MANCHESTER 1824
The University of Manchester

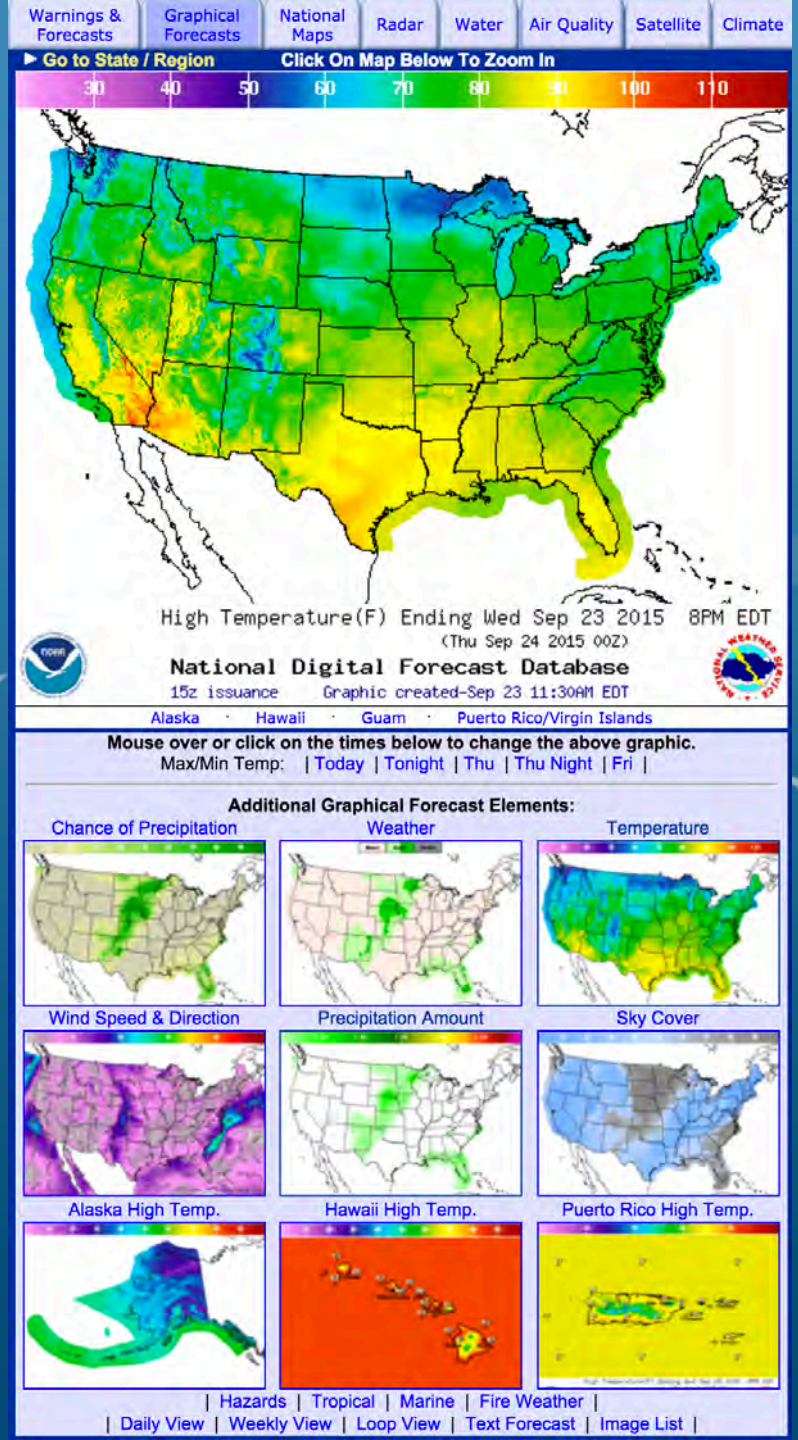
The visualisation of MAN UNICAST

Jonathan G Fairman, Jr
David Schultz, Stuart Anderson, Douglas Lowe, Gordon McFiggans, Elsa Lee, Ryo Seo-Zindy

RMetS Meeting: The Visualisation of Meteorological Data
30 September 2015

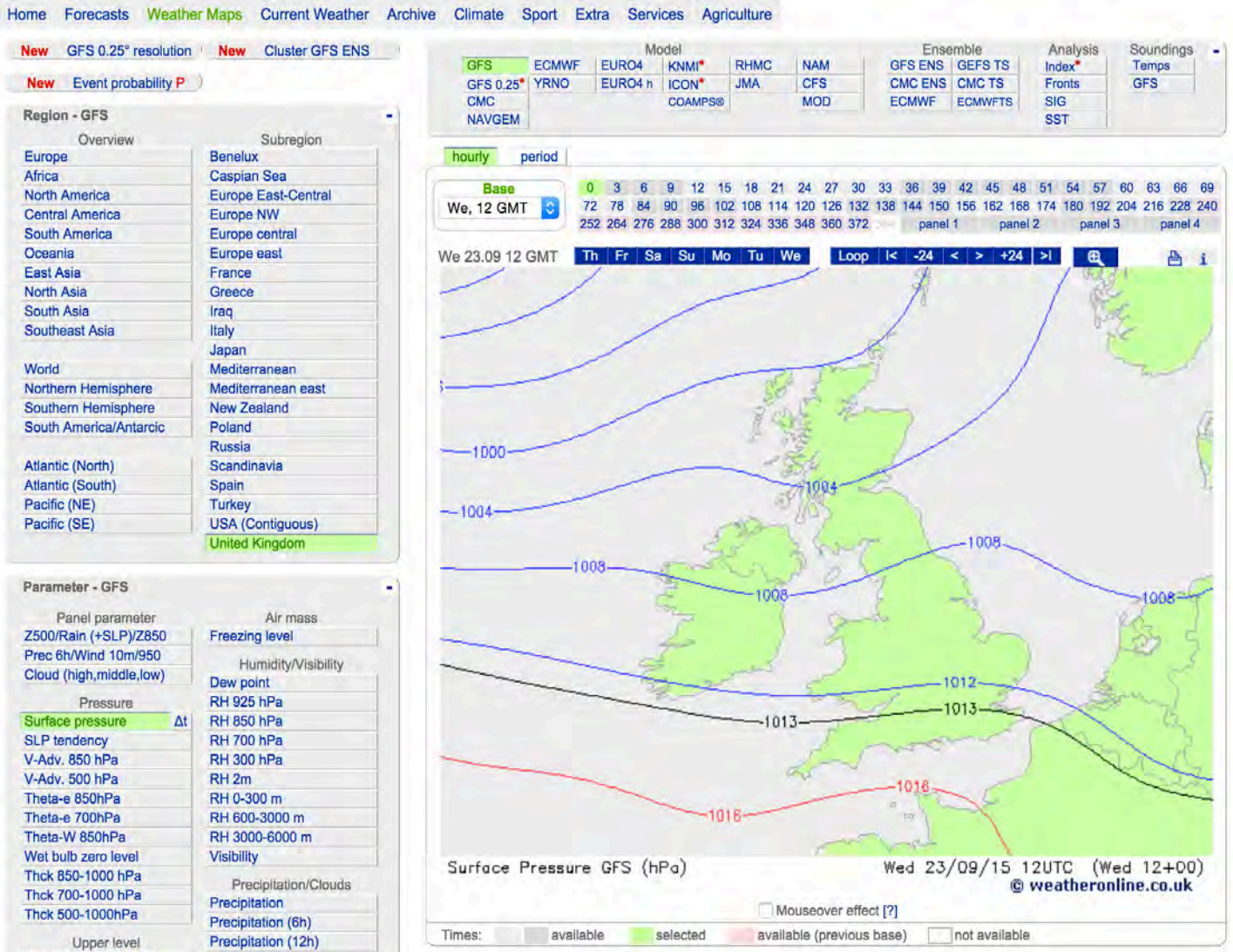
Online web portals to view meteorological data are usually one or more of three things

