

US EPA ARCHIVE DOCUMENT

# StatCharrms R Version Installation Guide

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## Installation

StatCharrms is a graphical user interface front end for R, designed for ease of operation that performs the recommended statistical procedure used in the Medaka Extended One Generation Test (MEOGRT) and Larval Amphibian Growth and Development Assay (LAGDA). The statistical procedures implemented within StatCharrms are; the Rao-Scott adjusted Cochran-Armitage trend test by slices (RSCABS), a repeated measures ANOVA using time and treatment as fixed effects, Jonckheere-Terpstra trend test, Dunnett test, Kruskal Wallis, Dunns Test, one way ANOVA, weighted one way ANOVA, mixed effect ANOVA for imbalanced replicate structures, and a mixed effect Cox proportional model for imbalanced replicate structures.

StatCharrms is implemented as an R workspace preloaded with the required functions. To Start StatCharrms double click on the R icon labeled StatCharrms-V##.RData. Now the installation of the required packages can begin by typing :

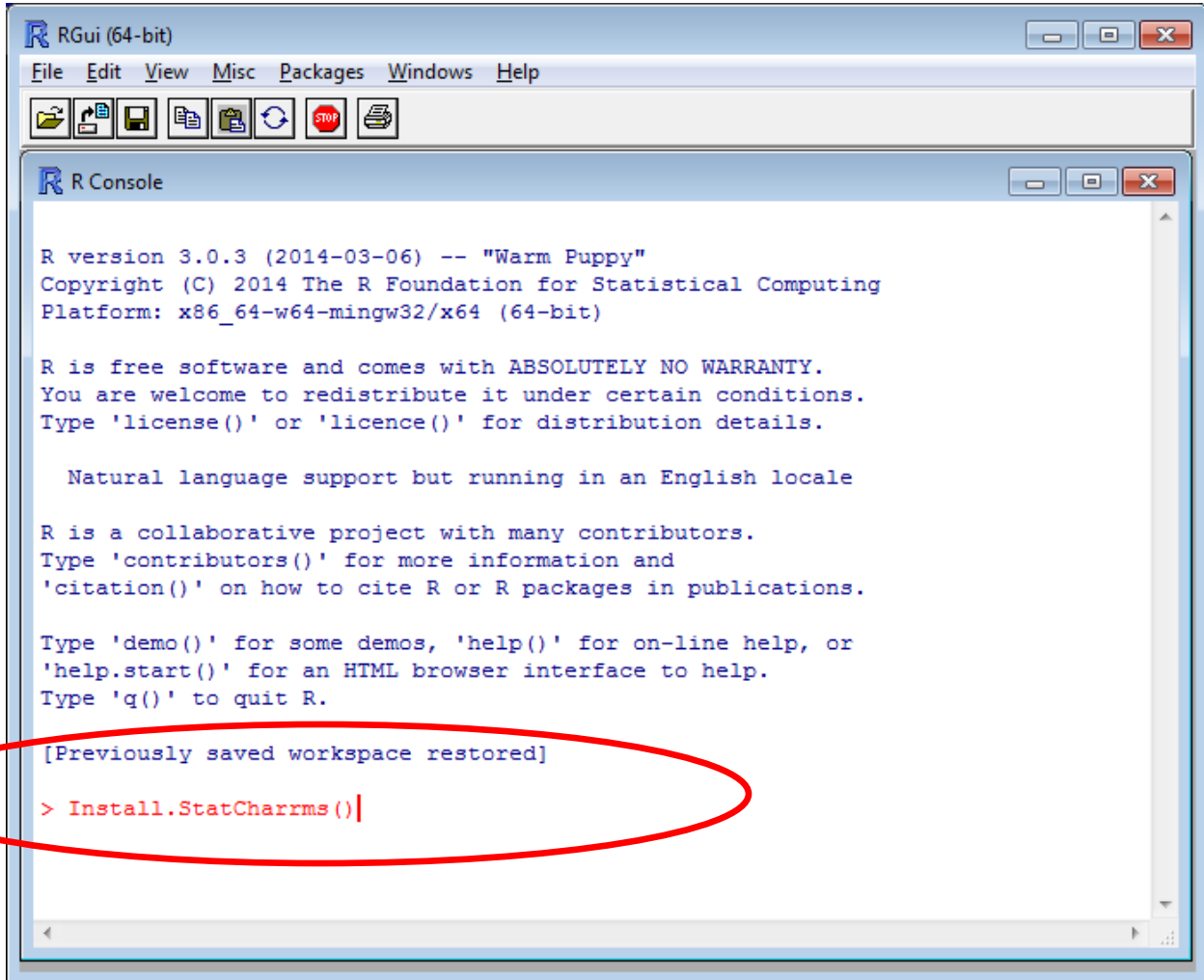
---

```
Install.StatCharrms()
```

---

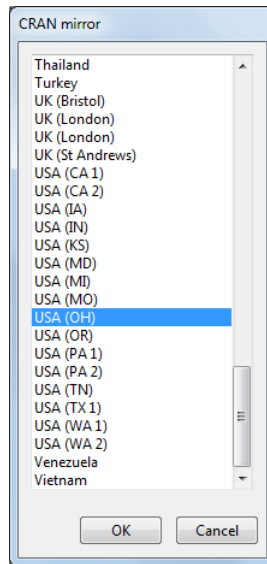
