Cooperative Extension Service Volunteers Educate and Motivate Citizens for Water Quality Protection

The Role of Volunteer Water Quality Monitoring Programs in the Cooperative Extension Service

••A Nationwide Assessment••

The USDA/Land Grant University Partnership

CES Monitoring Programs Produce Broad Economic and Environmental Impacts

Thanks to thousands of Cooperative Extension Service (CES) volunteers across the nation, individuals and their communities are actively engaged in local water quality protection. During the 1995-96 season, 29 CES volunteer water quality monitoring programs in 19 states across the nation engaged a diverse mix of 8,600 well-trained volunteers who monitored 1,700 lakes, streams, and estuaries and 22,000 wells in rural, suburban, and urban areas.[1] These volunteers contributed over 514,000 hours of their own time—worth $6,600,000 in comparable professional services.[2]

CES volunteer water quality monitoring programs have a unique capacity for capturing the excitement and attention of local communities. Through trained volunteers, these programs:

- heighten awareness of key local water quality issues;
- draw diverse audiences to other CES water quality programs; and
- lead directly to voluntary adoption by citizens of recommended best management practices (BMPs) for water quality protection.

CES volunteer monitoring programs have led to measurable improvements in local water quality. Moreover, CES-sponsored volunteer monitoring strengthens the capacity of Cooperative Extension to deliver timely programs at the state, county, and watershed levels.

Program Impact

In one area of coastal Maine, forty percent of the shellfish beds were closed due to bacterial contamination. Now, eight years after a CES water quality monitoring program began in several communities, 2,000 acres of shellfishing flats are reopened, restoring jobs to local shellfishermen.

[1] This assessment is the result of USDA CSREES project, *Assessing the Scope of Cooperative Extension Volunteer Water Quality Monitoring Programs*. The national assessment took place during 1995-96 and encompassed written and oral interviews with CE State Water Quality Coordinators in 49 states at both 1865 and 1890 institutions. We also spoke with individual program coordinators who manage CES-sponsored volunteer water quality monitoring programs.

[2] Figure based on the 1996 valuation of $12.84 per volunteer hour, established by The Independent Sector of Washington, D.C., a national coalition of voluntary organizations, foundations and corporate giving programs.

Clean water for future generations

Volunteer Monitoring Originates in the Local Community

Volunteer water quality monitoring programs begin when citizens seek information on a body of water they are concerned about—a lake, stream, estuary, or personal drinking-water well. When individuals discover that insufficient data exist about the site they know and love so well, they often approach their local Cooperative Extension offices for technical advice on how to determine the health of their water.

A volunteer monitoring program emerges when Cooperative Extension staff members provide leadership, organizational support, and technical knowledge of monitoring protocols and analyses. Volunteers contribute the manpower, time commitment, and intimate local knowledge.

Programs vary in size from fewer than ten people to as many as several thousand volunteers. New volunteers receive an average of 12 hours of training in approved monitoring techniques; returning volunteers update their skills with an additional four hours per year.

Funding for these programs varies from less than $5,000 per year to more than $100,000. Government agencies, educational institutions, lake and homeowner associations, environmental organizations, business and industry groups, foundations, and private citizens underwrite the costs for these programs.

PROGRAM IMPACTS

• Increased Knowledge of Local Water Conditions	64%
• Improved Visibility of CES Water Quality Programs	43%
• Changed Individual and/or Community Behaviors	39%
• Built Partnerships with New Groups	32%
• Built Credibility for CES Programming	29%
• Targeted Water Quality Programming Needs	21%
• Aided in Conflict Resolution	8%

(% of monitoring programs reviewed)

CES VOLUNTEER WATER QUALITY MONITORING STATISTICS

19 State CES Programs Sponsor 29 CES Volunteer Water Quality Monitoring Programs

- 8,600 highly trained volunteers conduct monitoring and sampling
- 514,000 volunteer hours contributed to monitoring
- $6,600,000 professional equivalent for volunteer services
- 1,700 lakes, streams, and estuaries
- 22,000 individual wells

(These statistics are based on 1995-1996 data.)