1. Overly simplified
2. Confusing to navigate
3. Tragically ugly



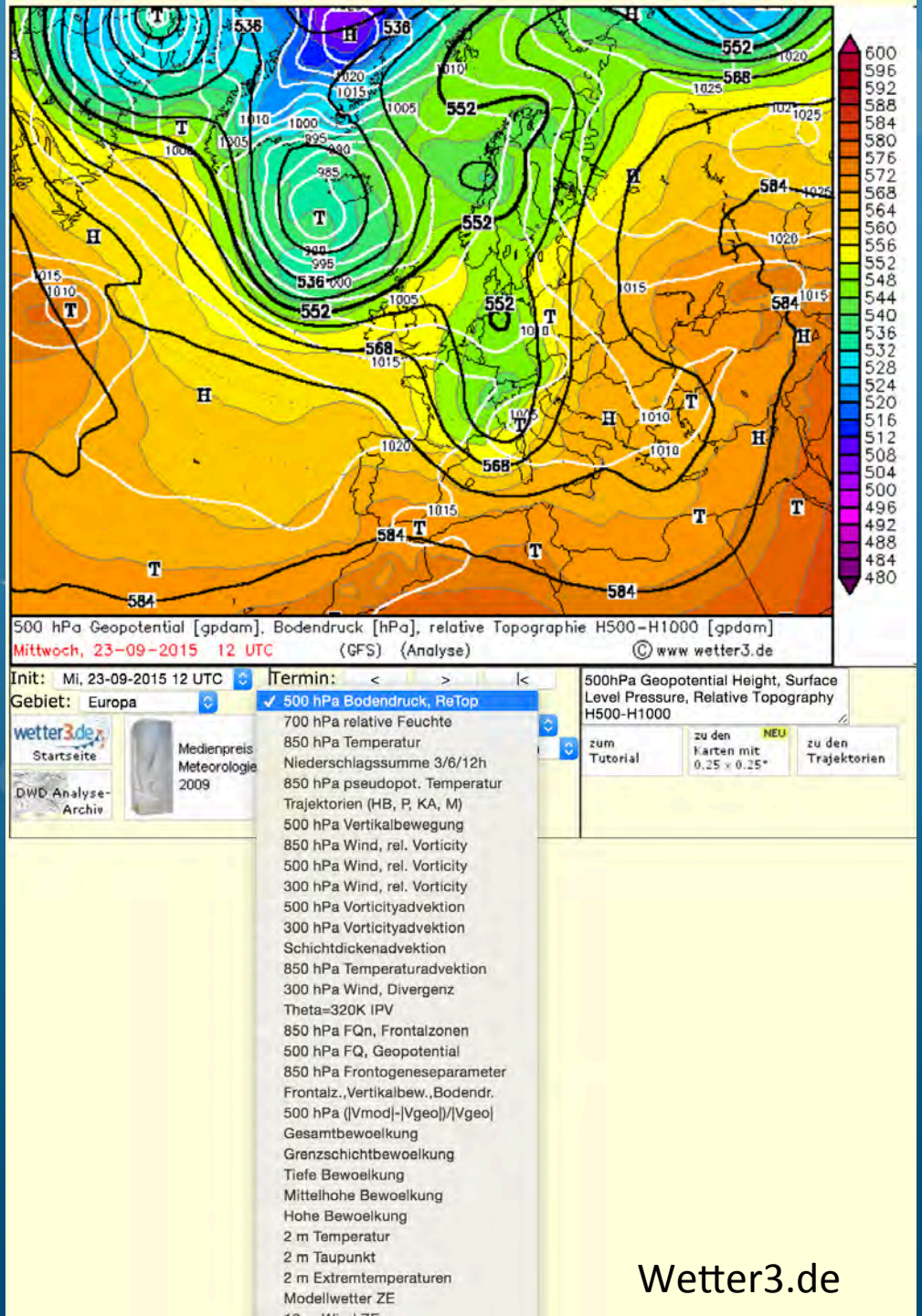
US National Weather Service

Graphical.weather.gov



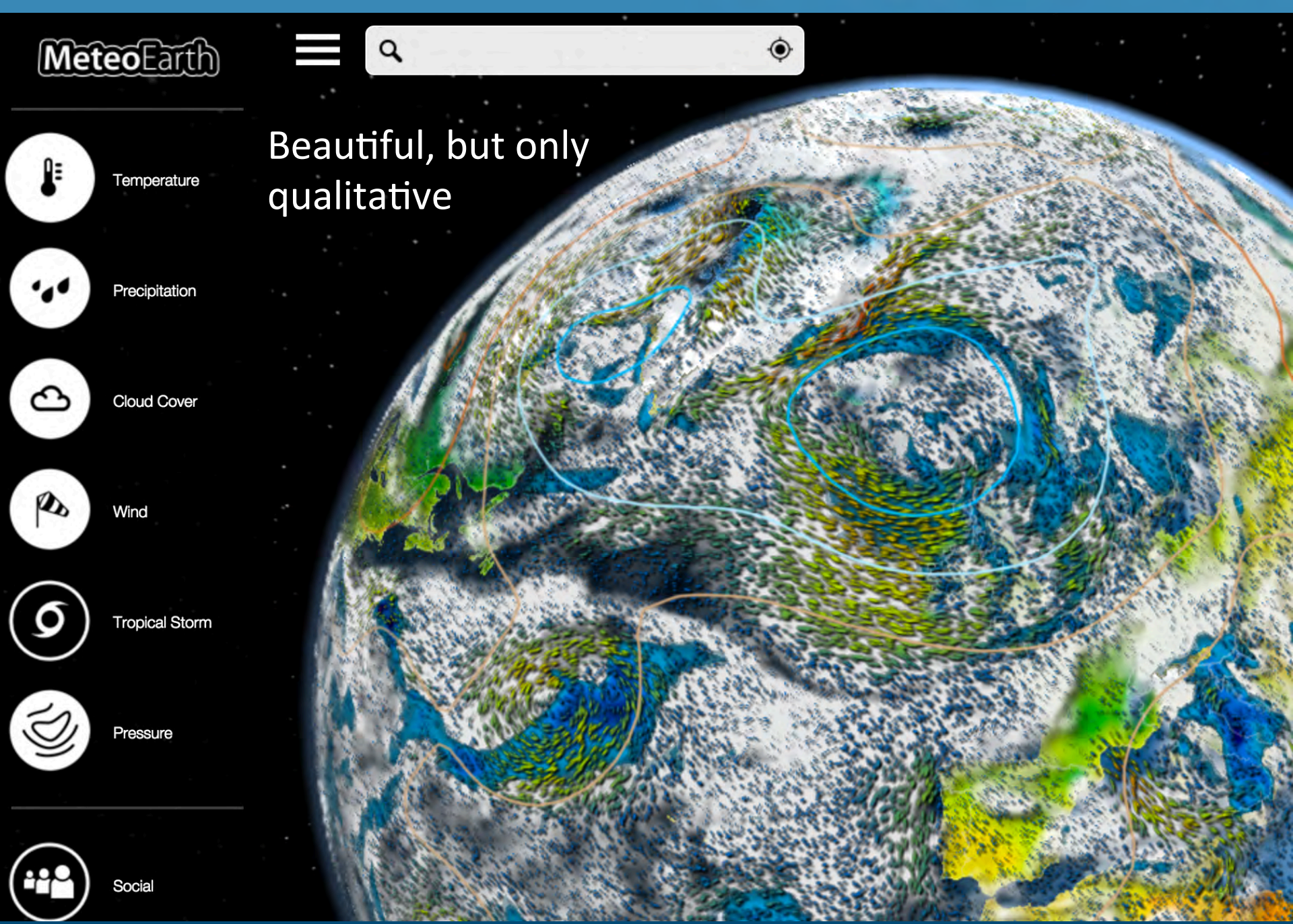
Very confusing and complicated

Weatheronline.co.uk



Wetter3.de

Welcome back to 1998!


MeteoEarth
Temperature
Precipitation
Cloud Cover
Wind
Tropical Storm
Pressure
Social
Beautiful, but only qualitative

Web visualisation challenges

1. Easy to use interface
2. Quantitative data
3. Research-quality graphics
4. Allow students to make their own connections

We think that we've done this with ManUniCast

Funded by HEA GEES Subject Centre and Faculty eLearning Team at Manchester

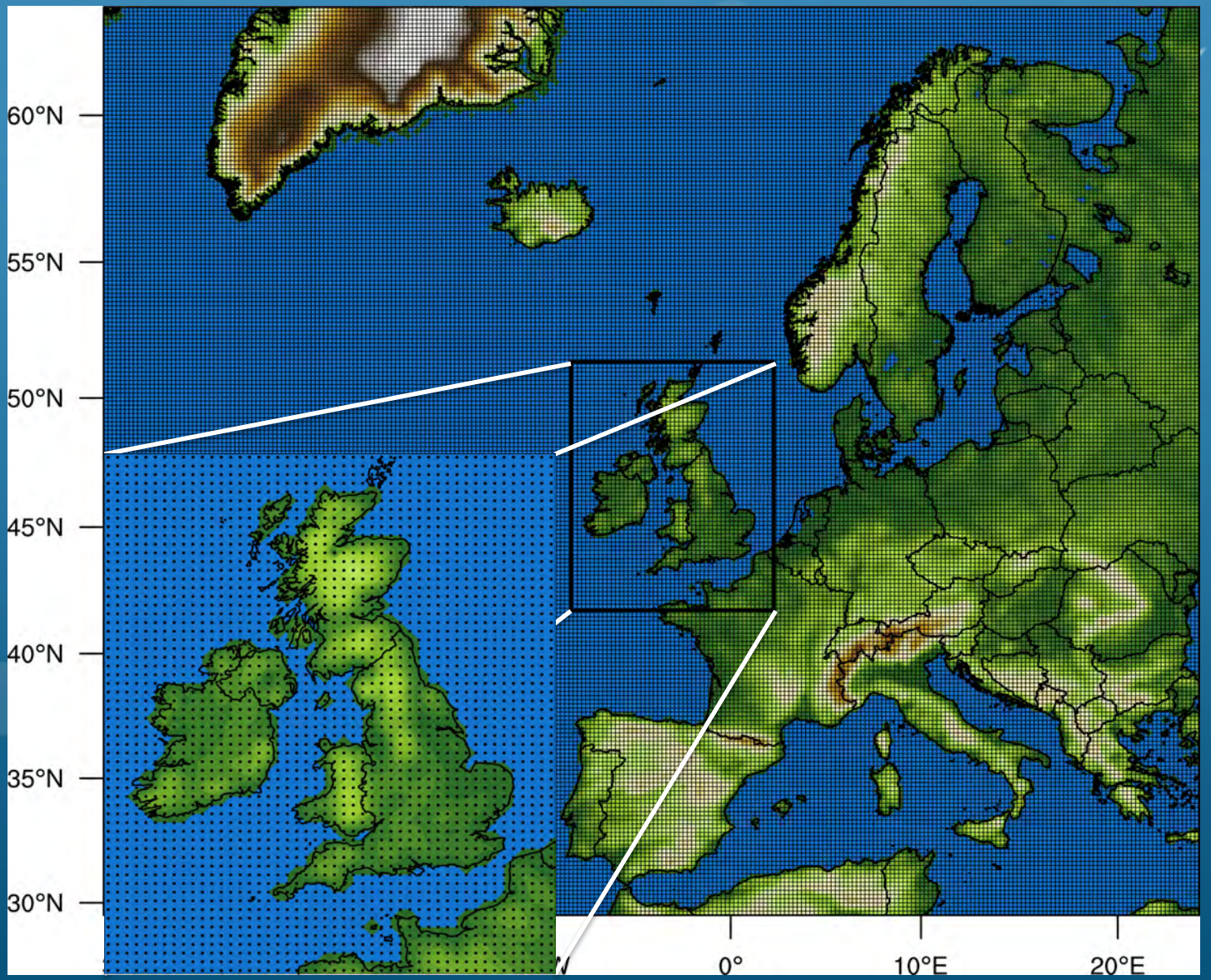
MANCHESTER 1824
The University of Manchester