into the R console and then hitting enter. R is case sensitive so you will need to type the command exactly as it is above. Figure one shows what it should look like. Executing the installation command will, by default, create a folder on the C drive called "Rlib" that will contain the libraries needed for StatCharrms to run.

Figure 1:



Next a window asking to select CRAN (Comprehensive R Archive Network) mirror will popup. In figure 2, the Ohio mirror is being selected.

Figure 2:



It may take several minutes, but after all the R packages have been downloaded and unpacked an error message will most likely pop up indicating that the computer is missing a dynamic linked library (libatk-1.0-0.dll). The computer is missing the libraries for gtk+ and, when using Windows, R will prompt the installation of gtk+ (figure 4). Accept the installation of gtk+ and R will download gtk+ from the gnome foundation. After gtk+ is done installing a warning message will appear (Figure 5) and ask for a restart of R. Quit R and **DO NOT SAVE THE WORKSPACE**, never save the workspace upon closing R when using StatCharrms.

Figure 3:

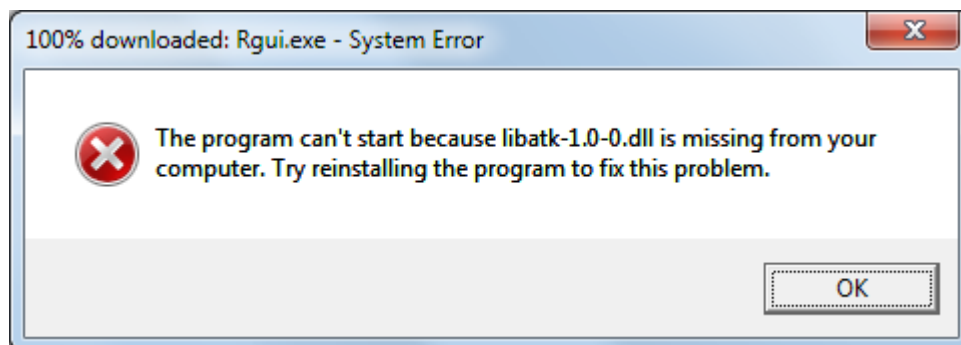


Figure 4:

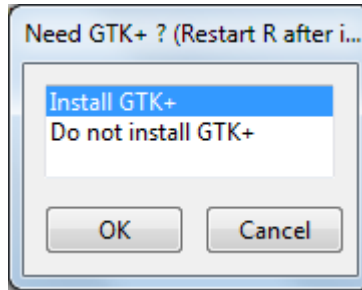
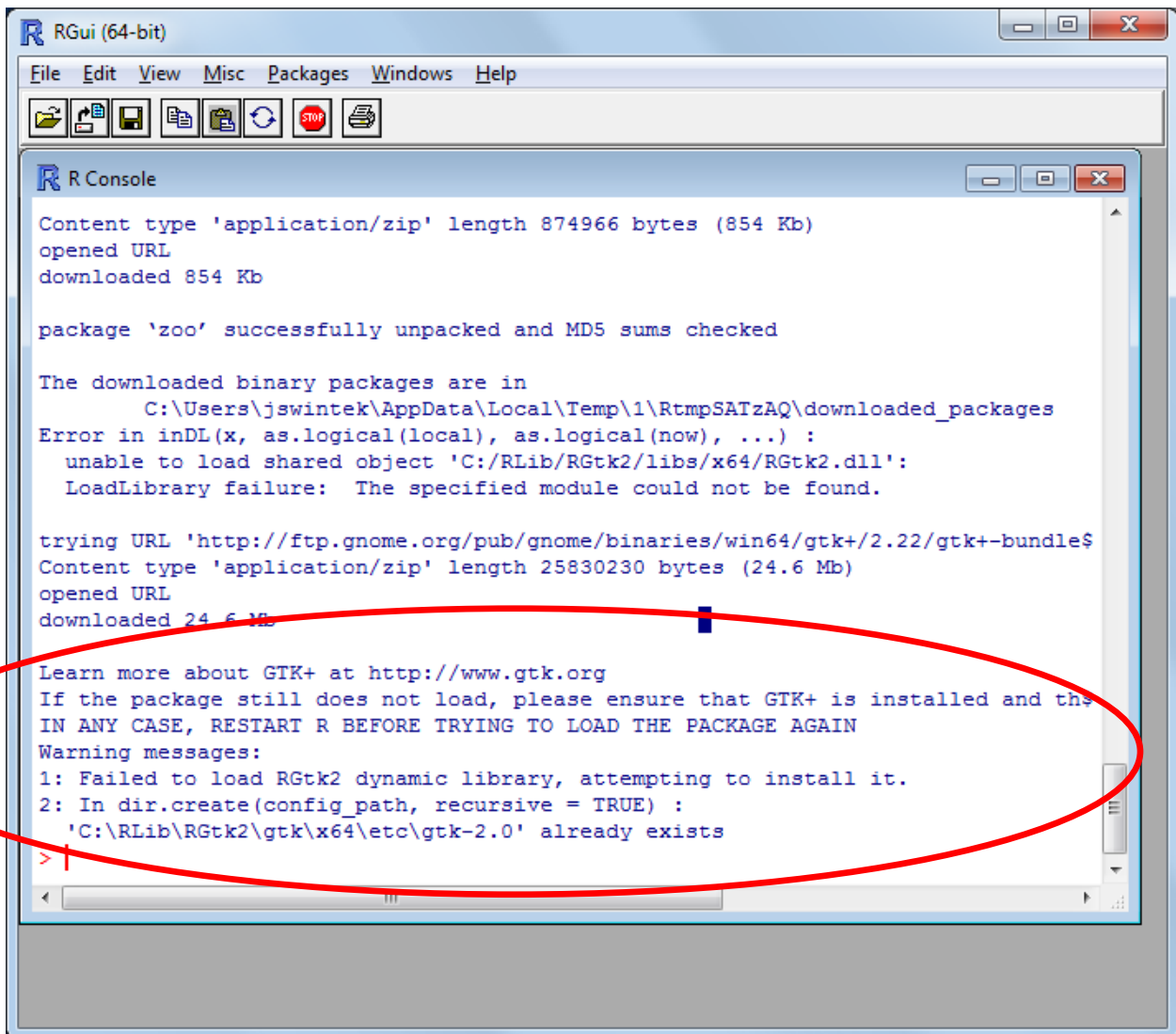


Figure 5:



After the installation is complete restart StatCharrms simply type:

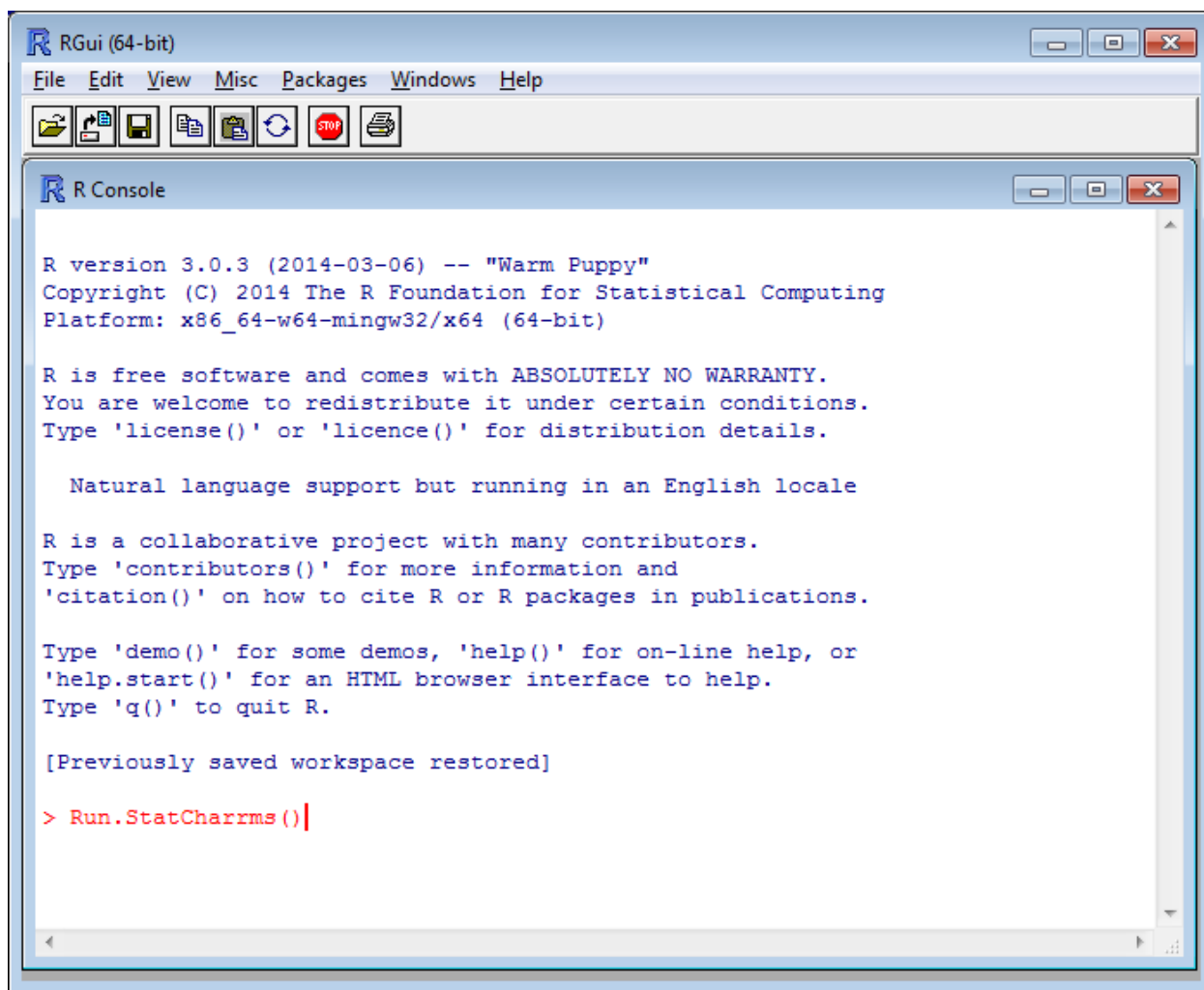
---

```
Run.StatCharrms()
```

---

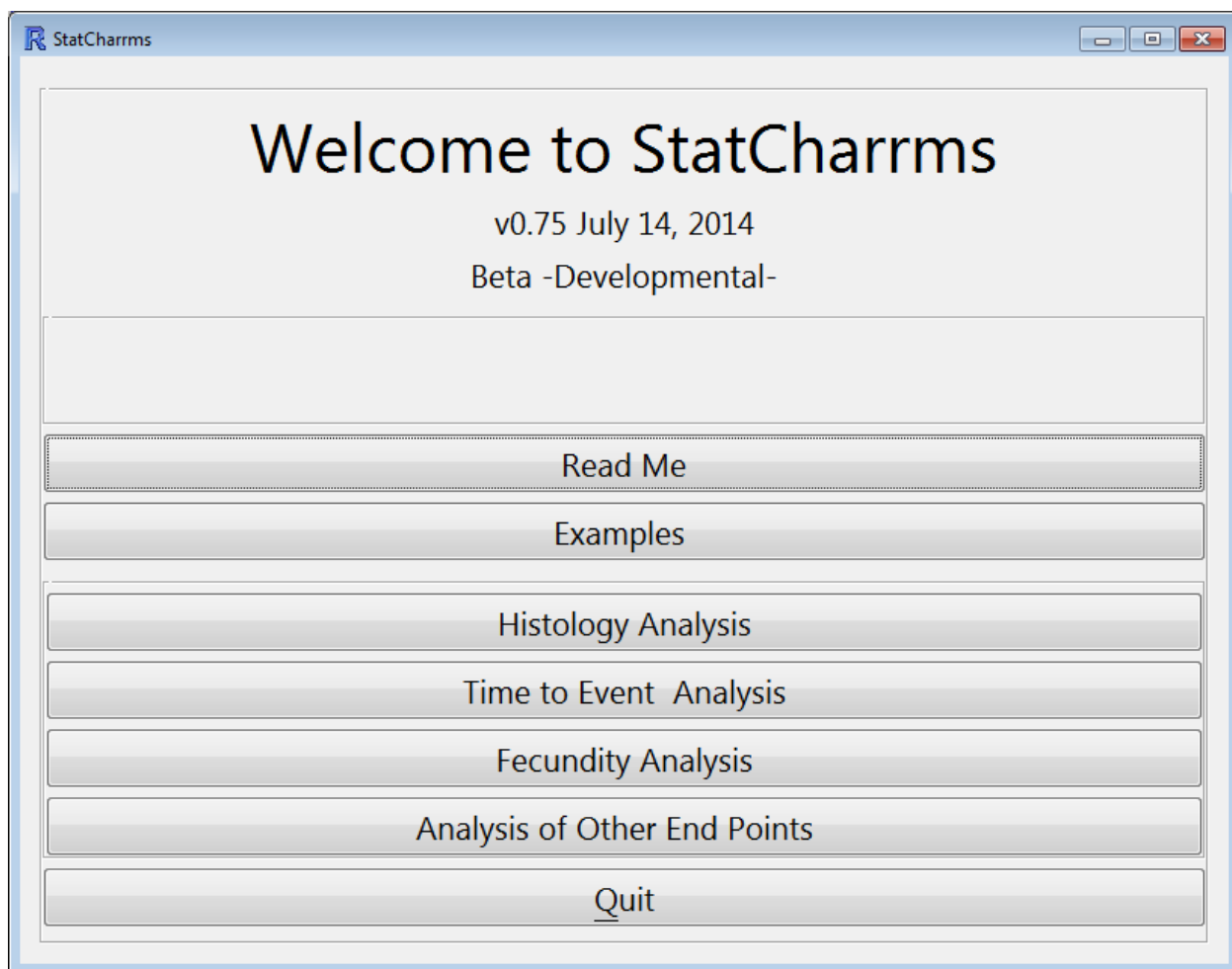
into the R- Console and hit enter.

Figure 6:



After all the required packages have been loaded the title screen should appear (Figure 7).

Figure 7:



### **FAQ and Troubleshooting**

- 1) StatCharrms fails to download or stops in the middle of downloading packages.
  - a. The successive downloading by third party software is sometimes blocked by a network's security setting. To fix this you can install each package directly in to C:\Rlib (or other R library directly) by typing the code below directly into the R Console. To use a different installation directory simply change the (R\_LIB\_USER='C:\\Rlib') line to (R\_LIB\_USER="My New Location") in the code below. Remember to replace all \ with \\ or R will give an error message. For example (R\_LIB\_USER='C:\\Desktop\\MyRlib') will install the packages to a folder called MyRlib on the desktop.



