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Earth System Science Data Discussions

Interactive comment on "Generating a global gridded tillage dataset" *by* Vera Porwollik et al.

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Thank you very much for providing helpful feedback. Please find below a point by point response to your comments.

Referee #2: The paper would be improved if the "bigger picture" was considered. In the discussion the authors discuss the impact of the work and the use the dataset could be put to but it would be an improvement to see this in the abstract and introduction. If you want the readers to use the data then you need to promote its uses as early as possible.

Authors' response: Thank you for this suggestion. We will modify the abstract and introduction section, already there emphasizing the possible applications and significance of the tillage data set for impact assessment of agricultural practices on carbon, water, and nutrient cycling.

Referee #2: Section 5 "Data Availability" needs expanding. Although you provide links to the data repository it would be an improvement to give some details of the structure of the data files. You seem to be using netCDF but it is worthwhile telling the reader the "flavour" of the format: are you using netCDF3, netCDF4 netCDF4 - classic for example. The other point is are these file CF compliant and if so which standard you are working to It is always useful to the potential user to know what meta data (global attributes) are in the files and if the file naming structure has any useful information embedded in it. It's also useful to provide the reader with an indication of what variables are in the filesetc. The final point is about the user licence and if the data set has a DOI.

Authors' response: We have now extended the data availability section with additional technical details. The user may also refer to more details described on the website and accompanying meta-data of the repository where the code and data set are available for download.

We exchange the text in section 5 with the following: The presented tillage system area dataset and source code are available under the ODBL (data) and MIT (source code) licenses. The tillage area dataset can be downloaded from: http://doi.org/10.5880/PIK.2018.012 and the corresponding R-code from: http://doi.org/10.5880/PIK.2018.013. The dataset is provided in netCDF format (version 4) and consists of 42 layers each reporting crop-specific tillage types per grid cell. Additionally, we provide a layer with indicating area to where CA may be likely (scenario CA area). The dataset can also be applied as a mask or overlay for identifying tillage area. The R-code is provided to enable other modelling groups to adjust our tillage area mapping algorithm to their needs, e.g. for different input data or scenarios. Supplementary information (SI) is available in the online version of this article.

Referee #2: Technical corrections Table 1: increase column width to allow "Conservation" to appear on one line

Authors' response: Agree.

Referee #2: Table 5: Increase column width to make "Logit-ref\and k-50%" to appear as "Logit-ref and\k-50%" - make the column title structure consistent between columns

Authors' response: Agree.

Referee #2: Tables general: consider using central justification as it will improve the appearance.

Authors' response: Agree.

Referee #2: Line 221: Sentence "We developed several rules have been in order.." does not make sense.

Authors' response: Agree and we changed the sentence to: We developed several rules in order to allocate the derived tillage systems to the grid scale.

Referee #2: Line 225: Replace "to" with "of"

Authors' response: Maybe there is a misunderstanding but we improved the sentence by deleting the ending "s" in "units" resulting in the following formulation: ". . .to distribute data of a larger spatial unit to the grid cell level. . ."

Referee #2: Line 262: Change "most efficient and homogeous" to "more efficiently and homogeneously"

Authors' response: Agree and improved to: . . . because efficient and equal distribution of water requires some leveling off of the field to flatten the surface in order to distribute irrigation water more efficiently and homogeneously over the field.

Referee #2: Line 297: Change "few" to "low"

Authors' response: Agree.

Referee #2: Line 454: Change "It is" to "It has"

Authors' response: Agree.

Referee #2: Line 455: Change to "South of the Sahal region"

Authors' response: We exchanged the former formulation to the following sentence: It occurs in Mexico, South of the Sahel region but mostly is found on cropland in India (Table S8 for further metrics across tillage system areas; Table S9).

Referee #2: Figure 1: The diagram is ok as it stands but would be much improved is standard flowchart practices were followed and the "yes\no" decisions were added to the relevant lines.

Authors' response: We adjusted slightly the settings of the flow chart but refrained from adjusting for exact flow chart standard as diamond shape for process (decisions) would require more space than our chosen rectangle shape but we add the "yes\no" decisions to the relevant lines and updated figure 1 in the manuscript.

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