by Germany.

Table 18. Number of Noise datasets in GeoPackage format by country in October 2025

Country	Nr of datasets
Belgium	26
Germany	3
Total	29

Insights on noise datasets in “application/zip” and “ATOM” formats

The 18 datasets found with application/zip are from Belgium and Germany and are related to the 2017 END reporting cycle.

Out of the 20 datasets found with “Atom Feed” formats, 19 datasets are indeed END reporting GeoPackage datasets (Table 19)

[14 datasets from Denmark](#)

[5 datasets from Austria](#)

Table 19. Number of Noise datasets in “application/zip” and “ATOM” formats by country in October 2025

Country	Nr of datasets
Denmark	14
Austria	5
Total	19

END Directive (2002/49) keyword

Looking for keywords that directly mention the END Directive (2002/49) yielded the results in the

Table 20 below.

Table 20. Number of datasets directly referencing the END Directive (2002/49) by country in October 2025

Country	Nr of datasets
Belgium	45
Netherlands	4
Latvia	1
Total	50

The 4 datasets from the Netherlands are the same ones found in the April investigation. They are in GeoPackage format; however, they do not appear in searches by format because the format information is missing from the metadata.

HVD category “noise”

The query results are provided below in Table 21 for “Noise” and in Table 22 for “Noise and INSPIRE”. The list of countries is the same as in the April investigation, but there are more datasets.

It should be noted that only 5 datasets are classified using both the Earth observation and environment and noise HVD categories.

Table 21. Number of datasets in the “Noise” HVD category by country in October 2025

Country	Nr of datasets
Spain	10
Luxemburg	4
Total	14

Table 22. Number of datasets in the “Noise” and “INSPIRE” HVD category by country in October 2025

Country	Nr of datasets
Belgium	28
Netherlands	21
Germany	18
Denmark	14
Luxemburg	18
Austria	4
Sweden	1
Total	94

END as INSPIRE Priority Datasets

Search by keyword

The following [query](#) searches noise datasets tagged by the keyword=“priority-dataset” using the Data tab. Only five datasets were found, all of which are from Luxembourg (Table 23). Four of these are INSPIRE GML datasets that conform to the AM and TN data themes.

Table 23. Number of datasets tagged “Priority Dataset” by country (END as INSPIRE priority datasets) in October 2025

Country	Nr of datasets
Luxemburg	5

SPARQL-based search

Looking via SPARQL query for the INSPIRE Priority dataset metadata codelist value <http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/dir-2002-49>, brought to results illustrated in the following Table 24:

Table 24. Number of datasets retrieved via dcat:theme using INSPIRE priority dataset metadata codelist

Country	Nr of datasets
Netherlands	8
Luxemburg	6
Denmark	1
Total	15

A slightly modified query was run using a FILTER with REGEX on the dcat:theme variable in order to search for URIs starting with “<http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/>” and ending with “[dir-2002-49](http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/Agglomerations-dir-2002-49)”.

This was done to include the priority datasets related to specific data flows, such as those tagged with “<http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/Agglomerations-dir-2002-49>”.

Three additional datasets were found as shown in Table 25:

Table 25. Number of datasets retrieved using REGEX filter on INSPIRE priority dataset (dcat:theme) by country

Country	Nr of datasets
Netherlands	10
Luxemburg	6
Denmark	2
Total	18

Licence

The Table 26 below shows the distribution of datasets licenses.

Table 26. Distribution of dataset licenses

Licence	Count
Creative Commons Attribution 4.0 International (all CC BY 4.0 variants merged)	86
http://dcat-ap.de/def/licenses/dl-by-de/2.0	44
https://data.vlaanderen.be/doc/licentie/modellicentie-gratis-hergebruik/v1.0	27
Creative Commons CC0 1.0 Universal (all CC0 variants merged)	15
https://www.etalab.gouv.fr/licence-ouverte-open-licence	2
http://inspire.ec.europa.eu/metadata-codelist/ConditionsApplyingToAccessAndUse/conditionsUnknown	1

4.1.4 Conclusions

The overall analysis revealed different approaches to providing documentation for HVD datasets in their metadata.

The greatest heterogeneity was observed in the use of the HVD categories and keywords, which are briefly described below.

Approaches to HVD categories:

- In most cases, only the generic category “Earth observation and environment” is used. This means that those noise datasets cannot be discovered by looking at the HVD category.
- When the “noise” sub-category is used, the generic “Earth observation and environment” category is usually missing.
- For noise datasets harmonised according to INSPIRE (AM or TN), only the relevant HVD sub-category is mostly provided. As with the sole use of the “Earth observation and environment” category, this hampers the findability of noise datasets by limiting searches to the HVD category.
- A significant percentage of datasets (24%) do not provide the HVD category at all, despite this being mandatory.

Approaches to Keywords:

- Substantial heterogeneity was found in the use of keywords, as the way these are used differs significantly across Member States and across the data providers within the Member State.
- Some datasets use a combination of English and national-language keywords, but others rely solely on national-language terms, which considerably hampers searchability and overall discoverability.

