

Watershed data management solutions

A simple search on the Internet will return an abundance of applications intended for environmental data management. Even a technical and business savvy user will find it a monumental task to sort through all of the options and determine which ones are even appropriate for his/her needs. Since everyone's needs differ, we quickly abandoned that approach and simply listed solutions which we have encountered over the last several years which we felt were worth listing. This listing also provides a variety of solutions meeting different needs and types of uses. These options only include one solution from a "for-profit" environmental consultant, and that is ours. We only included it because it is free. Going forward, we would be happy to retain and maintain this list and add any viable solutions that anyone E-mails to us at datamgtsolutions@newmilesobluestream.com. The list will be updated periodically and will be available at <http://www.newmilesobluestream.com/datamgt.html>.

We are not recommending any particular solution since everyone needs something different. Instead, we are providing a suggested framework for analyzing the options and selecting a solution (see attached grid). For example, if you are looking for a robust, feature rich, and well tested application and you have at least one capable technical person available to you, STORET is most probably the best solution for you. On the other hand, if finances are tight and you have very little technical support, another solution is required.

These options are described further below. The descriptions of these solutions were provided by the organizations which maintain these solutions.

Application	Cost	Contact/URL
AVStreams	Free†	http://www.avstreams.psu.edu/overview.htm
Alliance for the Chesapeake Bay Citizen Monitoring Clearinghouse	varies	http://www.acb-online.org/project.cfm?vid=217 jbretz@acb-online.org
DataShed (SRI)	Free*	www.datashed.org sri@streamrestorationinc.org
EASI monitor	Free	http://www.easi.org/monitor
NMBS WaMP	Free	http://www.newmilesobluestream.com – select NMBS WaMP menu item
PA Watersheds Data System	Free*	www.pawatershedsdatasystem.psu.edu . amccracken@pawatersheds.org
Project W.A.T.E.R.	Free†	juniataccd@juniataccd.org
STORET	Free∇	1-800-424-9067 STORET@epa.gov . http://www.epa.gov/storet/about.html

† Requires a licensed copy of ESRI software

* Currently free, may have a fee at some time in the future.

∇ Requires a licensed copy of Oracle™

Commercially available software options include:

Application	Contact/URL
EnABL	http://www.enabl.com
Equis	http://www.earthsoft.com
Hivemind	http://www.neonexuscop.com/eds.php

Other links of interest:

http://water.usgs.gov/software/water_quality.html

AVStreams

AVStreams is a GIS-based stream characterization tool that works in tandem with ArcView GIS software. The central concept behind development of this software is to automate a variety of stream assessment techniques that typically depend on users to manually enter stream characterization data (e.g., bed and streambank conditions, habitat types, erosion problems, stream morphometry, etc.) onto paper survey forms. Via AVStreams, users can access a variety of assessment forms via pull-down menus and associate the compiled data with digital stream segments and user-specified locations.

Included with AVStreams is a GIS database containing various digital map layers such as streams, USGS topographic maps, roads, watershed boundaries, and municipal and county boundaries. These data layers are utilized for storing stream-related information, as well as for providing “background” information useful for organizing and displaying field-compiled data. Digital images (e.g., photos, other maps, and scanned documents) can also be added to a project database, along with user-compiled field notes.

Alliance Citizen Monitoring Clearinghouse

The Alliance for the Chesapeake Bay (Alliance) trains citizen volunteers in water quality monitoring techniques for tidal and non-tidal waters, specifically DO, temperature, pH, Salinity (where appropriate) and water clarity. Some volunteers also monitor for fecal coliform bacteria, and record daily precipitation, jellyfish monitoring, bacteria monitoring and weather observations. Monitors are also shown how to record their data on standard Alliance data sheets and how to enter the data online. This data is collected under the Alliance's Quality Assurance Program Plan (QAPP) approved by Virginia's Department of Environmental Quality as Level III data (equivalent to the Department's agency collected data and therefore can be utilized in the Biennial Water Quality Assessment reports). Data are also useful in the development and implementation of Total Maximum Daily Load (TMDL) plans. Volunteers and any interested citizens can access this database, which includes data collected for many years in the Chesapeake Bay watershed, at: <http://www.alliancechesbay.org/monitoring/site.cfm>

The database houses all field and laboratory data collected by Alliance citizen monitors and contains data for both active and well as all historic (inactive) monitoring sites. Authorized citizen monitors are able to enter field data into the database through the World Wide. Data recording by volunteers is spot checked by Alliance staff. Data retrieval of all citizen monitoring data may be accomplished by Alliance monitors, staff, and the general public. Data searches are possible for site information, water quality and event data by site, tributary, hydrologic unit, city/county, and other fields. Time series graphing and statistical analysis by site and parameter is also available from the online database. This data management system not only enhances procedures for submittal but also enhances the further integration of citizen monitoring information with state and local agency-collected data.

Because in its present form, the database is used for volunteer-collected data that may be used for water quality assessment reporting to Virginia, the Alliance, under its QAPP, must assure that monitors using the system are properly trained and recertified. The Alliance presently provides this training on a fee-for-service basis to interested watershed groups throughout the Chesapeake Bay watershed. Costs vary according to location and training and data management requirements.

