

# Introduction to R for distance sampling

Workshop, 26 August 2018

*Centre for Research into Ecological and Environmental Modelling*

## Glossary of R terms and characters

This document is meant as a quick reference guide to some of the terms and special characters used in R. It is not a guide to the functions used throughout the course.

R is freely available and can be downloaded from <https://cran.r-project.org/>. There are versions for Windows and Mac users.

## Terminology

**arguments/default values** - parameters that need to be specified by the user in order to execute a function. Some arguments may have pre-specified, or default, values and so don't need to be changed unless different options are required.

**function** - collection of R commands to perform a particular task. Can be in-built (e.g. `mean`) or written by the user.

**package** - collection of functions.

**Rstudio** - graphical user interface to R.

**working directory** - directory specified by user and subsequently used, for example, to read files from or to save files to.

**workspace** - file containing data objects created during R session. Has filename suffix 'RData' by default, but this can be changed by user.

## Useful commands

`setwd` function - sets the working directory (i.e. `setwd("C:/mt1007/R")`).

`getwd()` - returns the working directory

`ls()` - lists objects in the R workspace

`save.image()` - saves everything in current workspace to 'RData' file

`load(".RData")` - loads workspace

**help** function - provides details about the specified function and what arguments it requires (i.e. `help(sample)`)

## Useful menu items in RStudio

Some of the basic commands in R used to navigate your directories can be performed using the menu items in RStudio. A few are listed below.

**File > Open file** - opens file (this could be an ‘.rmd’ file or a text file containing R commands)

**File > Save** - saves the active file.

**Session > Set working directory > Choose directory** - sets the working directory

**Session > Load workspace** - loads the chosen .RData file

## Special characters

`+, -, *, /` arithmetic operators

`:` as in `a:b` produces a vector from `a` to `b`, inclusive (e.g. `5:10` produces a vector 5 6 7 8 9 10)

`<-` assignment symbol (e.g. `x <- 5:10`)

`[]` used for selection (e.g. `x[1]` selects first element of a vector `x`)

`[rows, columns]` - used for selection of a dataframe where `rows` is the criteria for selecting rows and `columns` is the criteria for selecting the columns

`&` intersection, ‘and’

`|` or

`!` not

`<` less than

`<=` less than or equal to

`>` greater than

`>=` greater than or equal to

`==` logical equals, used in selection to compare two values

`!=` not equal to

`=` used to specify values for function arguments (e.g. `sample(x=1:30, size=5)`)

`~` notation for specifying a model as in `y ~ x`

`^` to the power of (e.g. `x^2` is  $x^2$ )

# comment; any code/text after # on the same line is ignored

\$ used to define elements (columns/object) within an R object (e.g. data\$X)

NA represents missing values

% used for matrix multiplication (e.g.  $x \%*\% y$ )

%>% pipe used in **tidyverse** to mean 'take the object before the pipe and feed into the next step'

pi is  $\pi$  i.e. 3.141593

## Useful hints

uparrow key - recalls previous command in Console panel

R is case specific and so **A** and **a** are treated as separate objects

If a package is not listed on the 'Packages' tab, it can be installed from the CRAN Repository