Meteorological Priorities in Support of a Volcanic Ash Strategy (2010-11)

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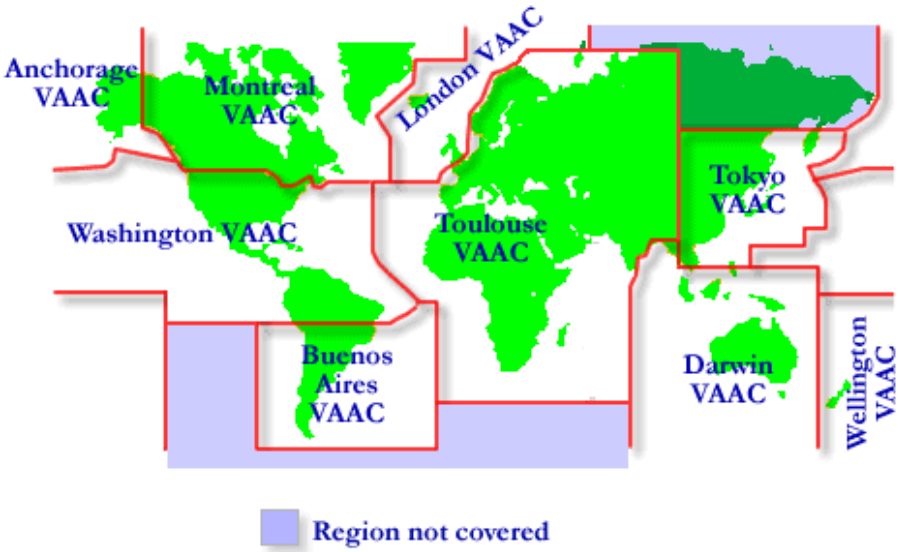
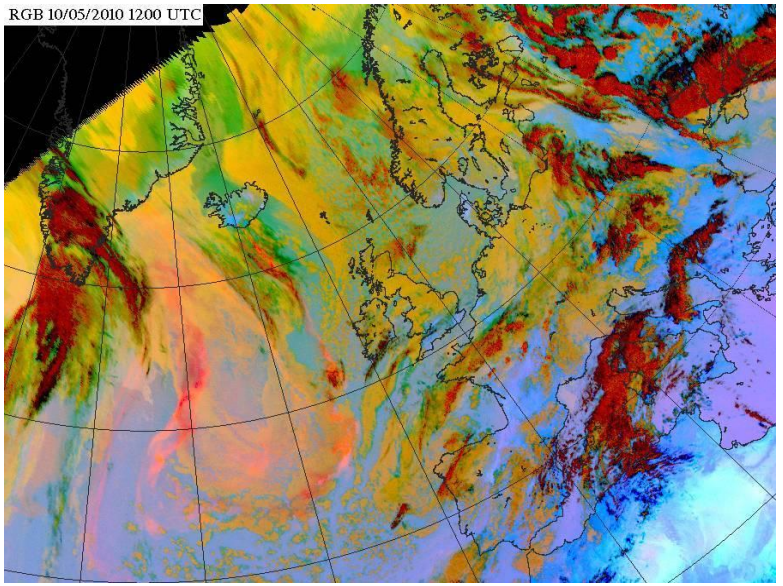
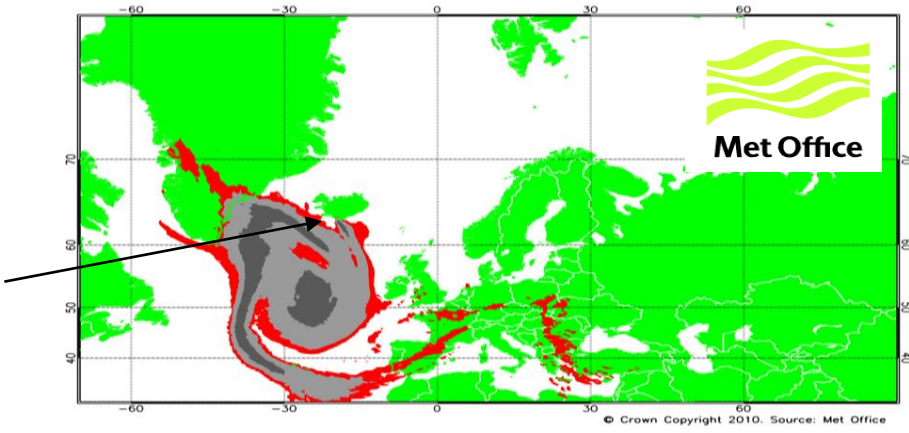
ICAO IAVW

- London VAAC is the ICAO IAVW designated centre for **volcanic eruptions** in the North-East Atlantic
- **Iceland** falls within this area of responsibility (IMO is the SVO)
- **ICAO Annex 3** *briefly* describes the responsibilities of a VAAC to include:
- Production of **advisories** detailing the spatial dispersion of VA
- **Running** (and/or **utilisation of** output from) NWP dispersion models
- **Monitoring of** observational data, especially satellite imagery for the presence of VA.





