

DESTINATION EARTH

A NOVEL INFORMATION SYSTEM FOR A RESILIENT SOCIETY

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EOSC

Berlin, October 22nd 2024

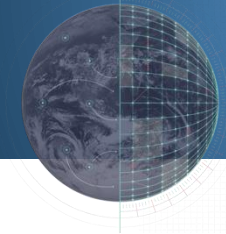


Funded by
the European Union

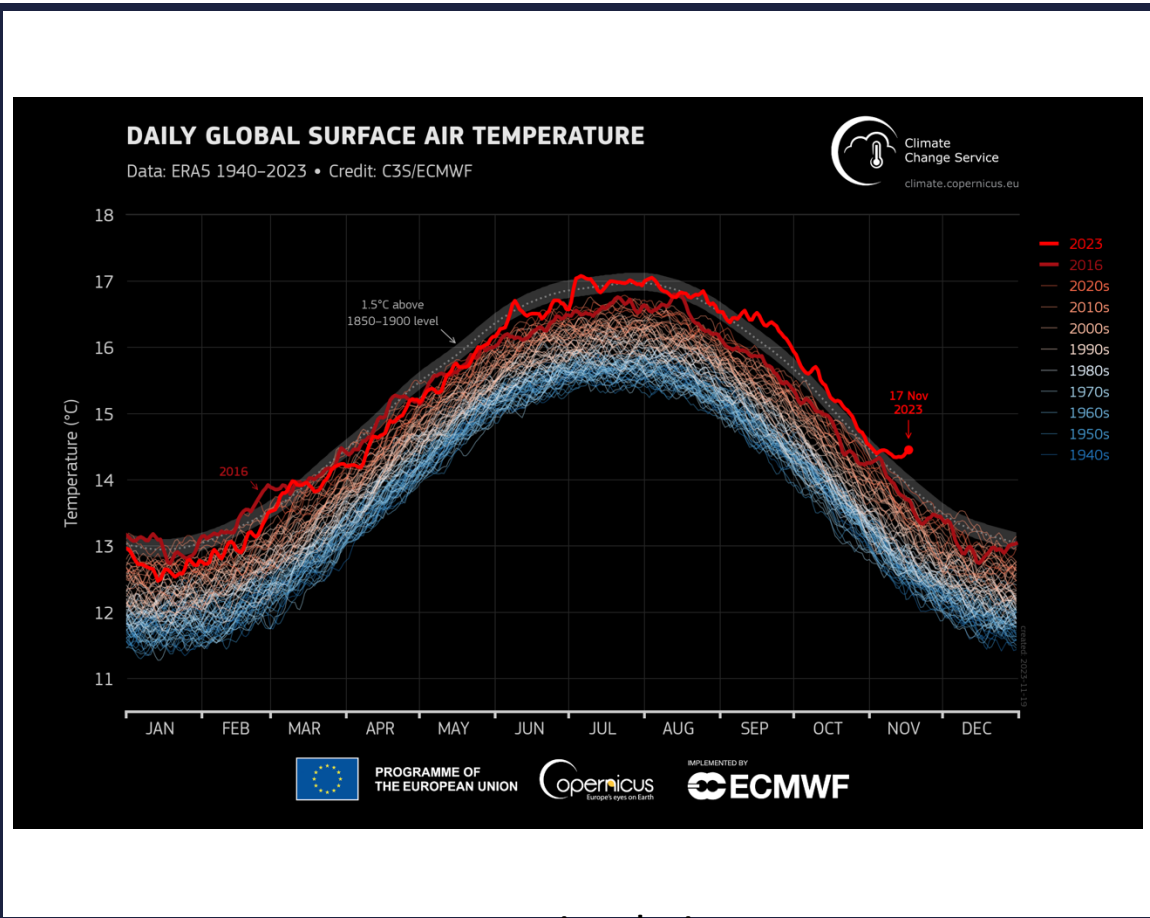
Destination Earth

implemented by

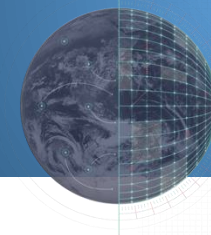




