Cargar datos de AIS en PostgreSQL

Contents

1 Cargar datos de AIS en PostgreSQL

1.1 Configurar y crear base de datos en PostgreSQL

Desde la terminal de Linux `bash`:

```
# El usuario y la base de datos por defecto se llaman postgres
# Acceder con el usuario postgres:
sudo -u postgres bash

# Crear nuevo usuario para postgres
createuser guzman

# Crear base de datos para el usuario
createdb -O guzman ais

# Ingresar a PostgreSQL como usuario postgres
psql
```

En PostgtreSQL:

```
-- Crear rol de superusuario para el usuario
ALTER USER guzman WITH SUPERUSER;

-- Salir de PostgreSQL (Ctrl+d)
```

Desde la terminal de Linux `bash`:

```
# Volver al usuario
su - guzman
```

```
# Conectar a base de datos
psql -d ais -U guzman
```

En PostgtreSQL:

```
-- Habilitar extensión postgis
CREATE EXTENSION postgis;

-- Habilitar extensión de topología
CREATE EXTENSION postgis_topology;

-- Salir de PostgreSQL (Ctrl+d)
```

1.2 Establecer conexión a la base de datos PostgreSQL desde R:

Cargar librerías en R

```
# Manipulación de datos
library("data.table")

# Conexión a Bases de Datos
library("RPostgreSQL")
```

```
## Loading required package: DBI
```

```
library("postGIStools")
```

```
## Loading required package: sp
```

```
# Manipulación de objetos espaciales
library("sf")
```

```
## Linking to GEOS 3.5.1, GDAL 2.2.1, proj.4 4.9.3, lwgeom 2.3.3 r15473
```

```
library("sp")
```

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

(conn)
```

```
## <PostgreSQLConnection>
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```

1.3 Cargar datos de AIS

```
# Descripción de barcos
aisBarcos <- data.table::fread(input = "/home/guzman/Documents/AIS/ais_barcos_v2.csv",
                                    sep = ",", header = TRUE, showProgress = TRUE)

# Posiciones de barcos
```

```
aisPosiciones <- data.table::fread(input = "/home/guzman/Documents/AIS/ais_20120508to2014-05-17.csv",
                                   sep = ",", header = TRUE, showProgress = TRUE)
```

```
##
Read 5.2% of 18815594 rows
Read 15.0% of 18815594 rows
Read 24.8% of 18815594 rows
Read 34.1% of 18815594 rows
Read 43.3% of 18815594 rows
Read 53.0% of 18815594 rows
Read 62.9% of 18815594 rows
Read 69.6% of 18815594 rows
Read 78.3% of 18815594 rows
Read 84.3% of 18815594 rows
Read 93.7% of 18815594 rows
Read 18815594 rows and 8 (of 8) columns from 1.104 GB file in 00:00:13
```

Table 1: Datos de posic

imo	mmsi	name	callsign	flag	flagcode	aisvesseltype	grosstonnage	deadweight
NA	353756000						NA	NA
NA	636013999						NA	NA
9526899	477423700	MAERSK LA PAZ	VRKC2	Hong	Kong	Cargo	88237	94267
9352743	236286000	BBC ATLANTIC	ZDGX2	Gibraltar	[GI]	Unspecified	5261	6090
9207778	636014381	ANNA S	A8TM3	Liberia	[LR]	Cargo	40030	75966

Table 2: Datos de barcos

MMSI	STATUS	SPEED	LON	LAT	COURSE	HEADING	TIMESTAMP
565971000	0	136	-55.22454	-35.10763	89	90	2012-05-08T19:47:00Z
353750000	1	1	-55.68514	-35.16375	349	110	2012-05-08T19:47:00Z
701006153	15	0	-57.89289	-34.86168	264	511	2012-05-08T19:47:00Z
701006257	0	0	-58.34548	-34.63896	257	511	2012-05-08T19:47:00Z
538003687	1	1	-57.36745	-34.86046	278	123	2012-05-08T19:48:00Z

