2D surface reanalysis over Europe at 5 km scale within EURO4M project: system description and validation

C.Soci[a], E. Bazile [a], T. Landelius[b]

[a] *CNRM-GAME, Météo-France, France, eric.bazile@meteo.fr.*
[b] *Swedish Meteorological and Hydrological Institute, Sweden*

This poster provides a brief description of the European Reanalysis and Observations for Monitoring (EURO4M) project. It is a 4-year project which has been started in 2010 under the 7th Framework Programme, Theme 9 "Space", and financed by the European Union. As mentioned in the Description of Work, "the overall goal of EURO4M project is to develop the capacity for, and deliver the best possible and most complete (gridded) climate change time series and monitoring services covering all of Europe."

The poster focuses on the improvements to the reanalysis of screen-level variables, and on the approach used to implement and validate an analysis of daily accumulated precipitation in the MESCAN system. The acronym MESCAN is a blending between MESAN ([1]) and CANARI (Météo-France operational surface analysis). MESCAN uses an optimal interpolation technique and refers to those parts of CANARI system which encompass the new implemented daily accumulated precipitation, more complex structure function and the error statistics for the screen-level variables from MESAN. The approach chosen to develop the precipitation analysis scheme is as in the Canadian Precipitation Analysis Project ([2]). It uses short-range forecasts as the background fields, and at this stage rain gauge data as observations. The scheme was initially developed such as to perform the precipitation analysis in the log-space on a transformed variable $x=\ln(RR+1)$, where RR is the 24-h accumulated precipitation expressed in millimetres. Nevertheless this transformed variable generates an negative bias which has more impact in hydrological application. Finally, the precipitation re-analysis over Europe will be carried out in the physical space (RR variable).

The background field is a HIRLAM forecast downscaled from 22 km to 5.5km. The available surface observations over Europe have not a homogeneous distribution, especially for the 24h cumulated precipitation observation. For this parameter a common database was created by SMHI from 3 dataset provided by Météo-France, SMHI and ECA&D (KNMI).

The preliminary results of the reanalysis over Europe will be shown. Validations will focus on regions with a high density of observations or complex topography (Alps, Scandinavia). Results of the comparisons of the MESCAN reanalysis with other reanalysis by MESAN, ERA-Interim will be also presented and discussed.

References
[1] L. Häggmark, K.-I. Ivarsson, S. Gollvik, and P-O. Olofsson. "Mesan, an operational mesoscale analysis system", Tellus, 52A, 2-20. 2000.
[2] J.-F. Mahfouf, B. Brasnett, and S. Gagnon. "A Canadian precipitation analysis (CaPA) project: Description and preliminary results", Atmosphere-Ocean, 45:1, 1-17, 2007.