D6.1 Catalogue with a clear access point to data

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* **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other
** **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified

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Executive Summary

This document provides a comprehensive catalogue of the primary access points for data generated and used within the ASPECT project, ensuring that users receive clear, consistent guidance on where datasets are archived and how to access them. The catalogue brings together information on model outputs, including seasonal forecasts, decadal predictions, and 30-year initialised outlooks, as well as derived data products such as forecast skill metrics, extreme-event catalogues, downscaled datasets, user-defined indicators, impact model outputs, and social science data.

ASPECT data is hosted across several established archiving platforms, such as the Earth System Grid Federation (ESGF) and the ECMWF Meteorological Archival and Retrieval System (MARS). These repositories provide long-term, secure, and standardised archives, along with various access options including web interfaces, metadata catalogues, standard APIs, and programmatic retrieval tools. Additional datasets created within ASPECT are accessible to partners and users via an FTP-based project data portal maintained by WP6.

By bringing all relevant access information together in one location, this catalogue helps researchers, operational staff, and stakeholders to efficiently find, understand, and use ASPECT data. Its goal is to enhance transparency, encourage reuse, and support the integration of ASPECT outputs into broader climate research and decision-making activities.

About ASPECT

ASPECT aims to establish and demonstrate a **seamless climate information system** providing predictions with a time horizon of up to 30 years. This project is supported by cutting-edge research and by the practical application of climate information to various socio-economic sectors.

The project's goal is to enhance existing prediction systems and integrate their outputs across different timescales, combining them with climate projections to create a unified, seamless source of climate information. This integrated framework will serve as a standard for sectoral decision-making and climate adaptation. While the primary focus is on European climate information, ASPECT also extends its scope globally wherever there is substantial policy relevance, such as in disaster preparedness.

Coordinated by the **Barcelona Supercomputing Center (BSC)**, ASPECT brings together a consortium of eight partners and three UK-associated partners, combining world-leading expertise across the physical and social sciences as well as IT. The partnership covers areas such as climate prediction and projection, impact assessment and applications, user engagement and co-development, communication, climate-service design and delivery, and data management.

The consortium includes **BSC**, **CMCC**, **ECMWF**, **MPI**, **RHMZ**, **SMHI**, **UKMO**, the **University of Leeds**, the **University of Oxford**, the **University of Zagreb**, and **Raventós Codorníu**.

1 Introduction

1.1 Purpose and Scope

This document introduces the ASPECT Data Catalogue, providing a central, transparent access point to datasets produced within the ASPECT project. The catalogue aims to support data discovery, increase transparency, and encourage consistent use of ASPECT outputs across the project and the broader climate services community.

The scope of the document includes all datasets available via the catalogue and is intended for a diverse audience: scientific users analysing seasonal-to-decadal prediction data; downstream services integrating ASPECT products; and ASPECT WPs' internal partners.

The catalogue offers an overview of the core ASPECT datasets, including seasonal and decadal predictions, research prototype outputs, and ASPECT case-study products. This document also details the available variables, formats, metadata standards, and access methods, as this information is provided through the archiving infrastructure to help users understand what is accessible and how to utilise it.

Providing a single entry point to these diverse datasets is essential for promoting reproducible research and ensuring consistency of ASPECT data in future. The catalogue improves interoperability among work packages, enhances usability for external users, and supports the broader objective of delivering reliable, seamless climate information for adaptation and sectoral decision-making.

Lastly, the catalogue aims to ensure that all data are findable, accessible, and interoperable across WPs and ASPECT users. In this context, WP6 supports other WPs by defining and implementing mechanisms to make these datasets available for analysis, evaluation, and training activities.

1.2 Acronyms and Abbreviations

Acronyms and abbreviations used in this document are defined in the following tables.

