R language

Emanuel Huber

Februar 28, 2018

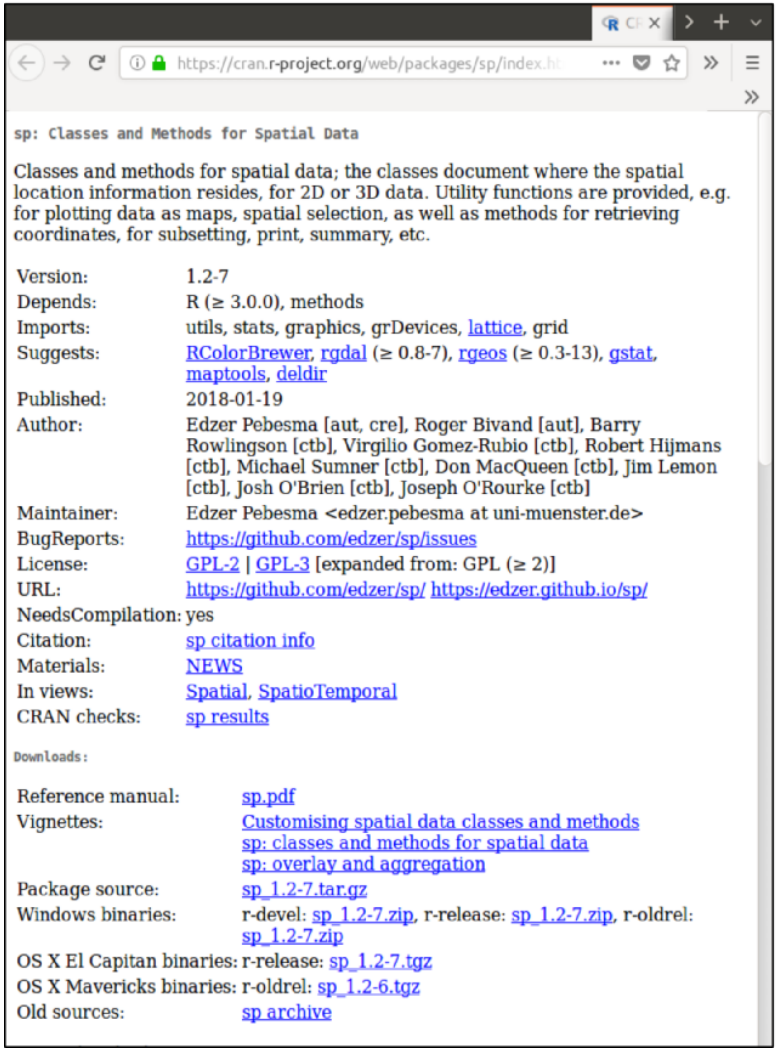
R packages

Package documentation

Here example of a package documentation page:

`https://cran.r-project.org/web/packages/sp/index.html`

https://cran.r-project.org/web/packages/sp/index.html



Package - Reference manual

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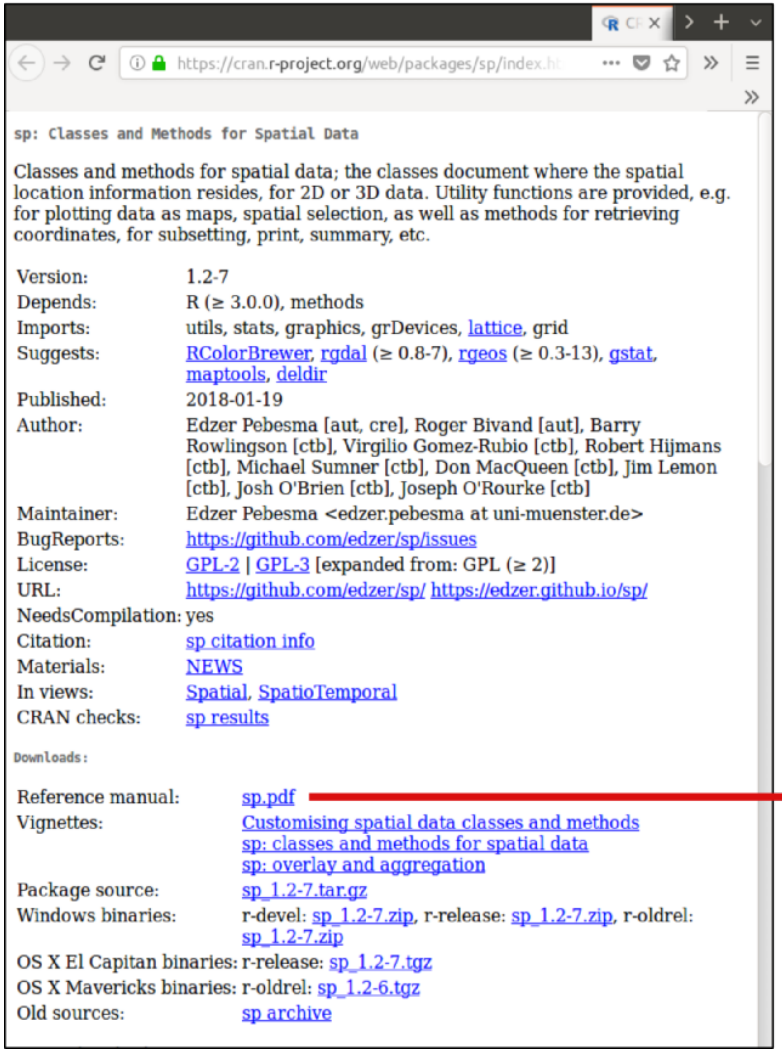

