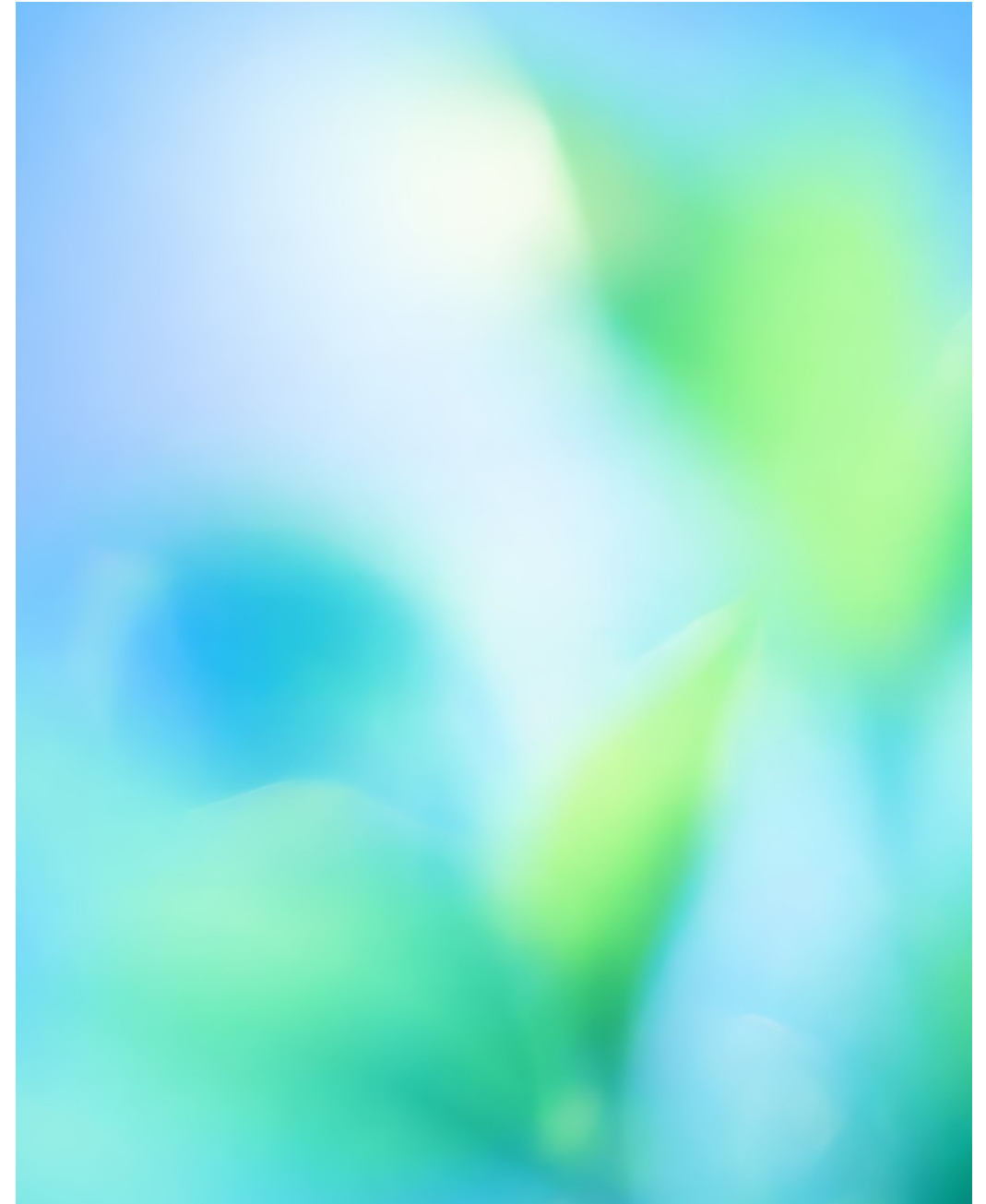


OpenAI

Meet GPT-Gaia.

