Package 'vmsbase'

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License GPL (>= 2)

Description The tools you need to process, analyze, combine, integrate and
plot your fishery data: the georeferenced dataset from the Vessel Monitoring
System (VMS), from the Automatic Information System (AIS) or other tracking
devices, as well as the catches or landings dataset from the Logbook or Vessel
Register. Package 'vmsbase' is equipped by Viewer Tools to visually inspect data
at different steps of the analyses and to produce effective outputs for reports
and scientific publications. Viewers are conceived to show the VMS pings, to
visualize single or multiple tracks for fishing vessels, or to represent the VMS
data on Google Viewer, so that the user can produce easy to interpret and more
realistic visualization of both fishing effort and effort behaviour. Package
'vmsbase' represents the implementation of several R routines which have been
developed by the ``Tor Vergata'' University of Rome Team involved in the Italian
National Program for the Data Collection Framework for Fisheries Data between
2009-2012.

Title GUI Tools to Process, Analyze and Plot Fisheries Data

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R **topics documented:**

Index

Assign_Area   *Assign Area - Internal Function*

Description

The Assign_Area is the internal function that implements the Assign Area routine.

Usage

```
Assign_Area(evnt, box)
```

Arguments

evnt   The VMS Track Data

box   The Sea Areas Shape File Box

Details

This function, with a VMS DB Track and a Sea Areas Shape File, (see gui_vms_db_are), finds the Sea Area that contain the VMS DB Track.

Value

This function does not return a value.

References

free text reference Pointers to the literature related to this object.

See Also

gui_vms_db_are

---

bathymetry *Bathymetry rData File class*

Description

Bathymetry rData File reference Class

- `path` character The Path to the Bathymetry rData file
- `data` XYZ-matrix The loaded Bathymetry data

Details

`bathymetry` class is a reference class for the Bathymetry rData file.

CountMap *Effort Count - Internal Function*

Description

The `CountMap` is the internal function that implements the Effort Count routine.

Usage

```
CountMap(xy, GridPS)
```

Arguments

xy	The VMS Fishing Point Data
GridPS	The Sea Area Grid File

Details

This function, with a VMS DB Track and a Sea Areas Shape File, (see [gui_out_grid](#)), computes the Effort Count Vector.

Value

This function does not return a value.

References

free text reference Pointers to the literature related to this object.

See Also

[gui_out_grid](#)

---

gui_dcf_ind *DCF indicators GUI*

Description

The `gui_dcf_ind` function implements the graphical user interface for the DCF indicators computation routine.

Usage

```
gui_dcf_ind()
```

Details

This function, with a count vector generated by `gui_out_grid`, computes the DCF indicators 5 and 6.

Value

This function does not return a value.

References

Russo, T., Parisi, A., & Cataudella, S. (2013). Spatial indicators of fishing pressure: Preliminary analyses and possible developments. *Ecological indicators*, **26**, 141–153. `http://www.sciencedirect.com/science/article/pii/S1470160X12003822`

See Also

`gui_out_grid`

---

gui_join_lb_vms *VMS-LB Match GUI*

Description

The `gui_join_lb_vms` function implements the graphical user interface for the VMS-LB Matching routine.

Usage

```
gui_join_lb_vms(lb_db_name = "", vms_db_name = "")
```

Arguments

lb_db_name	The path of a LogBook DataBase
vms_db_name	The path of a VMS DataBase

Details

This function, with both VMS and LogBook databases, performs a VMS-LB track match based on vessel, track and time conformity.

Value

This function does not return a value.

References

free text reference Pointers to the literature related to this object.

---

gui_lb_db_create   *LogBook DataBase Creation GUI*

Description

The `gui_lb_db_create` function implements the graphical user interface for the creation of a logbook database. This function, with an edited logbook dataset (see [gui_lb_editraw](#)), creates a new logbook database.

Usage

```
gui_lb_db_create()
```

Value

This function does not return a value. After the execution a logbook database will be deployed.

See Also

[gui_lb_editraw](#)

---

gui_lb_db_edit   *Logbook Editing GUI*

Description

The `gui_lb_db_edit` function implements the graphical user interface for the editing of a LogBook Database

Usage

```
gui_lb_db_edit(lb_db_name = "")
```

Arguments

lb_db_name   The path of a Logbook DataBase

Details

In this gui, with a LogBook Database, the user can automatically edit the logbook DB.

Value

This function does not return a value. After the execution, the Logbook DB will be updated with the edited format.

---

gui_lb_db_stat   *LogBook DB Status GUI*

Description

The gui_lb_db_stat function implements the graphical user interface for the LogBook DB Status viewer.