VAAC Advisory Process



NAME model output

NAME model initialisation

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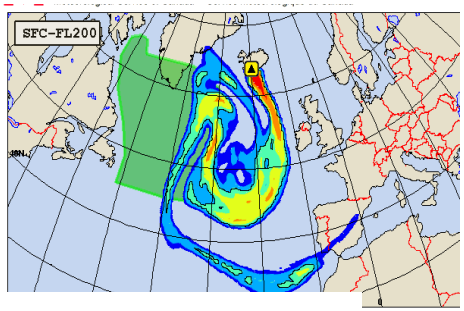

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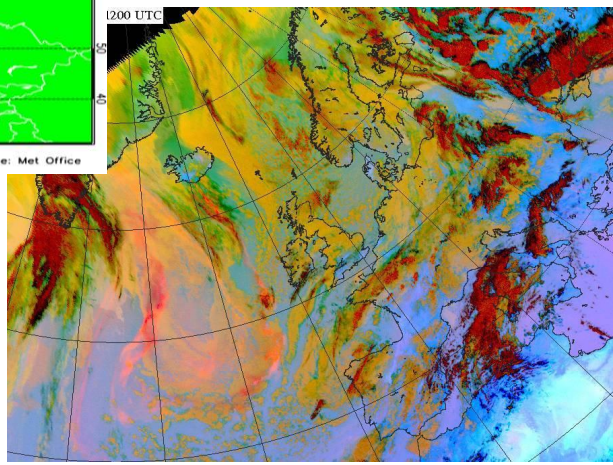

Satellite imagery

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Forecaster

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Other models (courtesy

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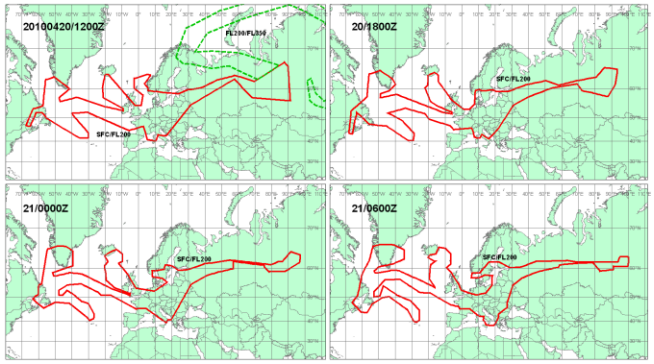


