Funded by the
European Union

IMPLEMENTED BY EUMETSAT esa ECMWF

DestinE - System Framework - Data Portfolio

Doc.No. : EUM/TSS/DOC/22/1279455
Issue : v1I e-signed
Date : 12 April 2023
WBS/DBS :

EUMETSAT
Eumetsat-Allee 1, D-64295 Darmstadt, Germany
Tel: +49 6151 807-7
Fax: +49 6151 807 555
http://www.eumetsat.int

Signature Table

This content has been intentionally removed.

Co-authors/Contributors

This content has been intentionally removed.

Distribution List

This content has been intentionally removed.

Change Record

Version	*Date*	*DCR* No. if applicable*	*Description of Changes*
v1B	30/03/2022		Initial version of DTE-USR-002
v1C	12/05/2022		Version for Internal Preliminary Design Review
v1D	25/05/2022		Version of DTE-USR-002 (KO+4 Milestone)
V1E	05/07/2022		Version for ITT release - New federated Datasets from Copernicus Emergency Service - Data Governance section updated - Update of Acronym table
V1F	19/07/2022		Version for KO+6 Milestone
V1G	09/09/2022		Update of corrupted DEDL Data types image (Figure 2) Version for DE System Review
V1H	19/10/2022		Update of document header
V1I	12/04/2023		Correction of ISIMIP previously misspelled Update of Climate Change Datasets description Update of Climate Adaptation and on-demand Weather-induced and Geophysical Extremes Digital Twins outputs according the latest specifications provided by ECMWF (DE330_D330.5.5.1_202301 and DE_340_M340.2.1.3_202302 On-demand Digital Twin, new IDs : DTCC-OD-1 and DTEE-OD-1 Deletion of EO:MO:DAT:GLOBAL_ANALYSISFORECAST_PHY_CPL_001_015 as removed by CMEMS

***DCR = Document Change Request**

Table of Contents

Table of Figures

Table of Tables

1 INTRODUCTION

The objective of Destination Earth initiative (DestinE) is to develop a very high precision digital model of the Earth to monitor and simulate natural and human activity, and to develop and test scenarios for more sustainable development and for achieving both the green (Green Deal) and digital (Digital Strategy) priorities of the EU.

DestinE is based on the following elements:

- DestinE Core Service Platform (DESP): A user-friendly platform that provides a large number of users with evidence-based policy and decision-making tools, applications and services, based on an open, flexible, scalable and evolvable secure cloud-based architecture.
- DestinE Data Lake (DEDL): fulfils the storage and access requirements for any data that is offered to DestinE users. It provides users with a seamless access to the datasets, regardless of data type and location. Furthermore, the DEDL supports near-data processing to maximize throughput and service scalability. The data lake is built upon existing data holdings such as Copernicus DIAS, ESA, EUMETSAT and ECMWF.
- The DestinE Digital Twins (DTs): initially, two Digital Twins are provided as part of Destination Earth.
    - DT on Weather-induced and Geophysical Extremes: provides capabilities and services for the assessment and prediction of environmental extremes at very high spatial resolution and close to real-time decision-making support at continental, country, coastline, catchment and city scales in response to meteorological, hydrological and air quality extremes. In addition to weather-induced extremes, geophysical extremes (earthquakes, volcanic eruptions and tsunamis, geomagnetic storms) will be added.
    - DT on climate adaptation: provides capabilities and services in support of climate adaptation policies and mitigation scenario testing at multi-decadal timescales. Artificial Intelligence and modelling techniques should provide means to fully exploit the vast amounts of data collected and simulated over decades and understand the complex interactions of processes between Earth system and human space.

Complementary to the two initial DTs listed above, DestinE will also provide, based on users request, on-demand Digital Twins. The on-demand DT for Weather-induced and Geophysical Extremes will have a higher spatial resolution than the initial Weather-induced and Geophysical Extremes DT (from 100m to 750m), with a frequency of 5 minutes, but on a limited spatial extent within Europe. The on-demand climate adaptation DT main aim will be to provide climate projections for specific scenarios requested by user (*e.g.* socio-economic and/or environmental conditions, new biophysical processes modelling), not provided by the initial DT on climate adaptation.

The DestinE Data Portfolio (DEDP) lists the datasets offered via DestinE to users. Two kind of data are offered:

- DestinE generated data such as from the DTs or promoted DestinE User generated data
- Datasets from federated data holdings

1.1 Scope

The data portfolio identifies and details all data that DestinE users may access.

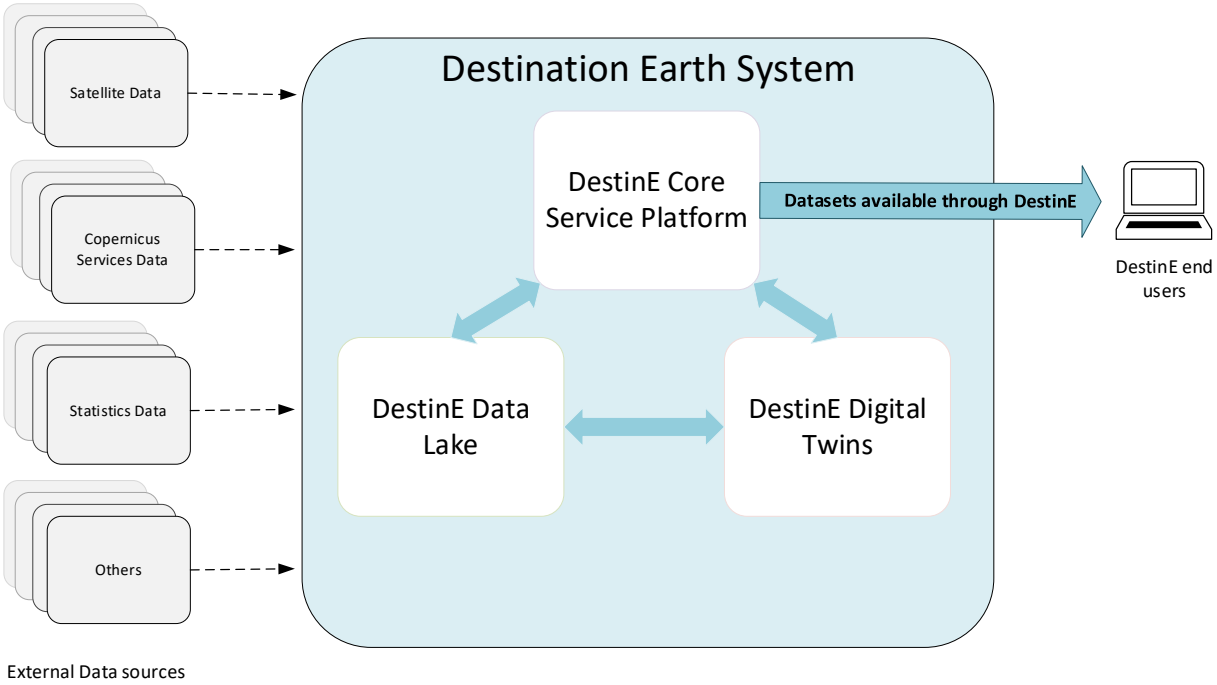

Figure 1: DestinE Data Portfolio access

This document allows to obtain an overview of the data portfolio available for DestinE Users.