Usage

```
gui_lb_db_stat(lb_db_name = "")
```

Arguments

lb_db_name   The path of a LogBook DataBase

Details

This function, with a LogBook database, shows the current LogBook DB status.

Value

This function does not return a value.

---

gui_lb_editraw   *Raw LogBook Editing GUI*

Description

The `gui_lb_editraw` function implements the graphical user interface for the editing of a raw logbook dataset

Usage

```
gui_lb_editraw()
```

Details

This function, with a raw logbook dataset, produces an edited version of it. The user must select, for each mandatory field, the column name where the data is stored.

Value

This function does not return a value. After the execution the user is asked where to put the edited file.

---

gui_lb_met_cla   *LogBook Metier Classification GUI*

Description

The `gui_lb_met_cla` function implements the graphical user interface for the LogBook metier classification

Usage

```
gui_lb_met_cla(lb_db_name = "")
```

Arguments

lb_db_name   The path of a LogBook DataBase

Details

This function, with a LogBook DB and a Metier Discovery object (see `gui_lb_met_dis`), computes a fuzzy classification of the logbooks in the seleted db according to the data provided from the Metier Discovery object.

Value

This function does not return a value. After the execution the computed result will be added to the logbook database in the 'lb_cla' table.

See Also

[gui_lb_met_dis](gui_lb_met_dis)

---

gui_lb_met_dis   *LogBook Metier Discovery GUI*

Description

The `gui_lb_met_dis` function implements the graphical user interface for the LogBook Metier Discovery

Usage

```
gui_lb_met_dis(lb_db_name = "")
```

Arguments

`lb_db_name`   The path of a LogBook DataBase

Details

This function, with a logbook database, performs a clustering over the whole db calculating the distance or dissimilarity between every observation in the sample.

Value

This function does not return a value. After the execution the user is asked where to save the result file.

---

gui_lb_met_edi   *Metier Editing GUI*

Description

The `gui_lb_met_edi` function implements the graphical user interface for the editing of a LogBook Metier file

Usage

```
gui_lb_met_edi()
```

Details

In this gui, with a LogBook Metier file, the user can change the simple discovery ordering of the clusters to a corresponding international metier code.

Value

This function does not return a value. After the execution, the edited names will be added to the LogBook Metier file.

---

gui_main   *VMSbase main GUI*

Description

The `gui_main` function implements the main graphical user interface of the VMSbase package

Usage

```
gui_main()
```

Details

With this gui the user can access all the functionalities of VMSbase

Value

This function does not return a value.

---

gui_mark_fis_poi   *Mark Fishing Points GUI*

Description

The `gui_mark_fis_poi` function implements the graphical user interface for the Fishing Point Marking routine.

Usage

```
gui_mark_fis_poi(vms_db_name = "", harb_file_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

harb_file_name   The path of a shape file with harbours point data

Details

This function, with a VMS database and a shape file with harbours points, performs a filtered search over the whole db assigning fishing status to the vms interpolated data.

Value

This function does not return a value.

---

gui_out_grid   *VMS Effort Gridding GUI*

Description

The `gui_out_grid` function implements the graphical user interface for the VMS Effort Gridding

Usage

```
gui_out_grid(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS DB and a Grid Sea Area Map shape file, computes the total fishing effort (in hours) over each cell of the submitted grid, relative to the selected metier

Value

This function does not return a value. The result count will be plotted on the submitted grid. The user can both save the result count vector as an r object (necessary for [gui_dcf_ind](#)), or the annotated grid shape file.

See Also

[gui_dcf_ind](#)

---

gui_vmsdb_mixsou   *VMS DataBase Creation GUI*

Description

The gui_vmsdb_mixsou function implements the graphical user interface for the creation of a VMS DataBase from multiple sources.

Usage

```
gui_vmsdb_mixsou()
```

Details

This function, with an edited vms dataset (see [gui_vms_editraw](#)), creates a new VMS DataBase.

Value

This function does not return a value. After the execution a VMS DataBase will be deployed.

See Also

[gui_vms_editraw](#)

---

gui_vms_db_are   *VMS DB Area Assignment GUI*

Description

The gui_vms_db_are function implements the graphical user interface for the VMS Assign Area routine.