sp: Classes and Methods for Spatial Data

Classes and methods for spatial data; the classes document where the spatial location information resides, for 2D or 3D data. Utility functions are provided, e.g. for plotting data as maps, spatial selection, as well as methods for retrieving coordinates, for subsetting, print, summary, etc.

Version:	1.2-7
Depends:	R (≥ 3.0.0), methods
Imports:	utils, stats, graphics, grDevices, lattice, grid
Suggests:	RColorBrewer, rgdal (≥ 0.8-7), rgeos (≥ 0.3-13), gstat, maptools, deldir
Published:	2018-01-19
Author:	Edzer Pebesma [aut, cre], Roger Bivand [aut], Barry Rowlingson [ctb], Virgilio Gomez-Rubio [ctb], Robert Hijmans [ctb], Michael Sumner [ctb], Don MacQueen [ctb], Jim Lemon [ctb], Josh O'Brien [ctb], Joseph O'Rourke [ctb]
Maintainer:	Edzer Pebesma <edzer.pebesma at uni-muenster.de>
BugReports:	https://github.com/edzer/sp/issues
License:	GPL-2 | GPL-3 [expanded from: GPL (≥ 2)]
URL:	https://github.com/edzer/sp/ https://edzer.github.io/sp/
NeedsCompilation:	yes
Citation:	sp citation info
Materials:	NEWS
In views:	Spatial, SpatioTemporal
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Downloads:

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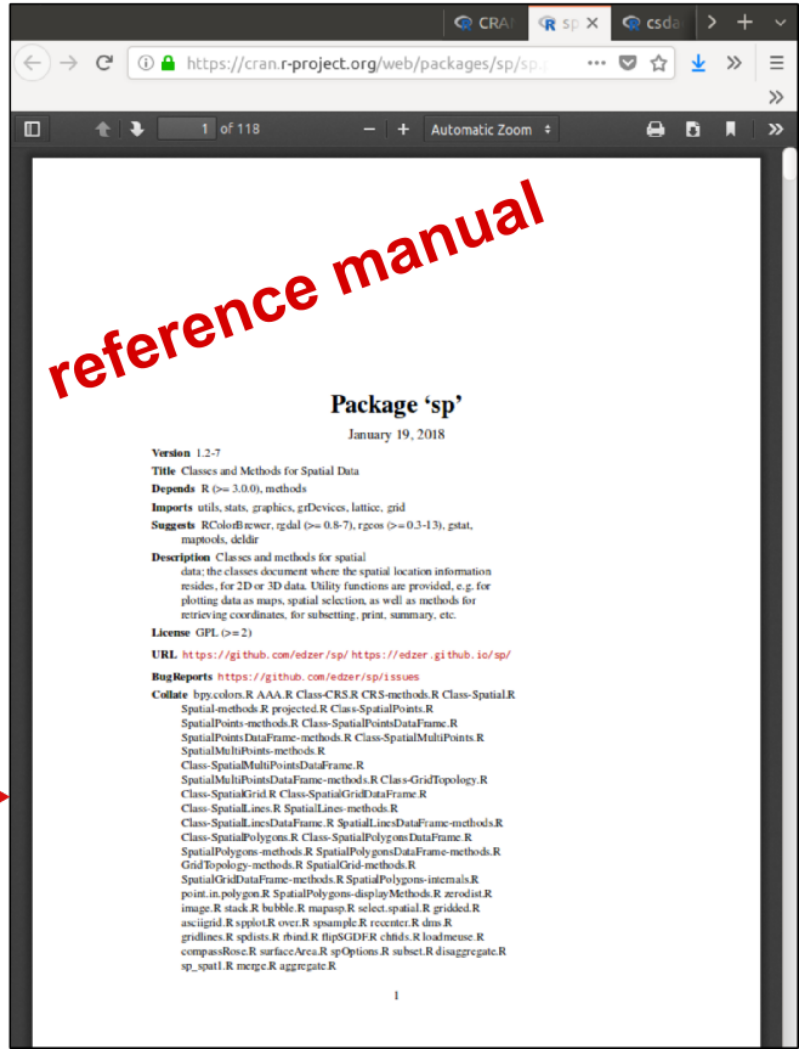
Old sources:	sp archive



