

Manuscript: Improving arable land heterogeneity information in available land cover products for land surface modelling using MERIS NDVI data

Major remarks

The authors have developed a new central European land cover map by the merging of several datasets. A very important feature is the discrimination of different crop types. Here, new approach has been included where bimonthly NDVI data are used to separate crop areas into spring and summer crops. Then, the sensitivity of the PROMET model in simulating latent flux was tested against the usage of three different land cover maps. In three cases, all arable land areas were classified 1) as maize (summer crop), 2) as winter wheat (spring crop), and 3) using the new land cover approach described in the paper.

The paper is concisely written. Only the abstract and especially the conclusions section need some improvement. In the conclusion section, I miss a summary of the important results of the present study. Except for one sentence indicating that a new land cover map has been developed, only more general statements are given that could also be written without any work conducted in the present study. In the abstract, it is described what has been done in the present study, but no indication of the impact and the quality of results is given either.

In summary, I recommend acceptance of the paper for publication after some revisions have been conducted.

Minor remarks

In the following suggestions for editorial corrections are marked in *Italic*.

Abstract – par. 1 - p. 4146 – line 14-15

It is written:

"The hydrological impact ... was modelledcatchment."

Here, information is missing, what kind of tool (and may be also which) was used to model this impact.

Sect. 1.2 – par. 1 - p. 4148 – line 13

Here, Fig. 3 is referred and discussed before Figs. 1 and 2 are mentioned. Thus, I suggest renaming Fig.3 into Fig. 1 and change the order of figures accordingly.

Sect. 1.2 – par. 1 - p. 4148 – line 25-28

Sentence "Studies2004) is difficult to read. Please rewrite!"

Sect. 1.2 – par. 1 - p. 4148 – line 28

It is written:

"However, this approach ..."

What do you mean with this approach? The approach of the present study or the work of Lobell and Asner (2004)?

Sect. 2.3 – par. 2 - p. 4150 – line 13-17

It is written that several CLC2000 classes were not reclassified, even though they currently do not exist in PROMET. But what about "Arable land" and "Pastures"? They also do not exist in PROMET, but are obviously classified (see Table 2 and 3) and also are central to the manuscript. It seems that some information is missing in this part of the manuscript. Two pages later, the separation of arable land is discussed, but the question on "Arable land" and "Pastures" arises here.

Sect. 3.1 – par. 3 - p. 4155 – line 25

Due to a lack ...

Sect. 4. – par. 1 - p. 4157 – line 25-26

Thus, *for the application in climate models*, both the spatial and temporal *distributions* of vegetation are required with ...

Figure 4

I suggest plotting the change of NDVI of bimonth 4 minus bimonth 3. Then, positive numbers would mean growth/increase of NDVI from spring to summer. This is more easy to look at and understand than if positive numbers mean decrease as it is the case for the current Fig. 4..

Figure 7

The legend is too small. Please increase character size!