DESTINATION EARTH

THE CLIMATE CHANGE ADAPTATION DIGITAL TWIN

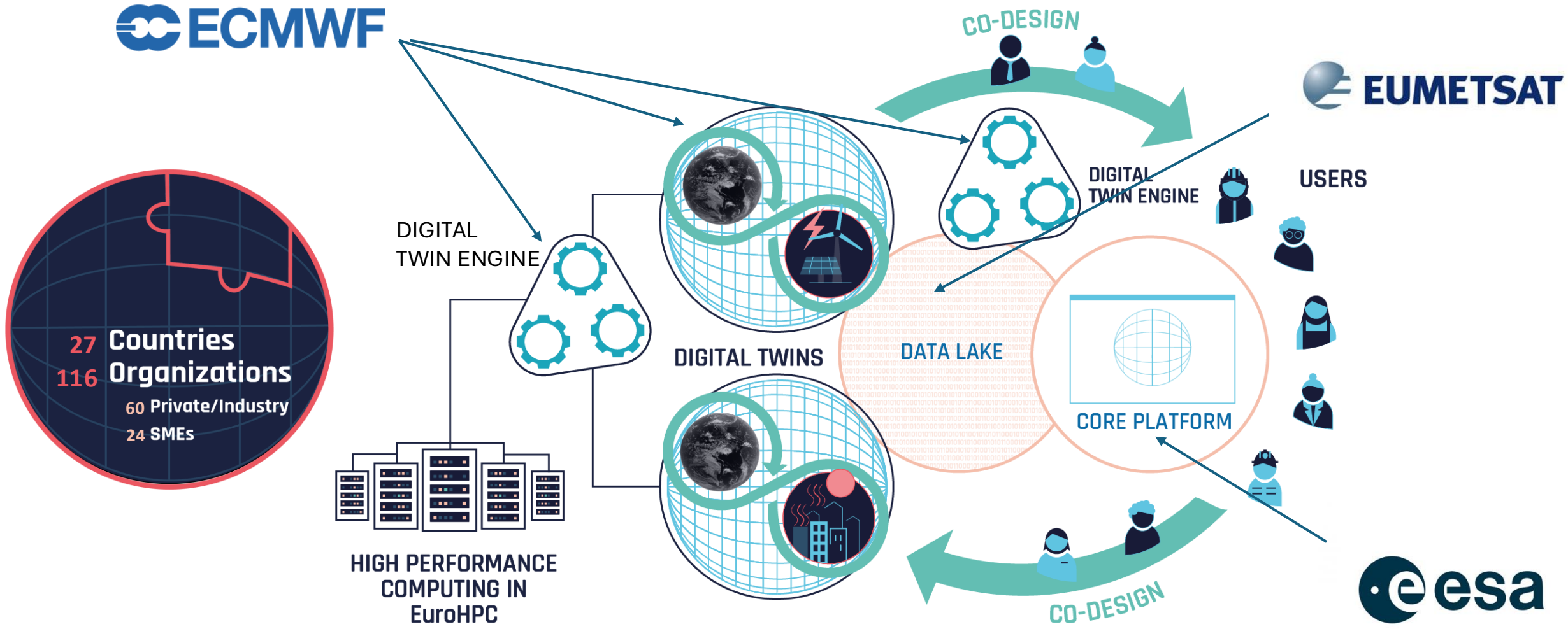
Sebastian Milinski

sebastian.milinski@ecmwf.int

Funded by the European Union

Destination Earth implemented by ECMWF esa EUMETSAT

DestinE: A NOVEL INFORMATION SYSTEM



The Climate Change Adaptation Digital Twin

Operational production of km-scale multi-decadal climate projections

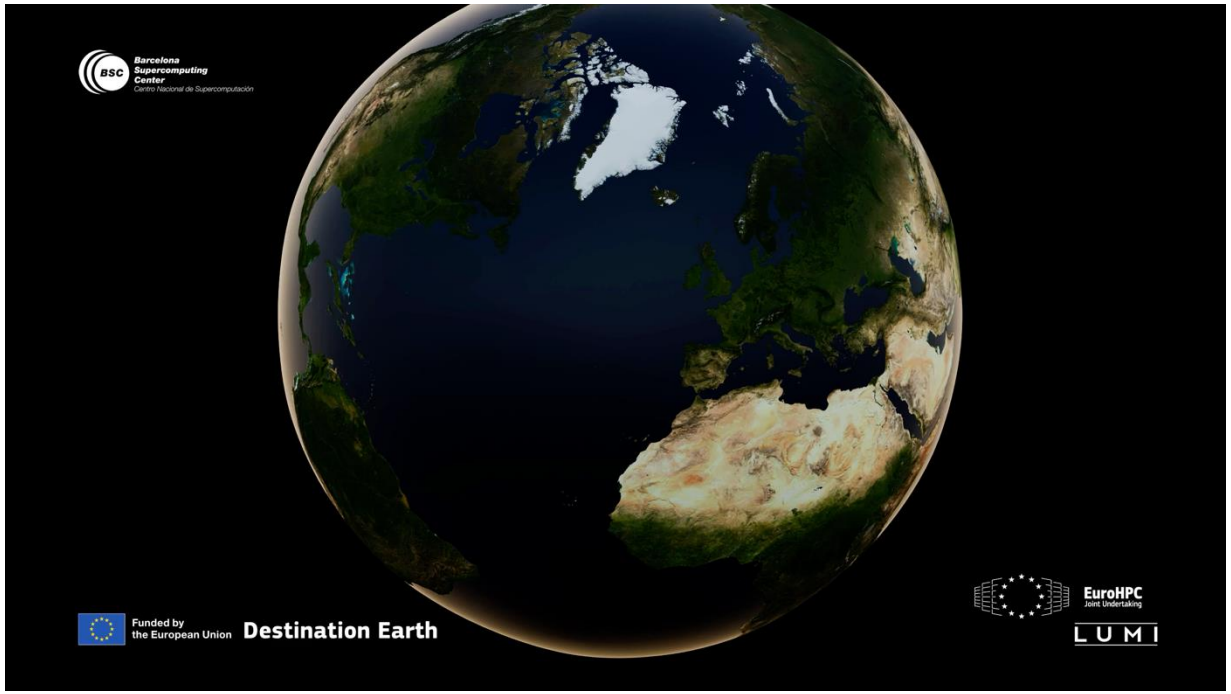
- 5-10 km resolution
- Global information with local granularity
- Bringing Earth System Models and impact sector models within the same workflow
- Regular production
- Flexible on-demand production

