

## Key Questions for Volunteer Monitoring Program Assembly

Is the primary interest of the Steering Committee: option #1), to educate the public and get them interested in their water resources; option #2), to educate and to generate a high quality biometric or water quality data collection program that will be managed by the SC, indefinitely; or, option #3), to educate and to generate a high quality biometric or water quality data collection program that will be recognized by the Michigan Clean Water Corps (MCWC) and used by the MDEQ?

The timing of volunteer monitoring program development for the Transition Grant falls in the midst of the formation of the MCWC, a developing statewide, standardized volunteer water quality monitoring program. Generally, the Steering Committee needs to decide whether to plan to be a part of the statewide program, or to develop an independent program.

This decision is complicated by the fact that most successful voluntary water quality monitoring programs cover a much larger spatial area (e.g., larger watersheds, counties, states). Local subwatershed coordinators rely on the larger programs for materials and data handling. Coordinators are then able to focus on managing people. With the formation of the MCWC, Michigan is on that organization path for statewide volunteer water quality monitoring.

After extensive review, K&A recommends that the SC adopt a plan that will lead to recognition by the MCWC. By doing so, the organization and data generated locally will have the maximum likelihood of existing and being useful beyond the life of the current available 319 funding.

If the Steering Committee agrees to align the fledgling program with the developing MCWC, existing materials can immediately be adopted (e.g., example Quality Assurance Project Plans [QAPPs]) and used (e.g., data sheets) and the committee can focus on developing the sponsor and volunteer force.

If option #1 is the only interest, then we should, for example, plan on supporting, emulating or expanding on the efforts of the Calhoun Conservation District stream ecology program. Primary responsibilities with option #1:

- finalize monitoring parameters of interest
- determine the fate of current data collected by volunteers
- create summary materials and place on web
- sponsor programs or support/expand existing programs

If option #2 is the primary interest, then we should, for example, mimic existing programs such as the St. Joseph River Program locally and develop the data management infrastructure. Primary responsibilities with option #2:

- same as option #1
- develop Quality Assurance that meets long-term SC goals
- develop field materials

- recruit and manage new and trained volunteers
- manage, summarize and distribute data collected by volunteers
- develop and maintain Internet-based platform (data entry, summary, and access)

If option #3 is the primary interest, then we need to better define the lead organization that has support and experience mobilizing a volunteer base and then get behind them in developing a pilot program with existing funds or implementation funds and applying the MCWC Program next year. A demonstration of effort and interest locally, and a well-defined project lead will increase the chance of receiving funding from the MCWC next year, according to the Great Lakes Commission (GLC). Primary responsibilities with option #3:

- same as option #1
- develop preliminary Quality Assurance in line with MCWC guidelines and example documents soon to be available on their website
- use MCWC field materials, currently available
- find out if any local individuals have training that already qualifies them as MCWC coordinators
- recruit and manage volunteers
- post 2005 data summaries on project website
- apply for MCWC support to be used to receive MCWC training and personalize a Quality Assurance Plan

### **Volunteer Monitoring Interests**

There are three lines of overlapping interest that have been expressed during the transition grant efforts to date.

#### 1) Steering committee monitoring suggestions:

- Stream macroinvertebrate community composition
- Habitat
- Temperature

#### 2) K&A – listed and ranked with limited Steering Committee feedback:

- Riparian habitat/buffers
- Sediment accumulation
- Pool/riffle habitat
- Turbidity

3) Dr. Joan Esson, of Kalamazoo College, has students that planned to measure the following parameters in 2004: alkalinity, hardness, “some metals”, lead in sediment, iron, phosphate, chloride, fluoride, organic extracts, sulfate, dissolved oxygen, suspended solids, pH, temperature. K&A had expressed interest in the following parameters in an e-mail exchange with Dr. Esson: TP, TSS, Pb, Cd, Cr, Cu, hardness, alkalinity, temperature, pH, dissolved oxygen, conductivity, wet and dry weather, sediment heavy metals and PNA’s.