All DestinE dataset are classified using the below maturity level.

In development: user level data under development. Limited data sets might be made available upon request for early evaluation purposes. There is no timeliness, quality monitoring and availability level imposed.

Experimental production: user level data routinely/on-demand generated and available upon request. There is no guarantee on availability. Quality is not necessarily monitored and timeliness is not necessarily within the target range.

Pre-operational: routinely/on-demand production of data. Expected timeliness and accuracy are as much in line with expected values as possible and are fully documented. The data retention time may be lower than the retention time for an operational dataset.

Operational: routinely/on-demand production of data. Expected timeliness, quality and availability level met expected values and are fully documented. Quality and timeliness are monitored and reported operationally.

The following table provides an overview of datasets characteristics according to their maturity level:

Maturity Level	Access	Timeliness	Quality Monitoring	Retention Time	Availability
In development	Restricted and temporary - access granted upon request	✗	N/A	N/A	N/A
Experimental	Restricted and temporary - access granted upon request	✗	Not mandatory	Set on-demand	N/A
Pre-operational	Routinely / On-demand production - discoverable	✓	✓	Can be lower than the retention time of OPE dataset	OPE SLA as much as possible
Operational	Routinely / On-demand production - discoverable	✓	✓	Agreed retention time documented in the Data portfolio	OPE SLA

The Data Portfolio document is an evolving document throughout the execution of the DestinE initiative. Also to note, described datasets list is an initial version at this stage. This as consequence means datasets might be added or removed. The target is to extend datasets diversity gradually to reflect the data space landscape as per Figure 2.

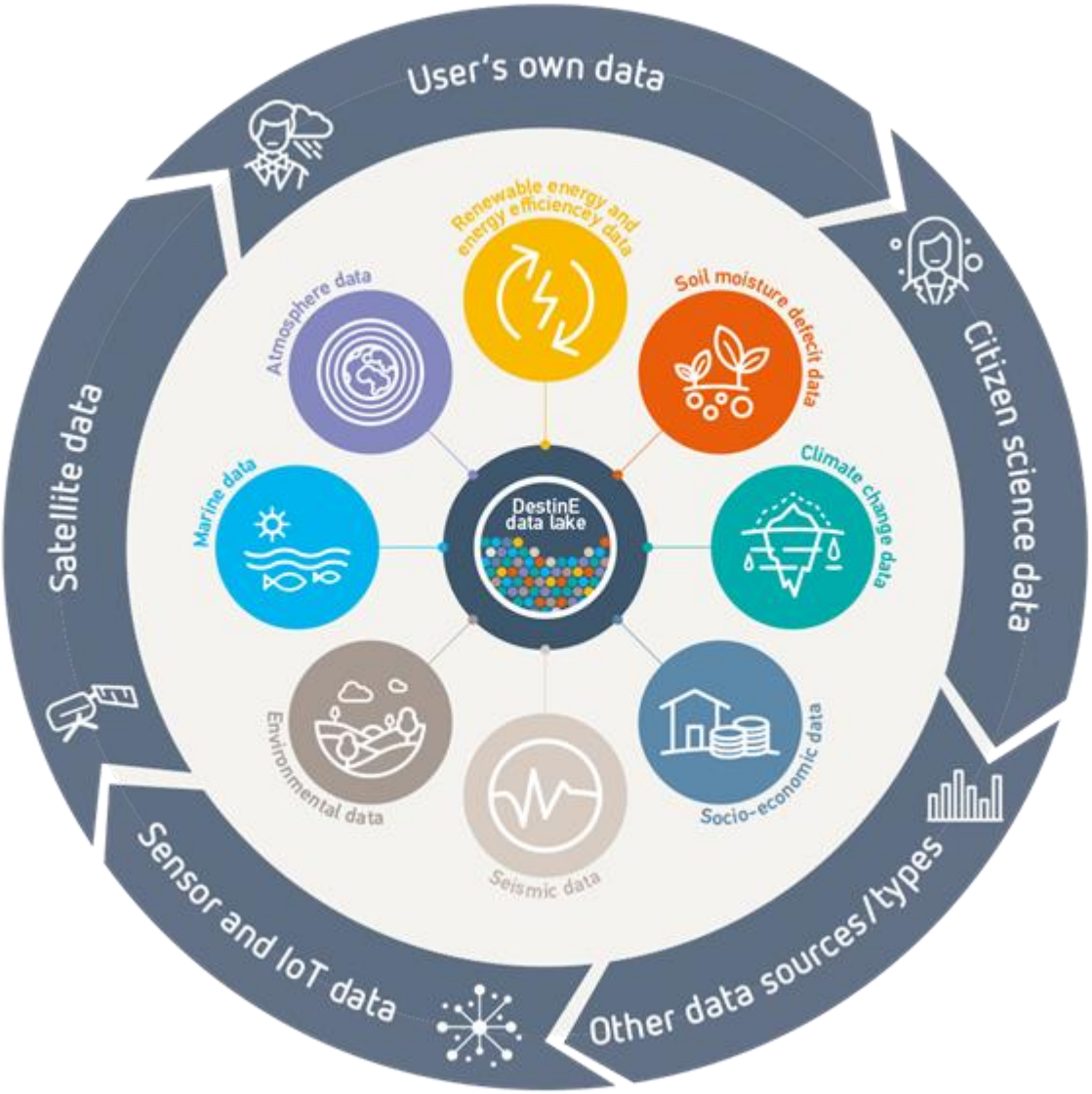

Figure 2: DEDL Data types

1.2 Structure of the document

This document is organized in four main chapters:

Chapter 1 Introduction: it describes the scope and the structure of the document, and lists the Applicable and Reference Documents

Chapter 2 Dataset Governance

Chapter 3 Overview of datasets available through DestinE

Chapter 4 External Data sources description

Chapter 5 DestinE Digital Twins generated datasets detailed description

Chapter 6 List of TBWs, TBDs, TBCs

1.3 Applicable Documents

	Document Title	**Reference**
AD-1	DestinE – System Framework High Level Description & Architecture	DTE-ADD-001, v1