12-member European consortium, led by CSC

CSC
ALFRED-WEGENER-INSTITUT HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG
Barcelona Supercomputing Center Centro Nacional de Supercomputación
Hewlett Packard Enterprise
Deutscher Wetterdienst Wetter und Klima aus einer Hand
DKRZ DEUTSCHES KLIMARECHENZENTRUM
ILMATIETEEN LAITOS METEOROLOGISKA INSTITUTET FINNISH METEOROLOGICAL INSTITUTE
UNIVERSITY OF HELSINKI
MAX-PLANCK-INSTITUT FÜR METEOROLOGIE
Politecnico di Torino
ISAC
HELMHOLTZ

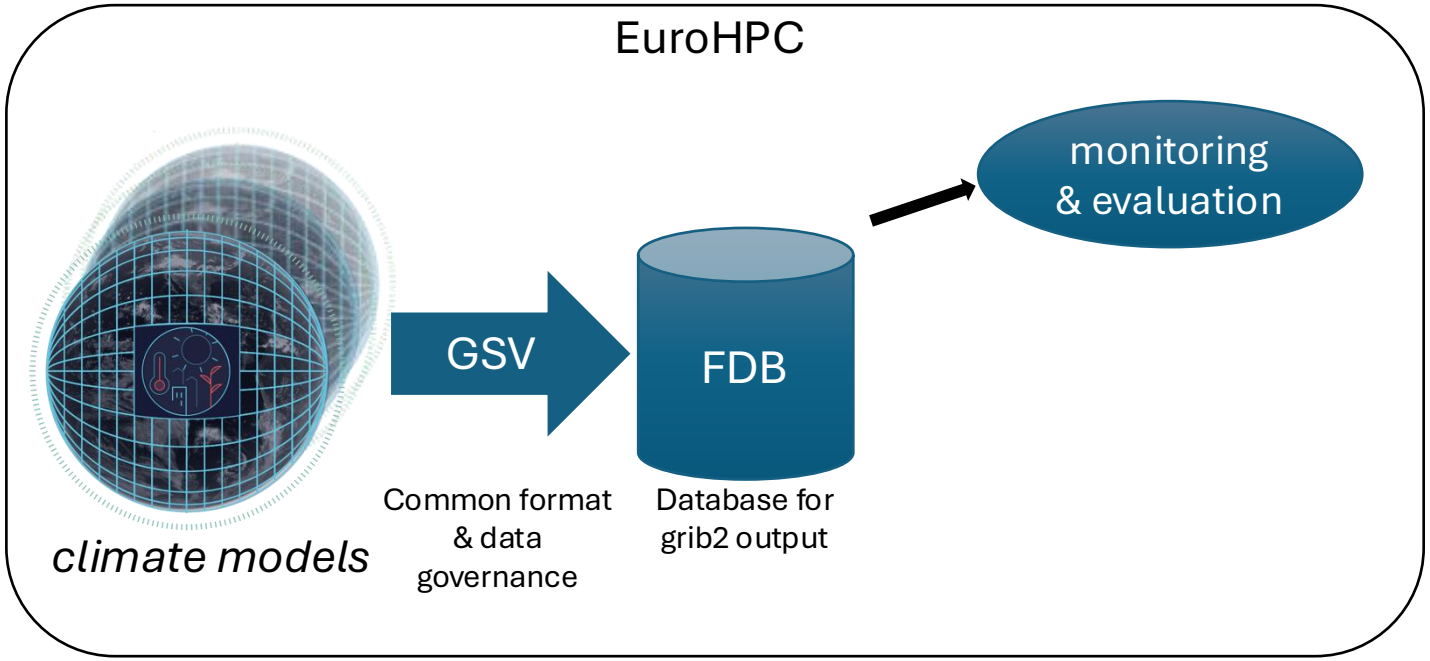
Climate DT producing tailored climate information

multi-decadal km-scale climate projections



Where should we build the next wind farms knowing storm occurrences could shift depending on different scenarios?

