THE STRENGTH OF A COMMON GOAL
European co-operation at its best: pooling resources
GLOBAL COLLABORATION
ECMWF ENSEMBLE PREDICTION

Initial conditions

Ensemble members illustrating the possible scenarios

Distribution of ensemble members

Confidence level of predicted forecasts

Low

High

3D view of model predictions

Flat view of model predictions
WHY WE NEED SCALABLE SOLUTIONS

The impact of improved forecasts on computing power

For forecasts that are:  We need:

More accurate  Higher resolution models

Longer in range  More realistic models

More reliable  Larger ensembles

And all of this translates to more computing power:
Ensemble prediction: an overview
CAPTURING THE WEATHER

To predict the future, we observe the present. Every day, we absorb 800 million observations to create a detailed snapshot of Earth’s weather.
VIRTUAL WORLD

After absorbing 600 million daily weather observations, we process 40 million of them to generate a virtual reality simulation of the Earth system. Using vast computing power and scientific expertise, we can then produce some of the world’s most accurate forecasts.

A hurricane over the Atlantic ocean can cause heavy rain in Europe a few days later.

Analysing dry conditions and high pressure helps predict heat waves.

Wind impacts ocean waves height and direction.
BEYOND THE WEATHER FORECAST

ECMWF’s forecasting system is now giving us even more vital predictions about Earth’s environmental developments. These forecasts can protect infrastructure, promote economic development and save lives.

Prediction of dry conditions and strong winds can help assess the risk of disasters like the California wildfires.

Precipitation and soil moisture conditions help predict flood hazards.
FROM RAW DATA TO REAL-WORLD VALUE

This powerful predictive data delivers valuable insights and information for the benefit of society.
Deliverables: Global NWP at all ranges

- **Medium-range prediction**
  - High-resolution mean sea level pressure and ensemble spread

- **Monthly forecast plumes**
  - Weekly anomaly – 2m temperature over Europe

- **Long-range prediction**
  - El Nino SST anomaly plume
Working with the EU: Environmental information

Atmosphere Monitoring  Climate Change  Flood forecasting  Fire forecasting