CLIMATE CHANGE AND INCREASE OF EXTREME EVENTS



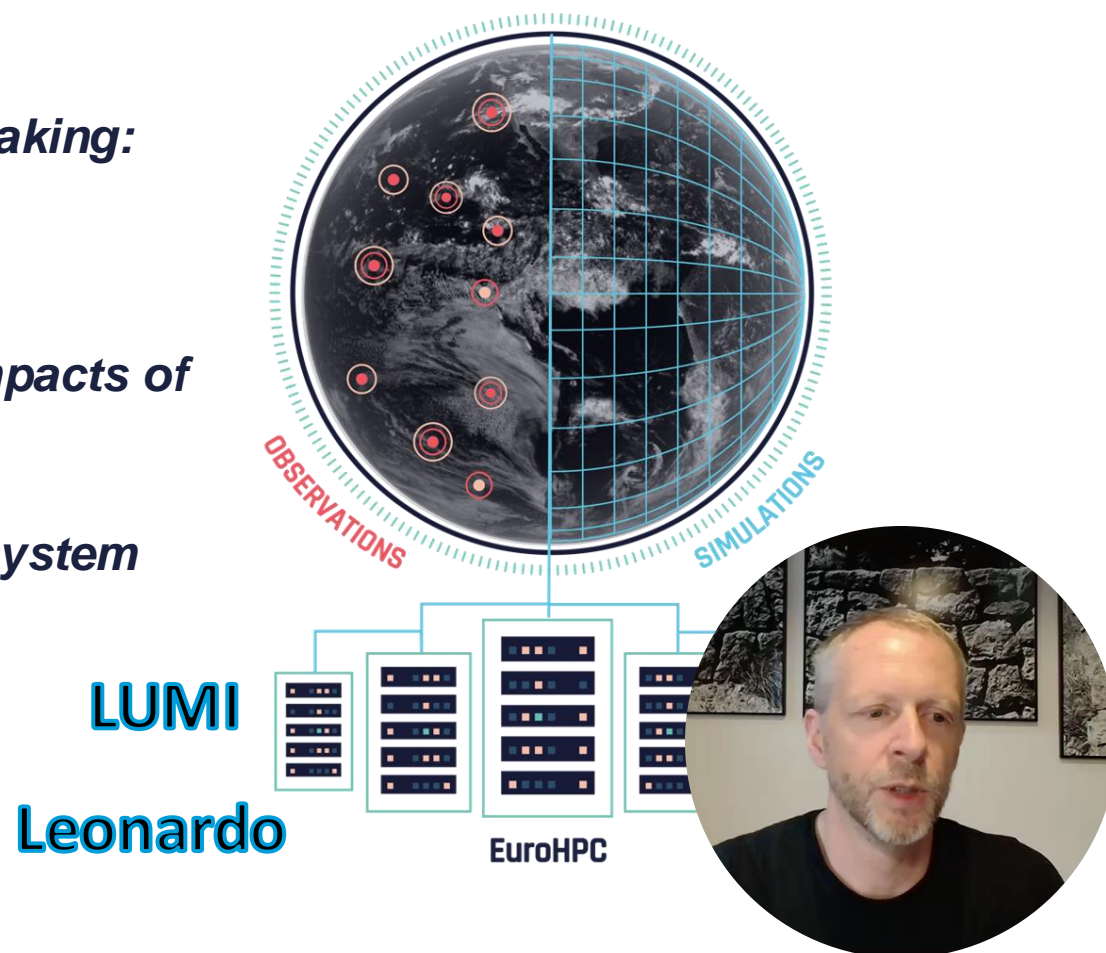
simulations
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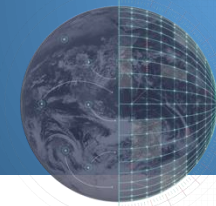


DESTINE: A DIGITAL TWIN OF OUR PLANET TO RESPOND AND ADAPT TO CLIMATE CHANGE AND EXTREME EVENTS

DestinE, in strategic partnership with EuroHPC Joint Undertaking:

