

Package ‘TOC’

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Type Package

Title TOC

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Description Construct the Total Operating Characteristic (TOC) Curve

License GPL (>= 2)

Encoding latin1

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TOC-package	<i>Construct the Total Operating Characteristic (TOC) Curve</i>
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Description

Construct the Total Operating Characteristic (TOC) Curve

Details

Package:	TOC
Type:	Package
Version:	0.0-1
Date:	2014-10-29
License:	GPL (>= 2)
LazyLoad:	yes

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See Also

[TOC](#), [plot.TOC](#)

plot.ROC

Plot the ROC curve

Description

Plot the Relative Operating Characteristic (ROC) curve

Usage

```
plot.ROC(roc, labelThres=FALSE, digits, ...)
```

Arguments

roc	an object of class ROC
labelThres	logical, default to FALSE. If TRUE, thresholds are labeled in the ROC plot
digits	integer indicating the number of decimal places (round) or significant digits (signif) to be used for labeling the thresholds. Negative values are allowed. See Details in the round function
...	additional parameters to be passed to plot

Value

a plot showing the ROC curve

See Also

[ROC](#)

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, NAval=0, uncertainty=TRUE)
rocd
plot.ROC(rocd, labelThres=FALSE)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
```

```

mask <- raster(system.file("external/MASK3.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
rocd
plot.ROC(rocd, labelThres=FALSE)

## End(Not run)

```

plot.TOC

*Plot the TOC curve***Description**

Plot the Total Operating Characteristic (TOC) curve

Usage

```
plot.TOC(toc, labelThres=FALSE, digits, ...)
```

Arguments

toc	an object of class TOC
labelThres	logical, default to FALSE. If TRUE, thresholds are labeled in the TOC plot
digits	integer indicating the number of decimal places (round) or significant digits (signif) to be used for labeling the thresholds. Negative values are allowed. See Details in the round function
...	additional parameters to be passed to plot

Value

a plot showing the TOC curve

See Also

[TOC](#)

Examples

```

index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, NAval=0, uncertainty=TRUE)
tocd
plot.TOC(tocd, labelThres=FALSE)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
tocd
plot.TOC(tocd, labelThres=FALSE)

## End(Not run)

```

ROC

*Construct the table for the ROC curve***Description**

Construct the table for the Relative Operating Characteristic (ROC) curve

Usage

```
ROC(index, boolean, mask=NULL, nthres=NULL, thres=NULL, NAval=0, ranking=FALSE,
    P=NA, Q=NA, uncertainty=TRUE, progress=FALSE)
```

Arguments

index	index Raster map
boolean	boolean Raster map
mask	mask Raster map
nthres	an optional integer indicating the number of equal-interval thresholds to be evaluated for the ROC curve. See Details below
thres	an optional numeric vector of thresholds to be evaluated for the ROC curve. See Details below
NAval	value for nodata (NA values) in the mask map
ranking	logical; default to FALSE. If TRUE, cell values are ranked to solve ties
P	count of reference presence observations in the population
Q	count of reference absence observations in the population
uncertainty	logical; if TRUE, uncertainty in AUC calculation is computed and maximum AUC and minimum AUC, given the uncertainty, are provided in the output. See Details below
progress	logical; if TRUE, a progress bar is shown

Details

thresholds are calculated as the unique values of the index map after masking out NA values (default option), if neither `nthres` nor `thres` is provided. The default option can be time-consuming if the amount of unique values in the index map (after masking out NA values) is large (e.g., > 1000). In the latter case, the user may prefer to enter specified thresholds (with the `thres` argument), or to indicate the number of equal-interval thresholds to be evaluated for the ROC curve (with the `nthres` argument)

Value

a list of class `ROC` containing the ROC table, the area under the curve (AUC) and the map coordinate units. Maximum AUC and minimum AUC are also provided if uncertainty is set to TRUE

See Also

[plot.ROC](#)

Examples

```

index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))

# all unique values of the index map after applying the mask are used as thresholds (default
# option)
rocd <- ROC(index, boolean, mask, NAval=0, uncertainty=TRUE)
rocd

## Not run:
# thresholds can also be defined by indicating the number of equal-interval thresholds
rocd <- ROC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
rocd

# A vector of thresholds can be used to define the thresholds
rocd <- ROC(index, boolean, mask, thres=seq(0, 100, by=10), NAval=0, uncertainty=TRUE)
rocd

## End(Not run)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
rocd <- ROC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)

## End(Not run)

```

TOC

Construct the table for the TOC curve

Description

Construct the table for the Total Operating Characteristic (TOC) curve

Usage

```
TOC(index, boolean, mask=NULL, nthres=NULL, thres=NULL, NAval=0, ranking=FALSE,
P=NA, Q=NA, uncertainty=TRUE, progress=FALSE)
```

Arguments

index	index Raster map
boolean	boolean Raster map
mask	mask Raster map
nthres	an optional integer indicating the number of equal-interval thresholds to be evaluated for the TOC curve. See Details below
thres	an optional numeric vector of thresholds to be evaluated for the TOC curve. See Details below
NAval	value for nodata (NA values) in the mask map

ranking	logical; default to FALSE. If TRUE, cell values are ranked to solve ties
P	count of reference presence observations in the population
Q	count of reference absence observations in the population
uncertainty	logical; if TRUE, uncertainty in AUC calculation is computed and maximum AUC and minimum AUC, given the uncertainty, are provided in the output. See Details below
progress	logical; if TRUE, a progress bar is shown

Details

thresholds are calculated as the unique values of the index map after masking out NA values (default option), if neither nthres nor thres is provided. The default option can be time-consuming if the amount of unique values in the index map (after masking out NA values) is large (e.g., > 1000). In the latter case, the user may prefer to enter specified thresholds (with the thres argument), or to indicate the number of equal-interval thresholds to be evaluated for the TOC curve (with the nthres argument)

Value

a list of class TOC containing the TOC table, the area under the curve (AUC), the map coordinate units, the prevalence (as pixel counts) and the population (as pixel counts). Maximum AUC and minimum AUC are also provided if uncertainty is set to TRUE

See Also

[plot.TOC](#)

Examples

```
index <- raster(system.file("external/p_built01_suitability_1.rst", package="TOC"))
boolean <- raster(system.file("external/BuiltGain1985_1999.rst", package="TOC"))
mask <- raster(system.file("external/1985NonBuilt01.rst", package="TOC"))

# all unique values of the index map after applying the mask are used as thresholds (default
# option)
tocd <- TOC(index, boolean, mask, NAval=0, uncertainty=TRUE)
tocd

## Not run:
# thresholds can also be defined by indicating the number of equal-interval thresholds
tocd <- TOC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
tocd

# A vector of thresholds can be used to define the thresholds
tocd <- TOC(index, boolean, mask, thres=seq(0, 100, by=10), NAval=0, uncertainty=TRUE)
tocd

## End(Not run)

## Not run:
index <- raster(system.file("external/Prob_Map2.rst", package="TOC"))
boolean <- raster(system.file("external/Change_Map2b.rst", package="TOC"))
mask <- raster(system.file("external/MASK3.rst", package="TOC"))
tocd <- TOC(index, boolean, mask, nthres=10, NAval=0, uncertainty=TRUE)
```

End(Not run)

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