Review of Discussion Paper www.geosci-model-dev-discuss.net/5/3573/2012

„ECOCLIMAP-II/Europe: a twofold database of ecosystems and surface parameters at 1-km resolution based on satellite information for user in land surface, meteorological and climate models

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Specific Comments

1. I have the impression that sometimes terms like “surface types” and “land cover classes/categories” mean different things, sometimes they are used synonymously. For example, in the abstract (line 17 and 18) and in Chapter 2 (page 3578, line 24) the authors talk about “4 main surface type or tiles (sea, inland water bodies, urban areas, natural land areas). On the other hand, they define 14 categories of surface types (Section 3.1, page 3581, line2 and 3) when combining GLC2000 and CLC2000 maps. There are other examples where terms like “classes” or “categories” or more general “land cover” are used, and it is not always clear to me whether they denote the same or different things.

We share the concern of the referee that there was existing some confusion here. The term ‘surface types’ is appropriate for the big 4 land units (sea, inland water bodies, urban areas, natural land areas). Further, the 12 generic types within natural land areas can be named ‘patch’ or ‘tile’. The rest is clearly the land cover types. The text has been arranged, which is now supported by the new Figure 1.

2. Page 3582, line 26: I don’t understand the first part of the sentence “This revealed conspicuous agreement between the two climate maps …”. What I can see in fig. 2 is the “boundary” between the two datasets. In Fig.2, page 3611, I miss a legend.

The boundaries between the two climate maps in Figure 2 are only visible because the authors enhanced the contrast. Otherwise, it could not even be seen the differences, which outlines the good continuity and thus agreement between both climate maps as it is suitable. A legend for climate zoning will not be inserted in Figure 3 (ex Figure 2) because it is not mandatory to understand the combination of the two maps. Thanks for posting this comment however.

.3. I have the most difficulties with the description how the ECOCLIMAP-II dataset is really created. For me it is not clear

.a. Which data sets are “disentangled” by the K-means method?

NDVI time profiles – each is associated to a land cover – are classified as shown in Figure 3 (before Figure 2) and as already explained explain in the body of the text when introducing this figure.

.b. What is classified by the clustering algorithm (the objects to be clustered) and according to which attributes the objects are clustered?
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Again NDVI products form the results of classification. Since they reveal the behaviour of a specific land cover class, then a land cover map can be derived. The attributes are the time profile and amplitude of NDVI. The text already described this.

.c. What do the resulting clusters represent? Land cover? Vegetation types? Does a cluster represent a specific geographical region? Or is it possible that a cluster contains information from different regions?

The resulting clusters represent land covers. A cluster may be specific to a given region because of the use of a climate stratification. For this reason, a given cluster cannot belong to different regions. We verifief that the text was already making clear that point.

.d. Reducing the numbers of clusters: which “mean 10-day NDVI profiles” (page 3585, line 23)? Where do they come from? From the clustering? Without some basic understanding of the clustering process and its outcome the rest of chapter 4 is also hardly to understand.

After a first level of classification (or clustering), a refinement is searched. The different steps are resumed in Figure 4 (before Figure 3). We believe that understanding Figure 4 makes Chapter 4 more easily readable.

.e. Also the role of the C14 map is not clear to me? Does it serve as a kind of “true reference” which, on the one hand, is used to verify basically whether the results of the clustering make sense, on the other hand, should be refined by the new dataset?

Yes, this is true and correct.

.f. Page 3587, line 4: “Climate maps were finally used **to avoid the segregation** of pixels belonging to different climate units …..”. I don’t understand this. I understand the usage of the climate map in such a way that one wants, for instance, to prove whether a pixel representing the continental climate over Russia has not been assigned to a land cover class belonging to marine climate along the Atlantic coast.

This is correct. However, the text was modified for the sake of more clearness.

4. Section 4.4 “Defining the surface parameters” is also hard to understand. What do the authors mean with “a thorough interpretation of the (combined 14?) CLC2000/GLC2000 classes appearing in a given cover” (page 3587, line 18)? What is the difference between these CLC2000/GLC2000 classes and the covers?

This means here that the labelling of the classes must agree with both given name in CLC2000/GLC2000. The text has been arranged for the sake of clear understanding.

Do I understand this section correctly that only temporal LAI profiles are determined by the procedure? The values for other surface parameters (root depth, total soil depth, tree heights) are taken from ECOCLIMAP-I due to lack of better and more reliable data sources. What is the "total soil depth"? What's about other parameters like roughness length, emissivity, albedo?

