Workstations at Met Éireann

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Head Applications Development

21st EGOWS, ECMWF, 1-4th
June 2010

Background

- For many years Met Éireann has used several systems for visualisation of data
- X-charts for NWP
- Intranet for Satellite/radar
- Telnet – observations
- Hardcopy
- Dedicated satellite and radar displays
- Many bespoke applications

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Background

- But little integration

- Production based on a collection of bespoke applications, created by different people on different systems.

- There was a need to integrate data and production into one system

Background

- In 2007 a tender was published for a Workstation system that would:

- Provide visualisation

- Integration of most data sources

- Some production capability

- Contract awarded in Nov 2007 to IBL

Background

- Installation commenced in early 2008
- Main installation was in Sept 2008 when some customisations were available
- Through 2009, many new releases
- Final stable version in Dec 2009
- Became operational in April 2010
- User training sessions each year

IBL Visual Weather

- 2 forecast offices one the Dublin and the aviation office at Shannon Airport
- The system is based on:
  - 2-server Linux cluster in Dublin
  - 1 server in Shannon
  - Total 8 Windows clients in HQ, Shannon and TV station.

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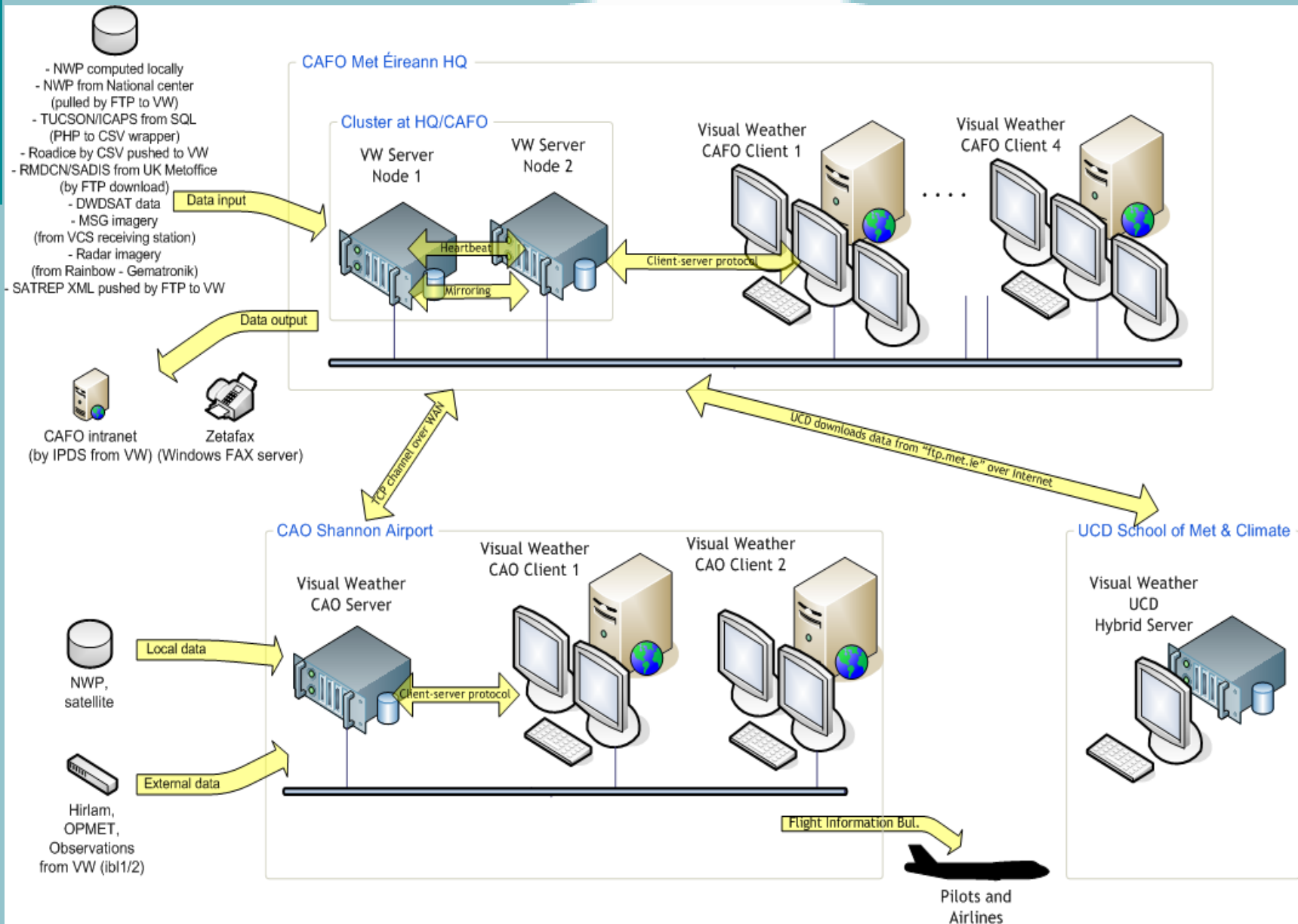
VW System

- HQ Cluster
  - Two identical Linux servers with shared 'drdb' disk array in a failover configuration
  - 6 Windows clients (4 in Forecast Office, 1 in TV station, 1 spare/test)
  - Windows clients share some information via Samba
  - 6 X-window user sessions
  - Approx 40 ingest channels for NWP, satellite, radar, observations, OPMET, WAFC,SatRep, etc
  - 30GB per day

VW System

- Shannon Aviation Office
  - Independent local server with 2 Windows clients
  - 90% data supplied via TCP socket from HQ cluster via 2 channels (NWP and other)
  - Local ingestion of Satellite data.
  - Some sharing of data with HQ via NFS and Samba for example message editing data.
  - 2MB WAN so data delivery is selective
    - Hirlam, 10km resolution, takes up to 30mins longer to reach Shannon

Other VW installations

- TV Station
  - Windows client on 2MB WAN
  - Performance OK apart from Satellite data
- University – School of meteorology
  - Totally independent
  - Receives data via ftp server
  - X-server clients only

IBL VW

- Batch system
  - Extensively used to generate off-line products for Intranet use
  - Over 270 'Jobs' generating over 9000 products per day
  - Recent parallelisation options have made the production more efficient
  - Also runs Field Diagnostics

Intranet Data Browser

Visual Weather NWP,Sat, Radar and Observation Products

Date	Centre	Model/Area	Product
20100514 ▼	SAT ▼	EUROPE ▼	ASH ▼

00 01 02 03 04 05 06 **07** 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 Next Prev

SAT/EUROPE ASH 20100514 ALLZ +07Hr [Animate]

SPECTRAL COMPOSITE
Volcanic Ash Detection
Ch10 - Ch9 Ch9 - Ch7 Ch9
Ash appears as pink to reddish colours
14.05.2010 07:00 UTC
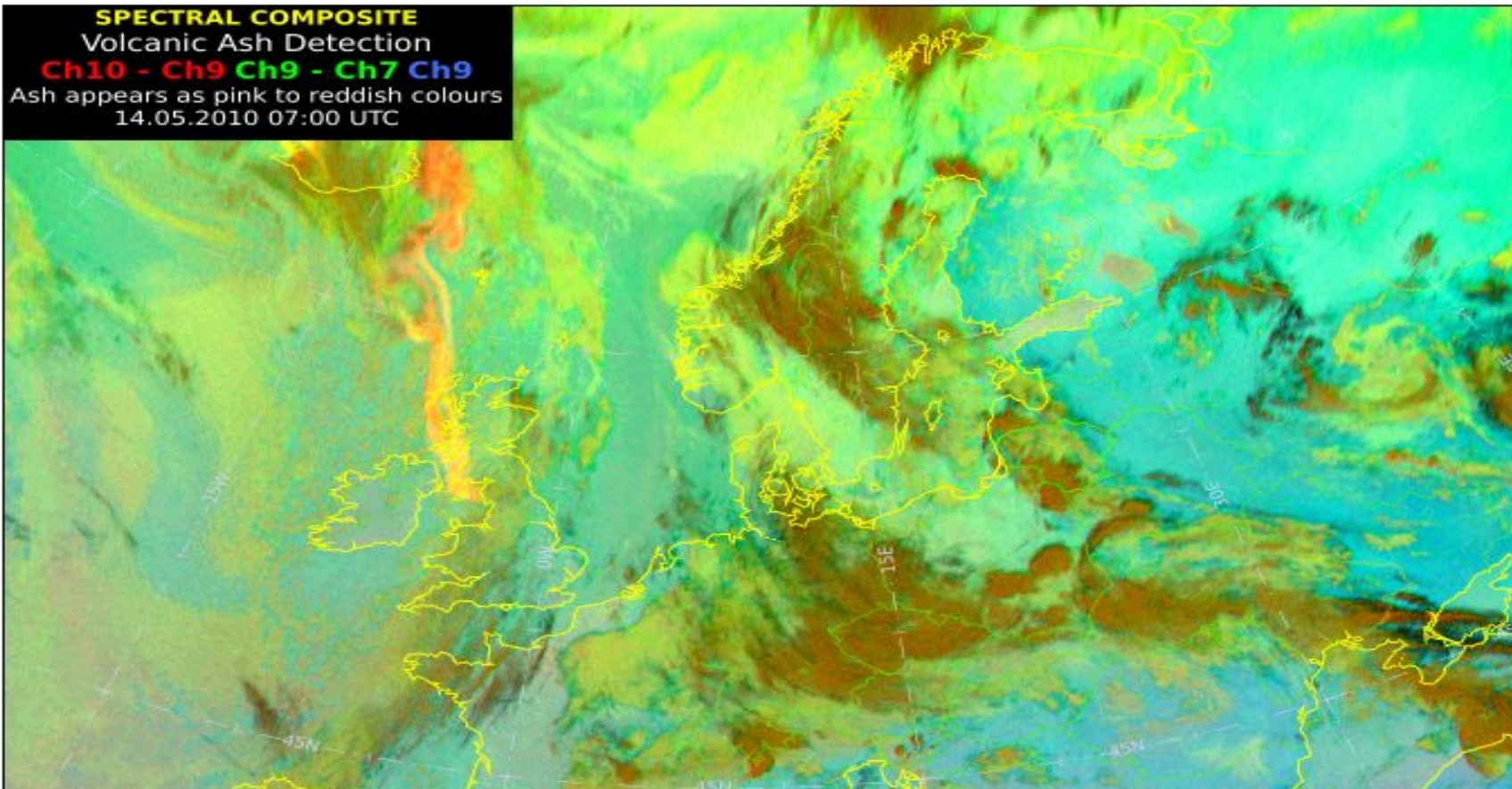
X-charts RIP

