ASSESSING THE NEEDS OF
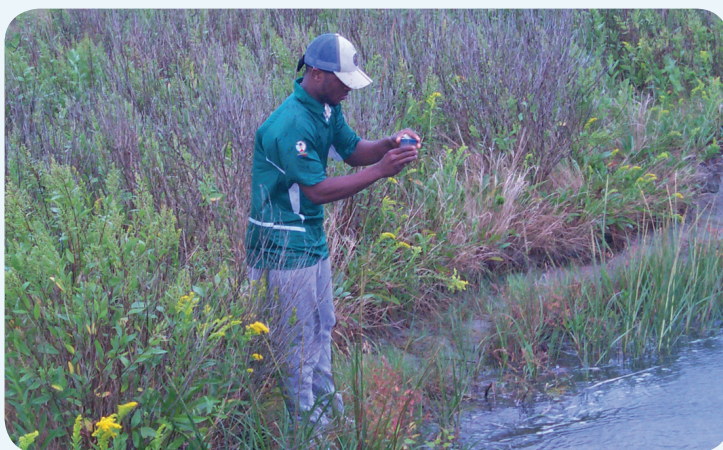# VOLUNTEER WATER MONITORING PROGRAMS

Survey Results & Implications

A product of the Extension Volunteer Monitoring Network

www.usawaterquality.org/volunteer

In late 2011 and early 2012, the Extension Volunteer Monitoring Network (EVMN) conducted a needs assessment of volunteer water monitoring programs across the United States. USEPA's Volunteer Monitoring listserv and the Extension Volunteer Monitoring Network's listserv were used to solicit responses. The survey asked about programs' beginnings, ongoing activities and existing needs. The 103 respondents from 41 states represented 94 unique programs.

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http://www.usawaterquality.org/volunteer

Who Started the Programs?

The responding programs began between 1971 and 2011, the vast majority (82%) in the latter half of this 40-year time period. State natural resource agencies were most commonly cited as the lead organizations in developing these programs.
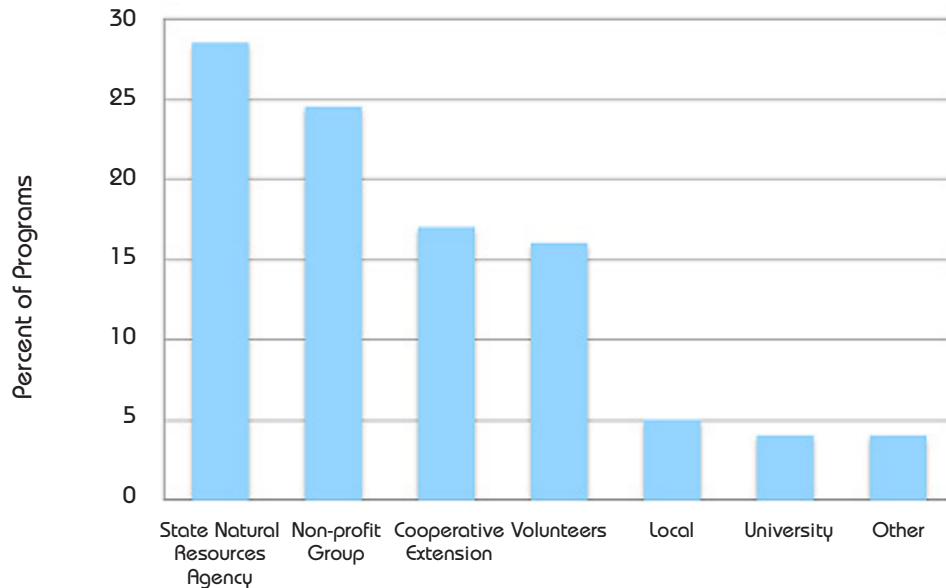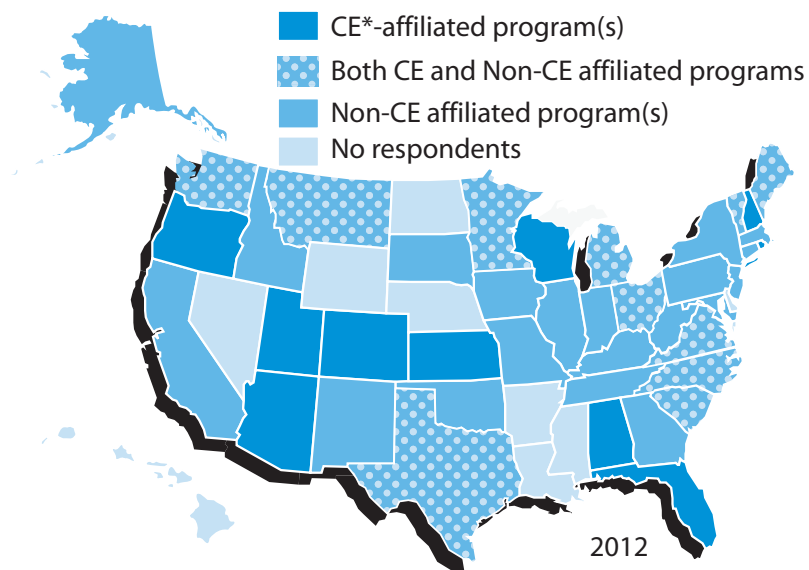

Figure 1.