Package 'sp'

January 19, 2018

Version 1.2-7

Title Classes and Methods for Spatial Data

Depends R (>= 3.0.0), methods

Imports utils, stats, graphics, grDevices, lattice, grid

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License GPL (>=2)

URL https://github.com/edzer/sp/ https://edzer.github.io/sp/

BugReports https://github.com/edzer/sp/issues

Collate bpy.colors.R AAA.R Class-CRS.R CRS-methods.R Class-Spatial.R Spatial-methods.R projected.R Class-SpatialPoints.R SpatialPoints-methods.R Class-SpatialPointsDataFrame.R SpatialPointsDataFrame-methods.R Class-SpatialMultiPoints.R SpatialMultiPoints-methods.R Class-SpatialMultiPointsDataFrame.R SpatialMultiPointsDataFrame-methods.R Class-GridTopology.R Class-SpatialGrid.R Class-SpatialGridDataFrame.R Class-SpatialLines.R SpatialLines-methods.R Class-SpatialLinesDataFrame.R SpatialLinesDataFrame-methods.R Class-SpatialPolygons.R Class-SpatialPolygonsDataFrame.R SpatialPolygons-methods.R SpatialPolygonsDataFrame-methods.R GridTopology-methods.R SpatialGrid-methods.R SpatialGridDataFrame-methods.R SpatialPolygons-internals.R point.in.polygon.R SpatialPolygons-displayMethods.R zerodist.R image.R stack.R bubble.R mapsp.R select.spatial.R gridded.R asciigrid.R spplot.R over.R spsample.R recenter.R dms.R gridlines.R spdists.R rbind.R flipSGDF.R chtids.R loadmeuse.R compassRose.R surfaceArea.R spOptions.R subset.R disaggregate.R sp_spat1.R merge.R aggregate.R

