

# **EXTENDING THE SAFRAN METEOROLOGICAL ANALYSIS SYSTEM TO THE IBERIAN PENINSULA AND THE BALEARIC ISLANDS. ANALYSIS OF ITS PERFORMANCE AND APPLICATIONS.**

Pere Quintana Seguí<sup>a,\*</sup>, Gonzalo Míguez Macho<sup>b</sup>, María del Carmen Llasat<sup>c</sup>

<sup>a</sup> Observatori de l'Ebre (Universitat Ramon Llull – CSIC). Roquetes (Tarragona), Spain.

<sup>b</sup> Universidade de Santiago de Compostela. Santiago de Compostela, Spain.

<sup>c</sup> Universitat de Barcelona, Barcelona, Spain.

Land surface models (LSM) play a key role in a number of different contexts, which range from the simulation of global and regional climate—when they are used within GCMs or RCMs—to the study of the functioning of specific basins (distributed hydrological simulation) including the evaluation of the impact of climate change—when they are used offline. Offline mode is very important, not only for its applications, but also for model development and validation. But, in order to be able to work offline, we need a high resolution and high quality meteorological forcing gridded dataset, which should include all the atmospheric variables necessary to force a LSM (temperature, precipitation, wind, relative humidity and downward IR and visible radiation). In addition, such gridded datasets are very useful in local and regional climate studies as they are necessary in order to downscale and bias correct existing GCM and RCM products.

Within the FP7 earth2Observe project we are studying the ability of different LSMs to simulate the processes of drought on the Iberian Peninsula. Within the Spanish MARCO project we are trying to improve the performance of LSMs coupled to RCMs. In both cases, in order to perform our simulations we need a good atmospheric forcing that covers the area of study. Thus, we decided to extend the SAFRAN meteorological analysis system to the whole Iberian Peninsula and the Balearic Islands with a spatial resolution of 5 km.

SAFRAN uses optimal interpolation in order to analyze the variables of interest using all available observed data (from AEMET's network) and a first guess (ERA-Interim). SAFRAN, which was first developed by Météo France, was recently extended to the Ebro basin in a pilot study that covered only three years. In earth2Observe we are extending it to cover the 1995-2007 period. In MARCO we will extend it to cover a period of 30 years.

We present the SAFRAN analysis system, its main features and its performance in the study area. In addition, we also present a first comparison with alternative databases. Finally, we explore the possibilities which SAFRAN opens to the climate and LSM communities in Spain.

**KEY WORDS:** Data, meteorological analysis, gridded dataset, optimal interpolation, land surface modeling, downscaling.

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\* Corresponding author. Pere Quintana Seguí ([pquintana@obsebre.es](mailto:pquintana@obsebre.es)), Observatori de l'Ebre, Horta Alta 38, 43520 Roquetes (Tarragona), Spain.