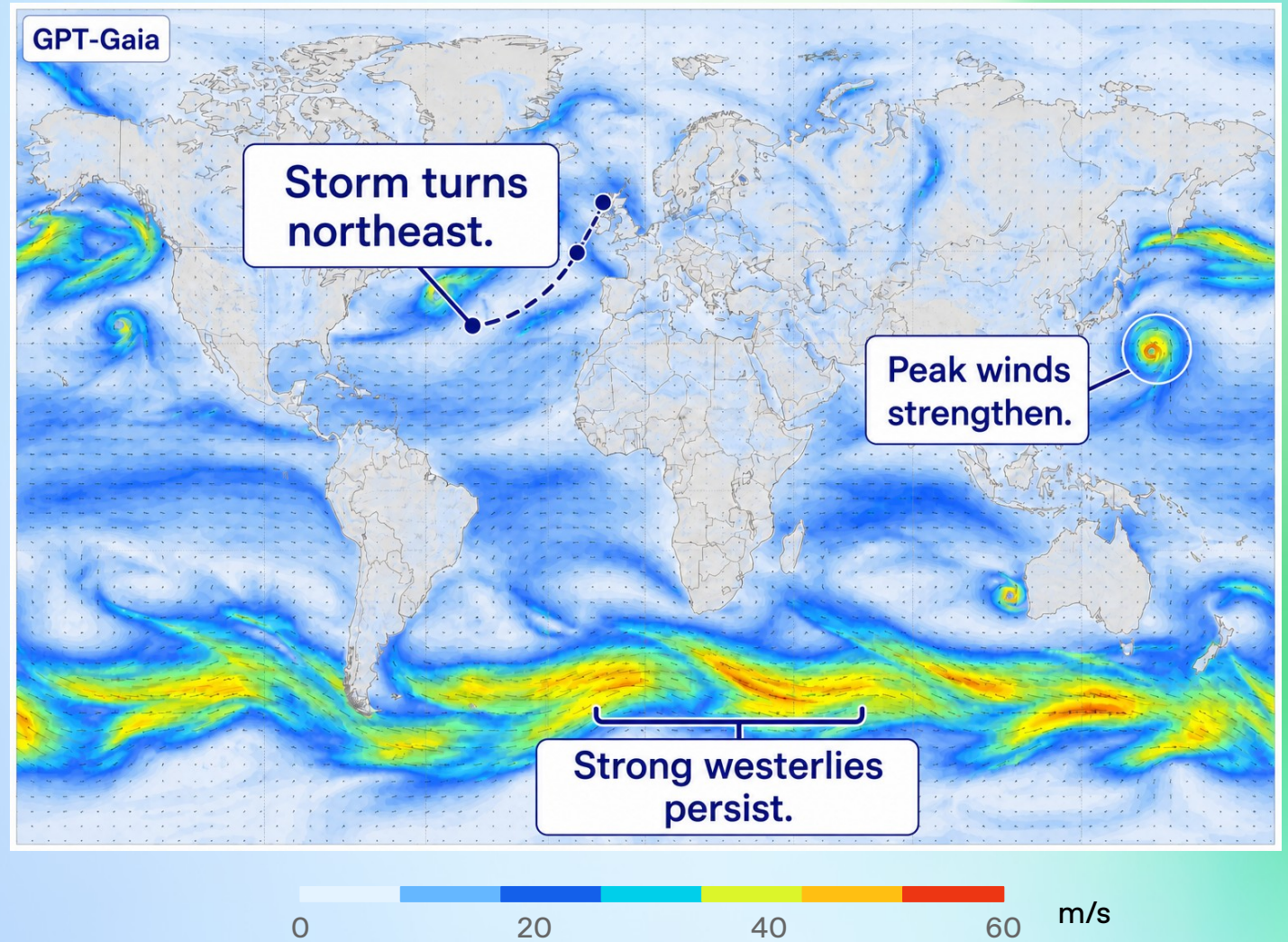
GPT-Gaia is a foundation model for the
climate



Gaia forecasts weather up to 15 days ahead.