1.4 Convertir datos a objeto 'sf' (simple features)

```
# Crear objeto sf
aisPosiciones.sf <- st_as_sf(aisPosiciones, coords = c("LON", "LAT"))

# Asignar SRC
st_crs(aisPosiciones.sf) <- "+proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0"
```

1.5 Escribir objetos espaciales a PostgreSQL

```
# Establecer conexión a PostgreSQL a través de una cadena de texto
dbString <- "PG:dbname='ais'"
```

```
# Posiciones
st_write(obj = aisPosiciones.sf, layer = "posiciones", driver = "PostgreSQL",
    dsn = dbString, layer_options = c("geometry_name=geom, OVERWRITE=YES"))
```

1.6 Escribir tabla de barcos a PostgreSQL

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Escribir tabla
dbWriteTable(conn, "barcos", aisBarcos, overwrite = TRUE, row.names = FALSE)

# Desconectar
dbDisconnect(conn)
```

1.7 Ver tablas

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ver tablas en la base de datos
dbListTables(conn)

# Desconectar
dbDisconnect(conn)
```

1.8 Resumen de tipos de campos en las tablas

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Función para generar consulta
resumenTabla <- function(tabla) {

  paste("SELECT DISTINCT
        a.attnum as num,
        a.attname as name,
        format_type(a.atttypid, a.atttypmod) as typ,
        a.attnotnull as notnull,
        com.description as comment,
        coalesce(i.indisprimary,false) as primary_key,
        def.adsrc as default
        FROM pg_attribute a
        JOIN pg_class pgc ON pgc.oid = a.attrelid
        LEFT JOIN pg_index i ON
        (pgc.oid = i.indrelid AND i.indkey[0] = a.attnum)
        LEFT JOIN pg_description com on
        (pgc.oid = com.objoid AND a.attnum = com.objsubid)
        LEFT JOIN pg_attrdef def ON
```

```
        (a.attrelid = def.adrelid AND a.attnum = def.adnum)
        WHERE a.attnum > 0 AND pgc.oid = a.attrelid
        AND pg_table_is_visible(pgc.oid)
        AND NOT a.attisdropped
        AND pgc.relname = '", tabla, "'
        ORDER BY a.attnum;", sep = "")
}

# Generar cadena de texto con la consulta
resumenPosiciones <- resumenTabla('posiciones')
resumenBarcos <- resumenTabla('barcos')

# Ejecutar consulta
dbGetQuery(conn, resumenPosiciones)
```

```
##   num         name               typ notnull comment primary_key
## 1   1      ogc_fid           integer    TRUE    <NA>        TRUE
## 2   2 wkb_geometry             bytea   FALSE    <NA>       FALSE
## 3   3         mmsi           integer   FALSE    <NA>       FALSE
## 4   4       status           integer   FALSE    <NA>       FALSE
## 5   5        speed           integer   FALSE    <NA>       FALSE
## 6   6       course           integer   FALSE    <NA>       FALSE
## 7   7      heading           integer   FALSE    <NA>       FALSE
## 8   8    timestamp character varying   FALSE    <NA>       FALSE
##                                      default
## 1 nextval('posiciones_ogc_fid_seq'::regclass)
## 2                                       <NA>
## 3                                       <NA>
## 4                                       <NA>
## 5                                       <NA>
## 6                                       <NA>
## 7                                       <NA>
## 8                                       <NA>
```