- After nearly 30 years for continuous use in various forms, the Charts and X-charts system was closed down for operational use at the end of April.

- Triggered the creating of new products!

- "Withdrawal symptoms"

Transition

- Forecasters like the VW visualisation
- But sometimes find it harder to get the same information quickly
- Also major changes in working conditions with increased workloads
- No radical change in easy even with a long transition and training

Uses of IBL VW

- Visualisation
  - Clients (Windows and X) used for visualisation
  - Large selection of pre-configured maps
  - Interactive use – maps, tephigrams, roaming profiles
  - Intranet using pre-generated products

Uses of VW

- Production
  - Limited to date
  - Tools available for editing Aviation messages but not yet operational
  - Mostly imagery for Intranet
  - But capability expanding
  - No short term plans for WMS but keeping watch on developments

Other systems

- MS Word/Access
  - Main system for production of text forecasts
  - Based on VB Macros
  - Partially automated – 'click and forget'

- Aviation Tools
  - Set of bespoke VB tools for TAF,SIGMET etc editing, monitoring forecasts and warnings
  - May be replaced by VW

- Surface and 500hPa products

ECMWF/Atmospheric Forecasts starting from 26.05.2010 00:00

21st E

Blight Meteogram

Effective Blight Hours ECMWF/Fine
valid 26.05.2010 06:00 - 05.06.2010 00:00, **EAST CORK** 52N 3' 8W 6'
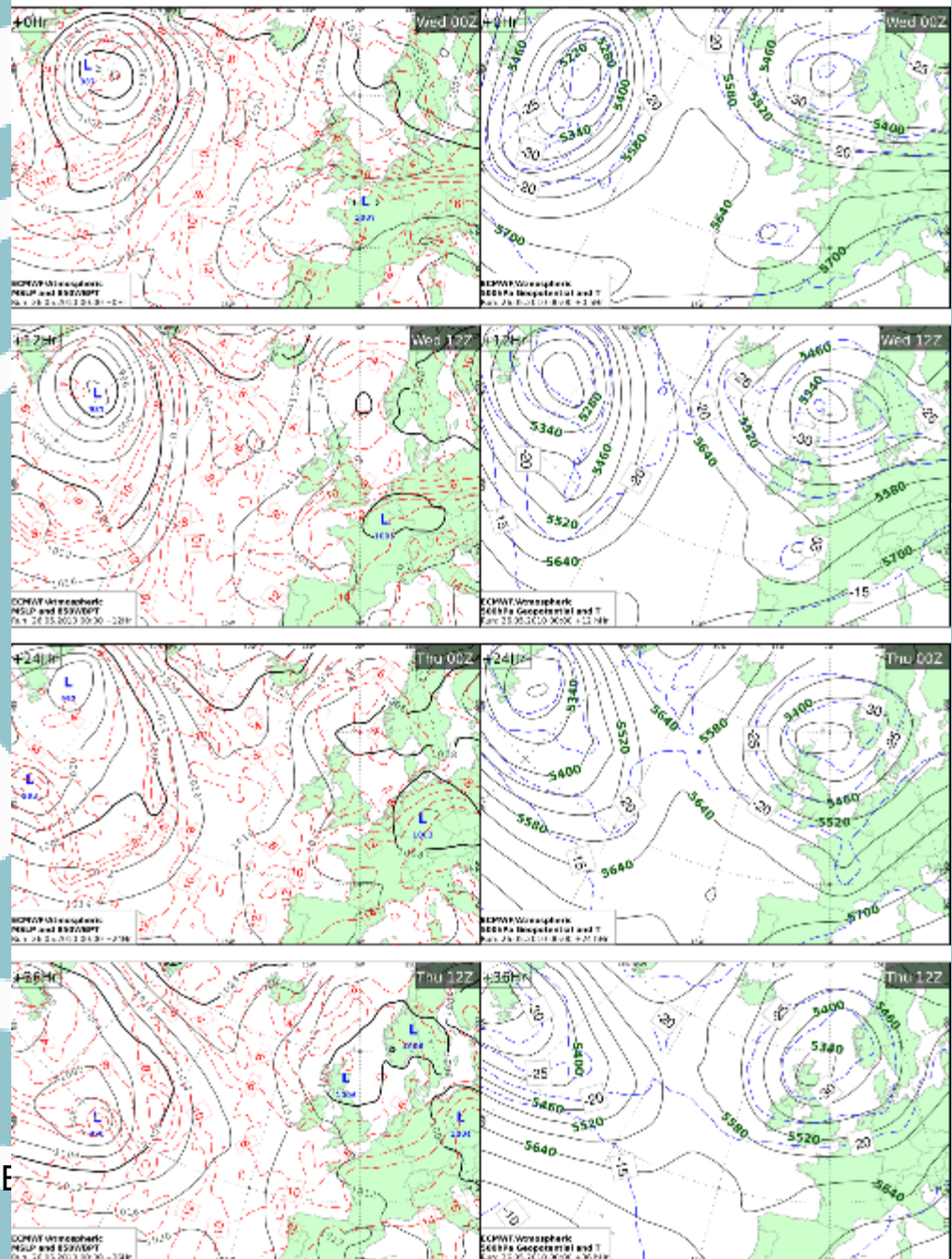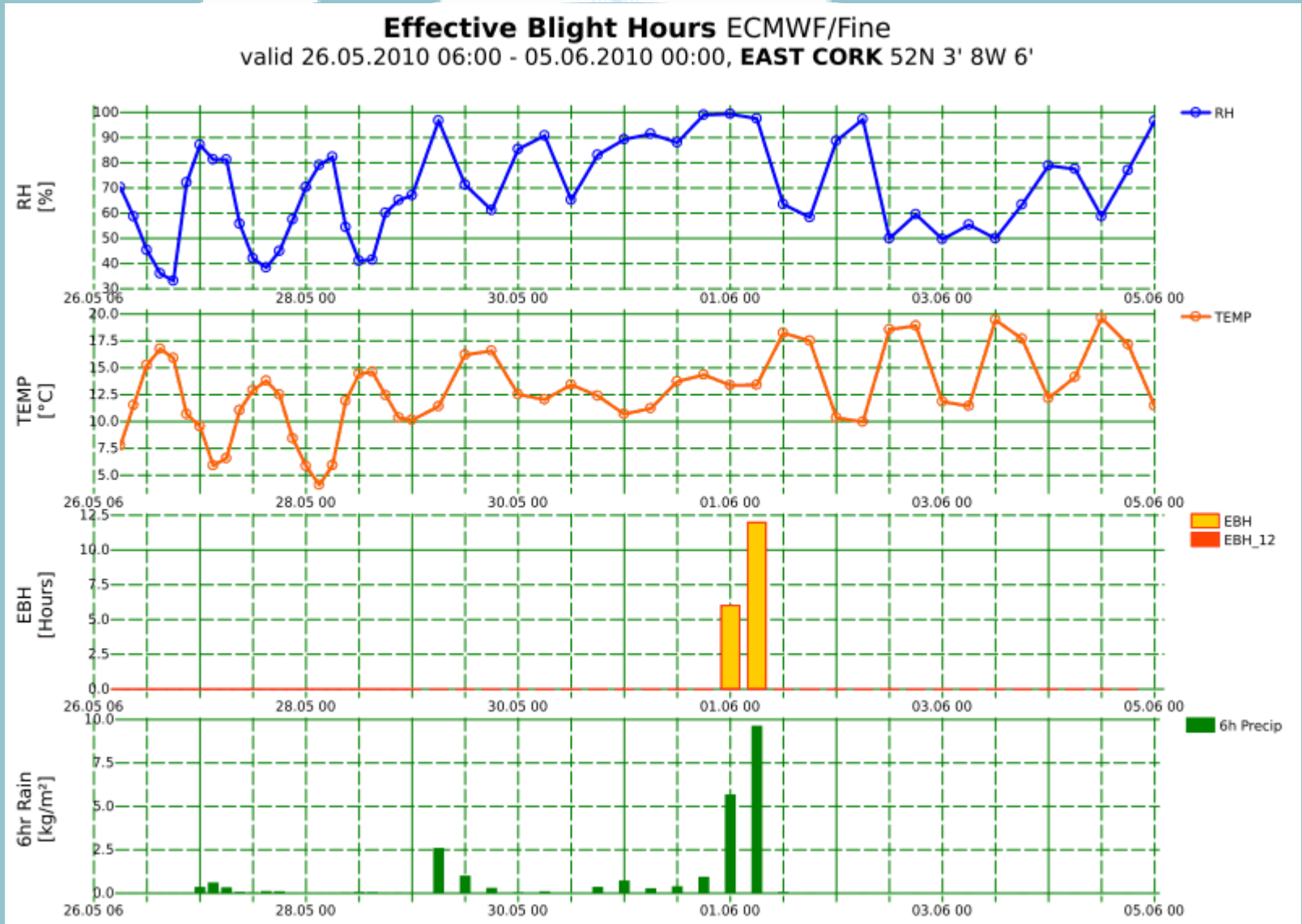
Blight Meteogram