OBS

London VAAC Advisory

NAME dispersion model Initialisation

- Volcano characteristics

- Height, diameter and time variance of eruptive column

- Ash release rate

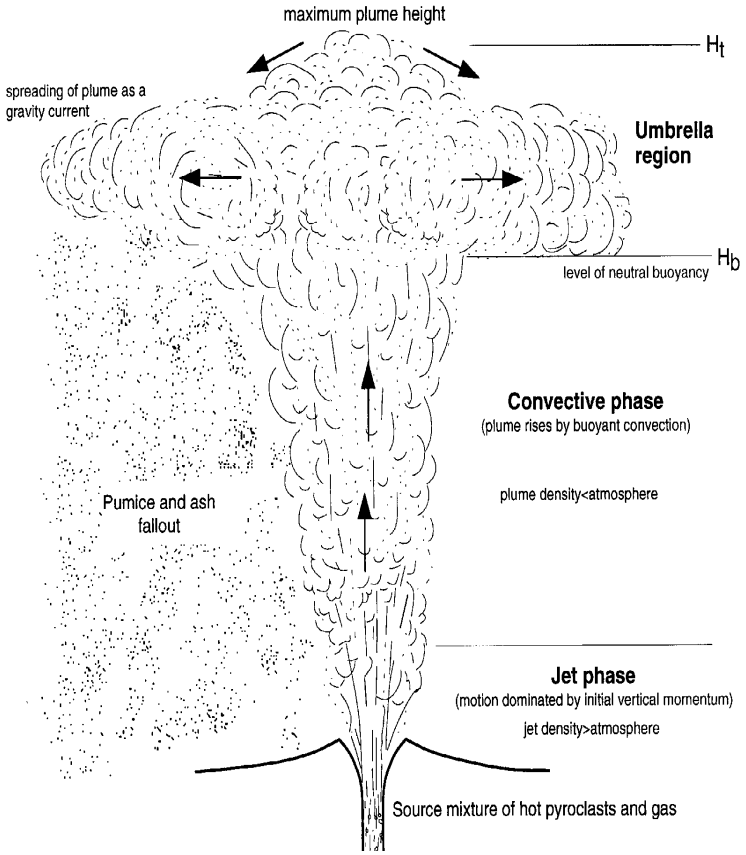
- Ash particle size and density

- State volcano observatory (IMO)

- Met Office MoU with IMO

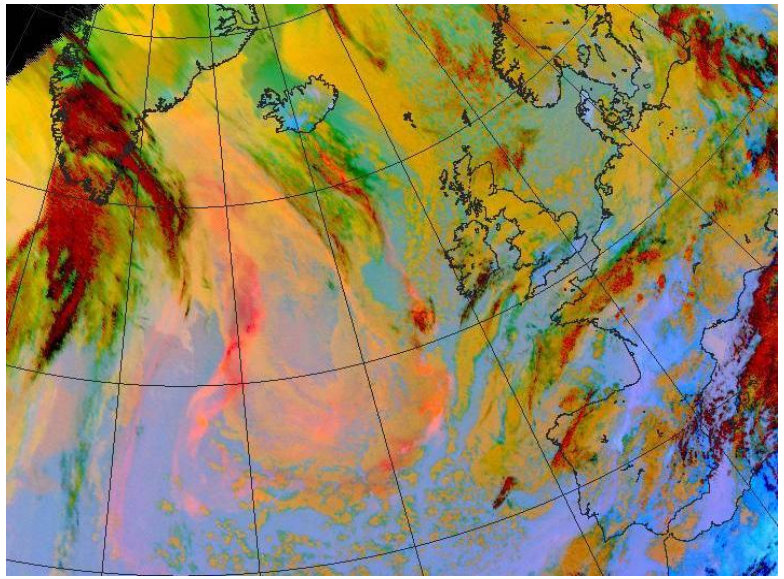
- New IMO mobile dual polarisation Doppler radar

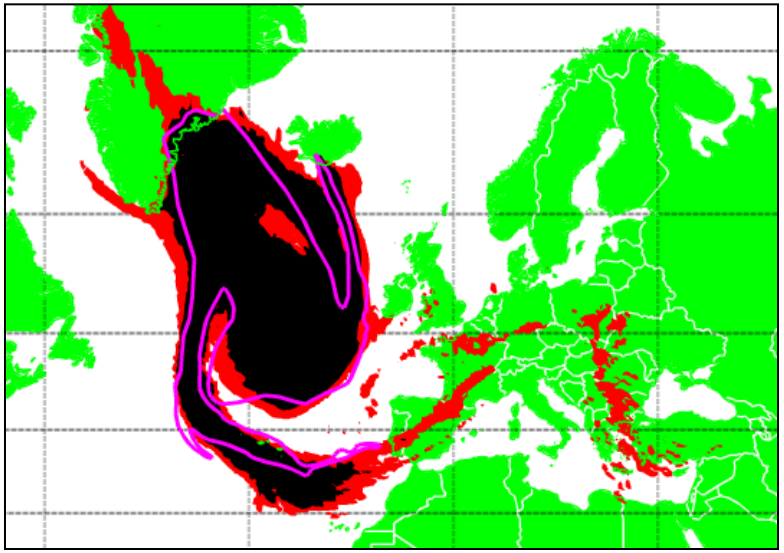
- UAV and aerosol sonde research.



NAME dispersion model Development

- Improvements to definition of eruptive source term
- Analysis of historic eruptions/ash encounters
- Evaluation of inversion modelling and data assimilation processes
- Climatological studies to better quantify risks
- Evaluation of peak and mean predictability
- Inclusion of other chemicals in VA plume
- Recommendations for operational implementation.





