

Forecast-In-A-Box

AI forecasting – easy to run,
simple to deploy

Powered by:



earthkit



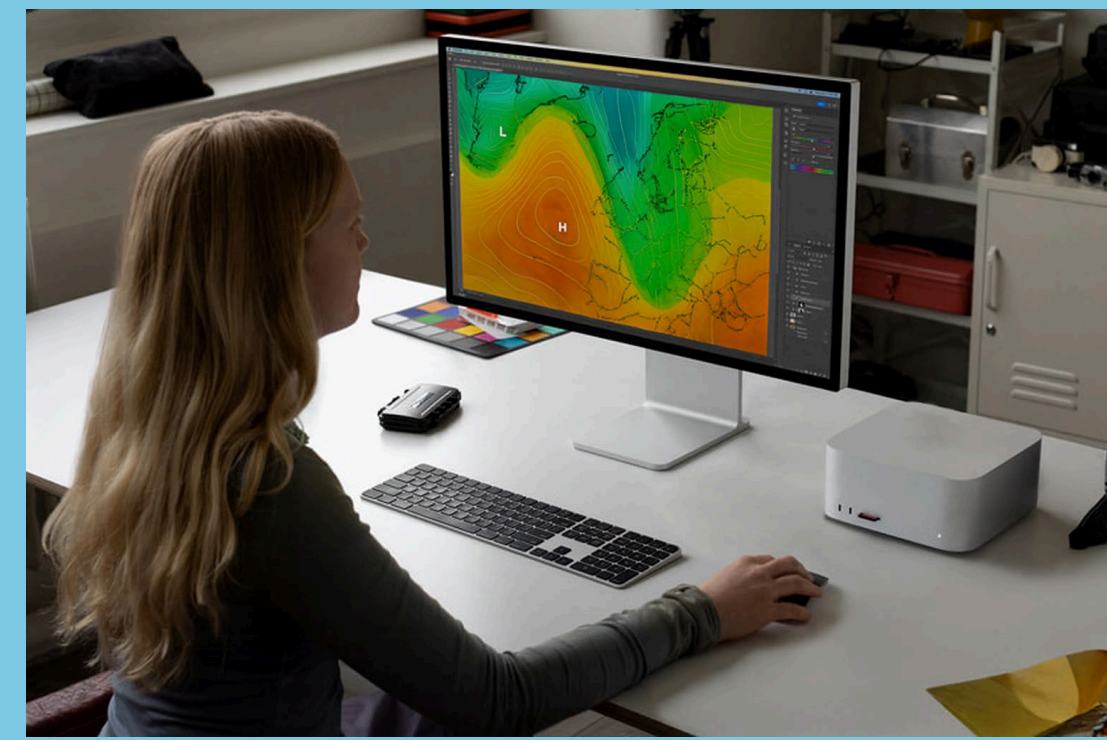
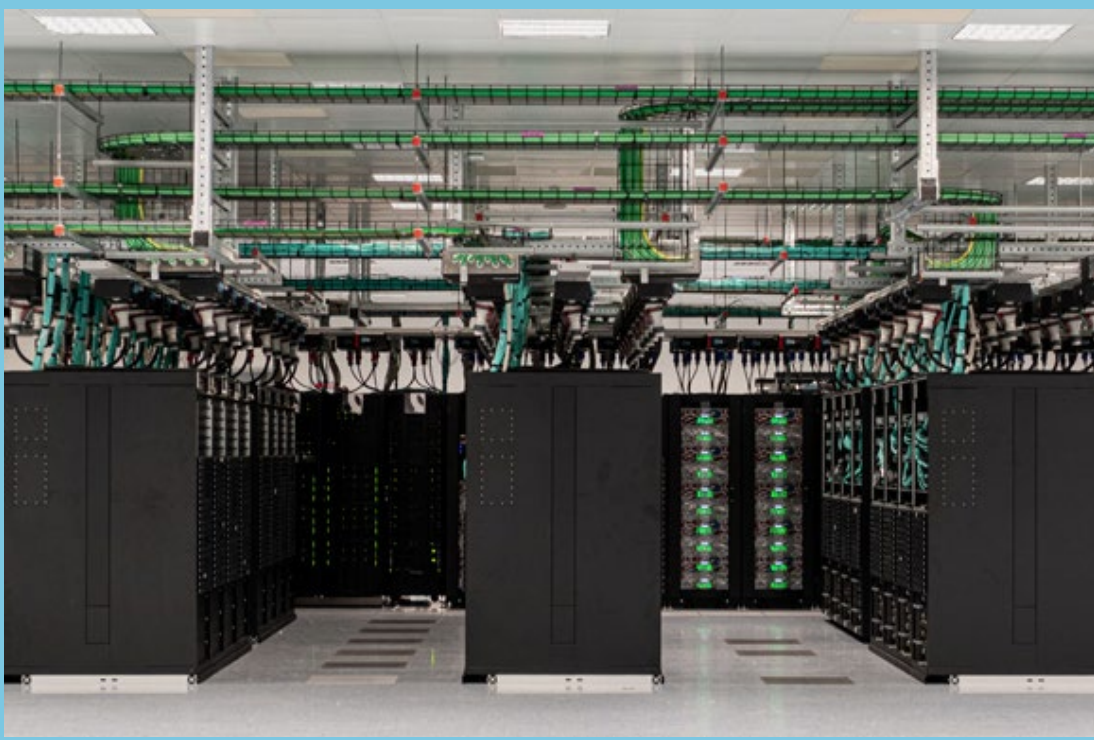
anemoi



