

# Package ‘processCFSR’

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**Type** Package

**Title** Process CFSR datasets

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## Description

Tools to download CFSR datasets and convert to SWAT and WGN Excel Macro inputs format. Also, It allows to plot and analyse anomalies between weather stations and CFSR data.

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CFSRStationData-class *Class "CFSRStationData"*

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## Description

Objects with this class store CFSR and Station data to be computed by `getAnomalies` function. Each pair of values must refer to the same day.

## Objects from the Class

Objects can be created by calls of the form `new("CFSRStationData", ...)`.

**Slots**

CFSR: Object of class "numeric"

Station: Object of class "numeric"

**Methods**

**getAnomalies** signature(object = "CFSRStationData"): This method calculates the anomalies (deltas) subtracting CFSR values from weather station values.

**Author(s)**

Jefferson Valencia Gomez

**See Also**

[CFSRStationDataExtra](#), [getAnomalies](#)

**Examples**

```
a = new("CFSRStationData", CFSR = 1:10, Station = 11:20)

showClass("CFSRStationData")
```

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CFSRStationDataExtra-class

*Class "CFSRStationDataExtra"*

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**Description**

Objects with this class store CFSR, Station and Anomalies data to be showed on a plot by `plotCFSRStation` function.

**Objects from the Class**

Objects can be created by calls of the form `new("CFSRStationDataExtra", ...)`.

**Slots**

CFSR: Object of class "numeric"

Station: Object of class "numeric"

Anomaly: Object of class "numeric"

**Extends**

Class "[CFSRStationData](#)", directly.

**Methods**

**plotCFSRStation** signature(data = "CFSRStationDataExtra"): This method plots the anomalies (deltas) which were obtained subtracting CFSR values from weather station values.

**Author(s)**

Jefferson Valencia Gomez

**See Also**

[CFSRStationData](#), [getAnomalies](#), [plotCFSRStation](#)

**Examples**

```
CFSR = 1:10
Station = 11:20
Anomaly = Station - CFSR
a = new("CFSRStationDataExtra", CFSR = CFSR, Station = Station, Anomaly = Anomaly)

showClass("CFSRStationDataExtra")
```

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CFSRStationSampleData *Sample dataset of precipitation with CFSR and weather station data*

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**Description**

Sample dataset of precipitation to be used in the function [getAnomalies](#) and then plot it by using [plotCFSRStation](#)

**Usage**

```
data(SampleData)
```

**Format**

A data frame with 10748 observations on the following 2 variables.

CFSR a numeric vector

Station a numeric vector

**Details**

This dataset can be compiled with the data downloaded from drfuka.org service and bound with weather station data.

**Examples**

```
data(SampleData)
CFSR = CFSRStationSampleData$CFSR
Station = CFSRStationSampleData$Station
```

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convertCFSRTo	<i>Convert from CFSR to SWAT Model/WGN Excel Macro input files format</i>
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### Description

Function to convert CFSR datasets downloaded by using [processSamplePoints](#) function to either SWAT Model or WGN Excel Macro input files format

### Usage

```
convertCFSRTo(CSVspath, format = "SWAT", inputStartDate = FALSE, inputEndDate = FALSE)
```

### Arguments

CSVspath	Folder path where stored all the CSV files downloaded by using <a href="#">processSamplePoints</a> function. See <code>extdata/CFSRData.csv</code> as an example file.
format	Format which datasets have to be converted to. Two possible options "SWAT" or "WGN".
inputStartDate	Start date to cut/trunc the data with format "m/d/Y".
inputEndDate	End date to cut/trunc the data with format "m/d/Y".

### Details

If format is not defined, the CFSR datasets are converted to SWAT Model input files format. If either `inputStartDate` or `inputStartDate` are not defined, the start date or end date are read from the input files.

### Value

In the CSVspath folder it will be created another folder named either SWAT or WGN with all the created TXT files that are ready to enter to SWAT Model or WGN Excel Macro.

### Warning

This function adds rows with -99 values where missing data.

### Author(s)

Jefferson Valencia Gomez

### References

For more references related to SWAT model please visit: [SWAT Model webpage](#)

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getAnomalies-methods      *Method* getAnomalies

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### Description

This method calculates the anomalies (deltas) subtracting CFSR values from weather station values.

### Details

This method removes all the pairs of data with any NA value.

### Methods

signature(object = "CFSRStationData") Based on an object of class [CFSRStationData](#) with CFSR and Station data, it calculates the anomalies (deltas) between both and returns an object of class [CFSRStationDataExtra](#).

### See Also

[CFSRStationData](#), [CFSRStationDataExtra](#)

### Examples

```
a = new("CFSRStationData", CFSR = 1:10, Station = 11:20)
b = getAnomalies(a)
```

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plotCFSRStation-methods  
                                  *Method* plotCFSRStation

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### Description

This method plots the anomalies (deltas) which were obtained subtracting CFSR values from weather station values. A scatter diagram and histogram of anomalies are showed on the plot for the variable defined as an input.

### Methods

signature(data = "CFSRStationDataExtra") Based on an object of class [CFSRStationDataExtra](#) with CFSR, Station and Anomalies data, it plots the anomalies (deltas) which were obtained subtracting CFSR values from weather station values.

### Examples

```
data(SampleData)
CFSR = CFSRStationSampleData$CFSR
Station = CFSRStationSampleData$Station

a = new("CFSRStationData", CFSR = CFSR, Station = Station)

b = getAnomalies(a)

plotCFSRStation(b, variable = "PCP")
```

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processSamplePoints	<i>Download CFSR datasets from drfuka.org service</i>
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**Description**

This function allows user to download CFSR datasets and cut them based on the start and end dates defined in the CSV input file.

**Usage**

```
processSamplePoints(samplePointsFile, finalFolder)
```

**Arguments**

samplePointsFile	CSV file with the id's, coordinates (Lat and Long) and start and end dates of the points to be downloaded. See <code>extdata/SamplePoints.csv</code> as an example file .
finalFolder	Folder path where all the downloaded CFSR datasets will be stored in CSV format.

**Details**

Id's have to be unique. Lat and Long coordinates must be in decimal degrees. Start and end dates have to be formatted as "m/d/Y".

**Value**

In the `finalFolder` it will be stored in CSV format all the downloaded CFSR datasets. See `extdata/CFSRData.csv` as an example file .

**Warning**

This function adds rows with NA values where missing data.

**Author(s)**

Jefferson Valencia Gomez

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