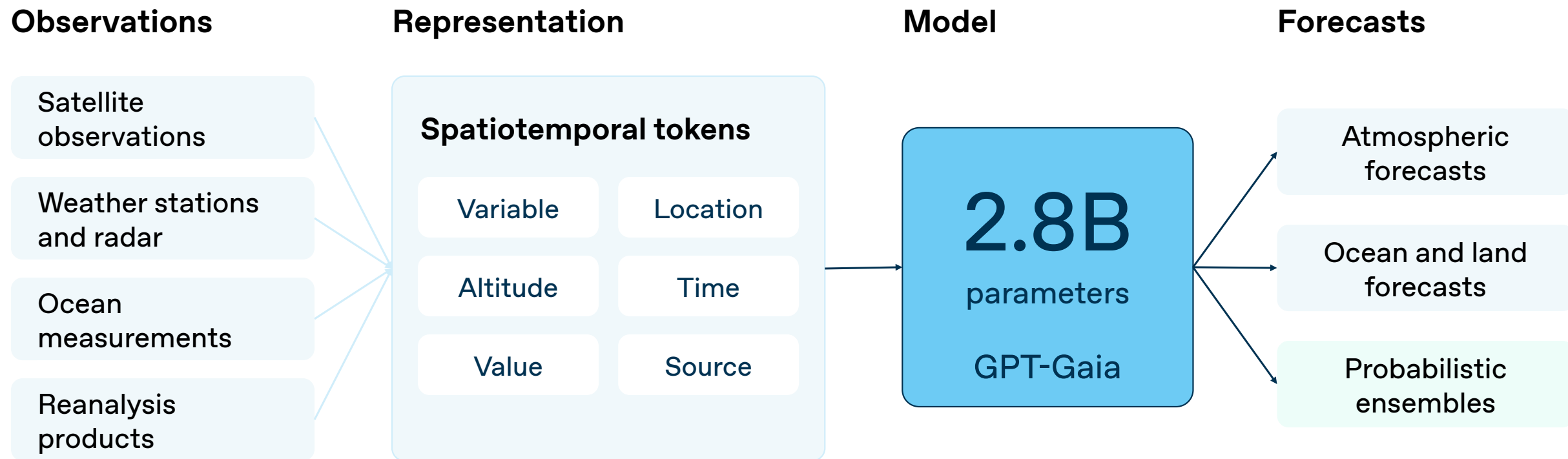
Gaia predicts hundreds of atmospheric, ocean, and land variables.

Its forecasts include temperature, wind, humidity, pressure, precipitation, and geopotential.



Gaia turns observations into forecasts of the Earth system.

It models the atmosphere, ocean, and land across space and time.



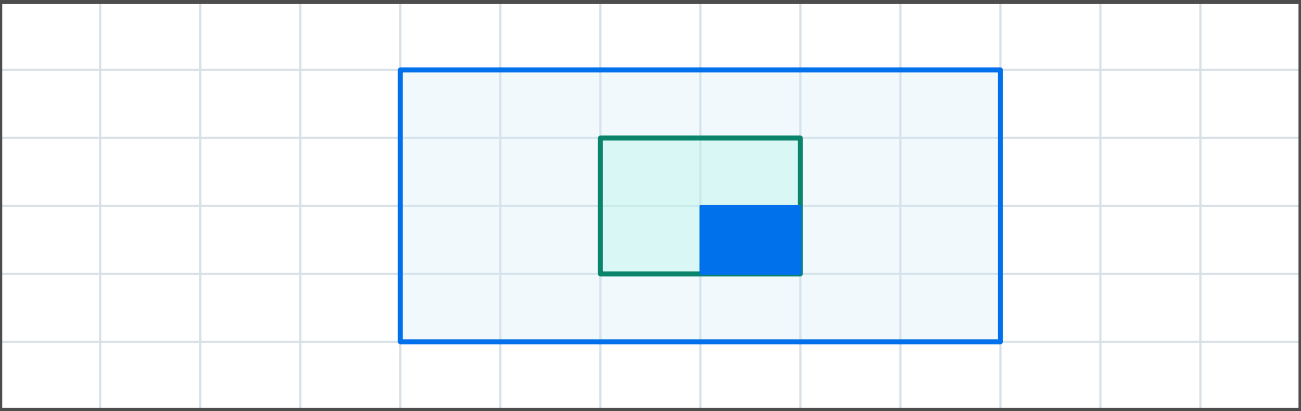
Gaia learns from observations across the Earth.