Teaching Innovation
in the Faculty of Engineering & Physical Sciences

EPS ELEARNING

The Higher Education Academy
Geography, Earth and Environmental Sciences (GEES)

WRF-ARW 2 nested weather grids



20 km grid over Europe

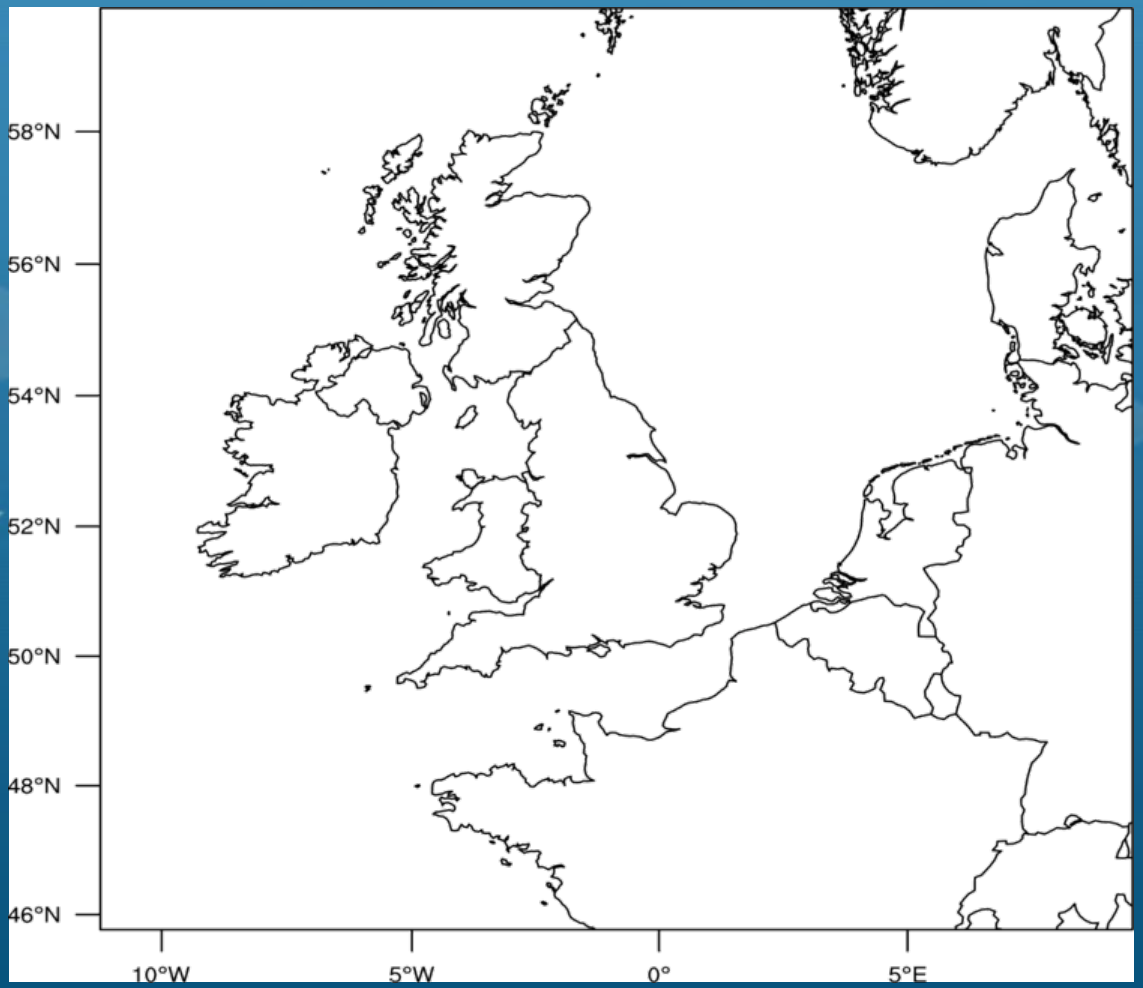
4 km grid over UK

Initialised at 1800 UTC daily from GFS, 54 hour forecast

WRF-Chem

1 air quality domain

12 km spacing



MAN UNICAST UK WEATHER & AIR QUALITY FORECASTING TEACHING PORTAL

Forecasts | How forecasts work | Product descriptions | Model setup | Links

Welcome to **ManUniCast**, a teaching and learning portal for weather and air quality forecasting. ManUniCast supports the teaching in the School of Earth, Atmospheric and Environmental Science at the University of Manchester and also educates the public about how weather and air-quality (including atmospheric composition and air pollution) forecasts are made.

Our ManUniCast App for iPhones and iPads is available on the App Store Available on the App Store

Top tip: Change "t=today" in the URL to always download the latest forecast. Useful for browser bookmarks.

1 **Select Date**

25/09/2015

2 **Choose Domain**

3 **Pick Product**

View Product

UK WEATHER & AIR QUALITY FORECASTING TEACHING PORTAL

Forecasts | How forecasts work | Product descriptions | Model setup | Links

Welcome to **ManUniCast**, a teaching and learning portal for weather and air quality forecasting. ManUniCast supports the teaching in the School of Earth, Atmospheric and Environmental Science at the University of Manchester and also educates the public about how weather and air-quality (including atmospheric composition and air pollution) forecasts are made.

Our ManUniCast App for iPhones and iPads is available on the App Store

Top tip: Change "t=today" in the URL to always download the latest forecast. Useful for browser bookmarks.

1 Select Date

25/09/2015

2 Choose Domain

3 Pick Product

Search Products...

- Mixing ratio at 2 m
- Planetary Boundary Layer Height
- Potential Vorticity at 320 K
- Precipitable water
- Radar-derived rain rate
- Relative humidity at 2 m
- Sea level pressure
- Simulated radar reflectivity at 1 km AGL
- Simulated satellite imagery
- Temperature at 2m (filled contours)
- Temperature at 2m (line contours)

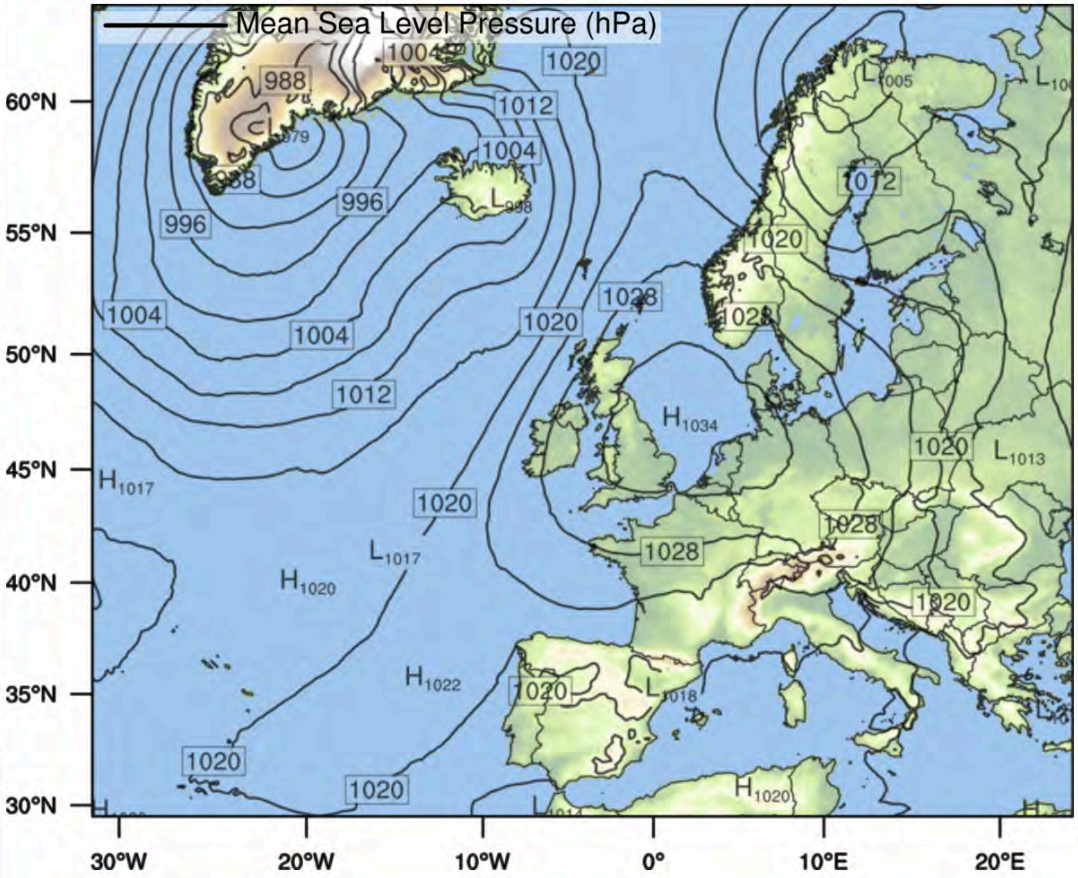
We are currently in the process of extending our weather forecasts to 78 hours [illegible] forecasts become available!

