

DESTINATION EARTH

Data-driven modelling for On-demand Extremes

Thomas Nipen on behalf of the DE330 team

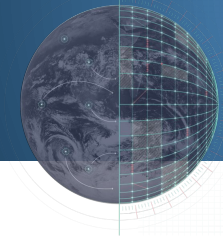


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the European Union

Destination Earth

implemented by



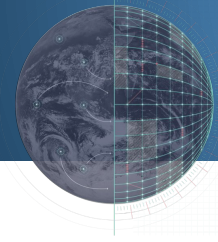


Why AI for extremes?

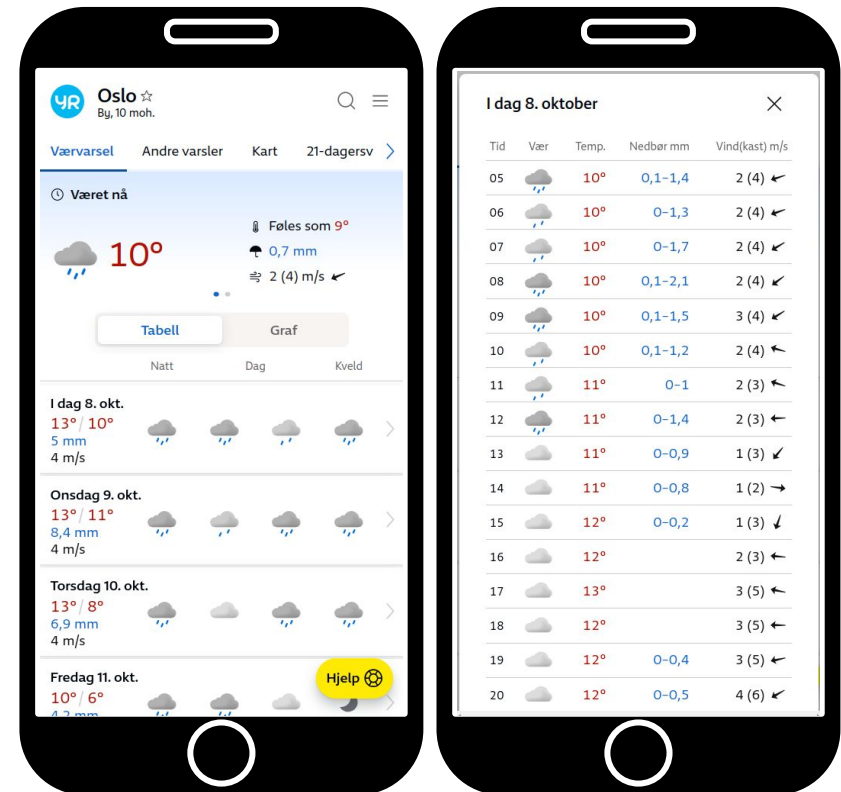
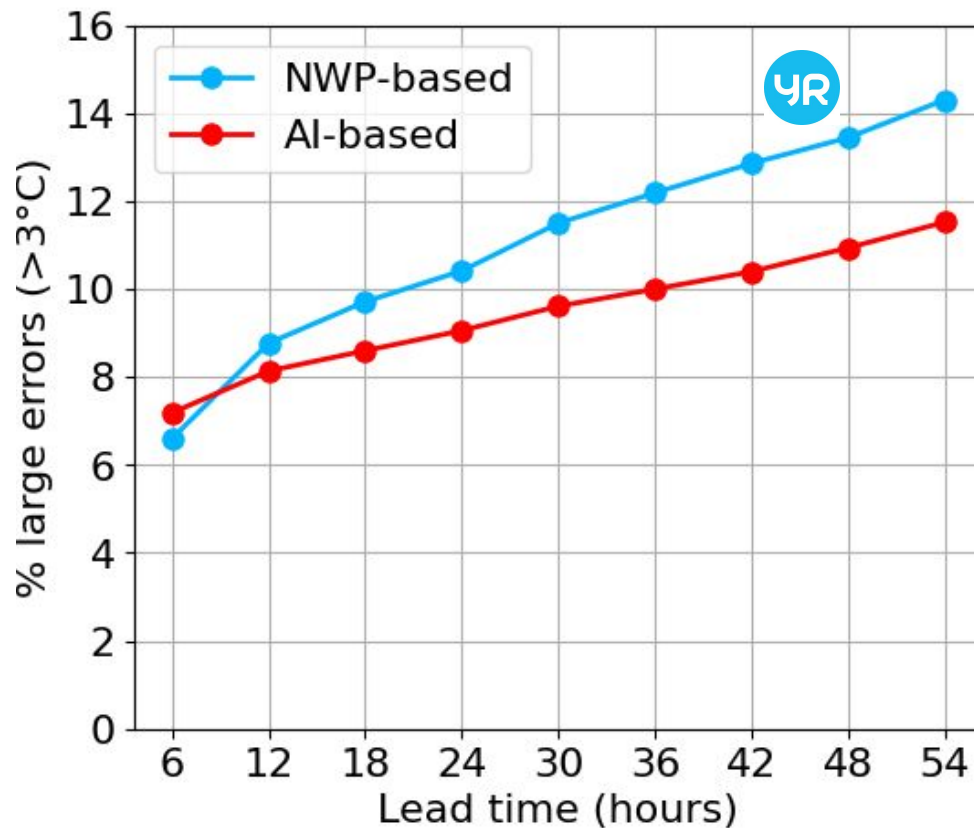
- **Computationally cheap solution** for hectometric ensemble forecasting
- Opportunity for **extensive fine-tuning** and evaluation on many past events across Europe