Volunteer Monitoring Recruits for other CES Education Programs

Volunteer monitoring—like master gardening programs and soil and plant testing programs—strengthens the delivery of a state's overall CES Water Quality Program. These programs provide both credibility and high visibility for CES. Community-wide volunteer monitoring efforts attract solid press coverage. The data are utilized by a wide array of federal, state, and local agencies, as well as by researchers and educators.

Volunteer Monitoring Creates Multiplier Effects

Monitoring programs are stepping-stones that broaden and deepen CES's community involvement. They create "multiplier effects" as citizen volunteer monitors carry their knowledge, commitment, concern, and energy into other areas of their community's life.

Volunteer Monitoring Builds Strong Community Partnerships

Water quality is an issue around which Americans rally. Through volunteer water quality monitoring, CES programs average more than seven partnership collaborations with other local groups interested in water quality. These interactions complement and enhance the delivery of CES's water quality programming.

Program Impact

The Island County Beach Watchers in Washington state have helped assess the environmental impact of algae harvesting and have worked to restore an important salmon run. They monitor 20 beaches and contribute more than 1,500 hours a year to conducting beach profiles and bioassessments.

Volunteers learn sampling techniques and protocols in pre-season training program.

> Monitoring is an integral part of our whole CES effort in this state. Monitoring creates an awareness about water quality among people who otherwise would not have any interest at all.
>
> *—Arkansas State WQ Coordinator*

Volunteer Monitoring Educates the Community to Make Informed Decisions

Volunteer water quality monitoring programs offer a non-regulatory approach to watershed management that creates a two-way channel of communication between the public and Cooperative Extension. These programs heighten the visibility and credibility of CES water-resource education programs within a community. They involve a wide spectrum of the community, which in turn enhances CES's ability to bring local knowledge to diverse stakeholders. These programs further motivate stakeholders by providing pertinent, timely information on water quality issues.

WHAT DO VOLUNTEERS MONITOR?

Water Temperature	75%
Nutrients	50-75%
Hypoxic Conditions	60%
Bacterial Indicators	50%
Clarity/Turbidity/ Sedimentation	60%
Salinity	48%
Habitat Assessments	35%
Aquatic Organisms	25%
Stream Flow	30%
Pesticides	13%

(% of monitoring programs reviewed)

THE ROLES CES PLAYS IN VOLUNTEER WATER QUALITY MONITORING PROGRAMS

Organizational Support

- Technical Training for Volunteers and Staff
- Volunteer Support and Logistics
- Scientific Support
- Assurance of Proper Monitoring Protocols and Analyses (QA/QC)
- Site and Parameter Selection
- Lab Analyses
- Program Development

Data Compilation

- Data Interpretation
- Program Follow-up
- Publication of Results in Usable Form
- Conflict Resolution
- Identification of BMPs
- Education

Program Impact

The Wampanoag Tribe, the University of Massachusetts CES Water Quality Program, Martha's Vineyard Shellfish Group, and the Martha's Vineyard Commission have teamed up to study eight coastal ponds on Martha's Vineyard. This partnership of professional and volunteer participants will provide the first comprehensive environmental assessment of these ponds which are used for both shellfishing and recreation. Tribal and local land-use planning decisions will benefit from the findings.

Volunteer Monitoring Provides Youth with Civic Lessons and Hands-on Science

Youth are direct participants in volunteer water quality monitoring programs through classrooms and youth groups such as 4-H and scouts. The benefits are enormous. Not only do students have the opportunity to work and interact as peers on projects of significance to a community, they receive hands-on science education about water quality and ecosystem management from monitoring professionals and fellow volunteers. Such mentoring can give birth to a lasting spirit of volunteerism in our youth.

Youth education reaches directly into the family. Children carry their newfound knowledge and enthusiasm home to parents and siblings. This in turn provides a key impetus for improving home and community water quality practices.

