Package: phenorice (via r-universe)

September 5, 2024

Type Package

Title phenorice

Version 0.1-1

Date 2019-11-04

Imports signal

SystemRequirements C++11

Maintainer Robert J. Hijmans <r.hijmans@gmail.com>

Description An implementation of phenorice algorithm to detect rice crops from remote sensing data.

License GPL (>=2)

Repository https://cropmodels.r-universe.dev

RemoteUrl https://github.com/cropmodels/phenorice

RemoteRef HEAD

RemoteSha d011bae7957082dc82b3d414f2f428a9d0db0064

Contents

phenorice-package *phenorice*

Description

phenorice model to detect rice from satellite reflectance data

References

Boschetti, M., L. Busettoa, G. Manfrona, A. Laborte, S. Asilo, S. Pazhanivelan & A Nelson, 2017. PhenoRice: A method for automatic extraction of spatio-temporal information on rice crops using satellite data time series. Remote Sensing of Environment 194: 347-365

getPars *Default parameters*

Description

Get default parameters for the phenorice model

Usage

```
getPars()
```

Details

Parameters	Explanation
evi_meanth	threshold for annual mean EVI
evi_maxth	threshold for maximum evi
evi_minth	threshold for minimum evi
pos_start	start of heading
pos_end	end of heading
vl1	the shortest vegetative growth length
vl2	the longest vegetative growth length
winfl	half period of flooding
minndfi	threshold for ndfi
windecr	period after maximum EVI
decr	percent decrease of EVI after EVI maximum
tl1	the shortest total growing length
tl2	the longest total growing length
lst_th	the minmum temperature for planting

Value

list

Examples

```
p <- getPars()
str(p)
```

`misc` *miscellaneous functions*

Description

miscellaneous functions for use with phenorice model

Usage

```
fill_VI(x)
filter_VI(x)
```

Arguments

`x`	vector

Value

vector

`phenorice` *R implementation of the phenorice model*

Description

Run the phenorice model

Usage

```
phenorice(evi, ndfi, lst, p, checkLST=TRUE)
```

Arguments

`evi`	numeric, rasterstack or SpatRaster with evi values
`ndfi`	numeric, rasterstack or SpatRaster with ndfi values
`lst`	numeric, rasterstack or SpatRaster with lst values
`p`	list with named parameters based on phenorice method
`checkLST`	boolean. If `TRUE` the LST is used

Details

Parameters	Explanation
evi_meanth	threshold for annual mean EVI
evi_maxth	threshold for maximum EVI
evi_minth	threshold for minimum EVI
pos_start	start of heading
pos_end	end of heading
vl1	shortest vegetative growth length
vl2	longest vegetative growth length
winfl	period for flooding
minndfi	threshold for NDFI
windecr	period after EVI maximum
decr	percent decrease of EVI after EVI maximum
tl1	shortest total growing length
tl2	longest total growing length
lst_th	minmum land surface temperature for planting, needs checkLST=TRUE

Value

vector

References

Boschetti, M., L. Busettoa, G. Manfrona, A. Laborte, S. Asilo, S. Pazhanivelan & A Nelson, 2017. PhenoRice: A method for automatic extraction of spatio-temporal information on rice crops using satellite data time series. Remote Sensing of Environment 194: 347-365;

Busetto, L., Zwart, S.J. and Boschetti, M., 2019. Analysing spatial?temporal changes in rice cultivation practices in the Senegal River Valley using MODIS time-series and the PhenoRice algorithm. International Journal of Applied Earth Observation and Geoinformation, 75, pp.15-28.

Examples

```
# Get index for one pixel
evi <- readRDS(system.file("evi.rds", package="phenorice"))
ndfi <- readRDS(system.file("ndfi.rds", package="phenorice"))
lst <- readRDS(system.file("lst.rds", package="phenorice"))

# Smooth each index
evi <- filter_VI(evi)
ndfi <- fill_VI(ndfi)
lst <- fill_VI(lst)

# Get parameters
p <- getPars()

# Run and get result (planting date, date of max EVI value, flowering date, heading date, harvest date) for tha pixel
```

```
re <- phenorice(evi, ndfi, lst, p)

# Change parameters
p['evi_minth'] = .2
re <- phenorice(evi,ndfi,lst,p)


f <- system.file("ricevi.rds", package="phenorice")
d <- readRDS(f)
evi <- unlist(d[1,2:47])
ndfi <- unlist(d[1,48:93])
lst <- unlist(d[1,94:139])
p <- getPars()

phenorice(evi, ndfi, lst, p)


x <- matrix(NA, 25, 5)
for (i in 1:25) {
 evi <- unlist(d[i,2:47])
 ndfi <- unlist(d[i,48:93])
 lst <- unlist(d[i,94:139])
 x[i,] <- phenorice(evi, ndfi, lst, p)
}
x
```

Index