



# Delivering Met to the Military User



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## This Presentation Will Cover:

- **Met Office Defence Services**

*How the Met Office supports military decision makers.*

- **Changes in Defence Requirements**

*How will the needs of the defence user evolve.*

- **The Met Office Response**

*Plans for a new way to exploit and deliver Met information.*



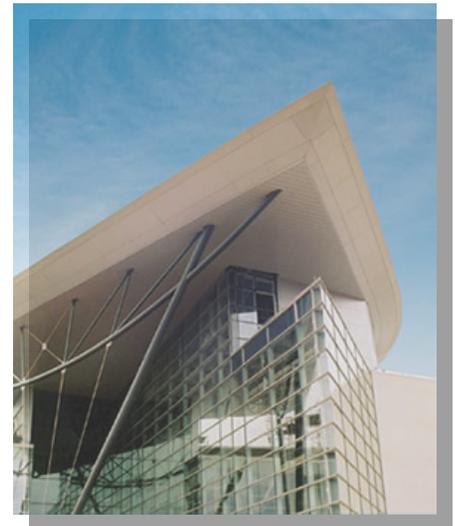


# The Met Office



## Links to Defence:

- The UK National Met Service - founded in 1854.
- Part of the UK Ministry of Defence – part of the Air Ministry since 1919.
- A Trading Fund owned by the Secretary of State for Defence.
- Employs over 1,600 people – 300 in Defence.
- Vision:  
*“Making our forecasts essential to everyone, every day”*



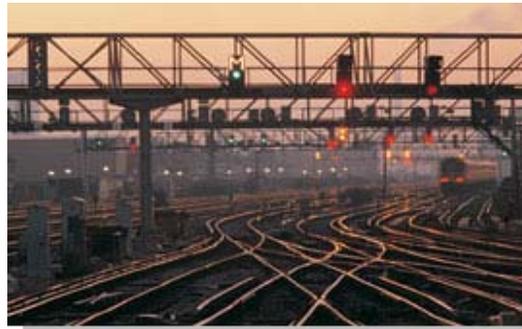
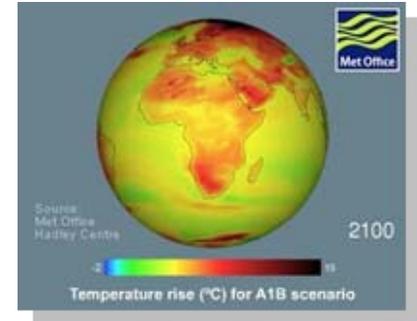
## Main Customers & Services:

### Services to Government

- Public Weather Service (PWS)
- *Defence*
- Climate Research
- Civil Sector Services (CSS)

### Services to Business

- Transport (Road, Rail, Marine, Civil Aviation)
- Utilities
- Media
- Retail
- Legal
- Consulting



## Defence Service Types:

- Forecast Services:
  - Forecasts, One-to-One briefings, Advice and Guidance
  - UK and Overseas stations, MMU
  - Includes data, infrastructure, systems, staff
  
- Data:
  - Raw NWP, Guidance and Products.
  
- Research & Development:
  - Defence-specific techniques and technologies.
  - Capability development
  - Pull-through to operational services
  - Defence Climate Research Programme



## The Mobile Met Unit (MMU):

### In theatre support to defence:

- MMU:
  - Met Office civilian staff;
  - First RAF Sponsored reserve unit.
  - Some 60 staff
  
- Deployments:
  - Iraq (Basra);
  - Afghanistan (Kabul, Helmand);
  - Multiple exercises
  
- Direct contact with tactical users of military Met.





# Changes in Defence



## Key Drivers for Change:

- **Doctrine** – The Way Wars are Fought  
Rapid Response, effects based, coalition.
- **NEC** – Network Enabled Capability  
Rapid analysis, dissemination and exploitation of information utilising common networks.
- **REP** – Recognised Environmental Picture  
Providing a common context for decision-making at all levels:
  - Political / Strategic
  - Operational
  - Tactical