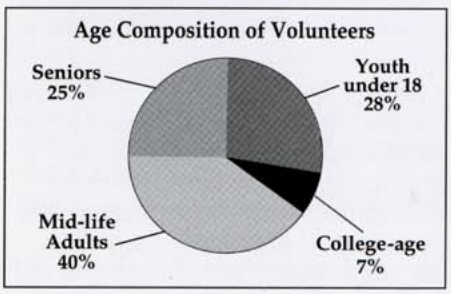
120 kids now know what a watershed is! They understand the watershed concepts and how things we do on land affect our water.

— Utah WQ HUA Program Coordinator

VOLUNTEER MONITORING DATA HAVE MULTIPLE USES

Education	75%
Target Problem Areas	60%
Local Decision making	35%
Watershed Planning	24%
Assessment of BMPs	16%

(% of monitoring programs reviewed)



Students perform dissolved oxygen tests during an Adopt-a-Lake Winter Workshop.

Program Impacts

- *Wisconsin's CES Adopt-a-Lake/ Project WET educates youth with hands-on monitoring, while providing data to local lake associations. This intergenerational, action-oriented program empowers youth and increases local awareness of lakes and lake ecology.*

- *The Little Bear River Hydrologic Unit Area (HUA) project in Utah brought 25 farmers/landowners together with middle school children to clear a sub-watershed of trash, fence a portion of Spring Creek, and plant willows to create a 25-foot riparian corridor. This hands-on education demonstrated for all involved the link between activities on land and their effects on the water.*

TYPES OF PROGRAMS

CES volunteer water quality monitoring programs take a wide array of forms:

- Urban, inner-city stream monitoring by teachers and students
- Cattle ranchers sampling their streams for evidence of degradation
- Farmers sampling groundwater for nitrogen leachate
- Estuary sampling to monitor shellfish habitats
- Lake and pond monitoring by homeowners and recreational users
- Local watershed assessments
- Boaters and fishermen monitoring their favorite recreational spots
- Homeowners monitoring the quality of their drinking water well
- Monitoring for exotic invasive species (e.g. zebra mussels, plants)
- Native Americans assessing the health of their tribal waters and watersheds

An Oregon farmer, a volunteer water quality monitor, takes pride in his apple crop.

Volunteer Monitoring Showcases Farmers as Leaders and Stewards

Sixty percent of CES volunteer water quality monitoring programs involve farmers who volunteer their time for monitoring and allow other volunteers access to their land. These programs give farmers the opportunity, in a non-regulatory framework, to be active stewards in identifying and developing BMPs for their own settings. Monitoring provides a perfect setting for introducing Farm*A*Syst and Home*A*Syst to families and individuals. As land use changes, CES programs also help farmers and suburbanites come together to face the common challenge of protecting water quality in a changing landscape.

Program Impacts

- *In Oregon, a Lane County Cooperative Extension agent diffused a conflict-laden situation when local farmers stood accused by other citizens of causing nitrate contamination of the groundwater. He organized volunteers—farmers, homeowners, environmental activists, and college students—to sample 1,300 wells across the county. The volunteers found that less than 4% of the wells had high nitrate levels and these occurred in high-growth areas of the county with many poorly designed septic systems and uncovered compost piles. As a result of volunteer findings, several communities have newly organized wastewater management districts. At the same time, farmers voluntarily implemented best management practices to combat possible water degradation. The conflict among the various users is well on its way to resolution.*

- *Jolly Farmer Greenhouses, the largest grower in New Hampshire, is a national model for self-monitoring by business. The company requested guidance from the CES N.H. Lakes Lay Monitoring Program on appropriate sampling protocols for the water quality of their effluent. The company monitors regularly and has instituted best management practices.*

Farmers are taking a proactive approach to water quality rather than waiting to react to restrictions. We live on the land. We want to be sure we're doing it right.

