

Package ‘CSmosquitoSp’

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Title Spatial analysis of Citizen Science mosquito reports

Version 0.5

Description Perform spatially-oriented analysis of Citizen Science mosquito reports for specific Area Of Interest and defined temporal interval.

Depends R (>= 3.4.2), sp (>= 1.2.7), sf (>= 0.9.4), ggplot2 (>= 2.2.1)

Imports rgdal, plyr, methods, ggpubr, units

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CSmosquitoSp.analysis *CSmosquitoSp spatial analysis*

Description

This function perform spatial analysis for a selected AOI using data from the CSmosquitoSp DataBase

Usage

```
CSmosquitoSp.analysis(input_db, aoi, start_date, end_date, method = "CM",
  full_clean = FALSE, aoi_name = NULL, ...)
```

Arguments

input_db	DataFrame. Input CSmosquitoSp DataBase imported using function CSmosquitoSp.import .
aoi	Character. Area Of Interest where to perform the spatial analysis.
start_date	Character. Input start date, either an object of class Date or a character object with format 'YYYY-MM-DD'.
end_date	Character. Input end date, either an object of class Date or a character object with format 'YYYY-MM-DD'.
method	Character. Method to be used for the analysis. The following options are supported: 'CM' (Class Median), 'RC' (ReClass) (default to 'CM').
full_clean	Logical. Wheter the full cleaning of the input DataBase should be performed prior the analysis.
aoi_name	Character. Name for the Area Of Interest when 'aoi' argument is supplied as external file.
...	Additional arguments to be passed through to function CSmosquitoSp.analysis

Value

The function returns an object of class [CSmosquitoSp.obj](#) containing the following slots:

- points Report spatial points used for the analysis
- aoi Spatial polygons of the selected Area Of Interest containing the results from the spatial analysis
- aoi_name Name of the selected Area Of Interest
- start_date Start day selected for the analysis
- end_date End day selected for the analysis
- method Method used for the analysis (currently 'CM' and 'RC' are supported)

Author(s)

Federico Filipponi, Mattia Manica

See Also

[CSmosquitoSp.plot](#) [CSmosquitoSp.export](#) [CSmosquitoSp.import](#)

Examples

```
## Not run:
# perform CSmosquitoSp spatial analysis
for the metropolitan area of the city of Rome
CSMS_roma <- CSmosquitoSp.analysis(input_db=input_db,
aoi="Roma", start_date="2017-09-01", end_date="2017-09-01")

# perform CSmosquitoSp spatial analysis using the 'full_clean' option
for the metropolitan area of the city of Rome
CSMS_roma_full_clean <- CSmosquitoSp.analysis(input_db=input_db,
aoi="Roma", start_date="2017-09-01", end_date="2017-09-01", full_clean=TRUE)

## End(Not run)
```

CSmosquitoSp.export	<i>CSmosquitoSp export</i>
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Description

This function export results computed using [CSmosquitoSp.analysis](#) function a specific Area Of Interest and a selected temporal range.

Usage

```
CSmosquitoSp.export(x, output_path, points = FALSE, kml = FALSE,
sensitive = FALSE)
```

Arguments

x	Input object of class CSmosquitoSp.obj
output_path	Character. Path where maps are saved on disk.
points	Logical. When set to TRUE export points used for the analysis also in 'shapefile' format (default to FALSE).
kml	Logical. When set to TRUE results are also exported in 'kml' format (default to FALSE).
sensitive	Logical. When set to TRUE export the sensitive information in records (default to FALSE).

Value

The function export the results generated using function [CSmosquitoSp.analysis](#) to disk. Output vector file format are 'shapefile' and 'kml' (optional).

Author(s)

Federico Filipponi

See Also

[CSmosquitoSp.analysis](#) [CSmosquitoSp.plot](#)

Examples

```
## Not run:
# perform CSmosquitoSp spatial analysis
for the metropolitan area of the city of Rome
CSMS_roma <- CSmosquitoSp.analysis(input_db=input_db, aux_path=aux_path,
aoi="Roma", start_date="2017-09-01", end_date="2017-09-01")

# export result
CSmosquitoSp.export(x=CSMS_result, output_path="C:/output")

# export result also in kml format
CSmosquitoSp.export(x=CSMS_result, output_path="C:/output", kml=TRUE)

# export also points used for the analysis
CSmosquitoSp.export(x=CSMS_result, output_path="C:/output", points=TRUE)

## End(Not run)
```

CSmosquitoSp.import	<i>CSmosquitoSp import</i>
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Description