European Weather 2D/3D Plot

New plot

2300 UTC Sat 26 Sep 2015, 53 h

Options



Switch Domain

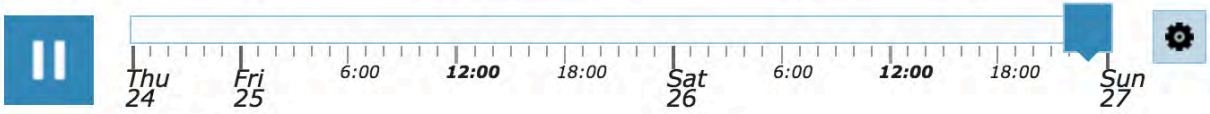
European Weather | UK Weather

Image Layers

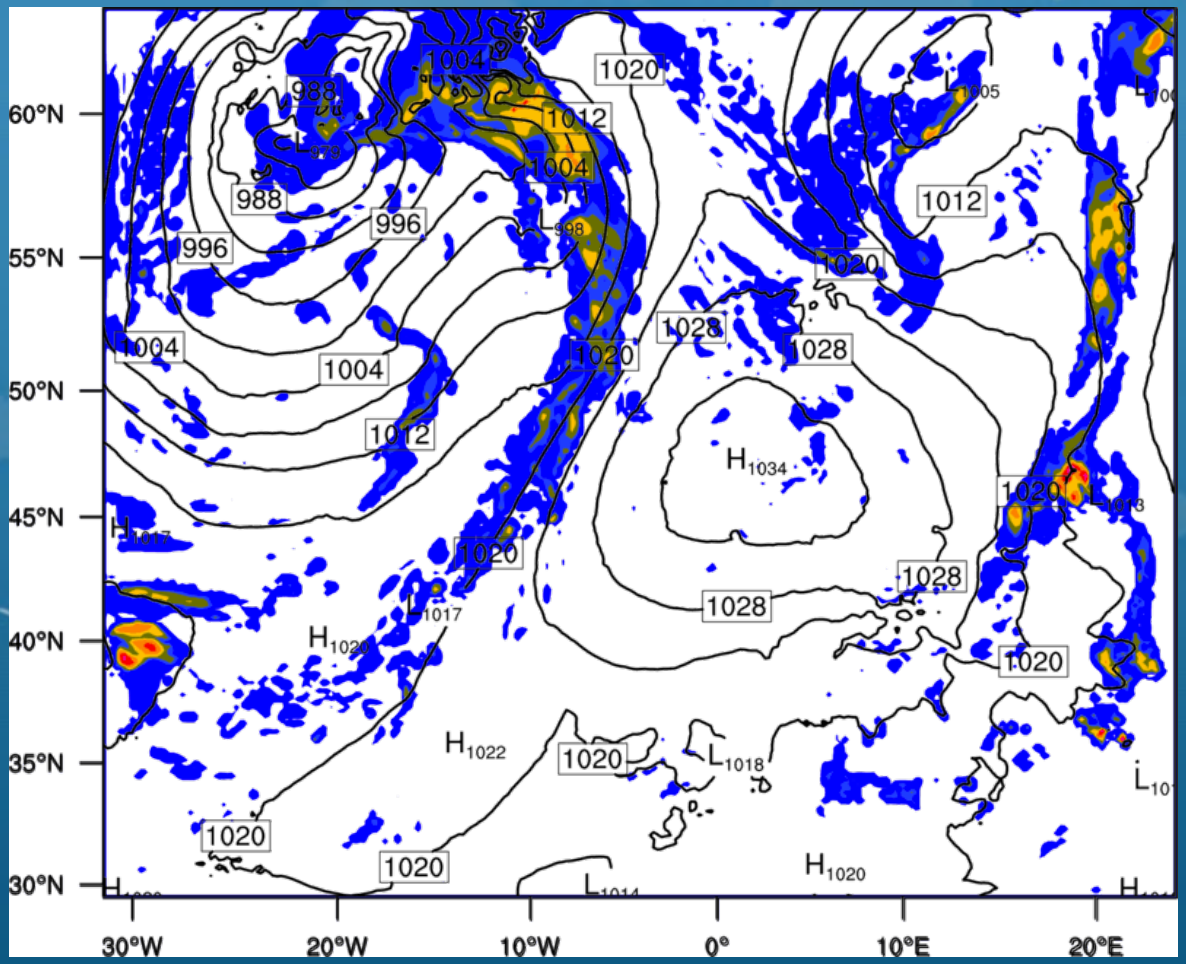
Select map overlay

Sea level pressure
sea level (0 m)
75

Select base map



Graphics creation from NCL (NCAR Command Language)

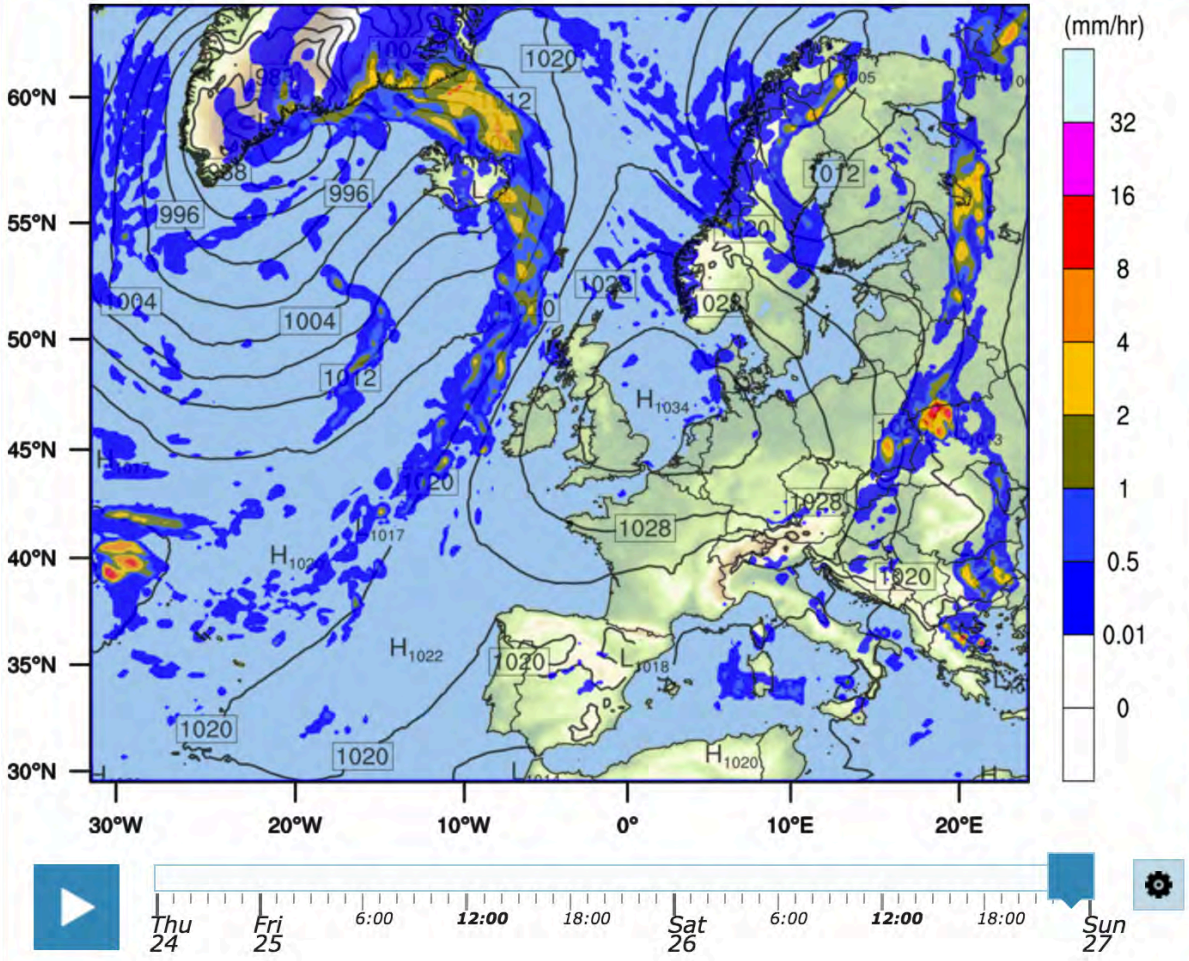


Each image is a transparent PNG – meaning that they are very small in file size, high quality, and can be layered easily

European Weather 2D/3D Plot

New plot

2300 UTC Sat 26 Sep 2015, 53 h



Options

Switch Domain

Image Layers

Search Products...

