Package 'GR2MSemiDistr'

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Type Package

Title A package for hydrological modelling with a semidistribute GR2M model version

Version 2.0.1

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Description This package run a semidistributed GR2M version applying a Weighted Flow Accumulation algorithm using TauDEM

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Encoding UTF-8

Depends R (>= 3.6),

Imports airGR, foreach, hydroGOF, ncdf4, raster, rgdal, rgeos, rtop, tictoc, ProgGUIinR

LazyData true

RoxygenNote 6.1.1

R topics documented:

`Create_Forcing_Inputs` *Create a text file with data inputs for the model*

Description

Create a text file with data inputs for the model

Usage

```
Create_Forcing_Inputs(Shapefile, Database, Precip, PotEvap, Qobs = NULL,
  Resolution = 0.01, DateIni = "1981/01/01", DateEnd = "2016/12/01")
```

Arguments

Shapefile	Subbasins shapefile.
Database	Directory where precipitation and evapotranspiration data (as netCDF) are located.
Precip	Precipitation filename.
PotEvap	Evapotranspiration filename.
Qobs	Observed streamflow filename (data in m3/s). NULL as default.
Resolution	Raster resolution to resample forcing data and extract areal mean values. 0.01 as default.
DateIni	Initial date (in 'yyyy/mm/dd' format) to subset data. '1981/01/01' as default
DateEnd	Final date (in 'yyyy/mm/dd' format) to subset data. '2016/12/01' as default

Value

Export a text file with forcing data inputs (Dates, Precip, Evap, Qobs).

Optim_GR2MSemiDistr *Optimization of GR2M model parameters with SCE-UA algorithm.*

Description

Optimization of GR2M model parameters with SCE-UA algorithm.

Usage

```
Optim_GR2MSemiDistr(Parameters, Parameters.Min, Parameters.Max,
  Max.Functions = 10000, Optimization = "NSE", Location, Shapefile,
  Input = "Inputs_Basins.txt", WarmIni, RunIni, RunEnd, IdBasin,
  Remove = FALSE, No.Optim = NULL, IniState = NULL)
```

Arguments

Parameters	GR2M (X1 and X2) model parameters and a multiplying factor to adjust monthly P and PET values.
Parameters.Min	Minimum GR2M (X1, X2, fprecip and fpet) model parameters values.
Parameters.Max	Maximum GR2M (X1, X2, fprecip and fpet) model parameters values.
Max.Functions	Maximum number of functions used in the optimization loop. 10000 as default.
Optimization	Mono-objective evaluation criteria for GR2M (NSE, lnNSE, KGE, RMSE, R, PBIAS).
Location	Work directory where 'Inputs' folder is located.
Shapefile	Subbasins shapefile.
Input	Model forcing data in airGR format (DatesR,P,T,Qmm). 'Inputs_Basins.txt' as default.
WarmIni	Initial date (in 'mm/yyyy' format) of the warm-up period.
RunIni	Initial date (in 'mm/yyyy' format) of the model simulation period.
RunEnd	Final date (in 'mm/yyyy' format) of the model simulation period.

IdBasin	ID for the outlet subbasin (from shapefile attribute table).
Remove	Logical value to remove streamflows of the outlet subbasin (IdBasin). FALSE as default.
No.Optim	Calibration regions not to be optimized.
IniState	Initial GR2M states variables. NULL as default.

Value

Best GR2M model parameters.

`Routing_GR2MSemiDistr` *Routing simulated monthly streamflows.*

Description

Routing simulated monthly streamflows.

Usage

```
Routing_GR2MSemiDistr(Location, Model, Shapefile, Dem, AcumIni, AcumEnd,
  Save = TRUE)
```

Arguments

Location	Work directory where 'Inputs' folder is located.
Model	Model results from Run_GR2MSemiDistr
Shapefile	Subbasins shapefile.
Dem	Raster DEM.
AcumIni	Initial date 'mm/yyyy' for flow accumulation.
AcumEnd	Final date 'mm/yyyy' for flow accumulation.
Save	Logical value to save results as rasters. TRUE as default.

Value

Routed streamflows for each subbasin.

Run_GR2MSemiDistr *Run GR2M model for each subbasins.*

Description

Run GR2M model for each subbasins.

Usage

```
Run_GR2MSemiDistr(Parameters, Location, Shapefile,
  Input = "Inputs_Basins.txt", WarmIni = NULL, RunIni, RunEnd,
  IdBasin = NULL, Remove = FALSE, Plot = TRUE, IniState = NULL,
  Regional = FALSE)
```

Arguments

Parameters	GR2M model parameters (X1 and X2) and a multiplying factors for P and PET.
Location	Work directory where 'Inputs' folder is located.
Shapefile	Subbasins shapefile.
Input	Model forcing data in airGR format (DatesR,P,T,Qmm). 'Inputs_Basins.txt' as default.
WarmIni	Initial date (in 'mm/yyyy' format) of the warm-up period.
RunIni	Initial date (in 'mm/yyyy' format) of the model simulation period.
RunEnd	Final date (in 'mm/yyyy' format) of the model simulation period.
IdBasin	ID for the outlet subbasin (from shapefile attribute table).
Remove	Logical value to remove streamflows of the outlet subbasin (IdBasin). FALSE as default.
Plot	Logical value to plot observed and simulated streamflow timeseries. TRUE as default.
IniState	Initial GR2M states variables. NULL as default.
Regional	Logical value to simulate in a regional mode (more than one outlet).

Value

GR2M model outputs for each subbasin.

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