1.4 Reference Documents

	Document Title	**Reference**
RD-1	Destination Earth: Use Cases Analysis	JRC122456, v1
RD-2	DestinE - Data Lake - High Level Description & Architecture	DTE-ADD-100, v1
RD-3	DestinE - Digital Twins - High Level Description & Architecture	DTE-ADD-200, v1
RD-4	DestinE - Core Service Platform - High Level Architecture & Description	DTE-ADD-300, v1
RD-5	FAIR principles	https://www.go-fair.org/fair-principles/
RD-6	DestinE Data Governance	EUM/DSA/DOC/23/1352587

1.5 Acronyms and Abbreviations

Acronym/Abbr.	Explanation
3E	ECMWF, ESA, EUMETSAT
ADS	Atmosphere Data Service
API	Application Programming Interface
CAMS	Copernicus Atmosphere Monitoring Service
CDS	Climate Data Service
CEMS	Copernicus Emergency Service
CSC	Copernicus Space Component
CLMS	Copernicus land monitoring service
CMEMS	Copernicus Marine Service
C3S	Copernicus Climate Change Service
DestinE	Destination Earth
DE	Destination Earth
DEDL	DestinE Data Lake
DEDP	DestinE Data portfolio
DESP	DestinE Core Service Platform
DIAS	Copernicus Data and Information Access Services
DT	Digital Twin
EC	European Commission
ECMWF	European Centre for Medium-Range Weather Forecasts
EO	Earth Observation
EODC	Earth Observation Data Centre
ESA	European Space Agency
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EWC	European Weather Cloud (EUMETSAT & ECMWF)
FAIR	Findability, Accessibility, Interoperability, and Reuse of digital assets
GSV	Generic State Vector
GUI	Graphical User Interface
HDA	Harmonised Data Access
HPC	High Performance Computing
IAGOS	In-service Aircraft for a Global Observing System
ISIMIP	The Inter-Sectoral Impact Model Intercomparison Project
REST	Representational State Transfer
SAF	EUMETSAT Satellite Application Facility
SSO	Single Sign On
TBC	To be confirmed
TBD	To Be Defined
TBW	To be written
WEkEO	DIAS Service implemented by EUMETSAT, ECMWF, EEA, and MOI

2 DATASETS GOVERNANCE

Data portfolio reviews

The DestinE Data portfolio will be reviewed regularly by the DestinE governance board. This board is responsible of defining the strategic guidelines

- Data access policies
- Data retention
- Datasets catalogue

Data portfolio updates' request

The addition or removal of datasets can be requested by users to Destination Earth (via User Portal or via Use Case on-boarding request). DestinE governance board will analyse the suitability and may implement the change.

Datasets management (Metadata)

Datasets are catalogued using metadata following FAIR Data principles (Findable, Accessible, Interoperable, and Reusable) [RD-5].

Further information about DestinE Data Governance are available in [RD-6].

3 DATASETS OVERVIEW

The table below lists and provides high level information on datasets available within DestinE:

- DestinE data are DT output and DestinE User Generated Data which are promoted to be available to the entire community.
- External data are federated datasets available via DestinE.

The DE Data Lake maintains a data pool for a subset of data called also "DEDL Fresh Data Pool" built and maintained from federated data sources. This Fresh Data Pool offers immediate access to potentially often used data by DE users to facilitate immediate computation close to the data.

"DE dataset access" column lists from where data from one dataset can accessed by DESP Users. Below the points of access:

- Federation Access - Access to external datasets via Federation
- DEDL Fresh Data Pool – Access to subset or entire dataset from the DEDL Fresh Data Pool.
- DT Data Warehouse – Access to DTs Data in DT Data Warehouse

DE dataset ID	Dataset description	Dataset provider	DE dataset access
DestinE referenced datasets			
Copernicus Satellites			
Sentinel-1 Data			
EO:ESA:DAT:EODC-SENTINEL-1:L1_SLC	Sentinel-1 Level 1 SLC	Copernicus Space Component Data access	DEDL Fresh Data Pool (Last 2 years rolling archive) Federation Access (Previous data not available in DEDL Fresh Data Pool)
EO:ESA:DAT:EODC-SENTINEL-1:L1_GRD	Sentinel-1 Level 1 GRD	Copernicus Space Component Data access	DEDL Fresh Data Pool (Last 2 years rolling archive) Federation Access (Previous data not available in DEDL Fresh Data Pool)
Sentinel-2 Data			

EO:ESA:DAT:SENTINEL-2:MSI:L1C	Sentinel-2 Level 1C: Top-Of-Atmosphere reflectances in cartographic geometry	Copernicus Space Component Data access	DEDL Fresh Data Pool (Last 2 years rolling archive) Federation Access (Previous data not available in DEDL Fresh Data Pool)
EO:ESA:DAT:SENTINEL-2:MSI:L2A	Sentinel-2 Level 2A: Bottom-Of-Atmosphere reflectances in cartographic geometry	Copernicus Space Component Data access	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
Sentinel-3 Data			
Sentinel-3 Land			
EO:ESA:DAT:SENTINEL-3:OL_2_LFR___	Sentinel-3 Level 2 OLCI Land Colour Full Resolution	Copernicus Space Component Data access	Federation access
EO:ESA:DAT:SENTINEL-3:OL_2_LRR___	Sentinel-3 Level 2 OLCI Land Colour Reduced Resolution	Copernicus Space Component Data access	Federation access
EO:ESA:DAT:SENTINEL-3:OL_2_LST___	Sentinel-3 Level 2 Land - Sea and Land Surface Temperature Radiometer (SLSTR)	Copernicus Space Component Data access	Federation access
EO:ESA:DAT:SENTINEL-3:OL_2_LAN___	Sentinel-3 Level 2 Land	Copernicus Space Component Data access	Federation access
Sentinel-3 Marine			
EO:EUM:DAT:SENTINEL-3:OL_1_EFR___	Sentinel-3 L1B OLCI Full Resolution	EUMETSAT Big Data Services	Federation access
EO:EUM:DAT:SENTINEL-3:OL_1_ERR___	Sentinel-3 L1B OLCI Reduced Resolution	EUMETSAT Big Data Services	Federation access

