Schweizerische Eidgenossenschaft
Confédération suisse
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CONSORTIUM FOR SMALL SCALE MODELING
COSMO

Some additional aspects

Jean-Marie Bettems / MeteoSwiss

COSMO GM
Sibiu, September 10th , 2013

Overview of ongoing land model developments within the CLM-Community

Synthesis collected by E. Davin

CLM Community
Organization

Atmosphere COSMO/CCLM

J-M. Bettems (WG3b)

S. Kothe

TERRA_ML

E. Davin
Community Land Model

M. Breil
VEG3D

Urban modules
H. Wouters

COSMO
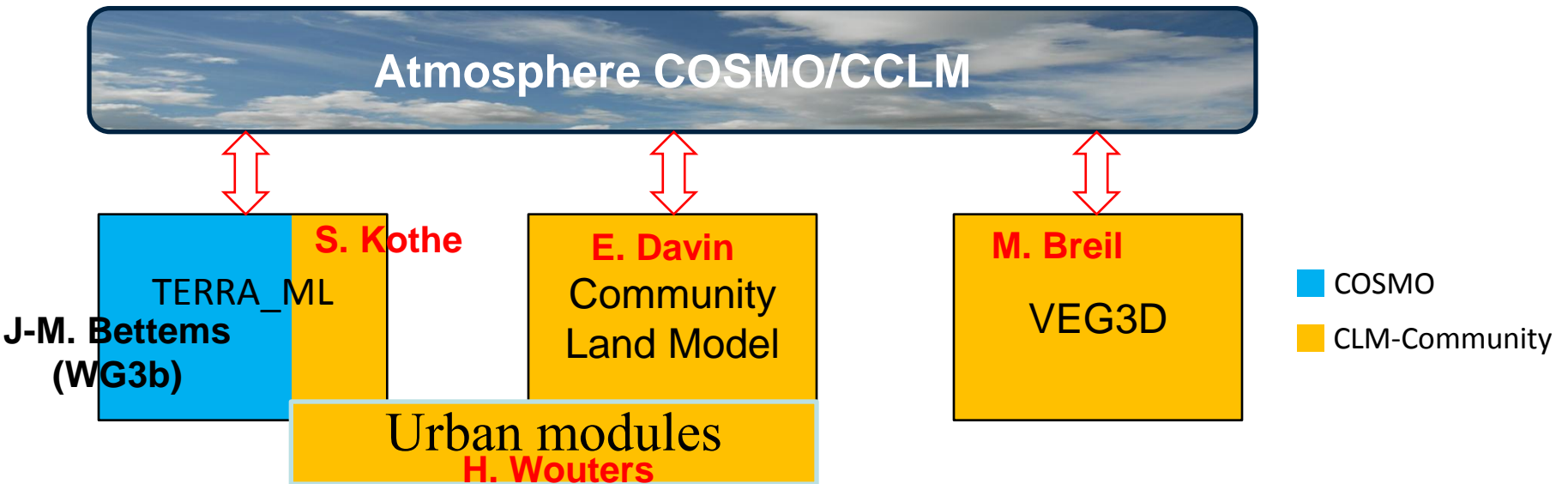
CLM-Community

CLM Community
Collaboration with COSMO

- Good information exchange between SOILVEG and COSMO WG3b

- Joint SOILVEG/WG3b meetings (COSMO/CLM user seminar)

- Common tool for documenting model developments: http://www.cosmo-model.org/content/model/releases/developments.htm

WG3b					
				description	technical	testing	documentation
0.1	stop	N/A	Scale separation for Z0 and SSO	N/A	N/A
				description	technical	testing	documentation
0.5	work	N/A	Tiles and Mosaic Approach	Machulskaya / Helmert (DWD)	N/A
				description	technical	testing	documentation
0.4	work	N/A	Multi-layers snow model	E.Machulskaya	2012-02-01
				description	technical	testing	documentation
0.2	evaluate	N/A	Orographic radiation correction	TBD	2012-09-01
				description	technical	testing	documentation
0.3	work	N/A	Mire parametrization	A.Yurova	2012-12-01
				description	technical	testing	documentation

