Package "habitat"

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Type Package
Title Analyze and Compare Habitat Changes Using Raster Data
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Depends R, terra
Imports ggplot2
Description provides tools to analyze and compare changes between two raster datasets representing current and projected habitat distributions. It allows users to perform threshold-based binary conversion. The package computes habitat gain, loss,stable areas, and overall changes. This functionality is designed for students, junior ecological researchers, conservation planners, and others working in habitat modeling and landscape analysis.
License GPL (>= 3)
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Repository github
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`.onAttach` *Load Essential Libraries for habitat*

Description

This file ensures that all necessary libraries are installed and loaded when the habitat package is loaded.

Usage

```
.onAttach(libname, pkgname)
```

binary *Convert Raster to Binary Map*

Description

Converts a continuous raster dataset into a binary map based on a specified threshold.

Usage

```
binary(x, th)
```

Arguments

x	A RasterLayer or SpatRaster object.
th	A numeric threshold value between 0 and 1.

Value

A binary RasterLayer or SpatRaster where values greater than th are TRUE, and others are FALSE.

Examples

```
library(terra)
r <- rast(nrows=10, ncols=10, vals=runif(100))
binary_map <- binary(r, th=0.5)
plot(binary_map)
```

export_csv *Export Habitat Results to CSV*

Description

Exports the habitat change metrics to a CSV file.

Usage

```
export_csv(result, file_path)
```

Arguments

result	A list containing the habitat change metrics.
file_path	The file path where the CSV file will be saved.

Examples

```
export_csv(result, "habitat_results.csv")
```

export_txt *Export Habitat Results to TXT*

Description

Exports the habitat change metrics to a TXT file.

Usage

```
export_txt(result, file_path)
```

Arguments

result	A list containing the habitat change metrics.
file_path	The file path where the TXT file will be saved.

Examples

```
export_txt(result, "habitat_results.txt")
```

habitat_range *Analyze Habitat Changes*

Description

Computes metrics such as gain, loss, stable areas, and total changes between two binary raster maps.

Usage

```
habitat_range(x, y, th)
```

Arguments

x	A RasterLayer or SpatRaster object representing the current habitat (binary).
y	A RasterLayer or SpatRaster object representing the future habitat (binary).
th	A numeric threshold value between 0 and 1.

Value

A list containing:

- `Compt.By.Models`: A data frame with detailed metrics.
- `Diff.By.Pixel`: A SpatRaster showing pixel-wise differences.

Examples

```
library(terra)
library(ggplot2)
r1 <- rast(nrows=10, ncols=10, vals=sample(c(0, 1), 100, replace=TRUE))
r2 <- rast(nrows=10, ncols=10, vals=sample(c(0, 1), 100, replace=TRUE))
result <- habitat_range(r1, r2, th=0.5)
results(result)
HC_plot(result$Compt.By.Models)
```

HC_plot *Plot Habitat Changes*

Description

Plots the habitat changes as a bar chart.

Usage

```
HC_plot(data)
```

Arguments

data	A data frame containing the habitat change metrics.

Examples

```
HC_plot(result$Compt.By.Models)
```

---

modify_raster *Modify Raster Parameters*

Description

Modifies the CRS, extent, resolution, and applies crop and mask to a raster.

Usage

```
modify_raster(
  raster,
  crs = NULL,
  extent = NULL,
  resolution = NULL,
  crop_extent = NULL,
  mask = NULL
)
```

Arguments

raster	A SpatRaster object to be modified.
crs	Optional. A character string specifying the new CRS (e.g., "EPSG:4326").
extent	Optional. A numeric vector of four values specifying the new extent (xmin, xmax, ymin, ymax).
resolution	Optional. A numeric value or a vector of two numeric values specifying the new resolution.
crop_extent	Optional. A SpatExtent object or numeric vector specifying the extent to crop to.
mask	Optional. A SpatRaster object to be used as a mask.

Value

A modified SpatRaster object.

Examples

```
r1 <- rast(nrows=10, ncols=10, vals=runif(100))
r2 <- rast(nrows=11, ncols=11, vals=runif(100))
modified_r1 <- modify_raster(r1, crs="EPSG:4326", extent=c(0, 1000, 0, 1000))
modified_r2 <- modify_raster(r2, crs=modified_r1, extent=c(0, 1000, 0, 1000), crop_extent = modified_r1)
```

---

res_check *Validate Raster Inputs*

Description

Checks whether two raster datasets have identical extent, CRS, dimensions, and resolution.

Usage

```
res_check(x, y)
```

Arguments

x	A RasterLayer or SpatRaster object representing the first dataset.
y	A RasterLayer or SpatRaster object representing the second dataset.

Value

Returns TRUE if all checks pass, otherwise throws an error.

Examples

```
library(terra)
r1 <- rast(nrows=10, ncols=10, vals=runif(100))
r2 <- rast(nrows=10, ncols=10, vals=runif(100))
res_check(r1, r2) # Should return TRUE
```

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