getCRUCLdata: Use and Explore CRU CL v. 2.0 Climatology Elements in R

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Summary

The CRU CL v. 2.0 data are a gridded climatology of 1961-1990 monthly means released in 2002 and cover all land areas (excluding Antarctica) at 10 arcminutes (0.1666667 degree) resolution (New et al. 2002) providing precipitation, cv of precipitation, wet-days, mean temperature, mean diurnal temperature range, relative humidity, sunshine, ground-frost, windspeed and elevation. While these data have a high resolution and are freely available, the data format can be cumbersome for working with. Four functions are provided by *getCRUCLdata* that automate importing CRU CL v. 2.0 climatology data into R (R Core Team 2016), facilitate the calculation of minimum temperature and maximum temperature, and format the data into a tidy data frame (Wickham 2014) in a *tibble* (Wickham, Francois, and Müller 2017) object or a list of *raster* stack objects (Hijmans 2016) for use in R or easily exported to a raster format file for use in a geographic information system (GIS). Two functions, `get_CRU_df()` and `get_CRU_stack()` provide the ability to easily download CRU CL v. 2.0 data from the CRU website and import the data into R and allow for caching downloaded data. The other two functions, `create_CRU_df()` and `create_CRU_stack()` allow the user to easily import the CRU data files from a local disk location and transform them into a tidy data frame *tibble* or *raster* stack. The data have applications in applied climatology, biogeochemical modelling, hydrology and agricultural meteorology (New et al. 2002).

References

Hijmans, Robert J. 2016. *Raster: Geographic Data Analysis and Modeling*. https://CRAN.R-project.org/package=raster.

New, M, D Lister, M Hulme, and I A Makin. 2002. "A high-resolution data set of surface climate over global land areas." *Climate Research* 21: 1–25. doi:10.3354/cr021001.

R Core Team. 2016. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Wickham, Hadley. 2014. "Tidy Data." *Journal of Statistical Software* 59 (1): 1–23. doi:10.18637/jss.v059.i10.

Wickham, Hadley, Romain Francois, and Kirill Müller. 2017. *Tibble: Simple Data Frames*. https://CRAN.R-project.org/package=tibble.