- Custom 'Field Diagnostics' python script
- Uses T,RH and Rainfall
- Blight hour when T>10 and RH>90
- Effective blight hour after 11 hours if wet or 16 hours is dry
- Resets to zero if gap greater 12 hours
- Runs automatically generating GRIB fields
- Complicated to implement in IBL python!

X-charts vs VW

X-charts
- Menu and command
- On-the-fly diagnostics

- Very fast
- Hard-coded – little configurable
- Macros – 'obey files'
- Quick learning

VW
- Menu only
- Pre-calculated apart from simple formulae

- Can be slow
- Highly configurable

- No macros as such
- Slow learning

X-charts vs VW

X-charts

- User familiarity
- Limited visualisation options
- Fixed maps
- No production
- No message editing

VW

- New system
- Wide range of options available
- Configurable maps
- Highly usable and flexible batch system
- Flexible message system

X-charts vs VW

X-charts

- Command line
- "Plot surf rain"
- "Plot 40hr – 18hr rain"
- Very flexible!

VW

- Menu only
- Limited rainfall accumulation period options
- Possible via 'equation editor' but not user friendly

Sample Products

SYNOP plot

21st EGOWS, ECMWF, 1-4th
June 2010

- Multiple layers
- Co-operating
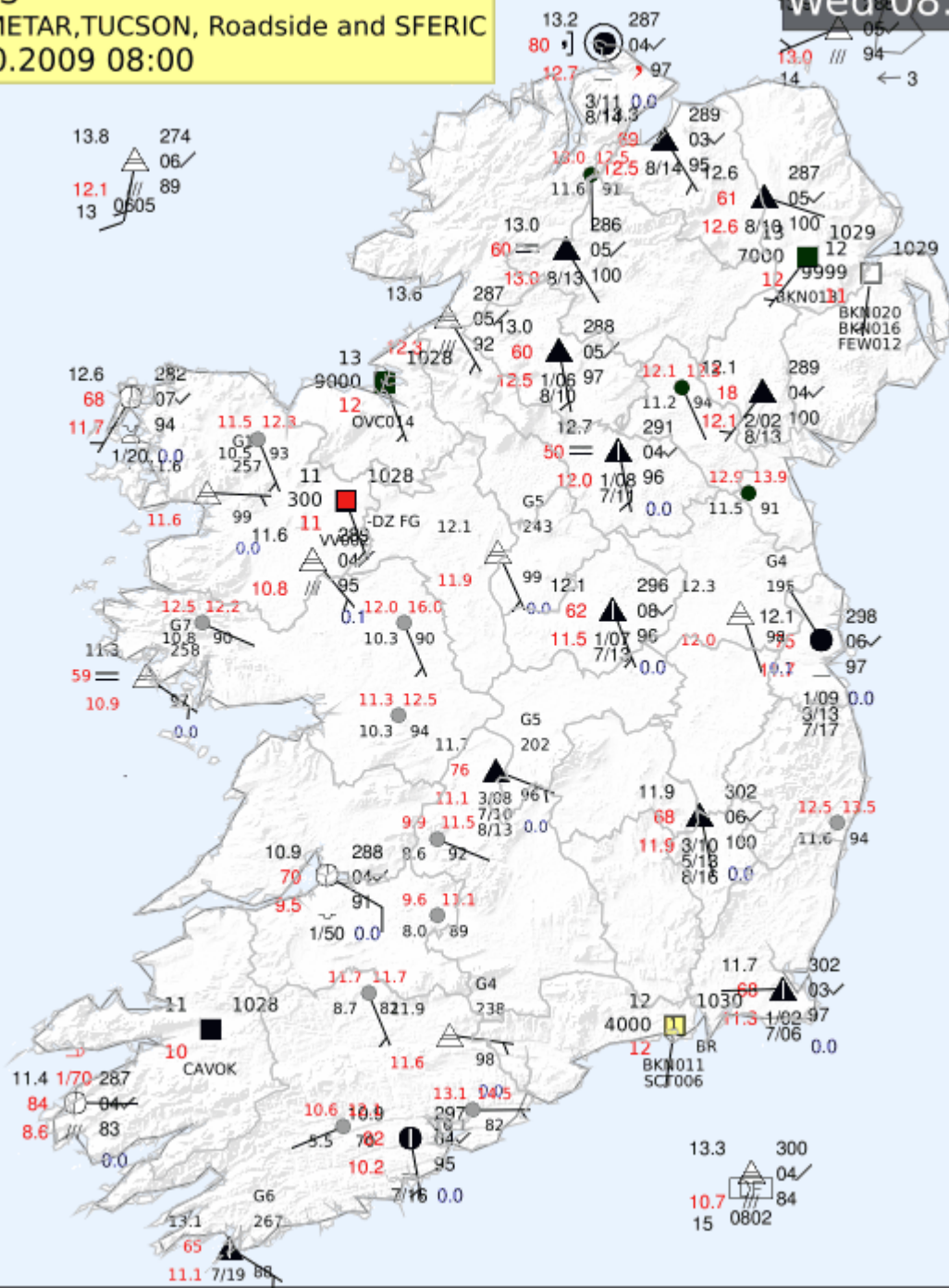
Sample Products

Roadside Stations

54 Roadside stations used with the Road Ice Prediction System

Data supplied in CSV

Roadside Data
Fri 28-05-2010 13:00

13Z

Roadside Colours
GREY - dry
GREEN - moist
BLUE - wet
ORANGE - frost
ORANGE and WHITE - snow
RED - ice
X - no data

21st EGOWS, ECMWF, 1-4th June 2010
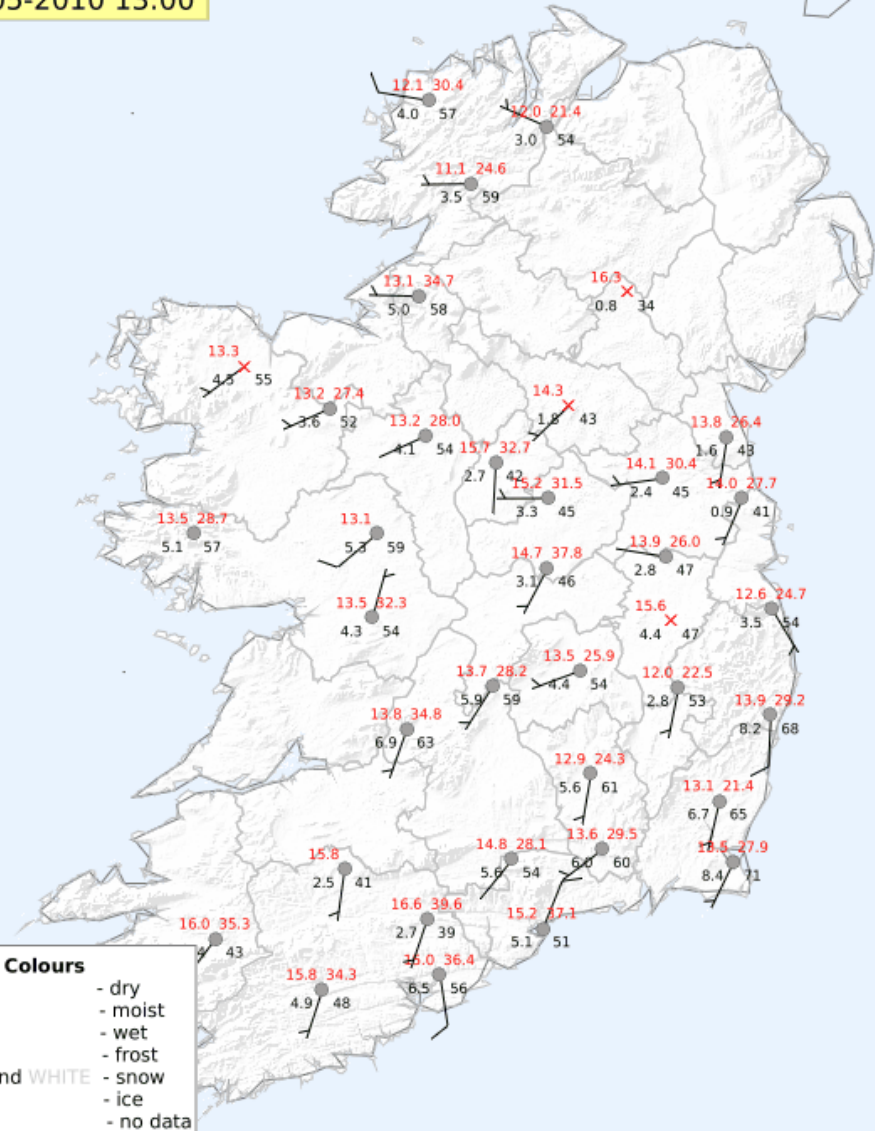
Sample Products