Climate DT: Operational production of multi-decadal climate projections



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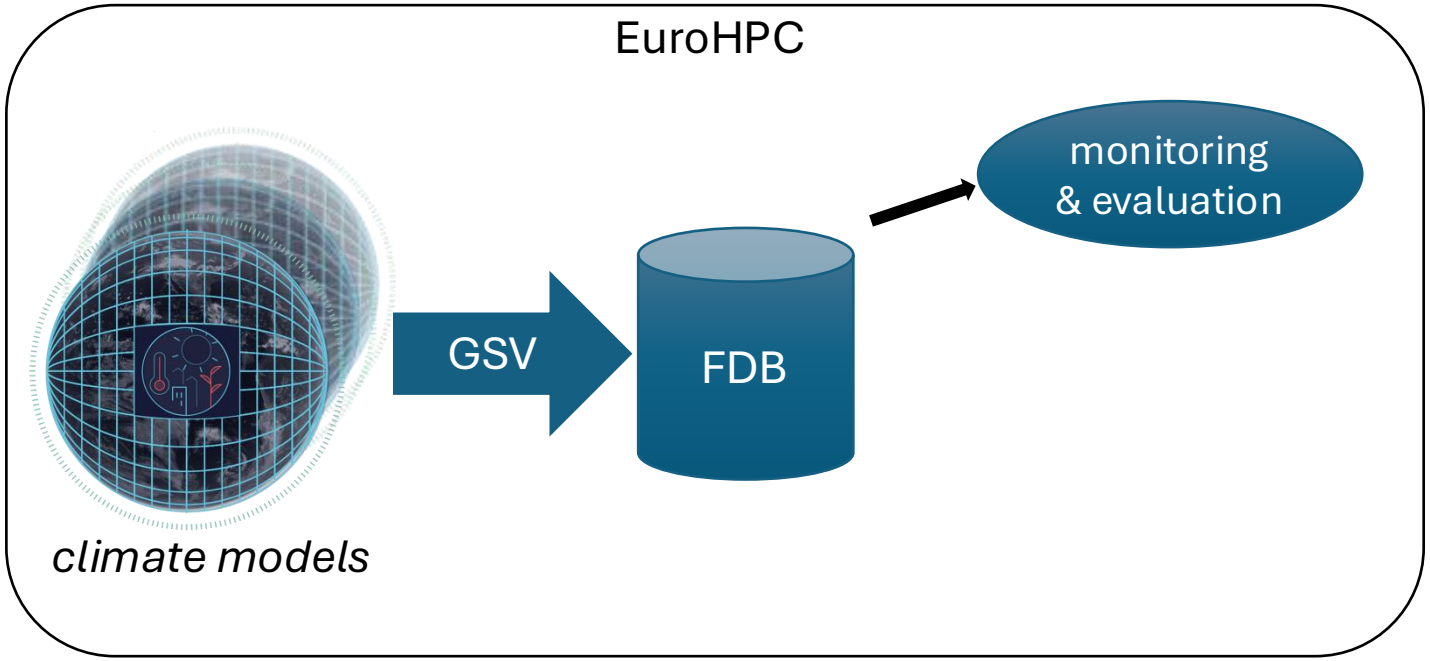
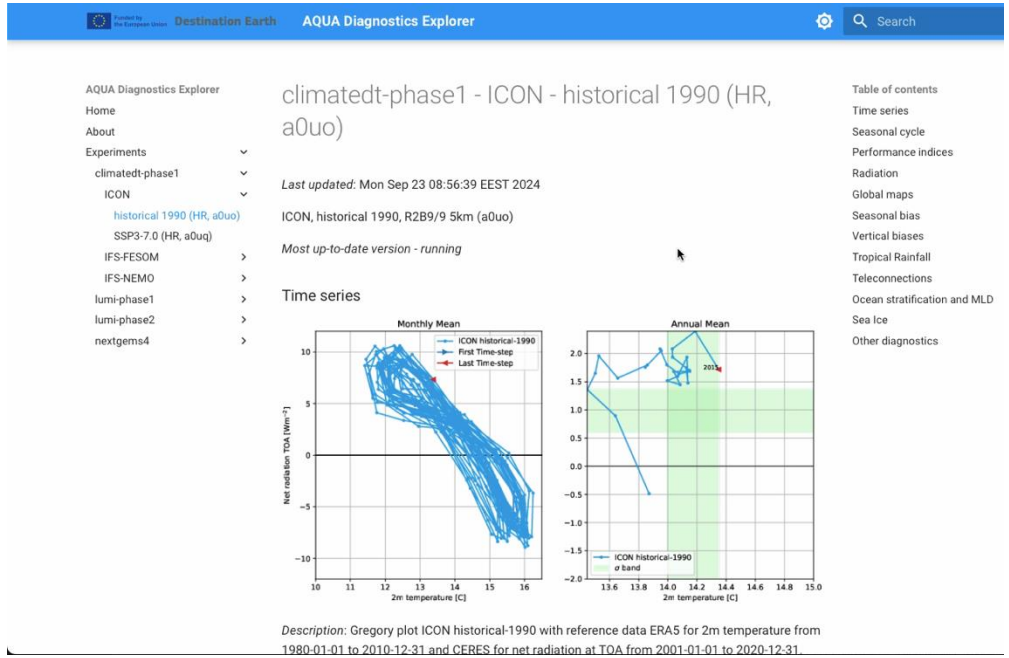


AQUA



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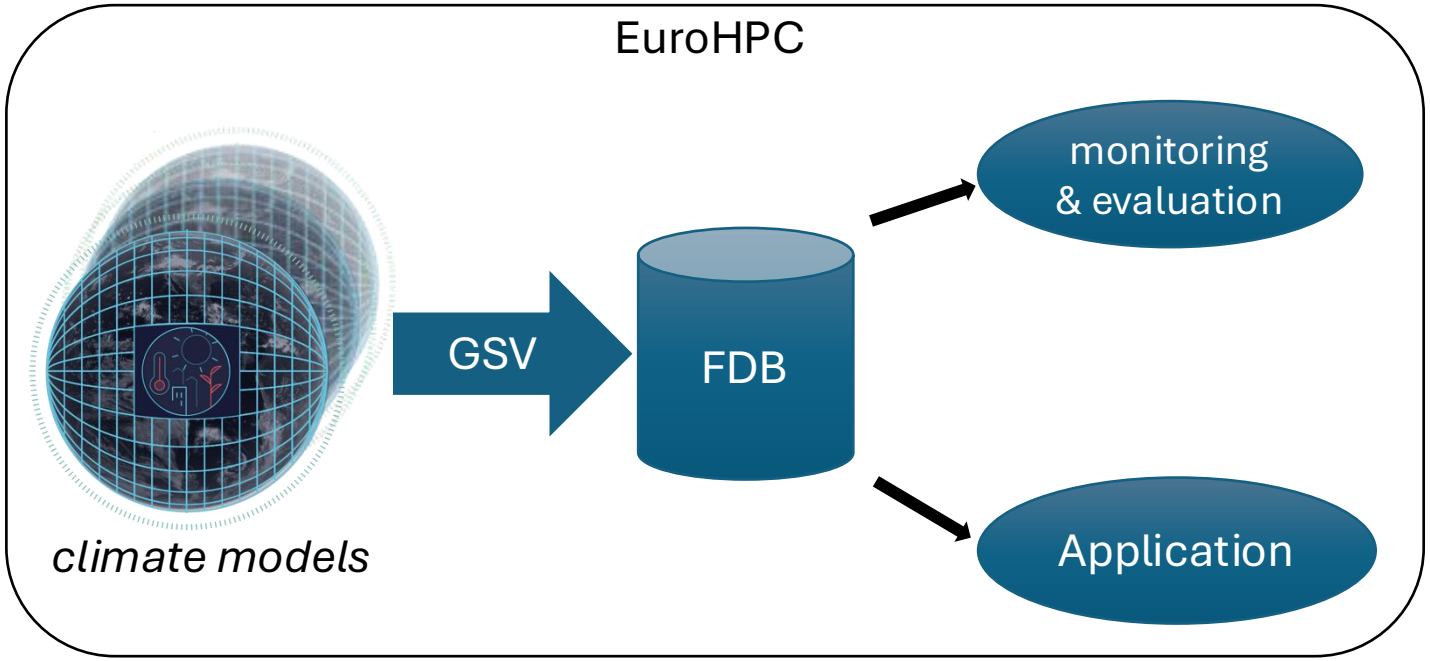

