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Interactive comment on "A global satellite assisted precipitation climatology" *by* C. Funk et al.

Anonymous Referee #2

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The authors introduce a very high-resolution (0.05 degrees) global monthly precipitation climatology built on three components, namely the integration of a blended set of five satellite based background climate surfaces, the climate normals from in-situ observations by combination of monthly normals published by the FAO augmented by those of GHCN and the thirdly the background information that can be taken from topographic and physiographic surfaces that are in particular helpful for a high-resolution climatology to downscale the information from station locations being very often too distant to each other to still provide for at least one station per grid cell in a 0.05 degrees resolving grid.

The basic idea to combine the three aforementioned information pools to an optimum climatology is solved by defining 56 distinct (!) modelling regions, each one character-

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ized by its individual levels of station density, homogeneity of predictor responses, and availability of predictor fields.

While the idea and methods to build the new climatology through this tiled approach is striking and convincing for regional assessments, the result post compositing has the inherent weakness that it cannot be a truly global climatology with a homogeneous methodology applied everywhere. So the data set is fit for regional assessments and purposes but has some clear limitations for global assessments, which the reader should be informed/warned of!

So I strongly support the first recommendation of referee#1, namely to ultimately show a global map of the final product, so the reader can convince her/himself of the global homogeneity of the product yielded. Also the three other recommendations of referee#1 mentioning the lack of demonstration of actually enhanced reliability in problematic regions with regard * to data scarcity, * mountainous areas, * areas of high natural variability of the precipitation parameter or the joint of all of them which is true in particular in Central and Eastern Africa or at the western edges of the Amazonas tropical forest along the eastern slopes of the Andes mountains.

Another Issue is the ease of access: I have tried myself to download the CHPclim v.1.0 data set from the pointer provided in the manuscript (BTW, the DOI reference to just an ftp-download-folder-tree without ANY meta information is not coping with the usual standard and should not be acceptable to ESSD!) but failed to find any easy available software tool to successfully read the TIFF file that seems to have been encoded in a very special TIFF dialect leading to my first additional recommendation to provide the user with ALL documentation and information necessary to actually access the data. With some forensic capability it is actual possible to assemble some of the essential information from http://chg.geog.ucsb.edu but that is far from the shape the material should be presented and documented to become eligible for ESSD publication!

I also encountered that among the state-of-the-science climatologies the authors men-

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tion those published by CRU and WorldClim (http://www.worldclim.org/methods) but are also ambiguous there. For CRU they cite New et al (1999), so it is unclear wether they actually refer to the outdated version CRU CL v.1.0 as there is also a more recent version offered under http://www.cru.uea.ac.uk/cru/data/hrg/.

I also miss mentioning and validation of the climatology against the in-situ data set built on the world-wide larges data archive, namely the one of the GPCC that has published quite a number of DOI referenced in-situ data set with ESSD (Becker et al, 2013; http://www.earth-syst-sci-data.net/5/71/2013/essd-5-71-2013.html). The most recent climatology at the much more reasonable 0.25 degrees resolution can be obtained from this DOI: http://dx.doi.org/10.5676/DWD_GPCC/CLIM_M_V2015_025 (and easily plotted, e.g. with NCAR's Panoply as it is encoded in OGC compliant CF formatted netCDF). When introducing and presenting a global precipitation climatology it is also good fashion to present and discuss some basic house-numbers with regard to the precipitation component of the global water budget and how they fit to existing numbers a published by Trenberth KE, Smith L, Qian T, Dai A, Fasullo J (2007) Estimates of the global water budget and its annual cycle using observational and model data. J Hydrometeor 8:758–769). I would strongly recommend this to provide for better confidence in the quantitative fidelity of the resulting data product.

So after all I fully join referees #1 rating that the product and method presented here has the potential to enhance regional (!) climate analysis in data sparse regions and definitely merits publication. However as material and methods go already now into the CHIRP and CHIRPS monitoring systems, and are already now employed also for decision making in the crucial sector Food Security and Agriculture in particular across Africa the paper in fact needs a major revision to tackle the deficiencies stipulated above, given the high level of responsibility that is taken with the publication of such kind of basic information in the field of precipitation climatology and ultimately potable water availability!

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