

## Practical Stats Newsletter for January 2011

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### 1. Upcoming Courses

Our Spring course schedule is now set, and registration is available through the Practical Stats “Upcoming Courses” page. If you have benefitted from our newsletters or courses, please tell your contacts about these courses. It makes a difference. Word of mouth is still a major way that people find out about them.

#### **Time Series and Forecasting**

for frequently-collected, “real-time” data

April 4-5, 2011                      \$895 registration before March 21

Homewood Suites Littleton   \$995 on or after.

Littleton Colorado 80127

#### **Nondetects And Data Analysis**

Correctly interpret data below detection limits

April 6-7, 2011                      \$895 registration before March 21

Homewood Suites Littleton   \$995 on or after.

Littleton Colorado 80127

#### **Applied Environmental Statistics**

Statistics, down to earth

May 2-6, 2011                      \$1395 registration before March 21

Temple Univ. City Center   \$1495 on or after.

Philadelphia, PA 19102

You can always find our complete course listing at

[http://www.practicalstats.com/new\\_classes/classes.html](http://www.practicalstats.com/new_classes/classes.html)

### 2. Updated software for nondetects released

Software to accompany the textbook *Nondetects And Data Analysis* has been available on the Practical Stats website since 2005 when the book was published. Methods for graphs, computing hypothesis tests and regression for censored data are available there, for free, in two formats. The first format is for the commercial software package Minitab. The second is for the free, GNU-license package R. NADA for Mtb (Minitab) and NADA for

R are both undergoing upgrades, as a second edition of the book is nearing completion sometime in 2011. The latest version (2.9) of NADA for Mtb includes several improvements and new routines that will be highlighted in the new edition. But you don't have to wait until them to get the software to perform some of these improvements.

NADA for Mtb 2.9 includes a new macro that performs the Generalized Wilcoxon (GW) test for left-censored data. This test is similar to a Mann-Whitney or Kruskal-Wallis test but applicable to data censored at multiple detection limits. The textbook explains how to 'flip' left-censored data and run the GW test using commercial software. This macro performs this all internally – just run the GW macro without the muss and fuss of flipping.

Also contained in 2.9 are new and improved bootstrapping macros for censored data. These macros provide bootstrapped estimates of medians and means using several procedures. The advantage of bootstrapping is that confidence limits around the estimates can be provided without assuming that the statistic being estimate follows a distribution, such as the normal. In short, there is no need for the 'Central Limit Theorem', which is certainly difficult to verify with censored environmental data. Routines for computing confidence limits for Kaplan-Meier, maximum likelihood and ROS procedures are included. The latter is available for the first time.

The new cdf macro produces a censored empirical distribution function plot for data with nondetects. Here's another way to get insight into your data. Using a "cumulative failure time" plot in survival analysis, this macro gives you the plot with no flipping required. Data classified by groups can be plotted, one edf per group, and compared.

Finally, changes and corrections to cplot, ckend, PPW and the ATS methods have been incorporated. For example in the PPW macro, paired data with one value a detected 1 and the other a <10 will be considered as tied, both becoming <10. This is the adaptation recommended in the original 1987 paper for handling a situation such as when the two groups represent two time periods or two laboratories, and consistently different detection limits have been used in each group.

More additions and improvements are planned for NADA for Mtb (3.0) and NADA for R as the release of the second edition of the NADA textbook occurs. In the meantime, you can get a taste of the newer macros, which make 'flipping' far less necessary, by downloading and installing version 2.9.

As always, suggestions on improvements or new procedures are welcomed. You can email us at the address from which this newsletter was sent, or use our Contact Us page at [www.practicalstats.com](http://www.practicalstats.com).

### 3. NEW: Webinars by Practical Stats

For those of you who haven't been able to make it to one of our courses, we are trying something new. We will offer two webinars this spring on the subject of stats for nondetects, conducted through Midwest Geosciences Group

(<http://www.midwestgeo.com/>). Click on their Webinars link at the left of their home page, or click on the 'Print Webinar Schedule' button. As of this writing, registration for the second webinar is not available online, but I am told this will be remedied very soon.

On April 11<sup>th</sup> I'll present "Why Subbing One-Half of the Detection Limit is Trouble and What You Can Do Instead". It is aimed at people who substitute some proportion of detection limits for nondetects, and think that this can't hurt too badly. It can! On May 16 I'll present "Handling Nondetect Data Correctly", an overview of methods available for performing statistics on left-censored data.

One downside of webinars is that the amount of material that can be presented is limited. These are small bites of the topic, and together might compose about half the material in our two-day *Nondetects And Data Analysis* course. Two upsides of webinars are that  
a) they are less expensive, especially when no travel dollars are required, and  
b) multiple people can attend at a site for one price.

Those of you who end up registering for one or both, send an email to us and let us know what you thought of it.

'Til next time,

Practical Stats (Dennis Helsel)

-- Make sense of your data