SURFEX Team

SURFEX steering committee
20/03/2019

Plan

1. Preparation of the next SURFEX version (V9)
2. ECOCLIMAP Second-Generation (ECO-SG)

METEO FRANCE

1 . Next SURFEX version (V9)

Reminder : what is asked to each merger

1. to merge developments with the version of the previous merger

2. to run the STRATO base of tests
   - to analyse the outputs
   - to be able to explain all differences
   - to provide outputs of STRATO

3. to provide a documentation explaining the differences

4. to update STRATO (new keys, new tests)

5. To update the SURFEX user's guide, each developer has to provide:
   - technical documentation of new developments
   - documentation all changes in namelists : new keys, new defaults values, etc...

METEO FRANCE

1 . Next SURFEX version (V9)

Contributors for SURFEX V9

done in progress

HIRLAM		reported at the end
ALADIN (D. Degrauwe)	Coupling SURFEX to ALARO	
CEN		
GMAP	ORORAD : Computation of orographic parameters for surface radiation interaction	
TEB	improvment of BEM urban hydrology	in progress V8.0 → V8.1 April/May
TOPD	Improvment coupling ISBA/TOPD (hydrological model for flash-flood simulations)	end of March / April
Ocean	coupling with a wave model	June
VEGEO	Irrigation in SURFEX	July/August
Meso-NH	snow transport by the wind MEGAN chemical scheme	September/October
Surface	simplification vertical interpolation PREP step	November
GMGEC	CMIP diagnostics Carbon flux	November/December

Details about wainting contributions : http://www.umr-cnrm.fr/surfex/spip.php?article436

1 . Next SURFEX version (V9)

Version management tool

Until 2017 : the versions of SURFEX were managed by SVN

From 2017 : we use GIT

2019 : exclusively GIT

2 . ECOCLIMAP-SG

- 2018: A first version of ECO-SG available
- Documentation and how to download the files:
  https://opensource.umr-cnrm.fr/projects/ecoclimap-sg/wiki
- Global at 300m-resolution
- 1 pixel = 1 surface/vegetation/town type
  → the concept of ECOCLIMAP cover disappears
- Based on ESA-CCI Land Cover version 1.6.1 (2016), satellites MERIS FR && RR et SPOT/VGT.
- Transformation ESA-CCI classes to ECOCLIMAP-SG types (transfer function)
  → mainly automated : easier to update regularly over the years.

METEO FRANCE

2 . ECOCLIMAP-SG

33 types : 3 water / 20 vegetation / 10 urban

1. Sea and oceans (cov. 1)	18. tropical grassland (veg. 11)
2. Lakes (cov. 2)	19. Winter C3 crops (veg. 7)
3. Rivers (cov. 3)	20. Summer C3 crops (new)
4. Bare soil (veg. 1)	21. C4 crops (veg. 8)
5. Bare rock (veg. 2)	22. Tree cover, flooded (new)
6. Permanent snow (veg. 3)	23. Shrub or herbaceous cover, flooded (new)
7. boreal broadleaf deciduous (veg. 16)	24. urban LCZ1: compact high-rise (new)
8. temperate broadleaf deciduous (veg. 4)	25. urban LCZ2: compact midrise (new)
9. tropical broadleaf deciduous (veg. 13)	26. urban LCZ3: compact low-rise (new)
10. temperate broadleaf evergreen (veg. 14)	27. urban LCZ4: open high-rise (new)
11. tropical broadleaf evergreen (veg. 6)	28. urban LCZ5: open midrise (new)
12. boreal needleleaf evergreen (veg. 5)	29: urban LCZ6: open low-rise (new)
13. temperate needleleaf evergreen (veg. 15)	30: urban LCZ7: lightweight low-rise (new)
14. boreal needleleaf deciduous (veg. 17)	31: urban LCZ8: large low-rise (new)
15. shrubs (veg. 19)	32: urban LCZ9: sparsely built (new)
16. boreal grassland (veg. 18)	33: urban LCZ10: heavy industry (new)
17. temperate grassland (veg. 10)	

2 . ECOCLIMAP-SG

→ This land cover map is associated to other global maps of primary parameters

Maps of primary parameters

Leaf area index (LAI) : 10-day period data of LAI from satellite PROBA-V (Copernicus), 300m-resolution, years 2014-2016.

Soil and vegetation albedos : 10-day period data of surface albedo from satellite SPOT/VGT (Copernicus), 1km-resolution, years 1998-2014.
Desagregation by a KALMAN filter (method from Carrer et al.,2014)

Height of trees : global map of tree height at 1km-resolution (Simard et al., 2011, NASA).

Uniform values

Soil depths (root and total soil depths) : uniform values by vegetation types inspired by the values displayed in classical ECOCLIMAP.

METEO FRANCE

2 . ECOCLIMAP-SG : first users

- SMHI
- Austria (Central Institute for Meteorology and Geodynamics ZAMG)
- Météo-France / VEGEO : irrigation in SURFEX
- Météo-France / GMAP :
  - tests in AROME in 2018
  - ongoing work : comparison of surface parameters (LAI, Albedo, Z0) between ECOCLIMAP / ECO-SG (small domain South-west of France) and impact on forecasts.
- MetService New-Zealand (Grégoire Pigeon)

METEO FRANCE

2 . ECOCLIMAP-SG : first problem/limitation

- In ECO-SG, 10 new urban types

- For the urban types, the presence of vegetation is imposed directly in the code

  Example : urban LCZ4: open high-rise

  - 40% GRAS (temperate grassland)
  - 20% NO (no vegetation)
  - 40% TEBD (temperate broadleaf deciduous)

- <u>Consequences:</u>

  - During the PGD step, if an urban type is present over a grid point: to calculate LAI and ALBEDO for this grid point, SURFEX needs to read LAI/ALBEDO values for GRAS/NO/TEBD vegetation types on another point of the domain.
  - But if one of this vegtation type id not present in the domain, impossible for SURFEX to calculate LAI and ALBEDO for the urban type.
  - Crash during PGD step

- <u>Temporary solution :</u>

Extension of the domain until having points with GRAS/NO/TEBD

METEO FRANCE