Add | Close

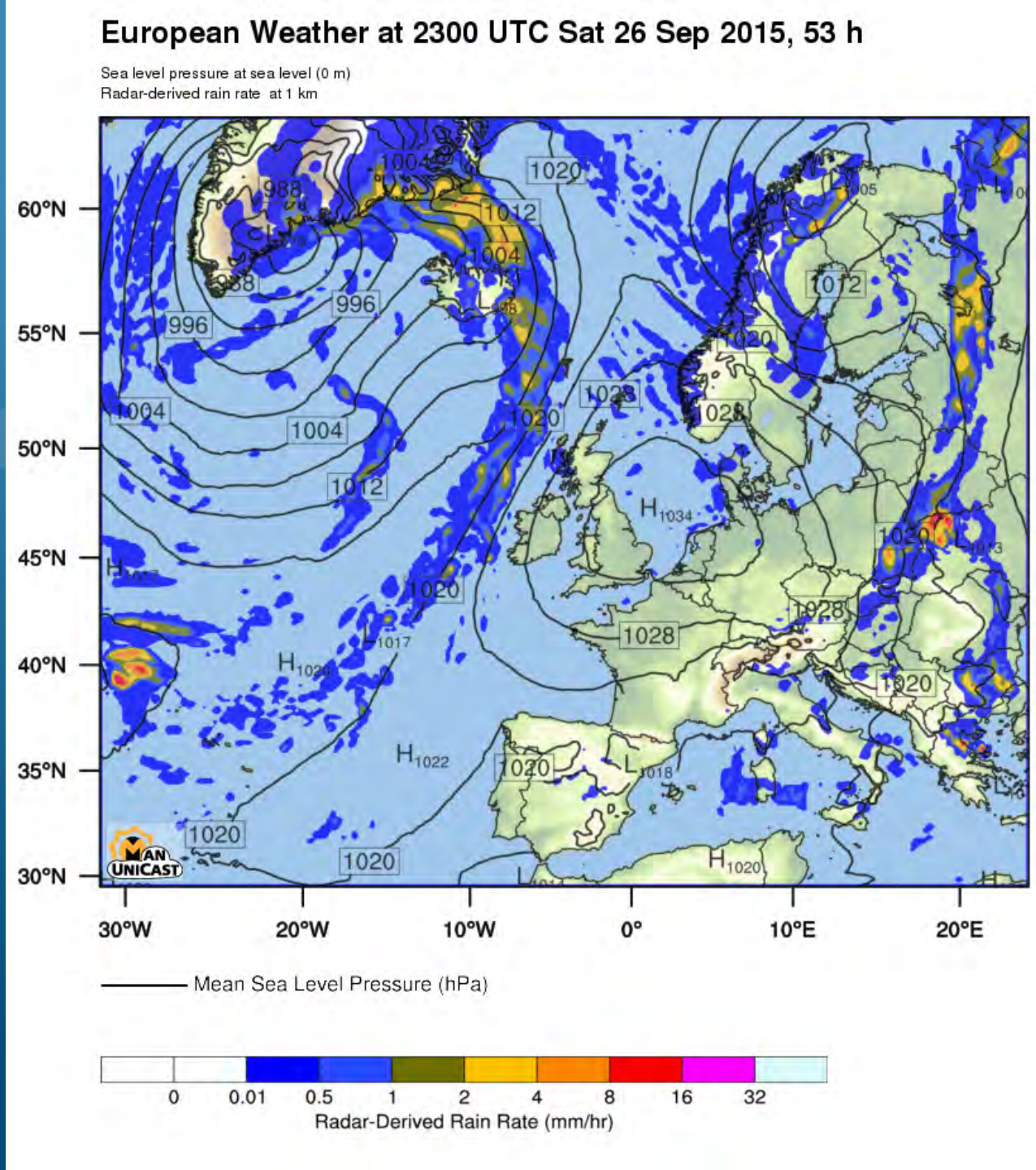
Select map overlay

Radar-derived rain rate
1 km
75

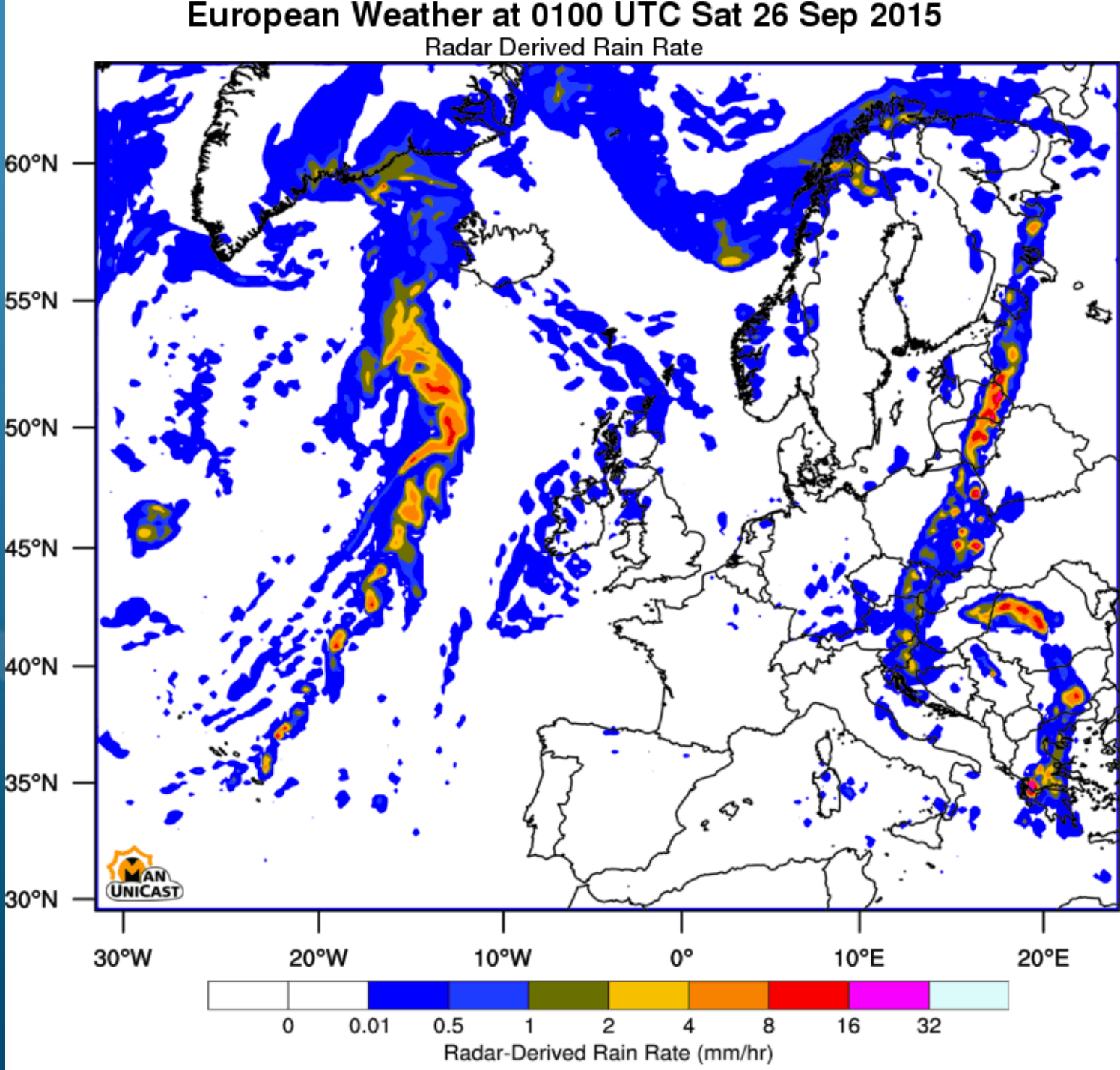
Sea level pressure
sea level (0 m)
75

Select base map

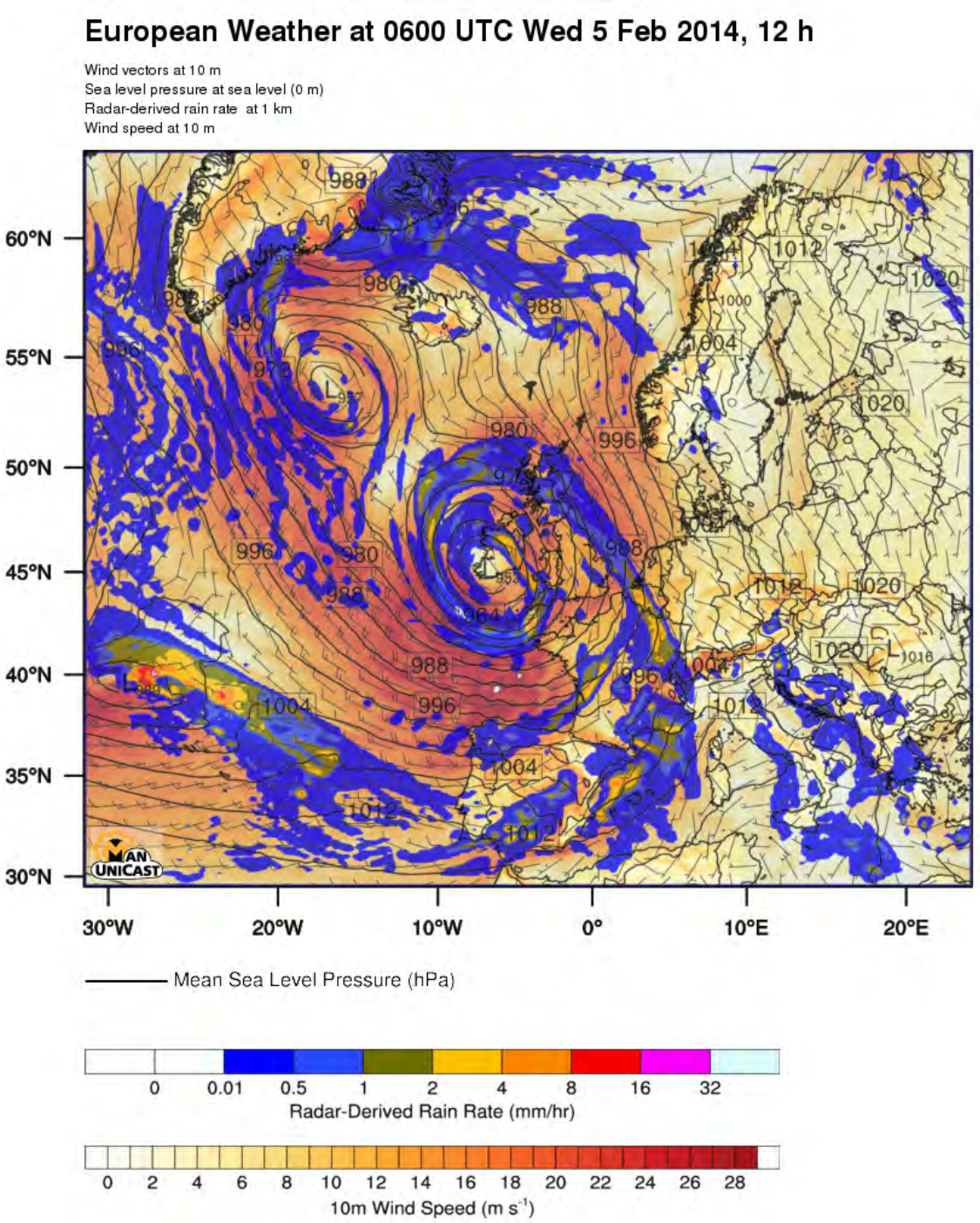
Dynamic image generation from layered image, immediately ready to be used for presentations



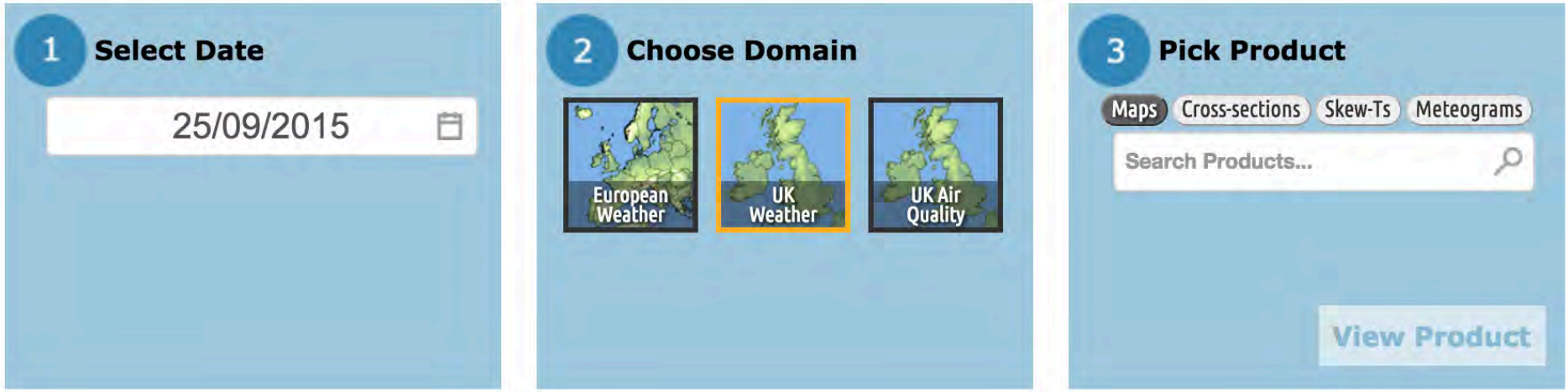
Animations of individual fields available as well



