

## Practical Stats Newsletter for September 2008

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This month is a special issue of our once per two months (is that bimonthly?) newsletter. We update and complete last month's review of statistical software priced at \$600 and under. Our summary ratings are at the end of this section -- one package performed the suite of methods we deemed necessary for environmental statistics for that cost.

### 1. Upcoming Courses

There are three courses coming up in the next few months. You can always find a complete listing at [http://www.practicalstats.com/new\\_classes/classes.html](http://www.practicalstats.com/new_classes/classes.html).

*Nondetects And Data Analysis*, the course that illustrates methods for correctly handling data with nondetects, will be held at the Mainsail Suites and Conference Center in Tampa, FL on Nov. 11-12, 2008. Registration is \$795 online at [http://www.practicalstats.com/new\\_classes/classes.html](http://www.practicalstats.com/new_classes/classes.html). The Conference Center is near the Tampa International Airport, so no car rental (and associated gas purchase) is necessary. Special rates on hotel suites are also available - see the above registration link at our new\_classes page.

Immediately following on Nov. 13-14 at the same location is *Untangling Multivariate Relationships*. This course covers the multivariate methods of primary interest to environmental science, focusing on what each method is designed to do, when to use them, and when not to. More detail on course content is on our website. Registration is \$895 through the same link, above. The following week in Tampa is the SETAC (Society for Environmental Toxicology and Chemistry) annual meeting.

*Applied Environmental Statistics*, our flagship one-week course to enable you to "make sense of your data", will be held on the campus of the Colorado School of Mines in Golden, CO on March 2-6, 2009. Be sure to check our course website for a complete course outline, and to register for the course. Online registration will be available soon.

We hope to see you at one of our upcoming classes!

### 2. Review of Lower-Cost Statistical Software, Part 2

This month we review four lower-cost options for performing statistical methods, alongside the five reviewed in our August newsletter. An Excel spreadsheet evaluating the feature set of all nine software packages is available on our newsletter site,

[<http://www.practicalstats.com/news>]. Environmental scientists have sophisticated statistical needs. Some of the features we evaluated each package for, and which for some came up lacking, include residuals and partial plots for multiple regression, regression diagnostics such as Mallow's Cp and VIFs, better tests for normality such as Shapiro-Wilk, Anderson-Darling or PPCC (not the much older Kolmogorov-Smirnoff or chi-square tests), and both parametric and nonparametric multiple comparison tests. These are all elements of what we teach in our *Applied Environmental Statistics* course, and should be tools of the trade when examining environmental data.

The four programs reviewed this month range in price from \$200 to \$599. The four are

Stat Plus	<a href="http://www.analystsoft.com/en/products/statplus/">www.analystsoft.com/en/products/statplus/</a>	\$200
Winks Professional	<a href="http://www.texasoft.com">www.texasoft.com</a>	\$229
Stat Tools	<a href="http://www.palisade.com/stattools/">www.palisade.com/stattools/</a>	\$595
NCSS	<a href="http://www.ncss.com">www.ncss.com</a>	\$599

We tested the Windows version of each package running MS Vista, except for Winks, which we ran on Windows XP. A Macintosh version of StatPlus is also available. If you haven't seen last month's review of the first five packages, it is available on our newsletter page, [www.practicalstats.com/news](http://www.practicalstats.com/news).

All four packages estimate percentiles, means and other summary statistics. All perform t-tests (paired and 2-sample), the Mann-Whitney, Kruskal-Wallis, and signed-rank tests. All perform ANOVA and estimate regression slopes and intercepts. All compute Pearson's r correlation coefficient and draw scatterplots. All compute contingency table (chi-square) tests on a table of counts, though we could not get Stat Plus to return correct results for contingency tables.

From there the feature sets of the packages diverge. NCSS provides the most extensive feature set of all of the nine packages we reviewed. It performs all of the features we were looking for in an environmental statistics package, except for Lowess smoothing and Kendall's tau correlation with the associated Theil-Sen line. Even there, NCSS performs an alternative robust line method, and so provides the functionality of Theil-Sen. Its capabilities best match the features we were looking for among all the nine software programs tested here. It includes modern regression diagnostic methods, the newer tests for normality, and both parametric and nonparametric multiple comparisons. For an individual scientist without a corporate license for one of the 'major' statistics packages costing \$1500 and up (see our November 07 newsletter on the cost of statistical software), NCSS would provide a complete suite of methods for much lower cost.

Stat Tools feature set is more consistent with software in the \$200-\$300 range, such as the two tested this month, Winks and StatPlus. Each of these three include and exclude methods in slightly different areas, but tend to not include some of the modern regression diagnostics that help scientists build good multiple regression models. Of the three, only StatPlus computes the Shapiro-Wilks test or one of the other better methods for judging how closely data fit a normal distribution. Only StatPlus computes Kendall's tau

correlation coefficient. None of the three compute a nonparametric multiple comparison test.

Check the full feature set evaluation on our newsletter site, to see which software package includes the features you require. In addition, a short summary evaluation of the nine packages is below, based on their ability to perform the procedures we find most necessary for the analysis of environmental data. The maximum rating is 6\*s. Six stars seemed appropriate since the maximum cost was \$600. One could look in your price range and find a package that had at least one star per \$100. In our judgment, to use one of these software packages as your only statistics package for environmental applications, you would need a package rated at either 5 or 6 stars.

NCSS	\$599	• • • • • •
Stat Tools	\$595	• •
xlStat	\$445	• • • • •
Winks Pro	\$229	• •
Stat Plus	\$200	• •
Analyze It	\$195	• • •
WinStat	\$99	•
StatistiXL	\$75	• •
Fast Stats	\$50	•

### 3. Visit us at SETAC 08

Practical Stats will be exhibiting at the SETAC (Society for Environmental Toxicology and Chemistry) national conference in Tampa in November. Stop by, say hello, and pick up our free CD of software and more.

'Til next time,

Practical Stats

-- Make sense of your data