Program Affiliations

Thirty-six percent of programs reported an affiliation with Cooperative Extension (CE), the component of each state's Land Grant University that brings university knowledge and resources from the campus to local communities. There were between one and ten program responses per state.

Types of responding programs

CE*-affiliated program(s)
Both CE and Non-CE affiliated programs
Non-CE affiliated program(s)
No respondents

2012

*CE: Cooperative Extension

Figure 2.

Geographic Scope of Programs

Most of these programs operate statewide rather than across smaller or larger scales.
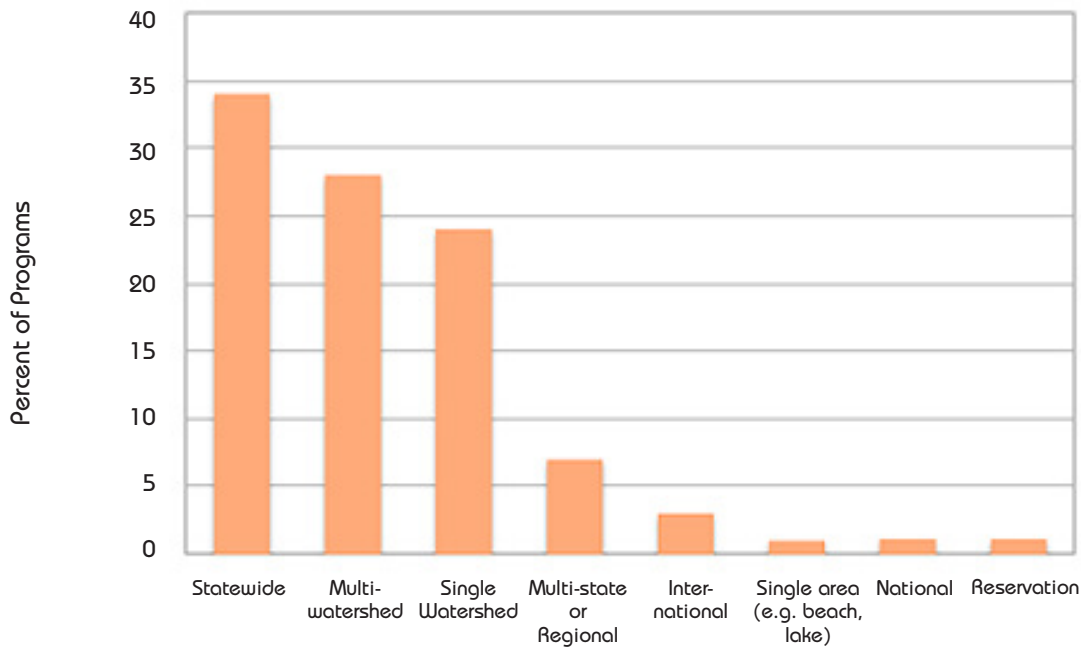
Program Staffing

The majority of volunteer water monitoring programs (65%) have only one staff person, most of whom (69%) are employed full-time. About a quarter of programs have two staff persons, 57% of whom are employed full-time. Only about one of every ten programs has three or more staff persons. The majority of respondents (59%), who were primarily program coordinators, have held their positions less than 10 years.
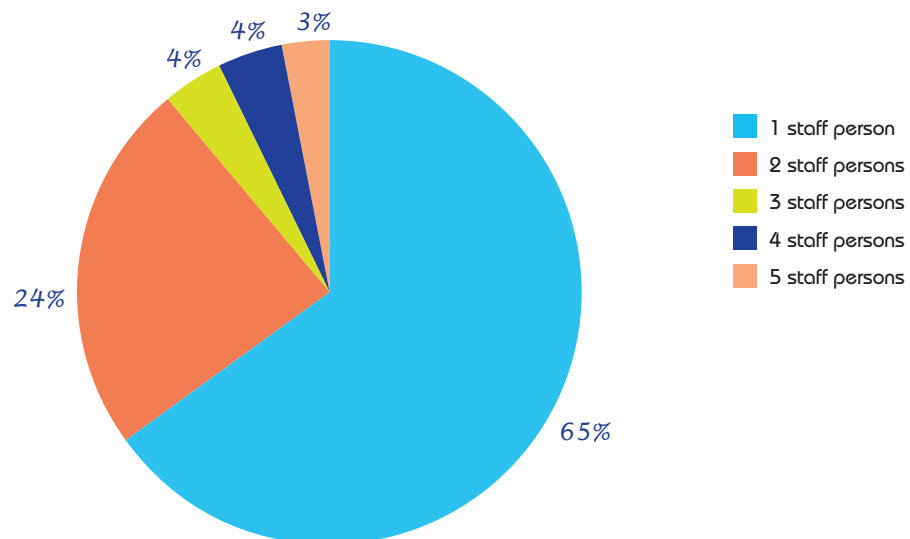
Program Objectives Then and Now