```
dbGetQuery(conn, resumenBarcos)
```

```
##    num                 name               typ notnull comment primary_key
## 1    1                  imo           integer   FALSE    <NA>       FALSE
## 2    2                 mmsi           integer    TRUE    <NA>        TRUE
## 3    3                 name              text   FALSE    <NA>       FALSE
## 4    4             callsign              text   FALSE    <NA>       FALSE
## 5    5                 flag              text   FALSE    <NA>       FALSE
## 6    6             flagcode              text   FALSE    <NA>       FALSE
## 7    7        aisvesseltype              text   FALSE    <NA>       FALSE
## 8    8         grosstonnage           integer   FALSE    <NA>       FALSE
## 9    9           deadweight           integer   FALSE    <NA>       FALSE
## 10  10              draught double precision   FALSE    <NA>       FALSE
## 11  11     maxspeedrecorded double precision   FALSE    <NA>       FALSE
## 12  12 averagespeedrecorded double precision   FALSE    <NA>       FALSE
## 13  13               length double precision   FALSE    <NA>       FALSE
## 14  14              breadth double precision   FALSE    <NA>       FALSE
## 15  15            yearbuilt           integer   FALSE    <NA>       FALSE
## 16  16               status              text   FALSE    <NA>       FALSE
## 17  17      datetimescraped double precision   FALSE    <NA>       FALSE
```

```
##    default
## 1     <NA>
## 2     <NA>
## 3     <NA>
## 4     <NA>
## 5     <NA>
## 6     <NA>
## 7     <NA>
## 8     <NA>
## 9     <NA>
## 10    <NA>
## 11    <NA>
## 12    <NA>
## 13    <NA>
## 14    <NA>
## 15    <NA>
## 16    <NA>
## 17    <NA>
```

1.9 Modificar tipos de campos

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Modificar mmsi de posiciones y barcos para que sean del mismo tipo
dbGetQuery(conn, "ALTER TABLE barcos
                  ALTER COLUMN mmsi TYPE integer;")

# Desconectar
dbDisconnect(conn)
```

1.10 Hacer consulta a la base de datos PostgreSQL

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ver tablas en la base de datos
dbListTables(conn)
```

```
## [1] "posiciones" "barcos"
```

```
# Generar consulta sobre tabla
dbGetQuery(conn, "SELECT * FROM posiciones LIMIT 5;")
```

```
##   ogc_fid                                  wkb_geometry      mmsi status
## 1  129601 \\x010100000089247a19c5064dc09cf9d51c205441c0 412045240      0
## 2  129602 \\x01010000000f0bb5a679d34bc030815b77f37841c0 240128000      1
## 3  129603 \\x0101000000f623456458194cc01f85eb51b87241c0 770576135      0
## 4  129604 \\x010100000069a9bc1de1004cc0abe7a4f78d8341c0 770576216      5
## 5  129605 \\x0101000000d769a4a5f2ce4bc0c3bb5cc4778e41c0 351811000      1
##   speed course heading            timestamp
## 1    79    293     291 2012-05-12T23:29:00Z
```

```
## 2     6     45     228 2012-05-12T23:29:00Z
## 3     0    170     511 2012-05-12T23:29:00Z
## 4   113    334     343 2012-05-12T23:29:00Z
## 5     5    100     240 2012-05-12T23:29:00Z
```

```
# Generar consulta sobre tabla
dbGetQuery(conn, "SELECT * FROM barcos LIMIT 5;")
```

```
##       imo      mmsi          name callsign      flag flagcode
## 1      NA 353756000
## 2      NA 636013999
## 3 9526899 477423700 MAERSK LA PAZ    VRKC2      Hong     Kong
## 4 9352743 236286000  BBC ATLANTIC    ZDGX2 Gibraltar     [GI]
## 5 9207778 636014381        ANNA S    A8TM3   Liberia     [LR]
##   aisvesseltype grosstonnage deadweight draught maxspeedrecorded
## 1                         NA          NA      NA               NA
## 2                         NA          NA      NA               NA
## 3         Cargo         88237       94267    20.4             20.4
## 4   Unspecified          5261        6090    11.4             11.4
## 5         Cargo         40030       75966    12.3             12.3
##   averagespeedrecorded length breadth yearbuilt status datetimescraped
## 1                   NA     NA      NA        NA             1490211409
## 2                   NA     NA      NA        NA             1490211411
## 3                 19.5  299.9   45.90      2011 Active      1490211413
## 4                 10.8  115.5   16.85      2005 Active      1490211414
## 5                 11.0  225.0   32.30      2001 Active      1490211416
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```