Generally, expressed Steering Committee and K&A monitoring suggestions can be addressed by adopting the standard forms provided by the Michigan Department of Environmental Quality (MDEQ) volunteer stream-monitoring program. Those forms are undergoing revision and are being combined with lake monitoring forms for use by the MCWC. Revisions are expected to be completed in March 2005. Forms will be publicly available on the MCWC website.

Background research on other successful programs reveals that volunteers are typically limited to data collection that is far less complex than that suggested by the Kalamazoo College instructor. A reduced number of parameters could be run on samples collected by volunteers in partnering laboratories identified by the Steering Committee, but it likely would require an overly complex Quality Assurance Plan. A few trial runs in the first year, however, would demonstrate the organizations interest and commitment to the resource. Parameters of interest above and beyond MCWC standards could be included in the Quality Assurance Plan.

### **Changes in the State of Michigan Volunteer Monitoring Program**

In the past, MDEQ provided \$50,000 per year in a “Water Quality Monitoring” grant program in which grantees were trained by MDEQ personnel, see [http://www.michigan.gov/deq/0,1607,7-135-3313\\_3686\\_3728-32396--,00.html](http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-32396--,00.html). Program materials (e.g., datasheets) were provided and are still available on the MDEQ website. Results were forwarded to District Biologists within the MDEQ, but they were not heavily relied upon. The MDEQ lake program has been better organized and data generated by volunteers was compiled and reported annually.

The specific objectives of the volunteer stream monitoring program element were to:

- Produce quality-assured data that can be used by DEQ biologists as a screening tool to identify sites where more detailed assessment by the Department is needed.
- Develop and maintain a database into which volunteer data can be stored.
- Generate/foster public awareness, stewardship and surveillance of Michigan surface waters.

In March 2001 the MDEQ released a report titled “*The Use of Michigan Volunteer Monitoring Data Benefits and Constraints*”. Benefits included:

- Volunteer data can serve as a valuable screening tool for the Water Division (WD) Biologists
- Volunteer data can be used for attainment decisions in some circumstances.
- Working with volunteers provides valuable opportunity to educate the public about water quality issues.
- Data collected by volunteers can spur local decisions and action to protect water quality.
- Volunteers can monitor watersheds more frequently than WD and can quickly inform the MDEQ of pollution incidents.
- The volunteer monitoring program provides good public relations for WD.

Constraints included:

- Schools are not as reliable as adult volunteers in providing reliable, high-quality data.
- Volunteer data alone should not be used for nonattainment decisions.
- A few volunteers do not appear to be thorough in collecting benthic invertebrates.
- It remains to be seen if groups continue to monitor over many years.

Observations:

- It is easier to work with an existing organization rather than one formed specifically for volunteer monitoring.

### **Michigan Clean Water Corps Status**

Recommendations from the MDEQ (2001) report guided the framework of the MCWC which is in the midst of replacing the “Water Quality Monitoring” Grant Program. The MCWC program is supported by the MDEQ and directed by the GLC with technical assistance from the Huron River Watershed Council. The MCWC will support citizen-based organizations by granting monies annually for the support of local coordinators to train citizen volunteers. The GLC administers pass-through grants. The application period for the first round of funding for MCWC ended in 2004.

Local coordinators do not need to be experts, but they need to commit to receiving 1-2 days of training from the GLC in order to serve as local watershed contacts that interact with citizen volunteers. Grant monies fund the development of Quality Assurance following general guidelines provided by the GLC. Quality Assurance for parameters or procedures unique to the grantee and not part of the standard MCWC suggestions are mapped out in this process. This structure releases the MDEQ from some of the burden of training and interacting directly with the volunteer groups.

Trained volunteers will collect data that conforms to specific guidelines set by the MCWC. Grantees will communicate data back to the GLC by entering it into forms on the MCWC’s publicly available website. The website layout is currently in the planning stages.