Usage

```
gui_vms_db_are(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS database, assigns areas to VMS tracks according to median positions.

Value

This function does not return a value.

gui_vms_db_clean *VMS DB Clean GUI*

Description

The `gui_vms_db_clean` function implements the graphical user interface for the VMS DataBase Cleaning routine.

Usage

```
gui_vms_db_clean(vms_db_name = "",
                 map_file_name = "",
                 harb_file_name = "",
                 inHarbBuff = 2)
```

Arguments

vms_db_name	The path of a VMS DataBase
map_file_name	The path of a shape file with land polygon data
harb_file_name	The path of a shape file with harbours point data
inHarbBuff	Numeric, buffer radius in kilometers to flag 'in harbour' pings. Default to 2 Km.

Details

This function, with a VMS database and two shape files with land polygon and harbours points, performs a filtered search over the whole db assigning warning status to the vms raw data.

Value

This function does not return a value.

gui_vms_db_create *VMS DataBase Creation GUI*

Description

The `gui_vms_db_create` function implements the graphical user interface for the creation of a VMS DataBase.

Usage

```
gui_vms_db_create()
```

Details

This function, with an edited vms dataset (see [gui_vms_editraw](#)), creates a new VMS DataBase.

gui_vms_db_cut

Value

This function does not return a value. After the execution a VMS DataBase will be deployed.

See Also

[gui_vms_editraw](#)

---

gui_vms_db_cut   *VMS DB Cut GUI*

Description

The `gui_vms_db_cut` function implements the graphical user interface for the VMS Track cutting routine.

Usage

```
gui_vms_db_cut(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS cleaned database (see [gui_vms_db_clean](#)), assign track numbers to the raw pings of each vessel in the VMS DB.

Value

This function does not return a value.

See Also

[gui_vms_db_clean](#)

---

gui_vms_db_dep   *VMS DB Depth Assignment GUI*

Description

The gui_vms_db_dep function implements the graphical user interface for the VMS Assign Depth routine.

Usage

```
gui_vms_db_dep(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS database, assigns depths to VMS interpolated points according to positions on the 3D spline of XYZ bathymetry data downloaded from NOAA servers.

Value

This function does not return a value.

---

gui_vms_db_intr   *VMS DB Interpolation GUI*

Description

The gui_vms_db_intr function implements the graphical user interface for the VMS Track Interpolation routine.

Usage

```
gui_vms_db_intr(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS cleaned and cutted database (see gui_vms_db_cut and gui_vms_db_clean), interpolates track data of each vessel in the VMS DB.

Value

This function does not return a value.

References

Russo, T., Parisi, A. and Cataudella, S. (2011) New insights in interpolating fishing tracks from VMS data for different metiers. *Fisheries Research*, **108(1)**, 184–194. `http://www.sciencedirect.com/science/article/pii/S0165783610003450`

See Also

`gui_vms_db_cut` `gui_vms_db_clean`

---

gui_vms_db_sel *VMS DataBase Select GUI*

Description

The `gui_vms_db_sel` function implement the graphical user interface for the VMS DataBase Select routine.

Usage

```
gui_vms_db_sel(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS DataBase (see `gui_vms_db_stat`), enables the user to perform queries on, and extract data from, the submitted VMS DataBase.

Value

This function does not return a value.

See Also

`gui_vms_db_stat`

---

gui_vms_db_stat *VMS DataBase Status GUI*

Description

The `gui_vms_db_stat` function implements the graphical user interface for the VMS DataBase Status viewer.

Usage

```
gui_vms_db_stat(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS DataBase, shows the current VMS DataBase status.

Value

This function does not return a value.

---

gui_vms_editraw *Raw VMS Editing GUI*

Description

The `gui_vms_editraw` function implements the graphical user interface for the editing of a raw vms dataset

Usage

```
gui_vms_editraw()
```

Details

This function, with a raw vms dataset, produces an edited version of it. The user must select, for each mandatory field, the column name where the data is stored.

Value

This function does not return a value. After the execution the user is asked where to put the edited file.

---

gui_vms_met_pred *Predict Metier GUI*

Description

The gui_vms_met_pred function implements the graphical user interface for the Metier Prediction

Usage

```
gui_vms_met_pred(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS database and a shape file with harbours points, performs a neural network prediction over the whole db assigning metier data to vms tracks based on a training with existing vms-lb match data given by the database.

Value

This function does not return a value.

References

Russo, T., Parisi, A., Prorgi, M., Boccoli, F., Cignini, I., Tordoni, M. and Cataudella, S. (2011) When behaviour reveals activity: Assigning fishing effort to metiers based on VMS data using artificial neural networks. *Fisheries Research*, **111(1)**, 53–64. http://www.sciencedirect.com/science/article/pii/S0165783611002281

---

gui_vms_save_bat *VMS DB Save Bathymetry GUI*

Description

The gui_vms_save_bat function implements the graphical user interface for the VMS Save Bathymetry routine.

Usage

```
gui_vms_save_bat(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS database, downloads an XYZ bathymetry file from NOAA servers.