Automatic TUCSON station

Plot of 1-minute data

21st EGOWS, ECMWF, 1-4th
June 2010
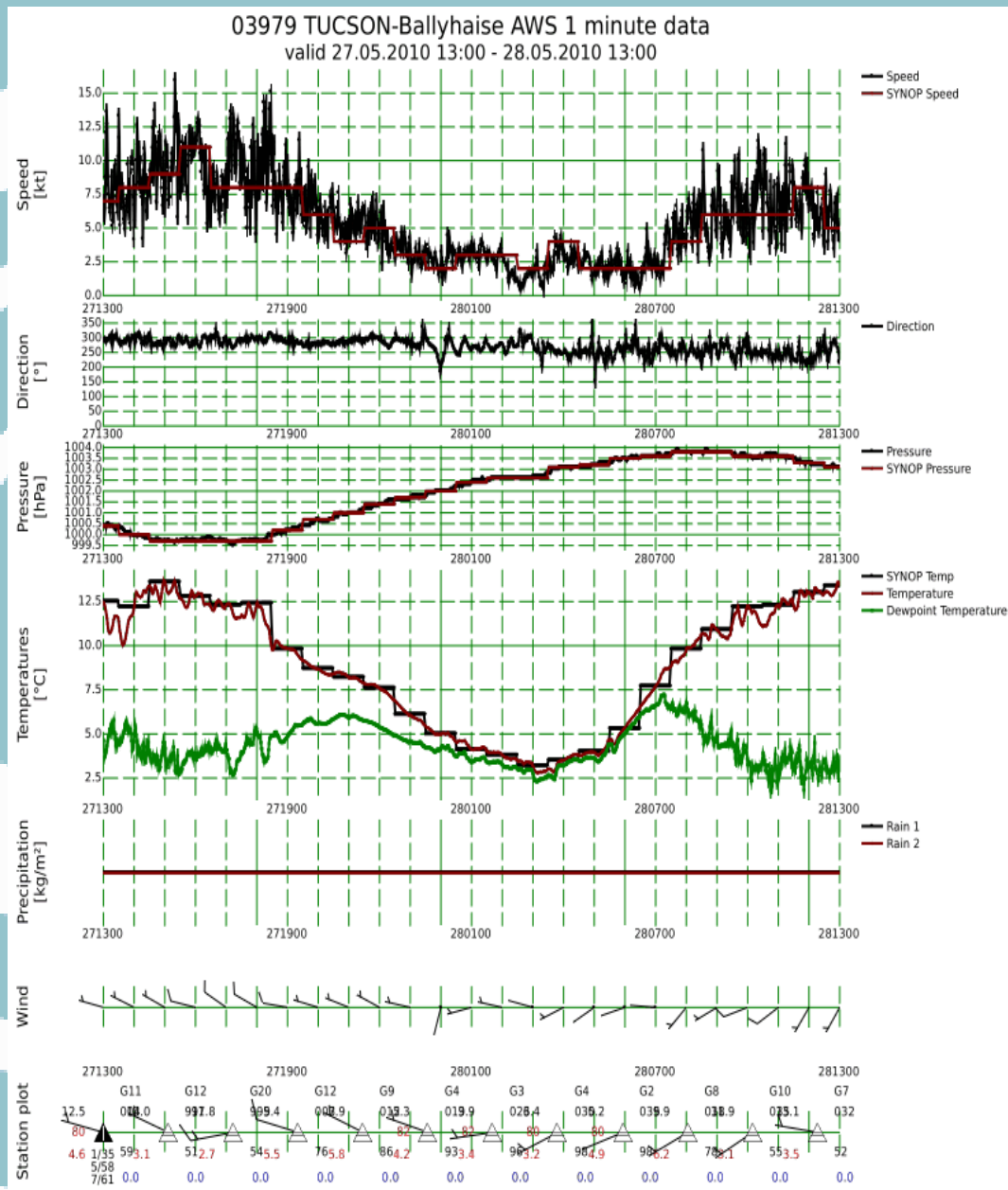
Sample Products

Automatic ICAPS station

Plot of 1-minute data from Ceilometer and Visibility measurements.

03979 TUCSON-Ballyhaise ICAPS 1 minute data
valid 27.05.2010 13:00 - 28.05.2010 13:00

21st EGOWS, ECMWF, 1-4th
June 2010
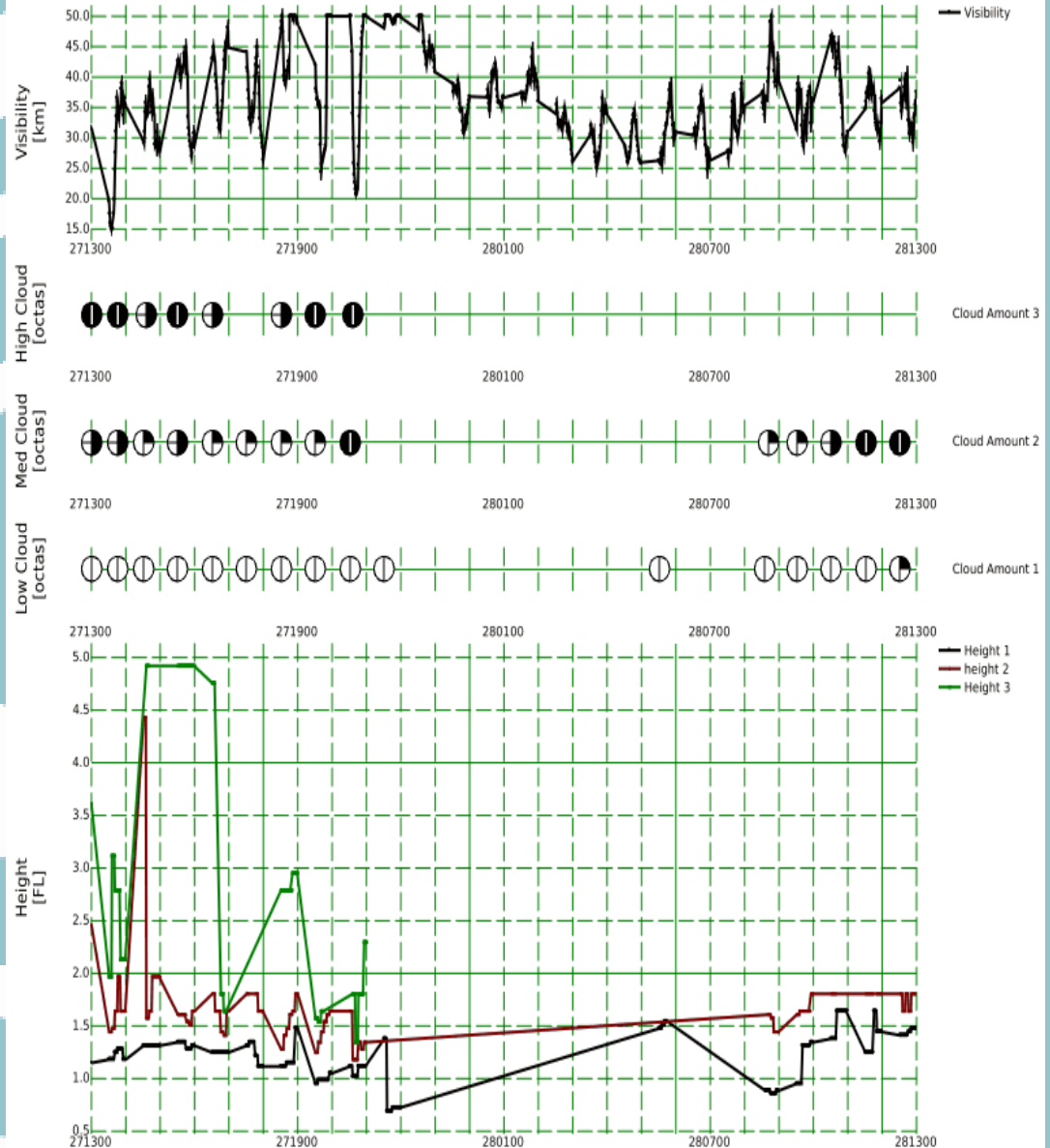
Sample Products