---

```
R_LIBS_USER='C:\\RLib'  
.libPaths(R_LIBS_USER)  
install.packages('RGtk2',dependencies ="Depends" )  
install.packages('R2HTML',dependencies ="Depends")  
install.packages('gWidgetsRGtk2',dependencies ="Depends")  
install.packages('multcomp',dependencies ="Depends")  
install.packages('nlme',dependencies ="Depends")  
install.packages('lattice',dependencies ="Depends")  
install.packages('ggplot2',dependencies ="Depends")  
install.packages('cairoDevice',dependencies ="Depends")  
install.packages('car',dependencies ="Depends")  
install.packages('clinfun',dependencies ="Depends")  
install.packages('zoo',dependencies ="Depends")  
install.packages('coxme',dependencies ="Depends")  
install.packages('agricolae',dependencies ="Depends")
```

---

- 2) R is giving me errors about not being able to write to the library location or it is asking me to set up a personal library.
- When trying to install packages for StatCharms, R will first try to install them to “C:\\RLib”, if you don’t have write access to the C drive, R will then try to install the packages to default R directory. If that fails R will prompt you to use a personal library. Selecting either yes or no in the prompt will likely cause the installation of StatCharms to fail. The problem can be solved in one of two ways. First R can be set up so that you, the user, has write access to the default R library folder. This may require a technician with administrative privileges on your computer. The second option is to change the R library location when StatCharms is installed. This can be done by typing `Install.StatCharms (“My New Location”)` instead of `Install.StatCharms()` when installing StatCharms. Remember to replace all \ with \\ or R will give an error message. The example below will install the packages to a folder called MyRLib on the desktop.

---

```
Install.StatCharms(“C:\\Desktop\\MyRLib”)
```

---

- 3) Following the steps of part 2 I’ve installed the R packages to a different directory but the program will not run.

- a. First check to see if the programs are in that directory by finding it through the windows interface. If all the packages are in the location you will need to call StatCharrms using `Run.StatCharms ("My New Location")` instead of `Run.StatCharms()` every StatCharrms is restarted to make use of the new library location. Remember to replace all `\` with `\\` or R will give an error message. The example below will run StatCharrms with packages installed to a folder called MyRLib on the desktop.

---

```
Run.StatCharms("C:\\Desktop\\MyRLib")
```

---

- 4) Typing `Run.StatCharms ("My New Location")` every time I want to run the program is an erroneous extra amount of work, is there a way to install the packages to a different location and run StatCharrms by only typing `Run.StatCharms()`?
  - a. Yes. You can type the code below into the R Console with the line `<function(Folder="C:\\RLib")>` changed to `<function(Folder=" My New Location ")>` and then resave the workspace through the R file menu, on the top right of the console. Using the resaved workspace should allow `Run.StatCharms()` to load StatCharrms every time now.

---

```
Install.StatCharms<-function(Folder="C:\\RLib"){
  dir.create(Folder, showWarnings = FALSE)
  R_LIBS_USER=Folder
  .libPaths(R_LIBS_USER)
  install.packages('RGtk2',dependencies ="Depends" )
  install.packages('R2HTML',dependencies ="Depends")
  install.packages('gWidgetsRGtk2',dependencies ="Depends")
  install.packages('multcomp',dependencies ="Depends")
  install.packages('nlme',dependencies ="Depends")
  install.packages('lattice',dependencies ="Depends")
  install.packages('ggplot2',dependencies ="Depends")
  install.packages('cairoDevice',dependencies ="Depends")
  install.packages('car',dependencies ="Depends")
  install.packages('clinfun',dependencies ="Depends")
  install.packages('zoo',dependencies ="Depends")
  install.packages('coxme',dependencies ="Depends")
  install.packages('agricolae',dependencies ="Depends")

  #Prompts instillation of gtk+
  library(RGtk2)
}
```

---

- 5) I already have a working R library and do not want to use a new one.
  - a. Follow the steps in question 2 though 5 setting the StatCharrms R library as your old R library

- 6) Will StatCharrms work under Linux or Mac?
  - a. It should, but you may need to manually load gtk+. Information on how can be found on its website at [www.gtk.org/](http://www.gtk.org/)
  
- 7) GTK+ will not load.
  - a. Are you on a windows machine? If you are, follow questions 2 though 4 above to set up a new R library. If you are not, you will need to follow the steps in question 6 to install gtk+
  
- 8) Will there be a standalone version of RSCABS that can be ran by command line
  - a. Yes, it is still in development.
  - b.
  