Point of contact: Jess Bretz, Volunteer Water Quality Monitoring Coordinator, jbretz@acb-online.org Alliance for the Chesapeake Bay, Virginia Office

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Richmond, VA 23218
(804) 775-0951
(804) 775-0954 (fax)

DataShed (SRI)

Datashed is a fully-featured, GIS enabled, internet database designed to assist watershed groups, academic institutions, private industry and government agencies.

Powered by open source software, this database provides a cost-effective and reliable solution to the management of data associated with environmental efforts. Specific, individualized functions can easily be added using common programming languages. Users can easily upload, download, and print data from any internet browser without the use of additional plug-ins or software allowing the website to function both as a data management and education/outreach tool.

Check out the site at www.datashed.org.

Contact Shaun Busler of Stream Restoration Inc. at (724) 776-0161 or email at sri@streamrestorationinc.org for more information.

EASI monitor

The Environmental Alliance for Senior Involvement, the Pennsylvania Department of Aging, and the Pennsylvania Department of Environmental Protection maintain citizen water monitoring databases for collecting and using information from thousands of citizen volunteer monitors around the Commonwealth of Pennsylvania. The database supports multiple suites of monitoring protocols for different organizations and purposes.

To review or subscribe to this, go to <http://easi.org/monitor>.

NMBS WaMP

In response to some watershed groups indicating that they felt more comfortable with a watershed data management application that was not internet based, that allowed them to control their data, and that wasn't costly each time they added a parameter to the list of parameters in the database, we "raided" the code from several of our existing programs and patched together this "quick and dirty" Watershed Management Program. It allows for basic data management of parameterized (e.g., AMD or agricultural chemical) data.

NMBS WaMP manages parameterized data for watersheds, sub watershed, and sampling points. Data can be filtered and results can be exported for manipulation and reporting. Output formats currently allow for exporting to an MS Access database, a csv file (for importing into programs like Excel), and a shp file (for GIS work – but currently it only outputs point referenced data). The underlying data is in an MS Access file and can be manipulated and reported on directly using MS Access or any other application that accesses MS Access (97) files.

NMBS WaMP is provided freely to any non-profit or government agency which wishes to use it. No support is currently provided; there are no concrete plans for a new version of the application. The application and documentation can be found at <http://www.newmilesofbluestream.com/wamp/index.html>.

PA Watersheds Data System

The *PA Watersheds Data System* is a data management tool for water monitoring groups who currently lack the means to store their own data in a manner that promotes use of the data. The *Data System* will allow groups to store and view their data in an organized manner, and because the Data System is accessible through the internet, it will be much easier to share data as well. Although on-line, groups will be able to define who views their data through different permission levels. Groups can enter data via an easy-to-use webform or through a batch upload process for legacy data. There will also be data from four larger databases, including the Susquehanna River Basin Commission, Department of Environmental Protection, Kiski-Conemaugh Stream Team, and Alliance for Aquatic Resource Monitoring. It can be accessed at www.pawatersheds.org.

Some analysis tools within the *Data System* include graphing functions such as line graphs and box-and-whisker plots, standard reports, and a GIS-enabled interactive map showing monitoring locations. This interactive map also has an additional 21 spatial data layers, allowing groups to view other characteristics of their watershed.

There is no user fee as of yet, but a fee structure will be implemented in the future. POWR must pay a hosting fee each month for the convenience of having the data on-line. The fee will be as minimal as possible, so as not to discourage groups from using the *Data System*. The more groups that we can get involved and using the *Data System*, the thinner we can spread these monthly costs, and therefore the lower we can make the user fee.

POWR is anxious to get groups involved and using this tool, and hopes to see more groups move forward and take action with their data. For more information or to get involved, visit www.pawatersheds.org or call or e-mail Angie McCracken at 717-234-7910 or amccracken@pawatersheds.org.

Project W.A.T.E.R. (Watershed Analysis Triggering Environmental Results)

Project W.A.T.E.R. is a “watered-down” version of ArcView that can be utilized with existing GIS data to make basic watershed-based environmental decisions within a region (county, watershed, etc.). It was created “by a Conservation District for a Conservation District”, in terms of creating watershed based agricultural databases and packaging them with shapefiles in a piece of software that is easy to use without extensive ArcGIS knowledge.

The emphasis at the Conservation District level was to be able to create educated decisions or “assessments” of environmentally sensitive areas, with the ability to create programmatic maps utilizing existing GIS data (tax parcels, streams, aerial maps, topographic maps, watershed boundaries), which assist in targeting those important areas in which to focus District resources, both staffing & cost-share.

Another function of Project W.A.T.E.R. is to have the ability to track Conservation District program participants, such as Act-38, Chesapeake Bay, EQIP, etc.

Current version is 90% complete, as the software has been migrated into ArcGIS 9.1 format. ArcGIS license software is necessary to utilize the software.

Contact Chris Snyder at the Juniata County Conservation District: juniataccd@juniataccd.org