

### Obs and Reanalysis at Met Office

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ECMWF reanalysis feedback 1<sup>th</sup> to 13<sup>th</sup> Nov 2014



#### EUROPEAN REANALYSIS AND OBSERVATIONS FOR MONITORING

Tracking changes in European climate

#### EU-project, April 2010 – March 2014, 9 partners

 Goal: LONG-TERM CLIMATE DATASETS + ASSESSMENTS OF CHANGE ...describing climate variability and change at the European scale ...placing high-impact extreme events in a historical context







# WP2.1 "Building capacity for advanced regional data assimilation"



### reanalysis period 2008 - 2009



## Observations

- Surface (SYNOP, buoy, etc)
- Upper air (sonde, pilot, wind profiler)
  - Aircraft
  - AMV ('satwinds')
  - GPS-RO and ground-based GPS
    - Scatterometer winds
      - ATOVS
        - AIRS
        - IASI
    - MSG clear sky radiances





### **Conventional Obs**

Based on monthly monitoring for operational NWP

Corrections to radiosonde temperature, surface pressure,

- use same as UKMO Global

**Rejection lists** 

- use oper UKMO Global and NAE lists





### Satellite Obs

### http://nwpsaf.eu/monitoring.html

Selection of:

instruments

channels

```
other (land/sea, IR/WV, etc)
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determined by eye from monitoring, and from impact studies.



### Satellite Obs

#### http://nwpsaf.eu/monitoring.html



#### **Time series**

These plots are considered experimental. The Met Office accepts no responsibility for actions taken on the basis of these monitoring plots.

Please select from these options to view the time series:

Satellite:	NOAA-15
Statistic type:	Observed-Background
Cloud type:	all
Time period:	Timeseries for 2 years 😂
Quality control:	Strict 2
Surface type or area:	global 🗘
Graph to display:	AMSU 6-10
Reset options	Display full size graph



ATOVS time series plot



Time series for NOAA-15 Observed - Background AMSU6-10











MEAN STANDARD DEVIATION



- Develop ensembles of regional reanalyses to produce long term datasets for Copernicus climate services with uncertainty estimates
- Longer periods
- Ensembles of reanalyses
- For use by climate monitoring service





## 50 years reanalysis



### SMHI EURO4M: 3D/2D reanalysis & validation









78 km

3D: HIRLAM

- ERA on the borders and as a large scale constraint
- 60 vertical levels
- 11km horizontal resolution



2D: MESAN

- HIRLAM as first guess
- Surface parameters
- **5** km grid





Rheinische Friedrich-Wilhelms-Universität Bonn

#### Hans-Ertel-Centre for Weather Research Climate Monitoring Branch

- Regional reanalysis ensemble
  - COSMO on European CORDEX domain
    - 847x823 grid points
    - 40 vertical levels
    - preferably at 6km resolution, otherwise 12km
  - 10 20 ensemble members











- Production period 1979 2017
- CORDEX Domain
- Ensemble Data Assimilation
- Unified Model
- Deterministic  $0.11^{\circ} \sim 12$ km
- Ensemble 20 members



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#### Indian Monsoon Data Assimilation & Analysis Project

- Collaboration with NCMRWF funded by Indian National Monsoon Mission
- To study the UM's ability to represent the Monsoon
- 1978 present, 4DVar reanalysis









- Regional reanalysis for SE Asia using UM systems
- Short test runs 2016
- Longer period 2017









## Questions..?











### Variational Bias Correction

Airmass-dependent bias correction of satellite radiances (based on Harris and Kelly, 2001)

$$bias = c^{scan} + \sum_{i=1}^{n} ci^{air} f(x_b)$$

VarBC allows Var to analyse {*c*}

