Package 'rpostgis'

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|---|
| Title PostGIS and PostgreSQL related functions |
| Description This package provides additional functions to the RPostgreSQL package, mostly convenient wrappers, with some PostGIS oriented functions. |
| Author Mathieu Basille, David Bucklin |
| Maintainer David Bucklin <david.bucklin@gmail.com></david.bucklin@gmail.com> |
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| <pre>URL http://ase-research.org/basille/rpostgis RoxygenNote 5.0.1</pre> |
| R topics documented: |
| pgAddKey pgAsDate pgColumn pgColumnInfo pgComment pgDrop pgGetBoundary pgGetLines pgGetPolys pgGetPs |

2 pgAddKey

Index 20

Description

Add a primary or foreign key to a table column.

Usage

```
pgAddKey(conn, name, colname, type = c("primary", "foreign"), reference,
colref, display = TRUE, exec = TRUE)
```

Arguments

| conn | A connection object. |
|-----------|---|
| name | A character string specifying a PostgreSQL table name. |
| colname | A character string specifying the name of the column to which the key will be assign. |
| type | The type of the key, either primary or foreign |
| reference | A character string specifying a foreign table name to which the foreign key will be associated. |
| colref | A character string specifying the name of the primary key in the foreign table to which the foreign key will be associated. |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |

Author(s)

Mathieu Basille

basille@ase-research.org>

See Also

 $The\ PostgreSQL\ documentation: \ http://www.postgresql.org/docs/current/static/sql-altertable.$ html

```
pgAddKey(name = c("fla", "bli"), colname = "id", type = "foreign",
    reference = c("flu", "bla"), colref = "id", exec = FALSE)
```

pgAsDate 3

Description

Convert a date field to a timestamp with or without time zone.

Usage

```
pgAsDate(conn, name, date = "date", tz = NULL, display = TRUE,
  exec = TRUE)
```

Arguments

| conn | A connection object. |
|---------|---|
| name | A character string specifying a PostgreSQL table name. |
| date | A character string specifying the date field. |
| tz | A character string specifying the time zone, in "EST", "America/New_York", "EST5EDT", "-5". |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |

Author(s)

Mathieu Basille

basille@ase-research.org>

See Also

 $The\ PostgreSQL\ documentation: \ http://www.postgresql.org/docs/current/static/datatype-datetime. \ html$

Examples

```
pgAsDate(name = c("fla", "bli"), date = "date", tz = "GMT", exec = FALSE)
```

| pgColumn | Add or remove a column | |
|----------|------------------------|--|
|----------|------------------------|--|

Description

Add or remove a column to/from a table.

Usage

```
pgColumn(conn, name, colname, action = c("add", "drop"),
  coltype = "integer", cascade = FALSE, display = TRUE, exec = TRUE)
```

4 pgColumnInfo

Arguments

| conn | A connection object. |
|---------|---|
| name | A character string specifying a PostgreSQL table name. |
| colname | A character string specifying the name of the column to which the key will be associated. |
| action | A character string specifying if the column is to be added ("add", default) or removed ("drop"). |
| coltype | A character string indicating the type of the column, if action = "add". |
| cascade | $Logical.\ Whether to drop\ foreign\ key\ constraints\ of\ other\ tables, if\ action\ =\ "drop".$ |
| display | Logical. Whether to display the query (defaults to TRUE). |
| | |

Logical. Whether to execute the query (defaults to TRUE).

Author(s)

exec

Mathieu Basille <basille@ase-research.org>

See Also

 $The Postgre SQL \ documentation: \ http://www.postgresql.org/docs/current/static/sql-altertable. \ html$

Examples

pgColumnInfo

Get information about columns in a PostgreSQL table.

Description

Get information about columns in a PostgreSQL table.

Usage

```
pgColumnInfo(conn, name, allinfo = FALSE)
```

Arguments

| conn | A connection object to a PostgreSQL database |
|------|--|
| name | A character string specifying a PostgreSQL schema (if necessary), and table or |
| | view name geometry (e.g., name = c("schema", "table")) |

allinfo logical, Get all information on table? Default is column names, types, nullable,

and maximum length of character columns

pgComment 5

Value

data frame

Author(s)

David Bucklin <david.bucklin@gmail.com>

Examples

pgComment

Comment table/view/schema

Description

Comment on a table, a view or a schema.