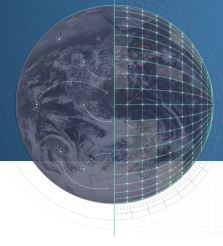


Photo: Thomas Mørch NRK



AI-models already capable of adding value in user applications





Our approach

- Extend ECMWF's **Anemoi framework** to on-demand forecasting
- Build on **regional AI-modelling approaches** (e.g. arxiv.org/pdf/2409.02891)
- Train on wide range of **high-resolution datasets** across Europe
- **Goal:** Provide high-resolution ensemble forecasts



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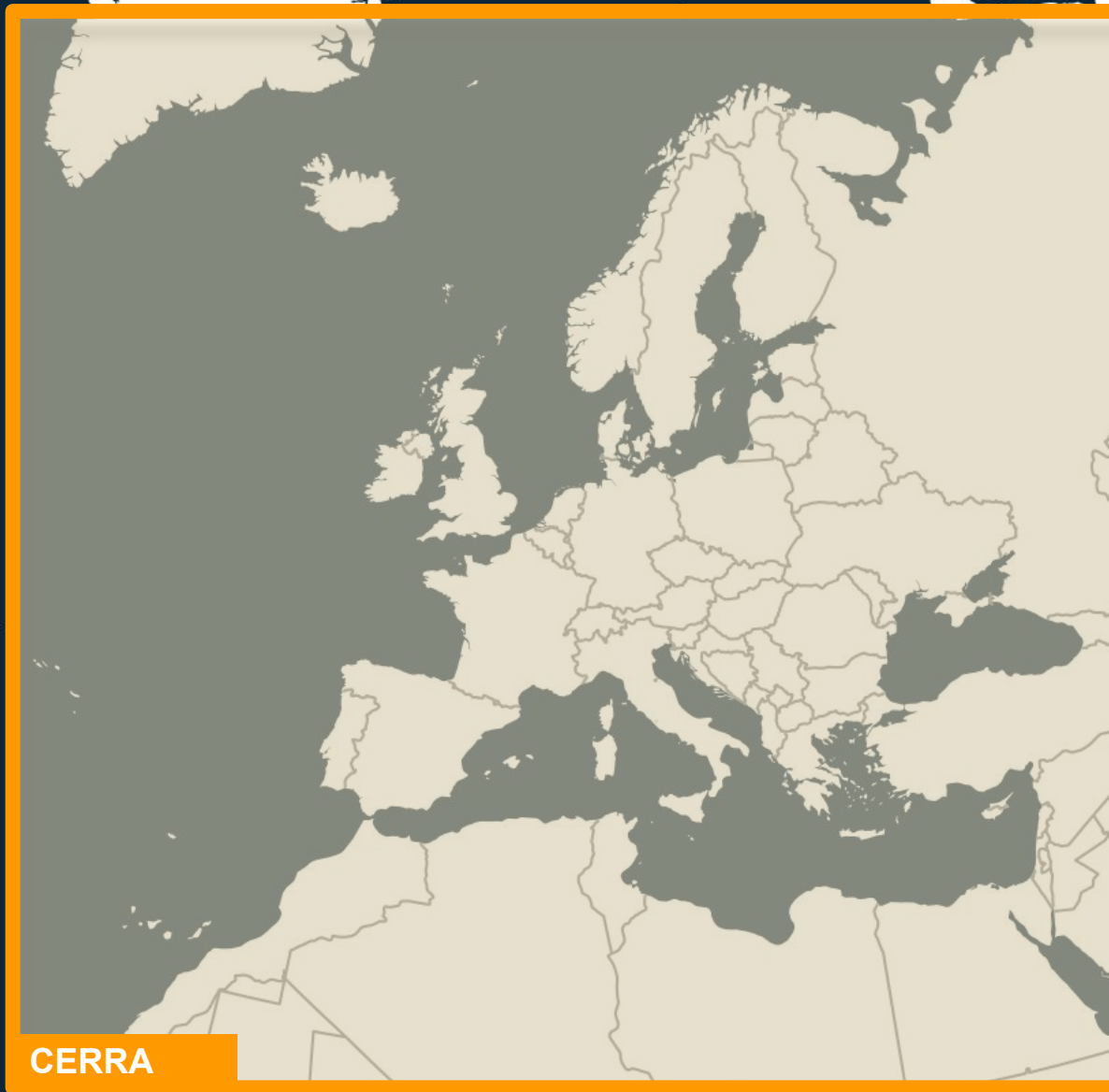
Destination Earth