This is a correct statement. Only LAI parameter is updated here while most other parameters are identical to ECOCLIMAP-I as mentioned in the text. In fact, roughness length may depend on LAI (for forested areas for instance) and will consequently be also updated. Further, LAI serves to partition the contributions from soil and vegetation. Therefore, total emissivity and albedo will also be updated. The text was arranged somewhat. Thanks for asking. Besides, total soil depth means inclusion of superficial and deep reservoirs.

5. Page 3587, line 23: there is no assessment of functional type fractions in Sect. 3.2.1,since Sect. 3.2.1 does not exist.

This is correct. This reference was removed.

6. Section 5.1: To my opinion this section is simply a description of the resulting ECOCLIMAP-II map, not a validation. Please, create a new chapter.

We do agree.

7. Section 5.1.1 Forests, page 3589, line 19: "Clearly, permanently **cool** temperatures coupled with sunny days…..". Is "cool" really correct? If yes, why?

This is certainly an acceptable statement. The word 'cool' was replaced by 'mild'

8. Section 5.1.2, page 3590, lines 16 to 18, description of Fig. 5l: I don't see a shift of the peak towards winter. The peaks are very similar to Fig. 5k, except that the minimum values in Fig 5l are at a slightly higher level. In Fig. 5 (page 3614) the beginning of a year is hardly to identify. Perhaps, the length of the corresponding tick can be increased a little bit.

If we look at the first year of the profile, we can notice that the growing of LAI begins earlier in 5l than in 5k.

9. Section 5.2.1, Comparison with AGRESTE:
 AGRESTE data are used to calculate "observational" PFTs that correspond to the PFTs of ECOCLIMAP-II, right?

Yes, this is correct.

- The AGRESTE data are given in hectares (Section 3.5, page 3583, line 9). Which data set is interpolated, ECOCLIMAP-II to AGRESTE or vice versa?

.ECOCLIMAP-II was brought to AGRESTE representation. Thanks for the comment. Text wasrevised accordingly.

- What are the “representative fractions of the covers” (page 3593, line 11)? Does “cover” mean “PFT”? The weighting using the representative fractions: which PFT fractions are weighted with which representative fraction?

We must admit that the text needed some improvements here, which was finally done. Thanks for posting such comment.

10. Section 5.2.3, page 3596 line 5 and 6: why do urban areas belong to the PFT? In section 2, page 3578, line 27, the PFTs are defined without urban areas. This is again an example of the steady mixture of definitions. Please, avoid this! It confuses the reader.

We do agree. We did change the text to remove any confusion. Thanks.

11. Section 5.2.3, page 3596,line 7: what are the “12 most representative ECOCLIMAP-II and FORMOSAT land covers”? How are they determined?

They are the most represented ECOCLIMAP-II covers in the FORMOSAT area. The text was modified accordingly.

12. Fig. 9, page 3618: Please, explain the abbreviation “ecov2” and “fms” (figure legends) in the figure captions. Other curves in yellow and light blue (C4 crops, grassland, urban areas) are neither explained in the figure caption nor discussed in the text.

“ecov2” refers to ECOCLIMAP-II and ‘fms’ refers to FORMOSAT. The text was corrected. The other curves are also now commented. Thanks for the addressing the point.

13. Section 5.3, Comparison with ECOCLIMAP-I: This section is by no doubt necessary. But the simple description of the differences does not really help the potential user to judge whether the new dataset is more realistic than the old ECOCLIMAP-I dataset. The authors should spent some more lines in order to argue why one should now use the ECOCLIMAP-II data.

This is certainly a good question. Actually, due to enhanced spatial resolution and working with longer and more recent time series, there is no doubt to advise the use of ECOCLIMAP-II. We put emphasize in that direction in the new version in following the suggestion raised by the reviewer.

14. Page 3600, line 13: Please insert “(Fig. 11g)” after “The fractions of C3 crops”

Was done.

15. Caption of Fig 11, page 3620: please reorder the enumeration of vegetation types according to the alphabet.

Was also done.

Technical corrections

1. 1. Page 3575, line 27: insert a blank between “and” and “red”
2. 2. Page 3578, line 3: delete the dot after “resolution”
3. 3. Page 3587, line 23: once more, Sect. 3.2.1 does not exist
4. 4. Page 3599, line 27: should be “(Fig. 11e)”, not “(Fig. 11b)”

All these technical corrections have been taken into account. Thanks.