Archive of past events dating back to autumn of 2013



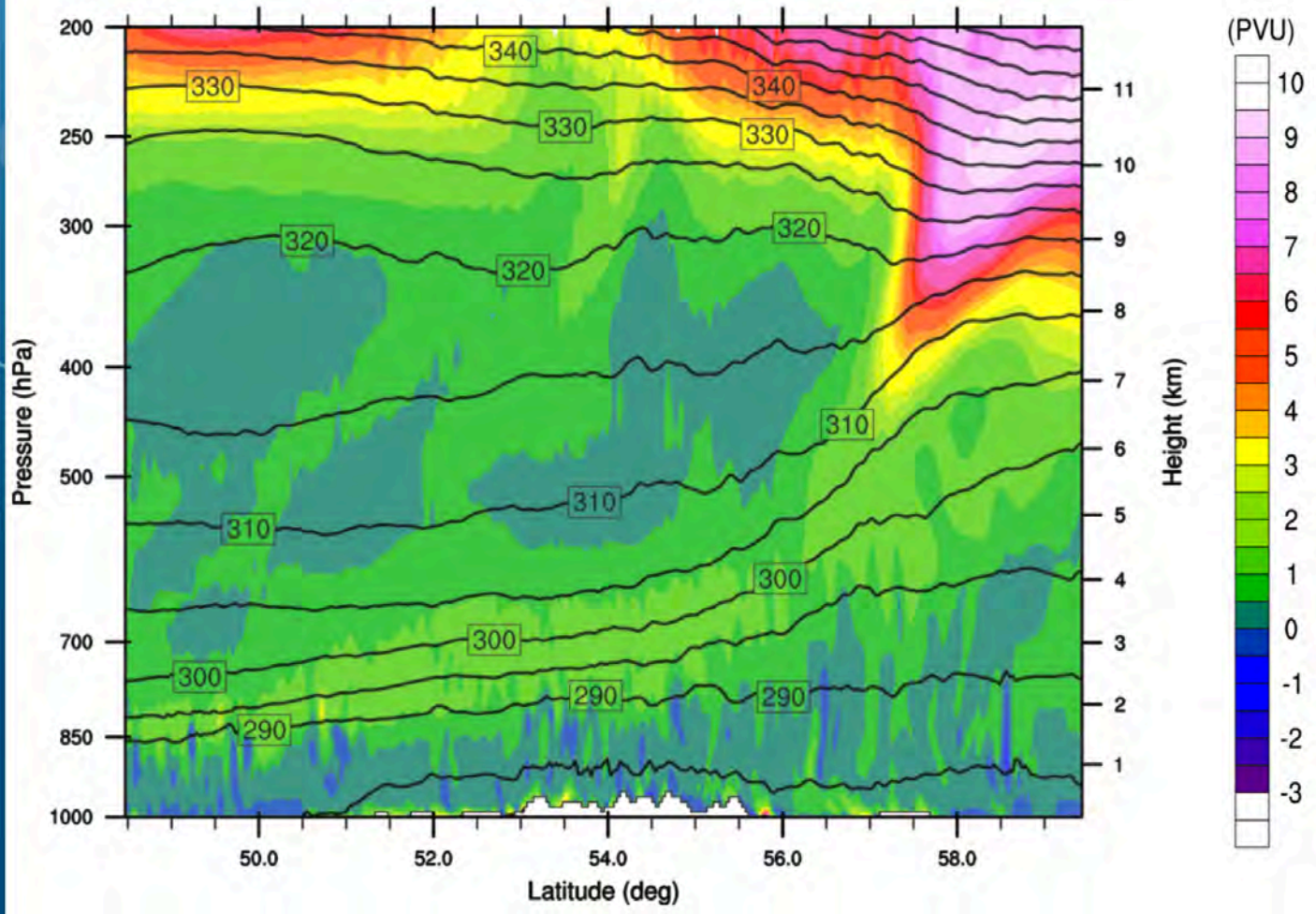
Various viewing options for the UK domain



UK Weather Cross-section (S→N)

New plot

0600 UTC Fri 25 Sep 2015, 12 h



Thu 24 21:00 | Fri 25 3:00 6:00 9:00 **12:00** 15:00 18:00 21:00 | Sat 26 3:00 6:00 9:00 **12:00** 15:00 18:00 21:00 | Sun 27

Options

Switch Direction

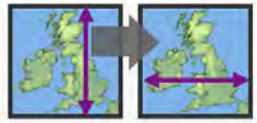


Image Layers

Search Products...