Institutions and organisations

Acronym	Definition
ASPECT	Adaptation-oriented Seamless Predictions of European ClimaTe
BSC	Barcelona Supercomputing Center
CMCC	Euro-Mediterranean Center on Climate Change
C3S	Copernicus Climate Change Service
ECMWF	European Centre for Medium-Range Weather Forecasts
MPI	Max-Planck Institute for Meteorology
RHMZ	Republic Hydrometeorological Service of Serbia

SMHI	Swedish Meteorological and Hydrological Institute
UKMO	UK Met Office
WMO	World Meteorological Organisation

Acronym	Definition
CDS	(Copernicus) Climate Data Store
CF conventions	Climate and Forecast Conventions
CMIP	Coupled Model Intercomparison Project
CMOR	Climate Model Output Rewriter
CORDEX	Coordinated Regional Climate Downscaling Experiment
ESGF	Earth System Grid Federation
GRIB	GRIdded Binary or General Regularly-distributed Information in Binary form
MARS	(ECMWF) Meteorological Archive and Retrieval System
NetCDF	Network Common Data Form
S2D	Seasonal to Decadal
WP	Work Package

2 Data Management and Support

ASPECT provides data generated from various numerical simulations, covering multiple model outputs and prediction systems. In addition to these model datasets, the project also gathers relevant non-meteorological information, including user-provided inputs collected through WP5 activities, to support sector-specific applications and case studies.

A detailed overview of all data products created within ASPECT is provided in Section 3. Besides newly generated climate simulations, the catalogue includes a selection of existing datasets, such as CMIP5 and CMIP6 model outputs, reanalysis datasets like ERA5, and observational records, which complement ASPECT data and are extensively used in ASPECT case studies and research.

In addition, ASPECT includes a heterogeneous variety of datasets and data types and a large data volume, making it highly challenging; therefore, it requires careful planning and management during development and implementation. For this reason, a Data Management Plan should be implemented to describe the strategies and define how data is handled throughout the project lifecycle.

2.1 Repositories

ASPECT data is archived in well-known and robust public repositories. ECMWF model and seasonal outputs are archived in the ECMWF MARS system, ensuring long-term preservation and integration with existing operational workflows. Data from other modelling centres (BSC, CMCC, MPI and UKMO) and timescales (multi-decadal, decadal and extended decadal) are stored within their respective ESGF data nodes, in accordance with CMIP standards for climate data sharing. Additionally, datasets produced by MPI are archived at the Deutsches Klimarechenzentrum (DKRZ), which offers high-performance climate data storage facilities. Further details on accessing these repositories are available in the ASPECT documentation (link).

All repositories used within ASPECT are trusted and operational infrastructures explicitly designed for the storage and distribution of weather and climate data. By relying on these robust, well-established systems, ASPECT ensures that all datasets are openly accessible, properly versioned, and compliant with relevant climate data protocols and metadata standards.

2.2 Quality Control

Before the model output is archived, it undergoes thorough quality control to verify the consistency of its metadata, encoding, and formatting. This ensures that all files meet the target archive's required standards, guaranteeing interoperability, reusability, and long-term accessibility. The quality control workflow is supported by dedicated software tools tailored to each archiving system and data protocol. Further details on the quality control procedures are provided in the relevant section of the Data Management Plan.

2.3 Documentation

As outlined above, many of the datasets produced within ASPECT are self-documented using standardised metadata conventions, allowing their use far beyond the project's immediate scope.

However, to support users in accessing, understanding, and correctly interpreting ASPECT data, and to offer further guidance for datasets that do not follow widely accepted encoding standards or are archived locally within the ASPECT FTP Portal, WP6 provides comprehensive documentation. ASPECT documentation is part of the ASPECT milestones, and it's available on the ASPECT Webpage. The documentation is also publicly available on the ASPECT FTP Portal.

This documentation includes detailed lists of available datasets, models, and experiments; clear definitions of variables, temporal frequencies, and file structures; and practical guidance on where the data are archived and how they can be accessed or downloaded.