Package - Reference vignette

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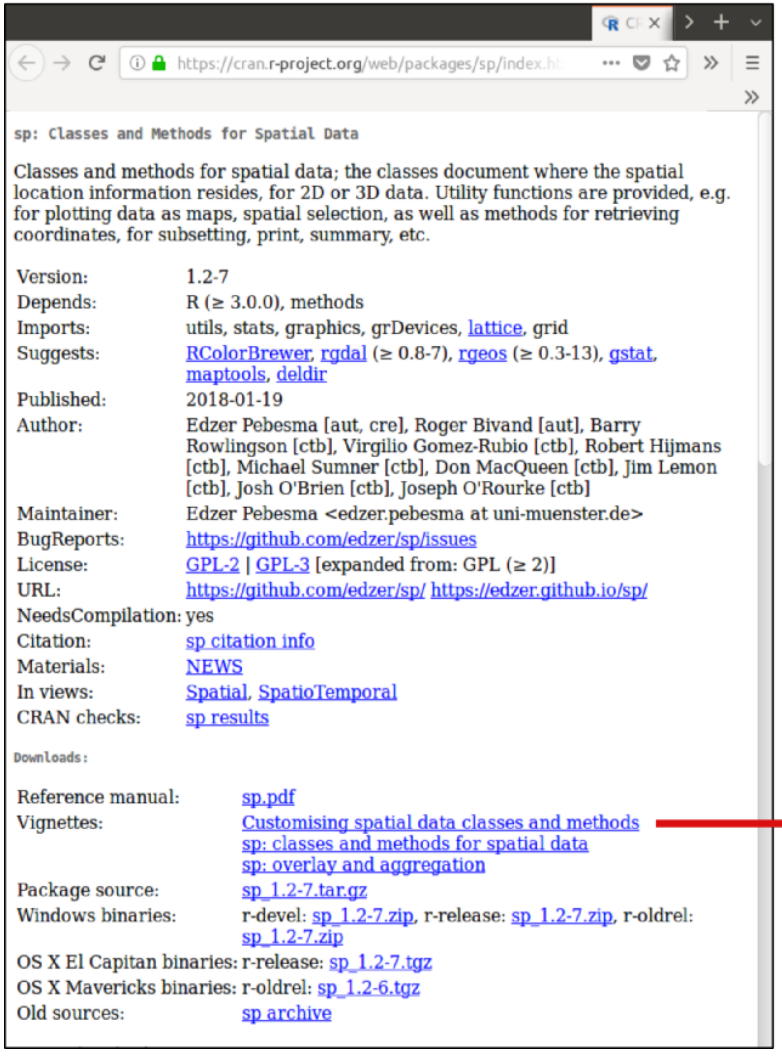

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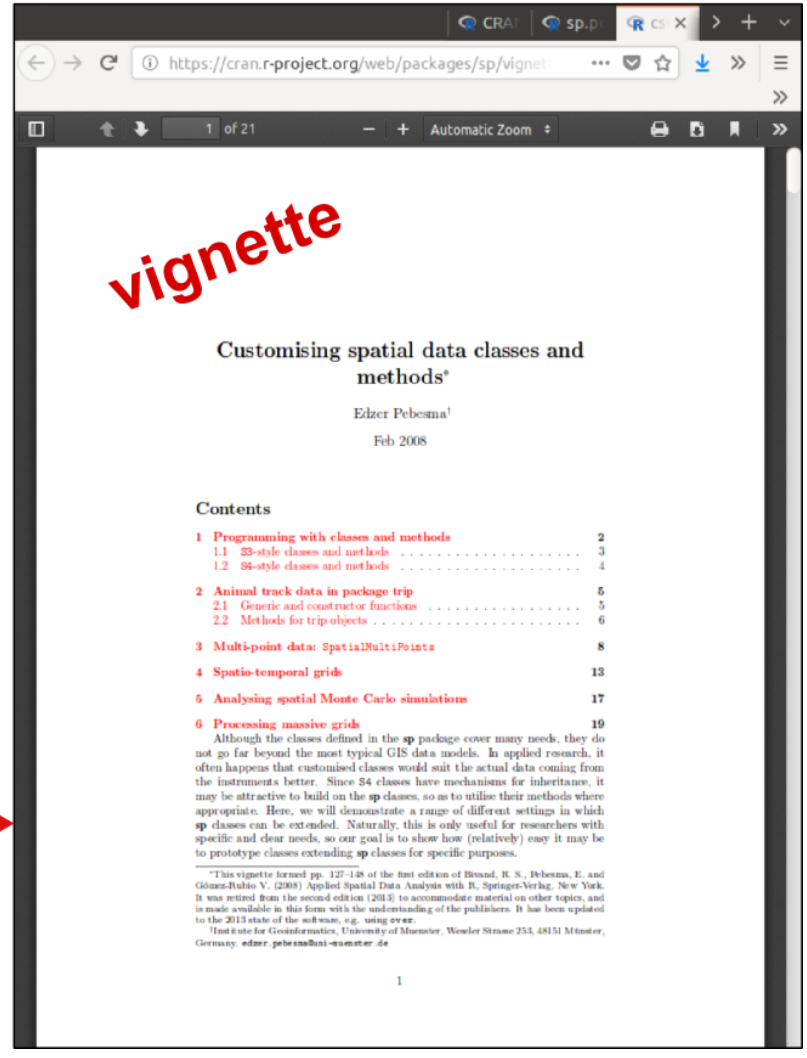

vignette

Customising spatial data classes and methods*

Edzer Pebesma[1]

Feb 2008

Contents

Although the classes defined in the sp package cover many needs, they do not go far beyond the most typical GIS data models. In applied research, it often happens that customised classes would suit the actual data coming from the instruments better. Since S4 classes have mechanisms for inheritance, it may be attractive to build on the sp classes, so as to utilise their methods where appropriate. Here, we will demonstrate a range of different settings in which sp classes can be extended. Naturally, this is only useful for researchers with specific and clear needs, so our goal is to show how (relatively) easy it may be to prototype classes extending sp classes for specific purposes.