SYNOP and
Automatic Analysis using
• 'Batch OSA'
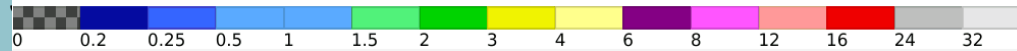•Tri-variate land only
•Hourly Hirlam model influence

HOURLY HIRLAM ANALYSIS
13 UTC 28-May-2010

21st EGOWS, ECMWF, 1-4th
June 2010

Sample Products
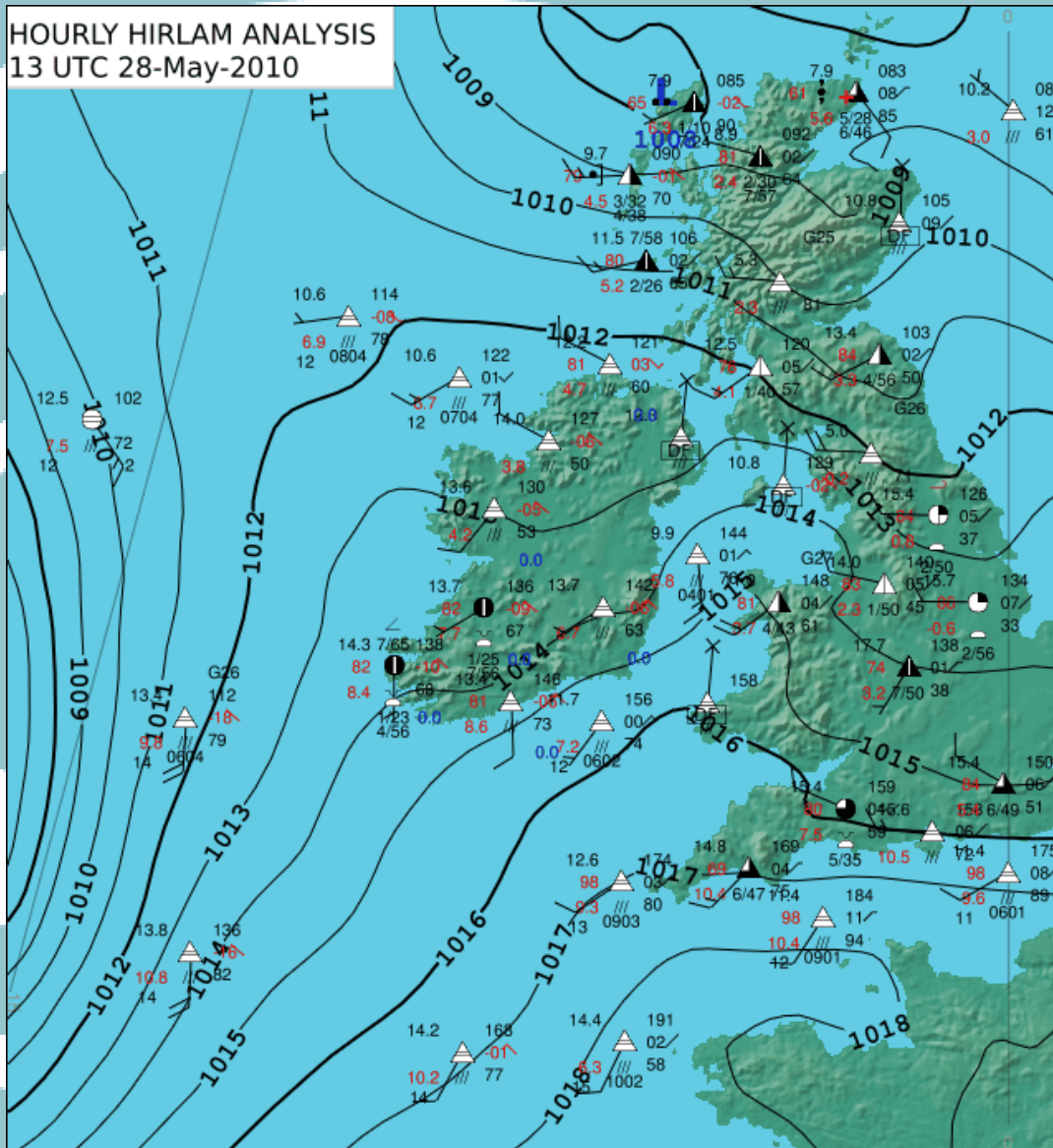
6-panel 12hr and 24 hr rainfall

HIRLAM/Main 12Hr/24hr Rain starting from 28.05.2010 06:00
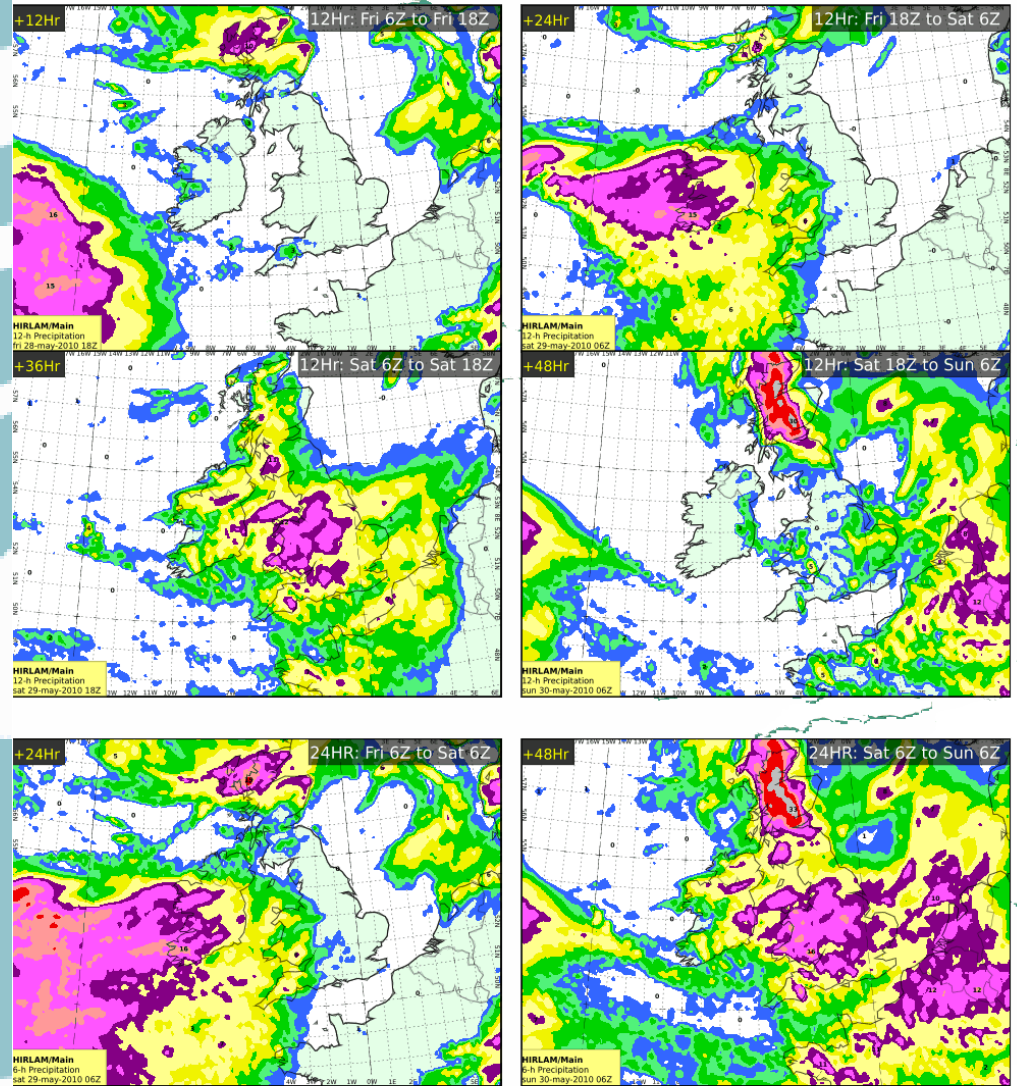
21st EGO

