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The Master Well Owner Network: Volunteers Educating Pennsylvania Well Owners

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Abstract

The Master Well Owner Network (MWON) was created to expand the capacity of Penn State Extension by training volunteers who would provide education to rural residents about private water system management. Eight workshops were conducted throughout Pennsylvania, and 243 volunteers representing 55 of 67 counties in Pennsylvania successfully completed the training. MWON volunteer reports have been very positive, with education provided directly to over 7,000 Pennsylvania residents and another 29,000 educated through the mass media. MWON's successes in Pennsylvania may serve as a model for other states that wish to increase outreach to the private water system education audience.

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Introduction

In Pennsylvania, management of private water systems is often inadequate, resulting in unprotected drinking water for residents in rural areas. Unlike public water systems, private systems are entirely unregulated; consequently, the well location, construction, testing, and treatment are the voluntary responsibility of the homeowner. As a result, many individual water wells have never been tested, and their owners are generally uninformed about water quality issues (Francis et al., 1982; Center for Watershed Stewardship, 2005).

This lack of knowledge can be a substantial health risk to owners of private systems because their water supply may go without testing or maintenance until obvious water quality symptoms occur. Uninformed homeowners may also fall victim to unethical businesses that will attempt to sell unnecessary treatment equipment, perform unacceptable water testing procedures, or use improper materials and techniques to construct private water wells. A recent survey of central Pennsylvania private well owners found that only 50% had their wells tested, 90% of the wells were inadequately constructed, and several owners had purchased unnecessary treatment equipment (Center for Watershed Stewardship, 2005).

Pennsylvania has the disadvantage of being one of only four states that have no statewide private water well construction standards. Construction standards for private wells provide protection for rural residents against the use of improper construction techniques and materials. Poorly constructed and unmanaged water wells represent potential risks to vital ground water aquifers

and the homeowners, farmers, and businesses that access them. Pollution of entire ground water aquifers may occur from failing septic systems, manure and fertilizer applications, mining, or other land uses. Individual water supplies may also be contaminated around the exposed well casing (wellhead) from surface water flowing along the well casing and/or from a loose fitting or absent well cap that allow insects, animals or surface water to directly enter the well.

Thus, the wellhead area, especially in poorly constructed wells, represents a very sensitive area that can serve as an open conduit to underground aquifers that threatens nearby private and public water supplies. Recent studies on private well contamination in other states with regulations have reported lower contamination rates than those previously reported for wells in Pennsylvania (New Jersey DEP, 2004; Liu, Ming, & Ankumah, 2005).

Despite the lack of private water well construction standards, rural residents can protect their drinking water supply if they are properly educated. Pennsylvania State (Penn State) Cooperative Extension has been providing education to private well owners for years, but the large target audience in this state has made this an increasingly difficult task (Mancl, Sharpe, & Makuch, 1989; Swistock, Sharpe, & Dickison, 2001). In Pennsylvania, over three and a half million residents or one million homes use a private system for their primary drinking water supply, and 20,000 new private water wells are drilled each year in the state (U.S. Census Bureau, 1990). These estimates are based on information collected in 1990 because data on private water systems was not collected in the 2000 Census.

In an attempt to more efficiently educate well owners, the Penn State Institutes of the Environment and Penn State Cooperative Extension received funding from the United States Department of Agriculture Cooperative State Research, Education and Extension Service to create the Master Well Owner Network (MWON). MWON is a network of trained volunteers throughout Pennsylvania dedicated to educating rural homeowners about private water system management. MWON was created to build the capacity of Penn State Extension to provide information about private water systems to as many rural residents as possible.

Training volunteers throughout the state has allowed Extension to reach many more people in less time and with fewer resources than traditional approaches. It has also increased public awareness of Extension programs. The long-term goal of MWON was to promote better management of the one million plus private water systems in the state of Pennsylvania.

Methods

Coordinators

To initiate the MWON program, a State Coordinator was hired to create all materials and organize all workshops. This coordinator also had the responsibility of communicating with volunteers after they completed the training and provide them with the educational materials necessary to accomplish their outreach objectives. To assist the coordinator with implementation of each workshop, eight Cooperative Extension educators were selected to serve as regional MWON Coordinators for the six Penn State Extension Regions.

Volunteer Recruitment

MWON was originally modeled after the Master Gardener Program, and although there are some similarities among the programs, volunteer recruitment is more difficult for MWON. This program is not based on any regular activity for typical homeowners. Finding individuals who are interested in learning about their private water system is not difficult, but finding volunteers who are willing to later educate the public about it is much more of a challenge.

