

# Package ‘phenomap’

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**Title** Projecting Satellite-Derived Phenology in Space

**Version** 1.2.1

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**Depends** R (>= 3.4.0)

**Imports** dplyr, phenex, plyr, raster, stringr, rgdal, doParallel

**Description** This tool projects annual phenology metrics and long-term phenology trends, 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** 6.0.1.9000

**NeedsCompilation** no

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**Repository** CRAN

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 mapPheno

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


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

### Value

Raster object with extent=extent(raster(File\_List)[1]) and CRS = crs(raster(File\_List)[1]). Digital numbers are expressed as Day of Year.

### Examples

```
## Not run:
```

```
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,
parallel = parallel, n.cores = n.cores,
verbose = verbose)

```

```
## End(Not run)
```

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mapTrend	<i>Convert a series of phenology raster files to a single long-term trend raster.</i>
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### Description

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

### Usage

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

### Arguments

File_List	List of phenology 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::aapply
n.cores	Integer number of cores to be used for parallel processing (only use if parallel = TRUE)
verbose	TRUE or FALSE (Default = FALSE)

### Value

Raster object with extent=extent(raster(File\_List)[1]) and CRS = crs(raster(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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