Package 'spi'

February 20, 2015

Type Package

Title Compute SPI index

Version 1.1

Date 2011-02-26

Author Josemir Neves

Maintainer Josemir Neves <josemir.neves@gmail.com>

Description Compute the SPI index using R

License GPL-2

LazyLoad yes

LazyData yes

Repository CRAN

Date/Publication 2012-10-29 08:59:48

NeedsCompilation no

R topics documented:

`spi` *Standardized Precipitation Index (SPI)*

Description

The SPI function computes the SPI index (McKee et al., 1993) from a predefined time scale (1 month, 3 months, 24 months, etc.) to a period choosen by users.

Usage

```
spi(nargs, filename, id, fd, title, output, txlab, tylab)
```

Arguments

`nargs`	number of arguments (minimum = 3)
`filename`	name of datafile

The datafile in ASCII format must have the following layout:

Months	2005	2006	2007	2008	2009	2010
Jan	28.1	5.8	22.9	64.2	70.1	85.9
Feb	41.4	85.1	149.2	31.0	142.1	36.9
Mar	153.2	145.9	101.6	308.8	171.8	57.5
Apr	57.0	212.4	170.3	244.5	278.9	132.9
May	154.9	119.9	57.8	128.8	212.7	55.6
jun	158.6	81.3	160.8	94.0	115.3	63.3
Jul	22.6	27.2	29.4	80.9	82.7	30.9

`id`	initial data
`fd`	final data
`title`	data title
`output`	output type (1 - graph, 2 - results matrix)
`txlab`	the X axis title
`tylab`	the Y axis title

Details

Positive SPI values indicate greater than median precipitation and negative values indicate less than median precipitation. Drought periods are represented by relatively high negative deviations. Normally, the 'drought' part of the SPI range is arbitrary split into moderately dry (-1.0 > SPI > -1.49), severely dry (-1.5 > SPI > -1.99) and extremely dry conditions (SPI < -2.0). A drought event starts when SPI value reaches -1.0 and ends when SPI becomes positive again (McKee et al., 1993).

This function use the SPI range defined by National Climatic Data Center (NCDC):

exceptionally moist:	SPI >= 2.0
extremely moist:	1.60 <= SPI < 1.99
very moist:	1.30 <= SPI < 1.59
moderately moist:	0.80 <= SPI < 1.29
abnormally moist:	0.51 <= SPI < 0.79
near normal:	-0.50 <= SPI <= 0.50
abnormally dry:	-0.79 <= SPI < -0.51
moderately dry:	-1.29 <= SPI < -0.80
severely dry:	-1.59 <= SPI < -1.30
extremely dry:	-1.99 <= SPI < -1.60
exceptionally dry:	SPI <= -2.0

Value

Returns a data matrix or a graphic with SPI values.

Author(s)

Josemir A Neves (josemir.neves@gmail.com/josemiremparn@rn.gov.br)

References

McKee, T.B., Doesken, N.J., Kleist, J., 1993. The relationship of drought frequency and duration to time scales. In: Preprints, Eighth Conference on Applied Climatology, January 17 e 22, Anaheim, California, pp. 179 e 184.

Examples

```
##load data

data(spi_data)

##write to file

write.table(spi_data,file="spi.txt",quote=FALSE,row.names=TRUE)

## Standard format with the output in the text format

spi(3,"spi.txt",1963,2010)

## A full output in graphical format

spi(7,"spi.txt",1963,2010,"Standardized Precipitation Index - Rio Grande do Norte State",1,"years","months")
```

---

spi_data *SPI of the rainy season in the Rio Grande do Norte*

Description

This data set present the Standardized Precipitation Index (SPI) of the rainy season in the Rio Grande do Norte State - Brazil.

Usage

```
spi_data
```

Format

A matrix containing 336 observations.

Source

Empresa de Pesquisa Agropecuaria do Rio Grande do Norte - EMPARN

References

EMPARN. Rainfall database of the Rio Grande do Norte. URL http://www.emparn.rn.gov.br

Index