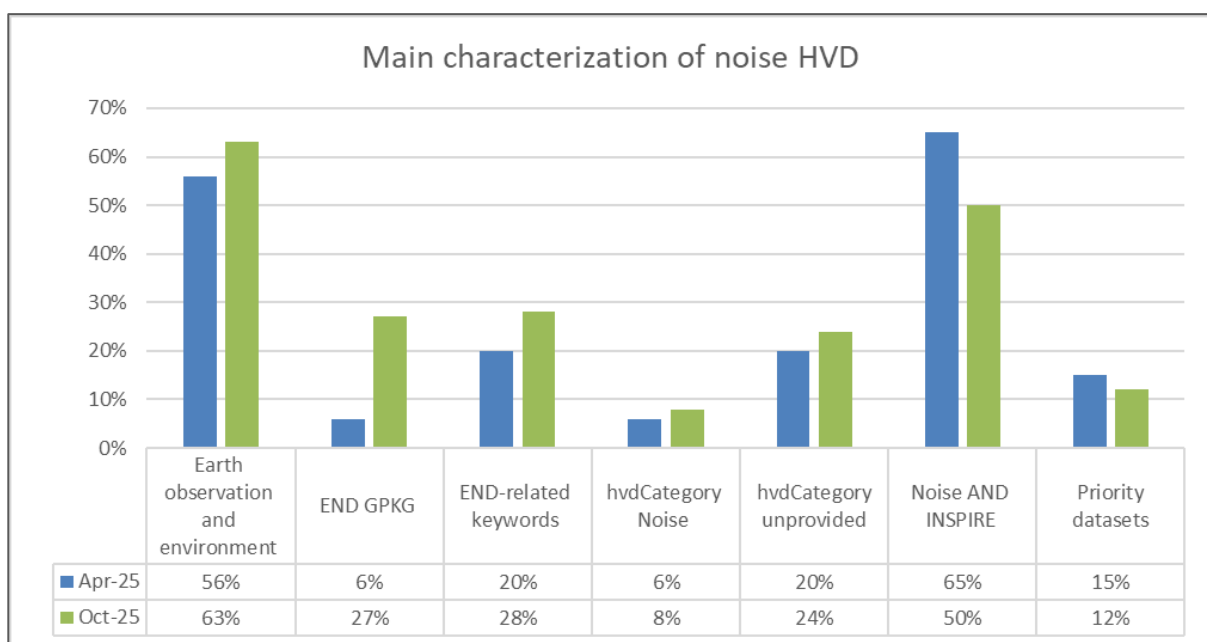
Comparison of the search results from April and October.

Several noteworthy trends emerge from a comparison of the search results from April and October (Figure 16).

1. First and foremost, there was a significant increase in the END GeoPackage category, rising from 6% to 27%. This highlights a clear shift towards compliance with the latest data model, which prescribes the GeoPackage format for spatial datasets.
2. The proportion of datasets classified under the “Earth observation and environment” HVD category increased from 56% to 63%. Similarly, the proportion of datasets in the “Noise” category increased by a similar amount, suggesting steady use of both the general and noise-specific HVD categories.
3. The proportion of datasets without a specified HVD category remained relatively stable, rising slightly from 20% to 24%.
4. END-related keywords increased from 20% to 28%, reflecting increased alignment with END reporting.
5. The proportion of datasets tagged with “Noise AND INSPIRE” decreased from 65% to 50%, indicating a decline in the number of datasets explicitly linking noise to INSPIRE.
6. The proportion of datasets classified as END according to the INSPIRE priority datasets slightly decreased from 15% to 12%.

Overall, these trends suggest an evolving dataset landscape, with stronger adherence to END reporting standards and increasing adoption of the recommended spatial data format.

Figure 16. Comparative analysis of Noise HVD characteristics (April vs October 2025 Results)



4.2 MSFD datasets

Investigation aimed to identify datasets relevant to END reporting, with a particular focus on those conforming to the latest data model, which specifies the GeoPackage format for spatial datasets.

4.2.1 Comprehensive search

The search aims to retrieve high-value datasets in which the term “MSFD” is mentioned in one or more of the metadata properties (title and/or keywords/data theme).

The data tab request and the API call used are the same as those in Section 4.1.1. The only difference is that the “noise” term has been replaced by the “MSFD” term.

Result Tables

The API request above was launched twice:

- on 30/04/ 2025 when it returned 5 datasets.
Quite interestingly, when not including the requisite of datasets being HVD the query⁵ returns 808 datasets.
- on 22/10/2025 when it returned 6 datasets.
Excluding the requirement for data being HVD, the query returned 758 datasets.

The main characteristics of the datasets (provenance, HVD category, keywords) are summarised in the Table 27, Table 28, Table 29, Table 30, Table 31 and Table 32 below.

Table 27. Provenance - API query results in April 2025

Provenance - 30/04/ 2025	Nr of datasets
Spain	3
France	1
Netherlands	1

Table 28. HVD category - API query results in April 2025

HVD category - 30/04/ 2025	Occurrences
Earth observation and environment	2
Sea regions	2
Water	1
http-data-europa-eu-bna-c_af646f5b6	2

It is worth noting that the category “http-data-europa-eu-bna-c_af646f5b6” does not correspond to any category of HVD. It should likely be “http-data-europa-eu-bna-c_af646f5b” corresponding to “Area management/restriction/regulation zones & reporting units”.

⁵ <https://data.europa.eu/data/datasets?query=msfd>

Table 29. Keywords - API query results in April 2025

Keyword - 30/04/2025	Occurrences
marine-reports-units	1
Marine-Strategy-Framework-Directive	1
mru	1
msfd	1

Table 30. Provenance - API query results in October 2025

Provenance - 22/10/ 2025	Nr of datasets
Spain	2
France	1
Netherlands	3
Total	6

Table 31. HVD category - API query results in October 2025

HVD category - 22/10/ 2025	Occurrences
Earth observation and environment	1
Sea regions	1
Water	1

The “Earth observation and environment” and “Sea regions” categories are associated with the same dataset. This means that 4 of the 6 datasets do not provide an HVD category.