Usage

```
pgComment(conn, name, comment, type = c("table", "view", "schema"),
  display = TRUE, exec = TRUE)
```

Arguments

conn A connection object.

name A character string specifying a PostgreSQL table, view or schema name.

comment A character string specifying the comment.

type The type of the object to comment, either table or view display Logical. Whether to display the query (defaults to TRUE). exec Logical. Whether to execute the query (defaults to TRUE).

Author(s)

Mathieu Basille <basille@ase-research.org>

See Also

```
The\ PostgreSQL\ documentation: \ http://www.postgresql.org/docs/current/static/sql-comment. \\ html
```

6 pgDrop

Examples

```
pgComment(name = c("fla", "bli"), comment = "Comment on a view.",
    type = "view", exec = FALSE)
pgComment(name = "fla", comment = "Comment on a schema.", type = "schema",
    exec = FALSE)
```

pgDrop

Drop table/view/schema

Description

Drop a table, a view or a schema.

Usage

```
pgDrop(conn, name, type = c("table", "view", "schema"), ifexists = FALSE,
  cascade = FALSE, display = TRUE, exec = TRUE)
```

Arguments

| conn | A connection object. |
|----------|---|
| name | A character string specifying a PostgreSQL table, view or schema name. |
| type | The type of the object to comment, either table or view |
| ifexists | Do not throw an error if the table does not exist. A notice is issued in this case. |
| cascade | Automatically drop objects that depend on the table (such as views). |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |

Author(s)

Mathieu Basille <basille@ase-research.org>

See Also

```
pgDrop(name = c("fla", "bli"), type = "view", exec = FALSE)
pgDrop(name = "fla", type = "schema", cascade = "TRUE", exec = FALSE)
```

pgGetBoundary 7

| pgGetBoundary | Returns bounding envelope of all combined geometries or rasters stored in a table in a PostgreSQL database. |
|---------------|---|
| | 210.100 II. II. II. II. II. II. II. II. II. I |

Description

Retrieve bounding envelope (rectangle) of all geometries or rasters in a table in Postgresql.

Usage

```
pgGetBoundary(conn, name, geom = "geom")
```

Arguments

conn A connection object to a PostgreSQL database

name A character string specifying a PostgreSQL schema (if necessary), and table or

view name for the table holding the geometries/raster(s) (e.g., name = c("schema", "table"))

geom character, Name of the column in 'name' holding the geometry or raster object

(Default = 'geom')

Value

SpatialPolygon

Author(s)

David Bucklin <david.bucklin@gmail.com>

8 pgGetLines

| pgGet | inaa |
|-------|--------|
| 11917 | 111145 |
| | |

Load a linestring geometry stored in a PostgreSQL database into R.

Description

Retrieve line geometries from a PostGIS table, and convert it to a SpatialLines or a SpatialLines-DataFrame.

Usage

```
pgGetLines(conn, name, geom = "geom", gid = NULL, other.cols = "*",
   query = NULL)
```

Arguments

| conn | A connection object to a PostgreSQL database |
|------------|---|
| name | A character string specifying a PostgreSQL schema (if necessary), and table or view name for the table holding the lines geometry (e.g., name = $c("schema","table")$) |
| geom | character, Name of the column in 'name' holding the geometry object (Default = 'geom') |
| gid | character, Name of the column in 'name' holding the ID for each line. Should be unique if additional columns of unique data are being appended. gid=NULL (default) automatically creates a new unique ID for each row in the table. |
| other.cols | character, names of additional columns from table (comma-seperated) to append to dataset (Default is all columns, NULL returns a SpatialLines object) |
| query | character, additional SQL to append to modify select query from table |

Value

SpatialLinesDataFrame or SpatialLines

Author(s)

David Bucklin <david.bucklin@gmail.com>

pgGetPolys 9

| pgGetPolys | Load a polygon geometry stored in a PostgreSQL database into R . |
|------------|--|
| | |

Description

Retrieve polygon geometries from a PostGIS table, and convert it to a SpatialPolygons or a SpatialPolygonsDataFrame.

