# Package 'rpostgis'

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Title PostGIS and PostgreSQL related functions
<b>Description</b> 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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URL http://ase-research.org/basille/rpostgis RoxygenNote 5.0.1  R topics documented:
pgAddKey pgAsDate pgColumn pgColumnInfo pgComment pgDrop pgGetBoundary pgGetLines pgGetPolys pgGetPts pgGetRast pgIndex pgInsert

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pgAddKey Add key

### **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

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

```
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 <br/>
<br/>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)
```

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### **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	$Logical. \ Whether to drop for eign key constraints of other tables, if action = "drop".$
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

### **Description**

This function takes a pgi list output object from pgInsertize or pgInsertizeGeom and performs the database insert (and table creation, if specified in the previous functions) on the database. If create.table or force.match were not specified in the pgInsertize\* statement, the table to insert into should be specified in name in this function. If a new table is created but the data insert statement fails, the new table is dropped from the database (a message will be given).

#### 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 the 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 pgInsertizeGeom

```
# 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,pgi=pgi,name=c("schema","meuse_data"))
## End(Not run)
```

pgInsertizeGeom

Format R data objects (data frames, spatial data frames, or spatialonly objects) for insert into a PostgreSQL table (for use with pgInsert).

### **Description**

These functions take an R sp object (Spatial\* or Spatial\*DataFrame; for pgInsertizeGeom) or data frame (for pgInsertize) and return a pgi list object, which is used in the function pgInsert to insert rows of the object into the database table. (Note that these functions do not do any modification of the database, it only prepares the data for insert.) The entire data frame is prepared by default, unless force.match specifies a database table (along with a database connection conn), in which case the R column names are compared to the force.match column names, and only exact matches are formatted to be inserted. A new database table can also be prepared to be created (if so, the actual table is created in pgInsert) using the create.table argument. If new.id is specified, a new sequential integer field is added to the data frame. For Spatial\*-only objects (no data frame), a new.id is created by default with name "gid". For pgInsertizeGeom, if the R package wkb is installed, this function uses writeWKB to translate the geometries (faster for large datasets), otherwise the rgeos function writeWKT is used.

### Usage

```
pgInsertizeGeom(data.obj, geom = "geom", multi = FALSE,
    create.table = NULL, force.match = NULL, conn = NULL, new.id = NULL,
    alter.names = TRUE)

pgInsertize(data.obj, create.table = NULL, force.match = NULL,
    conn = NULL, new.id = NULL, alter.names = TRUE)

## S3 method for class 'pgi'
print(pgi)
```

### **Arguments**

data.obj	A Spatial* or Spatial*DataFrame, or data frame for pgInsertize.
geom	character string, the name of geometry column in the database table. (existing or to be created; defaults to 'geom')
multi	Logical, if PostGIS geometry column is/will be of Multi* type set to TRUE new gid column. For spatial objects with no data frame (e.g., SpatialPolygons), a "gid" unique integer column is inserted by default.
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).

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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.

conn A database connection (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.

(for spatial objects without data frames, this column is created even if left NULL

and defaults to the name 'gid')

alter.names Logical, whether to make database column and table names DB-compliant (re-

move special characters). Defualt is TRUE. (This will need to be set to FALSE if matching to non-standard names in an existing database table using the force.match

setting.)

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

from the rpostgis package.

#### Value

pgi A 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 insert into, 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
\verb|pgi.new| < -pgInsertizeGeom(spdf,geom="point_geom",create.table=c("schema","table"),new.id="pt_gid")|
print(pgi.new)
## 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,pgi=pgi.new)
# Inserting into existing table
pgi.existing<-pgInsertizeGeom(spdf,geom="point_geom",force.match=c("schema","table"),conn=conn)
```

pgMakePts

```
# A warning message is given, since the "dist.m" column is not found in the database table
# (it was changed to "dist_m" in pgi.new to make name DB-compliant).
# All other columns are prepared for insert.
print(pgi.existing)
pgInsert(conn,pgi=pgi.existing)
## End(Not run)
## Not run:
#format regular (non-spatial) data frame for insert using pgInsertize
#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 non-spatial data frame for insert
values<-pgInsertize(data.obj=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,pgi=values,name=c("schema","table"))
#run with forced matching of database table column names
values<-pgInsertize(data.obj=data,force.match=c("schema","table"),conn=conn)</pre>
pgInsert(conn,pgi=values)
## End(Not run)
```

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)
```

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#### **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.

### **Examples**

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).

pgVacuum

#### Author(s)

Mathieu Basille <basille@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)
```

g	gVacuum	
ρ	gvacuum	

**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)
```

### **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
```

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

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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>

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