Table 32. Keywords - API query results in October 2025

Keyword -22/10/2025	Occurrences
water	3
marine-reports-units	1
Marine-Strategy-Framework-Directive	1
mru	1
msfd	1

From a quick metadata investigation, it was found that one dataset is tagged with multiple keywords, namely “water”, “msfd” and “Marine-Strategy-Framework-Directive”. Therefore, two datasets do not provide keywords at all.

4.2.2 More in-depth analysis

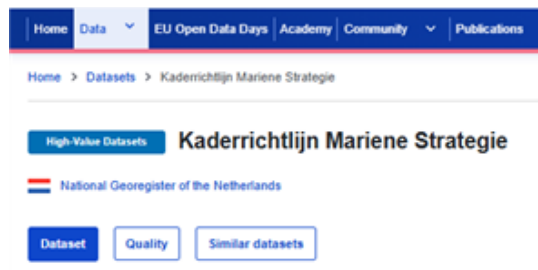
Due to the limited number of HVD datasets available, we haven’t conducted in-depth analyses, as they do not represent a statistically significant sample. We only searched for datasets at the same time available in the INSPIRE Geoportal and on the EDP.

More in-depth analysis - April 2025

Looking for the datasets in the INSPIRE Geoportal, only the one from the Netherlands is present.

EDP screenshot (Figure 17)

Figure 17. EDP initial search screenshot



INSPIRE Geoportal screenshot (Figure 18)

Figure 18. INSPIRE Geoportal initial search screenshot

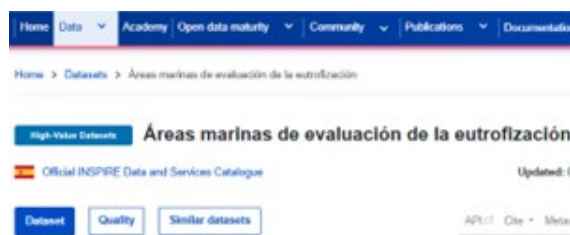


More in-depth analysis - October 2025

While the Netherlands dataset is no longer available in the INSPIRE Geoportal, one of the Spanish datasets is.

EDP screenshot (Figure 19)

Figure 19. EDP more in-depth search screenshot



INSPIRE Geoportal screenshot (Figure 20)

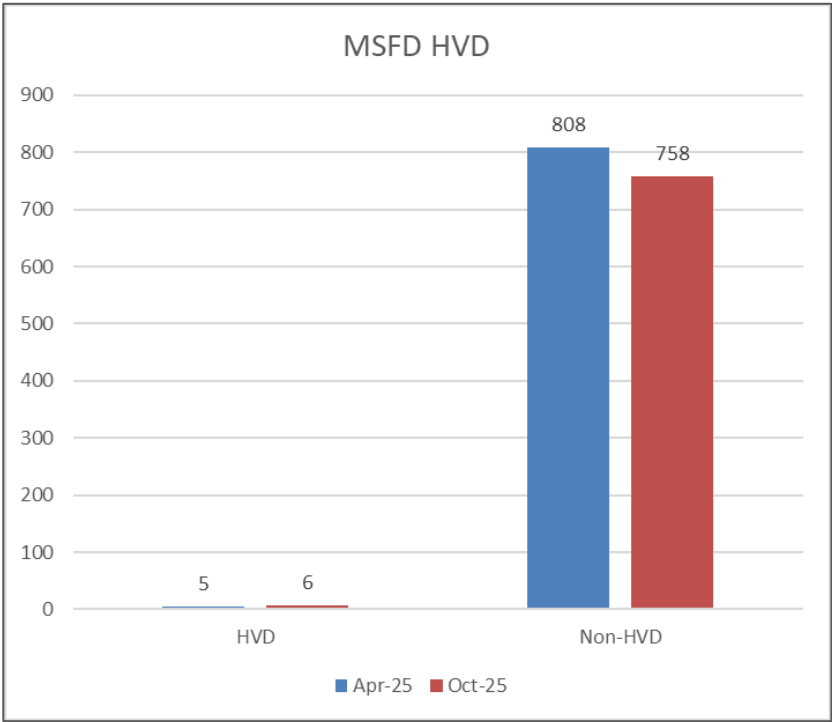
Figure 20. INSPIRE Geoportal more in-depth search screenshot



4.2.3 Conclusions

The research results highlight that, despite the large number of MSFD datasets available on the EDP, sharing this data as HVD has not yet begun in practice. The percentage of HVD data ranges from 0.006% to 0.008%. Figure 21 shows the comparison between MSFD HVD in April 2025 and October 2025

Figure 21. Proportion of MSFD datasets published as HVD on the EDP - April 2025 and October 2025



4.3 Water datasets

The investigation aimed to identify datasets published in the EDP related to water-domain reporting, with a particular focus on those relevant to the Water Framework Directive. To find HVD datasets related to the broader water domain, we first ran a comprehensive query⁶ for the term “water” on 21 October 2025 and then proceeded to analyse the API response. As expected, the search returned a large number of datasets - specifically, 1273 - which were distributed quite variably across the HVD categories. The Table 33 below only shows the most pertinent categories with the highest number of occurrences.

Table 33. water-related HVDs by HVD categories

HVD Category	Occurrences
Earth observation and environment	779
Natural risk zones	144
Area management / restriction / regulation zones & reporting units	63
Environmental monitoring facilities	45
Water	38
Hydrography	28

Limiting to datasets with more domain-specific HVD characterisation - i.e., “water” and “hydrography” - we also analysed related keywords in the English language to get a feel for the dataset content, with resulting main occurrences shown in Table 34 for “water” and in Table 35 for “hydrography” below. The Format frequency in hydrography HVD datasets is shown in Table 36.