1.11 Definir claves primarias y foráneas

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Definir MMSI como PK de barcos
rs.barcos_pk <- dbGetQuery(conn,
                           "ALTER TABLE barcos
                            ADD CONSTRAINT const_barcos_pk_mmsi
                            PRIMARY KEY(mmsi);")


# Definir MMSI como PK de posiciones y FK con respecto a la tabla barcos
rs.posiciones_pk <- dbGetQuery(conn,
                               "ALTER TABLE posiciones
                               ADD CONSTRAINT const_posiciones_pk_mmsi_timestamp
                               PRIMARY KEY(mmsi);")

rs.posiciones_fk <- dbGetQuery(conn,
                               "ALTER TABLE posiciones
                               ADD CONSTRAINT const_posiciones_fk_mmsi
                               FOREIGN KEY(mmsi) REFERENCES barcos(mmsi);")
```

```r
# Desconectar
dbDisconnect(conn)
```

```r
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ejecutar consulta
dbGetQuery(conn, resumenPosiciones)
```

```
##   num         name               typ notnull comment primary_key
## 1   1      ogc_fid           integer    TRUE    <NA>        TRUE
## 2   2 wkb_geometry             bytea   FALSE    <NA>       FALSE
## 3   3         mmsi           integer   FALSE    <NA>       FALSE
## 4   4       status           integer   FALSE    <NA>       FALSE
## 5   5        speed           integer   FALSE    <NA>       FALSE
## 6   6       course           integer   FALSE    <NA>       FALSE
## 7   7      heading           integer   FALSE    <NA>       FALSE
## 8   8    timestamp character varying   FALSE    <NA>       FALSE
##                                      default
## 1 nextval('posiciones_ogc_fid_seq'::regclass)
## 2                                       <NA>
## 3                                       <NA>
## 4                                       <NA>
## 5                                       <NA>
## 6                                       <NA>
## 7                                       <NA>
## 8                                       <NA>
```

```r
dbGetQuery(conn, resumenBarcos)
```

```
##    num                 name             typ notnull comment primary_key
## 1    1                  imo         integer   FALSE    <NA>       FALSE
## 2    2                 mmsi         integer    TRUE    <NA>        TRUE
## 3    3                 name            text   FALSE    <NA>       FALSE
## 4    4             callsign            text   FALSE    <NA>       FALSE
## 5    5                 flag            text   FALSE    <NA>       FALSE
## 6    6             flagcode            text   FALSE    <NA>       FALSE
## 7    7        aisvesseltype            text   FALSE    <NA>       FALSE
## 8    8         grosstonnage         integer   FALSE    <NA>       FALSE
## 9    9           deadweight         integer   FALSE    <NA>       FALSE
## 10  10              draught double precision   FALSE    <NA>       FALSE
## 11  11     maxspeedrecorded double precision   FALSE    <NA>       FALSE
## 12  12 averagespeedrecorded double precision   FALSE    <NA>       FALSE
## 13  13               length double precision   FALSE    <NA>       FALSE
## 14  14              breadth double precision   FALSE    <NA>       FALSE
## 15  15            yearbuilt         integer   FALSE    <NA>       FALSE
## 16  16               status            text   FALSE    <NA>       FALSE
## 17  17      datetimescraped double precision   FALSE    <NA>       FALSE
##    default
## 1     <NA>
## 2     <NA>
## 3     <NA>
## 4     <NA>
## 5     <NA>
```

```
## 6     <NA>
## 7     <NA>
## 8     <NA>
## 9     <NA>
## 10    <NA>
## 11    <NA>
## 12    <NA>
## 13    <NA>
## 14    <NA>
## 15    <NA>
## 16    <NA>
## 17    <NA>
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```