These monitoring programs were initiated primarily to increase community involvement and to create long-term data sets. Today, program goals are similar, but developing long term data sets has become the primary goal of the majority of programs.
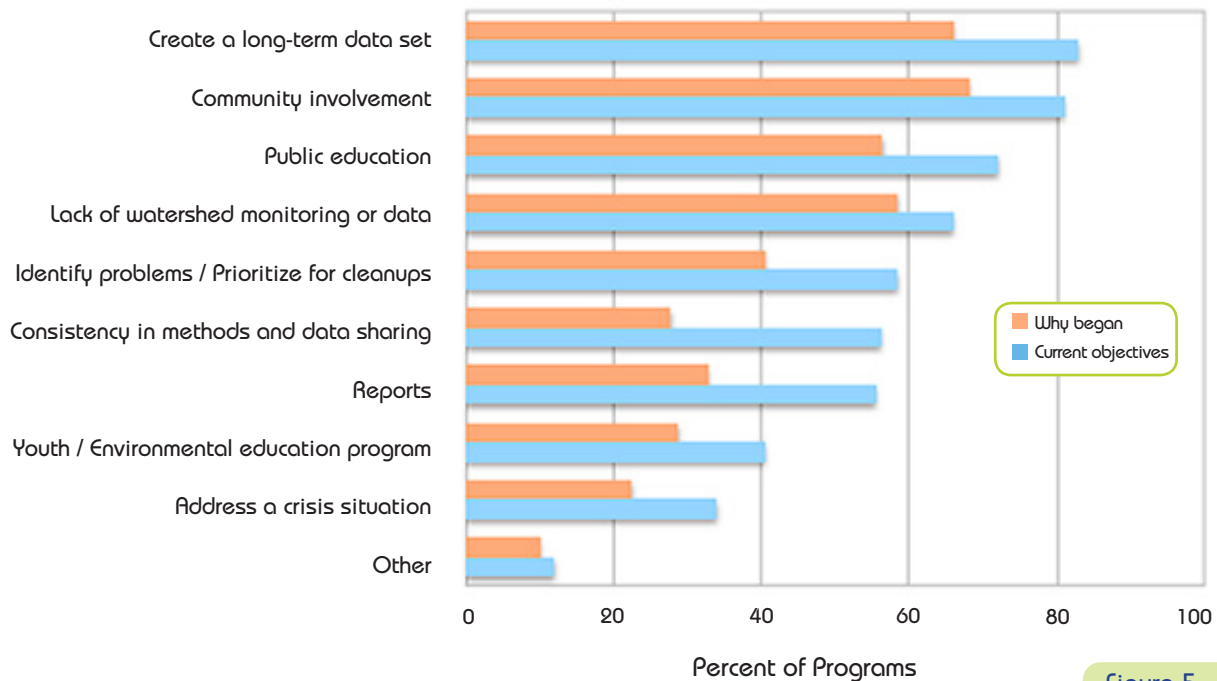

Figure 5.

Programs by the Numbers

These efforts support as many as 20,000 volunteers in a single program (Michigan's MiCorps). Volunteers monitor as many as 5,000 streams (Missouri Stream Team), 900 lakes (Wisconsin's Citizen Lake Monitoring Network), 300 wells (Montana State University Extension Well Educated Program), 300 beaches (Alliance for the Great Lakes), 150 wetlands (Michigan's Friends of the Rogue River), and 125 estuary/marine locations (Florida LAKEWATCH).

Water Body Type	Number of Sites	Number of Volunteers
Rivers / Streams	14,610	46,170
Lakes / Ponds	4,570	6,980
Wells	310	340
Beaches	660	9,400
Wetlands	300	710
Estuaries / Marine	390	660
Totals	20,840	64,260

In 2010 alone, these programs monitored over 20,000 sites and involved nearly 73,000 individuals. Program volunteers contributed more than 515,500 hours to monitoring. According to the Independent Sector, their effort is valued at $10,834,340!

Table 1.

Tiered Monitoring Approaches

Forty-one percent of the programs use a tiered approach to monitoring. In lower tiers, the volunteers carry out more simple tasks with a less rigorous approach. The data and results are primarily used for outreach and education, and quality assurance procedures are minimal. In upper tiers, there is more investment in volunteer training and often more structured monitoring. Volunteers follow more stringent procedures with heightened attention to quality. Thus, in higher tiers, equipment and analyses are generally more expensive than in lower tiers.

Results may be used to inform state and federal reports, including recommendations related to impaired waters lists. Some programs require volunteers to pass proficiency tests to become certified, and/or to have their procedures checked onsite by a staff member. Programs have designed their tiered approaches in a variety of ways. Table 2 gives examples of activities and monitoring carried out by volunteers in programs with tiered approaches.

Examples of Lower-tiered Activities and Monitoring	Examples of Upper-tiered Activities and Monitoring
• Attend meetings and tours • Participate in trash cleanups • Participate in educational events • Participate in the World Water Monitoring Challenge /one-day monitoring events • Conduct visual assessments • Make field observations about aquatic invasive species and lake characteristics • Monitor basic parameters such as water clarity and temperature • Collect water samples and deliver to lab for analysis	• Coordinate schedules for volunteers' sample collection and for lab analyses • Monitor such things as macroinvertebrates, bacteria, algae, plants, fish, chlorophyll a, dissolved oxygen, nutrients, suspended solids, periphyton, and harmful algal blooms • Monitor over an extended period and at specified times (such as very early morning) • Calibrate their own equipment • Process samples in the lab • Analyze and interpret data • Develop interpretation tools such as bathymetric maps, temperature profiles, and GIS models • Serve as team leaders for (non-trained) groups on monitoring days • Provided training in public outreach and inter-agency communications, and how to contribute to local, state and federal planning processes • Present monitoring results to a variety of audiences

Table 2.