⁶ https://data.europa.eu/data/datasets?locale=en&is_hvd=true&query=water

- Most used Keywords for HVD category=water

Table 34. Most used keywords in the ‘water’ HVD category

Keyword	Occurrences
Water Framework Directive (WFD)	14
Water Information System for Europe (WISE)	14
Water Framework Directive	10
Water information system for Europe	10
WFD	10
WISE	10
Surface Water Body	6
Area management/restriction/regulation zones and reporting units	5

- Keywords for datasets with HVD category=hydrography

Table 35. Most used keywords in the ‘hydrography’ HVD category

Keyword	Occurrences
inspire	16
Hydrography	3
flow	2
Water	2
water surface	2

Table 36. Most used Format in in the ‘hydrography’ HVD category

Format	Occurrences
Esri Shape	19
GML	17
GeoPackage	11
GeoJSON	7
JSON	6
ESRI REST	1
Zipped GML	1
XML	1

4.4 WFD datasets

The investigation described below aimed to identify high-value datasets that are specifically related to the Water Framework Directive.

4.4.1 Comprehensive search

The research results highlight that, despite the large number of MSFD datasets available on the EDP, sharing this data as HVD has not yet begun in practice. The percentage of HVD data ranges from 0.006% to 0.008%.

The search⁷ aims to retrieve high-value datasets that mention the term “WFD” OR “Water Framework Directive” in one or more of the metadata properties (title/keywords/data theme).

The API request was run on 22/10/2025.

The main characteristics of the datasets (provenance, HVD category, data theme category, keywords) derived by inspecting the API response are summarised in Table 37, Table 38, Table 39 and Table 40, below. Due to the large number and variety of keywords and formats used, the related tables and charts only show those in English-language that have occurred more frequently.

Provenance

Table 37. Country distribution of Water Framework Directive (WFD) HVDs

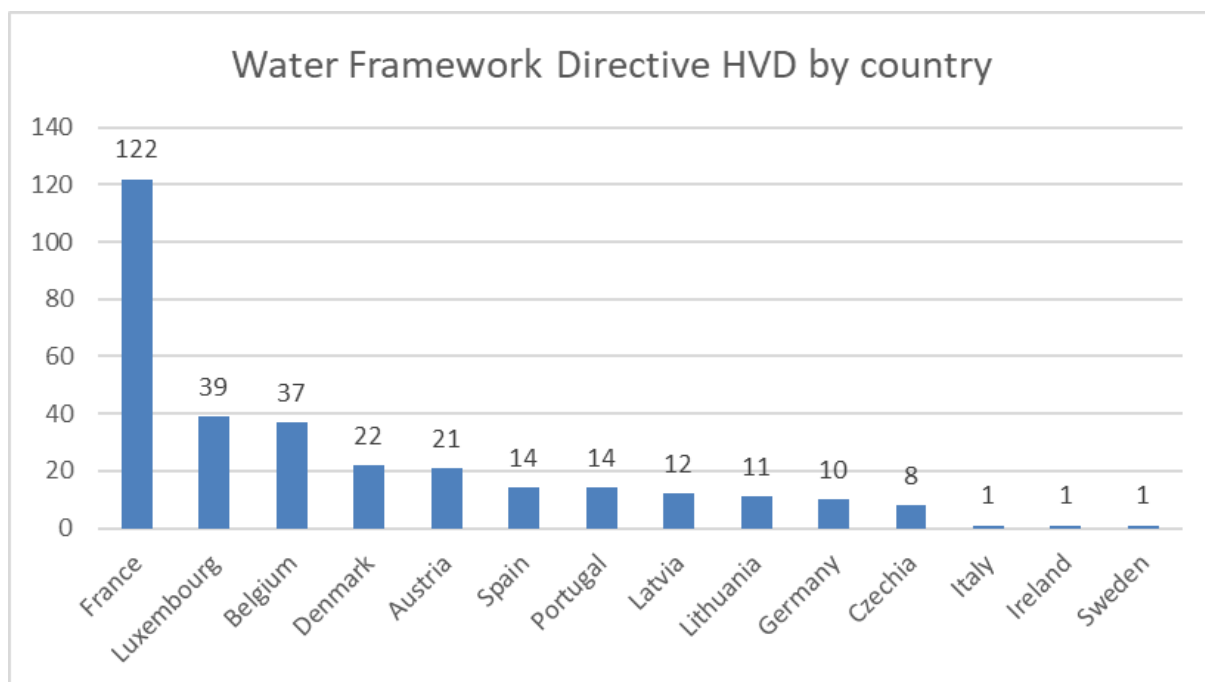
Country	Nr of datasets
France	122
Luxembourg	39
Belgium	37
Denmark	22
Austria	21
Spain	14
Portugal	14
Latvia	12
Lithuania	11
Germany	10
Czechia	8
Italy	1
Ireland	1
Sweden	1
Total	313

Figure 22 below shows the number of Water Framework Directive (WFD) datasets by country

7

https://data.europa.eu/data/datasets?locale=en&minScoring=0&selectedOption=datasets&query=WFD+OR+%22Water+Framework+Directive%22&is_hvd=true