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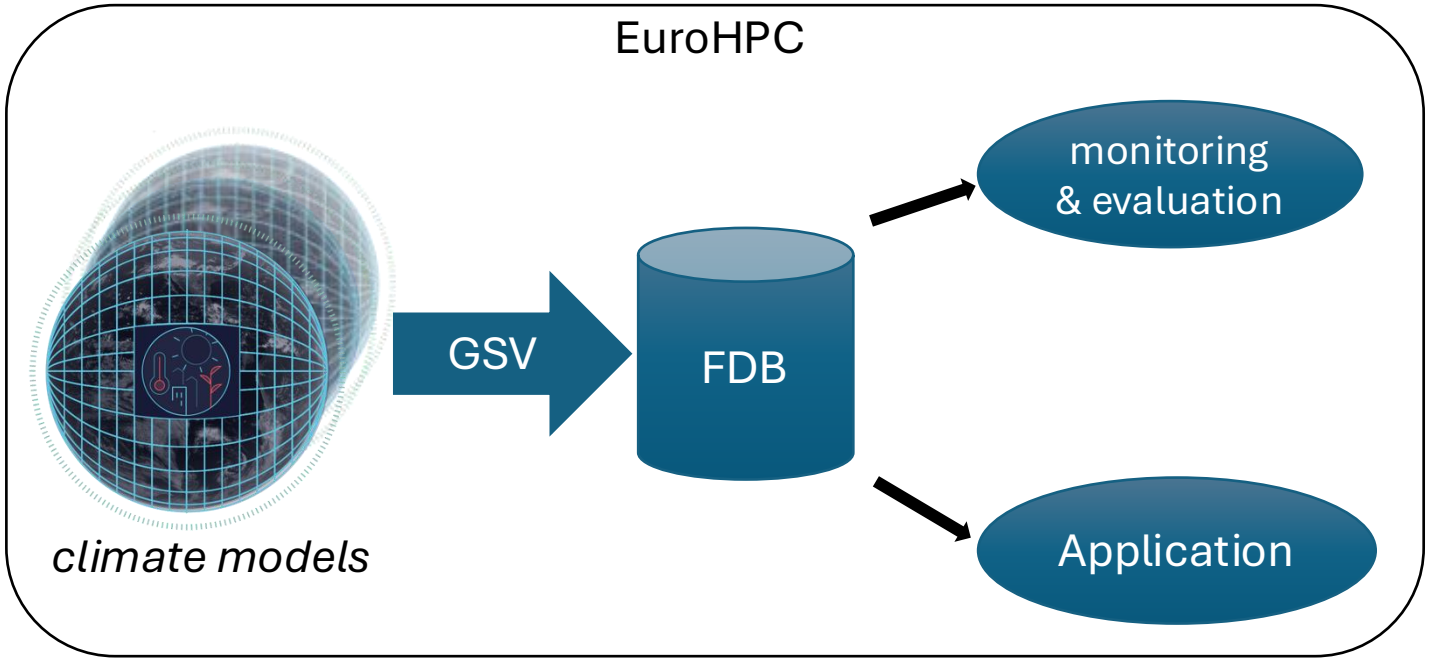
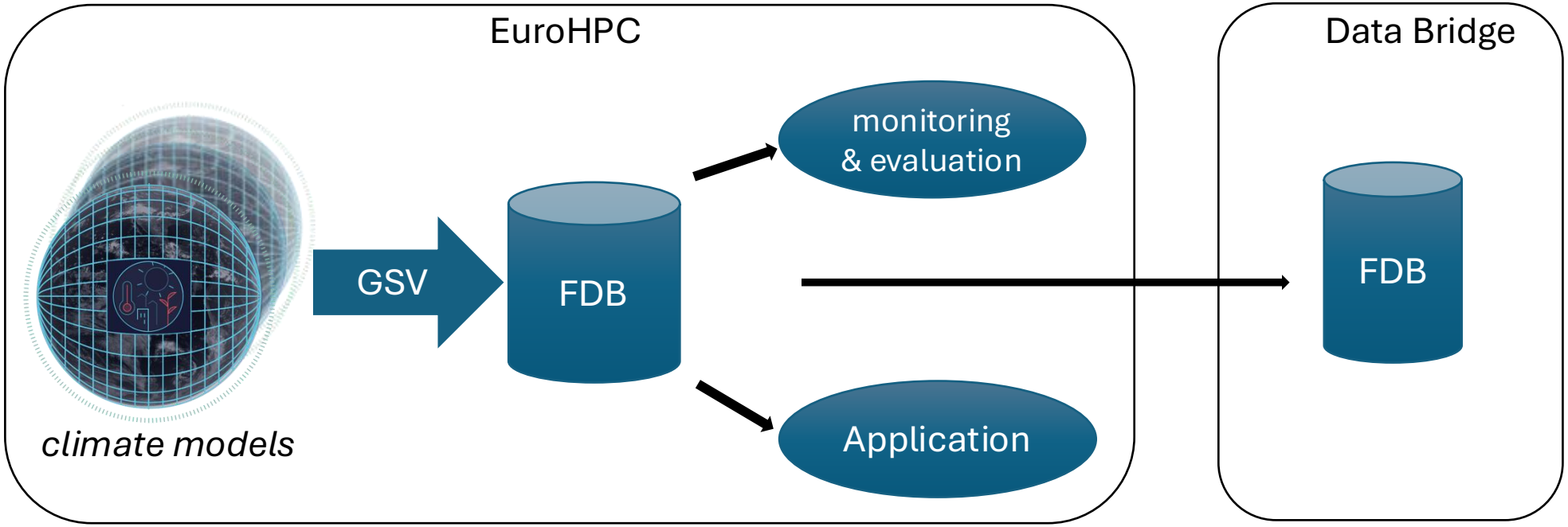
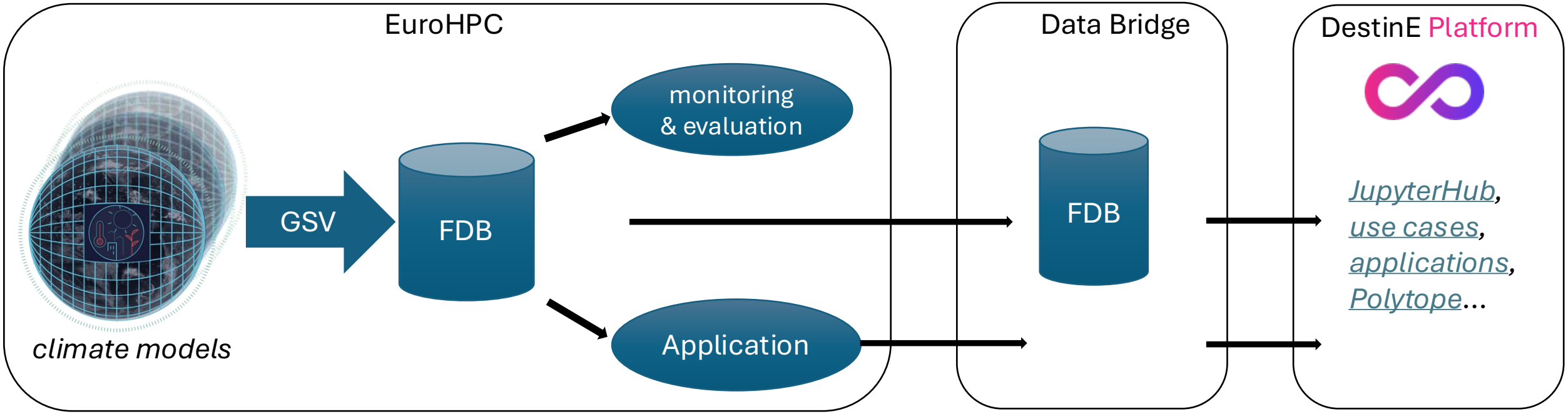


