

# Package: wdiEF (via r-universe)

December 2, 2024

**Title** Calculation of the Water Deficit Index (WDI) and the Evaporative Fraction (EF) on Rasters

**Version** 1.0.2

**Description** Calculates the Water Deficit Index (WDI) and the Evaporative Fraction (EF) using geospatial data, such as fractional vegetation cover (FVC) and surface-air temperature difference (TS-TA). Terms like ``raster'', ``CRS'' are part of standard geospatial terminology.

**License** GPL-3

**Encoding** UTF-8

**RoxygenNote** 7.3.2

**Imports** dplyr, stats, terra

**Suggests** testthat (>= 3.0.0)

**NeedsCompilation** no

**Author** Gaelle Hamelin [aut, cre]  
(<<https://orcid.org/0009-0007-2148-7937>>)

**Maintainer** Gaelle Hamelin <[gaelle.hamelin@institut-agro.fr](mailto:gaelle.hamelin@institut-agro.fr)>

**Repository** CRAN

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**Config/pak/sysreqs** libgdal-dev gdal-bin libgeos-dev libproj-dev  
libsqlite3-dev

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|              |                                                |
|--------------|------------------------------------------------|
| calculate_EF | <i>Calculate the Evaporative Fraction (EF)</i> |
|--------------|------------------------------------------------|

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### Description

This function calculates the EF from two rasters: fractional vegetation cover (FVC) and the surface-air temperature difference (TS-TA). It saves the resulting EF raster to the specified output path.

### Usage

```
calculate_EF(
  FVC_path,
  TS_TA_path,
  output_path,
  n_intervals = 20,
  percentile = 0.01
)
```

### Arguments

|             |                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| FVC_path    | Character. File path to the FVC raster. Must have the same CRS and extent as the TS-TA raster.                                                          |
| TS_TA_path  | Character. File path to the raster of TS-TA (surface-air temperature difference). TS and TA must have the same unit of measurement (Kelvin preferably). |
| output_path | Character. File path where the EF raster will be saved.                                                                                                 |
| n_intervals | Integer. Number of intervals for splitting FVC values (default: 20).                                                                                    |
| percentile  | Numeric. Percentage used for identifying wet and dry edges (default: 0.01).                                                                             |

### Details

- The input rasters (FVC and TS-TA) must have the same CRS (Coordinate Reference System) and extent.
- If they differ, the function will attempt to reproject and resample the rasters automatically.

### Value

A raster object representing the Evaporative Fraction (EF).

### Examples

```
# Paths to example data included in the package
library(terra)

FVC_raster <- rast(system.file("extdata", "FVC_reduced.tif", package = "wdiEF"))
TS_TA_raster <- rast(system.file("extdata", "TS_TA_reduced.tif", package = "wdiEF"))

# Output path (temporary file for example purposes)
```

```
output_path <- tempfile(fileext = ".tif")

# Run the function
calculate_EF(
  FVC_path = FVC_raster,
  TS_TA_path = TS_TA_raster,
  output_path = output_path,
  n_intervals = 20,
  percentile = 0.01
)

# Print the output path
print(output_path)
```

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`calculate_WDI`*Calculate the Water Deficit Index (WDI)*

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### Description

This function calculates the WDI from two rasters: fractional vegetation cover (FVC) and the surface-air temperature difference (TS-TA). It saves the resulting WDI raster to the specified output path.

### Usage

```
calculate_WDI(
  FVC_path,
  TS_TA_path,
  output_path,
  n_intervals = 20,
  percentile = 0.01
)
```

### Arguments

|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>FVC_path</code>    | Character. File path to the FVC raster. Must have the same CRS and extent as the TS-TA raster.                                                          |
| <code>TS_TA_path</code>  | Character. File path to the raster of TS-TA (surface-air temperature difference). TS and TA must have the same unit of measurement (Kelvin preferably). |
| <code>output_path</code> | Character. File path where the WDI raster will be saved.                                                                                                |
| <code>n_intervals</code> | Integer. Number of intervals for splitting FVC values (default: 20).                                                                                    |
| <code>percentile</code>  | Numeric. Percentage used for identifying wet and dry edges (default: 0.01).                                                                             |

### Details

- The input rasters (FVC and TS-TA) must have the same CRS (Coordinate Reference System) and extent.
- If they differ, the function will attempt to reproject and resample the rasters automatically.

**Value**

A raster object representing the Water Deficit Index (WDI).

**Examples**

```
# Paths to example data included in the package
library(terra)

FVC_raster <- rast(system.file("extdata", "FVC_reduced.tif", package = "wdiEF"))
TS_TA_raster <- rast(system.file("extdata", "TS_TA_reduced.tif", package = "wdiEF"))

# Output path (temporary file for example purposes)
output_path <- tempfile(fileext = ".tif")

# Run the function
calculate_WDI(
  FVC_path = FVC_raster,
  TS_TA_path = TS_TA_raster,
  output_path = output_path,
  n_intervals = 20,
  percentile = 0.01
)

# Print the output path
print(output_path)
```

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