

## Practical Stats Newsletter for March 2015

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1. Upcoming 2015 Training

### **In-person courses:**

#### [Permutation Tests](#)

Aug. 24-25, 2014 \$995 through Aug 9, \$1095 after.

Altamonte Springs (Orlando area), Florida

Permutation test procedures replace parametric tests like t-tests and ANOVA. Learn about these new, important methods for environmental statistics.

#### [Applied Environmental Statistics](#)

"Statistics down to earth". A complete survey of statistical methods for environmental data, as well as an introduction to using R statistical software.

Sept. 14-18, 2015. \$1495 through August 30, \$1595 after.

Lynnwood (Seattle area), Washington

### **Webinars:**

#### [\\* Statistics for Managers](#)

Monday March 30, 2015. 1:30-2:30 PM Eastern, 10:30-11:30 Pacific. Free

Why would my employees need to know more than that one-semester course they took 5 to 10 years ago in college? Think about what's changed over the last 10 years – tablets, ease of access to wi-fi, Facebook and Twitter..... Statistics has changed a lot as well.

We'll hit the high points of

- flexible tests with few requirements (no more "must have a normal distribution"),
- free comprehensive statistics software,
- new and better methods of finding the best regression line,
- why "has there been a change in concentration?" has very little to do with a mean, and much more.

#### [\\* Stats for Contaminated Sites](#)

Thursday, May 21, 2015. 11:30-1:00 PM Eastern, 8:30-10:00 AM Pacific Time

\$95 or \$190 depending on number of persons at your connection (see our web page for registration details)

[Online Registration through GeoEnviroLogic.ca](#)

An introduction to the statistics needed when evaluating site chemistry and possible effects of remediation. There are no requirements for previous statistical training to attend the webinar, but familiarity with computation of the UCL95 would be helpful. The

primary requirement is a recognized need to learn. A standalone webinar as part of the [Online Contaminated Site Professional 2015 Webinar Series](#) at GeoEnviroLogic.ca.

Topics include:

Which statistics to use when characterizing a site?

Should I use a mean or a percentile?

What are the effects of data transformations?

What is the UCL95 and what does it describe?

How to test data for similarity to standard shapes of distributions, and why?

How do I compute a UCL95 with skewed data?

How do I compute a UCL95 with small data sets?

Bootstrapping – what it is and why it is so useful.

How to test for differences between the site and background.

Trend tests – are conditions improving?

**\* Permutation Tests: Never Worry About a Normal Distribution Again!**

Monday June 22, 2015. 1:30-3:00 PM Eastern, 10:30-12 noon Pacific, \$250

Introduction to the new permutation test procedures that replace t-tests and ANOVA. See the benefits of the new, important methods for environmental statistics. (Our two-day class on permutation tests, above, will provide much more detail and hands-on use of software in class.)

To register and for more information on all of our courses and webinars, see our [Training](#) page at <http://practicalstats.com/training/>

## 2. RStudio as a Front-End to R Software

R is the free, open-source statistics software system that has become popular world-wide. R is modular, with new modules or 'packages' developed frequently. In our January 2010 newsletter we described one module that we use in many of our in-person classes, called R Commander. It provides an alternate front-end that gives R a pull-down menu interface for commonly-used routines such as regression and hypothesis tests, and even to some less-commonly used methods such as time-series procedures. The advantage of R Commander is that it makes R look similar to commercial statistics software with pull-down menus, so you don't initially need to know the R commands that would otherwise be typed into the console window. It helps the user to learn the command line approach (t.test for a t-test, etc.). Or not.

