

⚠️ PROTOTYPE

5TH DESTINE USER EXCHANGE · CO-DESIGN WORKSHOP

FORECAST-IN-A-BOX.

Portable AI forecasting workflows for the DestinE Digital Twin
Engine

github.com/ecmwf/forecast-in-a-box
box

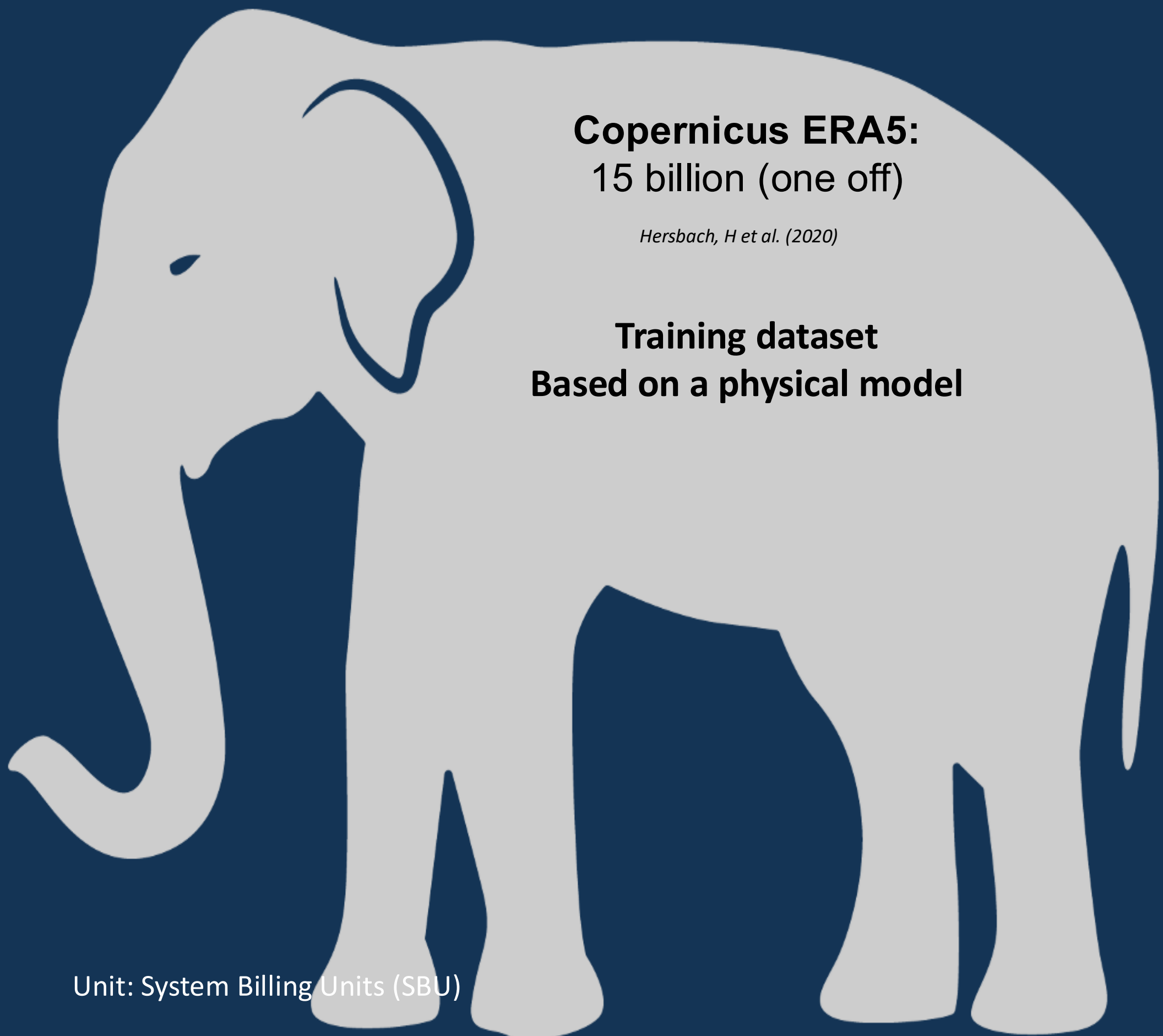


Funded by
the European Union

Destination Earth

implemented by





Copernicus ERA5:
15 billion (one off)