Use cases embedded in Climate DT

Climate DT: Operational production of multi-decadal climate projections



Climate DT: Operational production of multi-decadal climate projections



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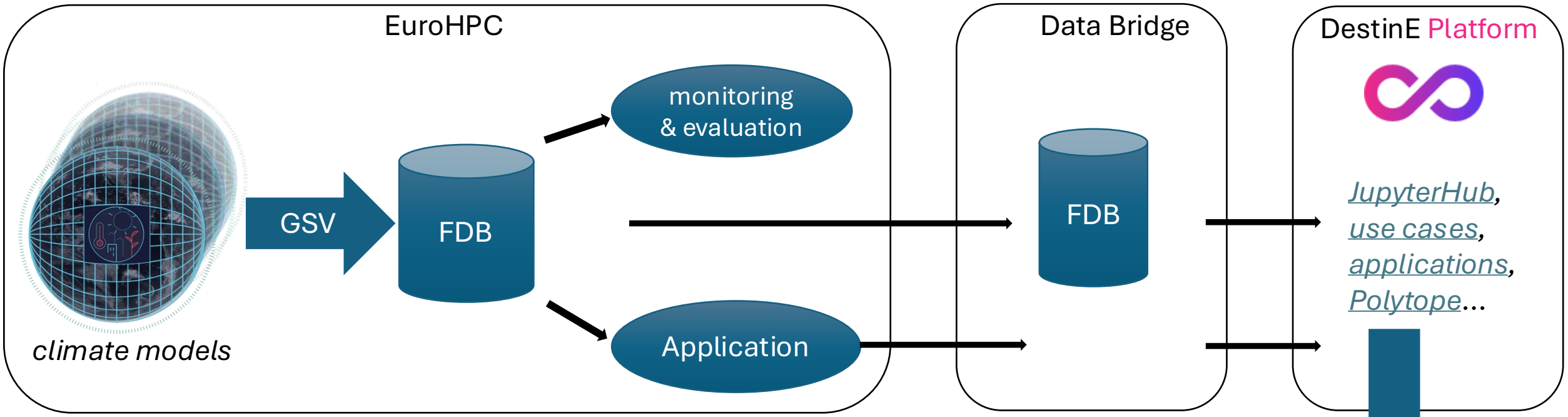
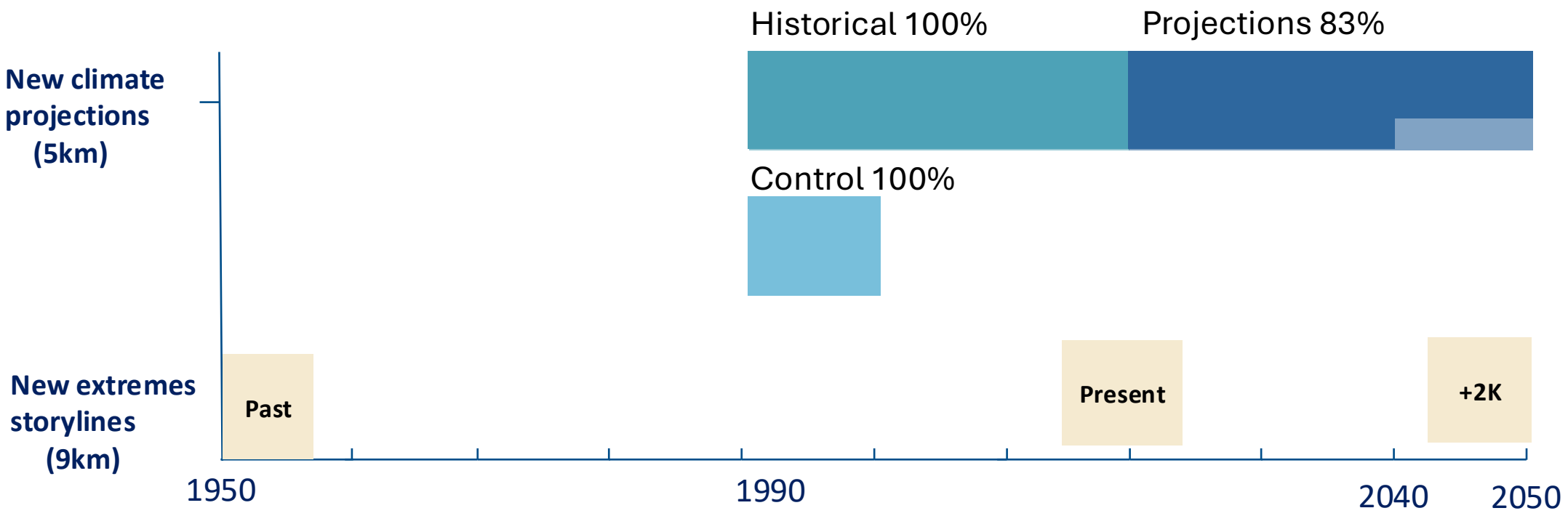