2.4 User Support

Any user request should be submitted via the ASPECT website through the "Contact" section. Depending on the nature of the request, it is then forwarded by the coordination team to the appropriate partners.WP6 is the primary contact for all data-related queries, including questions about data access, availability, formatting, metadata, and technical integration into

users' workflows. WP6 supports users in navigating datasets, understanding their structure, and resolving technical issues that may occur during download or use.

However, any questions or concerns about the scientific content of the data, such as interpreting variables, methodological choices, quality issues, or potential errors in the simulations, should be directed to the data producers, as they have the scientific expertise and knowledge.

3 Catalogue Structure and Navigation

The seasonal forecasts, decadal predictions and 30-year initialised outlooks together generate approximately 2 PB of model output. In addition to these core simulations, the modelling centres and ASPECT work packages produce a set of derived data products. These include metrics for evaluating forecast skill for means, extremes and user-relevant variables; temporally merged datasets that combine information from forecasts, predictions and projections; catalogues of extreme events; statistically downscaled datasets; and specialised indicators co-developed with super users.

3.1 Seasonal predictions

All ASPECT seasonal forecast data are accessed via the CDS and are currently stored in the ECMWF MARS archive, in GRIB format.

The data can be accessed through the following CDS entries:

- [Seasonal forecast daily and subdaily data on single levels](#)
- [Seasonal forecast subdaily data on pressure levels](#)
- [Seasonal forecast monthly statistics on single levels](#)
- [Seasonal forecast monthly statistics on pressure levels](#)

Each dataset is accompanied by an overview, a dedicated download interface, information on quality control procedures, and comprehensive documentation to support users.

Also, please note that within the MARS environment, the various forecasting systems from each producing centre are distinguished using the MARS-specific keyword 'system', stored as an integer within the GRIB header. Correct use of this keyword is essential to ensure that real-time forecasts are correctly paired with their corresponding hindcasts, which is a fundamental requirement for the accurate use and interpretation of C3S seasonal forecast data.

Systems producing their hindcasts as a fixed dataset
For these forecasting systems, a unique value for the keyword "system" is assigned to closely match the version numbering used by the forecasting centres. Specifically:

Forecasting centre	System name	'System' value
CMCC	CMCC-CM3	4
ECMWF	SEAS5	51

Systems producing their hindcasts on the fly

Systems that follow this approach generate a new set of hindcasts close to the real-time forecast they relate to.

The following table lists the values of the 'system' keyword used in the CDS for on-the-fly hindcasts systems:

Forecasting centre	System name	'System' value
UKMO	GloSea6	600/601/602/603

Comprehensive and detailed documentation on seasonal forecasts available in the CDS can be found in the official C3S seasonal forecast documentation.

3.2 Multi-annual predictions

Multi-decadal (extended seasonal) productions have been archived in a different archiving repository based on the model output format.

ECMWF data
Multi-decadal ECMWF data are stored in the MARS archive, where each dataset is identified using a set of specific MARS keywords.

The data can be accessed through the following MARS catalogue using the proper MARS keywords:

- Multi-annual predictions data (MARS)

These keywords are required to locate and retrieve the data correctly. The table below summarises the key values relevant to the ECMWF contribution:

Forecasting centre	System name	'expver' value	'class' value	'stream' value	'type' value	'levtype' value
ECMWF	SEAS6-prototype	ivdg	rd	mmsf (Multi-model seasonal forecast) msmm (Multi-model seasonal forecast atmospheric monthly means)	fc (forecast)	pl (pressure) sfc (surface)

These keywords ensure that users retrieve the correct multi-decadal forecast data associated with the SEAS6-prototype system. In particular, the *expver* and *class* fields uniquely distinguish this dataset within MARS and differentiate it from other ECMWF forecast systems and data streams.

All available variables with their frequency are listed in the 'parameters' table, while data availability can be checked using a dedicated MARS tool available on the MARS catalogue web page.

