Destination Earth

Flagship initiative of the European Commission

A Highly Accurate Digital Model of the Earth

The Climate Adaptation Use Case in Destination Earth

Climate Session - GEO
8 December 2022

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Implemented by ECMWF esa EUMETSAT

Destination Earth

A Highly Accurate Digital Model of the Earth

European Commission

To monitor, simulate and predict natural phenomena and the impact of human activity on Earth

To assist in designing accurate adaptation strategies and climate change related mitigation measures

To accelerate the EU's green and digital transition

To leverage existing and new data sources and EU's advanced digital and computing infrastructure

To create and test "what if" scenarios and to integrate impact sector applications for more sustainable development

To support near real-time decision-making at various levels (e.g. EU, national, regional, local)

To go beyond the current complex systems designed mainly for expert use

To scale up existing models and fuse simulation with observation

2022 — Kick-off event of DestinE initiative

2024 — Deployment of the core service platform, the data lake, the building of the Digital Twin engine environment and the first two Digital Twins

2027 — Integration of additional data sources, services and Digital

2030 — Full Digital Twin of the Earth

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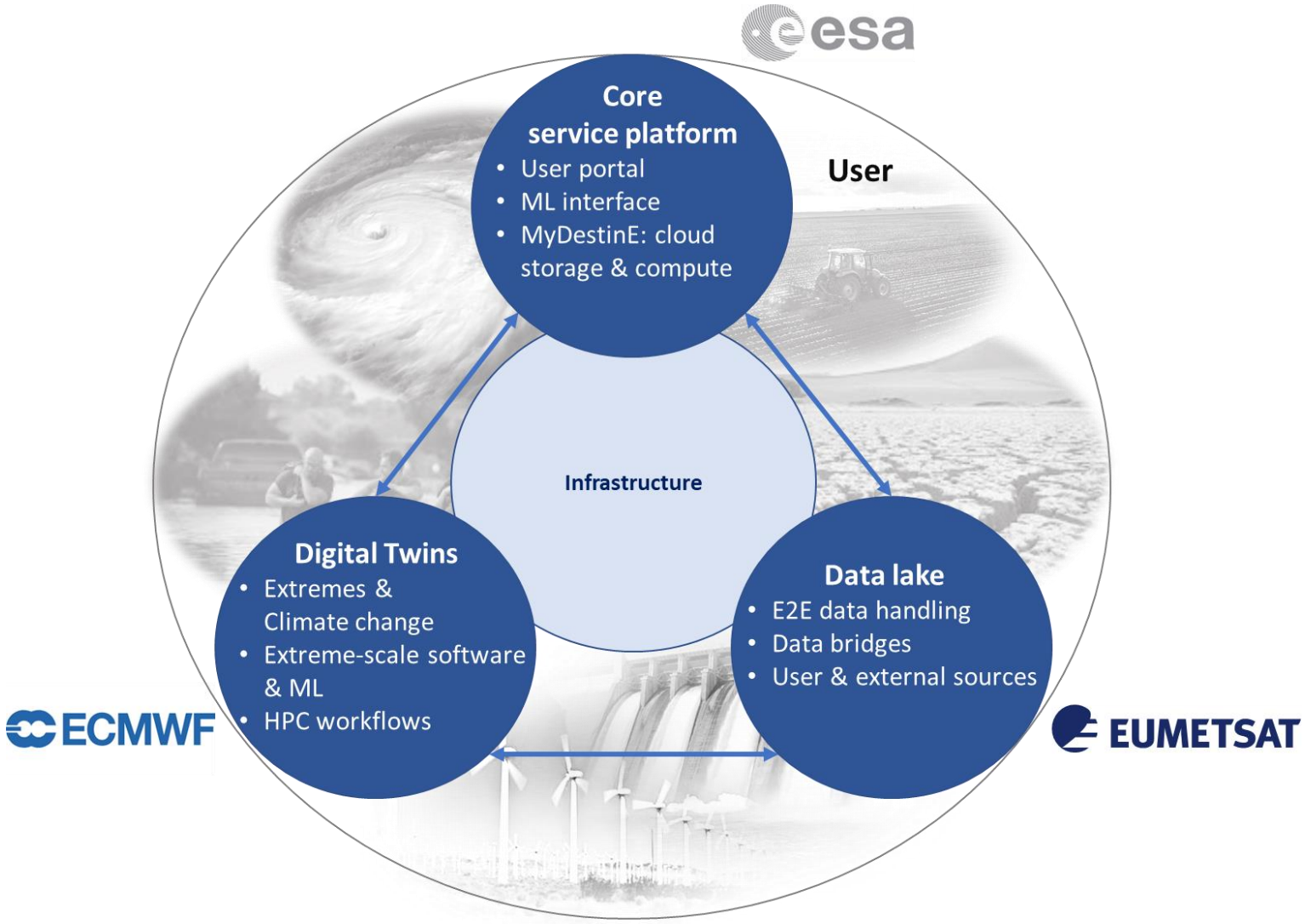
3E and the three main components



DestinE – Status Update

- **Signature of the CAs (official kick-off of Phase 1): 15 December 2021; end of Phase 1: mid-2024**
- **Milestones:**
  - First system review stage completed
  - A number of procurements already published by the 3Es
  - Joint User Partnerships Plan being finalised
- **Next steps:**
  - First DestinE User Exchange – 15 February 2023 (ESA Esrin)
  - DEP WP 2023 – 2024: Phase 2
  - HE WP 2023 – 2024: relevant calls in support of DTs from the HE RI WP
  - Discussions with EuroHPC JU and HPC centres for resource allocation
  - Discussions around future integration of the Digital Twin of the Ocean (DTO)

DestinE key components: The Digital Twins (DTs)

- DT: Creation of an interactive information system, giving users the ability to interact with workflows, data and models.
- DT1 on Environmental Extremes will focus on extreme weather event prediction on time spans of a few days ahead and provide information both globally at km-scale, in a continuous mode, and regionally at sub-km scale in an on-demand mode:
  - Global continuous component will build on ECMWF's Integrated Forecasting System.
  - On-demand component will be developed by a large pan-European partnership led by MétéoFrance.
- **DT2 on Climate Change Adaptation** will deliver global multi-decadal simulations at 5 km and will be developed by a partnership led by the CSC – IT Science Centre in Finland:
  - Use of prototype Earth system models developed in EU Horizon 2020 project nextGEMS (4 km resolution)
  - Need for information on global scale as well as on regional, national and even city levels
  - Future DT2-contribution to DG CLIMA's Climate Adaptation Mission
- ECMWF is responsible for DTs-development