The ultimate goal is the generation of standardized data that the MCWC can screen and the MDEQ can use least as a screening tool for its operations. The GLC has a current questionnaire for existing volunteer monitoring organization see [http://www.glc.org/mcwc/Copy%20of%20mcwc\\_survey.html](http://www.glc.org/mcwc/Copy%20of%20mcwc_survey.html). The GLC will use responses from the questionnaire to better characterize the current status of volunteer monitoring programs around the state and foster their continued development.

Specific recommendations that followed the implementation of that program included an important recommendation to fund volunteer monitoring groups that were a part of a larger, established water quality organization in order to ensure an adequate volunteer pool to carry out the work. Groups formed specifically for monitoring were thought to have a low likelihood of program continuance beyond the life of the grant. K&A has learned through conversations with

the GLC that funding would not have likely been awarded had the Steering Committee applied in 2004 because they are more likely to fund existing organizations with experience in mobilizing water quality volunteers. The GLC will be more likely to consider future funding if a local volunteer monitoring program is already established, especially if it has experience using standard protocols developed for the MCWC.

Perhaps the most important aspect of the MCWC program is the establishment of a system of training, standard documents, data exchange protocols (volunteers, to coordinators, to the GLC), and an Internet based data platform. This statewide standardization ensures that data collected by volunteer organizations may actually be used by the MDEQ. In addition, though details about field procedures have not yet been developed, it is likely that data collected using MDEQ protocols will be comparable to long-term datasets collected by agency staff in local watersheds on a rotating basis.

### **Initial Funds**

The Steering Committee could appoint an interim Volunteer Monitoring Coordinator that is part of an existing organization (Table 1). MCWC funds could be sought next year. Section 319 implementation funds could be sought this year to “launch” the program.

### **Local Educational Programs**

The following water quality related programs are generally educational in nature. Additional details are provided in the attached tables.

#### *Calhoun Conservation District*

Grant funding is available to train teachers to incorporate stream ecology into classroom activities. This program accepts teachers from the entire Kalamazoo River Watershed.

### **Local Educational and Monitoring Programs**

#### *Kalamazoo River Watershed Council*

Some members have taken MSU’s water quality monitoring course and participated in MSU monitoring. The council has no monitoring program.

#### *Kalamazoo Conservation District’s Earth Force*

Members of the “Earth Force” volunteered for the 2004 Kalamazoo River Clean Sweep river cleanup. There are distinct advantages to registering volunteers as “Earth Force” team members namely liability coverage and possible qualification for USDA funding programs. Marion Hill is the primary contact.

### *Kalamazoo County Surface Water Monitoring Program*

The Kalamazoo County Human Services Department runs a county-wide surface water monitoring program. The program is intended to monitor for compliance with Michigan Water Quality Standards for total body contact recreation at bathing beaches and in surface waters.

Water samples are collected (3 for bathing beaches and 1 for other surface waters) and delivered to the Kalamazoo County Human Services Department Laboratory for bacteriological analysis. Water temperature, dissolved oxygen, pH, conductivity, and turbidity measurements are taken with a multi-parameter meter. Data are used to identify, track, and document trends and provide water quality data to decision-makers.

A total of 17 beach and surface water sample stations are reported in the Portage/Arcadia Watershed associated with this project (Kalamazoo County Human Services Department, 2004).

### *Pfizer Wildlife Management Team*

The status of this group is uncertain. In the past, this group worked with the Kalamazoo Nature Center. Some members of this team may have taken MSU's water quality monitoring course. Historic water quality data may be available, but the current contact is unknown.

### *MSU Extension Land and Water Program*

Jane Herbert organizes volunteer water-quality monitor training programs with the Michigan State University Extension (MSUE) Kalamazoo River Watershed Monitoring Network. Jane also is a Steering Committee member of the MCWC.

MSU is currently collecting phosphorus samples that are being analyzed in Dr. Steve Hamilton's lab at the Kellogg Biological Station (KBS) associated with a TMDL related grant. The status of these efforts is not known.