— Oregon farmer

Volunteer monitors learn to identify and map aquatic vegetation.

WHO ARE THE VOLUNTEER MONITORS?

Americans from all walks of life engage in CES water quality monitoring. Volunteers include:

Farmers
Teachers and their Students
Merchants and Small Business Professionals
Youth
Urban, Suburban, and Rural Families
Scientists, Engineers, and Physicians
Commercial and Recreational Fishermen
Lake and Watershed Associations
Retirees
Native American Tribes
Local and State Officials

BART HURLEY: Profile of a Volunteer Water Quality Monitor

Bart Hurley, a long-time volunteer water quality monitor with the University of Rhode Island Watershed Watch Program, is a retired chemical engineer who once worked for a well-known pharmaceutical company. Bart has monitored his local Watchaug Pond in Rhode Island for the last nine years, 26 weeks per year. He has even initiated an endowment for the program. His strong commitment to the community led to his election to his local planning board and a recent run for a seat on his town council. Bart's involvement in every facet of URI's water quality education programs has allowed him to help educate the citizens of his community about measures to protect water quality.

Program Impact

- *In Arkansas, CES's statewide nitrate testing project helped farmers test their well water for nitrates. Farm*A*Syst then helped owners to assess their environment and pinpoint possible sources of nitrogen. Many instituted best management practices to minimize the problem.*

- *Data collected by Maine high school students helped the CES Royal River Watershed Project evaluate farm practices along the Collyer Brook. Thanks to the implementation of best management practices—including keeping livestock out of the brook and preventing stream erosion—a dairy farmer has seen increased pasture productivity and milk production. Water quality has improved in Collyer Brook.*

Volunteers of all ages work together to collect water quality samples.

Volunteer Monitoring Works for Cooperative Extension

The public's desire to initiate volunteer monitoring programs is at an all-time high. Citizens become volunteer monitors because of their interest in protecting the integrity of the water bodies they live on, love, and use. This grassroots enthusiasm enables CES to build citizen-driven monitoring programs into the non-formal educational initiatives that act as local catalysts for the protection of our nation's water resources.

Cooperative Extension Service volunteer water quality monitoring programs are effective mechanisms for helping to reduce the nation's risk of water quality degradation. They speak to diverse audiences and raise awareness of the water resources and watersheds within communities across America.

For further information

A detailed report on this assessment is available on the worldwide web at: http://www.edc.uri.edu/wqmonitoring. Specific questions may be directed to Linda Green, URI Watershed Watch, Department of Natural Resources Science, Woodward Hall, University of Rhode Island, Kingston RI 02881; e-mail: riww@uriacc.uri.edu.

At the outset of this assessment, a complete list of CES volunteer water quality monitoring programs did not exist. We have made every effort to locate such programs, but we acknowledge that we may have overlooked some. Our apologies. In addition, new monitoring programs continue to emerge in response to local needs. We acknowledge that this report no longer covers all existing CES volunteer water quality monitoring efforts. We welcome information about new or overlooked programs.

We extend our gratitude to all the state water quality coordinators and volunteer monitoring program coordinators who contributed their time to communicate their knowledge and experience.

Written by Deborah Grossman-Garber, Lisa L. Gould, Linda T. Green, and Arthur J. Gold, University of Rhode Island Cooperative Extension, Department of Natural Resources Science, Kingston, RI 02881. Funding provided by CSREES project #94-EWQI-1-9061, *Assessing the Scope of Cooperative Extension Volunteer Water Quality Monitoring Programs*. URI graduate assistant, Natalie R. Sanbe, provided project support and data management. Our thanks to National Project Manager, Cynthia Garman-Squier, National CES Water Quality Program, USDA.