Training data



1

**European
reanalyses**
5.5 km





Training data



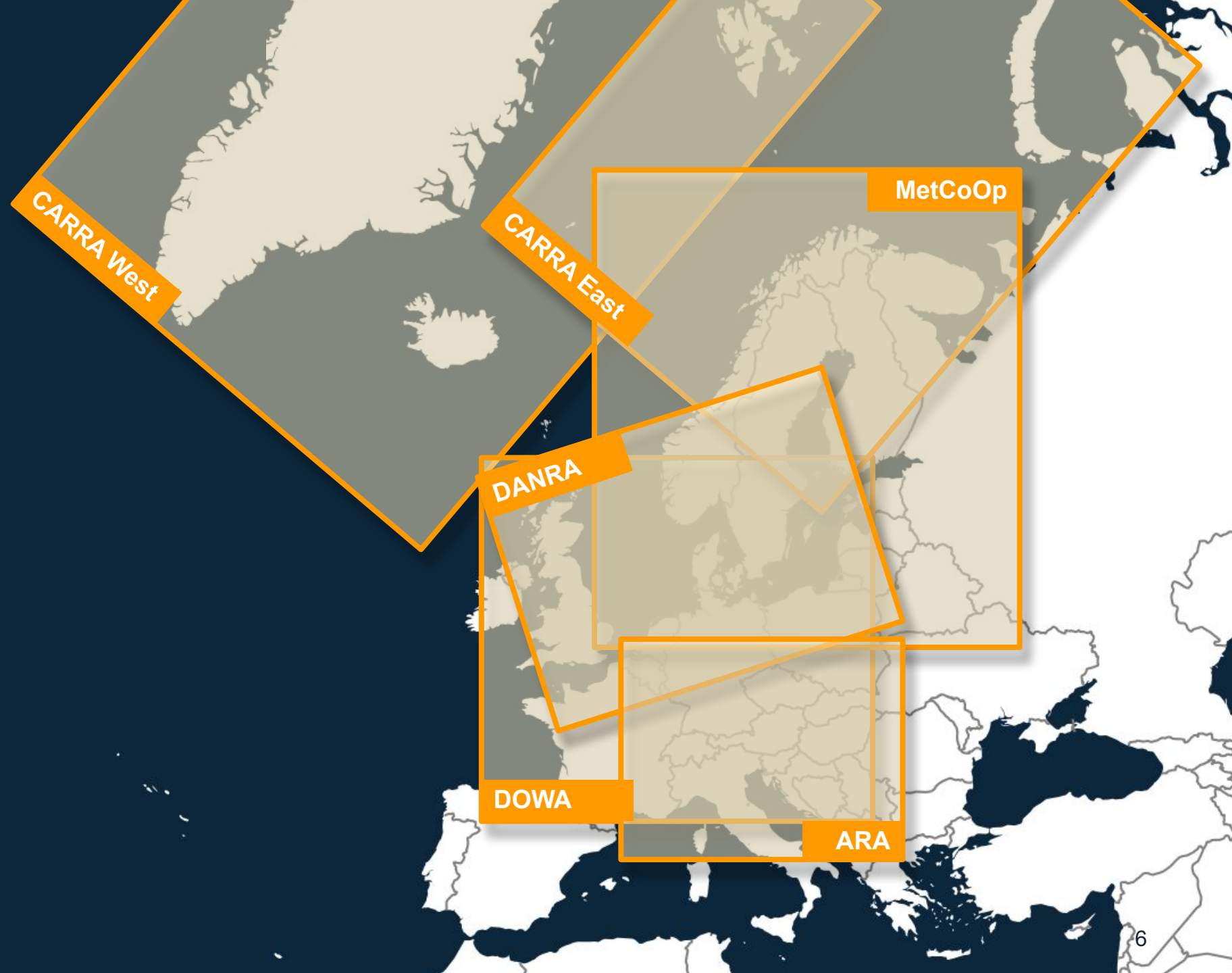
1

European
reanalyses
5 km



6

Regional
reanalyses
2.5 km





Training data



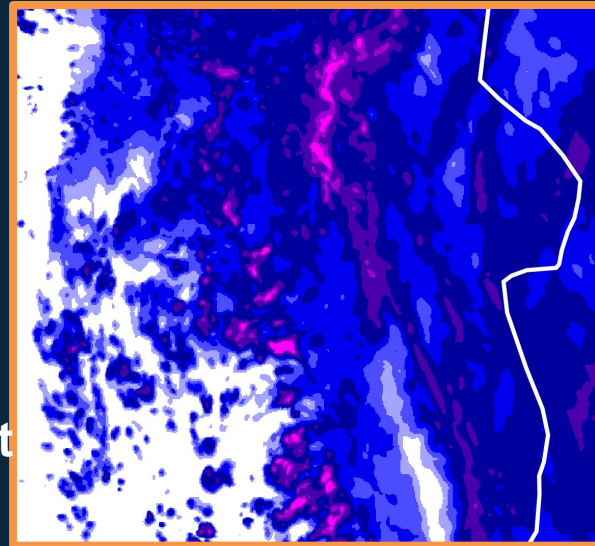
European
reanalyses
5 km



Regional
reanalyses
2.5 km



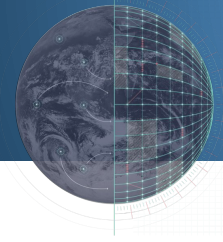
DE330 extreme event
simulations
200-750m