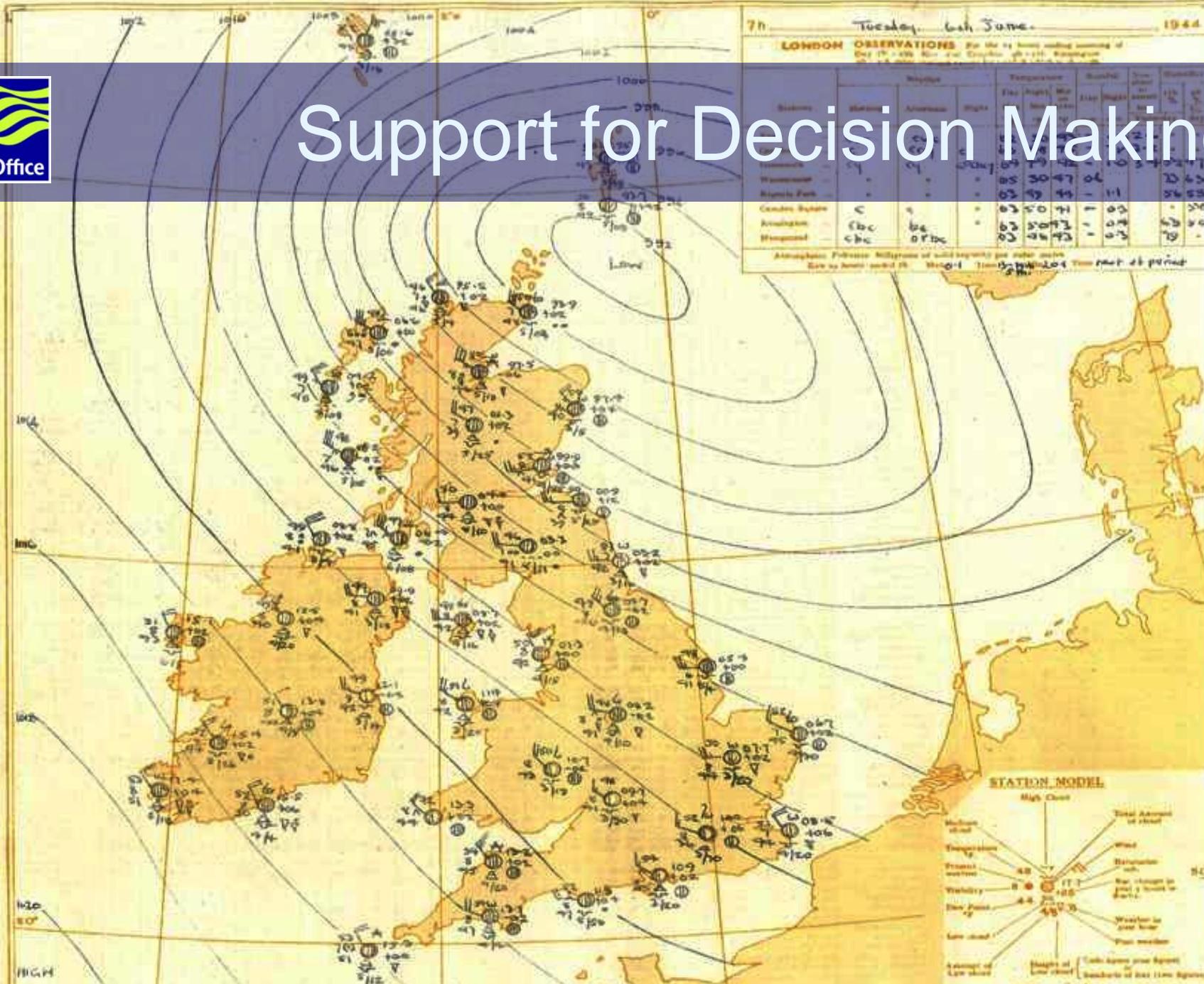
# Support for Decision Making

7h Tuesday, 6th June 1944

**LONDON OBSERVATIONS** For the 24 hours ending midnight on 6th June 1944. See also the Daily Summary on page 10.

Station	Station	Altitude	Height	Temperature		Quantity	Time of day	Direction
				Max	Min			
Windsor	W	100	57	47	0.2	11	W	
Hyde Park	W	100	55	45	0.1	11	W	
Greenwich	W	100	55	45	0.1	11	W	
Knightsbridge	W	100	55	45	0.1	11	W	
Windsor	W	100	55	45	0.1	11	W	

Atmospheric Pressure: Millibars or local equivalent per inch scale.  
See also hours worked in 'Miles' - Time - by the Log Time part of period.



**STATION MODEL**  
High Cloud

A station model diagram showing various weather parameters and their values. The diagram is a circular arrangement of lines radiating from a central point, each representing a different weather parameter. The values are as follows:

- Temperature: 55
- Pressure: 1006
- Wind: 10
- Humidity: 80
- Cloud: 4/8
- Sea level: 1006
- Time of day: 11
- Direction: W
- Quantity: 0.1
- Time of day: 11
- Direction: W

Scale: 1 - 4, every inch

## The Value of a Weather Forecast:

- Information, however accurate, has no intrinsic value...
- ...unless it can be used to make decisions that benefit the end user.

Or put another way...

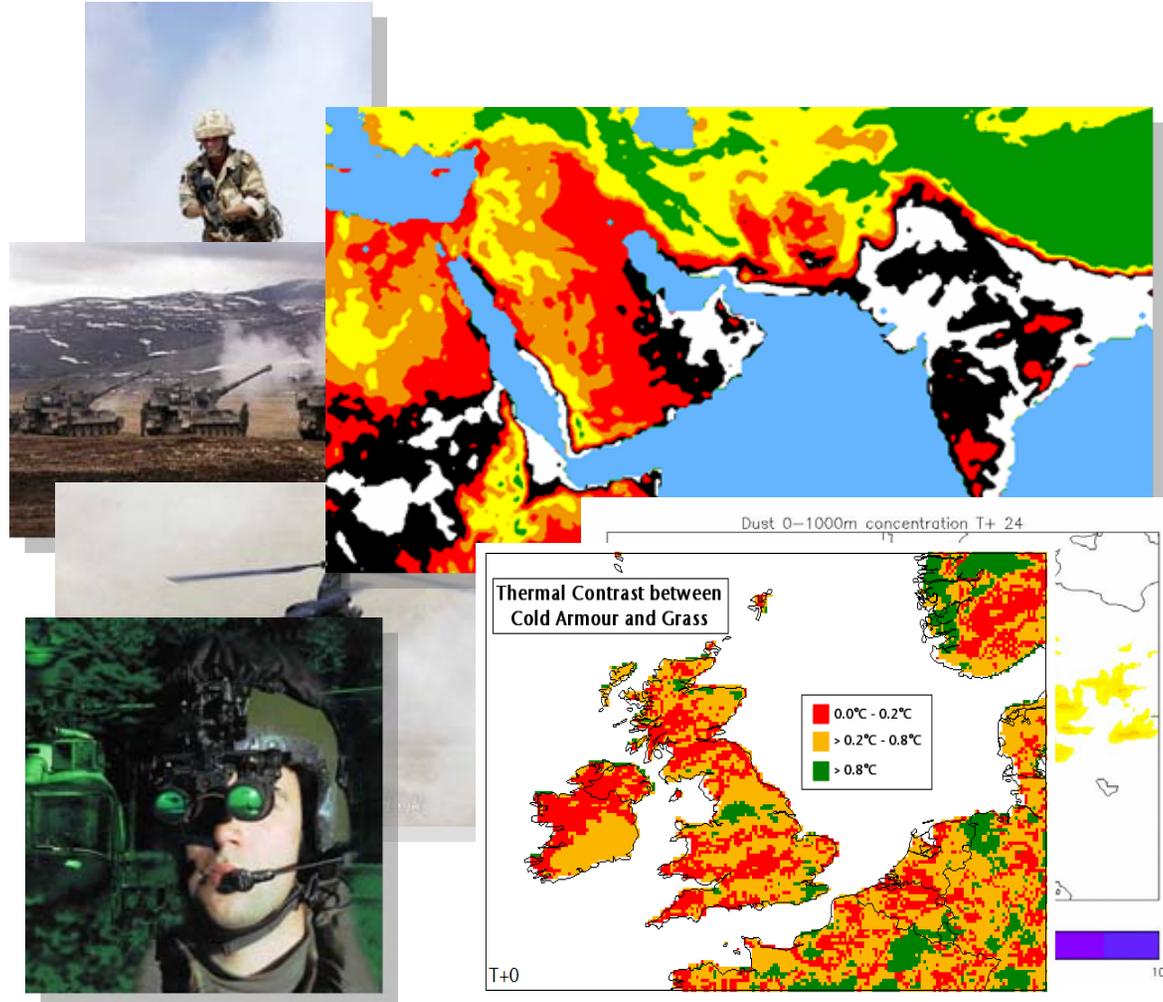
*“You don’t get points for predicting rain. You get points for building Arks.”*