*This vignette formed pp. 127–148 of the first edition of Bivand, R. S., Pebesma, E. and Gómez-Rubio V. (2008) Applied Spatial Data Analysis with R, Springer-Verlag, New York. It was retired from the second edition (2013) to accommodate material on other topics, and is made available in this form with the understanding of the publishers. It has been updated to the 2013 state of the software, e.g. using over.

[1]Institute for Geoinformatics, University of Muenster, Weseler Strasse 253, 48151 Münster, Germany. edzer.pebesma@uni-muenster.de

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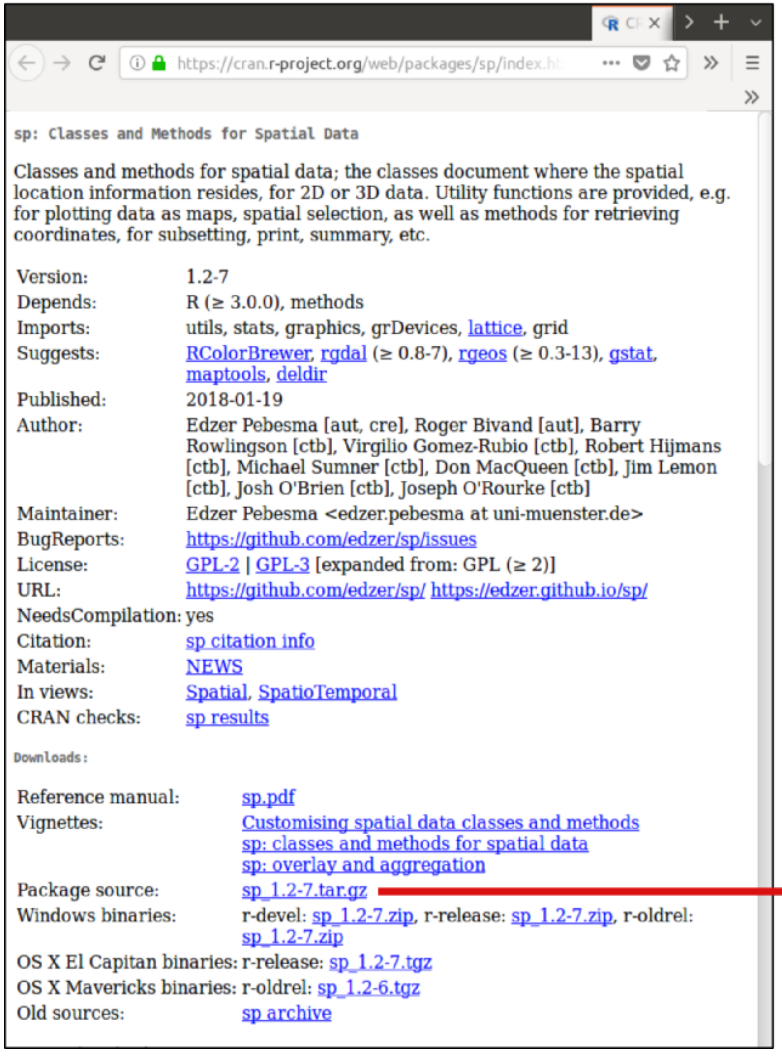