“Hans”

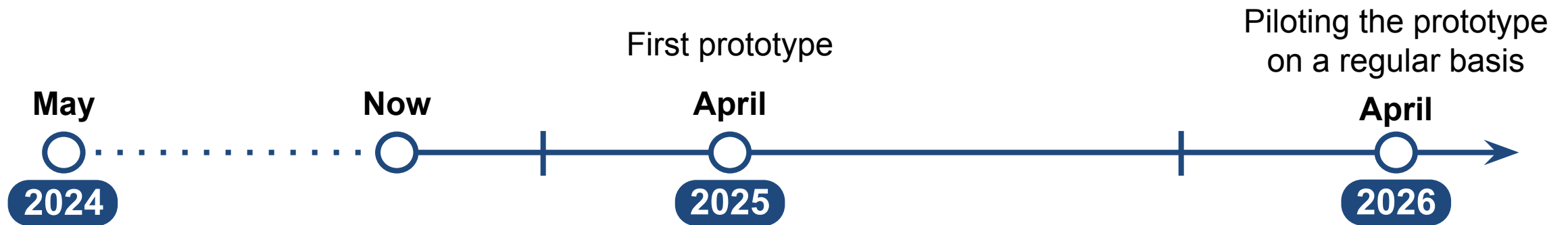
“Eunice”

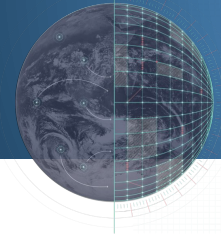
“Boris”