Lou Gerstner (Former CEO of IBM)

# Support for Decision Making

Meteorological relevance to military activities:

- Personnel
- Weapons
- Equipment
- Sensors



# Dust Forecasting

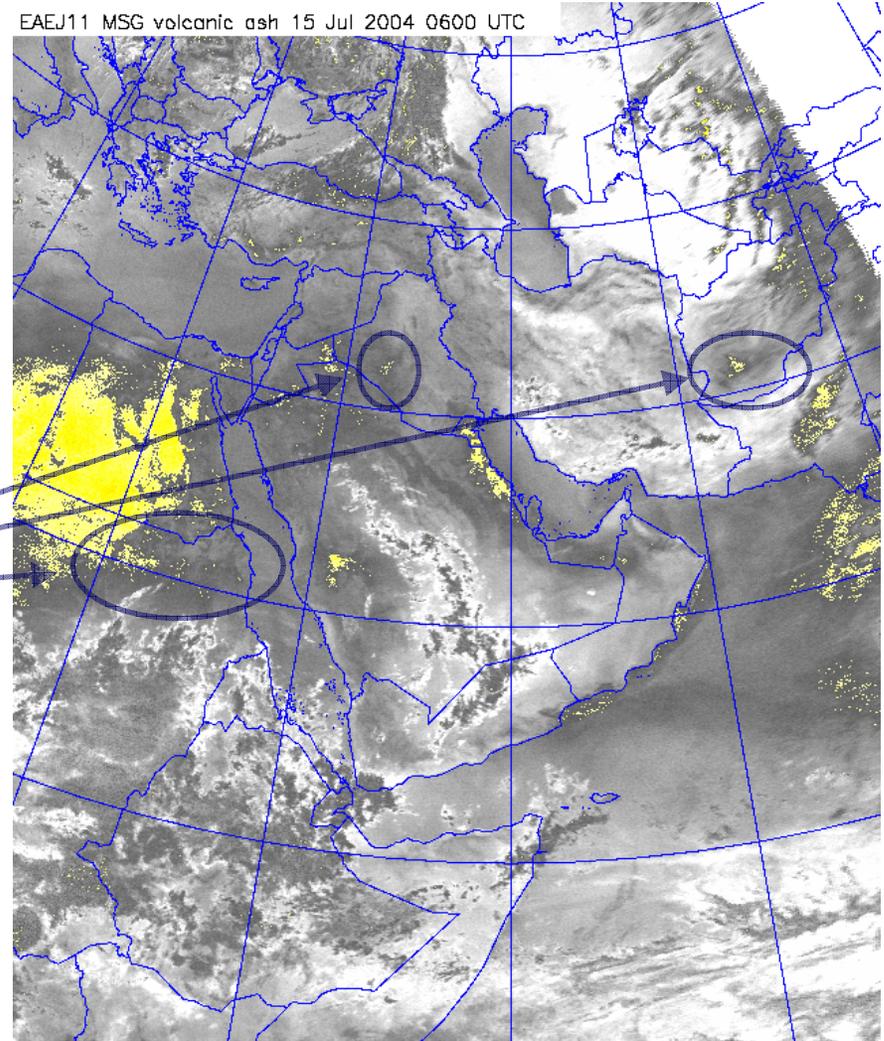
## Dust Monitoring by Satellite:



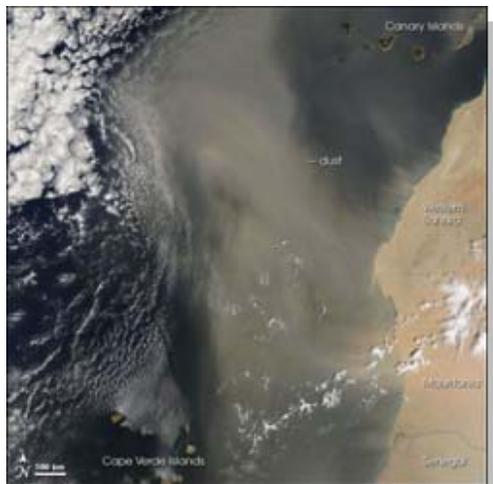
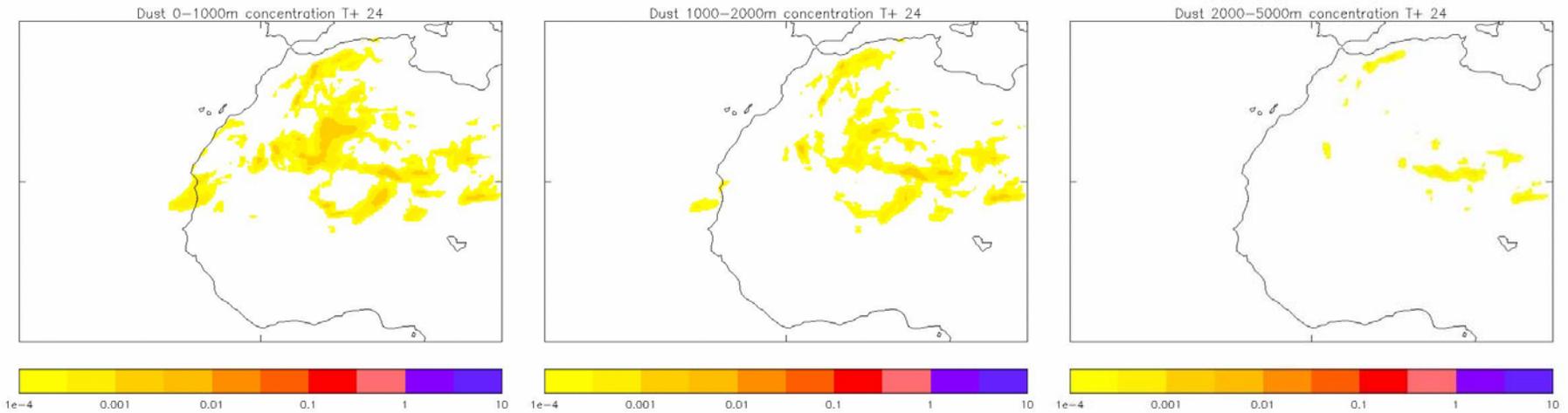
Dust Plumes