ECMWF

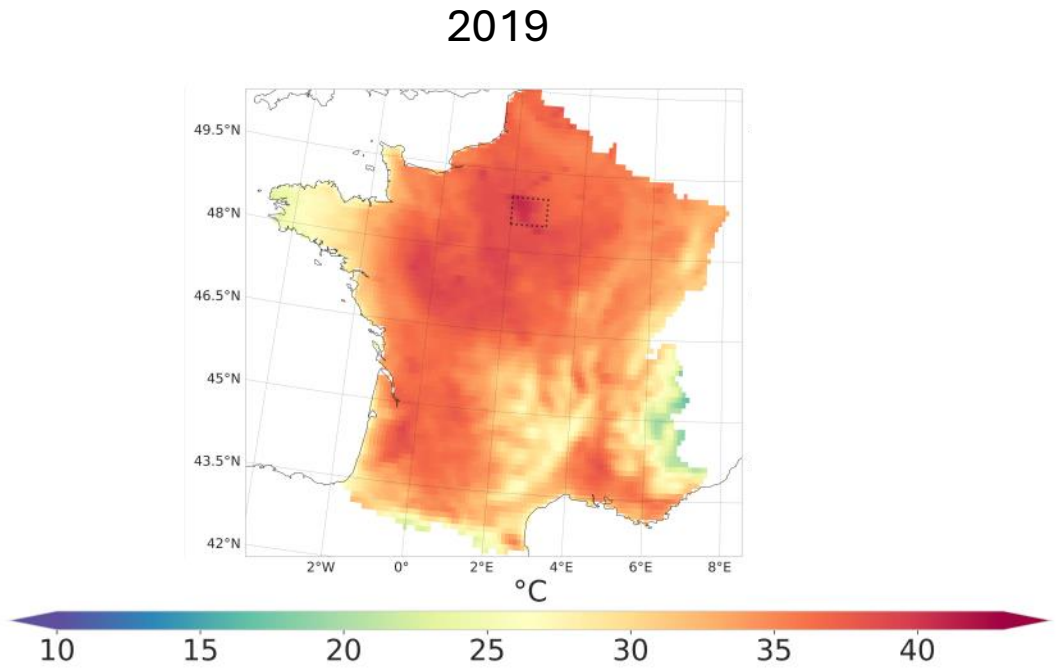
New simulations available soon



CLIMATE DT: storylines of extreme events – 2019 heatwave

“What-if” the 2019 heatwave occurred in 1950 or 2049 ?

IFS-FESOM with large-scale nudged towards ERA5 (2017-2023)



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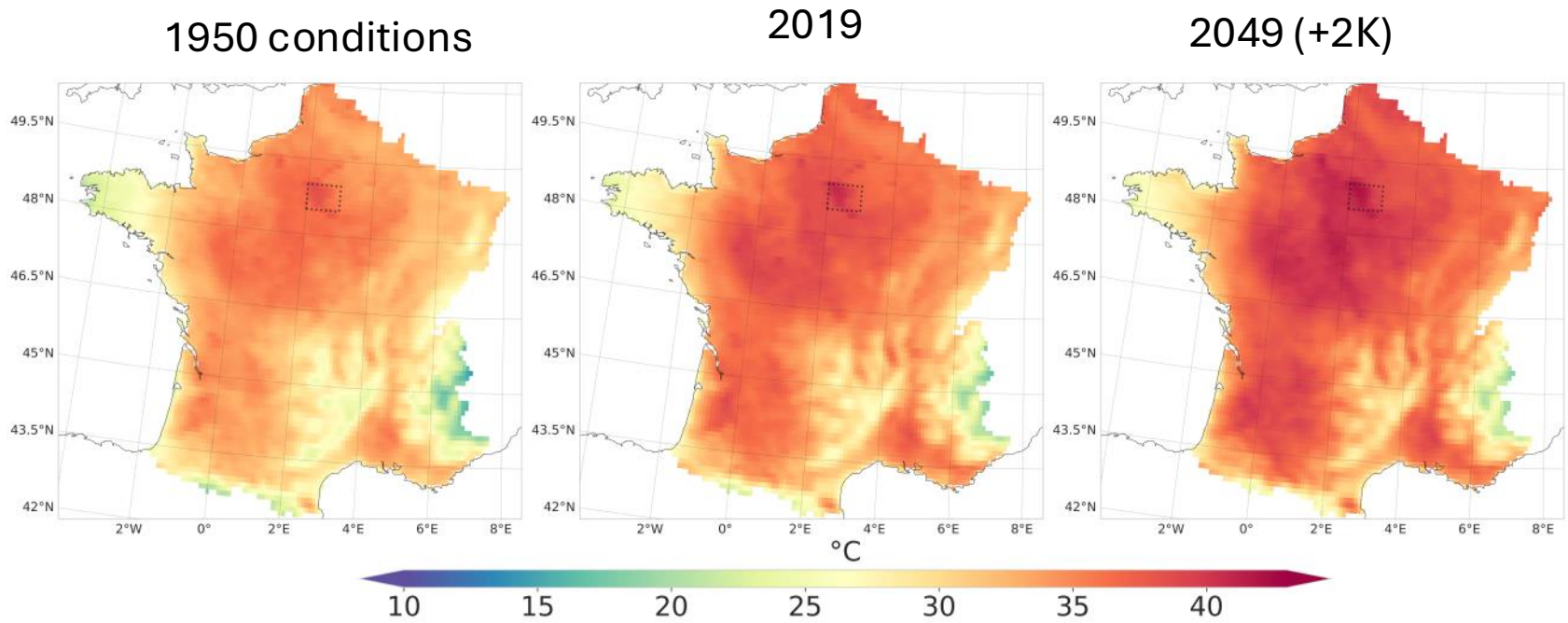