EO:EUM:DAT:SENTINEL-3:OL_1_WFR___	Sentinel-3 Level 2 OLCI Ocean Color Full Resolution	EUMETSAT Big Data Services	Federation access
EO:EUM:DAT:SENTINEL-3:OL_1_WRR___	Sentinel-3 Level 2 OLCI Ocean Color Reduced Resolution	EUMETSAT Big Data Services	Federation access
EO:EUM:DAT:SENTINEL-3:SL_1_RBT___	Sentinel-3 L1B SLSTR Radiances and Brightness Temperatures	EUMETSAT Big Data Services	Federation access
EO:EUM:DAT:SENTINEL-3:SR_1_SRA___	Sentinel-3 L1B SRAL	EUMETSAT Big Data Services	Federation access
EO:EUM:DAT:SENTINEL-3:SR_2_WAT___	Sentinel-3 Level 2 SRAL Altimetry Global	EUMETSAT Big Data Services	Federation access
Sentinel-5P Data			
EO:ESA:DAT:SENTINEL-5P:TROPOMI:L1	Sentinel-5P Level 1	Copernicus Space Component Data Access	DEDL Fresh Data Pool (Complete dataset)
EO:ESA:DAT:SENTINEL-5P:TROPOMI:L2	Sentinel-5P Level 2	Copernicus Space Component Data Access	DEDL Fresh Data Pool (Complete dataset)
Copernicus Services			
Copernicus Climate Change Service (C3S)			
In-situ and Satellite observations			
EO:ECMWF:DAT:SEASONAL_FORECAST_DAILY_DATA_ON_SINGLE_LEVELS_2017_PRESENT	Seasonal forecast daily and subdaily data on single levels	Copernicus CDS	Federation access
	Seasonal forecast subdaily data on pressure levels	Copernicus CDS	Federation access

EO:ECMWF:DAT:SEASONAL_FORECAST_DAILY_DATA_ON_PRESSURE_LEVELS_2017_PRESENT			
EO:ECMWF:DAT:SEASONAL_FORECAST_ANOMALIES_ON_SINGLE_LEVELS_2017_PRESENT	Seasonal forecast anomalies on single levels	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEASONAL_FORECAST_ANOMALIES_ON_PRESSURE_LEVELS_2017_PRESENT	Seasonal forecast anomalies on pressure levels	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEASONAL_FORECAST_MONTHLY_STATISTICS_ON_SINGLE_LEVELS_2017_PRESENT	Seasonal forecast monthly statistics on single levels	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEASONAL_FORECAST_MONTHLY_STATISTICS_ON_PRESSURE_LEVELS_2017_PRESENT	Seasonal forecast monthly statistics on pressure levels	Copernicus CDS	Federation access
EO:ECMWF:DAT:CO2_DATA_FROM_SATELLITE_SENSORS_2002_PRESENT	Carbon dioxide data from 2002 to present derived from satellite observations	Copernicus CDS	Federation access
		Copernicus CDS	Federation access

EO:ECMWF:DAT:GLACIERS_DISTRIBUTION_DATA_FROM_RANDOLPH_GLACIER_INVENTORY_2000	Glaciers distribution data from the Randolph Glacier Inventory for year 2000		
EO:ECMWF:DAT:GLACIERS_ELEVATION_AND_MASS_CHANGE_DATA_1850_PRESENT	Glaciers elevation and mass change data from 1850 to present from the Fluctuations of Glaciers Database	Copernicus CDS	Federation access
EO:ECMWF:DAT:METHANE_DATA_SATELLITE_SENSORS_2002_PRESENT	Methane data from 2002 to present derived from satellite observations	Copernicus CDS	Federation access
EO:ECMWF:DAT:REANALYSIS_UERRA_EUROPE_SINGLE_LEVELS	UERRA regional reanalysis for Europe on single levels from 1961 to 2019	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEA_ICE_MONTHLY_AND_DAILY_GRIDDED_DATA_1978_PRESENT	Sea ice monthly and daily gridded data from 1978 to present derived from satellite sensors	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEA_LEVEL_DAILY_GRIDDED_DATA_FOR_BLACK_SEA_1993_PRESENT	Sea level daily gridded data from satellite observations for the Black Sea from 1993 to 2020	Copernicus CDS	Federation access
EO:ECMWF:DAT:SEA_LEVEL_DAILY_GRIDDED_DATA_FOR_GLOBAL_OCEAN_1993_PRESENT	Sea level daily gridded data from satellite observations for the global ocean from 1993 to present	Copernicus CDS	Federation access

EO:ECMWF:DAT:SEA_LEVEL_DAILY_GRIDDED_DATA_FOR_MEDITERRANEAN_SEA_1993_PRESENT	Sea level daily gridded data from satellite observations for the Mediterranean Sea from 1993 to 2020	Copernicus CDS	Federation access
EO:ECMWF:DAT:WATER_QUALITY_INDICATOR_FOR_EUROPEAN_RIVERS	Water quantity indicators for Europe	Copernicus CDS	Federation access
EO:ECMWF:DAT:WATER_QUANTITY_INDICATORS_FOR_EUROPEAN_CATCHMENTS	Water quantity indicators for European catchments	Copernicus CDS	Federation access
Reanalysis			
EO:ECMWF:DAT:REANALYSIS_ERA5_SINGLE_LEVELS	ERA5 hourly data on singles levels from 1979 to present	Copernicus CDS	Federation access
EO:ECMWF:DAT:ERA5_HOURLY_VARIABLES_ON_PRESSURE_LEVELS	ERA5 hourly data on pressure levels from 1979 to present	Copernicus CDS	Federation access
EO:ECMWF:DAT:REANALYSIS_ERA5_SINGLE_LEVELS_MONTHLY_MEANS	ERA5 monthly averaged data on single levels from 1979 to present	Copernicus CDS	Federation access
EO:ECMWF:DAT:ERA5_MONTHLY_MEANS_VARIABLES_ON_PRESSURE_LEVELS	ERA5 monthly averaged data on pressure levels from 1979 to present	Copernicus CDS	Federation access

EO:ECMWF:DAT:ERA5_LAND_HOURLY	ERA5-Land hourly data from 1950 to present	Copernicus CDS	Federation access
EO:ECMWF:DAT:ERA5_LAND_MONTHLY	ERA5-Land monthly data from 1950 to present	Copernicus CDS	Federation access
Copernicus Atmosphere Monitoring Service Data (CAMS)			
EO:ECMWF:DAT:CAMS_GLOBAL_REANALYSIS_EAC4	CAMS global reanalysis (EAC4)	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_EMISSION_INVENTORIES	CAMS global emission inventories	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_REANALYSIS_EAC4_MONTHLY_AV_FIELDS	CAMS global reanalysis (EAC4) monthly averaged fields	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GREENHOUSE_GAS_FLUXES	CAMS global inversion-optimised greenhouse gas fluxes and concentrations	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_EURO_AIR_QUAL_REANALYSIS	CAMS European air quality reanalyses	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_RADIATIVE_FORCING	CAMS global radiative forcing	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_RADIATIVE_FORCING_AUX	CAMS global radiative forcing - auxilliary variables	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_GREENH	CAMS global greenhouse gas reanalysis (EGG4)	Copernicus ADS	Federation access