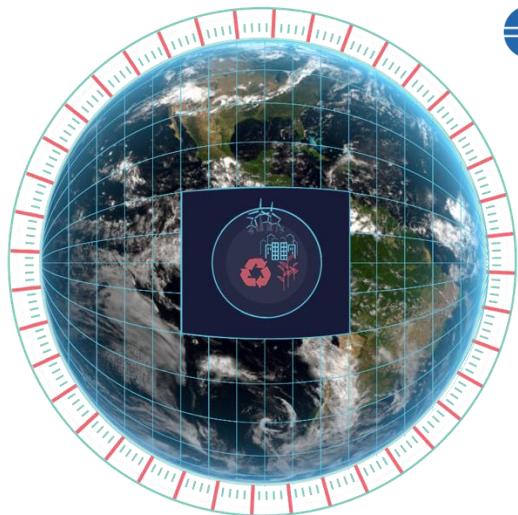
- *Establishes bespoke cutting-edge simulation capabilities*
- *Provides Earth-system information at scales where the impacts of extreme events and climate change are felt*
- *Fosters an innovative and thriving AI-enabled digital ecosystem*





FIRST HIGH PRIORITY DIGITAL TWINS SUPPORT THE GREEN DEAL

Climate change adaptation



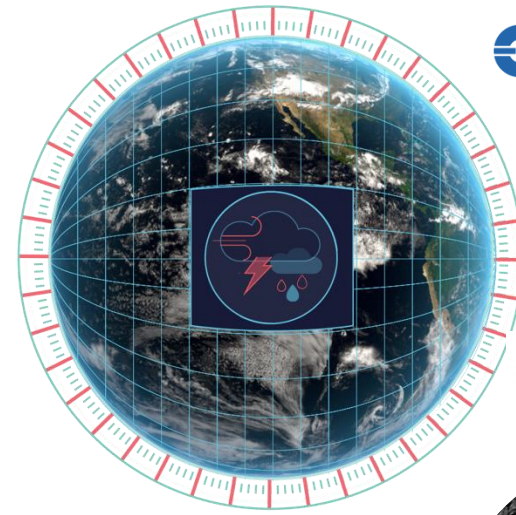
CSC	CSC - IT Center for Science	FI
BSC	Barcelona Supercomputing Center/Centro Nacional de Supercomputación	ES
MPI-M	Max Planck Institute for Meteorology	DE
UH	University of Helsinki	FI
AWI	Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research	DE
CNR-IGAC	Consiglio Nazionale delle Ricerche, Istituto di Scienze dell'Atmosfera e del Clima	IT
POLITO	Politecnico di Torino	IT
FMI	Finnish Meteorological Institute	FI
DWD	National Meteorological Service of Germany	DE
UFZ	Helmholtz Centre for Environmental Research	DE
UCLouvain	Université catholique de Louvain	BE
DKRZ	German Climate Computing Centre	DE
HPE	Hewlett Packard Enterprise	FR