CLM Community
TERRA

- Talk by JP Schulz

CLM Community
Community Land Model

- **Subroutine coupling :**
  - COSMO-CLM (various versions) coupled to CLM3.5
  - Currently in use within various projects, but no plans to implement it in official COSMO code

- **OASIS coupling :**
  - Uses OASIS3-MCT as external coupler
  - Upgrade to CLM4.0/4.5
  - Still under testing
  - Code will be distributed via the redmine server
  - Ongoing work to implement "unified interface" (OASIS PG)

- Tutorial will be proposed at the next COSMO training course (Feb. 2014)

CLM Community
Intercomparison TERRA_ML / CLM3.5

- Comparison COSMO-CLM coupled to TERRA_ML / CLM3.5 for Europe *(Davin et al., Clim. Dyn., 2011; Davin and Seneviratne, Biogeosciences, 2012; Lorenz et al., JGR, 2012)*

- Further comparisons for Europe, Africa, South America, Australasia are under discussion

CLM Community
Veg3D

- Coupling COSMO4.8-CLM19/Veg3D using OASIS3-MCT

- Technically working
- Scientific evaluation underway (Africa and Europe)

CLM Community
URBMIP

Name	TEB alongside TERRA_ML	TERRA-URB	TERRA-ML / BEP
Responsability	Kristina Trusilova	Hendrik Wouters	Sebastian Schubert
Features	inner building temperature snow model, water skin layer roofs/walls/roods, tiled urban fraction	Direct representation of the urban landcover in TERR-ML using a tile approach, new surface-layer transfer coefficients, thermal capacity, anthropogenic heat and impervious surface interception distribution	Street canyon model advanced double-canyon radiation scheme, shadows, radiation trapping, roof/wall/ground fluxes; coupled with the PBL scheme not only through surface fluxes but also by means of energy and momentum fluxes in layers above the surface
Input		Urban fraction (EEA), annual mean anthropogenic heat (NCAR)	Full 3D cityGML
References	Trusilova et al 2008, Masson 2001	Wouters et al. 2013, Wouters et al. 2012, Flanner 2010, Demuzere et al. 2008, De Ridder, 2012	Schubert et al. 2012, Martilli et al. 2002, Gröger et al. 2008
Aims	Urban climate of Europe and Germany	urban climate and its impact on Air-quality simulations Flanders Belgium	Urban climate of Berlin and Basel

CLM Community
TERRA_URB

- Urban parameterization in COSMO-CLM/TERRA-ML was successfully implemented and tested on 1km resolution over Belgium

- The temporal and spatial variatiability of the UHI intensity are very well reproduced

- Additional computational cost was negligible (+3% CPU-time)

