SPITSOIL SPECIAL PROJECT
PROGRESS REPORT

Reporting year	2014
Project Title:	Testing soil condition perturbations for a convection-permitting ensemble over Italy
Computer Project Account:	SPITSOIL
Principal Investigator(s):	Nicola Loglisci Riccardo Bonanno
Affiliation:	ARPA Piemonte
Name of ECMWF scientist(s) collaborating to the project (if applicable)	
Start date of the project:	02-07-2014 (Date of approval)
Expected end date:	31-12-2016

Computer resources allocated/used for the current year and the previous one
(if applicable)
Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)	450000	450000	500000	170000
Data storage capacity	(Gbytes)	100	100	100	80

Summary of project objectives

(10 lines max)

The project aims to develop and test a perturbing technique of the soil initial state in order to include soil perturbation in the convection-permitting ensemble COSMO-IT-EPS currently under development in Italy in collaboration between ARPA-SIMC, ARPA-Piemonte and CNMCA.

Summary of problems encountered (if any)

(20 lines max)

Summary of results of the current year (from July of previous year to June of current year)

This section should comprise 1 to 8 pages and can be replaced by a short summary plus an existing scientific report on the project

Different suites accounting for high resolution COSMO-EPS model have been set up. The differences among the suites are the perturbing ways of initial and boundary conditions:
SUITE-SOIL: initial soil moisture field (from both ECMWF and DWD) is perturbed using a stochastic pattern generator.
SUITE-EPS: initial and boundary conditions of the atmosphere is perturbed according with 10 random members taken from ECMWF EPS system.
SUITE-EPS-SOIL: both soil moisture IC and atmosphere IC and BC are perturbed.
SUITE-EPS-SOIL-PHYSICS: add a perturbation of some physical parameters taken into account in the convection calculation of the high resolution COSMO model.

Two case studies have been selected to test the perturbing methods. The first one is a typical summer convection produced by thermodynamic instability of the atmospheric vertical profile. The second one is a typical autumn convection induced by a pronounced dynamical convergence in the lower boundary layer over the sea and its interaction with the local topography.

First results demonstrate an appreciable daytime spread increase in summer case studies when surface fluxes are stronger allowing the transfer of soil moisture variability into the atmosphere. On the contrary, in autumn case study, the increase of spread is not relevant due to the different dynamical mechanisms triggering convection.

List of publications/reports from the project with complete references

None – Experiments are still running

Summary of plans for the continuation of the project

(10 lines max)

A verification analysis has been addressed to evaluate the skill of suite EPS-SOIL compared to suite EPS, but demonstrated the need to perform other simulations in order to increase the statistics in the ensemble verification method.
For this reason, other case studies will be simulated using all the test suites developed.