Value

This function does not return a value.

See Also

[gui_vms_view_ping](#) [gui_vms_view_track](#) [gui_vms_view_intrp](#)

---

gui_vms_view_intrp   *VMS DB View Interpolated Data GUI*

Description

The gui_vms_view_intrp function implements the graphical user interface for the VMS DB routine to view interpolated data.

Usage

```
gui_vms_view_intrp(vms_db_name = "", bathy_file_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

bathy_file_name

                The path of a Bathymetry file

Details

This function, with a VMS database, plots vessel and track data.

Value

This function does not return a value.

See Also

[gui_vms_view_ping](#) [gui_vms_view_track](#) [gui_vms_save_bat](#)

gui_vms_view_ping   *VMS DB View Raw Ping Data GUI*

Description

The gui_vms_view_ping function implements the graphical user interface for the VMS DB routine to view raw ping data.

Usage

```
gui_vms_view_ping(vms_db_name = "", bathy_file_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

bathy_file_name
                  The path of a Bathymetry file

Details

This function, with a VMS database, plots vessel data.

Value

This function does not return a value.

See Also

gui_vms_save_bat gui_vms_view_track gui_vms_view_intrp

---

gui_vms_view_track   *VMS DB View Track Data GUI*

Description

The gui_vms_view_track function implements the graphical user interface for the VMS DB routine to view track data.

Usage

```
gui_vms_view_track(vms_db_name = "", bathy_file_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

bathy_file_name
                  The path of a Bathymetry file

Details

This function, with a VMS database, plots vessel and track data.

Value

This function does not return a value.

See Also

gui_vms_view_ping gui_vms_save_bat gui_vms_view_intrp

---

gui_vms_viz_adv *VMS DB View Track Data GUI*

Description

The `gui_vms_view_track` function implements the graphical user interface for the VMS DB routine to view vessel and track data with the Google Maps capabilities.

Usage

```
gui_vms_viz_adv(vms_db_name = "")
```

Arguments

vms_db_name   The path of a VMS DataBase

Details

This function, with a VMS database, plots vessel and track data on Hybrid Satellite images from Google Maps.

Value

This function does not return a value.

See Also

gui_vms_view_ping gui_vms_view_track gui_vms_view_intrp

---

harbCoo *Harbours Coordinates Shape File class*

Description

Harbours coordinates Shape File reference Class

- `path` character The Path to the harbours coordinates shape file
- `data` SpatialPointsDataFrame The loaded harbours coordinates data

Details

`harbCoo` class is a reference class for the Harbours Coordinates shape file.

Join2shp *Shape File Data Joining - Internal Function*

Description

The `Join2shp` is the internal function that implements the Shape File Data Joining routine.

Usage

```
Join2shp(shpfile, datavector, dirdest)
```

Arguments

shpfile	The Original Grid Shape File
datavector	The Effort Count Vector
dirdest	The File Destination Directory

Details

This function, with a Grid Shape File, an Effort Count Vector and a File Destination Directory, (see [gui_out_grid](#)), creates a new Grid Shape File annotated with the Effort Count Vector.

Value

This function does not return a value.

References

free text reference Pointers to the literature related to this object.

See Also

[gui_out_grid](#)

---

kno2kmh   *Knots to Km/h speed conversion function*

Description

kno2kmh converts speed in knots to km/h values.

Usage

```
kno2kmh(speed)
```

Arguments

speed   The value in knots of the speed.

Value

The function returns the speed value converted in km/h

Examples

```
kno2kmh(speed = c(3, 4.5, 5))
```

---

latsex2dec   *Sexagesimal to Decimal Latitude conversion function*

Description

latsex2dec converts sexagesimal latitude data to decimal latitude values.

Usage

```
latsex2dec(degree, minute, second, direction)
```

Arguments

degree   The value in degrees of the latitude.

minute   The value in minutes of the latitude.

second   The value in seconds of the latitude.

direction   The direction, as "N" or "S", of the latitude.

Value

The function returns the latitude value converted in the decimal numeral system

Examples

```
latsex2dec(degree = 10, minute = 10, second = 10, direction = "N")
```

---

log_Cla   *LogBook Clustering class*

Description

LogBook Clustering rData file reference Class

- data character The Clustering result data
- options character Metier manual annotation

Details

log_Cla class is a reference class for the Logbook Clustering rData file.

---

log_DB   *LogBook DataBase class*

Description

LogBook DataBase reference Class

- dir character path of the LogBook DataBase
- db character name of the LogBook DataBase
- tab character tables in the LogBook DataBase

Details

log_DB class is a reference class for the Logbook DataBase.

---

log_File   *LogBook File Class*

Description

LogBook File reference Class

- path character path of the logbook file
- data data.frame data from the logbook file

Details

log_File class is a reference class for the LogBook file.

---

lonsex2dec *Sexagesimal to Decimal Longitude conversion function*

Description

lonsex2dec converts sexagesimal longitude data to decimal longitude values.

Usage