To support policymaking for adaption

Multi-decadal timescales



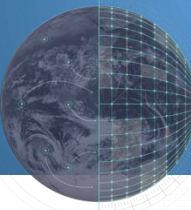
Weather-induced extremes



For rapid response to extreme

For a few days ahead

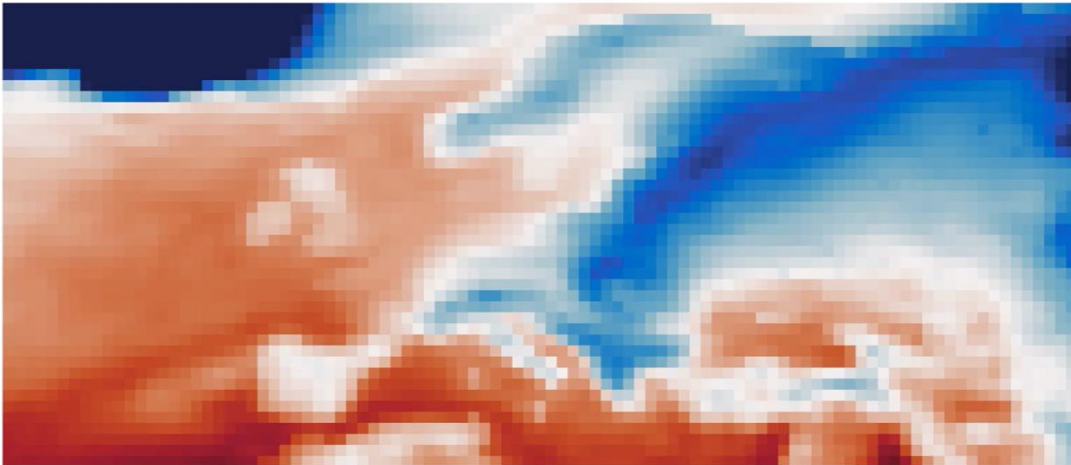




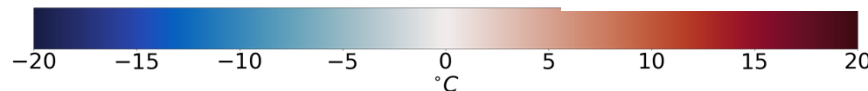
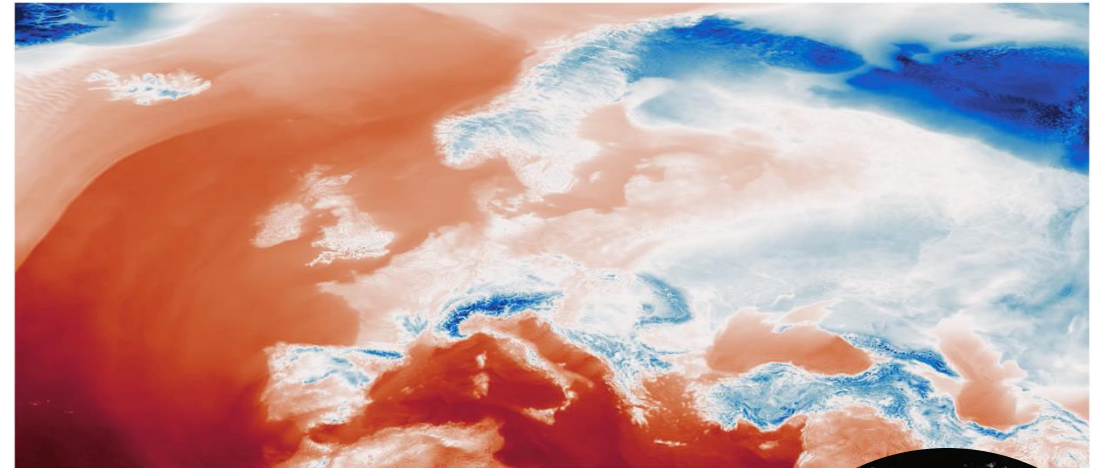
CLIMATE DT: GLOBALLY CONSISTENT CLIMATE INFORMATION AT KM-SCALE

To enable policy actions in support of climate change adaptation

IPCC AR6 (2021), 100km

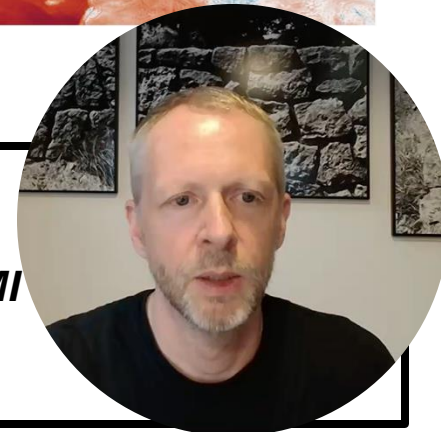


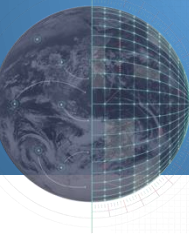
Digital Twin, 5km



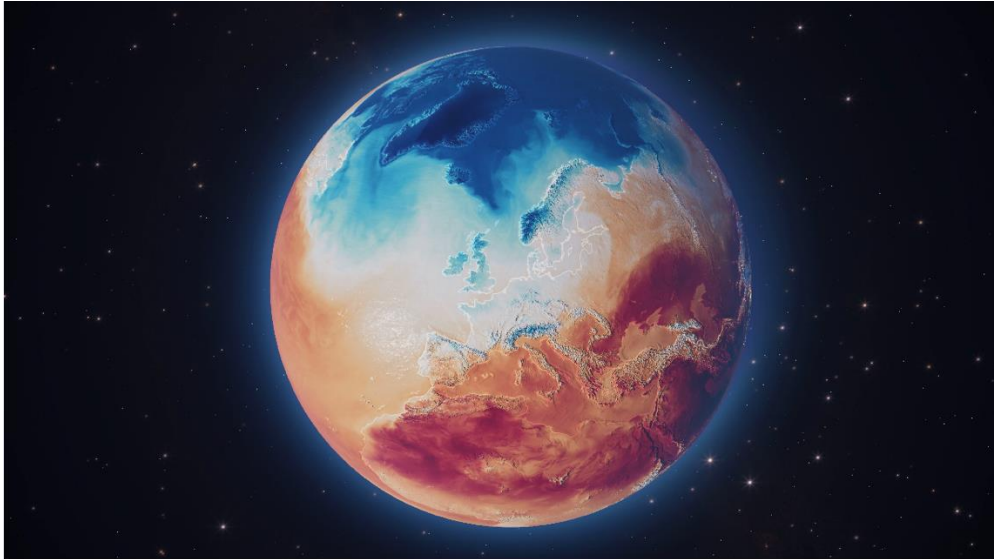
End-to-end climate DT workflow, including selected applications, deployed on LUMI

