Working group session 1

Data assimilation and use of observations

Topics to be discussed (1) Surface (J.-F. Mahfouf) : Review of ongoing activities : soil analysis within SURFEX – use of satellite products (ASCAT, LandSAF) – snow analysis Development of a 2D spatialisation tool with EU FP7 EURO4M

Topics to be discussed (2)

• Upper air (N. Gustafsson) :

LAM 4D-Var data assimilation : extension zone – Mariano's proposal

Joint efforts on radar assimilation (outcome from the working week in MetNo)

Joint Jk work

 Activities on flow dependent background error statistics

Interest for Mode-S observations ?

Soil analysis within SURFEX (1)

- Optimum Interpolation scheme (Giard and Bazile, 2000) using T2m and RH2m analysis increments (CANARI)
- Developed within SURFEX : all surface fields available in proper format (LFI)
- Suitable for ALADIN (ISBA 2L + binary land/sea) and AROME (ISBA 3L + TEB + fractional land/sea/lake/town)
- Current name : OI_MAIN (not suitable when we move to the EKF)

New name :

- ESAS (Externalised Soil Analysis System)
- TISANE (TEB-ISBA ANalysis Externalised)
- ASYLUM (Analysis SYstem for Land and Urban Models)

Soil analysis within SURFEX (2)

- Technical coupling with atmospheric 3D-Var : OK (ALADIN + HIRLAM ?)
- Scientific evaluation started but needs further investigations :
 - CANARI (statistical model + QC)
 - soil moisture increments (summer period, coastal regions)
 - SST analysis
 - Cycling of CANOPY and TEB
- Coupling of the EKF with the atmospheric data assimilation

On the use of satellite products

- Real-time products :
 - ASCAT superficial soil wetness fraction (feasibility studies at MF and ZAMG)
 - LandSAF surface albedo, LAI and snow cover extent
- Data handling for land data assimilation (use of ODB ? Done at ECMWF for ASCAT)
- Other products : SMOS brightness temperatures (~40 km) (monitoring started at ECMWF)
- Snow analysis : current status of CANARI ? Combined use of conventional and satellite data ?

2D spatialisation tool (1)

Various tools currently available (ALADIN/HIRLAM) :

CANARI (Optimum Interpolation) : 2D analysis embedded in 3D analysis – developed within operational libraries – data handling and computing efficiency compatible with NWP operational requirements – too simple statistical model – variables (T2m, RH2m, V10m, SST, snow depth)

 SAFRAN (Optimum Interpolation) : spatialisation tool developed to provide forcing to a snow model over mountainous areas and to an hydrometeorogical model over France – variables (precipitation, T2m, RH2m, V10m, downward radiative fluxes) – old frozen code

MESAN (Optimum Interpolation) : similar to CANARI but also used for precipitation and cloud cover (developed for climate applications – SPAN is the same tool for NWP applications)

2D-spatialisation tool (2)

- Opportunity to improve the existing tools : EU FP7 EURO4M (European Reanalysis and Observations for Monitoring) – 3 year project (06/2010-06/2013) – coordinated by Albert Klein (KNMI)
- Objective : provide high quality reanalyses of past data over Europe for Essential Climate Variables
- Data collection (+QC), atmospheric and surface reanalyses
- Participation of 7 European meteorological services (KNMI, MetOffice, Romanian Met Service, Meteo Swiss, DWD, SMHI, Meteo-France)
- Météo-France : 3 year post-doc for developing a new MESAN-SAFRAN system

2D-spatialisation tool (3)

Main features of the new tool :

- Should fulfil needs for both climate and NWP applications
- Data handling and computational efficiency are crucial for NWP applications
- Analysis should be as good as SAFRAN for precipitation (solid/liquid) over montainous areas (account for heterogeneous and anisotropic structure functions) with better temporal sampling (hourly analyses)
- Analysis system should run on any LAM domain (even global ?)
- Should we use a spatialisation tool for radiative fluxes (NWP short-range forecasts, satellite products) ?
- How to account for heterogeneous and anisotropic structure functions (eg wavelets, diffusion equation) ?
- Should we start from scratch ?