DestinE supporting European Climate Risk Assessments: Concept note

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Background

The first European Risk Assessment (EUCRA), published by the European Environment Agency (EEA) in March 2024, conducted a structured risk assessment of 36 major climate risks for Europe from various sectors and systems (energy, food security, ecosystems, infrastructure, water resources, financial systems, human health, etc) complemented by risk storylines of selected compound climate risks across systems. The approach and the results of the project were well received by the European Commission and other key stakeholders. The scoping phase of the follow-up ("EUCRA-2") has just commenced. EUCRA-2 is expected to be published in 2028. A scoping phase has commenced and a reflection paper by the European Topic Centre on Climate Change Adaptation and LULUCF (ETC-CA; contracted by the EEA) is expected to be completed in June 2025.

Destination Earth (DestinE) offers an opportunity to support the development of EUCRA-2 and further assessments, as well as decision making on climate change adaptation in Europe more generally. Benefits from the Destination Earth initiative and its Digital Twin on Climate Change Adaptation ("Climate DT") in particular are anticipated in

1. Contributing quantitative information on selected hazards via simulations of impacts, including dedicated investigations of tail risks
2. Simulating "adaptation pathways" to support analyses and evaluation of adaptation choices
3. Provision of event statistics, including probabilistic, in climate scenarios

The range of use cases, demonstrators and pilot services implemented during DestinE Phases 1 and 2 can contribute to these elements. The Adaptation Modelling Framework (AMF) for DestinE developed under contract of ECMWF under co-direction by EEA and ECMWF is expected to be used in managing adaptation options with DestinE.

DestinE-provided simulations and analyses should complement the hazard estimates and indices contributed from the operational Copernicus Climate Change Service (C3S) and other Copernicus services (notable land, emergency and atmospheric monitoring services).

The aim of this workshop

This first workshop aims to define pathways how DestinE could contribute to EUCRA-2 (e.g., specific products, simulations). A key outcome of the workshop will be a shared understanding on the data, tools, and services that could be provided by DestinE to underpin the next EUCRA. The discussion will be based on the **reflection paper** for EUCRA-2 (expected June 2025), that considers the expectation of CLIMA and EEA for EUCRA-2.

Concretely, the workshop aims to establish answers to the following questions:

1. How can DestinE, notably the capabilities in the Climate DT, contribute to a more quantitative risk assessment in EUCRA-2?
    - In which sectors could DestinE impact-sector simulations contribute to derive hazard estimates?
    - Which models and approaches are available and sufficiently mature to contribute to quantifying risk estimates (eg probabilistic and stochastic outputs), including for compound risks?
    - Which approaches could support the treatment of tail risks with DestinE Climate DT?
    - Which indicators or datasets from or using DestinE Climate DT could support a probabilistic risk assessment in EUCRA-2.
2. How can DestinE, notably the capabilities in the Climate DT, support EUCRA-2 in investigating the "solution space" (i.e., adaptation options)?
    - Which adaptation pathways could be used as a basis for this investigation? Which sectors should we focus on?
    - What indicators can be provided to quantify the efficiency of selected measures (cost of action vs. cost of inaction)?

The workshop should achieve a clear understanding of what would need to implemented in support of EUCRA-2 and how EUCRA-2 actors will integrate this into their assessment. Specifically, Commission services and implementing entities of DestinE and Copernicus should be in a position to assess the resource requirements and technical and programmatic feasibility of the actions discussed at the workshop.

Participants

The workshop should accommodate participants with various roles, background, expertise to facilitate posing the right questions on climate change adaptation issues and finding the most effective way of answering these.

Institution	Role(s)
EEA	Ensure alignment with EUCRA2 scope; validate feasibility and value of uptake; validate match in timelines;
ECMWF	Propose contributions, confirm feasibility of ECMWF-resourced contributions, including via DT Climate, pilot services, and demonstrators;
DT Climate contractors	Propose contributions, validate feasiblility, maturity, estimate resource requirements
EUCRA writing team / reflection paper team /ETC	Propose contributions, confirm value of potential contributions, ensure alignment with scope and timelines for EUCRA-2
DG JRC	Propose contributions, confirm feasibility and resources of JRC-provided contributions;

ESA	Propose contributions, confirm feasibility of ESA-resourced contributions, including via DESP
EUMETSAT	Propose contributions, confirm feasibility of EUMETSAT-resourced contributions, including via DEDL
DG CLIMA	Provide policy framing
DG CNECT	Provide policy framing

To ensure sufficient breadth in expertise and engagement of relevant institutions and allow for sufficient room for effective discussion, we expect that this workshop will attract 40-50 participants total.

Potential sector specific workshop topics to explore

Introduction of impact chains

- Quantifying risk assessments
    - Identify near- and mid-term risks to be addressed with support from DestinE capabilities
    - Prioritize where DestinE should be used to provide input (e.g. based on relevance/impact, likelihood, severity, ability to quantify, potential for significant process over existing models)
    - Identify input for EUCRA2 (parameters, indices, uncertainties, tools)
    - Identify relevant approaches, models, and data.
- Scenario modelling and its translation into impacts: what can be included and what cannot?
    - Integrating the interactions of the biosphere and the climatic developments in the plausible best-case and plausible worst-case
    - Correcting the conservative bias in modelling (empirical developments in terms of extreme weather events and their impacts already outstripping what the models predict)
- Exploring the solution space
    - Identify adaptation options that can feasibly be modeled, including risk owner, existing services, models that could support that. (Focus on EU level)
    - Propose a metric (cost, indicator, …) to quantify