The goal is to start a volunteer program that in the future will be managed by some sort of Kalamazoo River Watershed organization.

### *Kalamazoo Nature Center*

The Kalamazoo Nature Center has expressed interest in volunteer monitoring coordination. At least one previous employee has taken the MSU volunteer monitoring course.

### *Friends of the St. Joe River Program*

A local volunteer trains teachers and assists with field sampling. Data are entered into an online database maintained by the Friends of the St. Joe River Association, Inc. ([www.fotsjr.org](http://www.fotsjr.org)).

## **Other Large Programs**

The following are good examples of volunteer monitoring programs (Table 2). Each varies in its activities. The obvious commonality is that successful programs that maintain volunteer networks and generate long-term, publicly available datasets are associated with large, established organizations with some source of regular funding. These tend to operate at the county scale or larger, up to entire state programs.

### *Minnesota Pollution Control Agency*

Volunteer monitors collect basic stream information. The success and use of turbidity tubes for measuring stream water clarity is unique to the program.

### *Alabama Water Watch*

Alabama Water Watch (AWW) is coordinated through Auburn University's Department of Fisheries and Allied Aquacultures, and the International Center for Aquaculture and Aquatic Environments. AWW can be found on the web at <http://www.alabamawaterwatch.org/>.

The administrative office oversees the day-to-day operations of AWW. Program personnel provide a wide range of services to monitors, including: conduct training sessions; compile and maintain a collection of data on citizen volunteers, monitoring sites, and water quality data; interpret technical data gathered by monitors; produce a variety of media; and provide online summary graphs and maps.

Since the AWW began in 1992, nearly 225 citizen groups have become involved with water monitoring on hundreds of water bodies. Monitors have sampled 1,400 sites on 500 water bodies and submitted over 25,000 chemistry and 4,000 bacteriological data forms. This water information has had positive impacts on education, restoration, and local-to-state water policy.

### *Hoosier River Watch Program*

<http://www.in.gov/dnr/soilcons/riverwatch/>

### *Northern Virginia Soil and Water Conservation District's program NVSWCD*

<http://www.co.fairfax.va.us/nvswcd/monitoring.htm>

### *Shenandoah Water Window*

<http://www.purewaterforum.org/waterwindow/>

## **Federal Programs**

USEPA supports a national newsletter on volunteer monitoring and there are some suggestions and programs described in each issue. It comes out in hard copy, but back issues are also available online at: [http://www.epa.gov/owow/monitoring/volunteer/vm\\_index.html](http://www.epa.gov/owow/monitoring/volunteer/vm_index.html)

USEPA also maintains general guidelines for volunteer monitoring program QAPP development.

## **References**

Kalamazoo County Human Services Department, Environmental Health Bureau, December 2004. Surface Water Monitoring Program Annual Report; October 1, 2003 to September 30, 2004. Kalamazoo County Government. 47p.

**Table 1 – Coordinators**

<b>Coordinator Classification</b>	<b>Affiliation</b>	<b>Purpose</b>	<b>Contact information</b>	<b>Training</b>	<b>Data summary</b>	<b>Hard copy publishing/transfer</b>	<b>Electronic publishing</b>	<b>On-line interactive</b>	<b>Examples</b>
Volunteer	New WQ monitoring group	Education	Need to establish communication channels for group	Self training or trained by Committee or local agency	Simple	Unlikely	Unlikely	Unlikely	
School employee	School	Education	School	Local agency	Simple	Unlikely	Unlikely	Unlikely	Calhoun Conservation District
Sponsored volunteers with partial support	Umbrella organization (e.g., Forum, Conservation District, Watershed Alliance)	Education, data use	Existing communication channels and infrastructure	Experience mobilizing past volunteers	Statistical	Likely	Likely	Possible	MCWC coordinator (conservation district, Nature Center, Forum)
Existing WQ agency	Kalamazoo County	Water quality standards	Existing	Professional	Statistical	Likely	Likely available, but static	Unlikely	Kalamazoo County
Regulatory	MDEQ	Long-term rotational monitoring	Existing	Professional	Statistical	Yes	Yes	No	
Corporate	Pfizer Team	Outreach	Unknown	Self taught or partnering agency	Not public				