```
lonsex2dec(degree, minute, second, direction)
```

Arguments

degree   The value in degrees of the longitude.

minute   The value in minutes of the longitude.

second   The value in seconds of the longitude.

direction   The direction, as "E" or "W", of the longitude.

Value

The function returns the longitude value converted in the decimal numeral system

Examples

```
lonsex2dec(degree = 10, minute = 10, second = 10, direction = "W")
```

---

plotNet *Neural Network Plotting - Internal Function*

Description

The plotNet is the internal function that implements the Neural Network Plotting routine.

Usage

```
plotNet(net, Dg, ConfMat)
```

Arguments

net   The Neural Network

Dg   The Prediction Index

ConfMat   The Confusion Matrix

Details

This function, with a Neural Network, a Prediction Index and a Confusion Matrix, generated by [gui_vms_met_pred](#), plots the graphical overall result of the neural network prediction.

Value

This function does not return a value.

References

free text reference Pointers to the literature related to this object.

See Also

[gui_vms_met_pred](#)

---

polymap   *Land Map Shape File class*

Description

Land Map Shape File reference Class

- path character The Path to the Land Map shape file

- data SpatialPolygonsDataFrame The loaded Land Map data

Arguments

path   character The Path to the Land Map shape file

data   SpatialPolygonsDataFrame The loaded Land Map data

Details

polymap class is a reference class for the Land Map shape file.

---

que_vms_DB   *VMS DataBase Query class*

Description

VMS DataBase Query reference Class

- dir character path of the VMS DataBase
- db character name of the VMS DataBase
- que character query for the VMS DataBase

Details

que_vms_DB class is a reference class for the VMS DataBase.

---

rad2deg   *Radians to Degree Angles conversion function*

Description

rad2deg converts radian heading data to degree values.

Usage

```
rad2deg(heading)
```

Arguments

heading   The value in radians of the heading.

Value

The function returns the heading value converted in degrees

Examples

```
rad2deg(heading = 1.4)
```

---

saveRawLogBook   *Raw LogBook editing function*

Description

saveRawLogBook implements the routines that converts raw values to standard data.

Usage

```
saveRawLogBook(rawfile, widget)
```

Arguments

rawfile   The raw LogBook dataset.

widget   The widget list that contains the editing infos.

Value

The function returns the standardized VMS data.

See Also

gui_lb_editraw

---

saveRawVms   *Raw VMS editing function*

Description

saveRawVms implements the routines that converts raw values to standard data.

Usage

```
saveRawVms(rawfile, widget)
```

Arguments

rawfile   The raw VMS dataset.

widget   The widget list that contains the editing infos.

Value

The function returns the standardized VMS data.

See Also

gui_vms_editraw

---

vmsbase *GUI Tools to Process, Analyze and Plot Fisheries Data*

Description

Within **vmsbase** you can process, analyze, combine, integrate and plot: the georeferenced dataset from the *Vessel Monitoring System (VMS)*, the *Automatic Information System (AIS)* or other tracking devices, as well as the catches or landings dataset from the Logbook or Vessel Register, which constitute the primary sources of information for spatially explicit models of the fishing effort. **vmsbase** is conceived to solve many of the nuisance details related to this specific kind of data, providing a straightforward path from data massaging and management to sophisticated analyses and outputs.

Details

The only function you're likely to need from **vmsbase** is `gui_main`. All the other functionalities are available from the main Graphical User Interface but can also be invoked with the corresponding functions.

References

https://github.com/vmsbase/R-vmsbase

Russo, T., D'Andrea, L., Parisi, A. and Cataudella, S. (2014) VMSbase: An R-Package for VMS and Logbook Data Management and Analysis in Fisheries Ecology. *PloS one*, **9(6)**, e100195. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0100195

---

vms_DB *VMS DataBase class*

Description

VMS DataBase reference Class

- `dir` character path of the VMS DataBase
- `db` character name of the VMS DataBase
- `tab` character tables in the VMS DataBase

Details

`vms_DB` class is a reference class for the VMS DataBase.

vms_File *VMS File Class*

Description

VMS File reference Class

- `path` character path of the vms file
- `data` data.frame data from the vms file

Details

`vms_File` class is a reference class for the VMS file.

Index