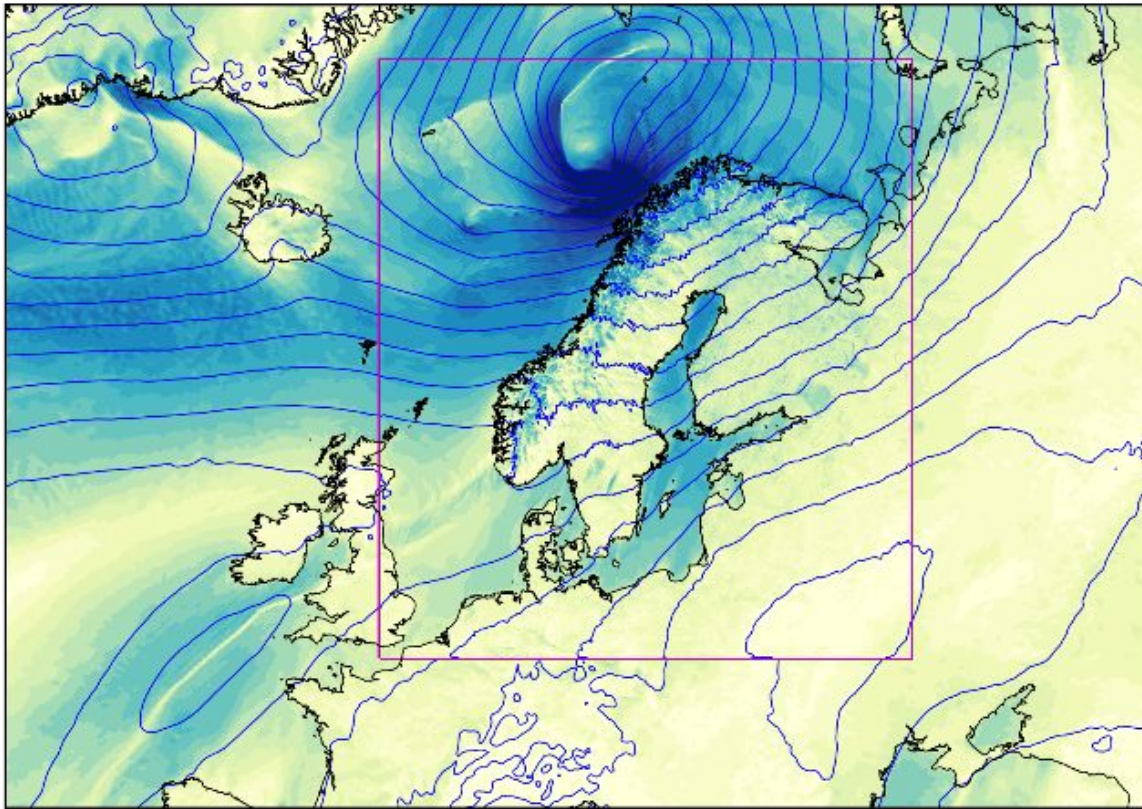
The way forward

- AI-based forecasts will be provided in the same format as for NWP