1.12 Consulta join barco (mmsi)

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ejecutar consulta
dbGetQuery(conn, "SELECT * FROM barcos, posiciones
                  WHERE barcos.mmsi = posiciones.mmsi
                  AND barcos.mmsi = '565971000'
                  LIMIT 10;")
```

```
##        imo      mmsi          name callsign      flag flagcode
## 1  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 2  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 3  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 4  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 5  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 6  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 7  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 8  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 9  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 10 9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
##    aisvesseltype grosstonnage deadweight draught maxspeedrecorded
## 1          Cargo        35835      43133    18.8              18.8
## 2          Cargo        35835      43133    18.8              18.8
## 3          Cargo        35835      43133    18.8              18.8
## 4          Cargo        35835      43133    18.8              18.8
## 5          Cargo        35835      43133    18.8              18.8
## 6          Cargo        35835      43133    18.8              18.8
## 7          Cargo        35835      43133    18.8              18.8
## 8          Cargo        35835      43133    18.8              18.8
## 9          Cargo        35835      43133    18.8              18.8
## 10         Cargo        35835      43133    18.8              18.8
##    averagespeedrecorded length breadth yearbuilt status datetimescraped
## 1                  17.6  223.5   32.26      2008 Active      1490212231
## 2                  17.6  223.5   32.26      2008 Active      1490212231
```

```
## 3                 17.6  223.5   32.26      2008 Active      1490212231
## 4                 17.6  223.5   32.26      2008 Active      1490212231
## 5                 17.6  223.5   32.26      2008 Active      1490212231
## 6                 17.6  223.5   32.26      2008 Active      1490212231
## 7                 17.6  223.5   32.26      2008 Active      1490212231
## 8                 17.6  223.5   32.26      2008 Active      1490212231
## 9                 17.6  223.5   32.26      2008 Active      1490212231
## 10                17.6  223.5   32.26      2008 Active      1490212231
##    ogc_fid                                wkb_geometry      mmsi status
## 1  1377167 \\x010100000059fad005f5e14bc0897b2c7de88641c0 565971000      0
## 2  1377269 \\x01010000001d8f19a88ce34bc057ec2fbb278741c0 565971000      0
## 3  1377438 \\x01010000009a081b9e5ee54bc07afcdea63f8741c0 565971000      0
## 4  1377536 \\x0101000000c217265305e74bc081b22957788741c0 565971000      0
## 5  1377615 \\x0101000000f94ecc7a31e84bc08126c286a78741c0 565971000      0
## 6  1377741 \\x0101000000cf83bbb376eb4bc0ab2688ba0f8841c0 565971000      0
## 7  1377838 \\x010100000003eca35357ee4bc08f19a88c7f8741c0 565971000      0
## 8  1377938 \\x0101000000064ce0d6ddf04bc09fcdaacfd58641c0 565971000      0
## 9  1378042 \\x01010000002506819543f34bc058ffe7305f8641c0 565971000      0
## 10 1378120 \\x0101000000317c444c89f44bc08369183e228641c0 565971000      0
##    speed course heading            timestamp
## 1    119    259     262 2012-06-22T06:44:00Z
## 2     85    255     261 2012-06-22T06:48:00Z
## 3     55    279     274 2012-06-22T06:55:00Z
## 4    124    260     260 2012-06-22T06:59:00Z
## 5    143    259     260 2012-06-22T07:02:00Z
## 6    157    270     274 2012-06-22T07:07:00Z
## 7    152    289     290 2012-06-22T07:11:00Z
## 8    143    284     284 2012-06-22T07:15:00Z
## 9    130    282     283 2012-06-22T07:19:00Z
## 10   126    281     283 2012-06-22T07:22:00Z
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```

1.13 Consulta join tiempo y barco (mmsi)

Para el año 2012.

