

Minutes of the Results

Workshop PP COLOBOC

Date: 12.03.2009

Time: 09:00-14:30

Location: BTZ Langen B1.04

Reference:

Participants:

Bettems (Bt, MeteoSwiss), Helmert (He, DWD), Asensio (As, DWD), Suklitsch (Sk, WegCenter Graz), Davin (Dv, ETHZ), Schomburg (Sb, U Bonn), Kerkweg (Kw, U Mainz), Wißkirchen (Wk, AGeoBW), de Morsier (Ms, MeteoSwiss), G. Vogel (GV, DWD), Georgievski (Gv, BTU), Früh (Fr, DWD), Lange (La, DWD), B. Vogel (BV, KIT Karlsruhe), Machulskaya (Mk, Roshydromet), Will (Wl, BTU), Hübener (Hb, HLUG), Smiatek (Sm, KIT), Rozinkina (Rz, Roshydromet), Kazakova (Ka, U Moskow), Anders (As, ZAMG), Fuhrer (Fu, MeteoSwiss), Mironov (Mi, DWD)

Distribution

Participants, COLOBOC mailing list, COSMO web site

Guidance: Bt

Record: He, Bt

Notes: version 1.0

Next meeting: COSMO General Meeting



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TOP 1	Responsible	To settle until
	All	-

Introduction (agenda, project status) (Bt)

Bt presented the agenda of the meeting and specific points for the general discussion.

TOP 2	Responsible	To settle until
	All	-
Support for validati	on of soil model - kick off discussion (B	Bt)

According to the project plan, the following actions have to be taken till September 2009:

- Create page on COSMO web site
- Describe useful data sources for SVAT validation
 - Type of observations, period of availability, format, ...
 - Links to contact person, web site, papers, ...
 - Users comments on quality, usability, ...
- Describe existing tools
 - Terra standalone & tools from G.Vogel, model farm, ...
 - Links to contact person, ev. software, ...

JB will contact the concerned people and coordinate the work.

Additional goals for this task will be proposed for the next COSMO General Meeting:

- Find a set of stations with near-real time data
 - for SVAT diagnostic and SVAT development
 - offering a good sampling of typical soil types & climates within the COSMO domain
 - with data available for COSMO members
 - ask COSMO members, take this point for the SRNWP ET workshop in June
- Extend G.Bonafe platform (Wiki space for sharing model diagnostic)
 - Link from COSMO web site
 - Include additional sites
 - (currently with Capofiume data; Falkenberg, Sodankylä, Payerne will follow)
 - Include additional operational COSMO models
 - Common data format? How long to keep data?
- Consolidate/extend model farm (framework for model development from R.Stöckli/MCH)
 - Update TERRA module
 - Include additional sites
 - consolidate gap filling procedure
 - Add possibility to drive SVAT with COSMO fields (NetCDF data)
 - Make software package available to others

There is a need for collecting data of at least the last 20 years, the minimum range for time series should be 4 years (WI). Over Germany, such data sets are available from the German Environmental Agency (WI). WI will inform JB **(T)**. Contact persons for NWP and CLM data useable for validation purposes are A. Will and S. Seneviratne.



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A list of available data for validation with format, access restrictions (legal) should be created and submitted to the COSMO website (Hb)(T).

There are studies being undertaken to use CEOP data at GKSS.

ТОР 3		Responsible	To settle until
		AII	-
TERRA star	ndalone – Cu	ent status	

Although this task has not yet formally started, MeteoSwiss already invested some effort to consolidate this code:

- A serie of bugs have been corrected
 - cycling TERRA standalone experiments
 - processing of GRIB files
 - processing and interpolation of atmospheric fields
- New features have been introduced
 - temporal gap filling to take care of missing BC files
 - new namelists parameters to control the way atmospheric fields are pre-processed (staggering, accumulation, ...)
 - more diagnostic

Other issues have been recognized, but are not yet solved

- Points with loam type are not generally usable (Wi will contact Fu, T)
- Still not all information is correctly initialized when cycling TERRA standalone runs (check Uli Schättler re-start flow chart)
- Robustness of the code should be improved
- There is a need to understand how much the evolution of the soil (and of the snow pack) differs between TERRA standalone and the full COSMO, as a consequence of the following simplifications:
 - simple transfer scheme by Louis
 - no feedback loop between soil and atmosphere

These simplifications and the used soil parameters should also be considered when using TERRA in a model farm and comparing the results with other models (He). A better coupling with the atmospheric model could be considered, along the lines of what is done in COSMO 1D (Mi).

A river routing scheme for TERRA will developed by Ahrens/Kunstmann, considering in particular the developments by Kirsten Warrach-Sagi (WI).

TOP 4	Responsible	To settle until
	AII	-
External Parameters	t DWD current status and new developmen	its (As)



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The current software system for the generation of external parameters at DWD (EXPAR) was presented by (As) with focus on the COSMO model. The current software system runs on the new High Performance Computing System at DWD on Linux nodes.

A technical revision of EXPAR including the use of a version control system and the output of additional datasets (NDVI, EMISS, PRSMIN) was performed. Additional datasets (FR_LAKE, DEPT_LK) and NetCDF output will be provided in near future..

NetCDF output (in addition to GRIB) was implemented.

DWD will contact BGR for soil texture data. A closer investigation of the potential of these data is necessary (Hb).

NetCDF attributes will used for data maintenance. Code maintenance is ensured by the version control system. The NDVI sensitivity depending on the geographical location (ecosystem) should be investigated (Sm). The question has been raised on the necessity to use some observed data set for the albedo.

