Package ‘phenomap’

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Title  Projecting Satellite-Derived Phenology in Space
Version  2.0.1
Date  2023-10-12
Maintainer  Christian John <cjohn@ucsb.edu>
Depends  R (>= 4.1.0)
Imports  phenex, plyr, stringr, terra, doParallel
Description  This takes in a series of multi-layer raster files and returns a phenology projection raster, following methodologies described in John (2016) <https://etda.libraries.psu.edu/catalog/13521clj5135>.
License  GPL-3
URL  https://github.com/JepsonNomad/phenomap
BugReports  https://github.com/JepsonNomad/phenomap/issues
RoxygenNote  7.1.2
NeedsCompilation  no
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Repository  CRAN
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R topics documented:

mapPheno ......................................................... 2
mapTrend .......................................................... 3
Index ......................................................... 5
Convert a series of raster files to a single phenology raster.

Usage

mapPheno(
  File_List = NA,
  PhenoFactor = NA,
  phase = NA,
  threshold = NA,
  year = NA,
  NDVI = NA,
  VIQ = NA,
  DOY = NA,
  PR = NA,
  SnowExtent = NA,
  verbose = FALSE
)

Arguments

File_List List of raster files
PhenoFactor Character string: type of dataset to analyze (e.g., "VI", "Snow")
phase Character string: name of phenophase to be measured (e.g., "greenup", "snowmelt", "senescence" or other arguments passed to phenex::phenophase())
threshold Float threshold GWI value to be projected. Use only for VI option.
year Integer Year (YYYY)
NDVI Integer Band number of NDVI band in raster files
VIQ Integer Band number of VI Quality layer in raster files
DOY Integer Band number of Composite Day of Year layer in raster files
PR Integer Band Number of PR layer in raster files
SnowExtent Integer Band number of Maximum_Snow_Extent in raster files
verbose TRUE or FALSE (Default = FALSE)

Value

Raster object with extent=extent(terra::rast(File_List)[1]) and CRS = crs(terra::rast(File_List)[1]). Digital numbers are expressed as Day of Year.
Examples

```r
## Not run:
fp <- system.file("extdata", package="phenomap")
File_List <- paste(fp, list.files(path = fp, pattern="TinyCrop_*"), sep="/"
PhenoFactor = "VI"
phase = "greenup"
threshold = 0.5
year = 2016
NDVI = 1
VIQ = 3
DOY = 4
PR = 5
verbose = TRUE

Sample.Greenup <- mapPheno(File_List = File_List, PhenoFactor = PhenoFactor,
phase = phase, threshold = threshold, year = year,
NDVI = NDVI, VIQ = VIQ, DOY = DOY, PR = PR,
SnowExtent=SnowExtent,
verbose = verbose)

## End(Not run)
```

mapTrend

Convert a series of phenology terra::raster files to a single long-term trend terra::raster.

Description

Convert a series of phenology terra::raster files to a single long-term trend terra::raster.

Usage

```r
mapTrend(
  File_List, 
  Year_List, 
  parallel = FALSE, 
  n.cores = NULL, 
  verbose = FALSE
)
```

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File_List</td>
<td>List of phenology terra::raster files (i.e. those produced in ‘mapPheno’)</td>
</tr>
<tr>
<td>Year_List</td>
<td>Vector of Integer Year (YYYY) with length &gt; 5</td>
</tr>
</tbody>
</table>
mapTrend

parallel    TRUE or FALSE (Default = FALSE) if TRUE, use parallel backend through plyr::aaply
n.cores    Integer number of cores to be used for parallel processing (only use if parallel = TRUE)
verbose    TRUE or FALSE (Default = FALSE)

Value

terra::raster object with extent=ext(rast(File_List)[1]) and CRS = crs(rast(File_List)[1]). Layer 1 is the slope estimate of the linear model relating green-up timing (Day of Year) to time (Year). Layer 2 is the p-value of the slope estimate. Layer 3 is the standard error of the slope estimate. Layer 4 is the r-squared value for the linear model.

Examples

```r
## Not run:

fpath <- system.file("extdata", package="phenomap")
File_List.Trend <- paste(fpath, list.files(path = fpath, pattern=c("Sample_Greenup_")), sep="/"

Year_List <- 2011:2016 # Tell it what years you’re using
n.cores <- 4 # Set up parallel computing

phenotrend <- mapTrend(File_List = File_List.Trend,
                        Year_List = Year_List,
                        parallel = TRUE,
                        n.cores = n.cores,
                        verbose=TRUE)

## End(Not run)
```
Index

mapPheno, 2
mapTrend, 3