OUSE_GAS_RANALYSIS			
EO:ECMWF:DAT:CAMS_GLOBAL_GREENHOUSE_GAS_RANALYSIS_MONTHLY_AV_FIELDS	CAMS global greenhouse gas reanalysis (EGG4) monthly averaged fields	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_EUROPE_AIR_QUALITY_FORECASTS	CAMS European air quality forecasts	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_GLOBAL_ATMOSHERIC_COMPO_FORECAST	CAMS global atmospheric composition forecasts	Copernicus ADS	Federation access
EO:ECMWF:DAT:CAMS_SOLAR_RADIATION_TIMESERIES	CAMS solar radiation time-series	Copernicus ADS	Federation access
Copernicus Marine Service (CMEMS) *Marine datasets are restricted to Global area in this initial version.*			
EO:MO:DAT:GLOBAL_ANALYSIS_FORECAST_PHY_001_024	Global Ocean 1/12° Physics Analysis and Forecast updated Daily	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L3_REP_OBSERVATIONS_009_065	Global Surface Chlorophyll Concentration from Satellite observations (daily average) Reprocessed L3 (ESA-CCI)10	Copernicus Marine	Federation access
EO:MO:DAT:GLOBAL_ANALYSIS_FORECAST_BIO_001_028	Global Ocean Biogeochemistry Analysis and Forecast	Copernicus Marine	Federation access
EO:MO:DAT:GLOBAL_ANALYSIS_FORECAST	Global Ocean Waves Analysis and Forecast	Copernicus Marine	Federation access

_WAV_001_027			
EO:MO:DAT:GLOBAL_MULTIYEAR_BGC_001_033	Global ocean low and mid trophic levels biomass content hindcast	Copernicus Marine	Federation access
EO:MO:DAT:GLOBAL_MULTIYEAR_WAV_001_032	Global Ocean Waves Reanalysis WAVERYS	Copernicus Marine	Federation access
EO:MO:DAT:GLOBAL_REANALYSIS_PHY_001_026	Global Ocean Ensemble Physics Reanalysis - Low resolution	Copernicus Marine	Federation access
EO:MO:DAT:GLOBAL_REANALYSIS_PHY_001_031	Global Ocean Ensemble Physics Reanalysis	Copernicus Marine	Federation access
EO:MO:DAT:INSITU_GLO_TS_OA_NRT_OBSERVATIONS_013_002_a	Global Ocean- Real time in-situ observations objective analysis	Copernicus Marine	Federation access
EO:MO:DAT:INSITU_GLO_TS_OA_REP_OBSERVATIONS_013_002_b	Global Ocean- Delayed Mode gridded CORA- In-situ Observations objective analysis in Delayed Mode	Copernicus Marine	Federation access
EO:MO:DAT:INSITU_GLO_UV_NRT_OBSERVATIONS_013_048	Global Ocean- in-situ Near real time observations of ocean currents	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_BIO_BGC_3D_REP_015_010	Global Ocean 3D Chlorophyll-a concentration, Particulate Backscattering coefficient and Particulate Organic Carbon	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_BIO_CARBON_SURFACE_REP_015_008	Global Ocean Surface Carbon	Copernicus Marine	Federation access

EO:MO:DAT:MULTIOBS_GLO_BIO_NUTRIENTS_PROFILES_REP_015_009	Nutrient profiles vertical distribution	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_PHY_NRT_015_003	Global Total Surface and 15m Current (COPERNICUS-GLOBCURRENT) from Altimetric Geostrophic Current and Modeled Ekman Current Processing	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_PHY_REP_015_004	Global Total Surface and 15m Current (COPERNICUS-GLOBCURRENT) from Altimetric Geostrophic Current and Modeled Ekman Current Reprocessing	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_PHY_S_SURFACE_MYNRT_015_013	Multi Observation Global Ocean Sea Surface Salinity and Sea Surface Density	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_PHY_TSUV_3D_MYNRT_015_012	Multi Observation Global Ocean 3D Temperature Salinity Height Geostrophic Current and MLD	Copernicus Marine	Federation access
EO:MO:DAT:MULTIOBS_GLO_PHY_W_3D_REP_015_007	Global Observed Ocean Physics 3D Quasi-Geostrophic Currents (OMEGA3D)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L3_NRT_OBSERVATIONS_009_032	Global Ocean Chlorophyll, PP and PFT (Copernicus-GlobColour) from Satellite Observations : Daily (Near Real Time)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L3_REP_OBSERVATIONS_009_085	Global Ocean Chlorophyll, PP and PFT (Copernicus-GlobColour) from Satellite Observations: Daily (Reprocessed from 1997)	Copernicus Marine	Federation access

EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L4_NRT_OBSERVATIONS_009_033	Global Ocean Chlorophyll, PP and PFT (Copernicus-GlobColour) from Satellite Observations: Monthly abd Daily Interpolated (Near Real Time)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L4_REP_OBSERVATIONS_009_082	Global Ocean Chlorophyll, PP and PFT (Copernicus-GlobColour) from Satellite Observations: Monthly and Daily Interpolated (Reprocessed from 1997)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_CHL_L4_REP_OBSERVATIONS_009_093	Global Surface Chlorophyll Concentration from Satellite observations (daily average) Reprocessed L4 (ESA-CCI): monthly	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_OPTICS_L3_NRT_OBSERVATIONS_009_030	Global Ocean NRRS, BBP, CDM, KD, ZSD, SPM (Copernicus-GlobColour) from Satellite Observations: Daily (Near Real Time)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_OPTICS_L3_REP_OBSERVATIONS_009_064	Global Ocean, Ocean Optics Products (daily average) Reprocessed L3 (ESA-CCI)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_OPTICS_L3_REP_OBSERVATIONS_009_086	Global Ocean NRRS, BBP, CDM, KD, ZSD, SPM (Copernicus-GlobColour) from Satellite Observations: Daily (Reprocessed from 1997)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_OPTICS_L4_NRT_OBSERVATIONS_009_083	Global Ocean NRRS, BBP, CDM, KD, ZSD, SPM (Copernicus-GlobColour) from Satellite Observations: Monthly and Daily Interpolated (Reprocessed from 1997)	Copernicus Marine	Federation access
EO:MO:DAT:OCEANCOLOUR_GLO_OPTICS_L4_REP_OBS	Global Ocean NRRS, BBP, CDM, KD, ZSD, SPM (Copernicus-GlobColour) from Satellite Observations: Monthly and Daily-	Copernicus Marine	Federation access