Based on a software requirement specification, which was presented, a consolidated system for the generation of external parameters will be developed. This system will support all NWP models of the current and next generation employed by DWD.

TOP 5		Responsible	To settle until
		All	-
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External Parameters - Requirements for COSMO ART (BV)

COSMO-ART requires several additional external parameters for pollen, aerosol and chemistry transport simulations.

A joint effort by MeteoSwiss, DWD, ZAMG, ... for pollen forecasts requires the density of individual plant species and temperature based threshold values for start/end of blooming period (BV). This should be considered for inclusion in the updated EXPAR.

Chemistry transport models need data for anthropogenic emissions (area sources for individual compounds) with temporal resolution of 1 hour. Point sources should contain coordinates, emissions, source height, and exhaust gas temperature. Do these data belong to the external parameters or to the boundary conditions? This question has been debated.

TOP 6			Responsible	To settle until
			All	-
External Para	ameters – Soi	l texture (Wi)		

Soil texture for Germany is available with a resolution of 4km, with provision for multiple soil types within a single column. The CLM community is very interested by this aspect. However, use of these data would require significant modifications of TERRA.

DWD will contact BGR for additional soil texture data; a closer investigation of the potential of these data is necessary (Hb).



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OP 7	Responsible	To settle until
	AII	-

Purpose of the Software Requirements Specification, overall description of the External Parameter System and specific requirements were presented (As).

There is a demand for fractional information, in particular for urban fraction. The provision of the two components of the surface roughness length (orographic , land use part) is also a wish (Fu). There is a strong argument to compute the smoothing of the orography within EXPAR and not within INT2LM, in order to properly account for the subscale contributions to SSO and other external parameters; this has to be discussed with Uli Schättler (**T**, As,He). The option to add external parameters for pollen forecast (topic 5) should be provided. Another issue to be considered is the use of non-global but more detailed raw data sets, available for some regions of the globe.

The consolidated software package should be modular and portable to allow users to experiments with new or different data sets, with different look-up tables or different types of aggregations; in this respect, it should be possible to get some arbitrary raw data from the DWD database, and to process these data locally with a local installation of the EXPAR software (Bt). There is an offer by MeteoSwiss to provide 'fieldextra' as interpolation/aggregation engine within EXPAR; this will be further discussed at the next COSMO GM (Bt).

There is a demand for a consolidation of the EXPAR web interfaces (PEP,DWD) into one interface (WI). Due to the wide variety of user demands it could make sense to use one implementation that supports experimental data and one implementation for users with a demand for the NWP operational data set (He). DWD could provide hosting space and technical infrastructure (database web-interface).

The current PEP system of the CLM community is fully compatible with the EXPAR software. It is important to make sure that this compatibility is kept in further developments.

TOP 8	Responsible	To settle until
	AII	_
Revision of the S\	r model TERRA in the COSMO model (He)	

TERRA-Standalone simulations have been performed for different climatic regions using different options of the SVAT model. What has been learnt:

• The Bowen ration can be reasonably well simulated by introducing the following modifications of the operational configuration: a depletion of root density with depth, a change in bare soil evaporation, a rigid lid as lower boundary condition for hydrological processes, and a satellite derived climatology of vegetation.



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- In autumn, the model performance depends essentially on the vegetation properties. Consequently, the NDVI inter-annual variability and the harvesting period have a large effect.
- Systematic experiments should be made to find out under which conditions the soil moisture clearly impacts on cloudiness, convection or precipitation.

The next step is to perform experiments with the full COSMO model, using the 'best' configuration obtained from the TERRA standalone experiments (first with bare soil evaporation, root depletion, and NDVI based plant properties). For that purpose, a revised TERRA has been prepared (v4.7), with enhanced external parameters and adapted look-up tables. The impact of these modifications on the DWD soil moisture analysis (SMA) has also to be considered, and requires some changes in the SMA.

TOP 9	Responsible	To settle until
	АШ	-
Snow analysis - current s	itus (Ms)	

The set up of the snow analysis, the data used for validation (MSG, SLF) and validation results were presented. The MSG derived snow mask and some tuning of the Cressman analysis bring a clear improvement of the snow analysis, specially in complex topography. The altitudinal interpolation and some bug fixes from DWD have yet to be incorporated and revised. A definitive package is expected for May/June 2009.

TOP 10		Responsil	ole	To settle until
		All		-
Snow model	- current stat	ıs (Mk)		

The impact of the new snow model on the snow water-equivalent depth, the surface temperature and on the energy budget was presented for a single case computed with COSMO-RU. Almost all the considered region was snow covered. The new model produces a spatially consistent larger snow depth and a higher surface temperature during night (only!).

Due to its non-linear behaviour, snow heat conduction has a large impact on surface temperature (He).

Initialization of the new snow model requires a careful setting of the initial snow density profile; however the sensitivity to the initial liquid water content is weak.

Wi offered to test this new snow model in climate mode.

The changes should be documented (history flowchart) (WI).



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TOP 11	Responsible	To settle until
	AII	-
CLM WG Soil and Vegetation	ı – report (Dv)	

Results from the implementation of the European Soil DataBase (JRC) in COSMO-CLM and the coupling of COSMO-CLM with the NCAR Community Land Model were presented.

Comparing the results with CRU data for JJA, the impact of the different soil data on the 2m temperature over Germany is not very large.

A first frozen version of COSMO including NCAR CLM is available. A switch to choose between the standard TERRA or the NCAR CLM has been built. The coupling of CLM to CCLM requires an adaption of the computation of fluxes, and is isolated in an 'ad hoc' interface. First comparisons between the effect of the two SVATs will be available at the end of summer 2009. Additional measurement sites could be useful for this study.