Hersbach, H et al. (2020)

Training dataset
Based on a physical model

Physics-based Forecast:

180 000
per forecast

AI Model:

0.3
per forecast

~1000x
reduction in
energy
Forecast time
reduced from
~30minutes to
~3minutes

Unit: System Billing Units (SBU)



Running an AI forecast is more than running a model

01

Fetch Data

Acquire initial conditions from ECMWF MARS, open open data, or external sources — in the right format

02

Run the Model

Execute an AI model (AIFS, BRIS...) with the right environment, weights, weights, and compute

03

Post-process

Compute ensemble statistics, derive products, apply calibration, interpolate to target grids

04

Deliver Output

Write results to Zarr, GRIB, or other formats — and optionally visualise or disseminate

Each step requires different software, configuration, and glue code. Most users just want forecasts.

FORECAST-IN-A-BOX

One package. Complete pipeline.

A **self-contained, containerised system** that packages the full AI forecasting workflow — from data ingestion to model execution, post-processing, and output — into a single deployable unit.

Browser-based UI

Configure and run forecasts from a visual pipeline editor — no command line required

Any Anemoi-compatible model

Plug in AIFS, BRIS, or any model using the Anemoi-Inference interface

Runs anywhere

Laptop, workstation, HPC cluster, cloud (EWC)