Figure 22. WFD HVDs by country



HVD Category

Table 38. Distribution of WFD datasets by HVD category

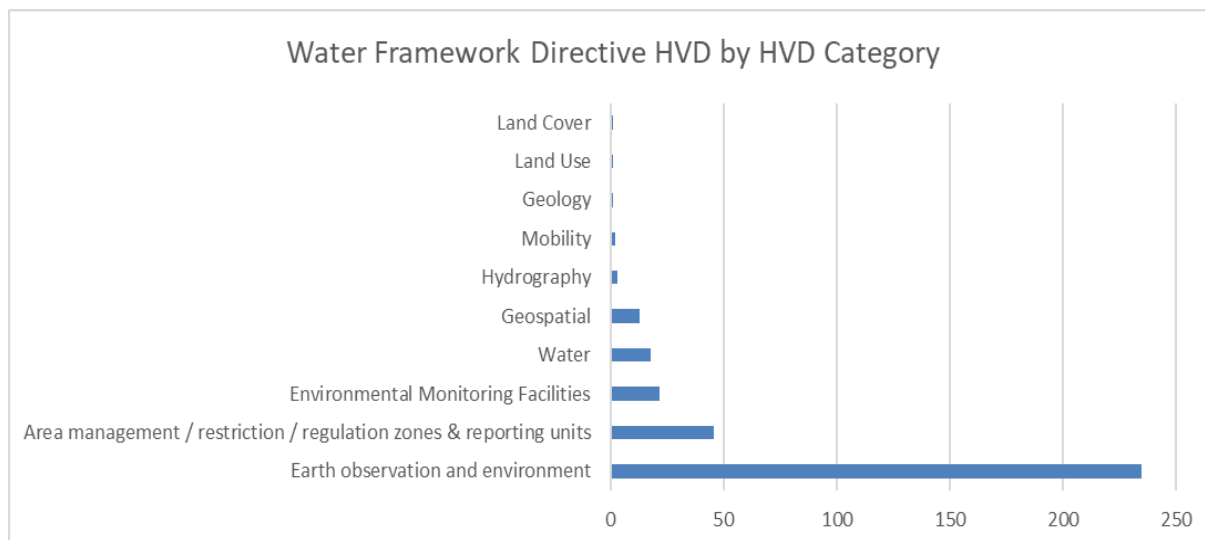
Category	Occurrences
Earth observation and environment	235
Area management / restriction / regulation zones & reporting units	46
Environmental Monitoring Facilities	22
Water	18
Geospatial	13
Hydrography	3
Mobility	2
Geology	1
Land Use	1
Land Cover	1
Total	342

Insights:

- The difference between the total number of datasets (313) and the total number of occurrences of the HVD category (342) indicates that all datasets most likely provided an HVD category and that some definitely provided more than one.
- The most frequent HVD category is “Earth Observation and Environment”,
- While a small percentage of datasets use the HVD category specific to the thematic domain - i.e., “water”- a relatively higher number of datasets use the HVD category corresponding to the INSPIRE theme - i.e., “Area management/ restriction/ regulation zones & reporting units”, “Environmental Monitoring Facilities”, “Hydrography”.

Figure 23 below shows the distribution of WFD datasets by HVD category

Figure 23. Distribution of WFD datasets by HVD category



Data theme category

Table 39. Data theme category distribution of WFD datasets

Category	Occurrences
Environment	120
Regions and cities	26
Science and technology	14
Government and public sector	6
Transport	5
Agriculture, fisheries, forestry and food	3
Economy and finance	1
Energy	1

Most used keywords

Table 40. Most used keywords in WFD HVDs

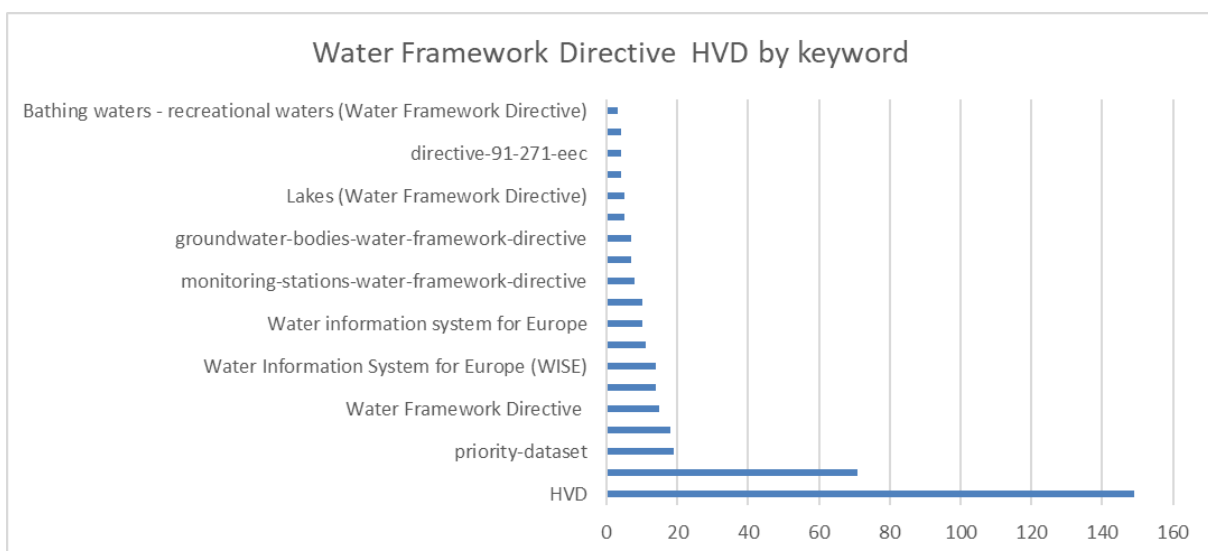
Keyword	Occurrences
HVD	149
INSPIRE	71
priority-dataset	19
Area management/restriction/regulation zones and reporting units	18
Water Framework Directive	15
Water Framework Directive (WFD)	14
Water Information System for Europe (WISE)	14
Hydrography	11
Water information system for Europe	10
Surface Water Body	10

Keyword	Occurrences
monitoring-stations-water-framework-directive	8
Groundwater bodies (Water Framework Directive)	7
groundwater-bodies-water-framework-directive	7
Monitoring stations (Water Framework Directive)	5
Lakes (Water Framework Directive)	5
Water bodies (Water Framework Directive)	4
directive-91-271-eec	4
River network (Water Framework Directive)	4
Bathing waters - recreational waters (Water Framework Directive)	3

We noticed that some countries have labelled the same dataset using variants of the same keyword, e.g., "Water Framework Directive" and "Water Framework Directive (WFD)", "Water Information System for Europe (WISE)" and "Water Information System for Europe".