GPT-Gaia has 2.8 billion parameters and learns from about 50 years of observations and reanalyses.

Each token describes a measurement.

Variable	Zonal wind
Location	34.5° N, 68.0° W
Altitude	10 m
Time	01 Sep 2026 · 00 UTC
Source	Reanalysis

Tokens interact at three spatial scales.



Local

Convection and local winds

Regional

Cyclones and atmospheric rivers

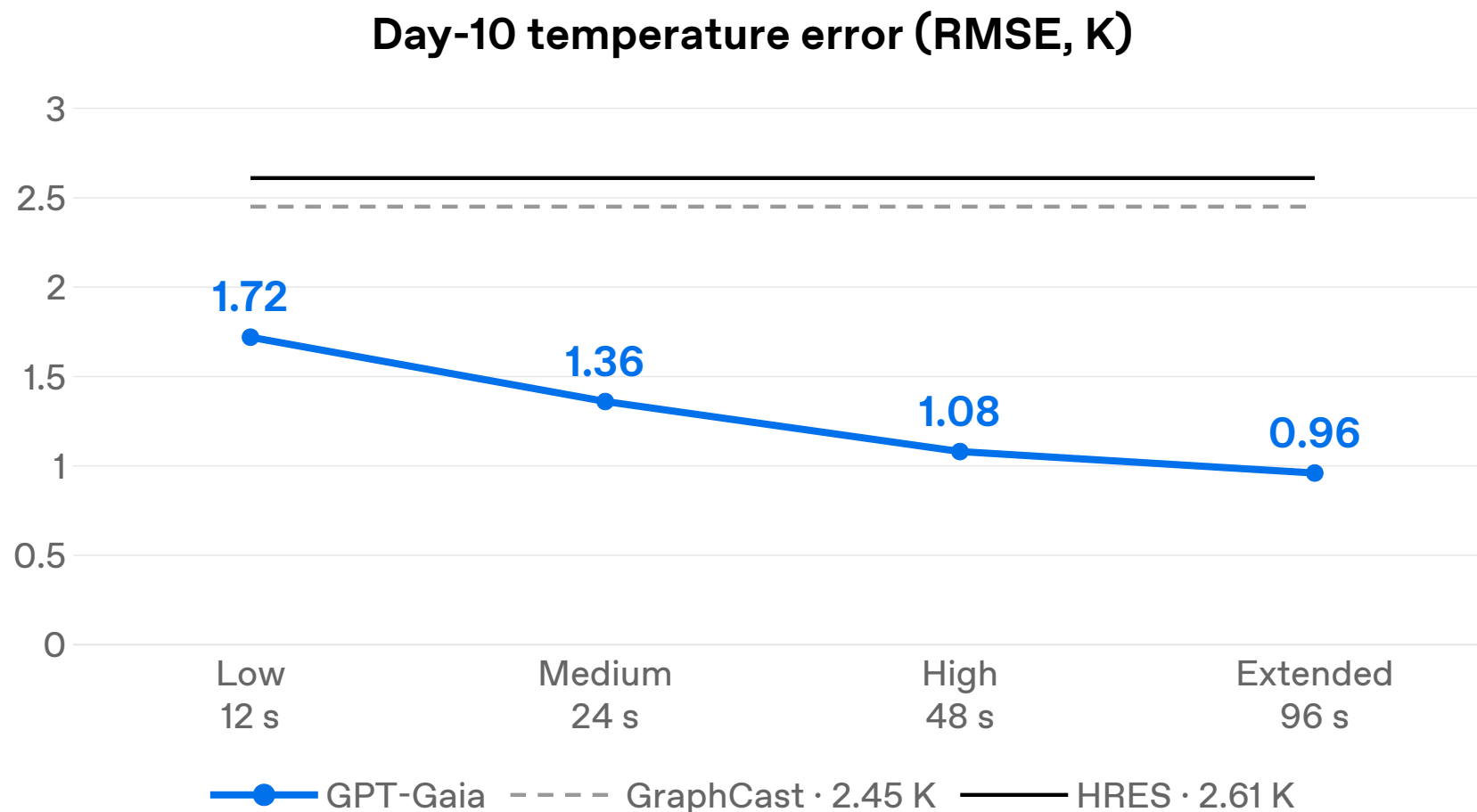
Global

Planetary waves and teleconnections

More inference effort reduces Gaia's forecast error.