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ejecutar consulta
dbGetQuery(conn, "SELECT * FROM barcos, posiciones
                  WHERE barcos.mmsi = posiciones.mmsi
                  AND barcos.mmsi = '565971000'
                  AND posiciones.timestamp BETWEEN '2012-01-01' AND '2012-12-31'
                  LIMIT 10;")
```

```
##        imo      mmsi         name callsign      flag flagcode
## 1  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 2  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 3  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 4  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
```

```
## 5  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 6  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 7  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 8  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 9  9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
## 10 9392925 565971000 MAERSK BUTON   9V7498 Singapore     [SG]
##    aisvesseltype grosstonnage deadweight draught maxspeedrecorded
## 1          Cargo        35835      43133    18.8              18.8
## 2          Cargo        35835      43133    18.8              18.8
## 3          Cargo        35835      43133    18.8              18.8
## 4          Cargo        35835      43133    18.8              18.8
## 5          Cargo        35835      43133    18.8              18.8
## 6          Cargo        35835      43133    18.8              18.8
## 7          Cargo        35835      43133    18.8              18.8
## 8          Cargo        35835      43133    18.8              18.8
## 9          Cargo        35835      43133    18.8              18.8
## 10         Cargo        35835      43133    18.8              18.8
##    averagespeedrecorded length breadth yearbuilt status datetimescraped
## 1                  17.6  223.5   32.26      2008 Active      1490212231
## 2                  17.6  223.5   32.26      2008 Active      1490212231
## 3                  17.6  223.5   32.26      2008 Active      1490212231
## 4                  17.6  223.5   32.26      2008 Active      1490212231
## 5                  17.6  223.5   32.26      2008 Active      1490212231
## 6                  17.6  223.5   32.26      2008 Active      1490212231
## 7                  17.6  223.5   32.26      2008 Active      1490212231
## 8                  17.6  223.5   32.26      2008 Active      1490212231
## 9                  17.6  223.5   32.26      2008 Active      1490212231
## 10                 17.6  223.5   32.26      2008 Active      1490212231
##    ogc_fid                                wkb_geometry      mmsi status
## 1  1377741 \\x0101000000cf83bbb376eb4bc0ab2688ba0f8841c0 565971000      0
## 2  1377838 \\x010100000003eca35357ee4bc08f19a88c7f8741c0 565971000      0
## 3  1377938 \\x0101000000064ce0d6ddf04bc09fcdaacfd58641c0 565971000      0
## 4  1378042 \\x01010000002506819543f34bc058ffe7305f8641c0 565971000      0
## 5  1378120 \\x0101000000317c444c89f44bc08369183e228641c0 565971000      0
## 6  1378208 \\x010100000034d769a4a5f64bc0a032fe7dc68541c0 565971000      0
## 7  1378324 \\x0101000000dba7e33103f94bc03ed00a0c598541c0 565971000      0
## 8  1378426 \\x01010000008104c58f31fb4bc037a6272cf18441c0 565971000      0
## 9  1378572 \\x0101000000cbd6fa22a1fd4bc05c5a0d897b8441c0 565971000      0
## 10 1378675 \\x010100000064cc5d4bc8ff4bc079e92631088441c0 565971000      0
##    speed course heading            timestamp
## 1    157    270     274 2012-06-22T07:07:00Z
## 2    152    289     290 2012-06-22T07:11:00Z
## 3    143    284     284 2012-06-22T07:15:00Z
## 4    130    282     283 2012-06-22T07:19:00Z
## 5    126    281     283 2012-06-22T07:22:00Z
## 6    124    281     283 2012-06-22T07:26:00Z
## 7    123    283     284 2012-06-22T07:30:00Z
## 8    124    282     284 2012-06-22T07:34:00Z
## 9    124    283     285 2012-06-22T07:39:00Z
## 10   124    283     285 2012-06-22T07:43:00Z
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```