ERVATIONS_009_081	Interpolated (Reprocessed from 1997)		
EO:MO:DAT:SEAICE_GLO_SEAICE_L4_NRT_OBSERVATIONS_011_001	Global Ocean - Arctic and Antarctic - Sea Ice Concentration, Edge, Type and Drift (OSI-SAF)	Copernicus Marine	Federation access
EO:MO:DAT:SEAICE_GLO_SEAICE_L4_NRT_OBSERVATIONS_011_006	Global Ocean - High Resolution SAR Sea Ice Drift	Copernicus Marine	Federation access
EO:MO:DAT:SEAICE_GLO_SEAICE_L4_REP_OBSERVATIONS_011_009	Global Ocean Sea Ice Concentration Time Series REPROCESSED (OSI-SAF)	Copernicus Marine	Federation access
EO:MO:DAT:SEALEVEL_GLO_PHY_L4_NRT_OBSERVATIONS_008_046	GLOBAL OCEAN GRIDDED L4 SEA SURFACE HEIGHTS AND DERIVED VARIABLES NRT	Copernicus Marine	Federation access
EO:MO:DAT:SEALEVEL_GLO_PHY_MDT_008_063	GLOBAL OCEAN MEAN DYNAMIC TOPOGRAPHY8	Copernicus Marine	Federation access
EO:MO:DAT:SST_GLO_SST_L3S_NRT_OBSERVATIONS_010_010	Global Ocean - Sea Surface Temperature Multi-sensor L3 Observations	Copernicus Marine	Federation access
EO:MO:DAT:SST_GLO_SST_L4_NRT_OBSERVATIONS_010_001	Global Ocean OSTIA Sea Surface Temperature and Sea Ice Analysis	Copernicus Marine	Federation access
EO:MO:DAT:SST_GLO_SST_L4_NRT_OBSERVATIONS_010_005	Global Ocean Sea Surface Temperature Multi Product Ensemble (GMPE)	Copernicus Marine	Federation access
EO:MO:DAT:SST_GLO_SST_L4_NRT_OBSER	Global Ocean OSTIA Diurnal Skin Sea Surface Temperature	Copernicus Marine	Federation access

VATIONS_010_014			
EO:MO:DAT:SST_GLO_SST_L4_REP_OBSERVATIONS_010_011	Global Ocean OSTIA Sea Surface Temperature and Sea Ice Reprocessed	Copernicus Marine	Federation access
EO:MO:DAT:SST_GLO_SST_L4_REP_OBSERVATIONS_010_024	ESA SST CCI and C3S reprocessed sea surface temperature analyses	Copernicus Marine	Federation access
EO:MO:DAT:WAVE_GLO_WAV_L3_SPC_NRT_OBSERVATIONS_014_002	GLOBAL OCEAN L3 SPECTRAL PARAMETERS FROM NRT SATELLITE MEASUREMENTS	Copernicus Marine	Federation access
EO:MO:DAT:WAVE_GLO_WAV_L3_SWH_NRT_OBSERVATIONS_014_001	GLOBAL OCEAN L3 SIGNIFICANT WAVE HEIGHT FROM NRT SATELLITE MEASUREMENTS	Copernicus Marine	Federation access
EO:MO:DAT:WAVE_GLO_WAV_L4_SWH_NRT_OBSERVATIONS_014_003	GLOBAL OCEAN L4 SIGNIFICANT WAVE HEIGHT FROM NRT SATELLITE MEASUREMENTS	Copernicus Marine	Federation access
EO:MO:DAT:WIND_GLO_PHY_CLIMATE_L4_REP_012_003	Global Ocean Wind L4 Reprocessed Monthly Mean Observations	Copernicus Marine	Federation access
EO:MO:DAT:WIND_GLO_WIND_L3_NRT_OBSERVATIONS_012_002	Global Ocean Daily Gridded Sea Surface Winds from Scatterometer	Copernicus Marine	Federation access
EO:MO:DAT:WIND_GLO_WIND_L3_REP_OBSERVATIONS_012_005	Global Ocean Daily Gridded Reprocessed L3 Sea Surface Winds from Scatterometer	Copernicus Marine	Federation access

EO:MO:DAT:WIND_GLO_WIND_L4_NRT_OBSERVATIONS_012_004	Global Ocean Wind L4 Near real Time 6 hourly Observations	Copernicus Marine	Federation access
EO:MO:DAT:WIND_GLO_WIND_L4_REP_OBSERVATIONS_012_006	Global Ocean L4 Reprocessed 6 hourly Observations	Copernicus Marine	Federation access
Copernicus Global Land Service (CLMS)			
EO:ESA:DAT:COP	Copernicus DEM - Global and European Digital Elevation Model (COP-DEM)	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
EO:CLMS:DAT:CGLS_GLOBAL_NDVI300_V1_333M	Global 10-daily Normalized Difference Vegetation Index 333M	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
EO:CLMS:DAT:CGLS_GLOBAL_NDVI_V2_1KM	Global 10-daily Normalized Difference Vegetation Index 1KM	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
EO:HRVPP:DAT:VEGETATION-INDICES	Vegetation Indices, daily	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
URN:CGLS:GLOBAL:BA300_V3_333M	10-daily Burned Area 300M (V3)	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*

URN:CGLS:GLOBAL:BA300_V1_333M	10-daily Burned Area 300M	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
EO:CLMS:DAT:CORINE	CORINE Land Cover	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
EO:CLMS:DAT:CGLS_GLOBAL_FCOVER300_V1_333M	Global 10-daily Fraction of Vegetation Cover 333m	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
URN:CGLS:GLOBAL:DMP300_V1_333M	10-daily Dry Matter Productivity 333M from 2014 to present	Copernicus Land	DEDL Fresh Data Pool (Complete dataset) *Gradually ramp-up during Phase I, reaching the target in Phase II*
URN:CGLS:GLOBAL:GDMP300_V1_333M	10-daily Gross Dry Matter Productivity 333M	Copernicus Land	DEDL Fresh Data Pool (Complete dataset)*Gradually ramp-up during Phase I, reaching the target in Phase II*
Copernicus Emergency Service (CEMS)			
EO:ECMWF:DAT:CEMS_FIRE_HISTORICAL	Fire danger indices historical data from the Copernicus Emergency Management Service	Copernicus Emergency	Federation access
EO:ECMWF:DAT:CEMS_GLOFAS_FORECAST	River discharge and related forecasted data by the Global Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:CEMS_GLOFAS_HISTORICAL	River discharge and related historical data from the Global Flood Awareness System	Copernicus Emergency	Federation access

EO:ECMWF:DAT:CEMS_GLOFAS_REFORECAST	Reforecasts of river discharge and related data by the Global Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:CEMS_GLOFAS_SEASONAL	Seasonal forecasts of river discharge and related data by the Global Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:CEMS_GLOFAS_SEASONAL_REFORECAST	Seasonal reforecasts of river discharge and related data from the Global Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:EFAS_FORECAST	River discharge and related forecasted data by the European Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:EFAS_HISTORICAL	River discharge and related historical data from the European Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:EFAS_REFORECAST	Reforecasts of river discharge and related data by the European Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:EFAS_SEASONAL	Seasonal forecasts of river discharge and related data by the European Flood Awareness System	Copernicus Emergency	Federation access
EO:ECMWF:DAT:EFAS_SEASONAL_REFORECAST	Seasonal reforecasts of river discharge and related data by the European Flood Awareness System	Copernicus Emergency	Federation access
ISIMIP Data			
TBD	Climate forcing data	ISIMIP	Federation access
TBD	Socioeconomic forcing data	ISIMIP	Federation access
IAGOS Data			
TBD	Atmospheric composition	IAGOS	Federation access
EuroStat Data			

