Climate Data 30-13 ka GIS Dataset

D. Becker, J. Verheul, M. Zickel, Y. Yener, C. Willmes

Abstract

This geospatial dataset contains climate data from 30 ka to 13 ka in 1000 year steps as raster data. The variables are PET (Potential Evapotranspiration) and WAB (Water balance) in mm/year and MCM (Mean temperature of the coldest month) in C°. The source data from Tallavaara et al. (2015) was imported from the original published Excel table to a shapefile with QGIS' "Create a Layer from a Delimited Text File" tool. The vector point data has been converted to GeoTIFF with GDAL's gdal_rasterize tool. The dataset has a resolution of 216x141 cells, with a cell size of 0.375° width and 0.25° height.

1 Context

The work for collecting the data and creating this GIS dataset was conducted within the Z2 Data Management and Data Services sub project of the Collaborative Research Centre 806 (www.sfb806.de).
The dataset is assigned with a DOI, and can be cited as follows in scholarly works:

> D. Becker, J. Verheul, M. Zickel, Y. Yener, C. Willmes (2016): Climate Data 30-13 ka GIS Dataset. CRC806-Database, doi: 10.5880/SFB806.21.

2 Metadata

The basic descriptive metadata of the dataset is given in this section.

2.1 Basic Metadata

Title	Climate Data 30-13ka GIS Dataset
Author(s)	D. Becker, J. Verheul, M. Zickel, Y. Yener, C. Willmes
Year	2016
License	CC-BY
Topic	Environment, Paleoclimate
Keywords	LGM, Paleoclimate, Paleoenvironment
Publisher	CRC806-Database, Tallavaara et al. (2015)
DOI	10.5880/SFB806.21

2.2 Spatial Metadata

Type	BoundingBox
Place	European part of the CRC 806 area
BoundingBox (SW, NE)	-11.25 35.625, 69.75 70.875
Region	Europe

The data is located in the CRC 806 area. The working area involves Europe. The area is delimited by a bounding box in longitude/latitude notation for the southwestern and northeastern corners.

2.3 Temporal Metadata

Type	Interval
Name	Late Pleistocene, Weichselian
Interval	30000, 13000

For temporal indexing the dates are given in years before present (yBP). The listed interval (30 ka to 13 ka) is sourced from Tallavaara et al. (2015).

3 Data sources

The **PET** variable shows the Potential Evapotranspiration which was calculated as follows: $PET = 58.93 * T_{above0°C}$. The **MCM** variable shows the mean temperature of the coldest month in °Celsius. The **WAB** variable shows the water balance, WAB is calculated as the difference between precipitation and potential evapotranspiration. The original data by Tallavaara et al. (2015) was supplied in a .xls file containing longitude/latitude coordinates with the related variable values. The source data was imported from the original Excel table to a shapefile with QGIS' "Create a Layer from a Delimited Text File" tool. The vector point data was converted to GeoTIFF with GDAL's *gdal_rasterize* tool as seen below. The dataset has a resolution of 216x141 cells, with a cell size of 0.375° width and 0.25° height.

```
gdal_rasterize -a pet_13 -of GTiff -tr 0.375 0.25
-a_nodata nodata -co COMPRESS=DEFLATE pet_13.shp pet_13.tif
```

Dataset	Source	Notes
Climate Data	Tallavaara et al. (2015)	Climate Data (PET, MCM, WAB)

4 Maps and Visualisations

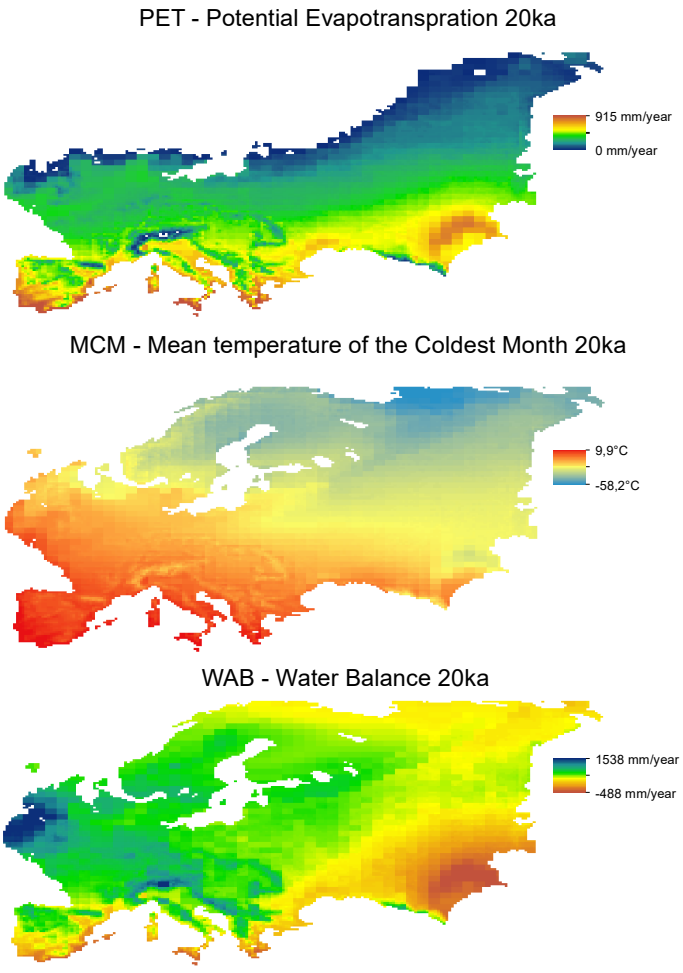

Figure 1: Exemplary maps of the three climate variables (PET, MCM, WAB).

