Package 'airGRdatasets'

May 7, 2026

Type Package

Title Hydro-Meteorological Catchments Datasets for the 'airGR' Packages

Version 0.2.3

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Description Sample of hydro-meteorological datasets extracted from the 'CAMELS-FR' French database <doi:10.57745/WH7FJR>.
It provides metadata and catchment-scale aggregated hydro-meteorological time series on a pool of French catchments for use by the 'airGR' packages.

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Encoding UTF-8

Depends R (>= 3.5.0)

Suggests testthat

URL https://gitlab.irstea.fr/HYCAR-Hydro/airgrgalaxy/airgrdatasets

BugReports https://gitlab.irstea.fr/HYCAR-Hydro/airgrgalaxy/airgrdatasets/-/issues

NeedsCompilation no

LazyData true

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Repository CRAN

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Contents

`airGRdatasets-package` *Hydro-Meteorological Catchments Datasets for the 'airGR' Packages*

Description

Sample of hydro-meteorological datasets extracted from the 'CAMELS-FR' French database <doi:10.57745/WH7FJR>. It provides metadata and catchment-scale aggregated hydro-meteorological time series on a pool of French catchments for use by the 'airGR' packages. More especially, it can be used by teachers and students for hydrological modeling exercises adapted to the 'airGRteaching' package (doi:10.32614/CRAN.package.airGRteaching), as described in Delaigue et al. (2023) and in the 'airGRteaching' vignettes.

The package contains the following types of datasets:

- `lumped_daily`: a collection of daily hydrometeorological time series of lumped catchments, along with associated metadata.

Source

Delaigue, O., Guimarães, G. M., Brigode, P., Génot, B., Perrin, C., and Andréassian, V. (2024). CAMELS-FR dataset, V1, Recherche Data Gouv [data set], doi:10.57745/WH7FJR.

References

Delaigue, O., Brigode, P., Thirel, G., and Coron, L. (2023). airGRteaching: an open-source tool for teaching hydrological modeling with R, Hydrol. Earth Syst. Sci., 27, 3293–3327, doi:10.5194/hess2732932023.

Delaigue, O., Guimarães, G. M., Brigode, P., Génot, B., Perrin, C., Soubeyroux, J.-M., Janet, B., Addor, N., and Andréassian, V. (2025). CAMELS-FR dataset: a large-sample hydroclimatic dataset for France to explore hydrological diversity and support model benchmarking, Earth Syst. Sci. Data, 17, 1461–1479, doi:10.5194/essd1714612025.

`lumped_daily` *Metadata and daily time series of catchment-scale hydro-meteorological observations*

Description

Meteorological forcing is derived from the SAFRAN reanalysis (8 km resolution grid) produced by Météo-France (Quintana-Seguí et al., 2008; Vidal et al., 2010).

Meteorological forcing is aggregated at the catchment scale and merged with streamflow data within the CAMELS-FR database from INRAE (Delaigue et al., 2024; Delaigue et al., 2025). To accomplish this, catchment boundaries, area, and elevation are determined using two digital terrain models (DTMs). For continental metropolitan France, we used the 100 m × 100 m resolution DTM from the Shuttle Radar Topography Mission (SRTM) project (Rabus et al., 2003; Farr et al., 2007), while for Corsica, the BD ALTI v1.0 with 25 m × 25 m resolution from IGN (2001) was employed. Stations were snapped to a theoretical river network derived from the DTMs, with flow directions constrained using the stream-burning method and the CARTHAGE river network (French water agencies, 2017) after channel removal.

The streamflow data, as well as the codes and names of hydrometric stations, are provided by SCHAPI (the French Central Hydrometeorological and Flood Forecasting Support Service) via the Hydroportail website (SCHAPI, 2022). Streamflows are converted to mm/d using the DEM-based catchment area

Usage

```
A273011002
A605102001
B222001001
E540031001
E645651001
H010002001
H120101001
F439000101
H622101001
J171171001
J421191001
K134181001
K265401001
K731261001
V123521001
X031001001
X045401001
Y643401001
Y862000101
```

Format

[list] of 3 elements:

`Meta` [list] metadata

- `Code` [list] of 2 [character] codes of the hydrometric station (`H3`: code since 2022, `H2`: former code)
- `Name` [character] name of the hydrometric station (H3)
- `Coor` [list] of 2 [numeric] coordinates (`X` and `Y`) of the catchment outlet [decimal degrees; epsg: 4326]
- `Area` [numeric] area of the catchment [km²]

`TS` [data.frame] catchment daily time series from 1999-01-01 to 2018-12-31

- `Date` [POSIXct] dates (timezone = "UTC")
- `Ptot` [numeric] total precipitation (liquid + solid) [mm/d]
- `Temp` [numeric] mean air temperature [°C]
- `Evap` [numeric] total potential evapotranspiration computed with Oudin's Formula (Oudin et al., 2005)
- `Qls` [numeric] outlet streamflow [l/s]
- `Qmmd` [numeric] outlet streamflow [mm/d]

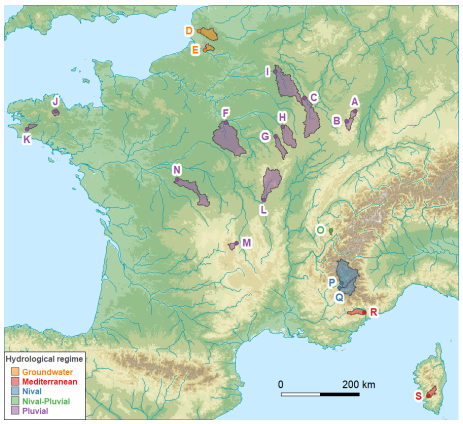
`Hypso` [numeric] hypsometric values (101 quantiles from 0 to 100 % of the elevation range of the catchment) [m]

Note

List of available catchments:

station_code	id_map	station_name
A273011002	A	the Bruche at Russ [Wisches]
A605102001	B	the Meurthe at Saint-Dié-des-Vosges
B222001001	C	the Meuse at Saint-Mihiel
E540031001	D	the Canche at Brimeux
E645651001	E	the Nièvre at Étoile
F439000101	F	the Loing at Épisy
H010002001	G	the Seine at Plaines-Saint-Lange
H120101001	H	the Aube at Bar-sur-Aube
H622101001	I	the Aisne at Givry
J171171001	J	the Trieux at Saint-Péver - Pont Locminé
J421191001	K	the Odet at Ergué-Gabéric - Treodet
K134181001	L	the Arroux at Rigny-sur-Arroux
K265401001	M	the Couze Pavin at Saint-Floret
K731261001	N	the Indre at Saint-Cyran-du-Jambot
V123521001	O	the Ire at Doussard
X031001001	P	the Durance at Embrun [La Clapière] - DREAL PACA
X045401001	Q	the Ubaye at Lauzet-Ubaye [Roche-Rousse] - DREAL PACA

Y643401001	R	the Esteron at Broc [La Clave]
Y862000101	S	the Taravo at Zigliara [Pont d'Abra]



Source

Delaigue, O., Guimarães, G. M., Brigode, P., Génot, B., Perrin, C., and Andréassian, V. (2024). CAMELS-FR dataset, V1, Recherche Data Gouv [data set], doi:10.57745/WH7FJR.

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Delaigue, O., Guimarães, G. M., Brigode, P., Génot, B., Perrin, C., Soubeyroux, J.-M., Janet, B., Addor, N., and Andréassian, V. (2025). CAMELS-FR dataset: a large-sample hydroclimatic dataset for France to explore hydrological diversity and support model benchmarking, Earth Syst. Sci. Data, 17, 1461–1479, doi:10.5194/essd1714612025.

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Rabus, B., Eineder, M., Roth, A., and Bamler, R. (2003). The shuttle radar topography mission—a new class of digital elevation models acquired by spaceborne radar, ISPRS J. Photogramm., 57, 241–262, doi:10.1016/S09242716(02)001247.

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Examples

```
library(airGRdatasets)

# list the datasets in the 'airGRdatasets' package
list_ds <- try(data(package = "airGRdatasets"), silent = TRUE)
list_ds$results[, "Item"]

# load the 'A273011002' catchment data
data(A273011002)

# display the structure of the data
str(A273011002)
```

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