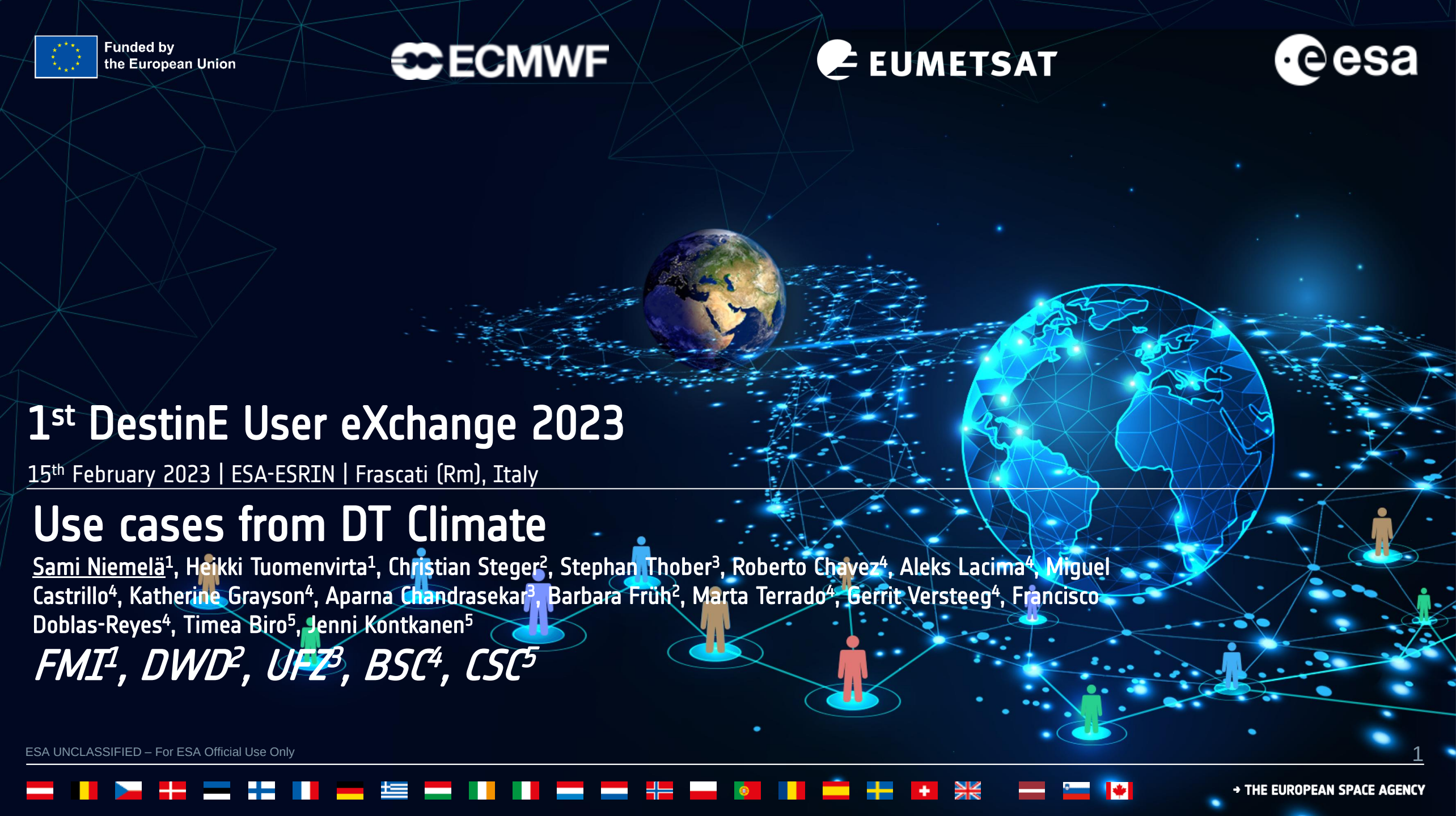
Funded by the European Union



1st DestinE User eXchange 2023

15th February 2023 | ESA-ESRIN | Frascati (Rm), Italy

Use cases from DT Climate

Sami Niemelä[1], Heikki Tuomenvirta[1], Christian Steger[2], Stephan Thober[3], Roberto Chavez[4], Aleks Lacima[4], Miguel Castrillo[4], Katherine Grayson[4], Aparna Chandrasekar[3], Barbara Früh[2], Marta Terrado[4], Gerrit Versteeg[4], Francisco Doblas-Reyes[4], Timea Biro[5], Jenni Kontkanen[5]

FMI[1], DWD[2], UFZ[3], BSC[4], CSC[5]

USE CASES AS A PART OF CLIMATE-DT (DE340)

- The long-term vision is to provide new tools for climate adaptation policy making and expand the user community, i.e., to allow the climate DT to scale across applications.