BUILT WITH

Anemoi

Earthkit



Funded by
the European Union

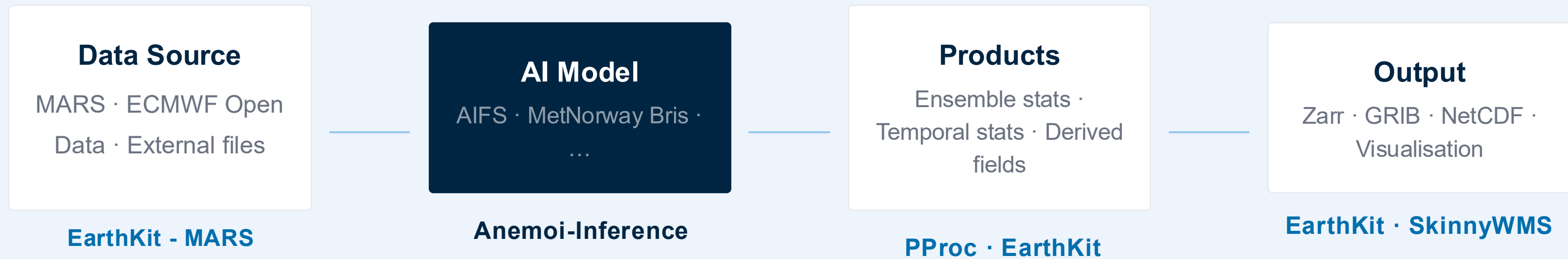
Destination Earth

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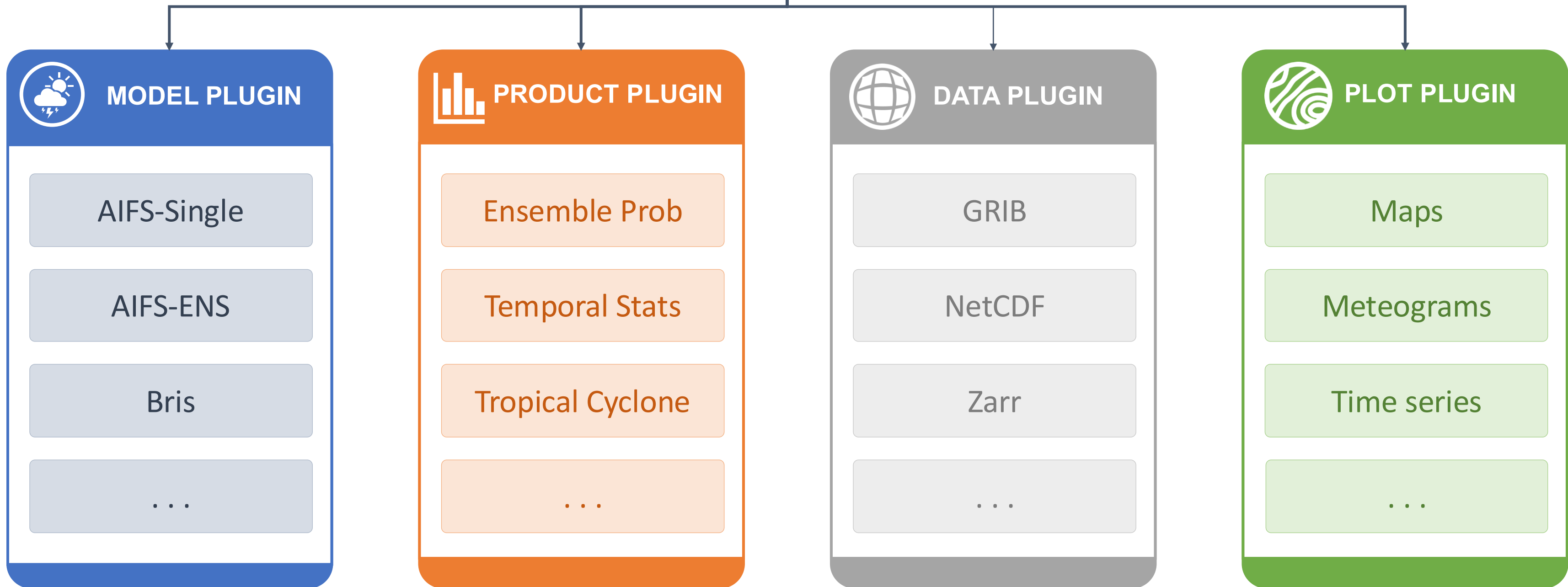
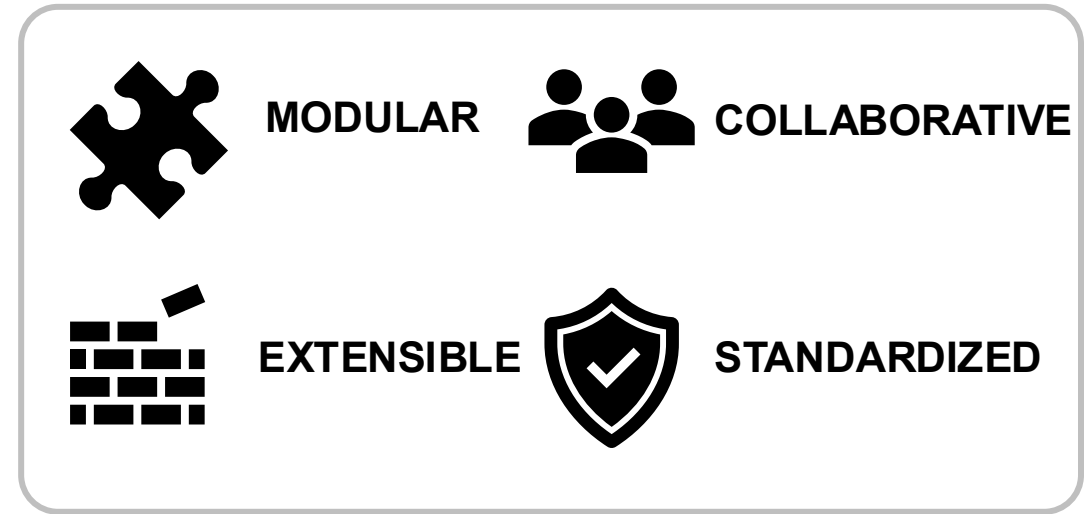
Inside the Box

FORECAST-IN-A-BOX CONTAINER



Each stage maps to a block in the visual pipeline editor

Plugins



The Dashboard

System status, model registry, community news, and getting-getting-started presets — all in one view