Corentin Carton de Wiart, Harrison Cook, Vojtech Tuma, Jenny Wong, James Hawkes, Tiago Quintino

Traditional weather forecasting relies on large-scale numerical simulations that run on high-performance computing (HPC) systems. These methods demand significant computational resources, involve complex workflows, and produce vast amounts of data — often exceeding what an individual user needs. Forecast-in-a-Box leverages advances in data-driven modelling to dramatically reduce computational and energy costs while delivering tailored forecast products directly to users. Developed within the *Destination Earth* initiative, it packages the entire forecasting chain into a simple, user-friendly application. Built on the open-source *Anemoi* and *Earthkit* projects, it provides a reproducible and modular environment that integrates data access, model execution, and visualisation — enabling accurate, locally run forecasts on laptops, on-premise computing infrastructure, or in the cloud.

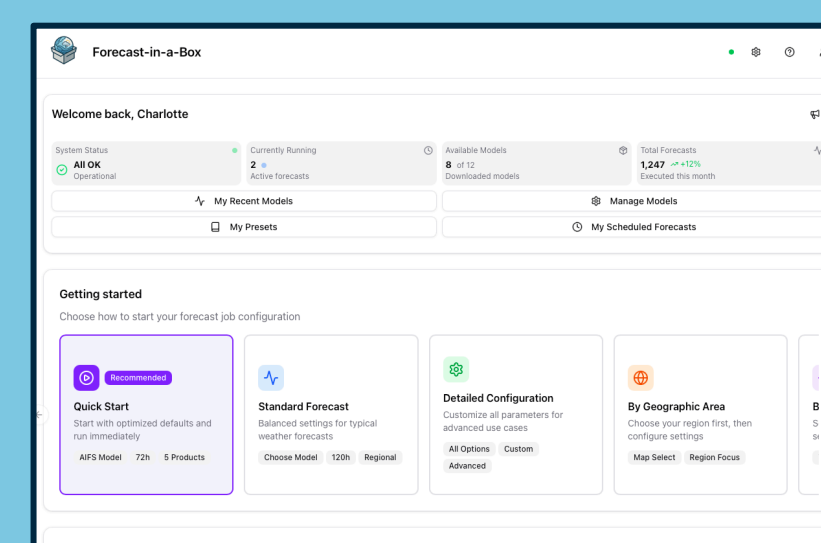
Ship the model, not the data!