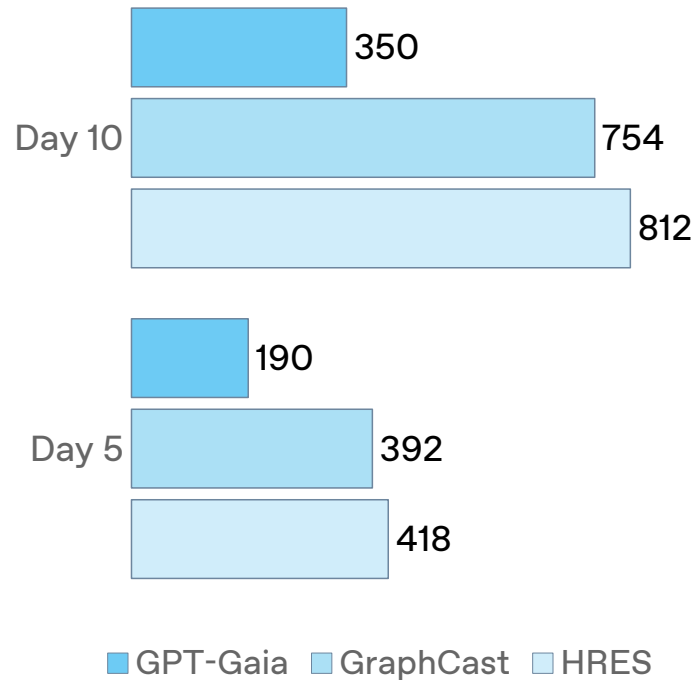
At high effort, Gaia's day-10 temperature error is 1.08 K, compared with 2.61 K for HRES.

Temperature is measured at 850 hPa. Lower error means a more accurate forecast.

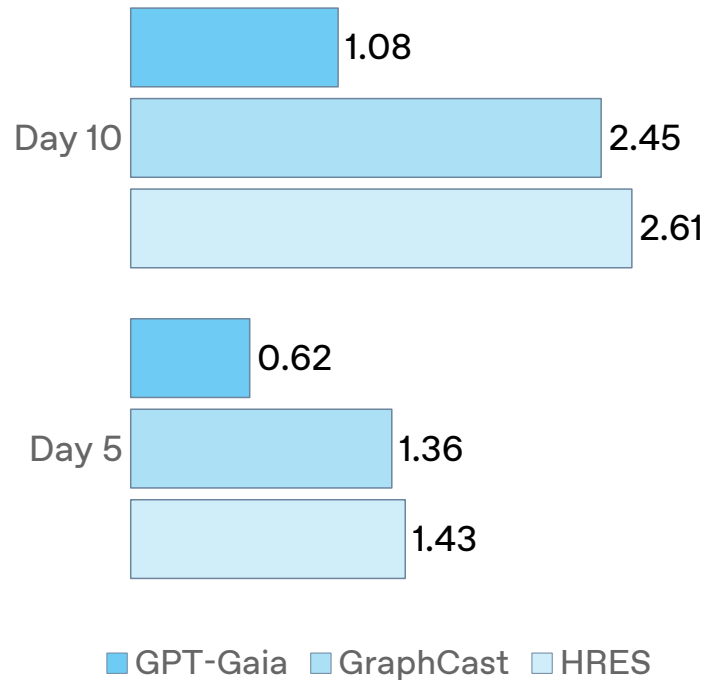


Gaia more than halves geopotential and temperature error.