Volunteer recruitment for this program was primarily completed using newspaper advertisements and electronic newsletter distribution lists. Because many environmental organizations and agencies have replaced hard copy newsletters with electronic newsletters, we identified what agencies used electronic newsletters and requested that they include our recruiting news release. Interested individuals were directed to complete an application and were later notified with an acceptance or rejection letter/email. Applicants were selected based upon the following criteria:

1. Willingness to perform education and outreach.
2. Applicant could not be employed by a company linked to private water systems.
3. Willingness to attend a one-day, 8-hour training workshop.

Training Workshops

Eight volunteer training workshops were held in selected regions throughout Pennsylvania with the intent of recruiting volunteers from every county in the state (Figure 1). Workshop locations were selected to maximize volunteer participation and minimize individual volunteer travel expenses. Workshops were 8 hours in length, and presentations were made by experts representing the

following organizations:

- Penn State Cooperative Extension
- Pennsylvania Ground Water Association
- Pennsylvania Department of Environmental Protection
- Pennsylvania Rural Water Association
- U.S. Environmental Protection Agency Region III

Figure 1.

PA Map Indicating Workshop Locations (X) Within Penn State Extension Regions



Each volunteer selected for a workshop had to attend the entire training and take an exam. To receive the MWON certificate and continue with the program, attendees were required to pass the exam to demonstrate that they understood the knowledge presented during the workshop. Evaluations were collected from volunteers at the conclusion of each training workshop so that improvements could be made to future workshops. A MWON policy statement was also signed by each volunteer to ensure that volunteers understood their educational limitations and were provided liability insurance coverage.

For participating in the training, each volunteer received a free lunch, a resource handbook, a sanitary well cap, testing completed on their own water sample, and an official MWON name badge.

Workshop topics were chosen to give volunteers useful information about private water system construction and management. Topics presented at each training workshop are listed below:

- Private Water System Basics
- Private Water Well Construction and Location
- Wellhead Protection and Land Use Impacts
- Water Testing and Interpretation
- Water Treatment
- Water Conservation
- MWON Policy and Volunteer Responsibilities

Data Collection

After each training workshop, volunteers were given a goal of educating at least 100 private water system owners in Pennsylvania in 2 years. Approved educational methods included individual consultation, group presentations, displays at public events, or newspaper articles. To assist them with their outreach, volunteers were provided with brochures, PowerPoint presentations, Web site cards, and informational displays.

After each educational event, volunteers were asked to submit reports to the MWON Coordinator indicating where and when they performed their outreach efforts and, most important, how many people they educated. A reporting system for volunteers was created on the MWON Web site, but reports were also accepted through mail or via fax. It was also suggested that volunteers try to obtain contact information in the form of an email or physical address for at least 20 of the 100 people that they educated to allow for later impact evaluations.

Program Evaluation

To determine actual program impacts, follow-up surveys were sent to any person who voluntarily supplied his or her contact information to an MWON volunteer. These surveys were sent out 6 months after the interaction with the MWON volunteer occurred to allow enough time for the homeowner to implement changes to their water system. The information collected from this survey solicited information about the following:

- Benefit of interaction with the MWON volunteer
- Concepts learned from talking to the MWON volunteer
- Actions taken to improve their private water system in response to information provided by MWON volunteers

Statewide Conference

After the eight training workshops were held and 243 volunteers were successfully trained, a statewide conference was organized in September 2005. This conference was held approximately 16 months after the first training and 5 months after the last training was conducted. The purpose of the conference was to provide additional education to the volunteers and to allow volunteers from around the state to network and learn from each other. Topics covered at the conference included the following:

- Effective public outreach
- The importance of well grouting
- Groundwater and public health
- Septic system management.

Results

Volunteer Recruitment

In 2004 and 2005, eight workshops were held and 243 Pennsylvania residents from 55 counties successfully completed the MWON training. Volunteer numbers ranged from 24 to 50 in each extension region.

The occupation of each trained volunteer was reviewed to determine what types of residents were interested in an outreach program such as MWON (Table 1). The highest percentage of volunteers who completed the training were natural resource professionals. Twenty-three percent of volunteers were residents employed in fields completely unrelated to this program. It was determined through application review that the majority of these individuals were interested in the program due to a concern about the quality of their home drinking water. Approximately 20% of all MWON volunteers classified themselves as retired, so a determination of their past employment could not be made. However, one third of those retired volunteers mentioned their involvement in some type of community watershed group. Other volunteer backgrounds included educator, township employee or sewage enforcement officer (SEO), health professionals, and farmers. Although these professions are not directly related to private water systems, most have a unique interest in the program beyond protection of their own water supply.