Educational Tools

Programs have a variety of types of educational tools available, from games, videos, and educational activities, to methods and identification keys. About a quarter of programs indicated they have identification keys available.

Program	State	ID Key Description	Web Links
Alabama Water Watch	AL	Macro Mania	http://www.lamotte.com/component/option,com_pages/lang,en/mid,/page,186/task,item
Georgia Adopt-A-Stream	GA	Benthic macroinvertebrates	http://georgiaadoptastream.org/Manuals_etc/Bio_Chem/Macro_Key.pdf
IOWATER	IA	Benthic macroinvertebrates	http://www.iowater.net/Publications/Publications.htm http://tdriskell.tripod.com/insecta.html
Hoosier Riverwatch	IN	Benthic macroinvertebrates	http://people.virginia.edu/~sos-iwla/Stream-Study/Key/MacroKeyIntro.HTML http://www.seanet.com/~leska/Online/Guide.html http://www.in.gov/dnr/nrec/2998.htm
Charles River Watershed Association Volunteer Monitoring Program	MA	Blue-green algae	http://www.crwa.org/water_quality/algae/algaefieldguide.pdf
Maryland Stream Waders	MD	Reptiles and amphibians	http://dnr.maryland.gov/streams/pdfs/herpkeyforweb.pdf
Maine Volunteer Lake Monitoring Program	ME	Aquatic invasive species and similar native species	http://www.mainevolunteerlakemonitors.org/mciap/herbarium/
Friends of the Rouge Benthic Macroinvertebrate Monitoring Program	MI	Benthic macroinvertebrates	http://therouge.org/fileadmin/groups/22420/therouge.org/Programs/REP/BNTHCIDN.pdf
Missouri Stream Team VWQM	MO	Benthic macroinvertebrates	http://mostreamteam.org/Documents/VWQM/LifeInRiverKey.pdf http://mostreamteam.org/Documents/VWQM/BugCard1.10.pdf
University of Rhode Island Watershed Watch	RI	Invasive non-native aquatic species	http://www.uri.edu/ce/wq/ww/Plants/aquatics_handbook_2011.pdf
University of Rhode Island Watershed Watch	RI	Aquatic invasive plants	http://www.uri.edu/ce/wq/ww/Plants/Resources-Plants.pdf
Loudoun Watershed Watch Stream Monitoring	VA	Benthic macroinvertebrates	http://vasos.org/images/stories/docs/ModifiedBugIDCardoct2004.pdf http://vasos.org/images/stories/docs/cheatsheet.pdf
Lake Champlain Sea Grant Watershed Alliance	VT	Benthic macroinvertebrates	http://www.dec.ny.gov/animals/35772.html
Lake Michigan Volunteer AMBLE	WI	Birds and fish	https://www.nwhc.usgs.gov/amble/files/Bird%20ID%20guide%20-%20Alive%20and%20Dead.pdf http://www.dnr.state.oh.us/Portals/9/pdf/pub418.pdf
Wisconsin Water Action Volunteers	WI	Benthic macroinvertebrates	http://watermonitoring.uwex.edu/pdf/level1/pondkey.pdf http://watermonitoring.uwex.edu/pdf/level1/riverkey.pdf
Wisconsin Citizen Lake Monitoring Network	WI	Weevils and aquatic invasive species	http://www4.uwsp.edu/cnr/uwexlakes/clmn/AIS-Manual/Appendices-additional/Weevil-laminate-printJune09.pdf http://www4.uwsp.edu/cnr/uwexlakes/clmn/publications.asp
West Virginia Save Our Streams (SOS)	WV	Benthic macroinvertebrates	http://www.dep.wv.gov/WWE/getinvolved/sos/Pages/Macros.aspx

Table 3.