Figure 24 below shows the most used keywords in WFD datasets

Figure 24. Most used keywords in WFD HVDs



Most used distribution formats

The format investigation has highlighted a noticeable inconsistency in naming, with multiple variants for the same format provided in Table 41 below:

Table 41. Formats and observed variants in WFD datasets

Format	Observed Variants
WMS	WMS, WMS_SRVC, ogc:wms
WFS	WFS, WFS_SRVC, ogc:wfs, ogc:wfs-1.0.0-http-get-capabilities
mid	www:download:mif / mid, www:download:mif/mid,
GML	GML, Geography Markup Language (GML), Zipped GML
Atom	Atom Feed, application/atom+xml
GeoPackage	GeoPackage, OGC GeoPackage Encoding Standard, GPKG

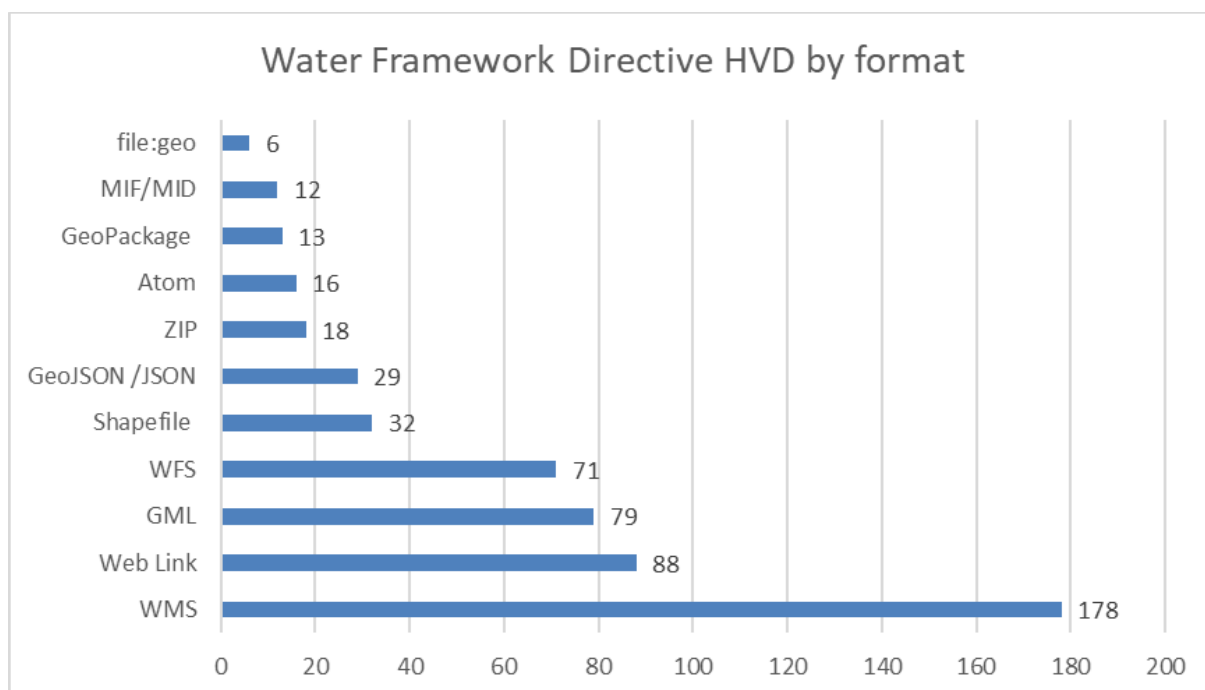
The Table 42 below shows the datasets formats, where naming variants have been aggregated as one value.

Table 42. Most used formats in WFD HVDs

Format	Occurrences
WMS	178
Web Link	88
WFS	71
GML	79
Shapefile	32
GeoJSON /JSON	29
Atom	16
GeoPackage	13
MIF/MID	12
file:geo	6
ZIP	18

The table indicates that web-accessible formats (WMS, Web link, and WFS) and the GML format are the most prevalent, consistent with the high percentage of datasets tagged with the "INSPIRE" keyword and/or the INSPIRE-theme-specific HVD category. Figure 25 below shows the most used keywords in WFD datasets

Figure 25. Dataset format distribution in WFD datasets



4.4.2 More in-depth analysis

The more in-depth analysis was aimed to identify WFD as INSPIRE Priority datasets.

WFD as INSPIRE Priority Datasets

Search by keyword

The 19 datasets with priority-dataset keyword already identified in the comprehensive search are from Luxembourg.

SPARQL-based search

A query was run that searched for URIs starting with “<http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/>” and containing the substring “dir-2000-60”.

This identifies all WFD priority datasets, either mentioning the general directive (<https://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/dir-2000-60>) or one of its dataflows, for example <https://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/ProtectedAreas-dir-2000-60>

Results are provided in Table 43 below:

Table 43. Country distribution of WFD priority datasets retrieved via SPARQL query

Country	Nr of datasets
Spain	42
Luxembourg	19
Netherlands	2
Denmark	4
Total	67

As expected, given the use of the INSPIRE Priority dataset codelist, most of these datasets are also available in the INSPIRE Geoportal.