Access to the data is open and available on demand; however, users are required to complete a simple registration process and submit a request to the project in order to obtain access.

<u>BSC, CMCC and UMKO data</u>
Multi-decadal data from BSC and CMCC are stored in ESGF.

The data can be accessed through the following ESGF search web interface using the proper keywords:

- [Multi-annual predictions data (ESGF)](#)

The relevant keywords that should be used are shown in the following table

Forecasting centre	System name	'Activity ID' value	'sourceID' value	'experimentID' value	'sub-experiment' value
BSC	EC-Earth3	DCPP	EC-Earth3	dcppA-hindcast	SYYYYMMDD 1980-2023
CMCC	CMCC-CM2	DCPP	CMCC-CM2-SR5	dcppA-hindcast	SYYYYMMDD 1980-2019
UKMO	DePreSys5 prototype	TBC	TBC	TBC	TBC

SYYYYMMDD stands for the start date of the forecast, where YYYY=year, MM=month and DD=day, where all available start dates are listed in the pop-up selection menu.

All available variables with their frequency are listed in the 'Classifications' facets. In ESGF terminology, a facet is the way to index the data, so each facet corresponds to a metadata attribute embedded in the dataset (mainly NetCDF global attributes and directory structure).

<u>MPI Data</u>
Multi-decadal data from MPI are stored at the World Data Center for Climate (WDCC), hosted and maintained by the German Climate Computing Center (DKRZ).

The data can be accessed through the dedicated entry for multi-annual prediction datasets at DKRZ, in the following link:

- [Multi-annual predictions data (DKRZ)](#)

Access to the data is free, but users must complete a simple registration process before downloading it.

Please also note that the output format is close to, but not fully compliant with, the CMOR standard, while the available variables are listed on the enter page together with the relevant documentation.

3.3 Decadal and extended predictions

BSC and CMCC data
Similar to the multi-annual predictions, decadal and extended decadal data from BSC and CMCC are also stored in ESGF.

The data can be accessed through the following ESGF search web interface using the proper keywords:

- [Decadal predictions data (ESGF)](#)

The relevant keywords that should be used are shown in the following table

Forecasting centre	System name	'Activity ID' value	'sourceID' value	'experimentID' value	'sub-experiment' value
BSC	EC-Earth3	DCPP	EC-Earth3	dcppA-hindcast	SYYYY
CMCC	CMCC-CM2	DCPP	CMCC-CM2-SR5	dcppA-hindcast	SYYYY
UKMO	TBC	TBC	TBC	TBC	TBC

SYYYY stands for the start date of the forecast, where YYYY=year, where all available start dates are listed in the pop-up selection menu.

All available variables with their frequency are listed in the 'Classifications' facets.

MPI Data
Decadal and extended decadal data from MPI are also stored at the World Data Center for Climate (WDCC).

The data can be accessed through the dedicated entry for decadal prediction datasets at DKRZ, in the following link:

- [Decadal - extended decadal predictions data (DKRZ)](#)

From the entry for "MPI-ESM-LR 1.2.01 decadal prediction localEnKF monthly" (ensemble members 1-16) and "MPI-ESM-LR 1.2.01 decadal prediction localEnKF LE monthly" (ensemble members 17-80), a user can download tar files for monthly atmospheric, oceanic and ocean-biogeochemistry monthly-means products.

Also available are daily atmospheric, oceanic, and ocean-biogeochemistry data, as well as 3-hourly atmospheric data.

Access to the data is free, but users must complete a simple registration process before downloading it.

Please also note that the output format is close to, but not exactly matching, the CMOR standard, while the available variables are listed on the enter page.

3.5 30-year outlooks

ECMWF Data
30-year ECMWF data is stored in MARS.

The data can be accessed through the following MARS catalogue using the proper MARS keywords:

- [30-year outlook predictions data (MARS)](#)

The relevant keywords that should be used are shown in the following table.