Data Sharing

The most common type of data sharing is an annual monitoring report. As of 2012, integrating data submission with mobile technologies was still uncommon among programs.
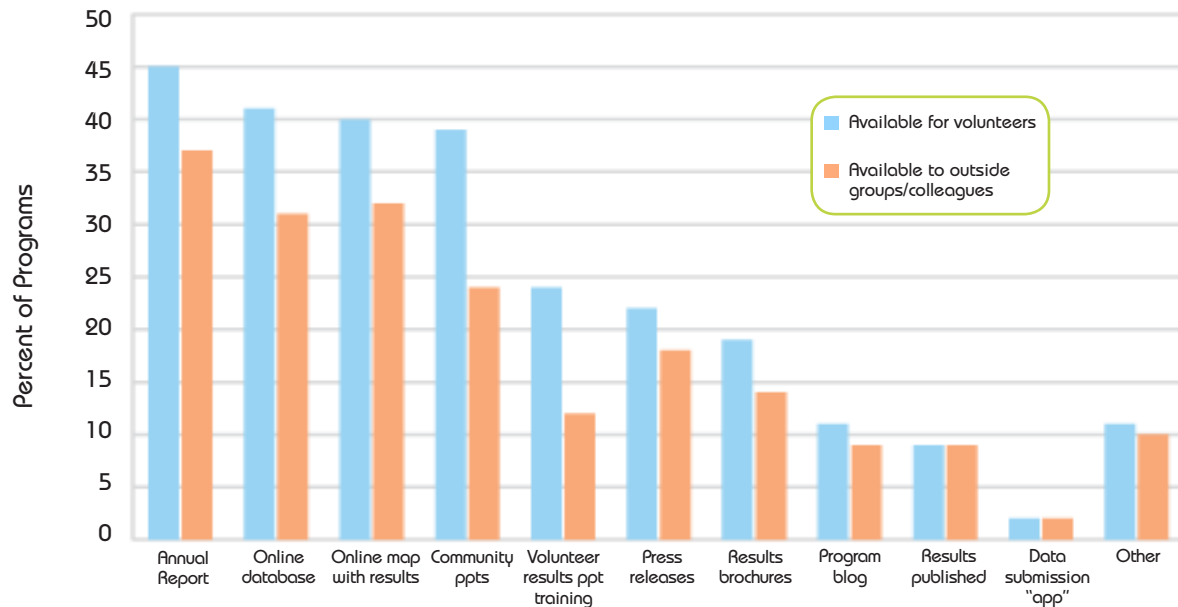

Figure 6.

Quality Assurance & Quality Control

Respondents were asked to identify the type(s) of quality assurance procedures they follow. Forty percent of programs indicated that they have a state-approved quality assurance project plan (QAPP), while about one third have a USEPA-approved plan. This is approximately the same as in the a 1996 survey (available at http://www.usawaterquality.org/volunteer/NationwideInquiry/URIInitialStudy1996.pdf).
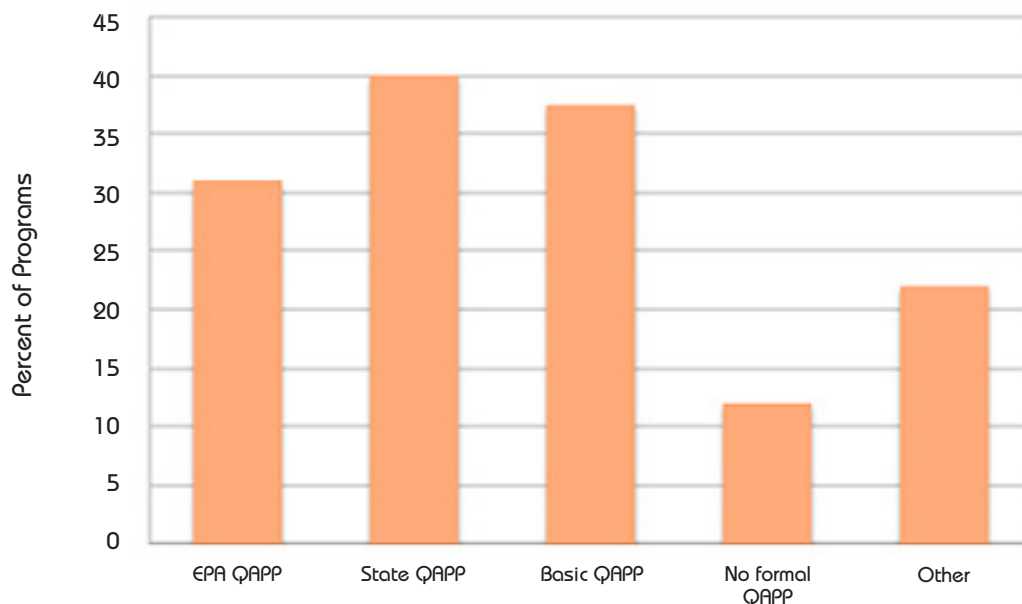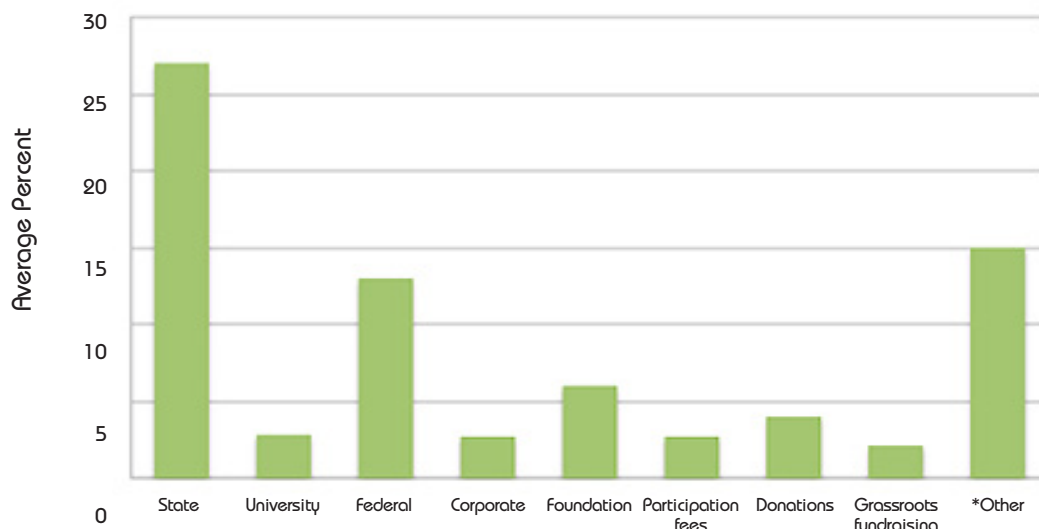

Figure 7.