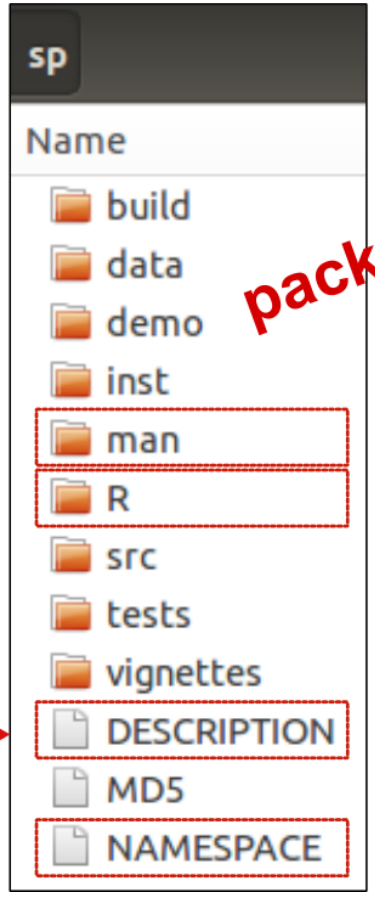

package source

Package - Install packages hosted on CRAN

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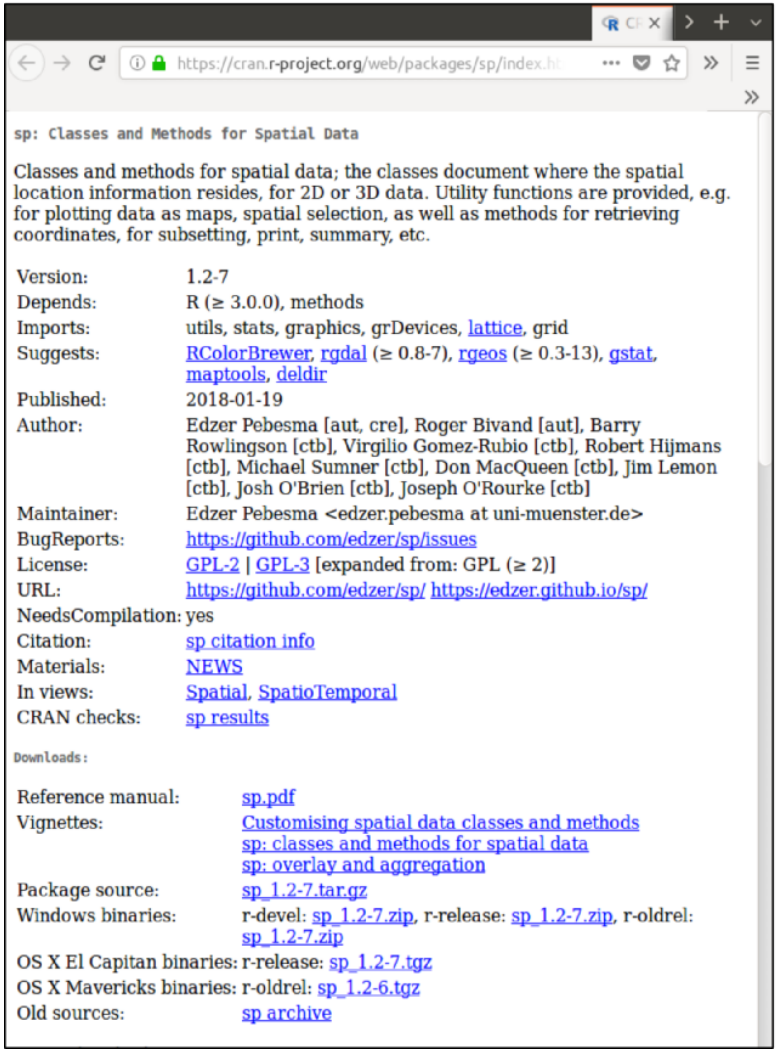

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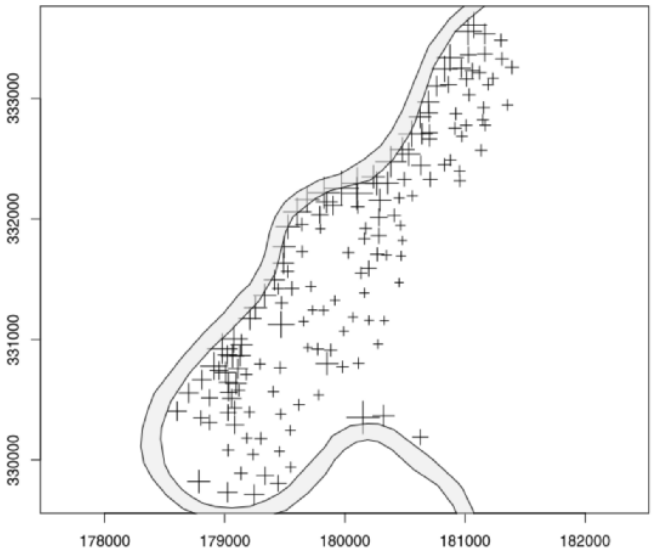
Old sources:	sp archive

```r
install.packages("sp")
library("sp")

demo(meuse, ask = FALSE, echo = FALSE)

plot(meuse, cex = sqrt(meuse$zinc)/12, axes = TRUE)
plot(meuse.riv, add = TRUE, col = grey(.9, alpha = .5))
```



