

6th SURFEX SG Meeting

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SURFEX Steering Group Meeting
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France

Current Uses and Ongoing Developments

GMME

1) Hydrological Processes (SIM, ISBA-TOP)

2) Soil-Vegetation processes (ISBA)

3) Lakes (FLAKE)

4) Urban processes (TEB)

5) Offline surface analysis & Assimilation

1) Hydrological Processes

Hydrological application **SIM** over France

- New SIM Chain with SURFEXv8.0 (ISBA-DIF, STRM 90m, Stomatal resistance using Jarvis or Ags) will be Operational in 2016

Hydrology for flash flood prediction : **TOPODYN** (ISBA-TOPmodel approach)

SURFEX v8 : TOPODYN approach for lateral distribution of soil water (+ ISBA-DIF)

Prospectives

- Development of a probabilistic version for simulating flash flood events. Ensemble members have perturbed hydrological parameters (soil and TOPODYN parameters) and initial soil moisture conditions

2) Soil-Vegetation Processes

Test of ISBA-DIF in coupled mode in the Meso-NH model

- Meso-NH with SURFEX-ISBA-DF : Ongoing scientific validation work in 2016
- SURFEXv8.0 soon available in MesoNH (2016)

Multi-Energy-Balance (MEB) ISBA option (CNRM + SMHI within HIRLAM)

- Now available in SURFEXv8.0 for **Forest Patches** (work for other patches in summer/autumn 2016)
- Forest litter option now available in MEB (generally better G , H)
- Current evaluation in SIM
- At Centre d'Etudes de la Neige (CEN) : couple MEB with CROCUS (2016) snow scheme
- Some minor bugfixes for V8.x
- ISBA-MEB Scientific documentation (for mid-June) 3 Papers under preparation for GMD *SURFEX Special Issue*
- MEB for crops (2016-2017) collab. With INRA Avignon
- Coupled tests with ARPEGE for late 2016- early 2017
- Global offline analysis/tests (2016)

2.) Vegetation, 3.) Lakes (Flake)

ISBA

- Prognostic snow-free surface albedo (consistent with LAI, FAPAR and soil moisture simulated using Ags NIT and NCB options)
- Values of the minimum Leaf Area Index (LAI_{min} parameter for NIT and NCB) being determined from satellite-based LA/Summer crop representation for NIT and NCB Ags options
- Integrated irrigation modelling work (2016-+...)

ECOCLIMAP-SG (Second Generation):

- Will be based on ESA-CCI and will adhere to a certain degree of continuity compared to previous versions.
- Notion of COVERS will be replaced by Plant Functional types (PFTs). This will require a major overhaul of certain elements of the SURFEX code, but this change corresponds to a conceptual simplification for both operational applications and TEB.

Work on Flake (with GMGEC) :

- Couple with ISBA-ES
- Add prognostic mass (lake hydrology/water storage changes), coupling possible with TRIP 2016-2017

4.) Urban (TEB)

TEB

- **Urban-Hydrology:** add a soil column below roads/buildings/gardens and compute the thermal exchange between TEB and hydrology (ISBA-DIF) for each compartment, compute explicit road infiltration, runoff towards drains/sewers, and soil water transfer to the hydrological network. Phasing with V8.0 ongoing and evaluation for 2 cases
- **Trees along Roads: adding a tree canopy in urban canyon,** modification of radiation scheme (solar and IR), evaluation by comparing with a detailed architectural (solar) model, Phasing with V8.0 ongoing
- **Code added to verify energy conservation,** checks: STOP if problems
- **BEM (building model)** New parameters added to model different (human) usages, option added to call BEM multiple times from TEB and aggregate the results from the various compartments, ventilation exchange rate formulation after a rain/infiltration event has been updated with a more robust model

5) Sfc re-analysis and Assimilation

Assimilation

- LDAS (version SODA V8) adapted for ISBA-DIF (VEGEO)
- Assimilation of satellite-based surface albedo (2016-2017)

Surface Offline Re-Analysis

LDAS-France is being recoded in preparation for use in LDAS-Monde (Global LDAS at 0.25x0.25 deg)

Fine scale runs (5.5 km) over Europe

- The follow on project UERRA (CNRM contribution) will start in Sept. 2015 - produce 50 years of data at the same resolution (as in EURO4M : 2007-2010)
- ISBA-TRIP 0.10 deg for river routing (valid using discharge)

Global Offline

- ISBA (SUREFEX v8) will participate in the GEWEX-supported Global Soil Wetness Project 3 (GSWP3) in 2015-2016. Forcings at 0.5 degree & 3h
- SAME config as for CMIP6 (within the LS3MIP CMIP6 sub-project)
- Exp1: Long term retrospective runs: 1901-2008.