- 9) I have found a bug or I have other questions/concerns
  - a. Contact the maintainer at [Swintek.Joe@epa.gov](mailto:Swintek.Joe@epa.gov)

#### **References and packages used:**

#### **General Use, Graphic, and I/O Packages**

GTK+

<http://www.gtk.org/> maintained by the GNOME foundation

RGtk2 Package

Michael Lawrence, Duncan Temple Lang (2010). RGtk2: A Graphical User Interface Toolkit for R. Journal of Statistical Software, 37(8), 1-52. URL <http://www.jstatsoft.org/v37/i08/>.

gWidgetsRGtk2 Package

Michael Lawrence and John Verzani (2013). gWidgetsRGtk2: Toolkit implementation of gWidgets for RGtk2. R package version 0.0-82. <http://CRAN.R-project.org/package=gWidgetsRGtk2>

R2HTML Package

Lecoutre, Eric (2003). The R2HTML Package. R News, Vol 3. N. 3, Vienna, Austria.

lattice Package

Sarkar, Deepayan (2008) Lattice: Multivariate Data Visualization with R. Springer, New York. ISBN 978-0-387-75968-5

ggplot2 Package

H. Wickham. ggplot2: elegant graphics for data analysis. Springer New York, 2009.

cairoDevice Package

Michael Lawrence (2014). cairoDevice: Cairo-based cross-platform antialiased graphics device driver.. R package version 2.20. <http://CRAN.R-project.org/package=cairoDevice>

multcomp Package

Torsten Hothorn, Frank Bretz and Peter Westfall (2008). Simultaneous Inference in General Parametric Models. *Biometrical Journal* 50(3), 346--363.

### **HistoPath**

John W. Green et al.

Statistical analysis of histopathology endpoints

Environmental Toxicology

Volume TBA

J. N. K. Rao and A. J. Scott

A simple method for analysing overdispersion in clustered Poisson data

Statistics in Medicine

Volume 18, Issue 11, pages 1373-1385, 15 June 1999

J. N. K. Rao and A. J. Scott

A Simple Method for the Analysis of Clustered Binary Data

Biometrics

Vol. 48, No. 2 (Jun., 1992), pp. 577-585

### **Fecundity**

Pinheiro J, Bates D, DebRoy S, Sarkar D and R Core Team (2014). nlme: Linear and Nonlinear Mixed Effects Models\_. R package version 3.1-115, URL: <http://CRAN.R-project.org/package=nlme>.

### **Analysis of Other Endpoints**

Zoo Package

Achim Zeileis and Gabor Grothendieck (2005). zoo: S3 Infrastructure for Regular and Irregular Time Series. *Journal of Statistical Software*, 14(6), 1-27. URL <http://www.jstatsoft.org/v14/i06/>

car Package

John Fox and Sanford Weisberg (2011). *An {R} Companion to Applied Regression*, Second Edition.

Thousand Oaks CA: Sage. URL: <http://socserv.socsci.mcmaster.ca/jfox/Books/Companion>

clinfun Package

Venkatraman E. Seshan (2013). clinfun: Clinical Trial Design and Data Analysis Functions. R package version 1.0.5. <http://CRAN.R-project.org/package=clinfun>

Agricolae Package

Felipe de Mendiburu (2014). agricolae: Statistical Procedures for Agricultural Research. R package version 1.1-8. <http://CRAN.R-project.org/package=agricolae>

### **Time to Event Analysis**

Coxme Package

Terry Therneau (2012). coxme: Mixed Effects Cox Models.. R package version 2.2-3. <http://CRAN.R-project.org/package=coxme>