Program Budgets & Sources of Funding

Volunteer monitoring programs are quite cost-effective. Half of responding programs' annual budgets are less than $50,000. Program budgets support between 0 and 15 full time equivalent (FTE) staff persons, with an average of 1.4 paid staff per program. The vast majority of programs rely on multiple sources of funding, which provide a measure of stability when one source ends. In general, state sources of funding are relied upon more often than other funding sources to support these volunteer monitoring programs.

*"Other" sources of funding mentioned by respondents include grants and various fees assessed to local municipalities.

Figure 8.

Budget Challenges

Programs reported a wide range of budget distributions. Not surprisingly, in addition to generally making up the largest percent of budgets (about 38% on average), salaries are the most challenging component of program budgets to fund. Only 13% of programs do not provide staff salaries, while 65% have no budget for office space, which tends to make up the smallest percent of program budgets overall. Nearly one third of programs (28%) have no budget for equipment and half have no budget for printed materials.
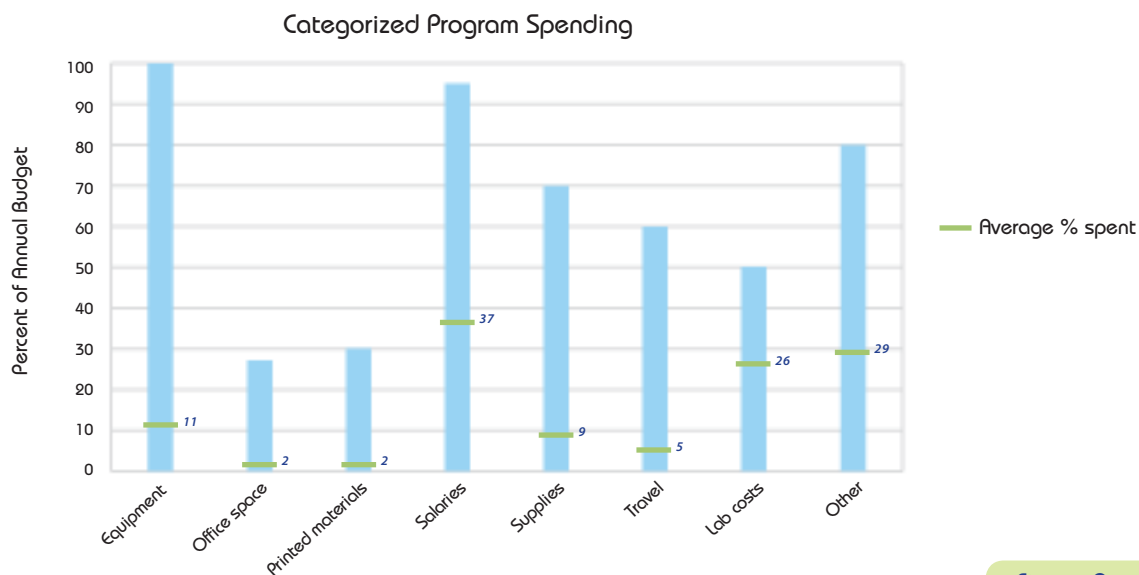

Categorized Program Spending

Figure 9.

Top Program Concerns

Respondents indicated that securing stable and sufficient funding topped the list of their greatest concerns. Most other top concerns were rated nearly equally, with each listed by about 40% of programs.
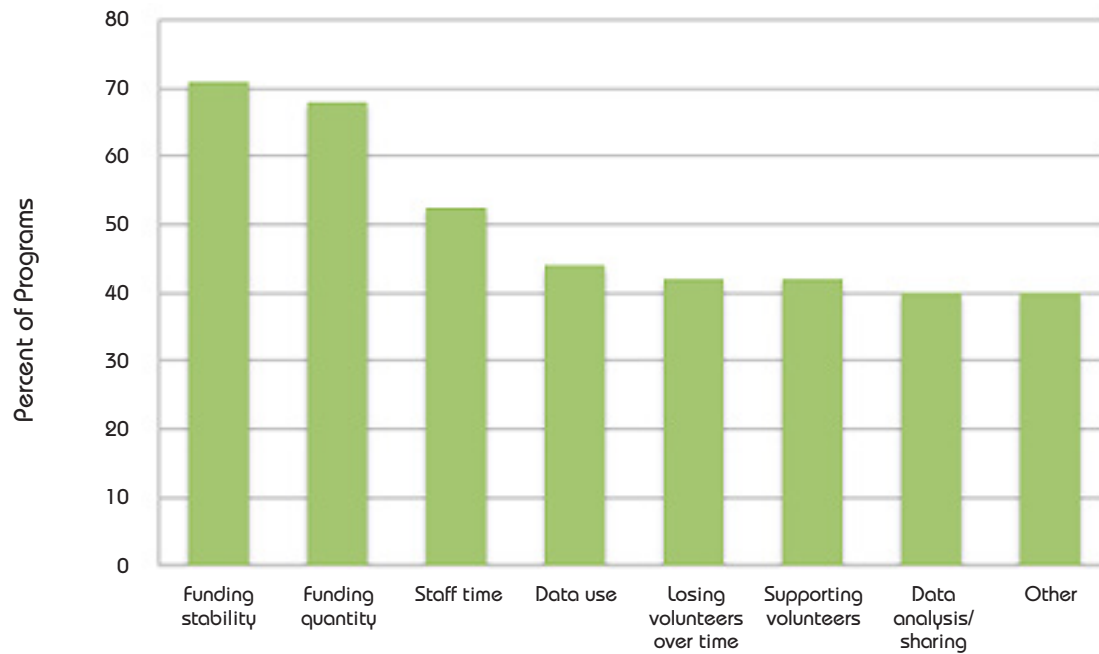
Program Support Desired