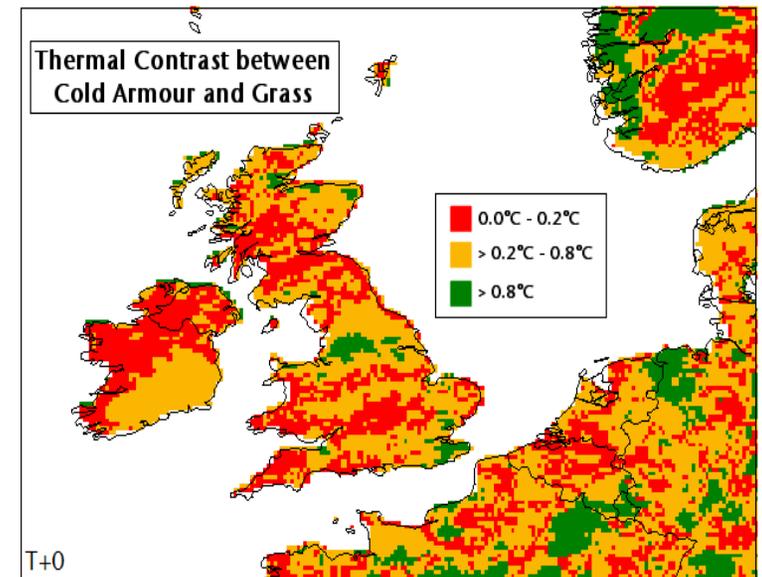
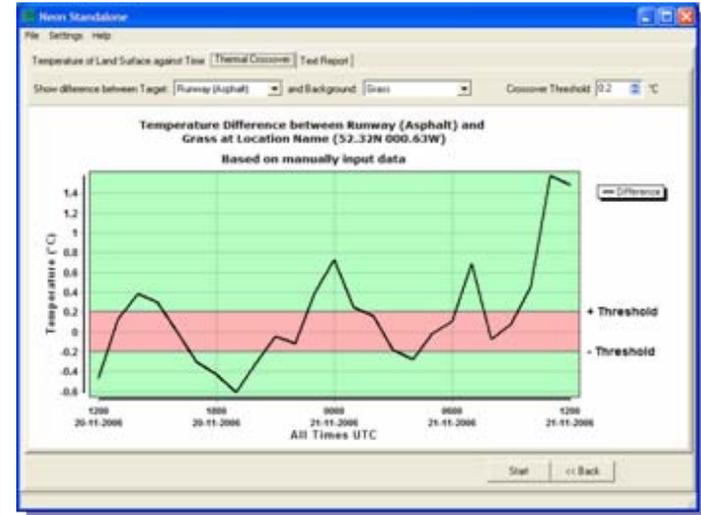
EAEJ11 MSG volcanic ash 15 Jul 2004 0600 UTC