Usage

```
pgGetPolys(conn, name, geom = "geom", gid = NULL, other.cols = "*",
   query = NULL)
```

Arguments

| conn | A connection object to a PostgreSQL database |
|------------|---|
| name | A character string specifying a PostgreSQL schema (if necessary), and table or view name for the table holding the polygon geometry (e.g., name = c("schema","table")) |
| geom | character, Name of the column in 'name' holding the geometry object (Default = 'geom') |
| gid | character, Name of the column in 'name' holding the ID for each polygon geometry. Should be unique if additional columns of unique data are being appended. gid=NULL (default) automatically creates a new unique ID for each row in the table. |
| other.cols | character, names of additional columns from table (comma-seperated) to append to dataset (Default is all columns, other.cols=NULL returns a SpatialPolygons object) |
| query | character, additional SQL to append to modify select query from table |

Value

SpatialPolygonsDataFrame or SpatialPolygons

Author(s)

David Bucklin <david.bucklin@gmail.com>

10 pgGetPts

| ngGet | +D+c | |
|-------|------|--|

Load a point geometry stored in a PostgreSQL database into R.

Description

Retrieve point geometries from a PostGIS table, and convert it to a SpatialPoints or a SpatialPoints-DataFrame.

Usage

```
pgGetPts(conn, name, geom = "geom", gid = NULL, other.cols = "*",
   query = NULL)
```

Arguments

| conn | A connection object to a PostgreSQL database |
|------------|---|
| name | A character string specifying a PostgreSQL schema (if necessary), and table or view name for the table holding the points geometry (e.g., name = c("schema", "table")) |
| geom | The name of the point geometry column. (Default = 'geom') |
| gid | Name of the column in 'name' holding the ID. Should be unique if additional columns of unique data are being appended. gid=NULL (default) automatically creates a new unique ID for each row in the table. |
| other.cols | Names of specific columns in the table to retrieve, comma seperated in one character element (e.g. other.cols='col1,col2'. The default is to attach all columns in a SpatialPointsDataFrame. Setting other.cols=NULL will return a SpatialPoints. |
| query | character, additional SQL to append to modify select query from table |

Value

A Spatial(Multi)Points or a Spatial(Multi)PointsDataFrame

Author(s)

```
David Bucklin <david.bucklin@gmail.com>
Mathieu Basille <basille@ase-research.org>
```

```
## Not run:
## Retrieve a SpatialPointsDataFrame with all data from table 'schema.tablename',
with geometry in the column 'geom'
pgGetPts(conn, c('schema','tablename'))
## Return a SpatialPointsDataFrame with columns c1 & c2 as data
pgGetPts(conn, c('schema','tablename'), other.cols = 'c1,c2')
## Return a SpatialPoints, retaining id from table as rownames
pgGetPts(conn, c('schema','tablename'), gid = 'table_id', other.cols = FALSE)
## End(Not run)
```

pgGetRast 11

| pgGetRast | Load a raster stored in a PostgreSQL database into R. |
|-----------|---|
| | |

Description

Retrieve rasters from a PostGIS table

Usage

```
pgGetRast(conn, name, rast = "rast", digits = 9, boundary = NULL)
```

Arguments

| conn | A connection object to a PostgreSQL database |
|----------|--|
| name | A character string specifying a PostgreSQL schema (if necessary), and table or view name for the table holding the raster (e.g., name = $c("schema","table"))$ |
| rast | Name of the column in 'name' holding the raster object |
| digits | numeric, precision for detecting whether points are on a regular grid (a low number of digits is a low precision) - From rasterFromXYZ function (raster package) |
| boundary | sp object or numeric. A Spatial* object, whose bounding box will be used to select the part of the raster to import. Alternatively, four numbers (e.g. c(north, south, east, west)) indicating the projection-specific limits with |

which to clip the raster. NULL (default) will return the full raster.