STAT:EUSTAT:DAT:POP_AGE_SEX_NUTS2	Population distribution: Population on 1 January by age, sex and NUTS 2 region	EC EUROPA Data Store	Federation access
STAT:EUSTAT:DAT:POP_AGE_GROUP_SEX_NUTS3	Population distribution: Population on 1 January by age group, sex and NUTS 3 region	EC EUROPA Data Store	Federation access
STAT:EUSTAT:DAT:POP_CHANGE_DEMO_BALANCE_CRUDE_RATES_NUTS3	Population change - Demographic balance and crude rates at regional level (NUTS 3)	EC EUROPA Data Store	Federation access
STAT:EUSTAT:DAT:GREENHOUSE_GAS_EMISSION_AGRICULTURE	Greenhouse gas emissions from agriculture	EC EUROPA Data Store	Federation access
STAT:EUSTAT:DAT:SHARE_ENERGY_FROM_RENEWABLE	Share of energy from renewable sources	EC EUROPA Data Store	Federation access
Landsat-8_Data			
EO:ESA:DAT:LANDSAT8:OLI-TIRS	Landsat 8 OLI-TIRS European Coverage	NASA Data	Federation access
EO:ESA:DAT:LANDSAT8:COL-2	Landsat 8 Collection 2 European Coverage	NASA Data	Federation access
Landsat-8 datasets list is provided as example here - TBC at this stage			
DestinE Generated Datasets			
DestinE Digital Twins Data			
DTCC-01	Climate Change Adaptation DT data	Destination Earth	DT Data Warehouse (See Chapter 5.1.) *Gradually ramp up during phase I, reaching the target by Phase II.*

DTEE-01	Weather-induced and Geophysical Extremes DT data	Destination Earth	DT Data Warehouse (See Chapter 5.2.) *Gradually ramp up during phase I, reaching the target by Phase II.*
DTCC-OD-01	On-Demand Climate Change Adaptation DT data	Destination Earth	DT Data Warehouse (See Chapter 5.3) *Gradually ramp up during phase I, reaching the target by Phase II.*
DTEE-OD-02	On-Demand Weather-induced and Geophysical Extreme DT data	Destination Earth	DT Data Warehouse (See Chapter 5.4) *Gradually ramp up during phase I, reaching the target by Phase II.*
DestinE User Generated Data			
DTUD-01	*<placeholder> DE User dataset X*	*Destination Earth*	*Use Case specific – it will be defined when DE User dataset available for the public*

Table 1: DestinE Data Lake datasets overview

4 EXTERNAL DATA SOURCES DESCRIPTION

This section will describe data sources from where Destination Earth federates data.

List of data sources and their description is TBW for the next published version of the document.

5 DESTINE DIGITAL TWINS GENERATED DATASETS DETAILED DESCRIPTION

This section describes the DestinE datasets (Routine or On-Demand) generated per Digital Twin.

5.1 Climate Change Adaptation DT

ID	**DTCC-01**	
Status	Development	
Description	Digital Twin forecast Climate Change Adaptation	
Data family	Destination Earth - Climate Adaptation Twin	
Documentation	RD-3	
Availability policy	permanent	
Data access	DESP web site API	
Geographical area	Global	
Geometry	HEALPix	
Vertical coordinate	model or pressure levels (to be defined in the GSV deliverable)	
Vertical coverage	from surface to (last level to be defined in the GSV deliverable)	
Horizontal resolution	depending on the variable (0.25°x0.25° to 1°x1° or native high very high resolution for some variables)	
Time coverage	1990-2040	
Time resolution	from 6-hourly to monthly	
Update frequency	Daily (when DTs run, this is the synchronization frequency between the HPC FDB and the data bridge FDB)	
Dissemination	DESP web server	
Data format	GRIB2	
Size	subject to procurement outcome, estimating 10PiB - 36PiB	
	Divergence Geopotential height Specific humidity	Pressure

	Relative humidity Temperature U component of wind V component of wind	
	Vorticity (relative)	

List of variables

Realm	Variable name	Frequencies
Atmosphere (2D and column integrations)	Total precipitation Snowfall 2 metre temperature Total cloud cover 10 metre U wind component 10 metre V wind component 100 metre U wind component 100 metre V wind component Snow depth 2 metre dewpoint temperature Surface sensible heat flux Surface latent heat flux Surface solar radiation downwards Surface net thermal radiation Surface net solar radiation Skin temperature Carbon dioxide Brightness temperature Skin temperature TOA incident solar radiation Surface thermal radiation downwards Surface thermal radiation downwards Top net thermal radiation Evaporation Total column cloud ice water	1, 3, 6-hourly, monthly
	Total column cloud liquid water	
Atmosphere: 19 pressure levels (1000, 925, 850, 700, 600, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30, 20, 10, 5, 1)	U component of wind V component of wind Temperature Relative humidity Geopotential	6-hourly, monthly
Sea Ice	Sea ice area fraction Sea-ice thickness Sea ice velocity along x	daily, monthly
	Sea ice velocity along y	

Ocean	Sea surface temperature Sea surface height Sea surface practical salinity Vertically integrated meridional volume transport Northward sea water velocity Eastward sea water velocity Ocean potential temperature Ocean salinity	daily, monthly

5.2 Weather-induced and Geophysical Extremes DT

ID	**DTEE-01**
Status	Development
Description	Weather-induced and Geophysical Extremes Digital Twin
Data family	DestinE generated data
Documentation	RD-3
Availability policy	• 2 weekly rolling archive / selected data at full resolution to be kept throughout Phase 1 for demonstrating the capabilities and performance of the system (fields in bold in the list below)
Data access	• DESP web site API
Geographical area	Global
Geometry	Globally gridded data, formatting (latitude-longitude, other to be decided)
Vertical coordinate	TBC
Vertical coverage	TBC
Horizontal resolution	1-4 km
Time coverage	4 days
Time resolution	Sub-hourly (3 hourly for fields kept throughout phase 1 – or hourly for 1 or 2 days only)
Update frequency	Daily