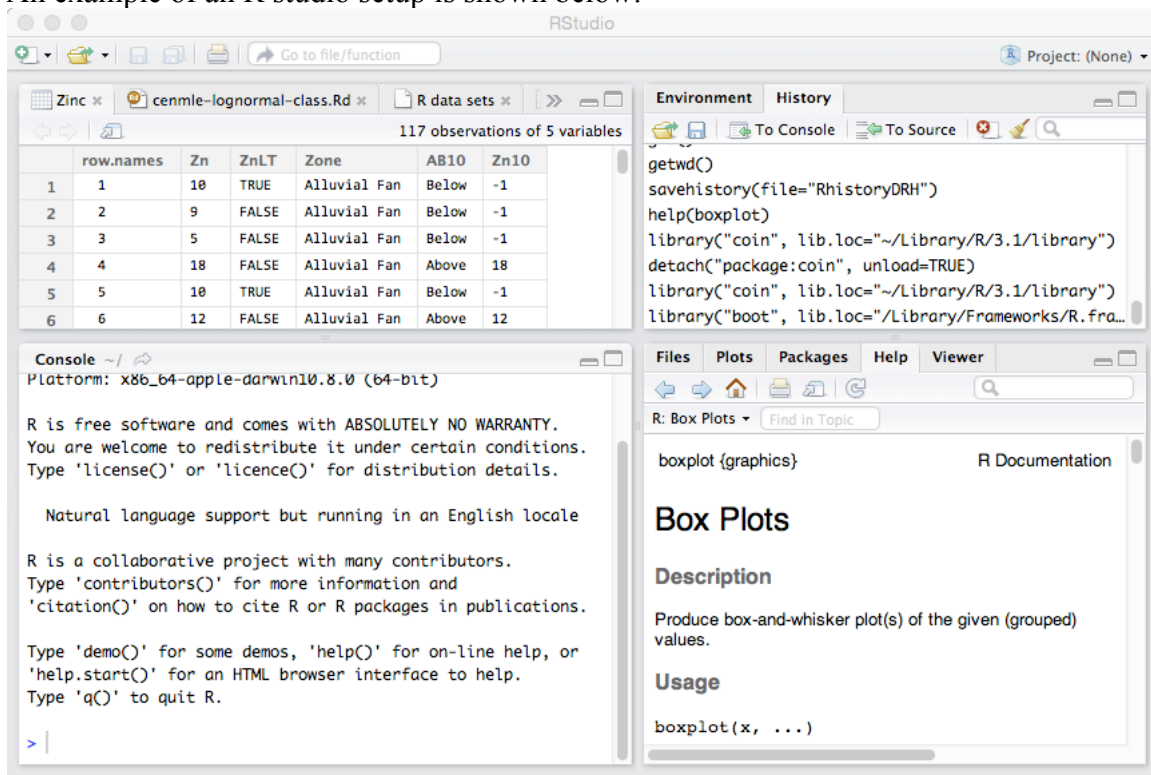
Users quickly get to the point where they would like to write short programs, or scripts, to do the same analysis at multiple sites or for multiple chemicals without pulling-down the menus manually each time. R is completely scriptable. A useful front-end to R for writing scripts that is freely-available as a standalone program is RStudio.

<http://www.rstudio.com/products/rstudio/>

RStudio augments the basic R console window, organizing and simplifying the typing approach to R, and especially aiding the process of creating R scripts. Some of the features of RStudio that we find helpful are:

1. Automatic completion of 'grammar' such as as parentheses and brackets. No more problems because you forgot to close "mean(x)" or more complicated expressions with the final end parenthesis.
2. Placing the graphics window and help windows alongside the console window in tabs for easy access.
3. Easy loading of R packages with a mouse click, and an easy way to see which packages are already installed, in another tab.
4. A window that shows the data set being worked on, with each data set loaded in its own separate tab.
5. Easy saving of computations and history in your workspace at the end of the session.
6. Debugging tools for script writing.

An example of an R studio setup is shown below:



If you write scripts to get graphs to look the way you want (your favorite colors, fonts, or required formats for your agency), or scripts to save work for repetitive operations, R Studio can help. Even if you simply want a more organized desktop when using R for statistics, R Studio can help. Check it out.

### 3. Webinar Safety

Webinar hosting companies take two approaches to allow you to see video and/or Powerpoint slides being presented. First, the big companies (you know their names -- you've probably used them) require you to install an extension into your browser software. This is code that you have no control over, and it modifies what runs on your computer. You are depending on the reputation of the hosting company that this code

hasn't been hacked by someone nasty. Many agency and business IT departments do not allow these extensions to be installed except on designated, 'at risk' company computers.

The smaller webinar host that we use requires only that you have Adobe Flash installed to view webinar video on a computer (and not even that for tablets). Flash has its own problems, but Adobe has been vigilant in releasing frequent updates that prevent Flash from being used for something unwelcome. Many of us probably have Flash already installed. Many of us are tired of continually updating Flash. Be vigilant! If your version of Flash is not kept up to date, it can be a way that hackers use to get information or gain control of your computer. If you use it, keep Flash up to date!

The safest way currently to use Flash is from within the Google Chrome browser. Chrome 'sandboxes' its Flash component. You do not need to have Flash installed on your computer; a current version comes inside of Chrome. Any rogue code that may target Flash is contained within the Chrome browser, and cannot get to your operating system. Deleting Chrome deletes Flash and any rogue code using Flash that finds its way to your browser. IT departments and individuals who are Flash-wary do not install Flash directly on their computers, but use Chrome when necessary, as when viewing webinars, to keep their computers safe. Practical Stats endorses this idea.

Tablets and phones use HTML5 instead of Flash. HTML5 is a more secure way of viewing a webinar or other videos. Our webinar host provides an app for iOS and Android users to view webinars without Flash, and so a tablet could be connected to a projector and sound system for safe roomwide viewing. Flash is still required for viewing with browsers on mac and windows computers. If you're using a computer, use the Chrome browser to keep Flash safely contained. And sign up for one of our webinars!

'Til next time,

Practical Stats

-- Make sense of your data