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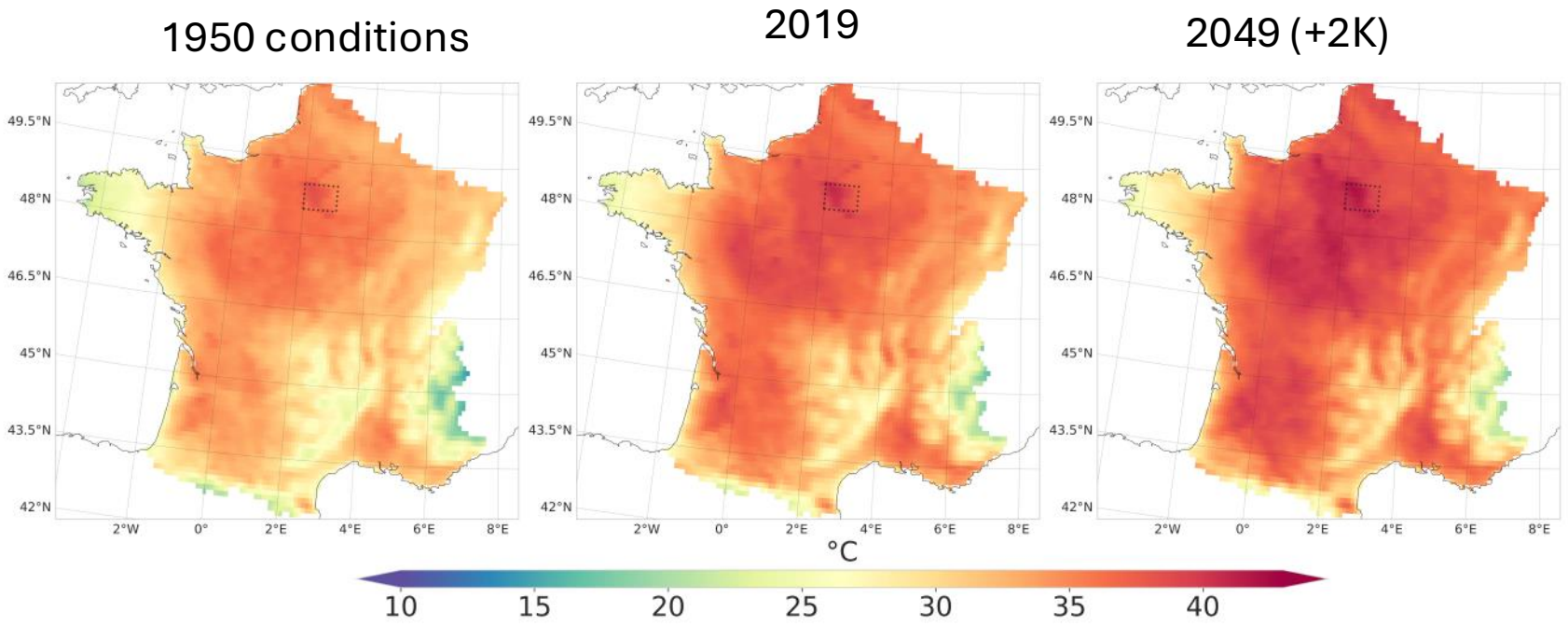

d) Maximum 2m-temperature (Paris)

