

README file for the “CHASE-PL – Natural Hydrology dataset (CPL-NH)”

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Piniewski M., Szcześniak M., Kardel I., Berezowski T., Okruszko T., Srinivasan R., Vikhamar Schuler D., Kundzewicz Z.W.: Natural streamflow simulation for two largest river basins in Poland at high spatial and temporal resolution. *Water Resources Research*, VOL. , XXXX, DOI:10.1002/

Latest news:

30.10.2015 CPL-NH v.1.0 uploaded to 3TU.Datacentrum; the accompanying manuscript submitted to Water Resources Research.

Content: daily natural streamflow and monthly water balance components simulated with SWAT model for the entire Vistula and Odra basins (VOB), for the time period 1954-2013.

Publisher: Warsaw University of Life Sciences (WULS-SGGW), Poland.

Data usage:

These data are provided for *bona fide* research purposes only. No warranty is given as to their suitability for user applications. No liability is accepted by the authors for any errors or omissions in the data or associated information and/or documentation.

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Piniewski, M., M. Szcześniak, I. Kardel, and T. Berezowski (2015), CHASE-PL Natural Hydrology dataset (CPL-NH), Dataset on 3TU.Datacentrum, doi: 10.4121/uuid:b8ab4f5f-f692-4c93-a910-2947aea28f42.

The underlying data, methods and simulation results related to this dataset belong to the manuscript submitted to Water Resources Research:

Piniewski M., M. Szcześniak, I. Kardel, T. Berezowski, T. Okruszko, R. Srinivasa, D. Vikhamar Schuler and Z.W. Kundzewicz (submitted). Natural stream flow simulation for two largest river basins in Poland at high spatial and temporal resolution. *Water Resources Research*.

Access:

URL <<https://data.3tu.nl>>

File nomenclature and units:

CHASE-PL – Natural Hydrology dataset (CPL-NH) dataset is available in two versions: NetCDF files and CSV files. Additional shapefiles containing river outlets, reaches and sub-basins are also available. Below one can find description of these files:

a) NetCDF files:

- “CPL-NH_streamflow.nc” contains simulated natural streamflow (m^3/s) for 2633 reaches in the VOB. The file has two dimensions: reach number and time, which is given as number of days since the 1954-01-01;
- “CPL-NH_subbasin.nc” contains water balance components for 2633 sub-basins in the VOB. The file has two dimensions: sub-basin number and time, which is given as number of days since the 1954-01-01. The variables included in this file are listed below. Variable descriptions are taken directly from the SWAT model documentation.

Variable name in NetCDF file	Variable name in CSV file	Description	Units
area	AREAKm2	Area of the subbasin.	km ²
precipitation	PRECIPmm	Total amount of precipitation falling on the subbasin during time step (mm H ₂ O).	mm
snow_melt	SNOWMELTmm	Amount of snow or ice melting during time step (water-equivalent mm H ₂ O).	mm
pet	PETmm	Potential evapotranspiration from the subbasin during the time step (mm H ₂ O)	mm
et	ETmm	Actual evapotranspiration from the subbasin during the time step (mm).	mm
soil_water	SWmm	Soil water content (mm). Amount of water in the soil profile at the end of the time period.	mm
perc	PERCmm	Water that percolates past the root zone during the time step (mm). There is potentially a lag between the time the water leaves the bottom of the root zone and reaches the shallow aquifer. Over a long period of time, this variable should equal groundwater percolation.	mm
surface_q	SURQmm	Surface runoff contribution to streamflow during time step (mm H ₂ O).	mm
groundwater_q	GW_Qmm	Groundwater contribution to streamflow (mm). Water from the shallow aquifer that returns to the reach during the time step.	mm
water_yield	WYLDmm	Water yield (mm H ₂ O). The net amount of water that leaves the subbasin and contributes to streamflow in the reach during the time step. (WYLD = SURQ + LATQ + GWQ - TLOSS - pond abstractions).	mm

b) CSV files:

- “CPL-NH_streamflow.csv” contains simulated natural streamflow (m^3/s) for 2633 reaches in the VOB. The first column contains date in the following format MM/DD/YYYY , next 2633 columns contain streamflow values simulated in every reach;
- “CPL-NH_subbasin.csv” contains water balance components for 2633 sub-basins in the VOB. The first column “SUB” contains sub-basin numbers, column “YEAR” and “MON” contain year and month, respectively, and columns “AREAKm2”, “PRECIPmm”, “SNOWMELTmm”, “PETmm”, “ETmm”, “SWmm”, “PERCmm”, “SURQmm”, “GW_Qmm”, “WYLDmm” contain values of the variables listed in the table above. The last column “YYYYMM” refers to the year and month of simulation.

Please note that the structure of this file is similar to the SWAT model output.sub file, so the first 2633 rows contain simulated values for the 2633 sub-basins in the first month of simulation, next 2633 rows contain values for the next month, etc.

c) Additional shapefiles:

- “CPL-NH_outlets.shp” contains 2633 outlets from the SWAT model of the VOB. These outlets can be joined by the “GRID_CODE” field with the values of simulated streamflow in the reaches from the “CPL-NH_streamflow.nc” or “CPL-NH_streamflow.csv” file;
- “CPL-NH_reach.shp” contains 2633 reaches from the SWAT model of the VOB. These reaches can be joined by the “GRID_CODE” field with the values of simulated streamflow in the reaches from the “CPL-NH_streamflow.nc” or “CPL-NH_streamflow.csv” file;
- “CPL-NH_subbasin.shp” contains 2633 sub-basins from the SWAT model of the VOB. These sub-basins can be joined by the “Subbasin” field with the values of the water balance components at sub-basins level from the “CPL-NH_subbasin.nc” or “CPL-NH_subbasin.csv” files.

File updates: none

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