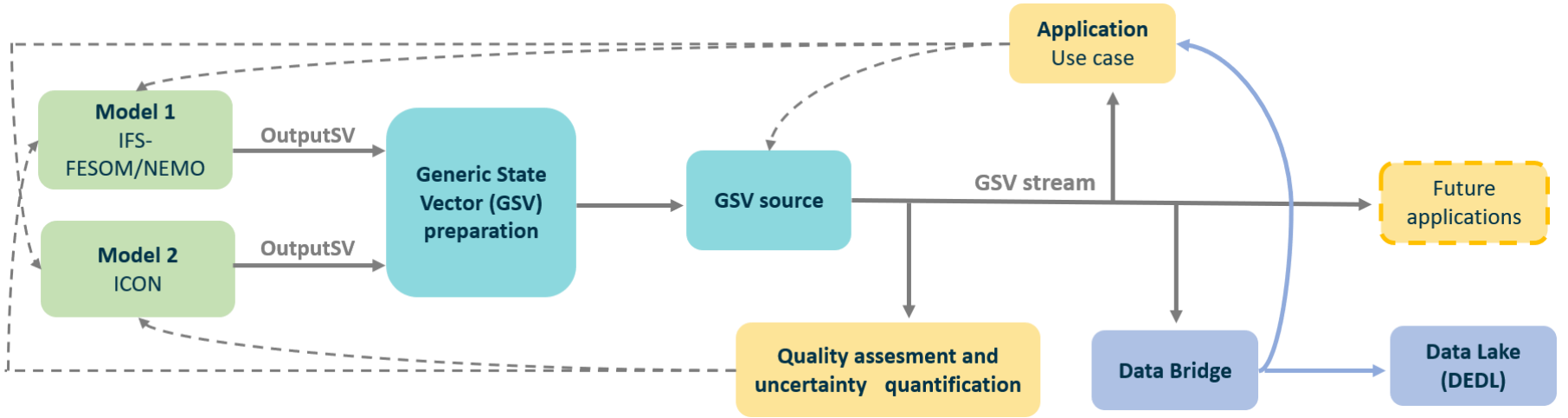
- Five different use cases are chosen to demonstrate the fidelity of the information provided by the ESMs within climate DT and to ensure that climate DT addresses the needs of different impact sectors.

  - **Wildfires** (e.g. impact of land use policies on wildfire risk)
  - **HydroRiver** (e.g. climate impact on key hydrological processes)
  - **HydroMet** (e.g. Hydro-meteorological extremes and their change)
  - **Energy** (e.g. future changes in wind energy resource.)
  - **Urban** (e.g. variability of heat waves in urban environments)

VISION OF HOW USERS WILL WORK WITH CLIMATE-DT

The digital twin aims to renew the way climate information has been provided and used, for instance in the context of CMIP or CORDEX. Time-scales from the order of years to months/weeks.

WHAT IS NEW?