Other than funding, the types of support of greatest interest to programs were to have a national newsletter, regional volunteer monitoring conferences and professional development trainings.
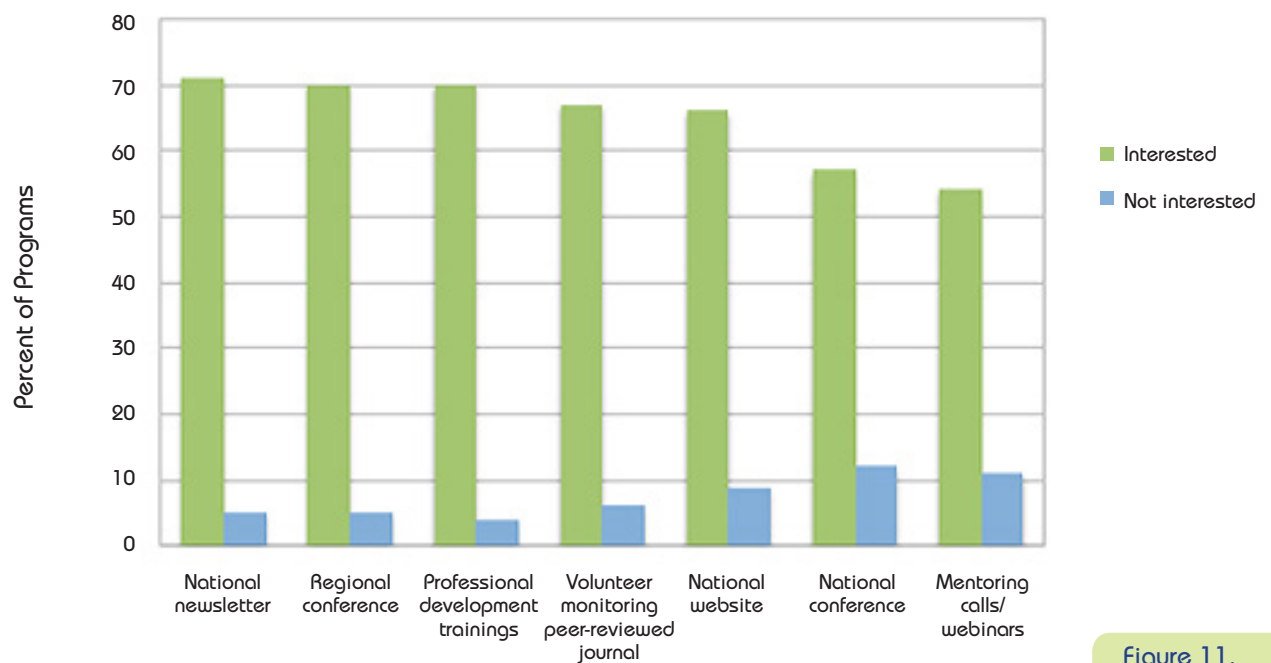
Resources & Support

For continued development and support, programs rely upon volunteer monitoring (VM) colleagues more than any other resource.
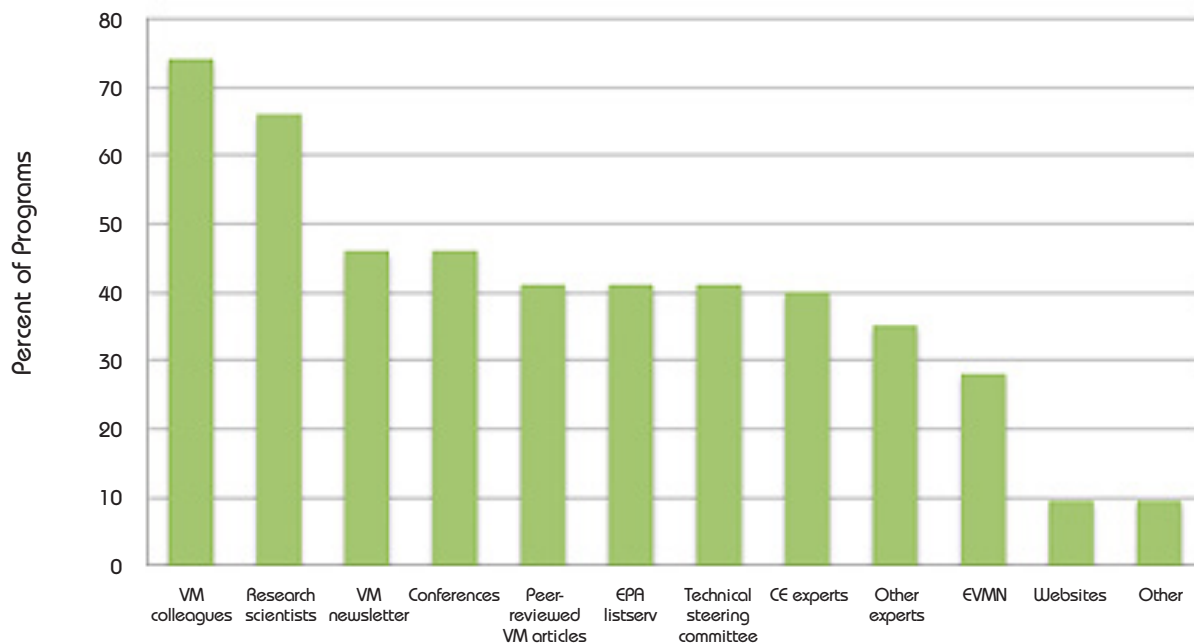
Emerging Monitoring Concerns