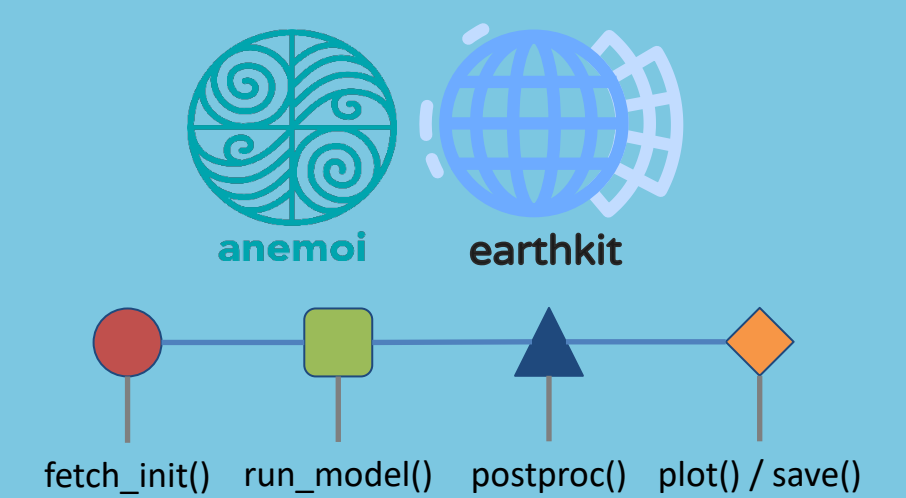
Traditional physics-based weather forecasting relies on complex numerical simulations that require high-performance computing systems. With data-driven AI models, the same forecasts can now be produced on lightweight hardware, even on a desktop computer. This shift enables ECMWF to distribute the *model* instead of the *data*, allowing users to run tailored forecasts to their needs. Forecast-in-a-Box brings together the complete forecasting workflow, from the retrieval of initial conditions to post-processing and visual products, in one portable, easy-to-deploy package.

