Package 'phenomap'

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Title Projecting Satellite-Derived Phenology in Space

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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>.

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URL https://github.com/JepsonNomad/phenomap

BugReports https://github.com/JepsonNomad/phenomap/issues

RoxygenNote 7.1.2

NeedsCompilation no

Author Christian John [aut, cre]

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R topics documented:

mapPheno *Convert a series of raster files to a single phenology raster.*

Description

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

```
## Not run:
fpath <- system.file("extdata", package="phenomap")
File_List <- paste(fpath, list.files(path = fpath, pattern=c("TinyCrop_")), sep="/")
File_List

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

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

Arguments

`File_List`	List of phenology terra::raster files (i.e. those produced in ‘mapPheno‘)
`Year_List`	Vector of Integer Year (YYYY) with length > 5

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

```
## 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)
```

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