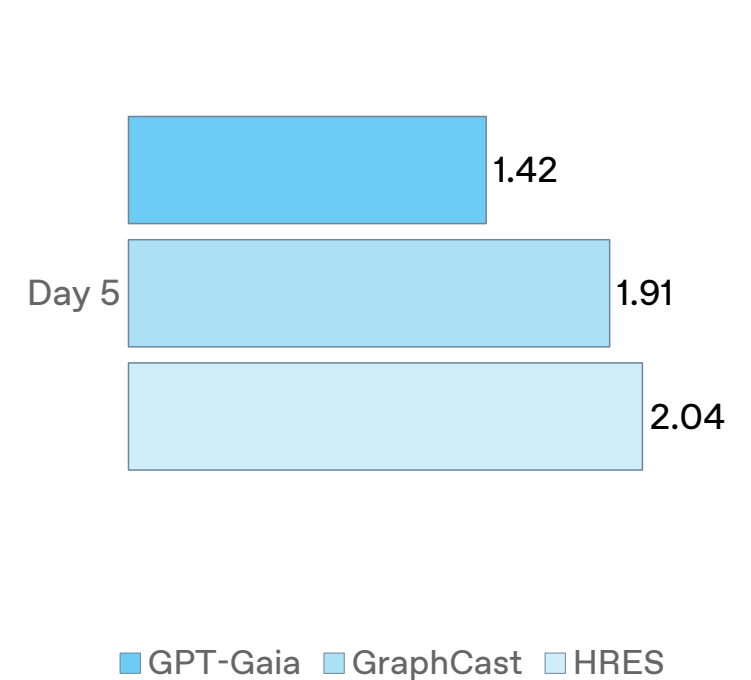
Z500 RMSE (m^2/s^2)



T850 RMSE (K)

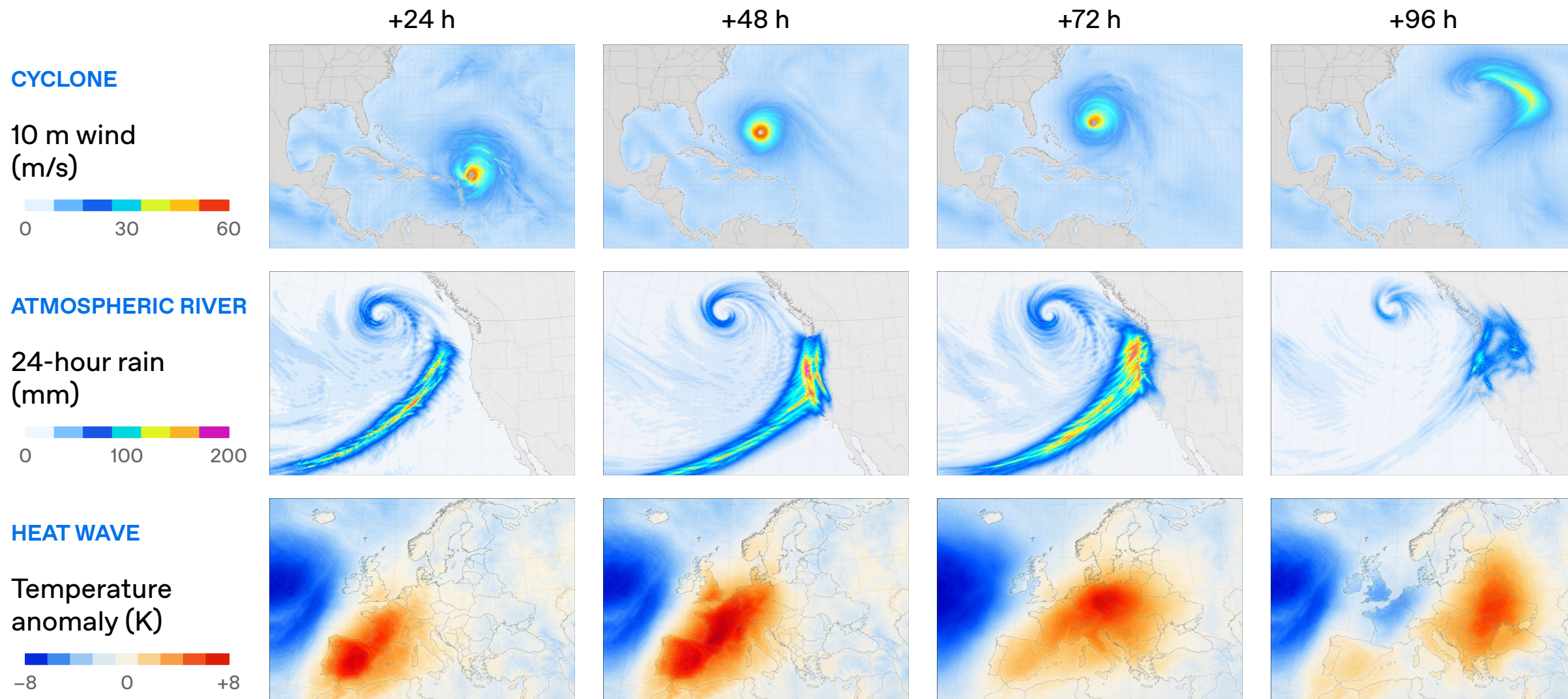


10 m wind RMSE (m/s)