1.14 Consulta join tiempo y barco (nombre)

Para el año 2012.

```
# Conectar con PostgreSQL
conn <- dbConnect(dbDriver("PostgreSQL"), dbname = "ais")

# Ejecutar consulta
dbGetQuery(conn, "SELECT * FROM barcos, posiciones
                  WHERE barcos.mmsi = posiciones.mmsi
                  AND barcos.name LIKE 'DHR-2'
                  AND posiciones.timestamp BETWEEN '2012-01-01' AND '2012-12-31'
                  LIMIT 10;")
```

```
##    imo      mmsi  name callsign    flag flagcode aisvesseltype
## 1   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 2   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 3   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 4   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 5   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 6   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 7   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 8   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 9   NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
## 10  NA 770576268 DHR-2     CXNK Uruguay     [UY]           Tug
##    grosstonnage deadweight draught maxspeedrecorded averagespeedrecorded
## 1            NA         NA     5.9              5.9                   5.7
## 2            NA         NA     5.9              5.9                   5.7
## 3            NA         NA     5.9              5.9                   5.7
## 4            NA         NA     5.9              5.9                   5.7
## 5            NA         NA     5.9              5.9                   5.7
## 6            NA         NA     5.9              5.9                   5.7
## 7            NA         NA     5.9              5.9                   5.7
## 8            NA         NA     5.9              5.9                   5.7
## 9            NA         NA     5.9              5.9                   5.7
## 10           NA         NA     5.9              5.9                   5.7
##    length breadth yearbuilt status datetimescraped ogc_fid
## 1      28       6        NA Active      1490211810 1389620
## 2      28       6        NA Active      1490211810 1390098
## 3      28       6        NA Active      1490211810 1390678
## 4      28       6        NA Active      1490211810 1391226
## 5      28       6        NA Active      1490211810 1391535
## 6      28       6        NA Active      1490211810 1391626
## 7      28       6        NA Active      1490211810 1391737
## 8      28       6        NA Active      1490211810 1391833
## 9      28       6        NA Active      1490211810 1391913
## 10     28       6        NA Active      1490211810 1392000
##                                    wkb_geometry      mmsi status speed
## 1  \\x0101000000f67af7c77b194cc0c976be9f1a7341c0 770576268     15     0
## 2  \\x01010000000068226c787a194cc03a1e3350197341c0 770576268     15     0
## 3  \\x0101000000002176a6d079194cc0102384471b7341c0 770576268     15     0
## 4  \\x0101000000afce31207b194cc0c976be9f1a7341c0 770576268     15     0
## 5  \\x01010000000044696ff085194cc0acc5a700187341c0 770576268     15    14
## 6  \\x0101000000021cd58349d194cc0bbf2599e077341c0 770576268     15    14
## 7  \\x0101000000b5a679c7291a4cc06688635ddc7241c0 770576268     15    36
```

```
## 8  \\x01010000000a68226c781a4cc0ad510fd1e87241c0 770576268     15      3
## 9  \\x010100000034f44f70b11a4cc0ac8bdb68007341c0 770576268     15     48
## 10 \\x0101000000b3d2a414741b4cc0fa0ad28c457341c0 770576268     15     50
##    course heading            timestamp
## 1      22     511 2012-06-22T14:01:00Z
## 2     143     511 2012-06-22T14:23:00Z
## 3       0     511 2012-06-22T14:45:00Z
## 4       0     511 2012-06-22T15:11:00Z
## 5     277     511 2012-06-22T15:26:00Z
## 6     334     511 2012-06-22T15:30:00Z
## 7     274     511 2012-06-22T15:35:00Z
## 8     187     511 2012-06-22T15:39:00Z
## 9     253     511 2012-06-22T15:43:00Z
## 10    253     511 2012-06-22T15:47:00Z
```

```
# Desconectar
dbDisconnect(conn)
```

```
## [1] TRUE
```