Value

RasterLayer

Author(s)

David Bucklin <david.bucklin@gmail.com>

12 pgIndex

| pgIndex CREATE INDEX |
|----------------------|
|----------------------|

Description

Defines a new index.

Usage

```
pgIndex(conn, name, colname, idxname, unique = FALSE, method = c("btree",
   "hash", "rtree", "gist"), display = TRUE, exec = TRUE)
```

Arguments

| conn | A connection object. |
|---------|--|
| name | A character string specifying a PostgreSQL table name. |
| colname | A character string specifying the name of the column to which the key will be associated. |
| idxname | A character string specifying the name of the index to be created. By default, this is the name of the table (without the schema) suffixed by _idx. |
| unique | Logical. Causes the system to check for duplicate values in the table when the index is created (if data already exist) and each time data is added. Attempts to insert or update data which would result in duplicate entries will generate an error. |
| method | The name of the method to be used for the index. Choices are "btree", "hash", "rtree", and "gist". The default method is btree. |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |

Author(s)

Mathieu Basille <basille@ase-research.org>

See Also

```
The PostgreSQL \ documentation: \ http://www.postgresql.org/docs/current/static/sql-createindex. \ html; the PostGIS \ documentation for GiST indexes: \ http://postgis.net/docs/using_postgis_dbmanagement.html#id541286
```

```
pgIndex(name = c("fla", "bli"), colname = "wkb_geometry", method = "gist",
    exec = FALSE)
```

pgInsert 13

| pgInsert | Inserts data from a pgInsertize* object into a PostgreSQL table |
|----------|---|
| | |

Description

Inserts data from a pgInsertize* object into a PostgreSQL table

Usage

```
pgInsert(conn, pgi, name = NULL, encoding = NULL)
```

Arguments

conn A connection object to a PostgreSQL database

pgi The output PostgreSQL insert object (pgi) created by pgInsertize() or pgInser-

tizeGeom())

name character strings specifying a PostgreSQL schema and table name to insert into

(e.g., name = c("schema", "table")). If table was specified in the pgInsertize*

through create.table or force.match, leave this NULL.

encoding Character vector of length 2, containing the from/to encodings for the data (as in

the function iconv. For example, if your dataset contain certain latin characters

(e.g., accent marks), and the database is in UTF-8, use encoding = c("latin1", "UTF-8").

Left NULL, no conversion will be done.

Value

DBIResult

Author(s)

David Bucklin <david.bucklin@gmail.com>

14 pgInsertize

```
# insert data in database table (note that an error will be given if
# all insert columns do not match exactly to database table columns)
pgInsert(conn,c("schema","meuse_data"),pgi=pgi)
## End(Not run)
```

pgInsertize

Formats an R data frame for insert into a PostgreSQL table (for use with pgInsert)

Description

Formats an R data frame for insert into a PostgreSQL table (for use with pgInsert)

Usage

```
pgInsertize(df, create.table = NULL, force.match = NULL, conn = NULL,
   new.id = NULL)
## S3 method for class 'pgi'
print(pgi)
```

Arguments

| df | A data frame |
|--------------|--|
| create.table | character, schema and table of the PostgreSQL table to create (actual table creation will be done in later in pgInsert().) Column names will be converted to PostgreSQL-compliant names. Default is NULL (no new table created). |
| force.match | character, schema and table of the PostgreSQL table to compare columns of data frame with If specified, only columns in the data frame that exactly match the database table will be kept, and reordered to match the database table. Default is NULL (all columns names will be kept, and in the same order given in the data frame.) |
| conn | A database connection (required if a table is given in for "force.match" parameter) |
| new.id | character, name of a new sequential integer ID column to be added to the table. |
| object | A list of class pgi, output from the pgInsertize() or pgInsertizeGeom() functions from the rpostgis package. |

Value

pgi object, a list containing four character strings- (1) in.table, the table name which will be created or inserted into, if specified by either create.table or force.match (else NULL) (2) db.new.table, the SQL statement to create the new table, if specified in create.table (else NULL), (3) db.cols.insert, a character string of the database column names to make inserts on, and (4) insert.data, a character string of the data to insert. See examples for usage within the pgInsert function.