## Forecasting Dust Storms:

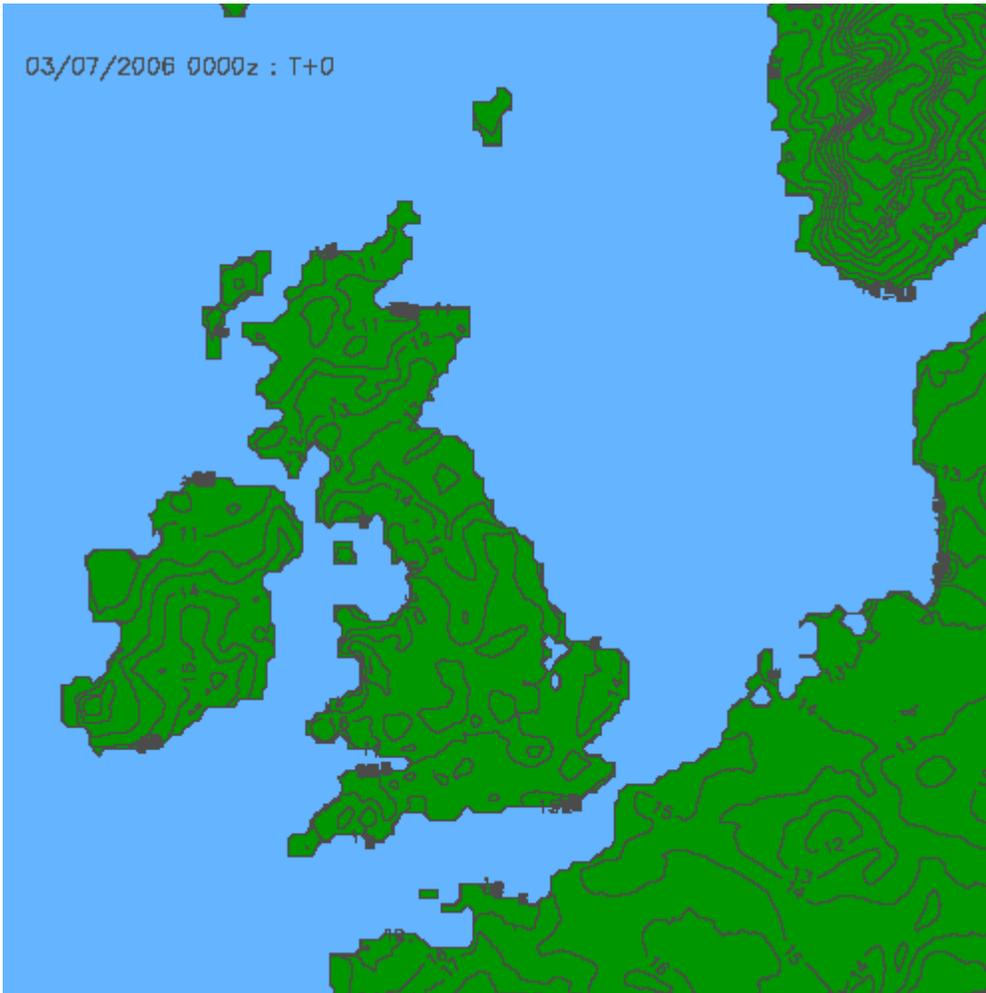


## Forecasting Sensor Performance:

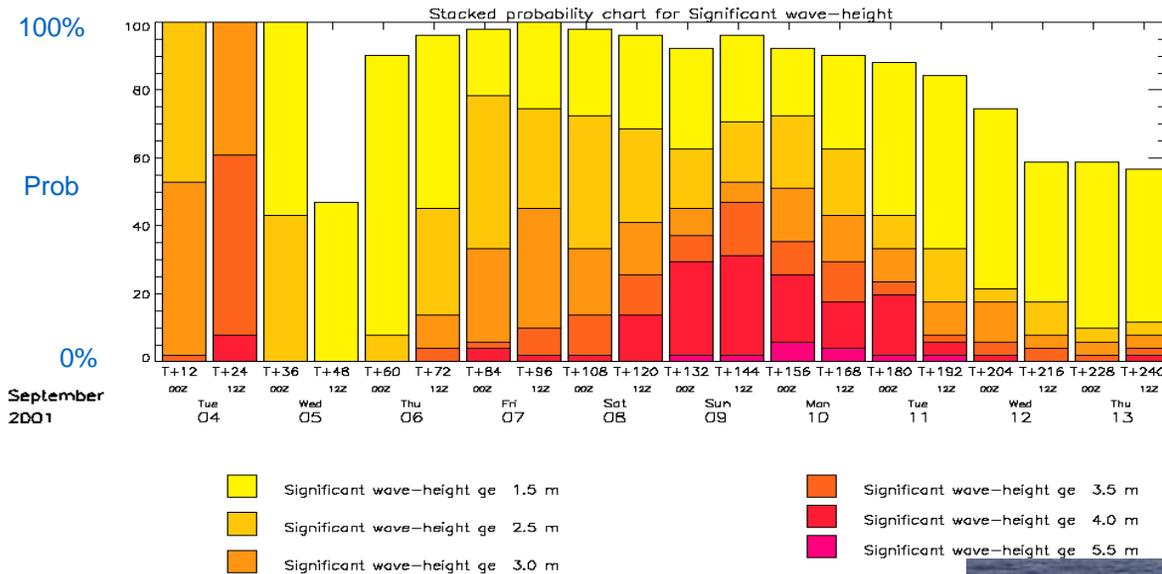


# Heat Stress Forecasting

Forecasting the Impact of Weather on the Human Body:



## Significant Wave Height:





## Delivering Met Data to Users and Systems:

- **Subject Matter Expert**

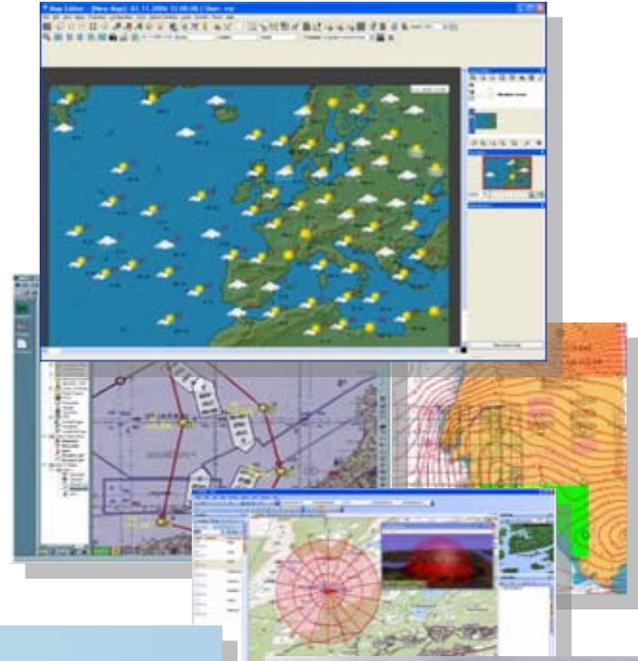
*Expert interpretation for the educated user*