Add Close

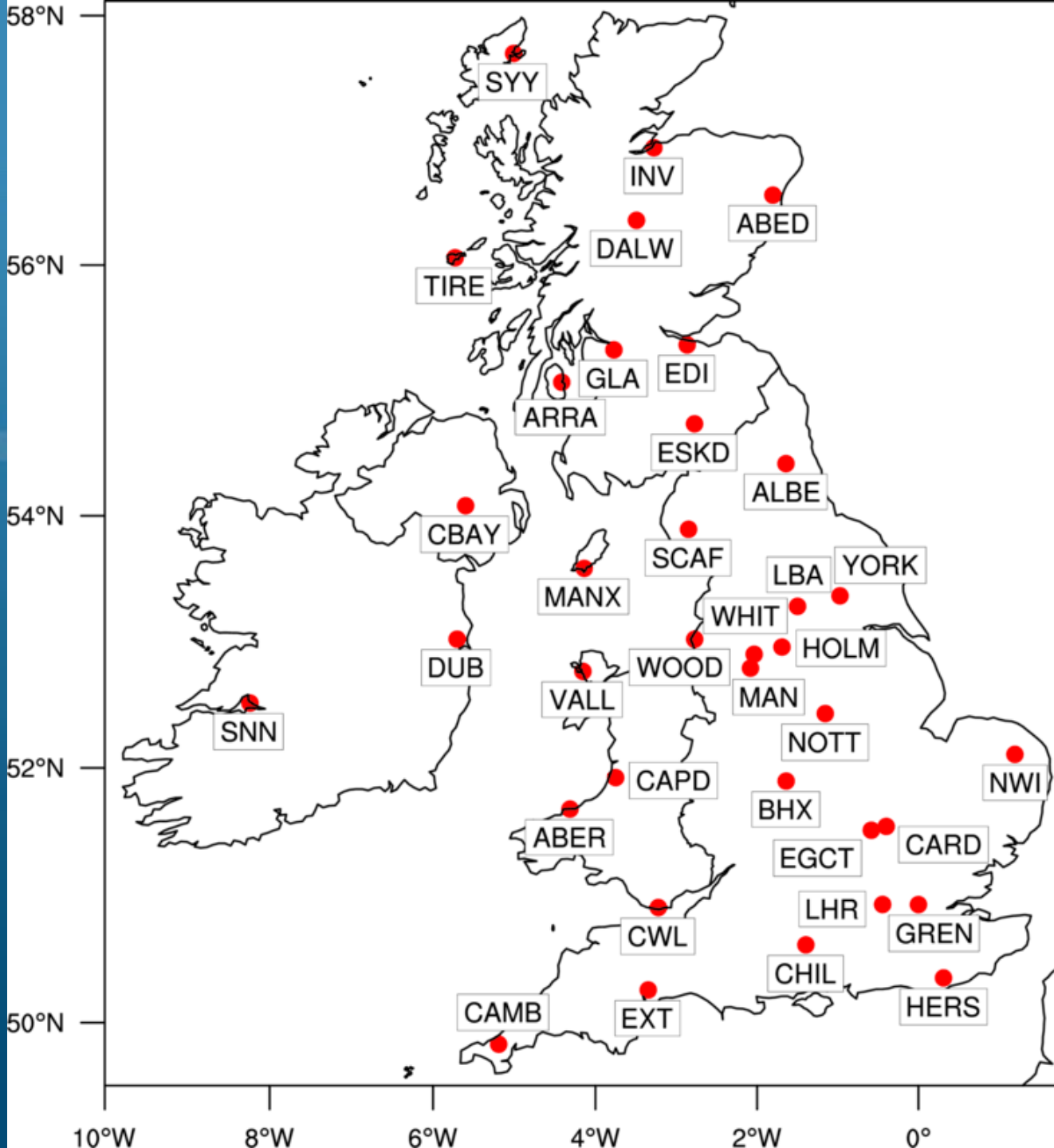
Potential temperature S->N 75

Potential vorticity S->N 75

Point Source Information

Skew-Ts

Meteograms



MAN UNICAST UK WEATHER & AIR QUALITY FORECASTING TEACHING PORTAL

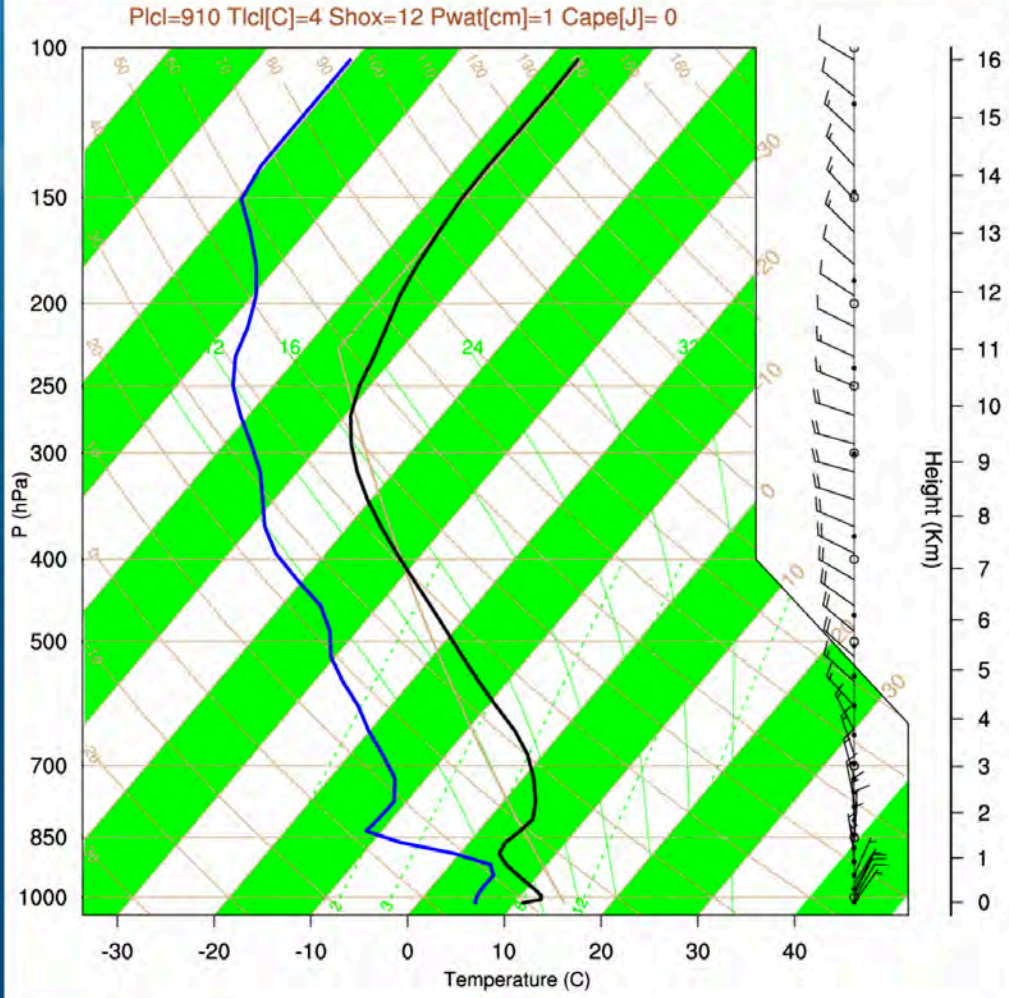
Forecasts | How forecasts work | Product descriptions | Model setup | Links

UK Weather Chilbolton Observatory, Hampshire, England

New plot

2000 UTC Fri 25 Sep 2015, 26 h

Options



Change Location

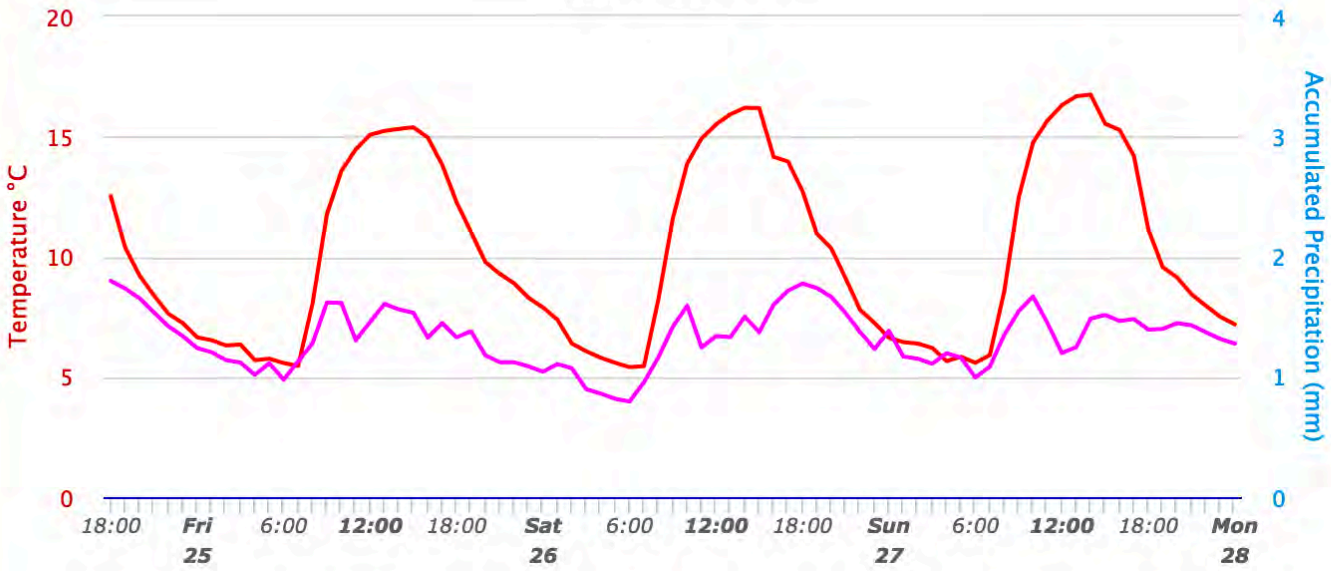
Chilbolton Observatory, Hampshire

UK Weather Meteogram

New plot

Chilbolton Observatory, Hampshire, England

51.15° N, -1.44° W



Products

(Select series legends below to enable/disable their display)

