

Introduction

ECOCLIMAP Second Generation is the latest version of ECOCLIMAP, produced at **300m-resolution** and following a new philosophy.

First, the land cover map is directly composed of the vegetation and urban types used in ISBA and TEB: each grid point of the map represents a pure type, either inland water bodies, or sea and ocean, or one vegetation type or one urban type. In other words, the notion of "cover" or ecosystem of homogeneous land cover type containing several fractions of vegetation types is abandoned.

This novelty leads to simplify the interpretation of the map inside the SURFEX code.

Secondly, the vegetation primary parameters (LAI, ground depths, height of trees, visible and near infrared soil and vegetation albedos), that are defined and averaged by cover in classic ECOCLIMAP, are now given to the PGD step through the namelist `NAM_DATA_ISBA`. Consequently, they can be uniform values or input maps coming from satellite data, for example.

Some default maps or values of these parameters are provided with the current version of ECOCLIMAP-SG. However, each user can use his own maps of parameters according to his specific case, he can also add new maps for parameters that are not externalized by the namelist in the default version.

To reduce the amount of memory needed to store these maps, and also to speed up their reading in SURFEX PGD, they were manually compressed following a made in-house method.

Legend of the land cover map and technical documentation

The land cover types represented in ECOCLIMAP-SG land cover map are:

1. sea and oceans
2. lakes
3. rivers
4. bare land
5. bare rock
6. permanent snow
7. boreal broadleaf deciduous
8. temperate broadleaf deciduous
9. tropical broadleaf deciduous
10. temperate broadleaf evergreen
11. tropical broadleaf evergreen
12. boreal needleleaf evergreen
13. temperate needleleaf evergreen
14. boreal needleleaf deciduous
15. shrubs
16. boreal grassland
17. temperate grassland
18. tropical grassland
19. winter C3 crops
20. summer C3 crops
21. C4 crops
22. flooded trees
23. flooded grassland
24. LCZ1: compact high-rise
25. LCZ2: compact midrise
26. LCZ3: compact low-rise
27. LCZ4: open high-rise
28. LCZ5: open midrise
29. LCZ6: open low-rise
30. LCZ7: lightweight low-rise
31. LCZ8: large low-rise
32. LCZ9: sparsely built
33. LCZ10: heavy industry

The detailed documentation of the method to build the land cover map and the maps of primary parameters is available [lower](#).

This documentation is completed by this [second one](#) (19/06/18).

The scripts mentioned in previous documentation are all included in the package [liste.tar.gz](#) available [here](#).

To the second documentation corresponds the package of scripts [liste2.tar.gz](#).

A special directory is dedicated to the realization of the maps of parameters: [save_scripts_param.tar.gz](#).

In this directory, the file **make_all_fields_param.sh** allows to build the maps of parameters without the Kalman filter; the txt file **process_kalman.txt** explains how to reproduce the creation of the maps with the Kalman filter.

How to download ECOCLIMAP-SG

Given the amount of externalized data needed to run ECOCLIMAP-SG, they were dropped off on an external ftp site: **ftp.umr-cnrm.fr**

To get the data, you need to connect to this ftp site as:

user: ecoclimap

password: ecoclimap

Note that the current version, with complete dataset is ECOCLIMAP-SG V0

ECOCLIMAP-SG V1 versions provide only cover and height of trees maps.

There, you will find the ECOCLIMAP-SG/V0 directory, containing the following files:

- **COVER:** contains *COVER_ECOSG_2010_V0.*.tgz*, the ECOCLIMAP-SG land cover map input files for SURFEX
Warning: formerly named *ecosg_final_map.dir.gz* and *ecosg_final_map.hdr.gz*.
NB: When several versions are available, be careful to always use the latest one.

- **HT**: contains *HT_ECOSG_2010_V0.*_c.tgz*, the compressed map for the heights of trees
Warning: formerly named *new_ht_c.dir.gz* and *new_ht_c.hdr.gz*.
NB: When several versions are available, be careful to always use the latest one.