Sample Products

Max and Min temps from Hirlam

Implemented as a **Field Diagnostic** that scans hourly temp fields and finds the max and min temps
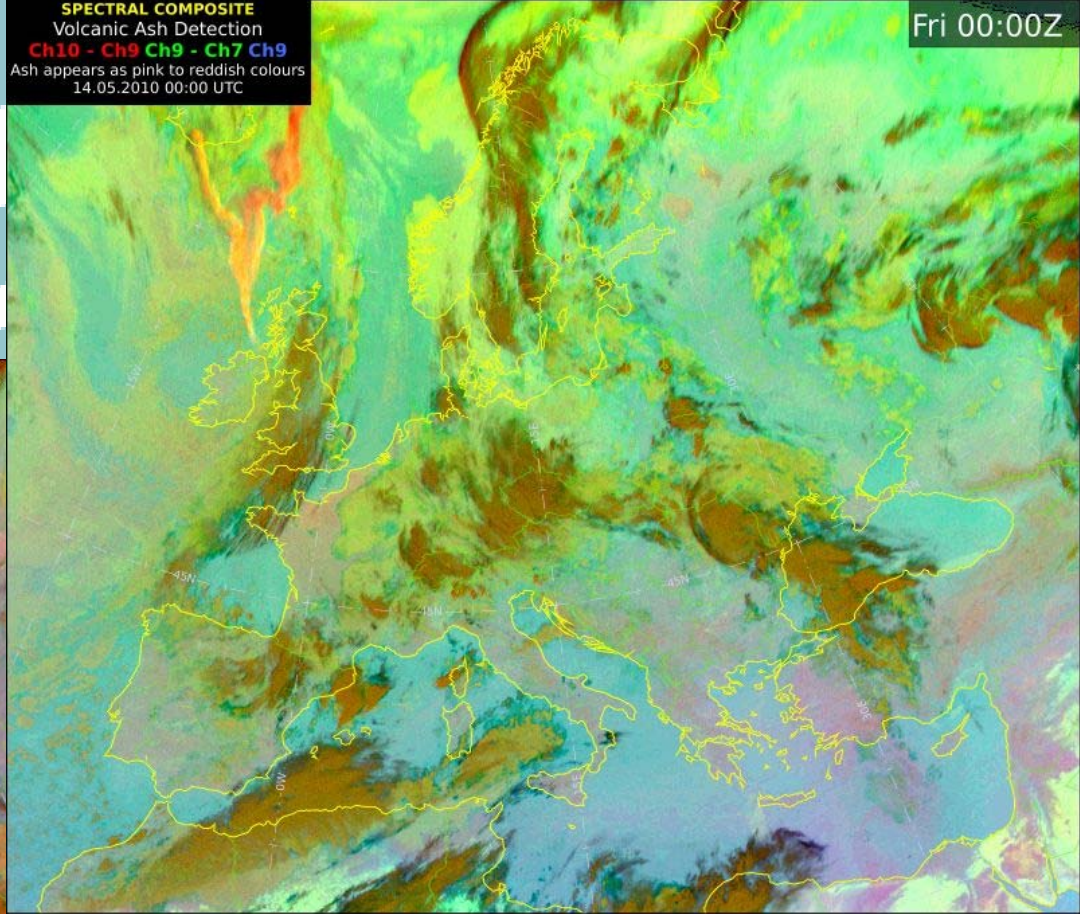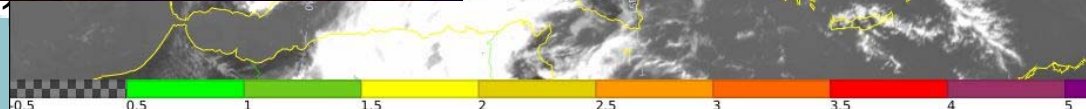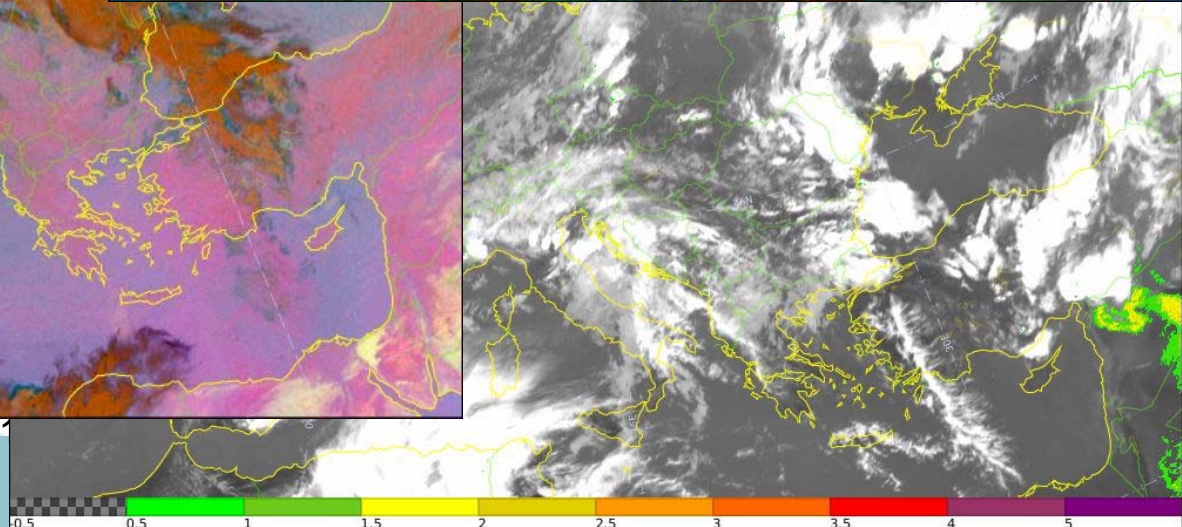

Max/Min Temps over 24 hours
Note: Day 1 MAXs are from Model run to 0Z
and Day1 MINs from Model run or 12Z to 12Z
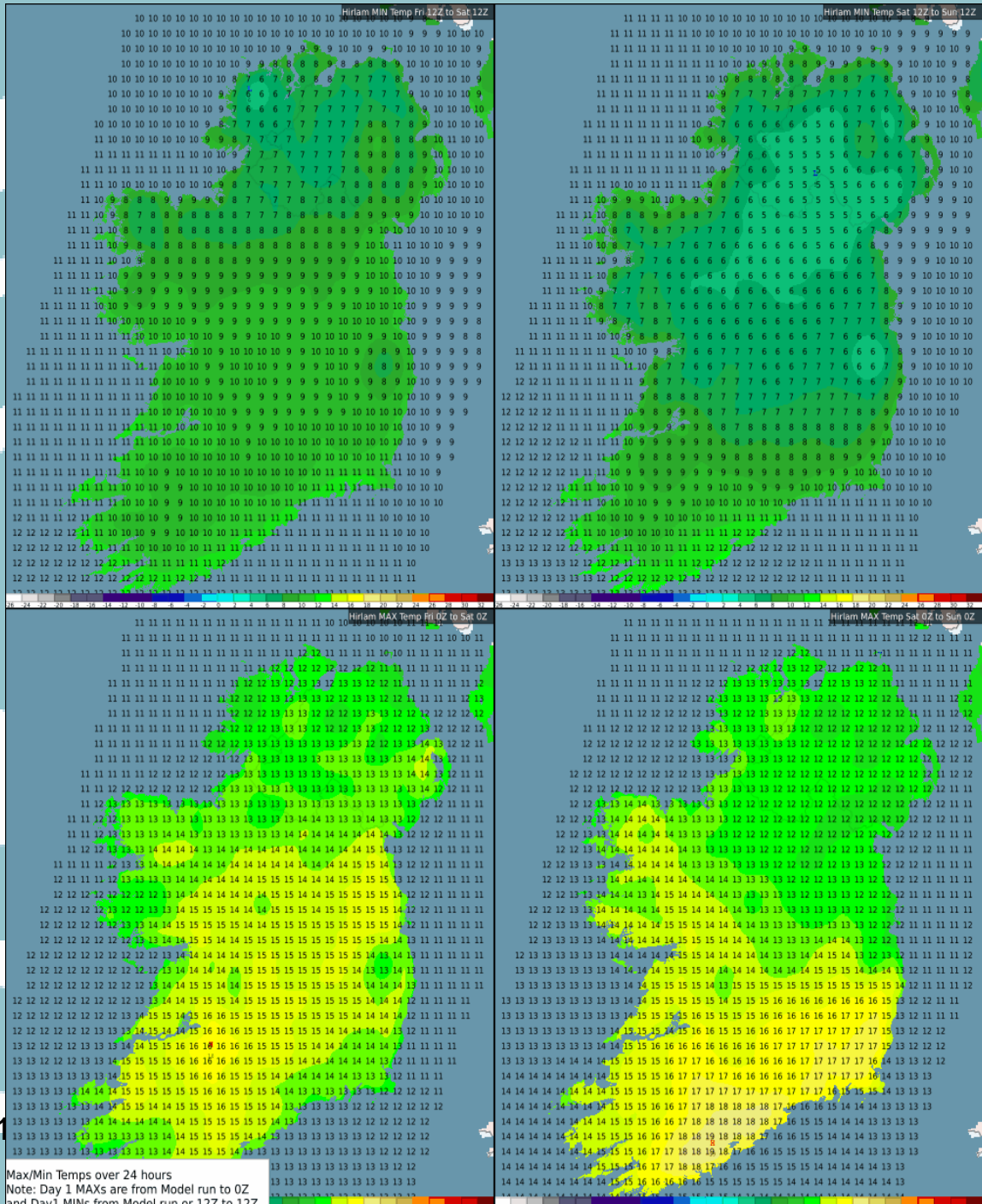
Volcanic Ash Satellite products