Table 1.
Volunteer Occupation

Occupation	Number of Volunteers	% of Total
Total Natural Resource Professionals	73	30
DEP Employee	19	
Water Quality Professional	37	
Environmental Consultant	15	
Graduate Student	2	
Field Unrelated to Natural Resources	56	23
Retired	48	20
Affiliated with a watershed group	16	
Educator	16	7
Unknown Profession	15	6
SEO/Township Employee	13	5
Health Professional	12	5
Farmer	9	4

Workshop Results

All volunteers who attended the MWON training passed the post-exam by scoring at least a 70%. Out of 243 volunteers who completed training, 236 workshop evaluations were submitted. Evaluation results from all workshops were combined because there was little variation among them. Workshop evaluations were overwhelmingly positive, and they clearly demonstrated that attendees found the training to be of value (Table 2).

Table 2.

Question 1: Circle the Word That Best Describes Your Opinion of the Master Well Owner Network Training.

Volunteer Responses	% of Total Responses
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Excellent	119	50
Very good	103	44
Good	11	5
Fair	0	
Poor	0	
No Answer	2	1

Workshop evaluations also asked MWON participants about their comfort level in presenting educational and outreach activities to the public after attending the 8-hour workshop. Because public education was the priority of this program, this was perceived as a potential barrier to the success of the program. Fortunately, evaluation results indicated that most volunteers were comfortable with the required education and outreach commitment (Table 3).

Table 3.
Question 2: After Attending This Training, How Comfortable Are You in Delivering Education to the Public?

Volunteer Responses		% of Total Responses
Very comfortable	84	36
Somewhat comfortable	111	47
Not at all comfortable	3	1
Unsure	1	<1
No Answer	37	16

As further evidence that the workshops were of value to the attendants, the majority of evaluations noted that they would attend another similar training in the future (Table 4).

Table 4.
Question 3: If an Additional Training Session Was Offered in Two Years, Would You Attend?

Volunteer Responses		% of Total Responses
Yes	169	72
No	1	<1
Unsure	28	12
No Answer	38	16

Program Results

From May 2004 through October 2005, MWON volunteers reported educating approximately 7,000 residents of Pennsylvania about private water system construction and management, and its effect on drinking water quality. Typical volunteer reports included activities such as talking to neighbors, presenting information at local township meetings, and hosting a booth at a county fair. In addition to those reports, volunteers also reported educating over 29,000 residents through various media sources (i.e., TV, newspaper, and township newsletter articles). Over 90% of all reports received were submitted using the internet reporting system.

Surveys of homeowners who have interacted with volunteers have demonstrated that this type of program can be effective in promoting proper management of private water systems to a large audience. Approximately 97% of those who returned surveys felt their interaction with an MWON volunteer was beneficial, and 92% learned at least one new idea about better management for their water supply. In addition, 82% of those contacted by an MWON volunteer indicated that they had taken some action to better manage their water supply, such as water testing, installation of water treatment equipment, or protection of their water supply.

Discussion

Workshop results demonstrated that volunteer recruitment for this program was not significantly difficult. It became apparent that a few counties needed more aggressive recruitment strategies and that other more urban counties may not have needed volunteers because they were dominated by public water systems. Workshop test scores indicated that a large amount of knowledge was gained through the training, and most MWON volunteers were pleased by the organization of their workshop, the experts that presented, and the resources that were provided

for their educational outreach efforts.

Outreach by the volunteers provided favorable results. Although we had an outreach goal for every volunteer of 100 people within 2 years, several of our volunteers exceeded that expectation. Volunteer reports submitted indicated higher than expected use of media sources to educate private water system owners. In the near future, MWON will be able to report on total volunteer hours since because information is now being collected along with contacts.

Public evaluations have only been sent to a fraction of those that have submitted contact information, and the rate of return has been low. Of the approximately 315 surveys that have been sent, only 64 surveys were returned completed. However, evaluation results from returned surveys were positive, and the majority of people indicated making a change to their private water system in response to talking to an MWON volunteer. Future surveys may use a reminder postcard in hopes of increasing the rate of return.

Cost savings from this program can be significant to private water system owners who may be able to avoid unnecessary water treatment. On the other hand, necessary water treatment could mean safer water with reductions in illness. Further, the use of water conservation devices may be of considerable financial benefit.

The most important benefit of this project was the increased capacity of Extension to educate owners of private water systems. The network of volunteers created was an effective means to educate large numbers of Pennsylvania residents in relatively little time. The successes of MWON in Pennsylvania indicate that it may be a useful model for other states interested in providing greater outreach to private water system owners.

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