Earth Syst. Sci. Data Discuss., 8, C541–C545, 2016
www.earth-syst-sci-data-discuss.net/8/C541/2016/

Open Access Earth System Science Data Discussions

ESSDD
8, C541–C545, 2016

Interactive Comment

Interactive comment on "CPLFD-GDPT5: high-resolution gridded daily precipitation and temperature dataset for two largest Polish river basins" *by* T. Berezwoski et al.

T. Berezwoski et al.

t.berezowski@levis.sggw.pl

Received and published: 3 March 2016

Reply to the review of "CPLFD-GDPT5: high-resolution gridded daily precipitation and temperature dataset for two largest Polish river basins" by T. Berezowski et al.

Anonymous Referee #1

We are grateful for appreciating our work on this paper as this was our main goal to make the study clear and understandable.

The general comment:

The CPLFD-GDPT5 can be a nice addition to the HYRAS data sets, extending the

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

spatial extent of daily observations.

Response:

Indeed the CPLFD-GDPT5 and HYRAS data sets could be used together to extend the spatial domain of both products. We have included the reference to the HYRAS dataset in the in the introduction section:

So far no high-resolution gridded dataset exists neither for Vistula nor Odra basin nor for Polish territory, except a partial cover by the CARPATCLIM (Spinoni et al., 2015) and HYRAS (Frick et al., 2014) projects.

Specific comments:

#1. Is this dataset going to be updated on a regular base?

Response:

We are planning to update the data-set by including recent meteorological data as well as improving the interpolation algorithms. We included a statement about this in the last paragraph of the section 7:

The CPLFD-GDPT5 product was constructed for the period 1951 – 2013. The new meteorological data and novel approaches to interpolation algorithms are continuously appearing. Hence, we are planning to update the product both by extending the time span and by testing new interpolation algorithms. The extension is planned on a three-year basis.

#2. From my point of view the missing piece for this paper is a similar figure like Figure 15, but with the SWAT model calibrated with EOBS data. Such a figure will show the added value of having a new data set with a very high resolution, in this case CPLFDGDPT5.

Response:

ESSDD

8, C541–C545, 2016

Such a comparison would indeed be very interesting. However, it would require few working months to set up the model, perform the calibration (the most time-consuming part due to the large scale and high-resolution setup of the Vistula and Odra basin SWAT application), and analyse the results. Unfortunately, we are not able to conduct such an analysis in the timeframe provided for the review of this paper and we think it would deserve a separate paper. For further explanation see the last comment in this document.

#3. Are the results very different when using Penman-Monteith method to compute the evapotranspiration, instead of Hargreaves?

Response:

Our selection of the Hargreaves method in this paper is not due to this method being better or worse than the Penman-Monteith method, but due to lower meteorological data demand for Hargreaves. The Penman-Monteith method requires also wind speed, air humidity and solar radiation, whereas Hargreaves relies only on minimum and maximum temperature, both of which were included in CPLFD-GDPT5. The solar radiation data are unfortunately not freely distributed by the Polish meteorological service, so we were not able to acquire them for this project. In order to give some more insight to the comparison of Penman-Monteith and Hargreaves method we update the section 5 as follows:

[...] In the Hargreaves method PET is proportional to mean temperature (approximated by the arithmetic mean of minimum and maximum temperature) and the difference between maximum and minimum temperature (being a proxy of solar radiation). As illustrated in many studies, the Hargreaves PET is highly correlated to other methods for PET estimations (Lu et al., 2005) and to PET observations (Hargreaves & Allen, 2003). Moreover, it was found particularly useful for SWAT modelling by decreasing the observed PET estimation error when compared to the Penman-Monteith PET estimation (Earls & Dixon, 2008). [...]

ESSDD

8, C541–C545, 2016

Common response to the comments #2 and #3

In our opinion the scope the data journal is to clearly present the datasets with a transparent explanation of the methods used and a fair verification. This was our goal in this manuscript. The reason we included in the manuscript the comparison with the climatic maps and the hydrological modelling results was to show (except the data applicability) that a potential user would be more confident about the quality of the data. Any further benchmarking i.e. comparisons with other datasets or scenarios with different models, would not be, in our opinion, in line with ESSD journal scope ("Any comparison to other methods is beyond the scope of regular articles"[1]) and would be better suitable for a follow-up paper in a different type of journal. Several papers are now being prepared or submitted in the framework of the CHASE-PL project and the majority of them will stem from this paper. Certainly, some of these papers will cover the comparisons mentioned by Reviewer #1. Accordingly, we included the reviewer comments in the outlook paragraph (Section 7):

The herein presented data-set and methods have several aspects of further research. It would be interesting to compare the data-set with other data-sets of lower resolution (e.g. EOBS) in order to show its true added value for high resolution hydrological modelling. Moreover, the comparison of the Hargreaves PET, estimated with the CPLFD-GDPT5 temperatures, could be further investigated in scope of other PET estimation methods (e.g. Penman-Monteith) and observations. Last, we believe that there is still space to improve the interpolation methods by testing other interpolation algorithms.

The CPLFD-GDPT5 product was constructed for the period 1951 - 2013. The new meteorological data and novel approaches to interpolation algorithms are continuously appearing. Hence, we are planning to update the product both by extending the time span and by testing new interpolation algorithms. The extension is planned on a three-year basis.

[1] http://www.earth-system-science-data.net/about/manuscript_types.html

ESSDD
8, C541–C545, 2016

The manuscript with the changes indicated is available as a supplement.

References:

Earls, J. & Dixon, B. 2008 A comparison of SWAT model-predicted potential evapotranspiration using real and modeled meteorological data. Vadose Zone Journal, Soil Science Society, 7, 570-580

Frick, C.; Steiner, H.; Mazurkiewicz, A.; Riediger, U.; Rauthe, M.; Reich, T. & Gratzki, A. 2014 Central European high-resolution gridded daily data sets (HYRAS): Mean temperature and relative humidity. Meteorologische Zeitschrift, Schweizerbart Science Publishers, 23, 15-32

Hargreaves, G. & Allen, R. 2003 History and Evaluation of Hargreaves Evapotranspiration Equation. Journal of Irrigation and Drainage Engineering, 129, 53-63

Lu, J.; Sun, G.; McNulty, S. G. & Amatya, D. M. 2005 A comparison of six potential evapotranspiration methods for regional use in the southeastern United States1. Journal Of The American Water Resources Association, Wiley Online Library, 41, 621-633

Spinoni, J.; Szalai, S.; Szentimrey, T.; Lakatos, M.; Bihari, Z.; Nagy, A.; Nemeth, A.; Kovacs, T.; Mihic, D.; Dacic, M.; Petrovic, P.; Krzic, A.; Hiebl, J.; Auer, I.; Milkovic, J.; Stepanek, P.; Zahradnicek, P.; Kilar, P.; Limanowka, D.; Pyrc, R.; Cheval, S.; Birsan, M.-V.; Dumitrescu, A.; Deak, G.; Matei, M.; Antolovic, I.; Nejedlik, P.; Stastny, P.; Kajaba, P.; Bochnicek, O.; Galo, D.; Mikulova, K.; Nabyvanets, Y.; Skrynyk, O.; Krakovska, S.; Gnatiuk, N.; Tolasz, R.; Antofie, T. & Vogt, J. 2015 Climate of the Carpathian Region in the period 1961-2010: climatologies and trends of 10 variables. Int. J. Climatol., John Wiley & Sons, Ltd, 35, 1322-1341

ESSDD

8, C541–C545, 2016