The visualisation of the data was conducted with esri ArcGIS 10.4. It shows examples of the three different data values, the GeoTIFFs are colorized with stretched color ramps indicating the values of each cell.

5 Data resources

5.1 File resources

The data was published as .zip files containing the raster files of the three variables and as GEOTIFFs.

File	Format	Size
MCM_30-13.zip	ZIP file containing GEOTIFFs	2122 kB
PET_30-13.zip	ZIP file containing GEOTIFFs	1727 kB
WAB_30-13.zip	ZIP file containing GEOTIFFs	1821 kB

5.2 Web resources

PET 13ka	http://crc806db.uni-koeln.de/layer/show/346/
PET 14ka	http://crc806db.uni-koeln.de/layer/show/347/
PET 15ka	http://crc806db.uni-koeln.de/layer/show/348/
PET 16ka	http://crc806db.uni-koeln.de/layer/show/349/
PET 17ka	http://crc806db.uni-koeln.de/layer/show/350/
PET 18ka	http://crc806db.uni-koeln.de/layer/show/351/
PET 19ka	http://crc806db.uni-koeln.de/layer/show/352/
PET 20ka	http://crc806db.uni-koeln.de/layer/show/353/
PET 21ka	http://crc806db.uni-koeln.de/layer/show/354/
PET 22ka	http://crc806db.uni-koeln.de/layer/show/355/
PET 23ka	http://crc806db.uni-koeln.de/layer/show/356/
PET 24ka	http://crc806db.uni-koeln.de/layer/show/357/
PET 25ka	http://crc806db.uni-koeln.de/layer/show/358/
PET 26ka	http://crc806db.uni-koeln.de/layer/show/359/
PET 27ka	http://crc806db.uni-koeln.de/layer/show/360/
PET 28ka	http://crc806db.uni-koeln.de/layer/show/361/
PET 29ka	http://crc806db.uni-koeln.de/layer/show/362/
PET 30ka	http://crc806db.uni-koeln.de/layer/show/363/
MCM 13ka	http://crc806db.uni-koeln.de/layer/show/328/
MCM 14ka	http://crc806db.uni-koeln.de/layer/show/329/
MCM 15ka	http://crc806db.uni-koeln.de/layer/show/330/
MCM 16ka	http://crc806db.uni-koeln.de/layer/show/331/
MCM 17ka	http://crc806db.uni-koeln.de/layer/show/332/
MCM 18ka	http://crc806db.uni-koeln.de/layer/show/333/
MCM 19ka	http://crc806db.uni-koeln.de/layer/show/334/
MCM 20ka	http://crc806db.uni-koeln.de/layer/show/335/
MCM 21ka	http://crc806db.uni-koeln.de/layer/show/336/
MCM 22ka	http://crc806db.uni-koeln.de/layer/show/337/
MCM 23ka	http://crc806db.uni-koeln.de/layer/show/338/
MCM 24ka	http://crc806db.uni-koeln.de/layer/show/339/
MCM 25ka	http://crc806db.uni-koeln.de/layer/show/340/
MCM 26ka	http://crc806db.uni-koeln.de/layer/show/341/
MCM 27ka	http://crc806db.uni-koeln.de/layer/show/342/
MCM 28ka	http://crc806db.uni-koeln.de/layer/show/343/
MCM 29ka	http://crc806db.uni-koeln.de/layer/show/344/
MCM 30ka	http://crc806db.uni-koeln.de/layer/show/345/
WAB 13ka	http://crc806db.uni-koeln.de/layer/show/364/
WAB 14ka	http://crc806db.uni-koeln.de/layer/show/365/
WAB 15ka	http://crc806db.uni-koeln.de/layer/show/366/
WAB 16ka	http://crc806db.uni-koeln.de/layer/show/367/
WAB 17ka	http://crc806db.uni-koeln.de/layer/show/368/
WAB 18ka	http://crc806db.uni-koeln.de/layer/show/369/
WAB 19ka	http://crc806db.uni-koeln.de/layer/show/370/
WAB 20ka	http://crc806db.uni-koeln.de/layer/show/371/
WAB 21ka	http://crc806db.uni-koeln.de/layer/show/372/
WAB 22ka	http://crc806db.uni-koeln.de/layer/show/373/
WAB 23ka	http://crc806db.uni-koeln.de/layer/show/374/
WAB 24ka	http://crc806db.uni-koeln.de/layer/show/375/
WAB 25ka	http://crc806db.uni-koeln.de/layer/show/376/
WAB 26ka	http://crc806db.uni-koeln.de/layer/show/377/
WAB 27ka	http://crc806db.uni-koeln.de/layer/show/378/
WAB 28ka	http://crc806db.uni-koeln.de/layer/show/379/
WAB 29ka	http://crc806db.uni-koeln.de/layer/show/381/
WAB 30ka	http://crc806db.uni-koeln.de/layer/show/382/

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References

Tallavaara, M., Luoto, M., Korhonen, N., Järvinen, H., and Seppä, H. (2015). Human population dynamics in europe over the last glacial maximum. *Proceedings of the National Academy of Sciences*, 112(27):8232–8237.