— Temperature at 2m — Dewpoint at 2m ■ Accumulated Precipitation

— Relative Humidity at 2m — Sea Level Pressure — Wind speed at 10m

···· Wind direction at 10m

Options

Change Location

Chilbolton Observatory, Hampshire

MAN UNICAST

UK WEATHER & AIR QUALITY FORECASTING TEACHING PORTAL

Forecasts | How forecasts work | Product descriptions | Model setup | Links

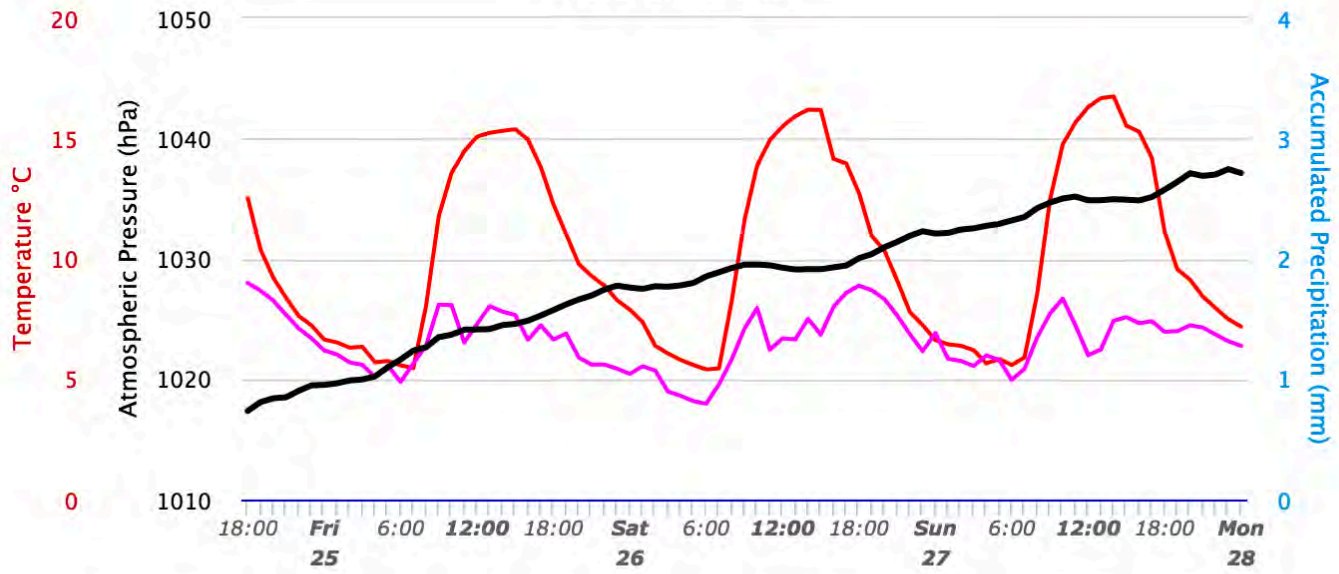
UK Weather Meteogram

New plot

Options

Chilbolton Observatory, Hampshire, England

51.15° N, -1.44° W



Change Location

Chilbolton Observatory, Hampshire

Overlay various fields onto line graphs (up to 78 hour forecasts)

Products

(Select series legends below to enable/disable their display)

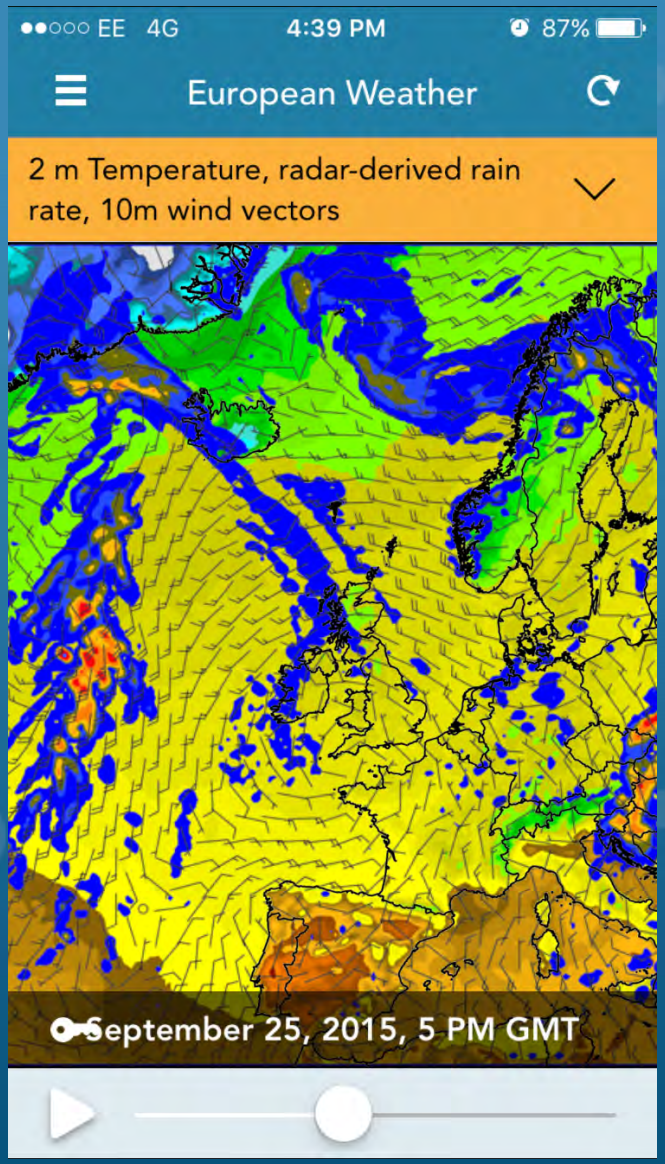
— Temperature at 2m — Dewpoint at 2m Accumulated Precipitation

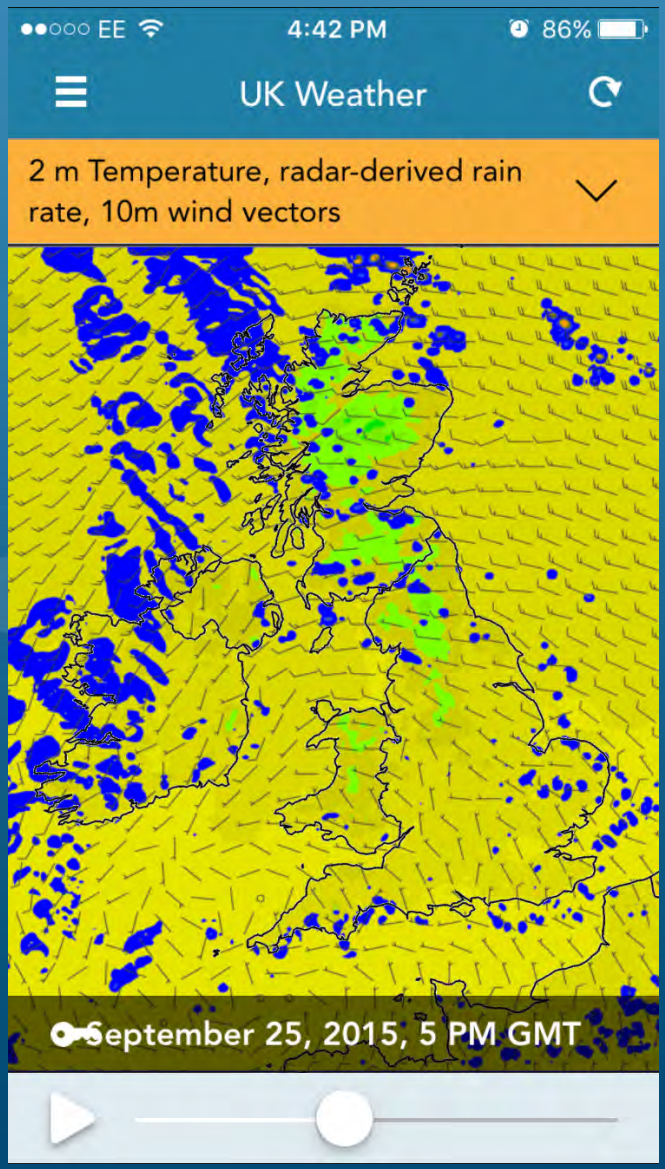
— Relative Humidity at 2m — Sea Level Pressure — Wind speed at 10m

···· Wind direction at 10m

iOS App

Available on the App Store





ManUniCast.com

Educational web site developed within the School of Earth, Atmospheric and Environmental Sciences