Monitoring the effects of climate change and stormwater topped the list of potential endeavors for programs. To facilitate resource and knowledge sharing, a table identifying programs that address the topics listed in below is available at:
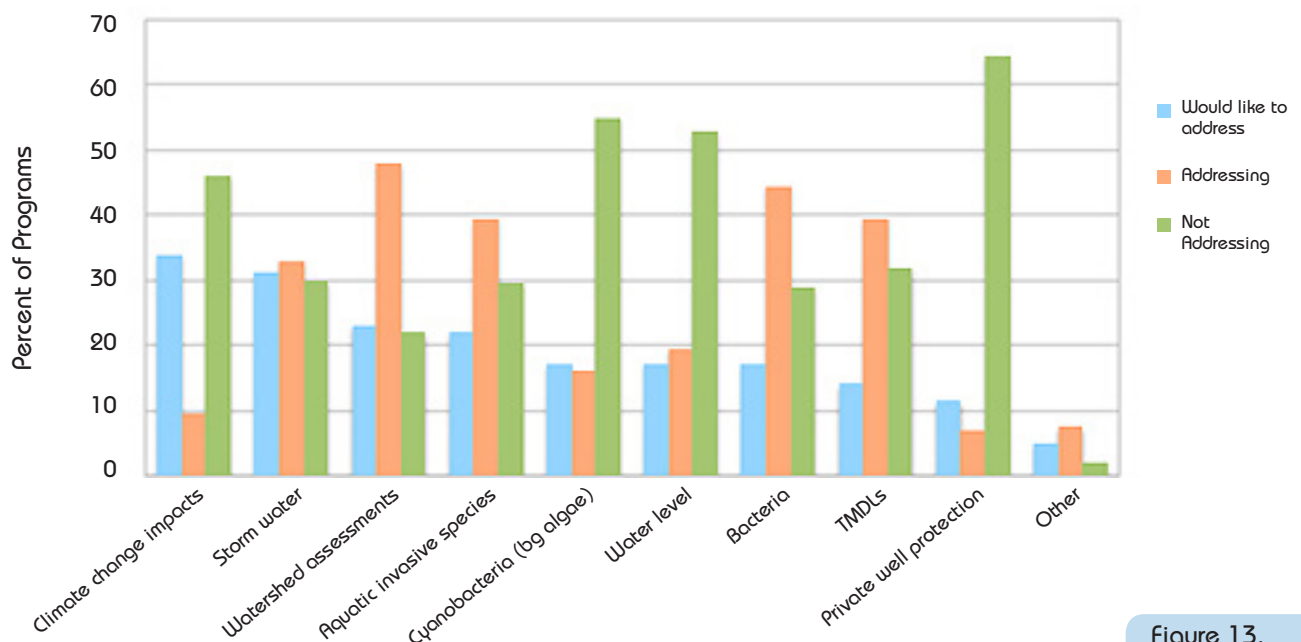
http://www.usawaterquality.org/volunteer/

Summary

The results of this needs assessment will be used to inform next steps for the Extension Volunteer Monitoring Network and possibly other regional or national efforts designed to help support and assist volunteer water monitoring programs in their growth and development. It is evident that like other citizen science programs, there has been a large increase in the number of volunteer water monitoring programs in recent years and that many face funding challenges. Nonetheless, program coordinators are turning to one another and to available resources such as the National Monitoring Conference for assistance in improving their programs. There is great interest in monitoring the effects of climate change and urbanization, and an interest in having a national newsletter, regional conferences and training to help program coordinators achieve their professional and programmatic development goals. More information and resources about volunteer water monitoring can be found on the Extension Volunteer Monitoring Network website:

http://www.usawaterquality.org/volunteer

or by contacting a member of the Extension Volunteer Monitoring Network Steering Committee:
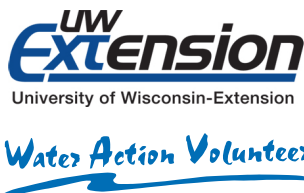
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