A fully-packaged forecasting chain

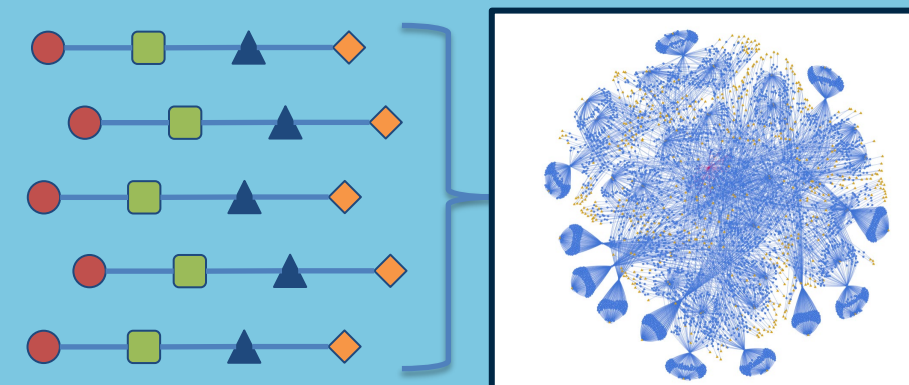
User Interface



Product Definition



Orchestration

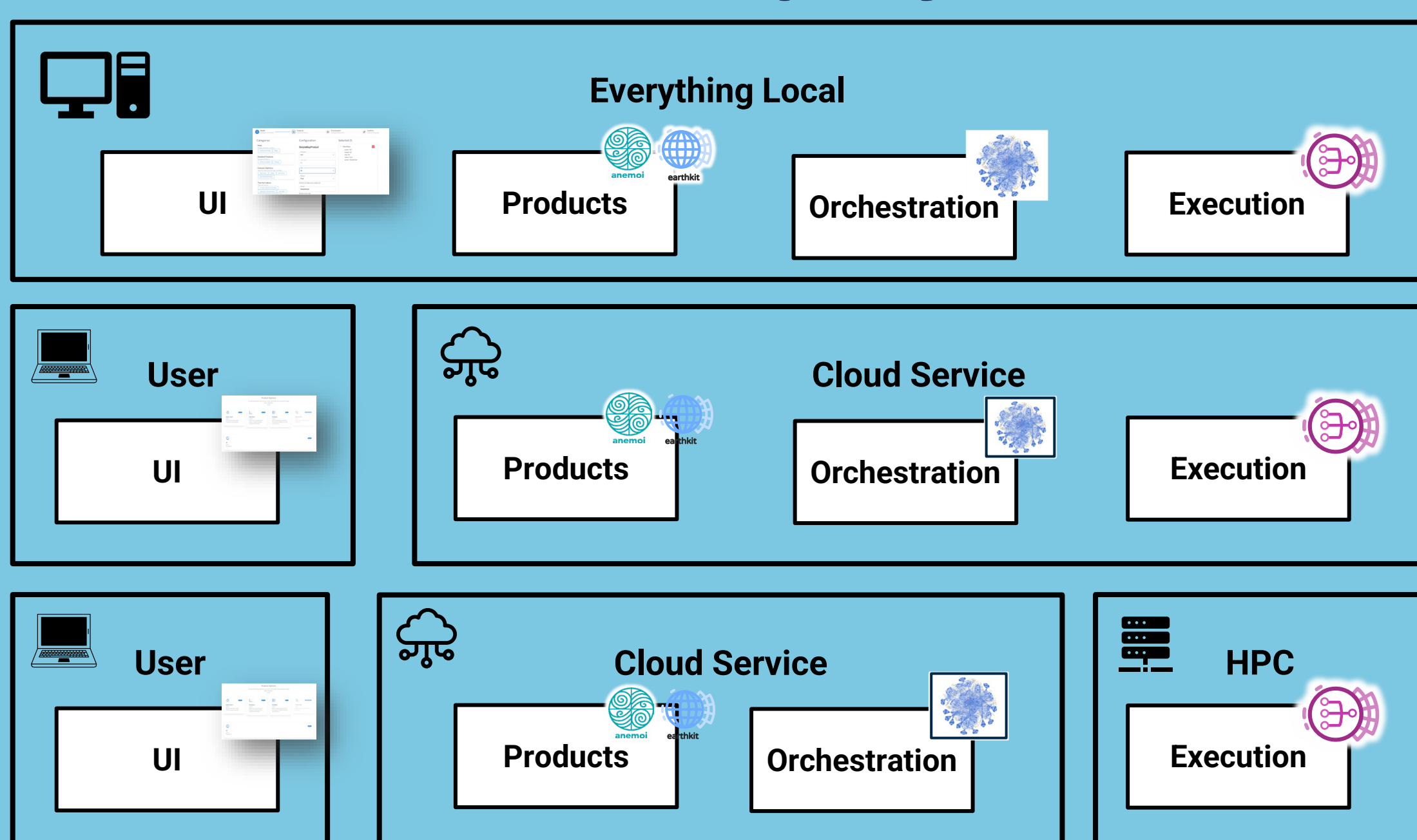


Execution



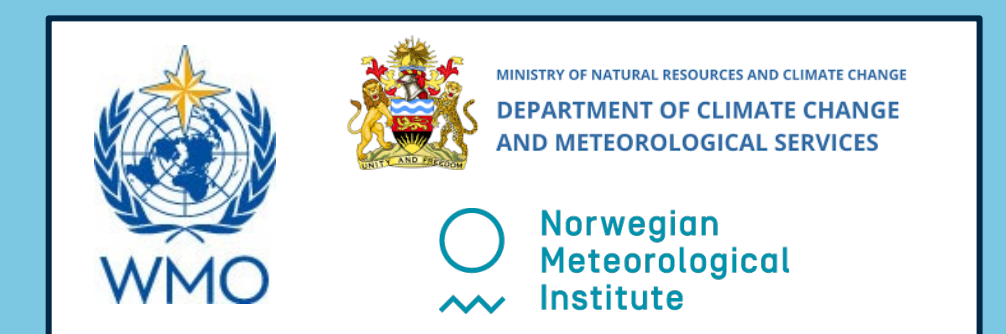
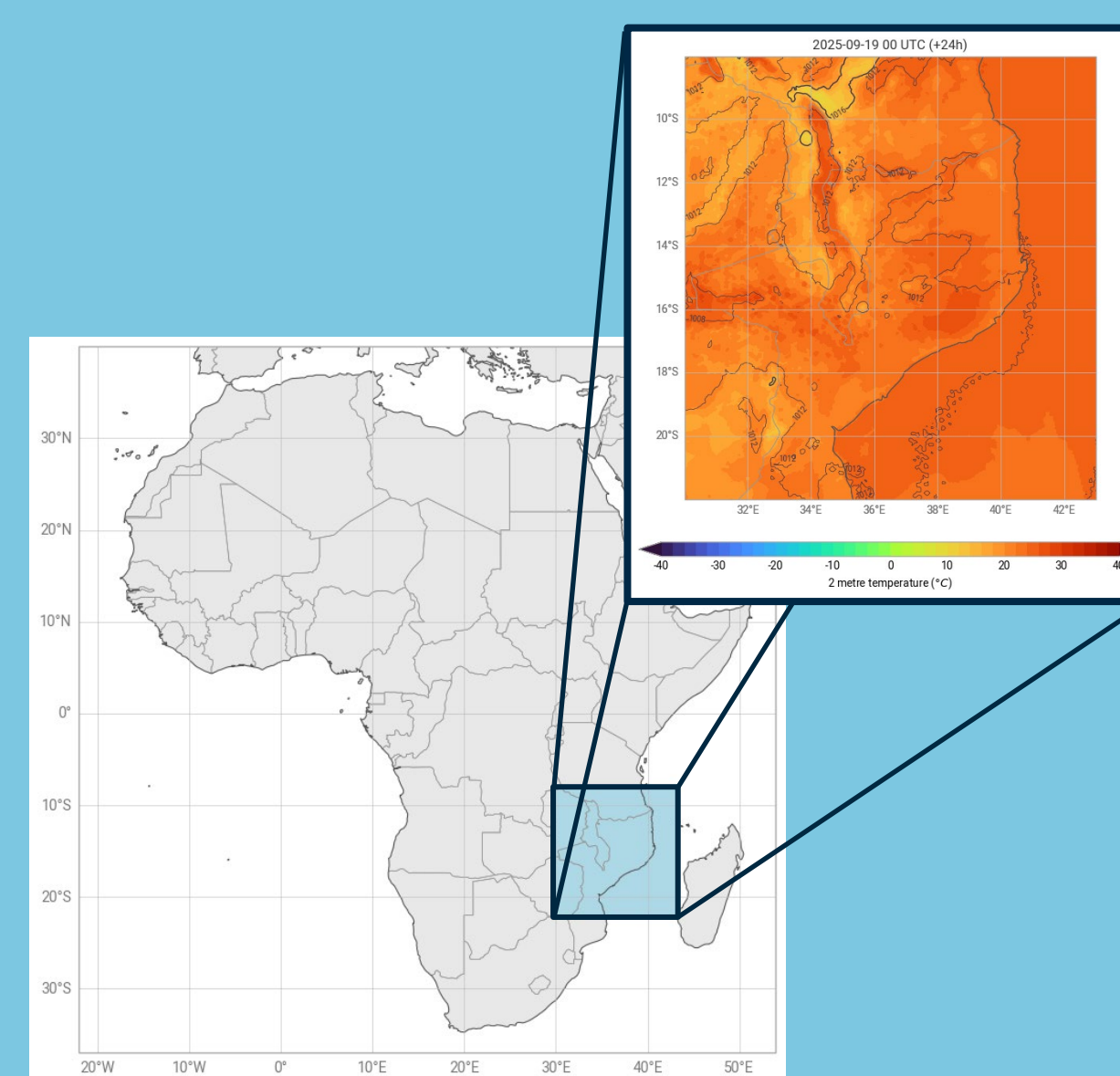
Forecast-in-a-Box provides a graphical interface for configuring, executing, and visualising forecasts. Each product is represented as a computational graph constructed from *Anemoi* and *Earthkit* components. These product graphs are merged into a meta-graph that orchestrates the full forecasting chain and executes it efficiently across the available computing resources.

Flexible Deployment



Forecast-in-a-Box is designed for flexible deployment, from running small models on a desktop computer to executing full ensemble forecasts on high-performance computing systems. The same modular environment adapts seamlessly to the available resources.

WMO/Malawi pilot project



ECMWF is collaborating with MET Norway to run their *Bris* AI-based regional model within Forecast-in-a-Box. The goal is to deliver a fully packaged forecasting system (including hardware) to the Malawi meteorological centre. This WMO pilot project was presented at the 2025 WMO Extraordinary Congress, where Norway delivered the first prototype “box” to Malawi.