The screenshot shows the 'Forecast-in-a-Box' dashboard. At the top, there's a navigation bar with 'Overview', 'Configuration', and 'Executions' tabs. The main content is divided into two columns. The left column, titled 'Welcome back', contains four summary cards: 'SYSTEM STATUS' (All OK, Operational), 'CURRENTLY SUBMITTED' (0 Active forecasts), 'AVAILABLE MODELS' (4 of 8 Downloaded models), and 'TOTAL FORECASTS' (14 Executed this month). Below these are four management buttons: 'Manage Plugins', 'Manage Job Executions', 'Manage Configuration Presets', and 'Manage Scheduled Forecasts'. The right column, titled 'Forecast-in-a-Box Community News', features a 'Latest Available Models' section with a 'New' badge, listing models like 'AIFS Single v2', 'MetNorway-ML v1.8', 'AICON v2.5', and 'AIFS ENS v2'. It also has a 'Latest Forum Topics' section with posts such as 'Best practices for extreme weather forecasting' and 'Comparing forecast model accuracy'. At the bottom of the right column are links for 'View Model Registry' and 'Visit Community Forum'.

Building a Forecast Pipeline

Drag-and-drop blocks: Source → Products → Output. No Python required.

Source blocks fetch from MARS / ECMWF Open Data

Product blocks compute statistics & derived fields

Output blocks write Zarr, GRIB, or other formats

Valid config — ready to submit

Supported Models

Downloaded and managed through the built-in model registry

AIFS

v2.0 / 1.1

ECMWF's AI Integrated Forecasting System.

ECMWF

BRIS

2026-01

Machine learning forecast model from the Norwegian Meteorological Institute.

MetNorway

Your model here

Any model that implements the Anemoi-Inference interface can be registered and run

AILA

v1.0

Machine learning forecast model from the Finnish Meteorological Institute.

FMI

DEPLOYMENT

Runs Anywhere

From a researcher's laptop to a HPC— the same package, just configured differently



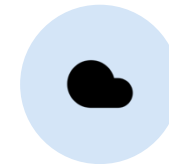
Laptop / Workstation

Single curl command. Runs in Docker. Good for development and small experiments.



HPC Cluster

Slurm deployment for large ensembles.



EWC

Preconfigured for the European Weather Cloud with direct MARS access and GPU support.

DESTINE

Coming Soon



Digital Twin Engine

Integrated with the DestinE DTE — brings portable AI workflows natively into the Digital Twin ecosystem.

HONEST DISCLAIMER

Known Limitations

It's a prototype. Here's what that actually means for you.

! Emerging maturity status

Classified as "Emerging" under ECMWF's Software Maturity framework. APIs and config formats will change. No stability guarantees.

! No operational support

Unless you're part of a formal ECMWF initiative, support is best-effort from the community. There is no SLA.

! Anemoi-Inference models only

Bring-your-own models must implement the Anemoi-Inference interface. Not every AI model qualifies out of the box.

! Single User

Not yet built for multi tenancy, large scale deployments

We'd rather you know going in — and we're working on it.

What's Next

NEAR-TERM

Stability & usability

- Improved error messages and troubleshooting guidance
- Auto-upgrade via the web UI
- Expanded block palette — more Transform blocks
- Improved model download and version management
- Output visualisation built into the UI

MEDIUM-TERM

Scale & integration

- Expanded Model Choices: Stretched Grid & LAM
- DestinE Digital Twin Engine integration
- Parallel Execution on cluster systems
- Finalised plugin system for custom Source and Product blocks

COMMUNITY-DRIVEN

Ecosystem growth

- More AI models in the registry
- Example presets for common DestinE use cases
- Training materials and documentation

GET INVOLVED

Try it. Break it. Tell us.

Forecast-in-a-Box is open source and actively developed. The best way to shape it is to use it — and file issues when it misbehaves.

github.com/ecmwf/forecast-in-a-box

INSTALL

```
curl ... | bash ./fiab.sh
```

One script. Runs in Docker. Opens in your browser at localhost:8000

DOCUMENTATION

```
github.com/ecmwf/forecast-in-a-box/
```

User guide, operator guide, troubleshooting

CONTRIBUTE

[Issues](#) · [Pull requests](#) · [Model plugins](#)

Built jointly by ECMWF & Destination Earth — community contributions welcome