Package - Install packages hosted on github

```
if(!require("devtools")) install.packages("devtools")
devtools::install_github("emanuelhuber/RGPR")
```

Help!

Getting help

- get help on the function `plot()`:

```
help(plot)
```

or

```
?plot
```

- get help on general terms

```
??regression
```

- ?? `library(help = "base")` See getting help with R
- Google: "**R Cran** how to extract rows data.frame"

R language

R language

Official documentation

Main differences to MATLAB

- `x <- x + 10` instead of `x = x + 10`
- Matrices A: `A[1, 3]` instead of `A(1, 3)`
- comments with # instead of %
- no need for ;
- R is more structured: use { in the loop

```
for(i in 1:10){
  # my code here
}
```

Matlab - R

Exotic stuff

Namespace

`packageName::functionName()`

Pipe %>%

```
third(second(first(x)))
first(x) %>% second %>% third
```

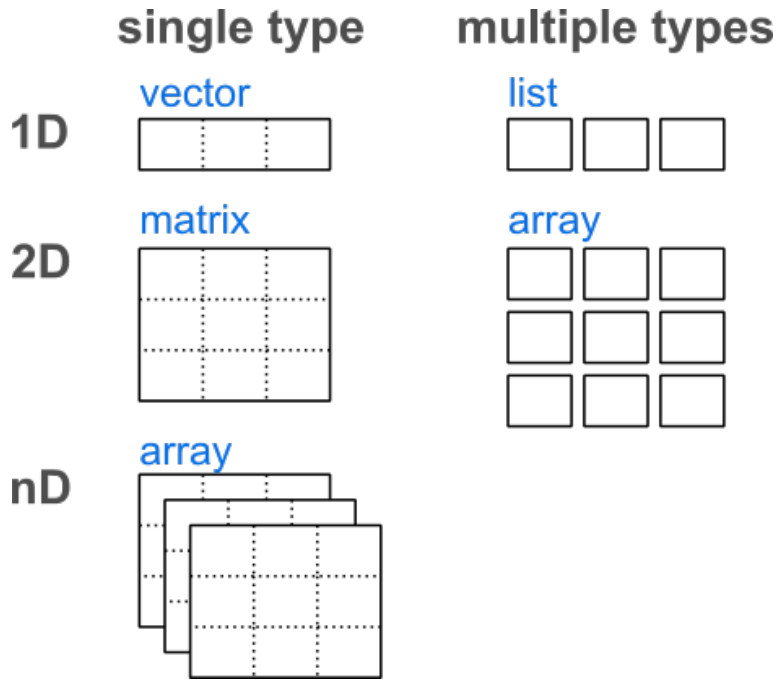
Basic object types

`type.of()???`

- numeric: `e24`, `-150.5`, `pi` `is.numeric()`
- integer: `1L`, `-54L`, `0L` `is.integer()`
- complex: `???` `is.complex()`
- character: “AUG”, “13.12”, “www.google.ch” `is.character()`
- boolean (logical): `TRUE`, `FASLE` `is.logical()`
- `NA`, `Inf`, `NULL`

check

Object classes



- numeric, matrix, list, data.frame
- S3 classes: example regression
- S4 classes tutorial
  - date and time good tutorial
  - spatial data raster/sf

Functions to understand your data

- `str()`
- `class()`
- `unclass()`
- `typeof()`
- `names()` `colnames()`, `rownames()`
- `dim()`, `length()`
- S4: `isS4()`, `getSlots()`, `slotNames()`
- attributes()

```
methods(class = "sf")
```

show example from ?approx

Conversion

Basic object types

- `as.character()`
- `as.integer()`
- `as.numeric()`
- `as.logical()`
- `as.complex()`
- `as.matrix()`
- `as.data.frame()`
- `as.list()`

conversion class `sf` to `sp`: as(x, "Spatial")