Author(s)

David Bucklin <david.bucklin@gmail.com>

pgInsertizeGeom 15

Examples

```
## Not run:
#connect to database
library(RPostgreSQL)
drv<-dbDriver("PostgreSQL")</pre>
conn<-dbConnect(drv,dbname='dbname',host='host',port='5432',</pre>
               user='user',password='password')
## End(Not run)
data < -data.frame(a=c(1,2,3),b=c(4,NA,6),c=c(7,'text',9))
#format all columns for insert
values<-pgInsertize(df=data)</pre>
## Not run:
# insert data in database table (note that an error will be given if all insert columns
# do not match exactly to database table columns)
pgInsert(conn,c("schema","table"),pgi=values)
##
#run with forced matching of database table column names
values<-pgInsertize(df=data,force.match=c("schema","table"),conn=conn)</pre>
pgInsert(conn,c("schema","table"),pgi=values)
## End(Not run)
```

pgInsertizeGeom

Formats an R sp object (Spatial* or Spatial*DataFrame) for insert (with geometry) into a PostgreSQL table (for use with pgInsert).

Description

Formats an R sp object (Spatial* or Spatial*DataFrame) for insert (with geometry) into a Post-greSQL table (for use with pgInsert).

Usage

```
pgInsertizeGeom(sdf, geom = "geom", create.table = NULL, multi = FALSE,
  force.match = NULL, conn = NULL, new.gid = NULL)
## S3 method for class 'pgi'
print(pgi)
```

Arguments

sdf A Spatial* or Spatial*DataFrame
geom character string, the name of geometry column in the database table. (existing or to be created; defaults to 'geom')

16 pgInsertizeGeom

create.table character, schema and table of the PostgreSQL table to create (actual table creation will be done in later in pgInsert().) Column names will be converted to PostgreSQL-compliant names. Default is NULL (no new table created). multi Logical, if PostGIS geometry column is/will be of Multi* type set to TRUE force.match character, schema and table of the PostgreSQL table to compare columns of data frame with If specified, only columns in the data frame that exactly match the database table will be kept, and reordered to match the database table. If NULL, all columns will be kept in the same order given in the data frame. A database connection (if a table is given in for "force.match" parameter) conn character, name of a new sequential integer ID column to be added to the table. new.gid object

A list of class pgi, output from the pgInsertize() or pgInsertizeGeom() functions

from the rpostgis package.

Value

List containing four character strings- a list containing four character strings- (1) in table, the table name which will be created or inserted into, if specifed by either create table or force match (else NULL) (2) db.new.table, the SQL statement to create the new table, if specified in create.table (else NULL), (3) db.cols.insert, a character string of the database column names to make inserts on, and (4) insert.data, a character string of the data to insert. See examples for usage within the pgInsert function.

Author(s)

David Bucklin <david.bucklin@gmail.com>

```
library(sp)
data(meuse)
coords <- SpatialPoints(meuse[, c("x", "y")])</pre>
spdf<- SpatialPointsDataFrame(coords, meuse)</pre>
#format data for insert
pgi<-pgInsertizeGeom(spdf,geom="point_geom")</pre>
## Not run:
library(RPostgreSQL)
drv<-dbDriver("PostgreSQL")</pre>
conn<-dbConnect(drv,dbname='dbname',host='host',port='5432',</pre>
                user='user',password='password')
# insert data in database table (note that an error will be given if all
# insert columns do not have exactly matching database table columns)
pgInsert(conn,c("schema","meuse_data"),pgi=pgi)
## End(Not run)
```

pgMakePts 17

| pgMakePts $Add\ a$ | POINT or LINESTRING geometry field. |
|--------------------|-------------------------------------|
|--------------------|-------------------------------------|

Description

Add a new POINT or LINESTRING geometry field.