First ever projections (2020-2040) at ~ 5km across earth-system components running now on LUMI streaming information to selected applications



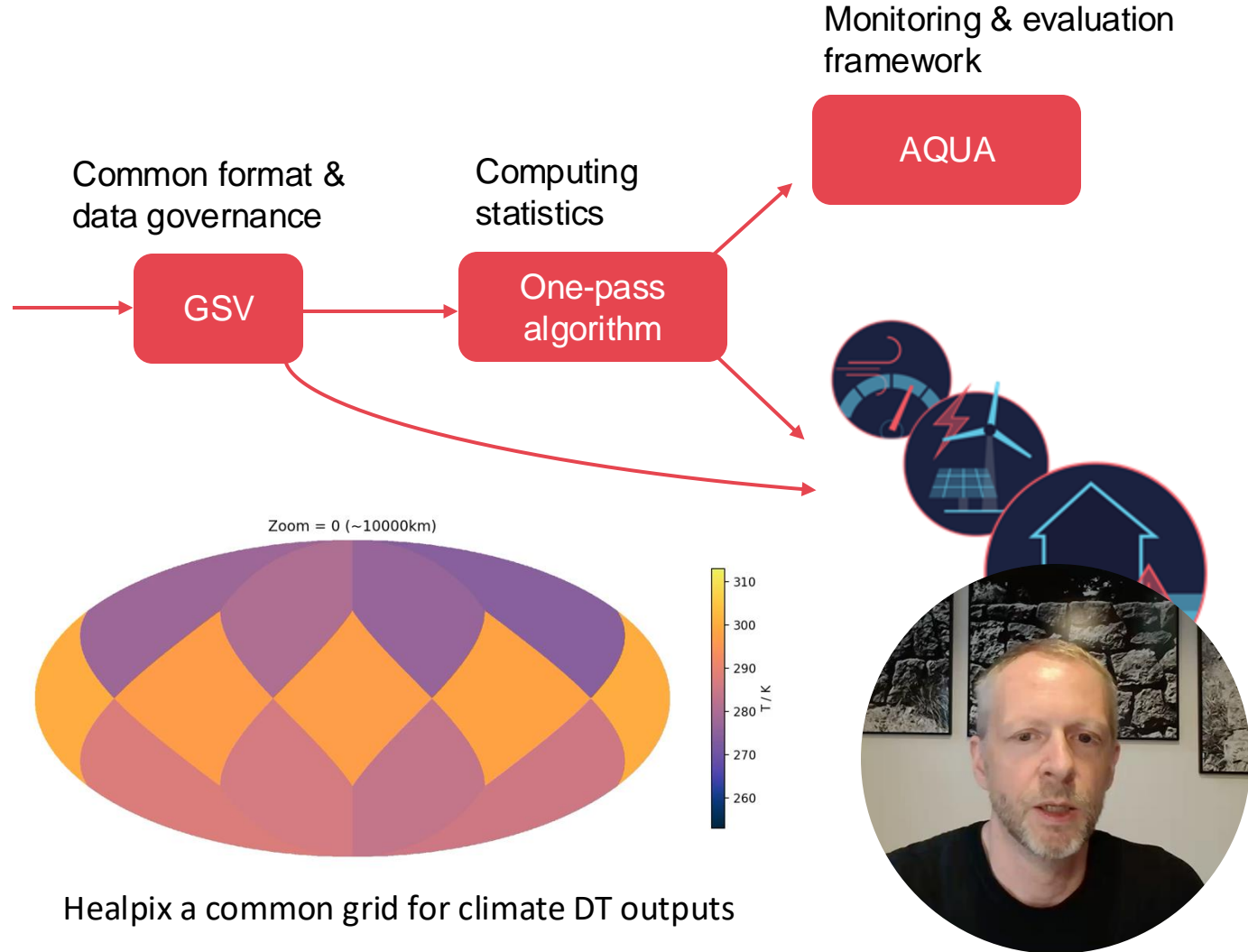


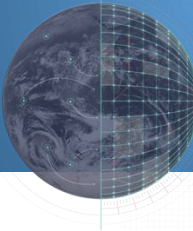
CLIMATE DT: CAPABILITIES AT THE END OF PHASE 1



3 global climate models at ~5km

IFS-NEMO
IFS-FESOM
ICON





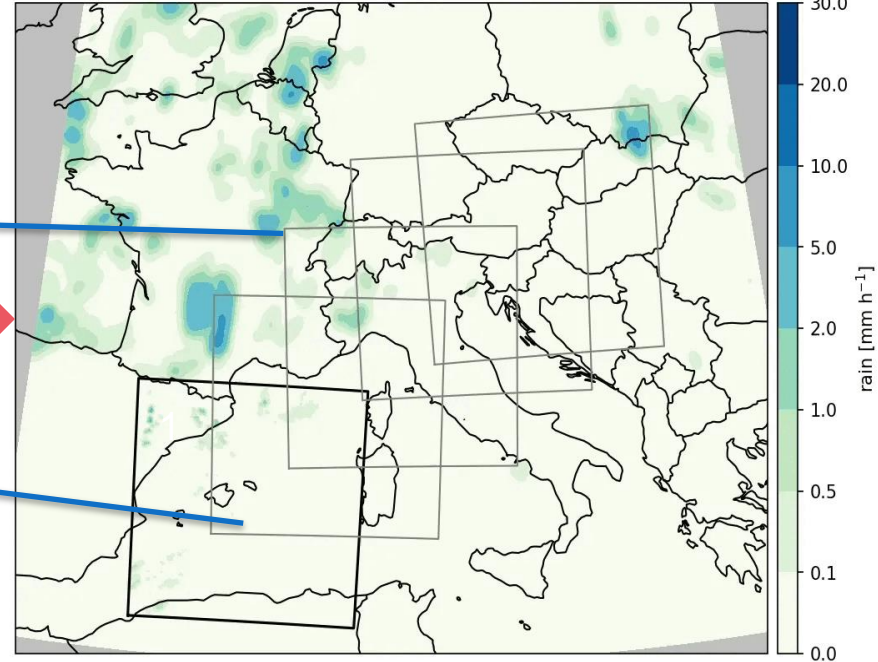
EXTREMES DT: A MAGNIFYING GLASS ON EXTREME EVENTS

Globally, 4 days ahead, 2-4km

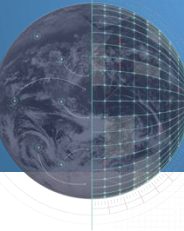


over Europe, 2 days ahead, 500-750m

Hourly precipitation for for init +1 hours



How will the approaching storm affect solar energy?



EXTREMES DT: STATUS

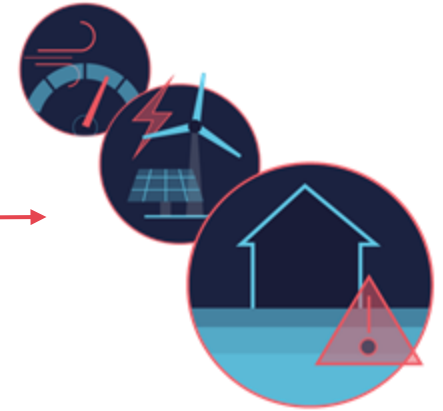


GLOBAL

DETECTION/
TRIGGERING



REGIONAL



Global and **daily** simulations of extreme weather
4 days ahead at **4.4km**

On-Demand regional simulations
2 days ahead at **750m** to **500m**

Impact-sector models:
user-relevant information for societal impacts

IFS-NEMO

Arome
Harmonie-Arome
Alaro



DESTINATION EARTH

THANK YOU

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Berlin, October 22nd 2024



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