- **Planning Applications**

*Data & products to improve situational awareness and plan missions*

- **Direct Data Ingestion**

*Data direct to weapons or systems*



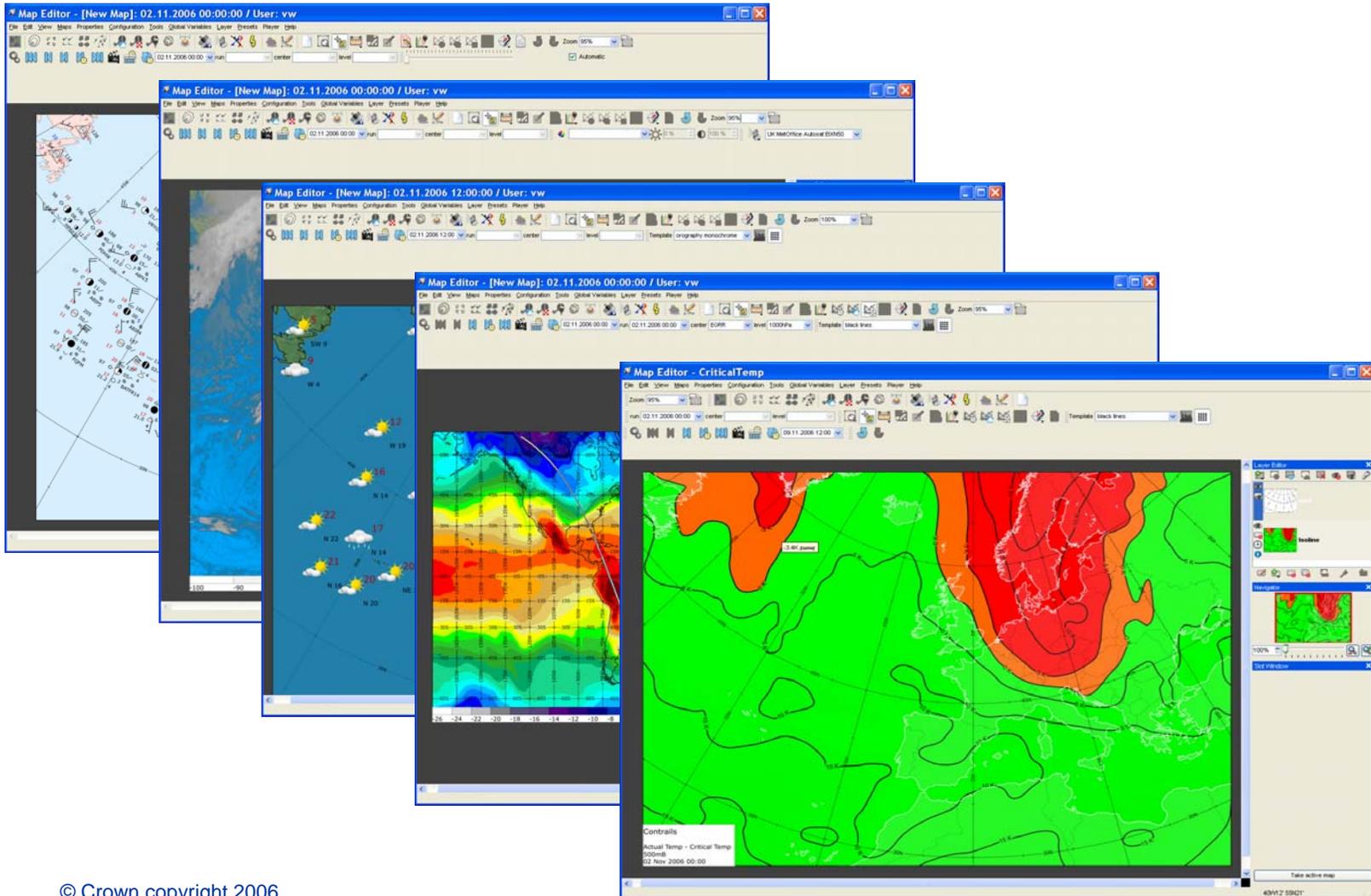
## Future Product Generation and Delivery:

- **SWIFT** – New Forecaster Workstation  
Expert interpretation of Met Data and Production
- **MOMIDS** – Met Display System  
Met Information for the Aviation user
- **JEDDS** – Met Information and Web Services  
Development of a Met Database
- **SOA** Foundation Project  
Project convergence.

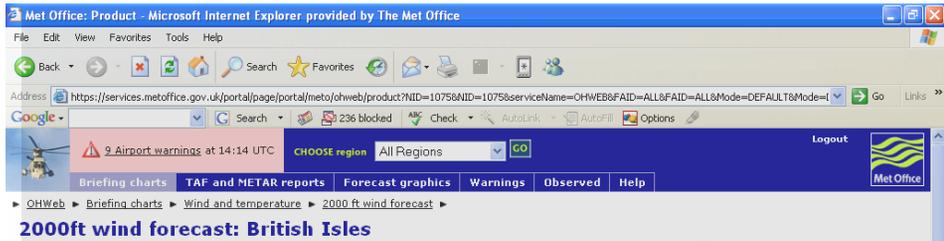
# The Swift Project



## New Forecaster Workstation:



## Supporting the Expert User:



Met Office: Product - Microsoft Internet Explorer provided by The Met Office

Address: <https://services.metoffice.gov.uk/portal/page/portal/meto/chweb/product?NID=1075&NID=1075&serviceName=CHWEB&FAID=ALL&FAID=ALL&Mode=DEFAULT&Mode=>

9 Airport warnings at 14:14 UTC

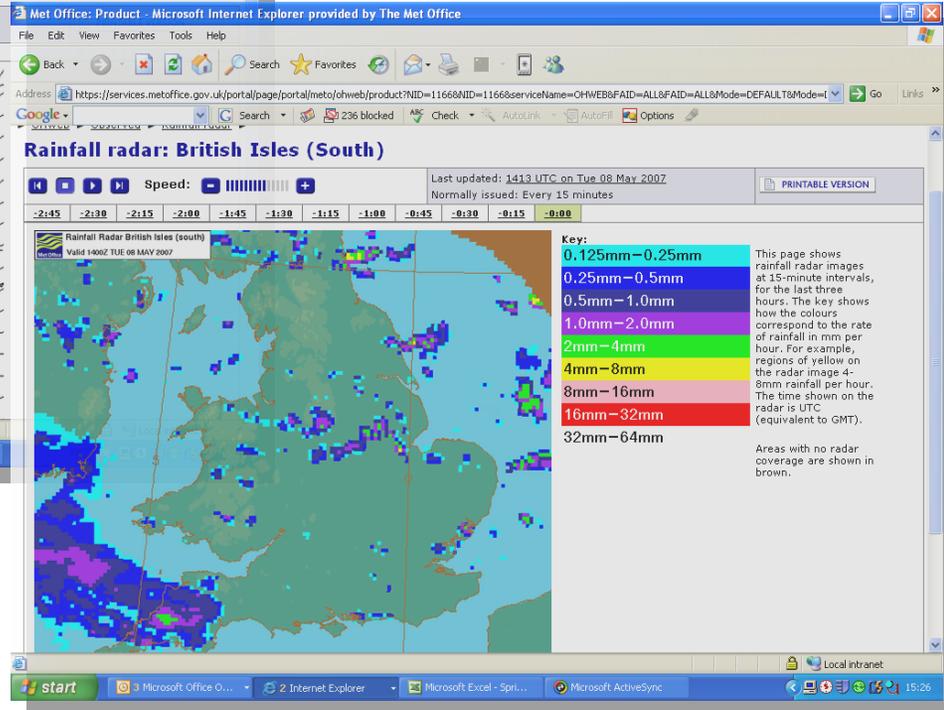
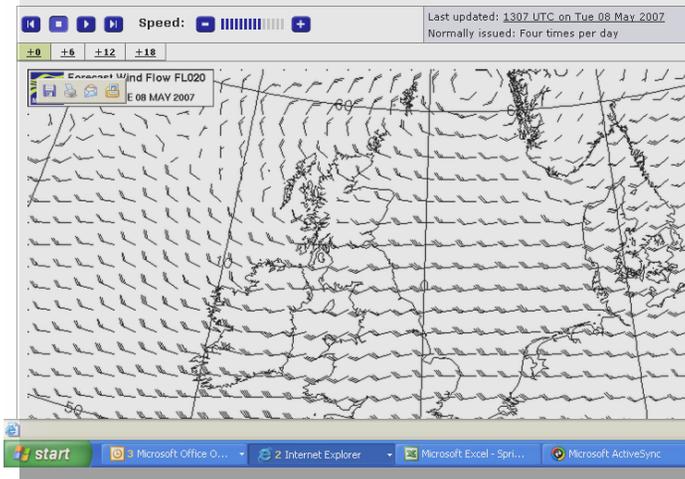
CHOOSE region: All Regions

