

Minutes from the working day of the SRNWP ET on surface processes held in Toulouse 12 June 2009

Participants : S. Pullen (UKMO), G. Rooney (UKMO), S. Tijm (KNMI/HIRLAM), F. Bouyssel (MF/ALADIN), P. De Rosnay (ECMWF), W. Lahoz (NILU/HIRLAM), E. Martin (MF/ALADIN), J.-M. Bettems (MeteoSwiss/COSMO), J. Helmert (DWD/COSMO), M. Diez (AEMET/HIRLAM), R. Hamdi (RMI/ALADIN), J. Cedilnik (DMS/LACE), A. Trojakova (CHMI/LACE), L. Kullmann (HMS/LACE), F. Meier (ZMAG/ALADIN), J.-L. Roujean (MF/ALADIN), J.-F. Mahfouf (MF/ALADIN)

The SRNWP ET on surface processes was created in October 2007 during the EWGLAM/SRNWP annual meeting in Dubrovnik (October 2007) with 6 other ETs. Since then, our ET has mostly worked through email exchanges for various activities (redaction of the workplan, preparation of the annual SRNWP meetings, interactions with other ETs). However, it was found (mostly by the chairperson) that despite rather constructive interactions among us, there was some imbalance towards three of the consortia having already a number of natural collaborations (ALADIN/LACE/HIRLAM). It was even felt more necessary for our ET to meet together and discuss possible collaborations since at the last annual SRNWP meeting in Madrid (October 2008) no ET members from COSMO and MetOffice were present.

This working day was very successful with that respect since all consortia were represented by at least two people and that the ECMWF representative was also present. The main purpose of this working day was to exchange information on the current status and ongoing developments on surface aspects in each consortium, to discuss possibilities for enhancing collaborations and/or exchange of information, to discuss about future activities (next SRNWP meeting, possible workshops, interactions with other ETs, planned collaborations).

JFM gave a general presentation of the C-SRNWP structure and the main duties of each ET (thanks to material provided by Andras Horanyi the programme manager). He also provided some justifications for SRNWP collaborations (in particular, to share expertise and data sets, to take advantage together of European initiatives such as an increase usage of EUMETSAT SAF products)

Then, each consortium presented its activities : COSMO activities take place within a recent project named COLOBOC (leader : J.-M. Bettems), MetOffice activities take place within the JULES externalized surface module, whereas SURFEX is (or will be) the externalized platform of the three other consortia (ALADIN/LACE/HIRLAM), ECMWF uses the H-TESSSEL surface scheme. A main outcome from these presentations has been the importance of high quality datasets at local scale for the identification of strengths and weaknesses of land surface schemes (including flux measurements and measurements within the soil), the need for having improved lake databases and also the interest in using more satellite products (for better analyses or climatologies) – All presentations will be available on a dedicated web page.

Tables summarizing the main features of the surface in each consortium (modelling, assimilation, physiography) was sent to each participant to be completed before this meeting. This document including the features of the 5 surface systems was given to the participants for discussion. Everybody was pleased with this information. It was found important to make it available electronically and to update it regularly. JFM proposed to reorganise the tables for improved intercomparison and to gather the bibliography. The final document will be available on a dedicated web page.

We discussed the workplan that was written almost two years ago, but no decision was taken on revising it.

The afternoon was devoted to discussions about possible collaborations. Some proposals were made by JFM such as validations at local scale (e.g. SMOSREX field experiment), or the use of NLDAS forcing for intercomparison of land surface modelling and assimilation systems. COSMO is gathering information on validation sites where they want to compare their land surface scheme. Once this set of sites has been chosen, each consortium could send its operational outputs at those locations for an intercomparison of the behaviour of the land surface schemes. J.-M. Bettems agreed to host this local scale validation on the COSMO web site. It was mentioned that within CEOP a number of sites already exists such as Cabauw in Netherlands. There is already a number of real-time sites hosted by the FMI that intercompares European LAMs (<http://fminwp.fmi.fi/mastverif/mastverif.html>).

The need for additional (independent) data set the validation of snow analysis was mentioned, this is a request that should be sent to the SRNWP ET on verification.