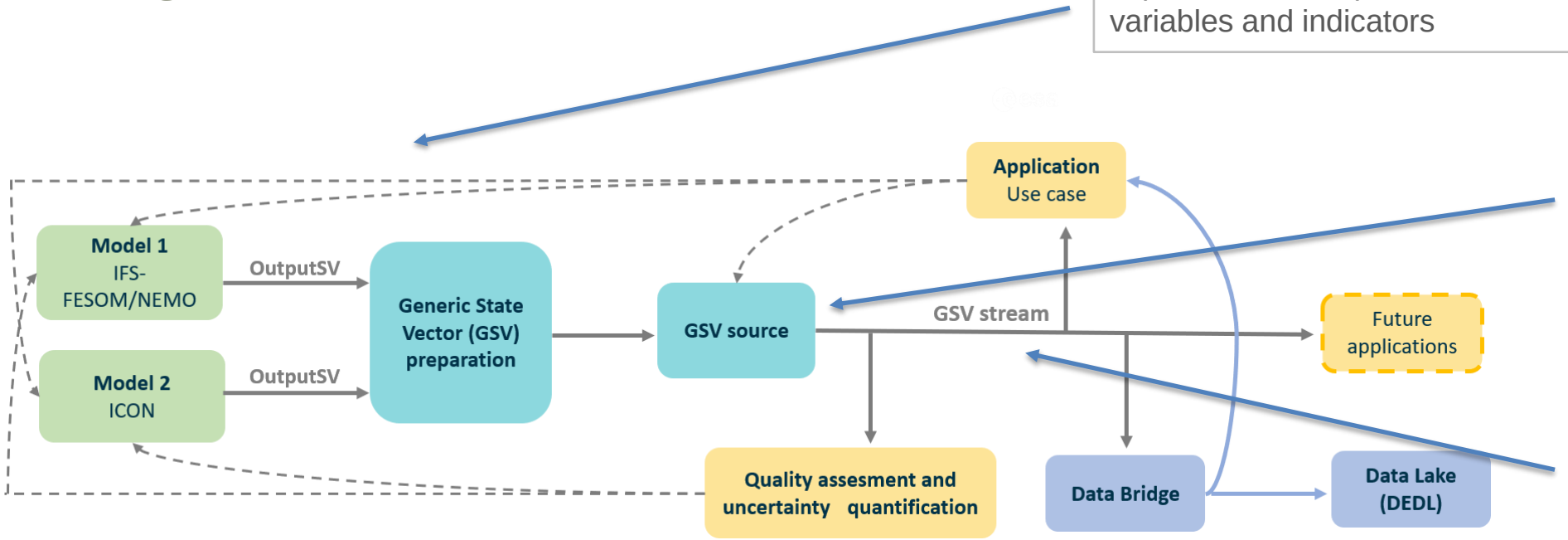


VISION OF HOW USERS WILL WORK WITH CLIMATE-DT

The digital twin aims to renew the way climate information has been provided and used, for instance in the context of CMIP or CORDEX. Time-scales from the order of years to months/weeks.

WHAT IS NEW?

Interaction: iteratively contribute to the design of the experimental setup of climate models and request additional variables and indicators



Continuously streamed climate model data:

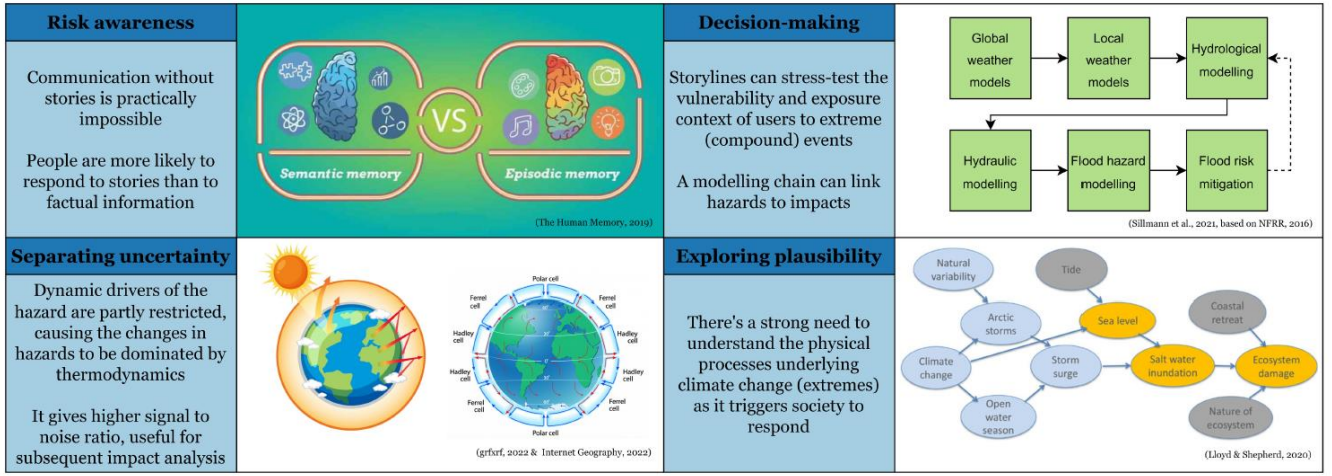
- high frequency
- native resolution
- common grid
- data available during runtime

One pass algorithms:

- data reduction tasks
- updated summary statistics
- on-the-fly bias correction

THE GOALS OF THE USE CASES IN CLIMATE-DT DURING PHASE 1

- To demonstrate the novelty, potential and advantages the DT offers.
- To provide technical recipes for users to access the data and to link application or impact models to digital twin.
- To provide the results of the use cases in the form storylines that are physically self-consistent unfoldings of historic extreme events in plausible future climates



Four characteristics of why a storyline approach has potential

STATUS AND PLANS OF USE CASE IMPLEMENTATION IN DE340 DURING PHASE 1