Forecasting centre	System name	'expver' value	'class' value	'stream' value	'type' value	'levtype' value
ECMWF	SEAS6-prototype	**TBC** (The experiment is expected to be completed by Q1/2026)	rd	mmsf (Multi-model seasonal forecast) msmm (Multi-model seasonal forecast atmospheric monthly means)	fc (forecast)	pl (pressure) sfc (surface)

Note: Please note that at the time of producing this document, the 30-year outlook run was still in progress, and some information was therefore not yet available. Once the run is complete, the ASPECT documentation will be updated to incorporate the complete set of details and better support user needs.

BSC Data
30-year outlook data from BSC are stored in ESGF.

So, the data can be accessed through the following ESGF search web interface using the proper keywords:

- [30-year outlook predictions data (ESGF)](#)

The relevant keywords that should be used are shown in the following table

Forecasting centre	System name	'sourceID' value	'experimentID' value	'sub-experiment' value
BSC	EC-Earth4	EC-Earth4 (TBC) (The experiment is expected to be completed in the first half of 2026.)	dcppA-hindcast	SYYYY

SYYYYMMDD stands for the start date of the forecast, where YYYY=year.

Note: As with ECMWF data, at the time this document was produced, the EC-Earth4 development was still in progress. Once the model is read and the run is completed, the ASPECT documentation will be updated accordingly to incorporate the complete set of details.

3.6 Other research outputs

Alongside the core simulations, the modelling centres and model-focused work packages (WP1-WP2-WP3) generate derived data products. These data include metrics for evaluating forecast skill for means, extremes, and user-relevant variables; temporally merged datasets combining information from forecasts, predictions, and projections; catalogues of extreme events; statistically downscaled datasets; and specialised indicators co-developed with super users.

To support the distribution of these diverse datasets, WP6 has established and maintains an FTP-based data portal within ASPECT. This service provides a central location where project partners and registered users can access additional ASPECT data that are not available through public repositories such as the CDS or ESGF.

The FTP portal is used to share products for other ASPECT deliverables where data delivery is mandatory.

The URL of the FTP portal is: https://aux.ecmwf.int/ecpds/home/aspect/

Statistical downscaled data
For the moment, only data from Deliverable 3.2 (WP3) has been stored (output fields from statistical downscaling for user variables in full time series, for regions in Europe agreed with users in WP4 and WP5). That data has been created for the needs of ASPECT case studies and compressed into zip files for each case study, and each downscaling method applied. The internal data format is NetCDF, but not CMORised. It is important to note that within the compressed file, detailed documentation is available describing data input, observations, scope and methodology, improvements achieved, etc.

Temporal Merging
The methodology developed and tested for temporal data merging is described in the D3.1 deliverable (internal ASPECT document). Several YAML files are used to provide unambiguous identifiers of the specific simulations chosen at each start date.

Such an identifier can typically be constructed from a combination of the model name and the identifiers of specific ensemble members (e.g. r1i1f1p1, r2i1f1p1, etc.) as used within the Coupled Model Intercomparison Project Phase 6 (CMIP6).

As part of D3.1 deliverable, the data associated with two recent publications: Cos et al. (2024) and Donat et al. (2024). These data are available at the following Zenodo repository links:
- Cos et al. (2024): https://doi.org/10.5281/zenodo.14393191
- Donat et al. (2024): https://doi.org/10.5281/zenodo.14393338

Finally, graphical results of the temporal merging techniques can be found in the seasonal to decadal Shiny Application available at the link:
https://earth.bsc.es/shiny/cdelgado_ASPECT-S2D-merging/ (the application is not open publicly, and access can be granted upon demand).

