



# A Powerful New Tool for Visualizing Water and Habitat Quality Data



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## SUMMARY

As part of a collaboration between the Maryland Department of Natural Resources and students and faculty participating in the Research Experience for Undergraduates (REU) Program hosted by the Department of Mathematics and Statistics at the University of Maryland Baltimore County (UMBC), a Graphical User Interface (GUI) was developed for visualizing and analyzing water quality data. This interactive software, which can be used to graphically view water quality data in a number of different ways and to calculate formal statistical results for evaluating the health of monitoring sites, provides scientific researchers and the general public with a powerful new tool to aid in the understanding of water and habitat quality data. This joint effort also provided undergraduate students from around the United States with 'real-world' experience in applying high performance computing and statistical methods to environmental monitoring projects.

## FEATURES

### Graphing

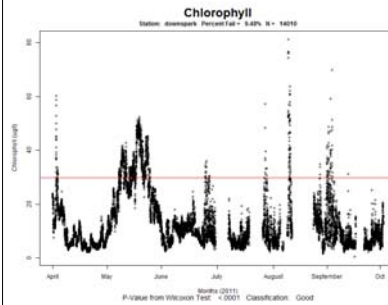
- Seven types of plots available for visualizing water and habitat quality data
- Plots can incorporate six different water and habitat quality parameters:
  - Dissolved Oxygen
  - pH
  - Turbidity
  - Temperature
  - Chlorophyll
  - Salinity

### Analyses

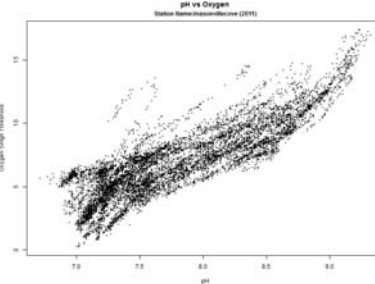
- Applies MD DNR accepted thresholds to compute and compare failure rates for various water quality parameters
  - Dissolved Oxygen (< 5 mg/l)
  - Turbidity (> 7 NTU)
  - Chlorophyll (> 30 ug/l)
- Assesses status of monitoring stations based on failure rates and application of Wilcoxon Signed-Rank tests
- Identifies trends in the data using Seasonal Mann-Kendall tests
- Incorporates data from MS Access databases
- Available for free download at [www.chrisrackauckas.com/assets/WQM](http://www.chrisrackauckas.com/assets/WQM)
  - Installation of R not necessary for MS Windows version

## AVAILABLE GRAPHING OPTIONS

**Parameter vs. Time:** includes results from percent fail and status analyses

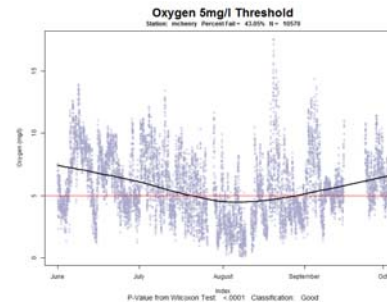


**Scatter Plot:** plots one parameter vs. another

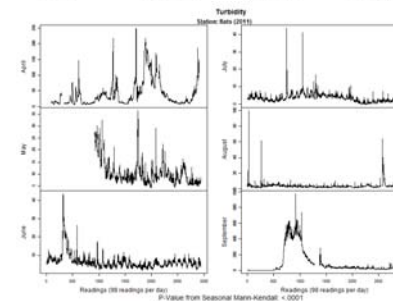
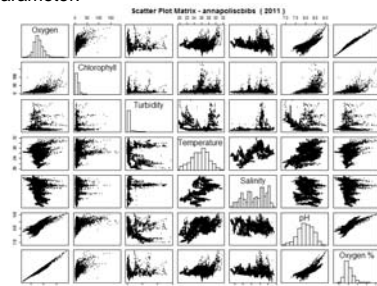


**Month Stacked Time Series:** plots monthly graphs for each parameter; includes results from trend analyses

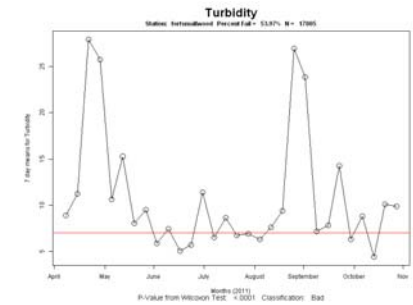
**Parameter vs. Time (Overlaid):** plots include trend line



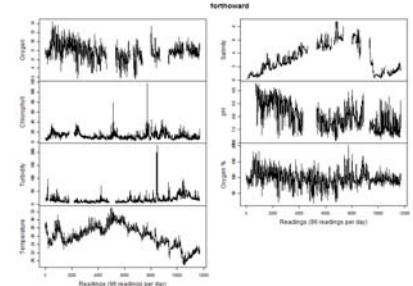
**Scatter Plot Matrix:** gives a matrix of all possible scatter plots; diagonal displays histogram for each parameter:



**Parameter vs. Time (means):** plots mean values for user-defined interval



**Parameter Stacked Time Series:** plots all parameters for a single monitoring station



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