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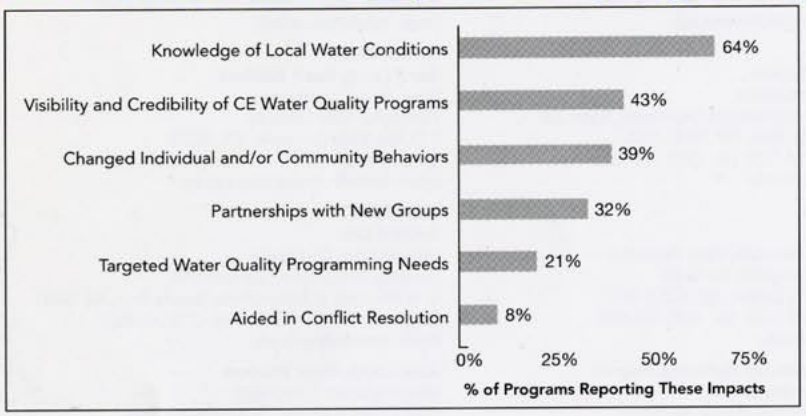
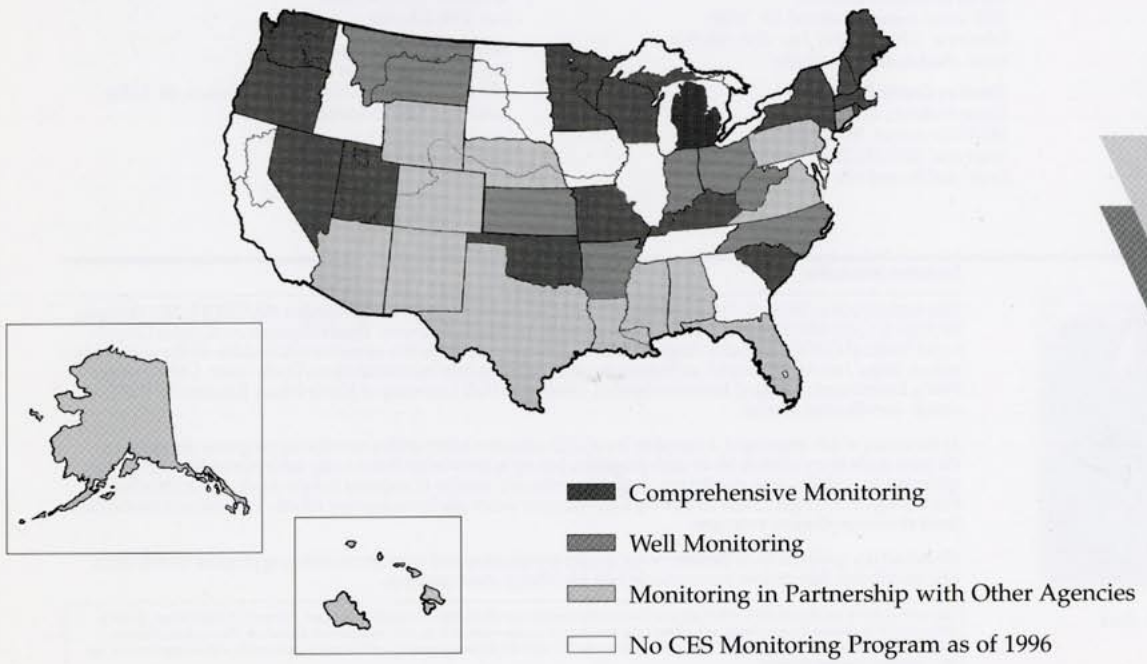
CES Volunteer Water Quality Monitoring Program Impacts



Location of Cooperative Extension Service Volunteer Water Quality Monitoring Programs & Related Activities, 1996



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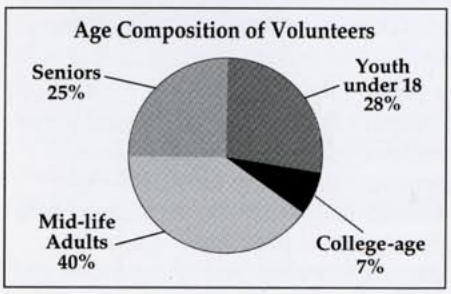

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