- **LAI**:

- The **LAI_SAT** dataset
=> contains 36 couples of compressed files .dir/.hdr, one couple for each 10-day period
=> comes from the **2014-2016** [CGLS](#) LAI data at 300m-resolution
=> is provided without missing data.
Warning: this dataset is centered on 2015. There is a time difference with the other data centered on 2010.
- The **LAI_KAL** dataset
=> contains 36 couples of compressed files .dir/.hdr, one couple for each 10-day period
=> comes from the **2008-2012** [CGLS](#) LAI data at 1km-resolution
=> is brought to 300m resolution following the method explained in Munier et al. (2018), that uses a Kalman filter to separate the contributions of each vegetation type present in the 1km-pixel
=> is provided without missing data.

S. Munier, D. Carrer, C. Planque, F. Camacho, C. Albergel, J. C. Calvet, 2018. Satellite Leaf Area Index: global scale analysis of the tendencies per vegetation type over the last 17 years. Remote Sensing, 10(3), 424. doi:10.3390/rs10030424.

- **ALBEDO**:

- The **ALB_SAT** dataset
=> contains 2*36 couples of compressed files .dir/.hdr, two couples for each 10-day period (white-sky albedo over visible and near-infrared wavelengths)
=> comes from the **2008-2012** [CGLS](#) albedo data at 1km-resolution, excluding the effect of snow
=> is provided without missing data.
- The **ALB_KAL** dataset
=> contains 2*2*36 couples of compressed files .dir/.hdr, four couples for each 10-day period (white-sky soil albedo and white-sky vegetation albedo, over visible and near-infrared wavelengths)
=> comes from the **2008-2012** [CGLS](#) albedo data at 1km resolution, excluding the effect of snow
=> is brought to 300m resolution following the method explained in Carrer et al. (2014), that uses a Kalman filter to separate the contributions of the soil and each vegetation type present in the 1km-pixel
=> is provided without missing data.

D. Carrer, C. Meurey, X. Ceamanos, J. L. Roujean, J. C. Calvet, S. Liu, 2014. Dynamic mapping of snow-free vegetation and bare soil albedos at global 1km scale from 10-year analysis of MODIS satellite products. Remote Sensing of Environment, 140, 420-432.

Note that if you run a PGD with ECOCLIMAP-SG, you need to choose the LAI and albedo datasets to use. To be consistent, you can combine LAI_KAL and ALB_KAL or LAI_SAT and ALB_SAT (giving the same files for soil and vegetation albedos).

- **DEPTH**:

Currently, we use uniform values for the root depth and the ground depth, because we don't have maps for these parameters. For your information:

- [Default depth values in Surfex versions prior to V9.1](#)
- [Default depth values in Surfex versions V9.1 and later](#)

NB: All provided files need to be unzipped ("gunzip [file].gz" or "tar xzvf [file].tgz") to be used as input in SURFEX.

How to install and to use ECOCLIMAP-SG in SURFEX V81 or higher

If you want to run a PGD with ECOCLIMAP-SG in SURFEX V81 or higher, you will first need to activate, in addition to the LECOCLIMAP key, a new namelist key :

```
&NAM_FRAC
LECOCLIMAP = T,
LECOSG = T
/
```

Then, you need to link all the input files you want to use in the run directory.

After that, you will need to refer to the correct name in:

```
&NAM_COVER
YCOVER = 'COVER_ECOSG_2010_V0.0'
YCOVERFILETYPE = 'DIRECT'
/
```

And finally, you will need to update your namelist NAM_DATA_ISBA with the names of the files you use for the primary parameters.

Here two examples:

- namelist with the [LAI_KAL](#) and [ALB_KAL](#) datasets
- namelist with the [LAI_SAT](#) and [ALB_SAT](#) datasets

You can notice that the type for the compressed maps of parameters is not "DIRECT" but "DIRTYP".

How to visualize a compressed input map

If you want to visualize one of the compressed input data file, you can use the [uncompress](#) tool.
A README file (included in the archive) explains how to use the tool.

How to contact us

You can send an e-mail to the following addresses:

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