

Package: insights (via r-universe)

September 14, 2024

Title An R implementation of the InSiGHTS framework

Version 0.3

Year 2023

Description The package provides an implementation of the InSiGHTS modelling framework for creating climate and land-use indicators. This package acts a simple wrapper to do an area-of-habitat refinements on top of climatic envelope models or species distribution models (SDMs). By default it is assumed that such models are obtained through the `ibis.iSDM` package and this package contains a simple wrapper to link the two approaches.

License CC BY 4.0

Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

Imports sf, terra, ibis.iSDM, stars, assertthat, tibble, dplyr

Remotes iiasa/ibis.iSDM

Depends R (>= 4.2.0)

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

Repository <https://iiasa.r-universe.dev>

RemoteUrl <https://github.com/iiasa/insights>

RemoteRef HEAD

RemoteSha a27d950c092e029fb5307ab02a1d1935ecc2a2ba

Contents

insights_fraction	2
insights_summary	3

Index	5
--------------	----------

insights_fraction *Apply InSiGHTS with fractional land use data*

Description

This function applies an area-of-habitat (AOH) correction to a provided single time step or multiple step range estimate (binary format). This thus assumes that species-habitat relations remain stable also in future conditions within a provided climatic niche.

It is assumed that the land-use layers come in fractional units, so are ranging from 0 to 1. Optionally also a elevation (elev) layer and habitat condition (condition) can be provided to support refinements by elevational range or habitat condition.

Usage

```
insights_fraction(range, lu, other, outfile = NULL)

## S4 method for signature 'SpatRaster,SpatRaster,SpatRaster,character'
insights_fraction(range,lu,other,outfile)

## S4 method for signature 'SpatRaster,stars,ANY,character'
insights_fraction(range,lu,other,outfile)

## S4 method for signature 'stars,stars,ANY,character'
insights_fraction(range,lu,other,outfile)

## S4 method for signature 'ANY,ANY,SpatRaster,character'
insights_fraction(range,lu,other,outfile)
```

Arguments

range	A SpatRaster or temporal stars object describing the estimated distribution of a biodiversity feature (e.g. species). Has to be in binary format! Alternatively a DistributionModel fitted with ibis.iSDM package can be supplied.
lu	A SpatRaster or temporal stars object of the future land-use fractions to be applied to the range. Each layer has to be in units of fractions, e.g. between 0 and 1.
other	Any other SpatRaster or temporal stars objects that describe suitable conditions for the species.
outfile	A writeable character of where the output should be written to. If missing, the function will return a SpatRaster or stars object respectively.

Value

Either a [SpatRaster](#) or temporal [stars](#) object or nothing if outputs are written directly to drive.

Author(s)

Martin Jung

References

- Rondinini, Carlo, and Piero Visconti. "Scenarios of large mammal loss in Europe for the 21st century." *Conservation Biology* 29, no. 4 (2015): 1028-1036.
- Visconti, Piero, Michel Bakkenes, Daniele Baisero, Thomas Brooks, Stuart HM Butchart, Lucas Joppa, Rob Alkemade et al. "Projecting global biodiversity indicators under future development scenarios." *Conservation Letters* 9, no. 1 (2016): 5-13.

`insights_summary`*Summarize inSiGHTS into an index*

Description

This function handily summarizes the suitable habitat for a given species or biodiversity feature into an index. If a single timestep (or object with a single layer) is provided, this function simply summarizes the suitable area.

Usage

```
insights_summary(obj, toArea = TRUE, relative = TRUE)

## S4 method for signature 'SpatRaster,logical,logical'
insights_summary(obj,toArea,relative)

## S4 method for signature 'stars,logical,logical'
insights_summary(obj,toArea,relative)
```

Arguments

<code>obj</code>	A SpatRaster or temporal stars object describing with the applied InSiGHTS outputs from <code>insights_fraction</code> . If the number of layers is greater than 1, the parameter "relative" might be applied.
<code>toArea</code>	A logical flag whether the suitable habitat should be summarized to area (Default: TRUE)? Note: If this parameter is set to FALSE, the suitable habitat is summarized through a "mean".
<code>relative</code>	A logical flag whether a relative index is to be constructed (Default: TRUE).

Value

A [data.frame](#) with area estimates or the respective indicator.

Author(s)

Martin Jung

References

- Baisero, Daniele, Piero Visconti, Michela Pacifici, Marta Cimatti, and Carlo Rondinini. "Projected global loss of mammal habitat due to land-use and climate change." *One Earth* 2, no. 6 (2020): 578-585.
- Powers, Ryan P., and Walter Jetz. "Global habitat loss and extinction risk of terrestrial vertebrates under future land-use-change scenarios." *Nature Climate Change* 9, no. 4 (2019): 323-329.

Index

character, [2](#)

data.frame, [3](#)

insights_fraction, [2](#)

insights_summary, [3](#)

logical, [3](#)

SpatRaster, [2](#), [3](#)

stars, [2](#), [3](#)