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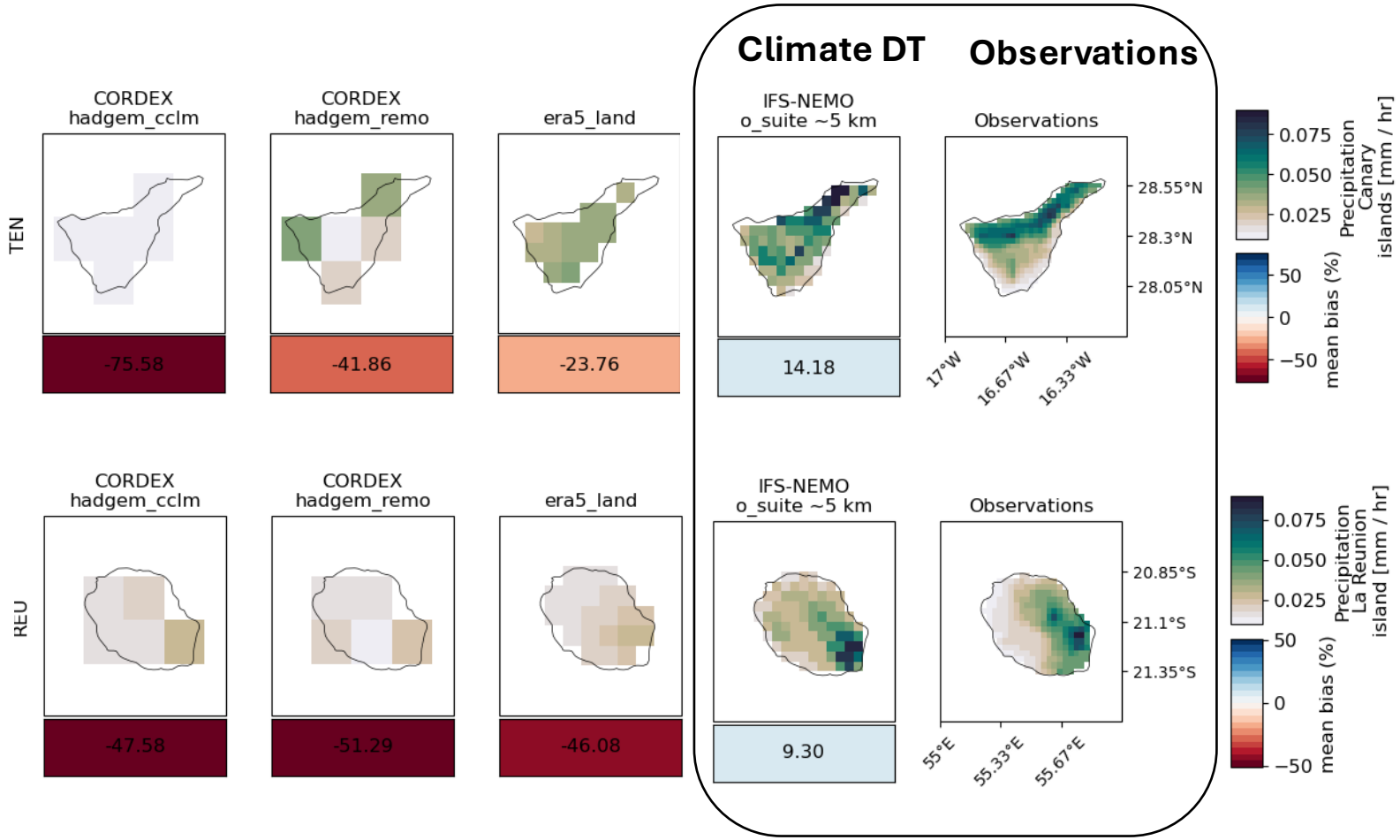
2049	29.5	28.8	28.2	27.9	27.7	27.7	29.0	31.0	33.4	35.9	38.1	39.9	41.0	41.8	42.1	41.8	41.8	40.4	38.9	36.9	34.8	33.5	31.9	30.6
2019	30.1	29.2	28.5	28.0	27.4	27.1	28.1	29.9	32.4	35.0	37.2	38.8	39.8	40.5	40.8	40.9	40.5	39.4	38.8	37.3	35.5	34.1	32.8	31.5
1950	27.1	26.4	25.7	25.2	24.5	24.3	25.3	27.3	29.6	31.9	34.2	35.9	37.2	37.9	38.2	38.3	37.1	37.0	36.7	35.4	33.1	31.4	30.1	29.1

Maximum 2m temperature (Paris)

CLIMATE DT: CAPTURING LOCAL DETAILS



WHAT'S NEXT?

- **New set of simulations** with upgraded models
- **Lower emission scenario** to complement SSP3-7.0
- **Operate** & **upgrade** digital twins & engine
- Run **regular** & bespoke '**what-if**' simulations
- Tailored **AI-ready** datasets, AI Earth system model & AI solutions

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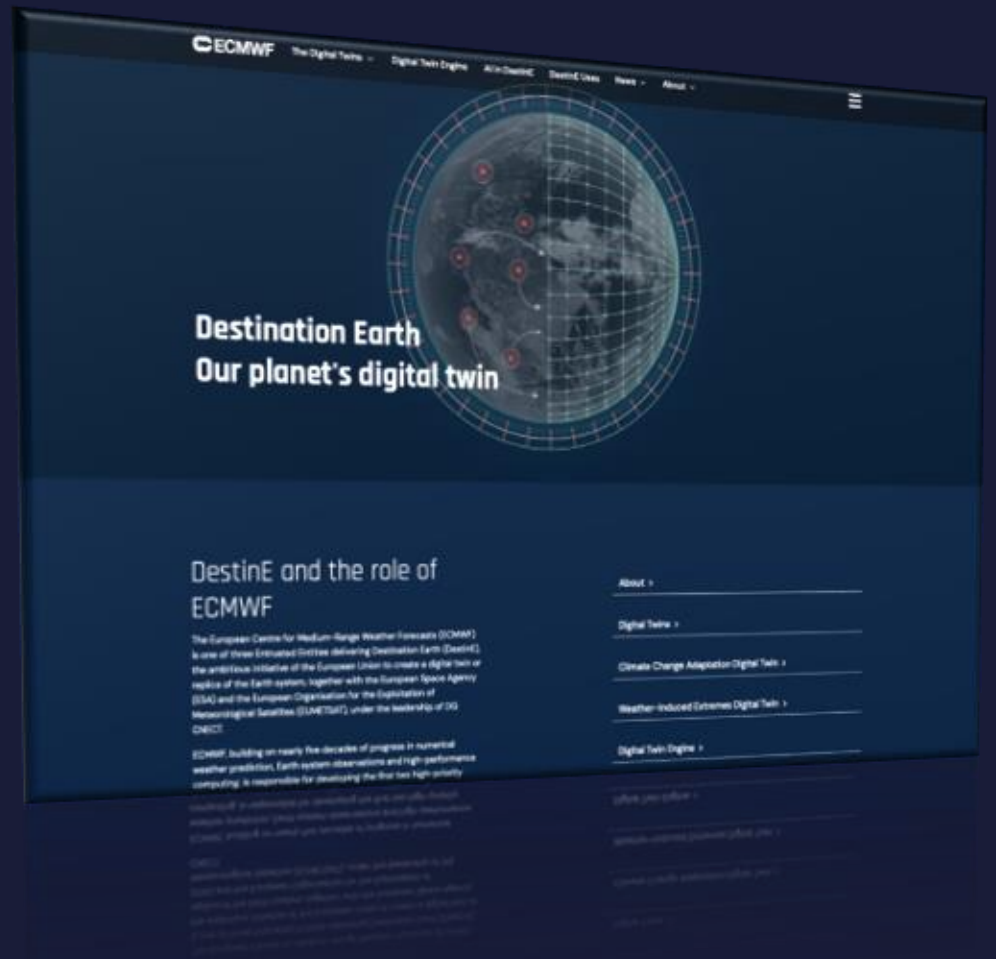
SEBASTIAN.MILINSKI@ECMWF.INT



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