**Table 2. Example programs**

<i>Example</i>	<b>Coordinator</b>	<b>Sponsor (s)</b>	<b>Volunteers</b>	<b>Data Collected</b>	<b>Data Summary</b>	<b>Website</b>	<b>Interactive mapping</b>	<b>Notable Features</b>	<b>On-line data entry</b>
St. Joseph River	Dr. Ray Leising, trains students and teachers	Friends of the St. Joseph River	Students	Benthic macroinvertebrates, chemistry in Phase II (date of Phase II unknown)	Online data summary results in site rankings, manually ranked	Yes- not recently used	Static mapping in windows	Seems inactive	Yes
Calhoun Conservation District	Tara Egnatuck and Conservation District	Grant from a foundation for Kalamazoo River Watershed Teachers	Trained teachers work with Coordinator in the field to educate students about stream ecology	Unknown	Unknown	General overview and application brochure	No	This program is educational and does not appear to be intended to generate a dataset. A land-use component is included	No
Hoosier River Watch & Adopt-a-River Program	Partnering agencies statewide and qualified/trained monitors serve as local contacts	State of Indiana since 1994, through Federal Sport Fish Restoration Fund	Any citizen or student can be trained	Habitat, chemistry, bioassessment	Paper Reports	Yes, with materials and program information	No	Training manual and powerpoint available on-line. QAQC powerpoint. Equipment grants, borrowing, or building programs available	No
Shenandoah River	Canaan Valley Institute	Friends of the Shenandoah River, Pure Water Forum, James Madison University, Canaan Valley Institute, Terralogic Inc. plus another 12 funders	Citizens	Water chemistry/quality since 1996, ammonia, nitrate, phosphate, D.O., pH, turbidity, temperature	Friends of Shenandoah write a periodic summary report	Shenandoah Water Window by the Canaan Valley Institute, began as a graduate student project, James Madison University	GIS type spatial component of Shenandoah GIS project, zoom to station, view drainage area, land use summary, graphing of parameters for each station	User can see the difference between the upstream land uses for any given station (e.g., urban vs. ag)	No
Minnesota Pollution Control Agency				Turbidity tubes related to water chemistry and utilized by the agency					

**Table 2. Example programs (continued)**

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Alabama Water Watch since 1992	Auburn University Department of Fisheries and Allied Aquaculture, and the International Center for Aquaculture and Aquatic Environments Train and certify trainers who in turn train volunteers	USEPA ADEM Alabama Ag. Exp. Station Alabama Cooperative Extension	Citizens trained by staff members of Water Watch	Water chemistry, bacteria	Water Watch Staff	Water Watch Staff	Not a GIS platform, but graphs have more options for the user to make adjustments	Bioassessment game for elementary age simulation inside the classroom. Program appears to collect bioassessment data but it is not displayed on the website	Yes, for volunteers
Northern Virginia Soil and Water Conservation District's program NVSWCD	Northern Virginia Soil and Water Conservation District's program NVSWCD	Fairfax County Stream Protection Strategy Program, Virginia Department of Environmental Quality, and Virginia Save Our Streams, George Mason University	Citizens trained and certified as local leaders, and members of USDA NRCS Earth Team, tort and injury coverage, network, hour tracking	Chemical and biological – benthic macroinvertebrates, turbidity, nitrate/nitrite		Virginia Save our Streams training module available online		This program appears to be most flexible. There is a handbook online	
Miami Conservancy District	NASA, NSF, Department of State	Stream Team	Students	Primary purpose is education and outreach			For announcements		
Globe program									