4.4.3 Conclusions

The analysis indicates that most datasets provide at least one HVD category, with some datasets assigned multiple categories, as reflected by the total of 342 category occurrences across 313 datasets.

Specifically, the top-level category “Earth Observation and Environment” is the most commonly assigned HVD category. More domain-specific categories, such as “Water”, are used less frequently, while INSPIRE-related categories, such as “Area management/restriction/regulation zones & reporting units,” “Environmental Monitoring Facilities,” and “Hydrography”, appear more frequently.

Numerous inconsistencies were observed in naming, with datasets labelled using variant keywords (e.g., “Water Framework Directive” vs. “Water Framework Directive (WFD)”) and format labels (e.g., “GML” vs “Geography Markup Language (GML)”).

Web-accessible formats (WMS, Web link, WFS) and GML format are the most prevalent distribution formats, very likely indicating the presence of a INSPIRE Spatial Data Infrastructure serving the datasets, aligning with the high proportion of datasets tagged with the “INSPIRE” keyword or INSPIRE-theme-specific HVD categories.

Analysis of the datasets identified as INSPIRE Priority Datasets in the EDP confirmed that most are also accessible via the INSPIRE Geoportal.

5 Conclusions

This report provides an overview of European initiatives supporting the once-only publication of High-Value Datasets (HVDs), together with a preliminary analysis of environmental reporting HVDs submitted by Member States following the first reporting deadline in the scope of the HVD Implementing Regulation in February 2025.

The assessment focuses on the noise (END), marine (MSFD), and water (WFD) domains. Beyond presenting quantitative results, the report highlights best practices and the main factors currently hindering the effective sharing and discoverability of reporting-related HVDs.

Repeated searches in April and October showed that the European Data Portal's frequent (mostly daily) harvesting of national catalogues can cause short-term fluctuations in dataset counts, making it advisable to re-execute identical searches on different dates.

Furthermore, because a single dataset may be associated with multiple keywords, HVD categories and data themes, the resulting figures provide only indicative rather than absolute insights, even when additional analysis is carried out to reduce overlap.

Most importantly, the investigation shows that, while meaningful insights into the availability of END, MSFD, and WFD datasets can be obtained, their discoverability is limited by inconsistent metadata practices. In the absence of standardised rules for clearly characterising the metadata of environmental reporting HVDs, individual data providers or countries follow their own approaches, meaning that no single, unambiguous query can reliably retrieve a complete set of relevant datasets. Searches based on keywords, classification codes, legislative references, or any combination of these, therefore, do not necessarily capture all relevant results.

To compile the most complete list possible, a stepwise search strategy is therefore required, starting from broad, high-level queries and progressively refining the results using directive-specific criteria.

To address these limitations and support more accurate, efficient, and reproducible identification of environmental reporting datasets, the adoption of harmonised metadata guidance, supporting coherent use of standardised vocabularies and directive-specific keywords, is essential. Coupled with clearer training and support for data providers, these measures would greatly strengthen the accessibility and reusability of environmental reporting HVDs.

To improve the discoverability of datasets, several measures can be adopted to ensure the consistent use of controlled vocabularies, codelists, and directive-related keywords.

Based on our search experience and drawing on good practices supporting the once-only publication of HVD, identified both in some Member States and through INSPIRE MIWP initiatives, we recommend the following straightforward yet high-impact measures:

Controlled Vocabularies and codelists

- Reuse the INSPIRE Priority Dataset metadata codelist, already applied to identify environmental reporting datasets in the INSPIRE Geoportal, and extend it if needed.
- Following the INSPIRE Good Practice on Geospatial HVD tagging, provide values from this codelist via the <dc:theme> metadata property to enable targeted SPARQL queries.
- Additionally, use the <dc:theme> metadata property to provide information via controlled vocabulary terms that can support discoverability.

Directive-Specific Keywords

- Require datasets to include explicit, commonly agreed keywords in a standardised formulation—e.g., indicating the directive or dataflow they support—ensuring that searches using these keywords reliably return relevant results.

Applicable Legislation Reference

- Since multiple <applicableLegislation> property instances can be included in a single metadata record, in addition to the instance referencing the HVD Implementing Regulation, provide additional <applicableLegislation> instance that reference the environmental directive relevant to the dataset.

Lastly, it is worth noting some observations regarding the current performance of the EDP. The search service experienced occasional downtime in April and more frequent disruptions in October, with some outages lasting several hours, as well as periods of very slow response. Additionally, certain searches—such as queries targeting specific terms—returned results that did not fully match the search criteria (see Section 4.1.4).

Although these findings are based on a limited number of queries on specific days and may not reflect overall system performance, they highlight potential opportunities to enhance the EDP search engine’s resources, as well as to strengthen indexing, filtering, and quality control processes, thereby improving the accuracy and reliability of search results. Furthermore, they reinforce the previously expressed need to adopt measures that improve dataset discoverability. Such improvements will become increasingly important as the number of datasets available through the EDP continues to grow.