This function import CSmosquitoSp DataBase to be used for spatial analysis using function [CSmosquitoSp.analysis](#)

Usage

```
CSmosquitoSp.import(x, type = NULL)
```

Arguments

x	Character. Input path where CSmosquitoSp DataBase in CSV format is stored on disk.
type	Character. Type of the imported Citizen Science mosquito DataBase (at present only 'ZanzaMapp' type is supported)

Value

The function return a DataFrame containing the CSmosquitoSp DataBase

Author(s)

Federico Filipponi

See Also[CSmosquitoSp.analysis](#) [CSmosquitoSp.plot](#) [CSmosquitoSp.export](#)**Examples**

```
## Not run:
# set input path
input_path <- normalizePath(path=system.file("external/CSmosquitoSp_database.csv"),
winslash="/", mustWork=TRUE)
# import mosquito DataBase of type 'ZanzaMapp'
input_db <- CSmosquitoSp.import(x=input_path, type="ZanzaMapp")

###
# directly input mosquito DataBase file path in the function
input_db <- CSmosquitoSp.import(x="C:/CSmosquitoSp_database.csv", type="ZanzaMapp")

## End(Not run)
```

CSmosquitoSp.obj	<i>Class "CSmosquitoSp.obj"</i>
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Description

Result from [CSmosquitoSp.analysis](#) stored as a [CSmosquitoSp.obj](#) object. Slots for CSmosquitoSp.obj objects include: (1) the reported points from the mosquito DataBase; (2) the AOI spatial polygons containing results from the spatial analysis of the mosquito DataBase.

Slots

DB Character. Type of the imported Citizen Science mosquito DataBase

points SpatialPointsDataFrame. Report spatial points used for the analysis

aoi SpatialPolygonsDataFrame. Spatial polygons of the selected Area Of Interest containing the results from the spatial analysis

aoi_name Character. Name of the selected Area Of Interest

start_date Date. Start day selected for the analysis

end_date Date. End day selected for the analysis

method Character. Method used for the analysis (currently 'RC' and 'CM' are supported)

Objects from the class

Objects are created by calls to [CSmosquitoSp.analysis](#).

Author(s)

Federico Filipponi

See Also

[CSmosquitoSp.analysis](#) [CSmosquitoSp.plot](#) [CSmosquitoSp.export](#)

CSmosquitoSp.plot

CSmosquitoSp plot

Description

This function create spatial maps for a selected AOI using the results generated from spatial analysis of CSmosquitoSp data

Usage

```
CSmosquitoSp.plot(x, field = "VAL_PMFA",
  maptitle = "Perceived mosquito abundance", lang = "ENG",
  filename = NULL, caption_logo = FALSE, ...)
```

Arguments

x	Input object of class CSmosquitoSp.obj
field	Character. Fields to be mapped from the 'aoi' slot of object of class CSmosquitoSp.obj
maptitle	Character. 'Map title.
lang	Character. Language to use for map footer ('ENG' or 'ITA').
filename	Character. Plot result to speified file path.
caption_logo	Logical. Add the caption logo (currently available only for 'ZanzaMapp' DataBase) to the map (Default to FALSE).
...	Additional arguments to be passed through to function CSmosquitoSp.plot

Value

The function return a plot for the selected field computed from [CSmosquitoSp.analysis](#) within the Area Of Interest

Author(s)

Federico Filipponi

See Also

[CSmosquitoSp.analysis](#) [CSmosquitoSp.export](#)

Examples

```
## Not run:
# perform CSmosquitoSp spatial analysis
for the metropolitan area of the city of Rome
CSMS_roma <- CSmosquitoSp.analysis(input_db=input_db, aux_path=aux_path,
aoi="Roma", start_date="2017-09-01", end_date="2017-09-30")

# plot result
CSmosquitoSp.plot(x=CSMS_roma, field="VAL_PMFA")

## End(Not run)
```

show	<i>CSmosquitoSp methods</i>
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Description

This function define methods for the CSmosquitoSp package for class [CSmosquitoSp.obj](#) a specific Area Of Interest and a selected temporal range.

Usage

```
## S4 method for signature 'CSmosquitoSp.obj'
show(object)
```

Arguments

object CSmosquitoSp.obj. Object of class [CSmosquitoSp.obj](#)

Author(s)

Federico Filipponi

val_w	<i>CSmosquitoSp val_w</i>
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Description

Function for weighted mean

Usage

```
val_w(x, y)
```

Arguments

<i>x</i>	Numeric. Value <i>x</i>
<i>y</i>	Numeric. Value <i>y</i>

Author(s)

Federico Filipponi

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