Gaia forecasts how weather systems evolve over four days.

These forecasts start from 1 September 2026 at 00 UTC.



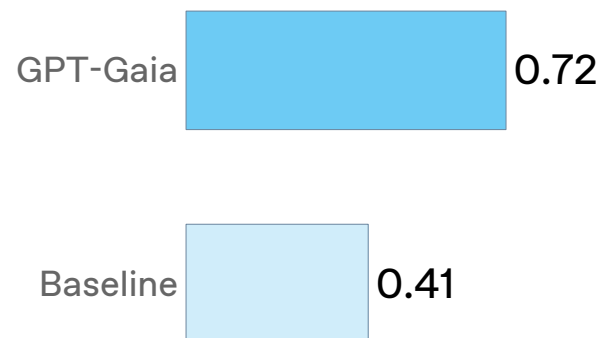
Gaia predicts extreme weather more accurately.

We test rainfall forecasts on events above the historical 99th percentile.

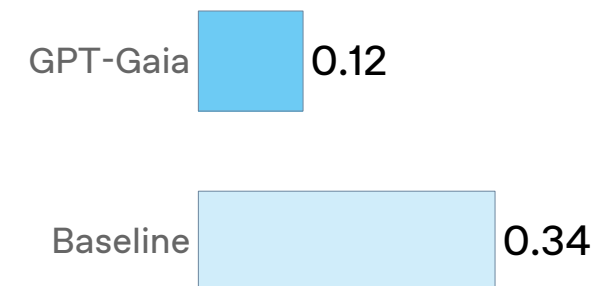
We test heat forecasts on events above the local 99th temperature percentile.

GPT-Gaia can still miss individual severe weather events.