Dissemination	DestinE DESP web server	
Data format	GRIB2	
Size	215 TiB – 655 TiB TBD	
Initial variables (list to be refined during Phase I)	Name	Variable Type
	10 metre U wind component **10 metre V wind component** **2 metre temperature** Mean sea level pressure **Runoff** Surface pressure Total column water **Total Precipitation** Mean zero-crossing wave period Mean wave direction Mean wave period Peak wave period Significant wave height of combined wind waves and swell Soil temperature	Single and Surface fields
	10 metre wind gust since previous post-processing **100 metre U wind component** **100 metre V wind component** **2 metre dewpoint temperature** Accumulated freezing rain Average potential temperature in the upper 300m Averaged total lightning flash density in the last 6 hours Convective available potential energy Convective inhibition Convective precipitation Convective rain rate Eastward turbulent surface stress Friction velocity Instantaneous 10 metre wind gust Instantaneous total lightning flash density Large scale rain rate Large scale snowfall rate water equivalent Large-scale precipitation Northward turbulent surface stress Precipitation type Sea ice area fraction Sea surface temperature Simulated satellite images Snowfall Surface net solar radiation Surface net thermal radiation **Surface solar radiation downwards** Surface thermal radiation downwards	

	Top net solar radiation Top net thermal radiation **Total cloud cover** Total column cloud liquid water Total column vertically-integrated water vapour Vertical integral of eastward water vapour flux, Vertical integral of northward water vapour flux Visibility Volumetric soil water layer 1 Volumetric soil water layer 2 Volumetric soil water layer 3 Volumetric soil water layer 4	
	Divergence Geopotential height Specific humidity Relative humidity Temperature U component of wind V component of wind Vorticity (relative)	Pressure
User defined / flexible variables	Variables related to user application that can be flexibly defined, e.g. related to hydrology, air quality, extremes indices, etc. which may be produced directly from user-defined plugins as part of the DT	Single

5.3 On-Demand Climate Change Adaptation DT

ID	**DTCC-OD-01**
Status	Development
Description	On-Demand Digital Twin forecast Climate Change Adaptation
Data family	Destination Earth - Climate Adaptation Twin
Documentation	RD-3
Availability policy	On-demand
Data access	• DESP web site API
Geographical area	On-demand
Geometry	Globally gridded data, details subject to procurement outcome

Vertical coordinate	On-Demand	
Vertical coverage	On-Demand	
Horizontal resolution	On-Demand	
Time coverage	On-demand	
Time resolution	depending on parameter: hourly, 3-hourly, daily, monthly	
Update frequency	On-demand	
Dissemination	DestinE DESP web server	
Data format	TBD - subject to procurement outcome	
Size	Depends on user' request	
User defined / flexible variables	Variables related to user application that can be flexibly defined, e.g. related to hydrology, air quality, extremes indices, etc. which may be produced directly from user-defined plugins as part of the DT	Single

5.4 On-Demand Weather-induced and Geophysical Extremes DT

ID	**DTEE-OD-02**
Status	Development
Description	On-Demand Weather-induced Extremes Digital Twin within Europe
Data family	Destination Earth - Digital Twin Extreme
Documentation	RD-3
Availability policy	• 2 weekly rolling archive / selected data at full resolution to be kept throughout Phase 1 for demonstrating the capabilities and performance of the system (fields in bold in the list below)
Data access	• DESP web site API
Geographical area	Up to 2000x2000x137 (x,y,z) grid points
Geometry	Polar stereographic, Lambert conical tangent projection or Mercator projection depending on the latitude

Vertical coordinate	Hybrid levels, numbers of levels up to 137	
Vertical coverage	From surface to ~10hPa	
Horizontal resolution	100-750m	
Time coverage	36-60 hours	
Time resolution	5 minute – hourly, applies to both initial time and output resolution	
Update frequency	On-Demand	
Dissemination	DestinE DESP web server	
Data format	GRIB2, ccsds_packing	
Size	1.5 GB per output step every 5min x 60h ~1.1TB (2000x2000 grid points)	
Initial output variables	10m U wind component 10m V wind component 10m Max Gust, u-component 10m Max Gust, v-component 2m Temperature 2m Maximum Temperature 2m Minimum Temperature Surface pressure Mean sea level pressure 2m Relative Humidity 2m Specific Humidity Total Precipitation Total solid Precipitation Precipitation type Graupel precipitation rate Total snowfall rate water equivalent Snow depth water equivalent Global radiation flux Long wave radiation flux Shortwave radiation flux LW net clear sky rad SW net clear sky rad Global (horizontal) irradiance Direct normal irradiance Global irradiance in clear sky conditions	Single and surface fields

	Direct normal irradiance in clear sky conditions Total cloud cover Low cloud cover Medium cloud cover High cloud cover Water Evaporation Sensible heat flux Mixed layer depth CAPE SST Visibility Land-sea mask	
	Temperature U wind component V wind component Specific humidity Sp cloud liquid water content Sp cloud ice water content Specific graupel Turbulent Kinetic Energy Geopotential Relative humidity Total cloud cover Geometrical vertical velocity	Pressure fields 50,100,150,200,250, 300,400,500,700,800, 850,925,1000
	Temperature U wind component V wind component Specific humidity Sp cloud liquid water content Sp cloud ice water content Specific graupel Turbulent Kinetic Energy Relative humidity Total cloud cover Geometrical vertical velocity	Height levels 15, 30, 50, 75, 100, 150, 200, 250, 300, 400 and 500 m
	Risk of icing at height level	

	T2m forest Top soil temperature Top soil moisture Snow depth Canopy air temperature Intercepted snow **T2m open land** Top soil temperature 10th layer soil temperature Top soil moisture 10th layer soil moisture Snow depth **T2m lake** Water surface temperature Snow depth Ice thickness **T2m urban** Top road temperature Outer wall temperature Top roof temperature Street canyon air temperature Street canyon air humidity **T2m sea ice** Acc ice sensible heat flux Snow depth	Surface fields
	Surface Geopotential Land sea mask tile/patch distribution Land use Wind power per grid cell: ● Number of turbines ● (if possible) hub height ● (if possible) rotor diameter ● (if possible) power production capacity	Constant fields
Air quality	NO_2 O_3 PM10 PM2.5 SO_2	
Hydrology	Discharge from rivers or streams Water runoff and drainage rate Snow depth water equivalent	

Renewables	Instantaneous wind power production Accumulated wind power production Global irradiance on tilted surfaces Accumulated PV yield	
Uncertainty estimation	Probabilistic predictions in terms of quantiles O(10), threshold probabilities and/or scenarios of ● wind speed at 10m, and wind power turbine height ● gust at 10m ● precipitation for various accumulation periods (1h, 3h, 6h, 12h, 24h) ● Power production These may (likely) also be maximised in time/space. Pure deterministic post-processing may also be provided.	

6 LIST OF TBWS, TBCS AND TBDS

SECTION	DESCRIPTION	DUE DATE
SECTION 2	Variables list of DTCC-OD-1 is TBC at this stage	Q2 2024
SECTION 4	List of external data sources and description – To be written as per implementation	Q4 2023