List of abbreviations

Table 44. List of abbreviations and references

Abbreviation	Name
EEA	European Environment Agency
SPD	Single Programming Document
ETC DI	European Topic Centre on Data Integration and Digitalisation
UBA	Umweltbundesamt GmbH
EAA	Environmental Agency Austria
NILU	Stiftelsen Norsk Institutt for Luftforskning
WRWENR	Stichting Wageningen Research – Wageningen Environmental Research
EU	European Union
INSPIRE	Infrastructure for Spatial Information in Europe
HDV	High-Value Dataset
API	Application Programming Interface
SEMIC	Semantic Interoperability Community
DCAT	Data Catalogue
DCAT-AP	Data Catalog Vocabulary Application Profile
HVD IR	High-Value Dataset Implementing Regulation
EDP	European Data Portal
MIWP	Maintenance and Implementation Work Programme
ISO	International Organization for Standardization
JRC	Joint Research Centre
XLST	Extensible Stylesheet Language Transformations
MIG	Maintenance and Implementation Group
CRS	Coordinate Reference Systems
OGC	Open Geospatial Consortium
WFS	Web Feature Service
MQA	Metadata Quality Assessment
FAIR	Findability, Accessibility, Interoperability, and Reuse
SPARQL	SPARQL Protocol and RDF Query Language
AI	Artificial Intelligence
JSON	JavaScript Object Notation
MSFD	Marine Strategy Framework Directive
WFD	Water Framework Directive
END	Environmental Noise Directive
RDF	Resource Description Framework
LDEN	Day–evening–night noise level
LNight	Night-time noise indicator
WMS	Warehouse management system
GML	Geography Markup Language
ZIP	Compressed File
SRVC	Service
GPKG	GeoPackage
CSV	Comma-Separated Values
SHP	Shapefile
PDF	Portable Document Format
TIFF	Tagged Image File Format
ENVI	Environment

ATOM	Atom Syndication Format
AM	INSPIRE Annex theme: Area Management / Restriction / Regulation Zones and Reporting Units
TN	INSPIRE Annex theme: Transport Networks
CC	Creative Commons
WISE	Water Information System for Europe
MIWP	Maintenance and Implementation Work Programme

Annex 1

Table 45. Spatial data themes list linked to HVD regulation categories

INSPIRE Directive		HVD Regulation	
Annex	Spatial data theme	HVD category	HVD
I	Coordinate reference systems	No direct reference in HVD	Coordinate reference systems and geographical grids are basic location frameworks - part of spatial data.
I	Geographical grid systems	No direct reference in HVD	Coordinate reference systems and geographical grids are basic location frameworks - part of spatial data.
I	Geographical names	1. Geospatial	Geographical names
I	Administrative units	1. Geospatial	Administrative units
I	Addresses	1. Geospatial	Addresses
I	Cadastral parcels	1. Geospatial	Cadastral parcels
I	Transport networks	6. Mobility	Transport networks
I	Hydrography	2. Earth observation and environment	Hydrography
I	Protected sites	2. Earth observation and environment	Protected sites
II	Elevation	2. Earth observation and environment	Elevation
II	Land cover	2. Earth observation and environment	Land cover
II	Orthoimagery	2. Earth observation and environment	Orthoimagery
II	Geology	2. Earth observation and environment	Geology
III	Statistical units	No direct reference in HVD	HVD category (4) Statistics likely include statistical classifications and units, such as NUTS
III	Buildings	1. Geospatial	Buildings
III	Soil	2. Earth observation and environment	Soil
III	Land use	2. Earth observation and environment	Land use
III	Human health and safety	No direct reference in HVD	Might be included in the environmental domains in the HVD category (2) Earth observation and environment.
III	Utility and governmental services	No direct reference in HVD	Might be included in the environmental domains in the HVD category (2) Earth observation and environment.

III	Environmental monitoring facilities	2. Earth observation and environment	Environmental monitoring facilities
III	Production and industrial facilities	2. Earth observation and environment	Production and industrial facilities
III	Agricultural and aquaculture facilities	No direct reference in HVD	Might be included in the environmental domains in the HVD category (2) Earth observation and environment.
III	Population distribution — demography	No direct reference in HVD	HVD category (4) Statistics includes population data
III	Area management/restriction/regulation zones and reporting units	2. Earth observation and environment	Area management/restriction/regulation zones and reporting units
III	Natural risk zones	2. Earth observation and environment	Natural risk zones
III	Atmospheric conditions	No direct reference in HVD	Datasets are described in the HVD category (3) Meteorological
III	Meteorological geographical features	No direct reference in HVD	Datasets are described in the HVD category (3) Meteorological
III	Oceanographic geographical features	2. Earth observation and environment	Oceanographic geographical features
III	Sea regions	2. Earth observation and environment	Sea regions
III	Bio-geographical regions	2. Earth observation and environment	Bio-geographical regions
III	Habitats and biotopes	2. Earth observation and environment	Habitats and biotopes
III	Species distribution	2. Earth observation and environment	Species distribution
III	Energy resources	2. Earth observation and environment	Energy resources
III	Mineral resources	2. Earth observation and environment	Mineral resources
		1. Geospatial	Reference parcels
		1. Geospatial	Agriculture parcels
		2. Earth observation and environment	Environmental domain and related legislation: Air
		2. Earth observation and environment	Environmental domain and related legislation: Climate

		2. Earth observation and environment	Environmental domain and related legislation: Emissions
		2. Earth observation and environment	Environmental domain and related legislation: Nature preservation and biodiversity
		2. Earth observation and environment	Environmental domain and related legislation: Noise
		2. Earth observation and environment	Environmental domain and related legislation: Waste
		2. Earth observation and environment	Environmental domain and related legislation: Water (including Marine Strategy Framework Directive)
		3. Meteorological	Observations data measured by weather stations
		3. Meteorological	Climate data: validated observations
		3. Meteorological	Weather alerts
		3. Meteorological	Radar data
		3. Meteorological	NWP model data
		4. Statistics	Several statistical datasets are defined
		5. Companies and company ownership	Basic company information and company documents and accounts
		6. Mobility	Inland waterways datasets: static, dynamic and inland electronic and navigational charts

European Topic Centre on
Data integration and digitalisation
<https://www.eionet.europa.eu/etcs/etc-di>

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