

AGENDA OF THE SOIL AND VEGETATION WORKING GROUP



Coordinators: Merja Tölle and Mario Raffa

20th September 2018, COSMO-CLM Assembly, Karlsruhe, Germany

Room: LH59, 15:30 – 17:00

Moderator: Merja Tölle

Participants: Merja Tölle, Ronny Petrik, Jennifer Brauch, Natalie Laube, Melanie Karremann, Marcus Breil, Mario Raffa, Oscar Brousse, Sebastian Helgert, Hans-Jürgen Panitz, Johann Züger

- **Opening/Agenda**

- Adoption of the Agenda

- **Current Developments / News / Discussions**

Planned developments of research groups involved in SOILVEG WG (each group):

Mario Raffa from CMCC: involved in CORDEX LUCAS (performed FOREST and GRASS with TERRA-ML at CMCC to see impact of different computer center) and convective permitting scale, TERRA urban scheme over Italian cities: testing and validating

Marcus Breil: LUCAS is last project with VEG3D

Sebastian Helgert: Simulations over 3 km Mediterranean region (group of Khodayar), soil moisture, process studies

Oscar Brousse: TERRA-urb over African region (Dakar and Kampala), implement new data set Wudapt for better definition of urban environment, cooperation with CMCC about parameterization

Natalie Laube: CCLM-VEG3d, 2.8 km with 3 nests, impact of different soil initial fields on decadal scale

Melanie Karremann: paleo climate studies with different vegetation and soil

Stefan Hagemann (reported from Ronny): ecosystem in Baltic sea area, pollution from rivers into sea, old/new version of TERRA-ML (??) and CCLM over Australia, river run-off, routing together with soil and vegetation, comparison with observations

Johann Züger from AIT: CCLM TERRA-urb over Vienna and Linz, urban fabric changes into the parameters in TERRA-Urb (e.g. greening), 1km

- **Implementation of possible discussion groups with similar topics for intensifying communication, exchange, and possible collaboration. Groups need to organize themselves depending on demand.**

- Urban discussion group: members from CMCC, KUL and AIT
- Soil moisture discussion group: Africa Uganda, Spain (Robert Vautard et al. 2007, 2013), propagation of heat wave of 2003, everybody involved in soil moisture and land
- Runoff discussion group: Linda Schlemmer, Stefan Hagemann (need to be asked)
- **New funded project on uncertainty due to land-atmosphere interactions (Merja Tölle, 2 PhDs (Mingyue Zhang))**

- **LUCAS**

- Phase I: Continental scale, idealized experiments**

- How sensitive are the regional climate models to LUC and how is this interrelated to the land-atmosphere coupling strength in different regions and seasons?**

- Idealized vegetation cover simulations finished (FOREST, GRASS, EVAL)**

- Paper on “The biophysical role of European forests: First results from the LUCAS FPS multi-model ensemble”**

- **Mario Raffa gave presentation of his results of FOREST and GRASS at CMCC. Next step: check differences due to computer center.**
- **Review of strategy of the science plan for COSMO-CLM 2014-2018 and discussion of next science plan 2019-2022:**

Aim to establish an earth system model encompassing all relevant components of the climate system.

TERRA is planned to be further developed with respect to consider dynamical vegetation (seasonal varying phenology), more land surface types, urban structure, changes to the groundwater table, a vertical inhomogeneous soil texture, river routing, as well as sea and lake ice surfaces.

Furthermore, it is necessary to better understand the role of land-atmosphere interactions at the regional scale. Therefore, it is of great importance to implement processes like e.g. the dynamical change of vegetation, the thawing of the permafrost, the transient change of land use (natural or anthropogenic), or the soil-moisture precipitation feedback at the regional climate.

For urban land investigations respective high resolution parameterizations are already implemented in COSMO-CLM (Schubert et al., 2012; Trusilova et al., 2013; Wouters et al., 2012). The outcome of these parameterizations is compared and the impact to the regional climate is assessed in Trusilova et al. (2014).

Wishes to be included in the next science plan:

Single column simulations over different observational sites to elaborate if the model can see the underlying surface with its fluxes (CCLM-TERRA, CCLM-Veg3D, CCLM-CLM), compare different LSMs on European scale, carbon cycle (TERRA as climate model, JSBACH), dynamic vegetation, improvement of multi-layer snow model, improvements in snow melting, couple to an ice-sheet model, canopy shading, pt-aevus optimum parameterization, multi-layer urban canopy model for neighbourhoods with trees (BEP-Tree Krayenoff) -> Schubert single column, ICON-CLM², ICON with Parflow

- **Update of research groups related to SOILVEG WG**

New research groups are asked to give a short introduction and put their information into the topic browser.

- **New Publications**

Cherubini, F., B. Huang, X. Hu, **M. H. Tölle**, A. Hammer Strømman, 2018:
Quantifying the climate response to extreme land cover changes in Europe with a regional model, Environmental Research Letters, 13, 074002, DOI: 10.1088/1748-9326/aac794