SPECTRAL COMPOSITE
Volcanic Ash Detection
Ch10 - Ch9 Ch9 - Ch7 Ch9
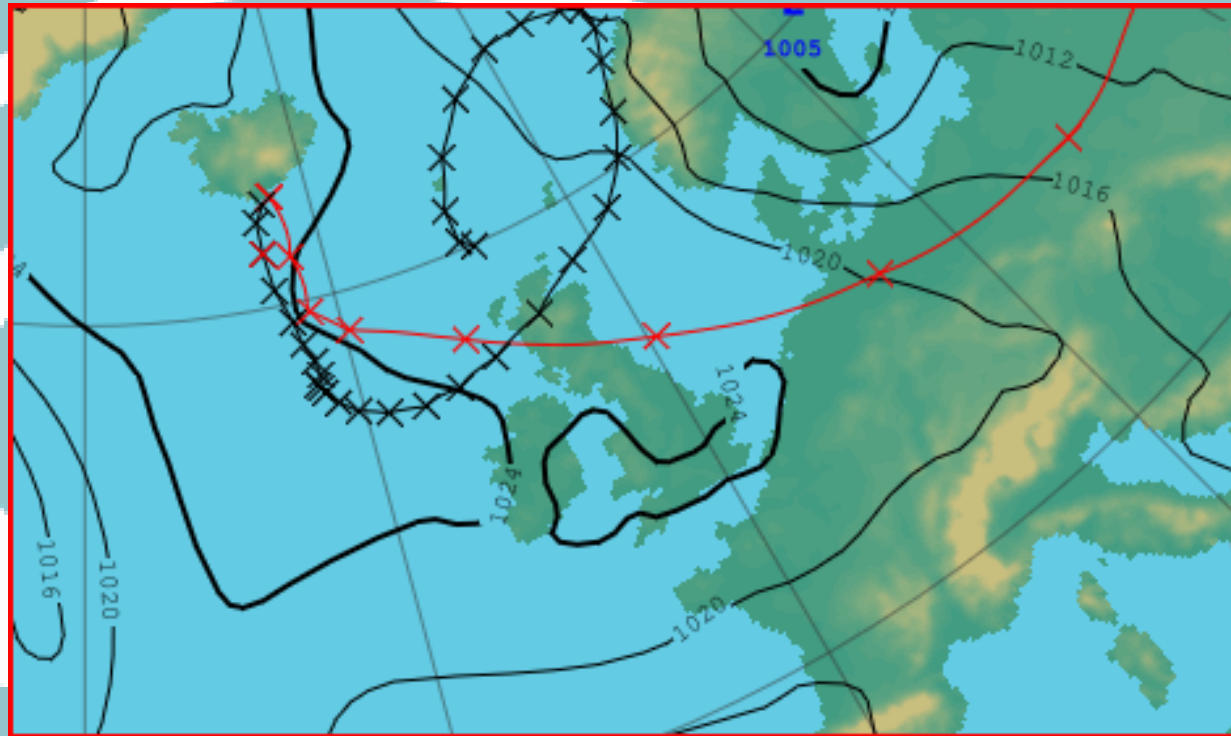Ash appears as pink to reddish colours
14.05.2010 00:00 UTC

Fri 00:00Z
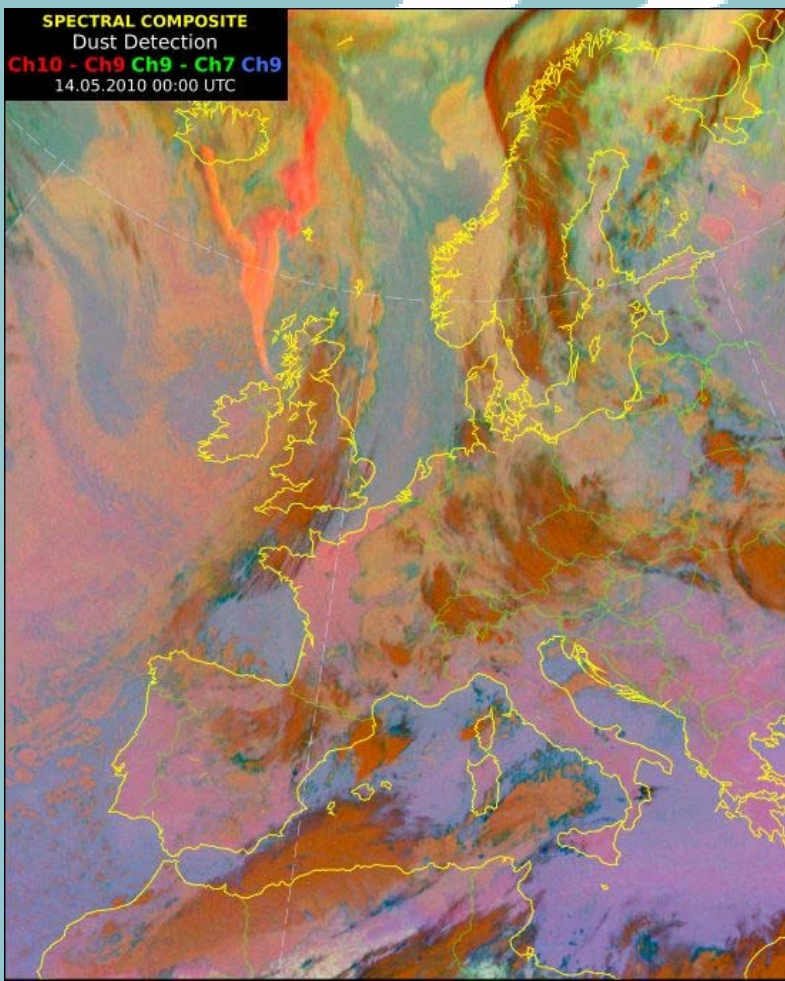
SPECTRAL COMPOSITE
Dust Detection
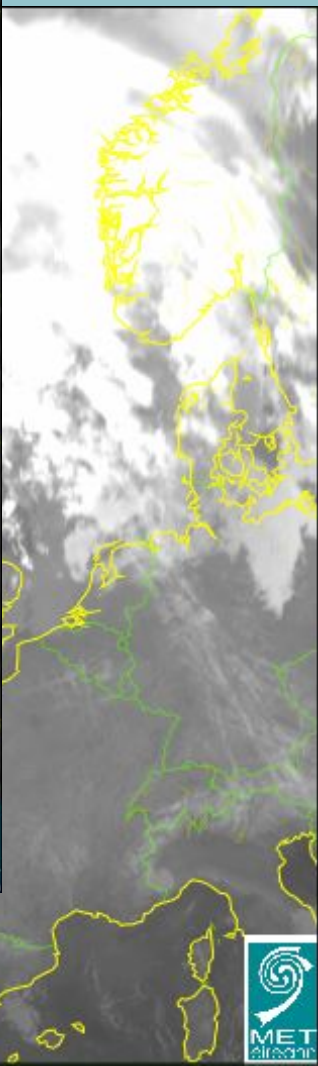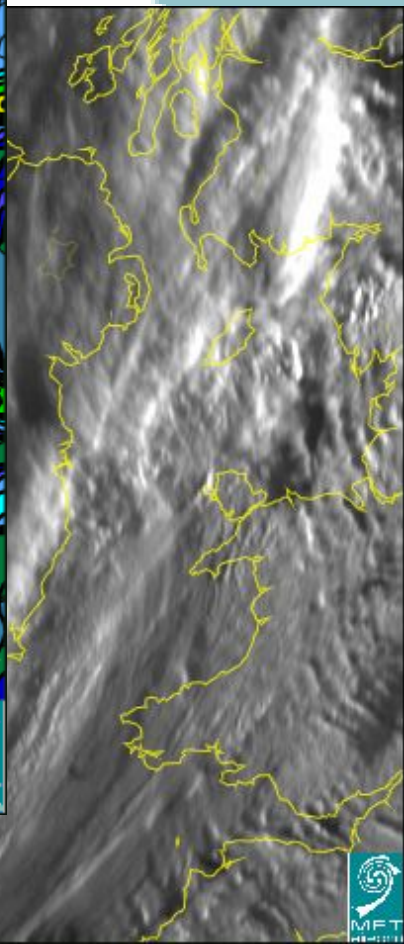Ch10 - Ch9 Ch9 - Ch7 Ch9
14.05.2010 00:00 UTC