Usage

```
pgMakePts(conn, name, colname = "pts_geom", x = "x", y = "y", srid,
  index = TRUE, display = TRUE, exec = TRUE)

pgMakeStp(conn, name, colname = "stp_geom", x = "x", y = "y", dx = "dx",
  dy = "dy", srid, index = TRUE, display = TRUE, exec = TRUE)
```

Arguments

| conn | A connection object. |
|---------|--|
| name | A character string specifying a PostgreSQL table name. |
| colname | A character string specifying the name of the new geometry column. |
| x | The name of the x/longitude field. |
| У | The name of the y/latitude field. |
| srid | A valid SRID for the new geometry. |
| index | Logical. Whether to create an index on the new geometry. |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |
| dx | The name of the dx field (i.e. increment in x direction). |
| dy | The name of the dy field (i.e. increment in y direction). |

Author(s)

Mathieu Basille <basille@ase-research.org>

See Also

The PostGIS documentation for ST_MakePoint: http://postgis.net/docs/ST_MakePoint.html, and for ST_MakeLine: http://postgis.net/docs/ST_MakeLine.html, which are the main functions of the call.

18 pgVacuum

| pgSchema | Create schema | |
|----------|---------------|--|
| | | |

Description

Create a schema.

Usage

```
pgSchema(conn, name, display = TRUE, exec = TRUE)
```

Arguments

conn A connection object.

name A character string specifying a PostgreSQL schema name.
display Logical. Whether to display the query (defaults to TRUE).
exec Logical. Whether to execute the query (defaults to TRUE).

Author(s)

Mathieu Basille

dasille@ase-research.org>

See Also

 $The \ Postgre SQL\ documentation: \ http://www.postgresql.org/docs/current/static/sql-createschema.html$

Examples

```
pgSchema(name = "schema", exec = FALSE)
```

| pgVacuum | VACUUM | |
|----------|--------|--|
| | | |

Description

Performs a VACUUM (garbage-collect and optionally analyze) on a table.

Usage

```
pgVacuum(conn, name, full = FALSE, verbose = FALSE, analyze = TRUE,
  display = TRUE, exec = TRUE)
```

rpostgis 19

Arguments

| conn | A connection object. |
|---------|---|
| name | A character string specifying a PostgreSQL table name. |
| full | Logical. Whether to perform a "full" vacuum, which can reclaim more space, but takes much longer and exclusively locks the table. |
| verbose | Logical. Whether to print a detailed vacuum activity report for each table. |
| analyze | Logical. Whether to update statistics used by the planner to determine the most efficient way to execute a query (default to TRUE). |
| display | Logical. Whether to display the query (defaults to TRUE). |
| exec | Logical. Whether to execute the query (defaults to TRUE). |
| | |

Author(s)

Mathieu Basille <basille@ase-research.org>

See Also

 $The\ PostgreSQL\ documentation: \ http://www.postgresql.org/docs/current/static/sql-vacuum. \ html$

Examples

```
pgVacuum(name = c("fla", "bli"), full = TRUE, exec = FALSE)
```

| rpostgis | PostGIS and PostgreSQL functions | |
|----------|----------------------------------|--|
| | | |

Description

rpostgis

Details

This package provides additional functions to the RPostgreSQL package, mostly convenient wrappers to PostgreSQL queries, with some PostGIS oriented functions. For a list of documented functions, use library(help = "rpostgis")

Author(s)

Mathieu Basille <basille@ase-research.org>

Index

```
pgAddKey, 2
pgAsDate, 3
pgColumn, 3
pgColumnInfo, 4
pgComment, 5
pgDrop, 6
pgGetBoundary, 7
pgGetLines, 8
pgGetPolys, 9
pgGetPts, 10
pgGetRast, 11
pgIndex, 12
pgInsert, 13
pgInsertize, 14
pgInsertizeGeom, 15
pgMakePts, 17
pgMakeStp (pgMakePts), 17
pgSchema, 18
pgVacuum, 18
print.pgi (pgInsertizeGeom), 15
print.pgi (pgInsertize), 14
rpostgis, 19
rpostgis-package(rpostgis), 19
```