Logout

Briefing charts | TAF and METAR reports | Forecast graphics | Warnings | Observed | Help

OHWeb | Briefing charts | Wind and temperature | 2000 ft wind forecast

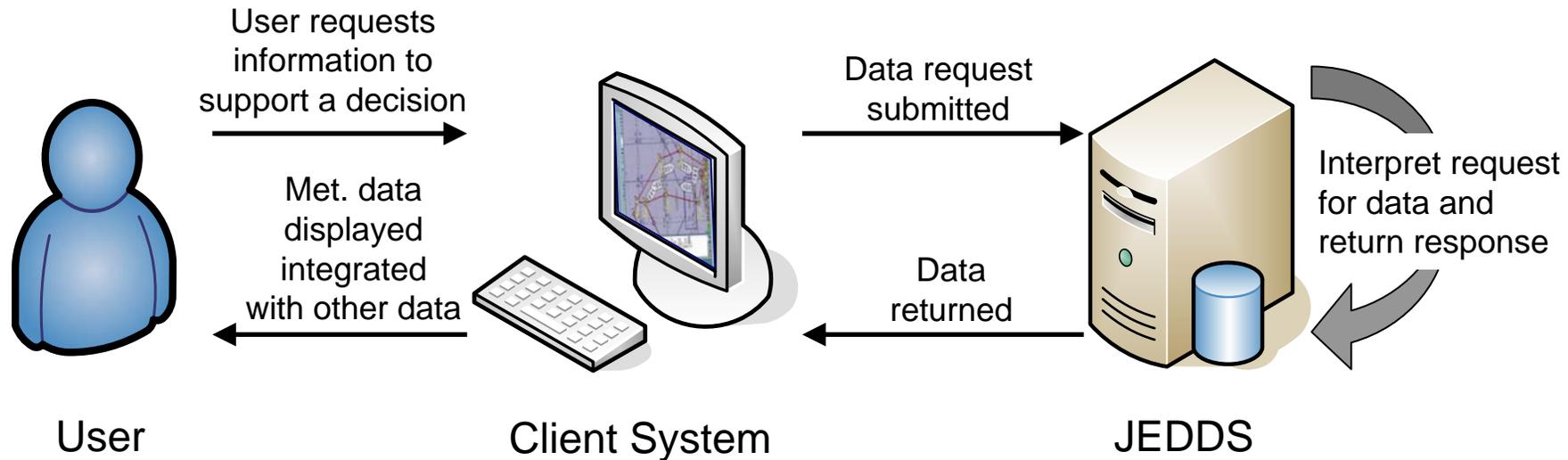
### 2000ft wind forecast: British Isles



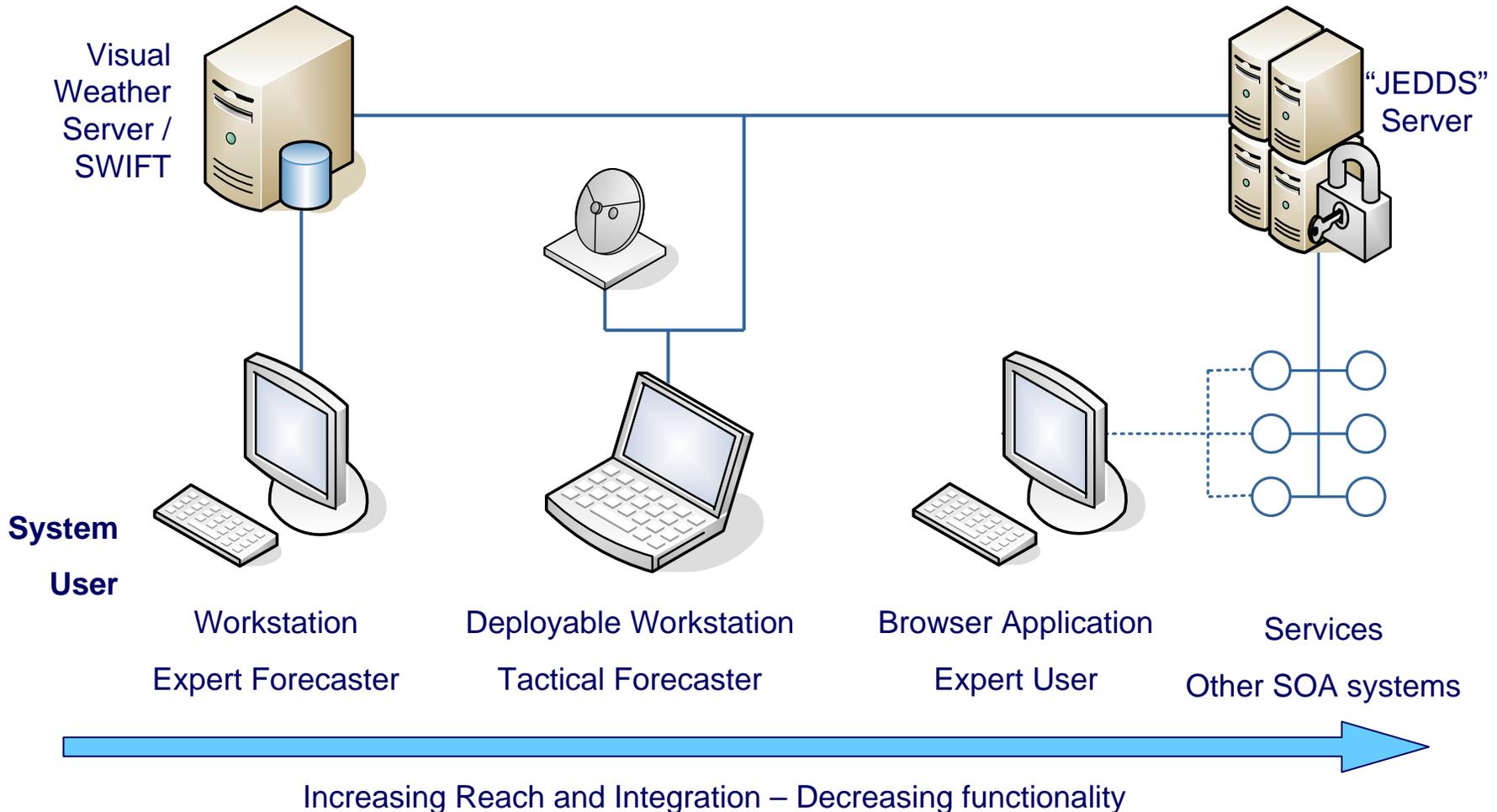
# The JEDDS Project



A Prototype Met Data Server utilising Web Services:



## The Future Product Generation and Distribution System:



## Advantages to the User:

- Interoperability through OGC Web Services

*Integration with existing systems using common standards*

- Fusion with other data sources

*Enabling the generation of products that includes contextual data, including other environmental information*

- Rapid prototyping and product generation

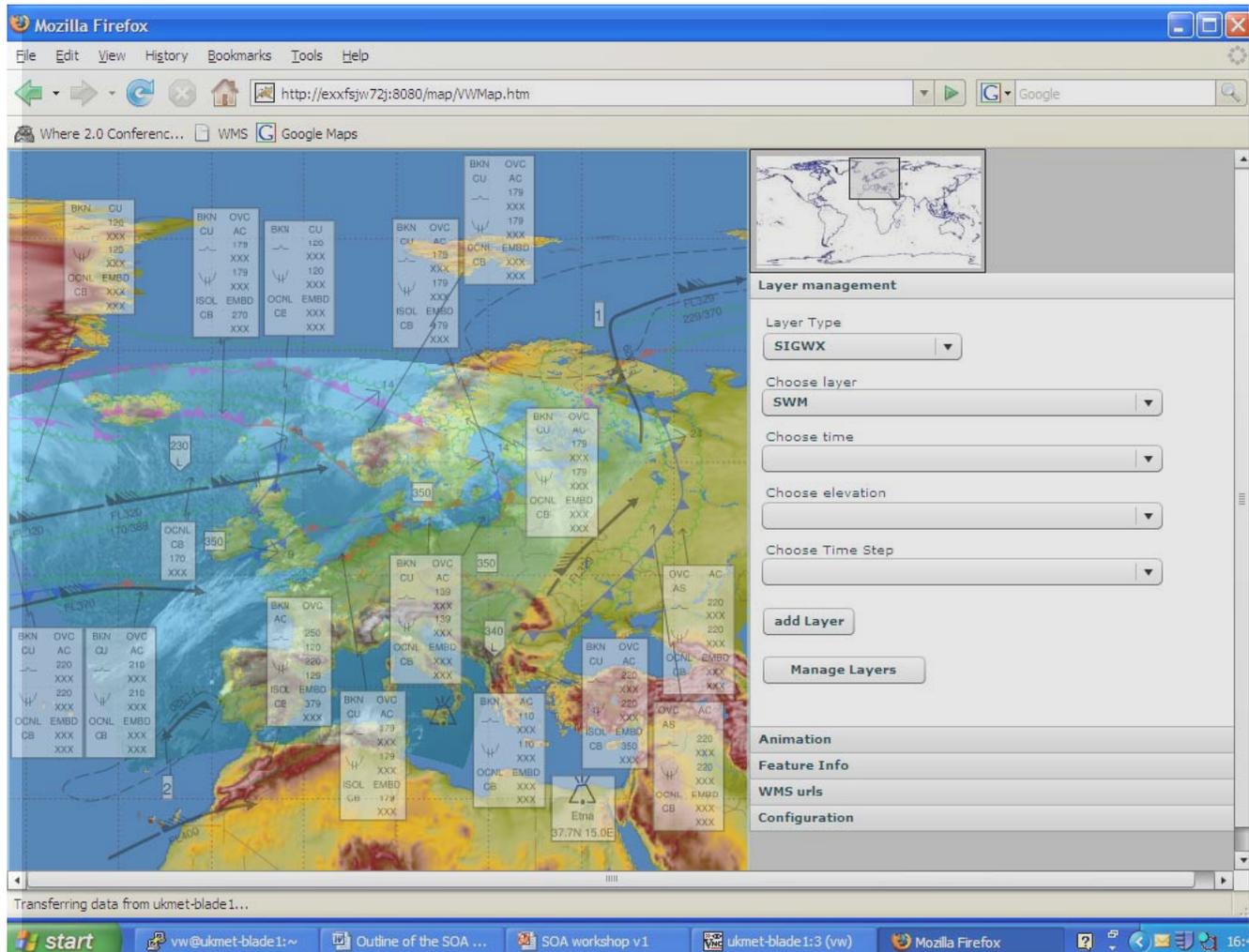
*Reducing cost and increasing flexibility and the potential to innovate.*

- Flexible use of Bandwidth

*Reducing Provides the right information to the right level of detail when and where ever the user needs it.*

# Under Development...

Watch this space....:



The screenshot shows a Mozilla Firefox browser window displaying a WMS map of Europe. The map is overlaid with various weather layers, including cloud cover (CU), visibility (VIS), and precipitation (PRCP). The map is titled "http://exxfsjw72j:8080/map/VWMap.htm". The browser's address bar shows the URL. The right-hand side of the browser window contains a "Layer management" panel with the following controls:

- Layer Type: SIGWX
- Choose layer: SWM
- Choose time: [Dropdown]
- Choose elevation: [Dropdown]
- Choose Time Step: [Dropdown]
- add Layer button
- Manage Layers button

Below the "Layer management" panel are sections for "Animation", "Feature Info", "WMS urls", and "Configuration". The status bar at the bottom of the browser window shows "Transferring data from ukmet-blade1...". The Windows taskbar at the bottom of the screen shows the Start button and several open applications, including "vw@ukmet-blade1:~", "Outline of the SOA ...", "SOA workshop v1", "ukmet-blade1:3 (vw)", and "Mozilla Firefox".



# Thank you

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