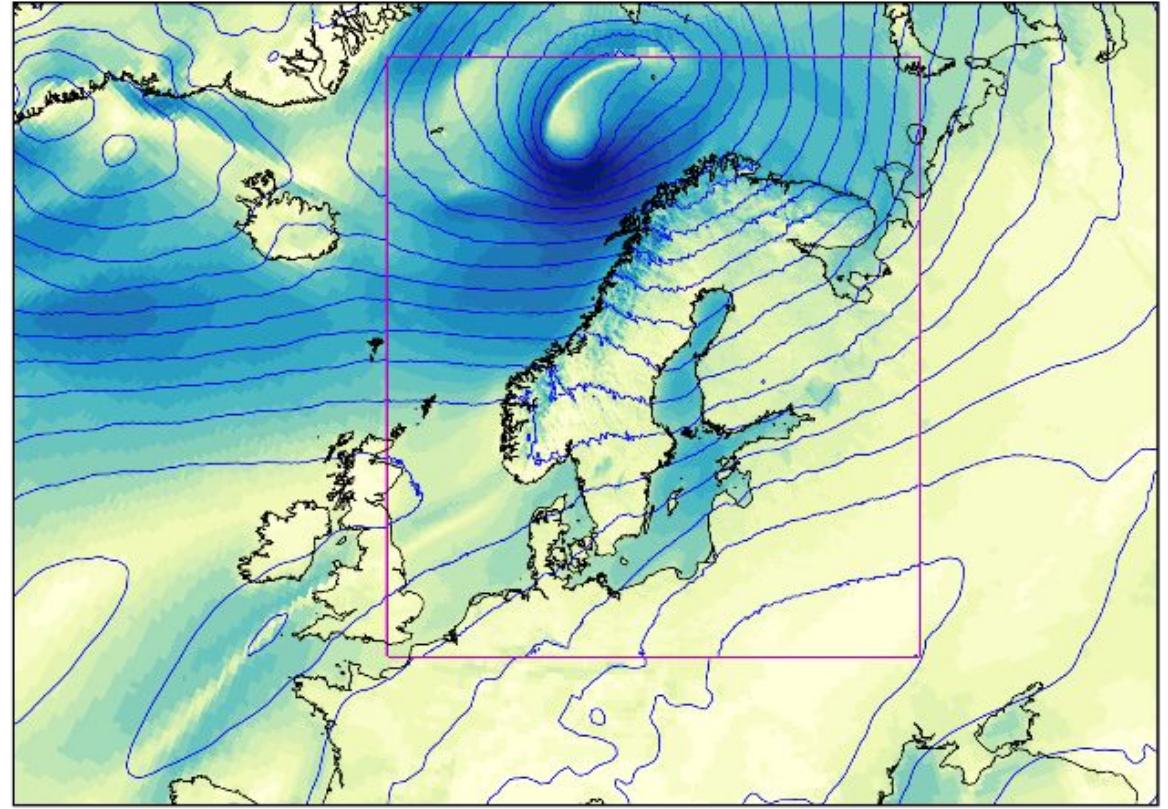




Extreme weather “Ingunn” 24 hours in advance



NWP-based



AI-based