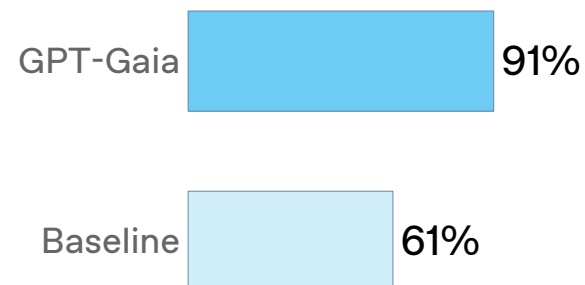
24-hour precipitation CSI ↑



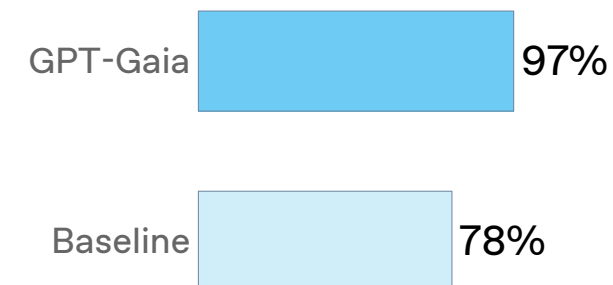
Precipitation false alarm ratio ↓



5-day precipitation event recall ↑

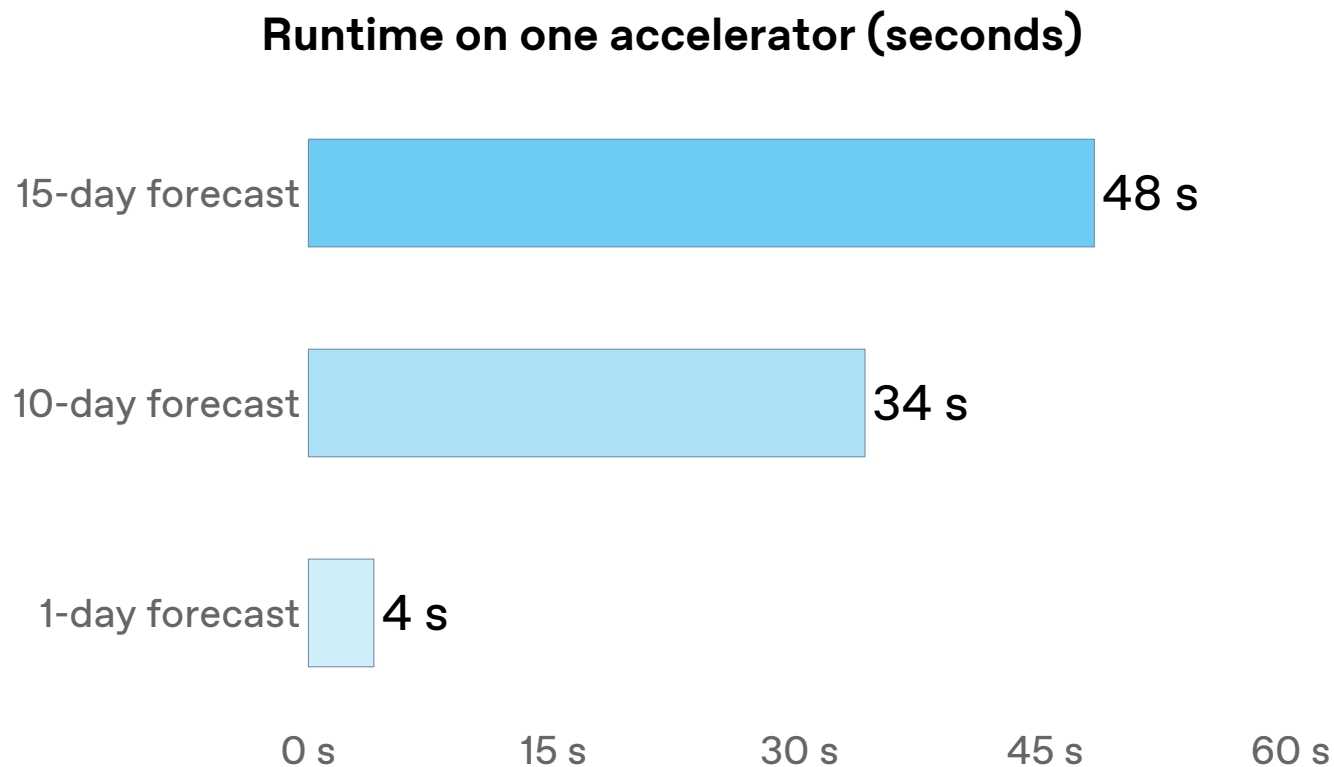


5-day extreme heat event recall ↑



Gaia forecasts 15 days in under a minute.

It runs on a single accelerator, making it practical to generate hundreds or thousands of possible futures.



For a 15-day ensemble, 50 forecasts take 3.8 minutes and 1,000 take about 31 minutes.

Gaia pricing scales with reasoning effort.

The API starts at \$0.02 for a 15-day global forecast at low effort.

Each forecast represents one ensemble member. Prices are in US dollars.

Reasoning effort	1 forecast	50 forecasts	1,000 forecasts
Low	\$0.02	\$1.00	\$20.00
Medium	\$0.03	\$1.50	\$30.00
High	\$0.05	\$2.50	\$50.00
Extended	\$0.10	\$5.00	\$100.00

Gaia still has important limitations.

We see Gaia as a complement to operational forecasts and expert meteorologists.



It does not enforce physical laws.

Gaia does not explicitly solve the governing equations, so energy and mass conservation are not guaranteed.



Historical data limit what it can learn.

Forecasts are worse where observations are sparse. Unprecedented extremes remain difficult to predict.



Local weather remains difficult to predict.

Thunderstorms, tornadoes, and rainfall at kilometer scales can depend on processes the global model does not resolve.

Our goal is to model the coupled Earth system.

We want to help scientists understand how the atmosphere, oceans, land, ice, and human activity interact, and what those interactions mean for possible futures.