Graphical Catalogue

A dedicated application was developed in the scope of the ASPECT milestone 22 (Catalogue of decadal prediction graphical results) for users to access forecast and prediction skills:

- The online catalogue of decadal prediction graphical products, which is available at the link: https://earth.bsc.es/shiny/cdelgado_ASPECT-WP6-M22/

Finally, detailed graphical products for the case studies are also available:
- Agriculture case study: https://earth.bsc.es/shiny/cdelgado_ASPECT-wine-casestudy/ (the application is not open publicly, but access can be granted upon demand).
- Humanitarian case study: https://earth.bsc.es/shiny/cdelgado_ASPECT-humanitarian-casestudy/ (the application is not open publicly, but access can be granted upon demand.)

Those applications were developed with the R Shiny framework, and additional information can be found in the deliverable D6.2.

3.7 Non-scientific data

WP5 is analysing how climate information and knowledge can support organisations in preparing for the physical risks associated with a changing climate. This work is based on a quantitative survey conducted across at least four regions that capture Europe's geographical diversity, with a target of 500 responses per region.

All anonymised survey data will be deposited in a public repository appropriate for social science and climate-related research. For ASPECT, Zenodo has been selected for this purpose. Zenodo is an open-access repository developed and hosted by CERN, offering long-term, free storage for research outputs including datasets, software, publications, posters, and presentations. Each upload receives a persistent and citable DOI (Digital Object Identifier), which supports reproducibility and reliable dataset referencing.

The DOI corresponding to the ASPECT WP5 dataset will be published on the ASPECT website once the related paper has been accepted.

3.8 Existing Data used by the ASPECT project

Below, a list of existing data used by the ASPECT project, sourced only from CDS or ESGF, is provided.

CDS Data
The data can be accessed through the following ESGF search web interface using the proper keywords:

- CMIP6 Projections data (CDS)
- ERA5 hourly climate and weather data from 1940 to present
- ERA5 monthly averaged data on pressure levels from 1940 to the present

ESGF Data
The data can be accessed through the following ESGF search web interface using the proper keywords:

- [CMIP6 projection data (ESGF)](#)

The relevant keywords that should be used are shown in the following table

Forecasting centre	System name	'sourceID' value	'experimentID' value
BSC	EC-Earth3	EC-Earth3	historical
MPI	MPI-ESM-LR	MPI-ESM1-2-LR	historical

Similarly, data from the following scenarios: ssp119, ssp126, ssp245, ssp370 and ssp585 can be found.

The relevant keywords that should be used are shown in the following table

Forecasting centre	System name	'sourceID' value	'experimentID' value
BSC	EC-Earth3	EC-Earth3	ssp119, etc
MPI	MPI-ESM-LR	MPI-ESM1-2-LR	ssp119, etc

The scenario data are for the period 2015-2100.

4 ASPECT Data Hub

It is important to emphasise the collaborative effort across ASPECT work packages to ensure that the ASPECT Catalogue remains user-friendly instead of a static, difficult-to-navigate document. To facilitate this, a dedicated web platform, the ASPECT Data Hub, consisting of https://www.aspect-project.eu/dataset/, https://www.aspect-project.eu/case-studies/, and https://www.aspect-project.eu/applications/ has been developed. The ASPECT Data Hub provides a comprehensive catalogue of all datasets produced within the project and serves as the main entry point for accessing ASPECT data. It provides a clear overview of where each dataset is archived, along with practical examples and guidance on accessing, downloading, and using the data. This approach significantly enhances usability and ensures that both project partners and external users can reliably work with ASPECT data.

The ASPECT Data Hub serves as the project's delivery system, providing a clear overview of all ASPECT datasets organised by time scale, data provider, and case study relevance, and enabling users to filter and explore the data according to their needs.

A key innovation of the ASPECT Data Hub is the "integration" of datasets with their corresponding applications and use cases. Alongside the dataset catalogue, users can directly access information about the relevant case studies and browse the applications developed within ASPECT. This structure provides the practical value of ASPECT's seamless climate predictions and supports the complete delivery of climate information, from user web applications to tailored climate-data services, resulting in making climate information more accessible.