The importance of sharing information on lake modelling was mentioned and it has been found important to provide on a web site contact points, so that each consortium can be aware of activities on lake modelling : developments of snow modelling on top of the ice layer (HIRLAM), extension of lake databases (E. Kourzeneva, RSHU), lake depth climatology (G. Balsamo, ECMWF – information provided at the end of these minutes)

The problem of snow analysis was discussed : it appears that there are two products from the LandSAF and the H-SAF and that COSMO (MeteoSwiss) has also another snow cover product that has been found superior to the LandSAF. It was suggested to contact Pedro Viterbo so see if a visiting scientist could be possible in order to evaluate/improve the LandSAF product. F. Bouyssel agreed to contact the LandSAF programme manager on that respect.

Discussions continued on the request from the SRNWP interoperability programme regarding the conversion of surface fields from one model to another. JFM provided a number of documents that were the answers (ideas) from each consortium. It was agreed that when possible the surface should be kept from the target model and simply use the atmosphere from another model. When it is not possible several options can be envisaged (flux preserving) but none of them is entirely satisfactory, since the conversion are very much « scheme dependent ». It is important that some surface physiographic parameters are also provided (vegetation cover, soil textural properties) to make « physical » conversions. JFM will provide all these information in a single document to the SRNWP interoperability programme manager in one month time.

Then we discussed about the next SRNWP assembly in Greece for which JFM will not be present (conflict with the WMO symposium of data assimilation in Melbourne), even though he insisted that ET members should make an effort to attend this annual event, as it is an opportunity to meet together. A. Trojakova will attend and volunteered to give a review talk on surface processes. All members of the ET are invited to give their inputs. The main driver for the talk will be a summary of the various activities from our ET during the last year. The ET members will also be contacted in order to fill the two hour session on surface processes : the idea would be to have a 20 min presentation from each consortium (5 presentations) and to finish the session by a 20 min discussion.

Finally we talked about the opportunity to meet together on a regular basis (once a year). People agreed that it would be a good idea: the natural place would be the SRNWP annual meeting and to take this opportunity to have a ET meeting on surface aspects. This may be difficult in practice because this gathering is also an opportunity for individual consortia management meetings. Having one day meeting in association with another event (such as what has been done this year in

Toulouse with the ITWG workshop) appeared to be the preferable format. We discussed about the interest of having a workshop in two-year time, since last year at the lake workshop, it was suggested that another lake workshop could take place in the coming years under the SRNWP umbrella. No decisions were taken there, but JFM will ask again the ET members about the opportunity of a SRNWP workshop on surface processes in 2011. JFM has no objection in being the local organizer in Toulouse.

Other relevant information provided after the meeting

NILU : SMOS will be launched in late 2009 (current launch date November 2009) and will provide hydrological cycle information of interest to the SRNWP community. A number of participants in SRNWP (e.g. NILU, Météo-France) submitted a proposal for an International Team (led by W.A. Lahoz, NILU) to the International Space Science Institute (ISSI), with a focus on the use of SMOS soil moisture measurements. This proposal has been accepted and dates for the first meeting are being discussed (most likely date is early 2010). Yann Kerr (SMOS PI) is a member of this International Team and has confirmed that access to simulated and real SMOS data for members of the Team should not be a problem. The SRNWP community interested in SMOS soil moisture is encouraged to liaise with this International Team.

ECMWF : The lake modelling activities have been progressing in the past two years in the framework of a collaboration with Emmanuel Dutra (U. Lisbon), Viktor Stephanenko (Moscow State U.), Pedro Viterbo (Instituto de Meteorologia, Portugal) and Pedro Miranda (U. Lisbon). The implementation of FLake inside HTESSEL is done with a separate tile (tile 9) allowing to consider both subgrid and resolved lakes and to consider lake freezing. This is available within the IFS since cycle 35R2 (march 2009). Dutra et al. (2009) have demonstrated the impact of lakes on global scale offline simulations using ERA-Interim forcing with HTESSEL+FLake model and assessing evaporation impacts coming from the inclusion of lakes. This work has used a fixed lake depth (of 30m). In parallel, Balsamo et al. (2009) have developed a method for the lake depth inversion using FLake at global scale, and based on MODIS remote sensing observations of the lake surface temperatures. This work tries to respond to the lack of a lake bathymetry at global scale (especially for small lakes) avoiding the use of a fixed depth. The method has been tested on a few Eurasian lakes for which lake depth estimates are available, showing a good convergence. A derived 2D lake bathymetry has been obtained over the Great Lakes and the Caspian Sea and it has shown to compare qualitatively well with the available bathymetry fields. Since the obtained lake depth is optimizing the match of the FLake modelled annual cycle of surface temperature to the observed values, the methodology is highly relevant for global weather and climate prediction (since it optimizes surface fluxes).