

Status update TERRA_URB:
urban land-surface parametrization for
COSMO(-CLM)

Current working version in COSMO5.0-CLM (only 'CLM')

- Release COSMO5.0_clm8 + TERRA_URB 2.0 (see Wouters et al., 2016 GMD)
 - Provided as cclm-sp_2.1_terra_urb package on the CLM-website including modifications for int2lm
 - Some bugs detected (thanks to Mikhail V. and Edoardo B.):
 - vegetation abundancy
 - anthropogenic heat flux
 - poormans' tile approach
 - Diagnosis issues regarding 2d surface fields
- Release TERRA_URB v2.1
 - bugs above are fixed:
 - avoids model crashes over the Alps (cfr. Tests Edoardo B.)
 - avoids unrealistic heating and low wind speeds in the rural areas of Moscow (cfr. Tests Mikhail V.)
 - Available on the clm website very soon
 - Will also include the update to COSMO-CLM5.0-clm9 (thanks to Edoardo B.)
- Pending work (for TERRA_URB v2.2)
 - Make option for 2D fields of urban canopy parameters (building height, height-to-width ratio, building albedo, emissivity,)
 - At the moment, this is hard-coded by Mikhail V. in his customized version (see his poster)
 - Vegetation insulation effect (by Jan-Peter S.)
- Misc:
 - WebPEP: Urban fields (ISA and AHF) give zero values for Lake Victoria tropical Region.

Next version in COSMO5.06 (both for NWP and CLM)

- Initial test version has been made by Ulrich S., based on TERRA_URB 2.0
 - A revised tile approach in accordance to the new ICON/COSMO block data structure
 - Version works well in default configuration for which TERRA_URB is switched off
 - Yet, switching on TERRA_URB implementation gives unrealistic results (eg., extremely low wind speeds)
 - In this version, additional work is required for taking the urban-canopy radiation balance into account (a solution was discussed with Ulrich B.)
- New version is on the way...
 - Bug fixes might solve the unrealistic results have been made in a recent COSMO version
 - they are currently transferred to the TERRA_URB branch
 - Note: The 'next' version does not include the bug fixes of TERRA_URB v2.1 of the 'current' version yet

Ongoing projects with TERRA_URB

- Urban heat island of Moscow mega-city (see presentation Mikhail V.)
- REACT: Malaria drivers in tropical cities (see poster Oscar Brousse)
- CORDEX.be: Belgian urban climate projections at convection-permitting scale (temperature and precipitation extremes)
- tests regarding Belgian UHI in relation to implicit vegetation insulation parametrization and modified turbulence parameters (see poster Hendrik)
- Urban heat island of Vienna (by Austrian Institute of Technology; Johann Züger)
- Upcoming: AEVUS PT