- Number of needed extra parameters is small and readily available globally

➢ Proposal to the SMC to include this development in the official COSMO code (Kristina Trusilova from DWD as possible responsible person)
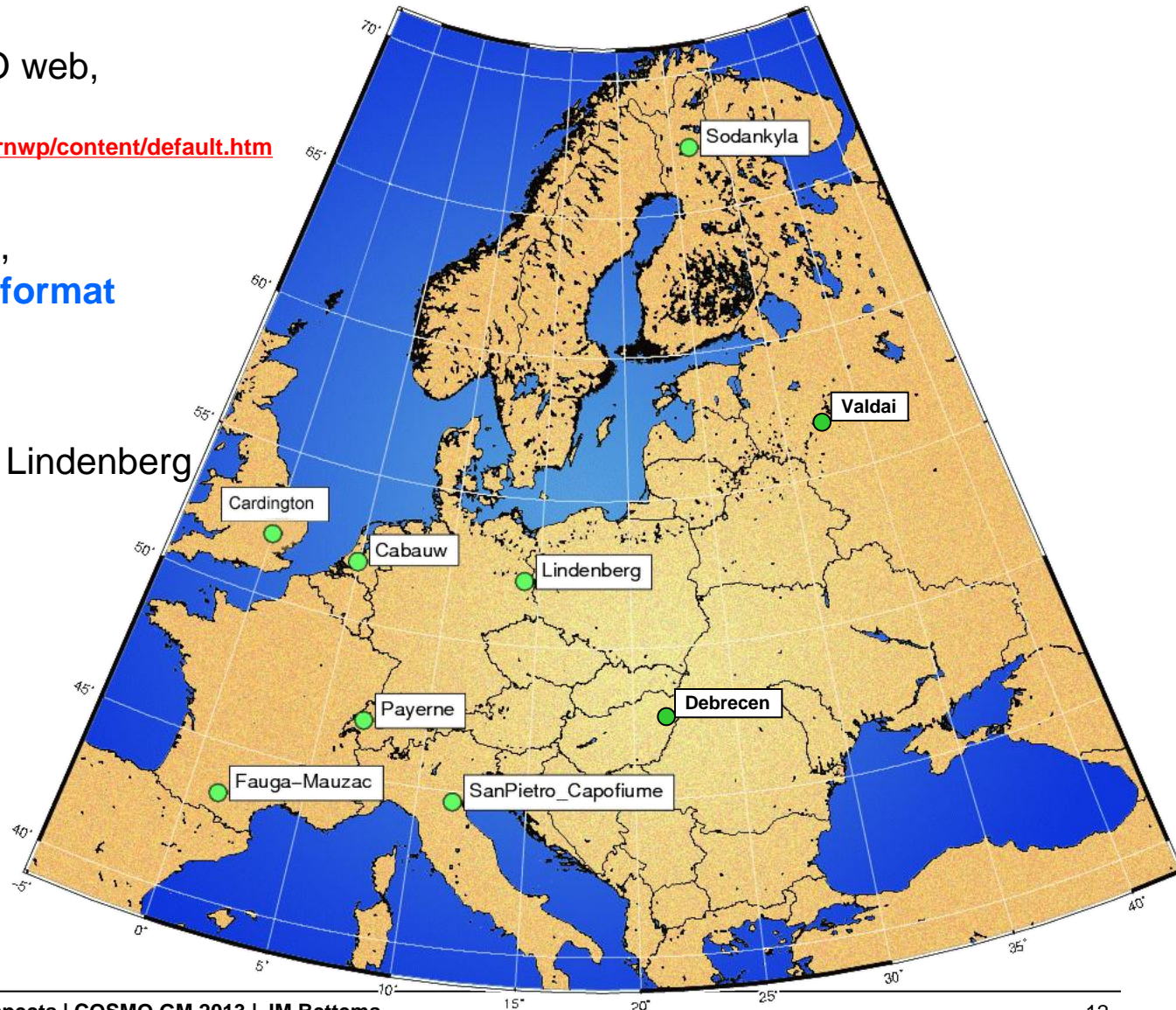
SRNWP data pool

Data pool action

- Access from COSMO web,
  password protected
  http://www.cosmo-model.org/srnwp/content/default.htm

- Currently **9 sites**,
  data from **2006-2012**,
  in a **common ASCII format**

- **Soil**, **surface** and
  BL observations

- Work done at DWD / Lindenberg
  (C.Heret)

Data pool action
Status

- Data available from start of the action to end 2012 from
  Cabauw (NL), **Capofiume** (IT), **Lindenberg** (DE),
  Payerne (CH), **Sodankyla** (FI)

- Waiting for (some) 2012 data from
  Fauga-Mauzac (FR), **Cardington** (GB)

- New site **Valdai** (RU)
  … but no fluxes measurements, no soil measurements … work in progress

- Very few data for
  Debrecen (HU)

- **The SMC recommends following this action**

- Are more resources needed for this action ($\rightarrow$ StC) ?

- Is it ok to keep the responsibility for this action in COSMO ?

Thank you for your attention!