Satellite Applications Development

- MSG

- Use of third infrared channel at 8.6microns wavelength to reduce number of VA false alarms

- Use of radiative transfer model to improve VA detection

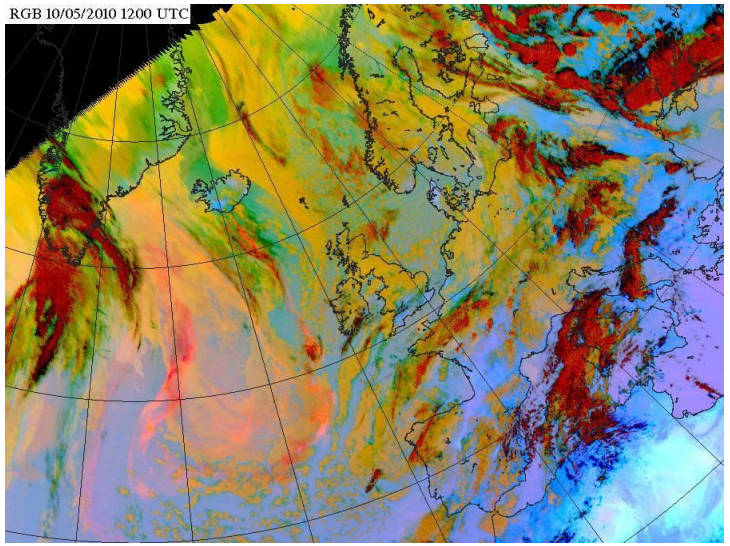
- Optimal quantitative parameters estimation techniques for ash top height, ash column amount and ash particle size

- Improvements to volcanic plume gas products e.g. SO2

- Polar orbiters

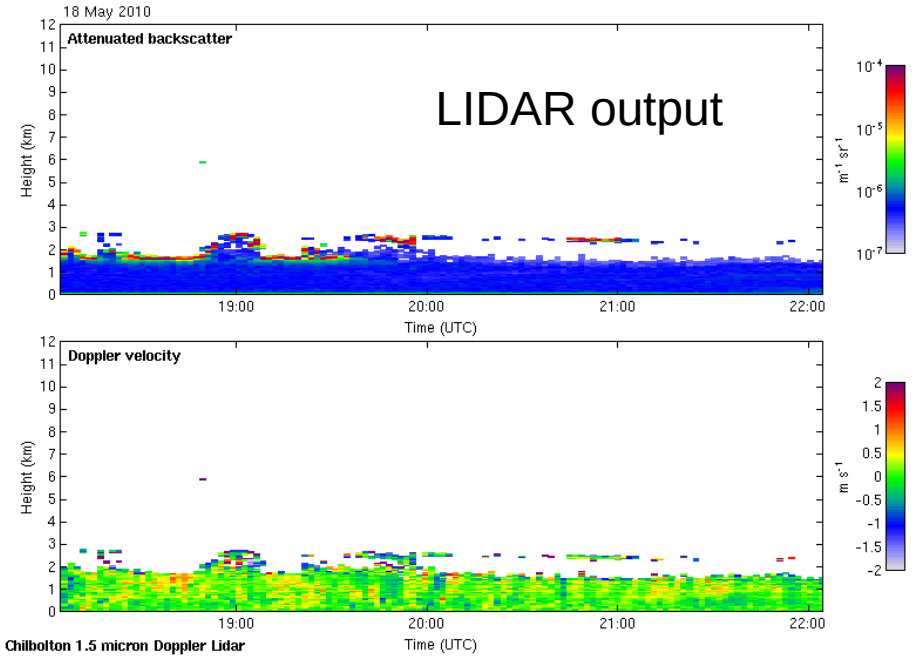
- High resolution RGB VA products

- Applications of MODIS, VIIRS and CALYPSO products.



Operational Integrated VA Observation Networks

- Basic underpinning infrastructure
- Standardisation and availability
- Ground-based
  - LIDAR
  - RADAR
  - ATD Lightning Detection
- Airborne
  - Research Aircraft
  - Unmanned Airborne Vehicles
  - Aerosol sondes



Picture from DLR Falcon

Future Met Office VA Products

- Multiple vertical layers of forecast VA concentration
- Shorter VA forecast time steps
- Development of products which sample uncertainty in the volcanology and meteorology to enable better-informed risk assessments
- Medium range scenario planning charts
- User requirements, consultation and education
- Underlying transparent, peer reviewed science.

National and International Coordination

- Ongoing discussions with CAA, airlines and engine manufacturers
- Member of European Aviation Crisis Coordination Cell (EACCC)
- Met Office leading EUTMETNET involvement in proposed VA related FP7 CSA with focus on enhancing European VA observation coordination
- Enhanced VA research flight coordination with DLR and DWD
- Daily VAAC tele-conferences with European NMS during significant European VA episodes
- Member of WMO VA Scientific Advisory Group
- Member of ICAO VA Task Force
- Attendance at numerous VA related meetings and workshops.