Please note that the ASPECT Data Hub is still under development, so some links or content may not yet function as expected. Additional material will be added later as the case studies and associated outputs reach a more mature stage.

5 Access Mechanisms

5.1 Access via the catalogue landing page

It is clear from the previous section that ASPECT data has been archived and made publicly available through various data infrastructures, each with its own access mechanisms. Once published, datasets become searchable via their metadata and can then be downloaded using the tools provided by each archive.

Users can access ASPECT datasets via the catalogue landing pages provided in the previous section. These pages offer a web-based interface for exploring, searching, and filtering available resources. The interface features a metadata search function that allows users to find datasets by keywords, variables, frequency, model, experiment, or other metadata fields. After performing a search, users can utilise the dataset selection and filtering tools to refine results and navigate to the specific data of interest.

For MARS users, it is important to reach the end of the search page to view the complete list of variables associated with a given dataset. Likewise, when accessing data through ESGF, users can display all available variables and frequencies by selecting a single ensemble member and broad search criteria.

Also, it is essential to note that data published through ESGF becomes fully accessible immediately upon appearing on the ESGF nodes. These datasets can be explored using the ESGF portals (index nodes), which provide a web interface for browsing and accessing data distributed across multiple participating data centres. However, data stored in the ECMWF MARS archive becomes publicly accessible at a later stage, once it is incorporated into the ECMWF open research experiments. Until then, data can be accessible on demand. WP6 is responsible for handling these requests and giving access to ASPECT users.

Users can browse datasets in the MARS web catalogue and generate download links to retrieve files. For data stored in ESGF, access is provided via ESGF endpoints that support browser-based downloads.

5.2 Direct data access

Users who prefer to download data directly can make use of several access options provided by the different archiving systems.

For data stored in ESGF, access is provided via ESGF endpoints that support authenticated command-line tools, such as wget scripts generated by the portal. However, more advanced automation tools are available and described on the ASPECT Data Hub page, with clear examples of how to use them.

For data stored in ECMWF systems, programmatic access is available through APIs: the CDS API for datasets served through the Climate Data Store, the MARS API for retrievals from the ECMWF MARS archive.

These options enable users to automate downloads, integrate data retrieval into workflows, and efficiently access large volumes of data as needed.

5.3 Interoperability

Machine-readable metadata and established community standards support interoperability across ASPECT datasets. Metadata allows automated tools to interpret dataset attributes. For the data archived in NetCDF format, standard vocabularies are used throughout, including CF conventions for variable naming, units, and coordinate definitions, as well as CMIP-compliant variable names and experiment identifiers. For the data archived in GRIB format in MARS/CDS, an extensive parameter database is available. (https://codes.ecmwf.int/grib/param-db/).

In addition, the ASPECT documentation includes a first attempt to map variables between CMIP and MARS.

6 Data Lifecycle and Maintenance

The ASPECT data lifecycle is managed through update cycles that reflect both the production schedules of the contributing modelling centres and the operational timelines of the underlying data services. A perfect example is the seasonal forecast, which is under the C3S umbrella.

Dataset updates occur whenever new forecasts or hindcasts are generated, with metadata and documentation revised accordingly to ensure consistency and traceability.

An archiving and version-replacement policy applies across all repositories: older versions of datasets are preserved for reproducibility, while newer versions are published as separate, clearly identifiable releases. New systems or experiments are integrated into the archive as soon as they become available.

References

European Commission, Research & Innovation, Participant Portal H2020 Online Manual, http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/openaccess-data-management/data-management_en.htm

Data management plan

ASPECT Grand Agreement, Project: 101081460 — ASPECT — HORIZON-CL5-2022-D1-02

ASPECT Description of Action (DoA) Project: 101081460 — ASPECT — HORIZON-CL5-2022-D1-02