21

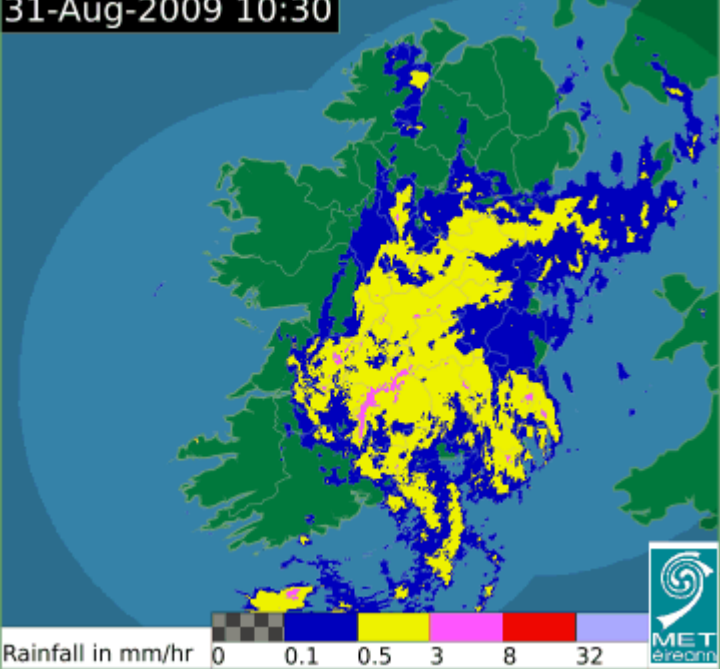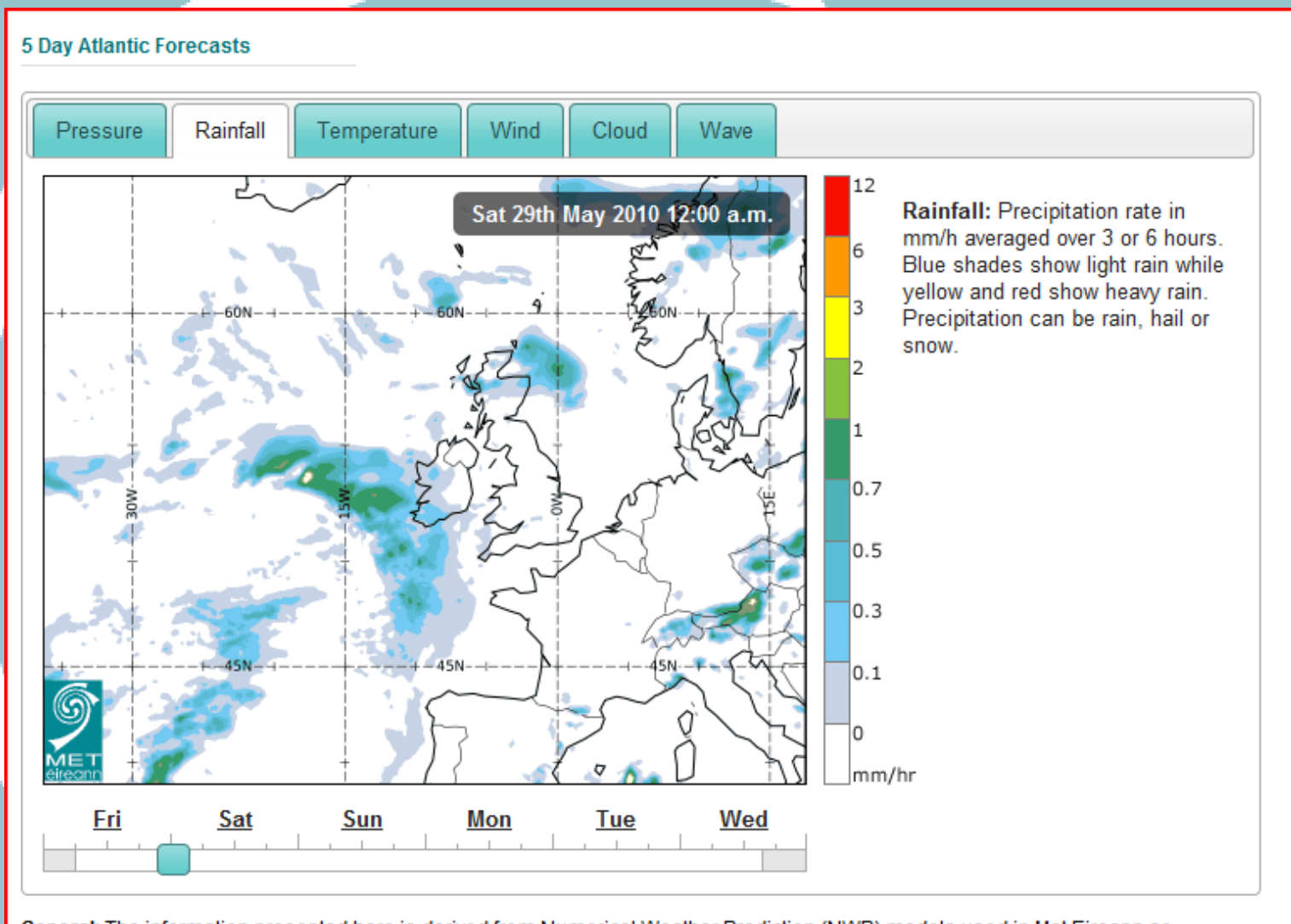# Trajectory Tool

Simple, but very quick trajectory tool.

www.met.ie

31-Aug-2009 10:30

Rainfall in mm/hr   0   0.1   0.5   3   8   32

Rainfall (MM) for 12 UTC 31 AUG 2009

0   0.2 0.3 0.5 1   1.5 2   3   4   6   8   12 16 24 32
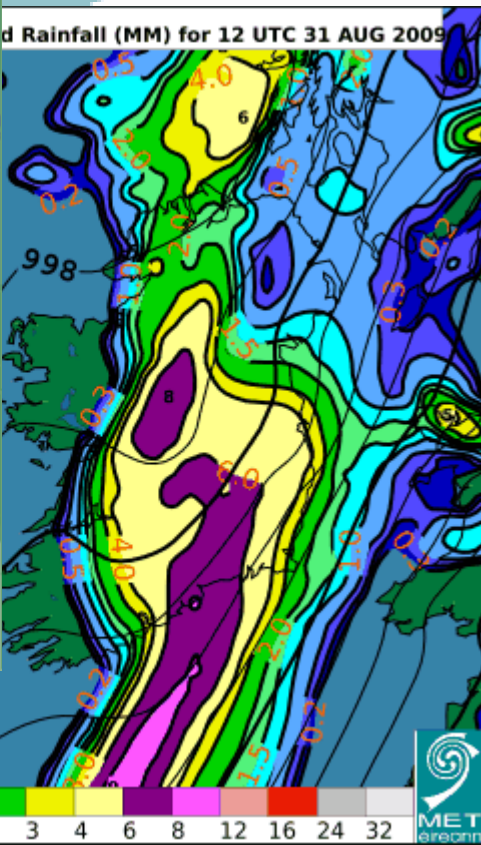
21st EGOWS, ECMWF, 1-4th
June 2010

New products for www.met.ie

Fax Product
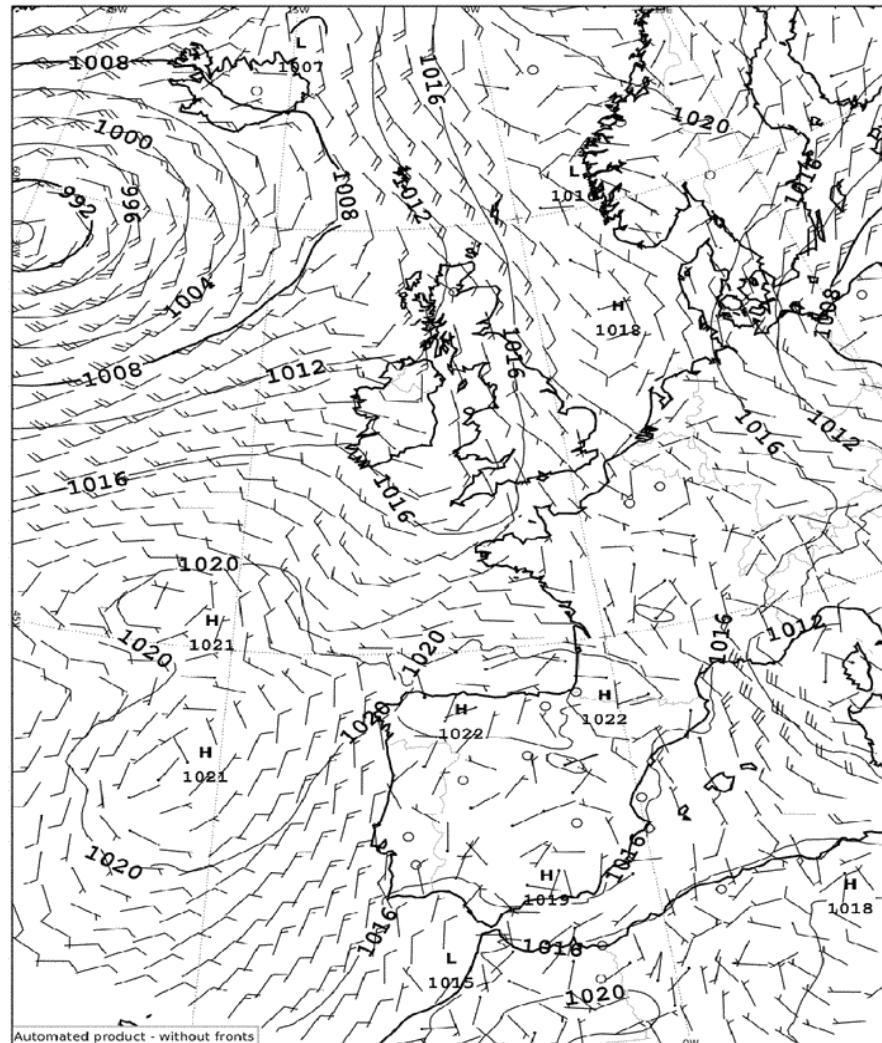
Using Message Editor and
OpenOffice ODT Template

Sea Level Pressure / 10-Metre Wind
Product number 0015 updated at 0400 / 1000 / 1600 / 2200
Analysis valid on Tue 01 Jun 2010 at 06 UTC

Automated product - without fronts

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In conclusion

- VW now Operational in Met Éireann forecast offices

- Forecasters suffering 'withdrawal symptoms' with the end of X-charts

- Potential just being explored

Thank You