

Citizen Involvement in Water Resources Issues in New England

Abstract

A survey determined citizen involvement and actions taken about water resource issues in New England. The major findings were: (1) 50% of citizens had changed their yard watering practices in the last few years; (2) 43% had changed their use of pesticides; and (3) 12% indicated that they were actively involved in an environmental protection group. To obtain additional water resources information 55% of respondents indicated they would read printed fact sheets, 43% would read newspaper articles, and 37% would watch a television program. Extension will use these data to increase citizen involvement in water quality issues.

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Introduction

As water resources planning and management moves forward, there is also an increased awareness of the need for all individuals to take actions in and outside the home to

conserve and preserve water quality (Campbell, Johnson, & Larson, 2004). Extension programs seek to educate and encourage citizens to take personal responsibility for actions that ensure preservation and conservation of water resources (Beierle, 1999). Experiential learning has been shown to be very effective at promoting lasting conservation behaviors (Barr, 2003). Therefore, developing educational programming to increase citizen's knowledge and direct experience is very important to guarantee adequate water quality in the future.

Current data is needed to establish a baseline to measure the effectiveness of Extension programs that address the issues of water conservation and quality. Learning more about the degree that citizens are involved and care about water quality issues will allow Extension faculty from the Land-Grant Institutions (LGI's) and other educational organizations to target citizens and citizen groups that are lacking in involvement and to formulate the best strategies to increase citizen participation.

In order to evaluate the degree of current citizen involvement in water resources issues in New England, a public opinion survey was developed and conducted in May of 2005. This survey was based on a template developed in the Pacific Northwest (Mahler, Simmons, Sorensen, & Miner, 2004; Mahler, Simmons, & Sorensen, 2005). This article focuses on citizen actions taken to preserve or conserve water quality in the New England region.

Materials and Methods

A 53-question survey was designed to assess public attitudes about water issues in the New England states. This article focuses on the following four questions from the survey that address specific actions of survey respondents:

Q-1. How important is involving citizens in collecting water quality information in protecting our water resources? (*Circle one answer*)

- a. Not important
- b. Somewhat important
- c. No opinion
- d. Very important
- e. Extremely important

Q-2. Have you or someone in your household done any of the following as part of an individual or community effort to conserve or preserve water quality? (*Circle all that apply*)

- a. Changed the way your yard is landscaped
- b. Changed how often you water your yard
- c. Changed your use of pesticides, fertilizers, or other chemicals
- d. Pumped your septic system (if you have one)
- e. Tested your drinking water

Q-3. Have you participated in any of the following activities? (*Circle all that apply*)

- a. Master Gardener program
- b. Volunteer water quality monitoring
- c. Lake, river, or bay protection groups
- d. Town conservation commissions
- e. Other water or environmental protection groups

Q-4. If you had the following kinds of learning opportunities available, which would you be most likely to take advantage of for water quality issues? (*Circle up to three items*)

- a. Read printed fact sheets, bulletins, or brochures
- b. Visit a web site for information and tips
- c. Attend a short course
- d. Look at a demonstration or display
- e. Read a newspaper article or series
- f. Watch TV coverage
- g. Watch a video of information
- h. Take part in a one time volunteer activity to learn or do something (for example, water monitoring, streamside restoration or education)
- i. Take a course for certification or credit
- j. Get trained for a regular volunteer position (for example, as a watershed steward or water quality monitor)
- k. Learn how to conduct a home, farm, or workplace water practices assessment
- l. Attend a fair or festival

The four survey questions discussed in this article were developed for similar surveys used in other regions of the U.S. In addition to the questions, gender, age, education level, state of residence, and community size data were also collected. Surveys were sent to residents in each state on a proportional population basis using the Dillman survey methodology (Dillman, 2000). Residents in each of the six states were identified through a list of randomly selected residents purchased from a commercial survey business (survey Sampling International, Fairfield, CT). A target response rate (50%) was designed to be achieved through four mailings using the Dillman mail survey methodology (Salant & Dillman, 1994). The first mailing took place in March of 2005, and the survey process was completed by the end of June.

Survey answers were coded and entered into Microsoft Excel. Incorrect and missing data were assigned the numbers 8 and 9, respectively, and were excluded from the statistical analysis. The survey data were analyzed on two levels using SAS (SAS, 2000). The first level of analysis was a basic data summary that provided the number and percentage of respondents for each question. The second level consisted of constructing contingency tables (cross tabulation) to determine if specific demographics (i.e., age, community size, etc.) affected responses to particular questions. A chi-square distribution was used to test significance (0.05).

Results and Discussion

The overall survey achieved a return rate of 43.8 %, and return rates for the individual states ranged from 37.0% to 51.4% (Table 1). The return rate was deemed high enough that the estimated margin of error was only +/-3%.

More males than females returned the survey (63% vs. 37%) even though half of the surveys initially mailed were sent to females. The respondents were older and better educated than the population of New England, based on recent census data.

| State | Survey Sample Size | Surveys Completed | Return Rate (%) |
|---------------|--------------------|-------------------|-----------------|
| Connecticut | 498 | 226 | 45.4 |
| Maine | 282 | 142 | 50.4 |
| Massachusetts | 794 | 294 | 37.0 |
| New Hampshire | 280 | 119 | 42.5 |
| Rhode Island | 258 | 128 | 49.6 |
| Vermont | 212 | 109 | 51.4 |
| Total | 2324 | 1018 | 43.8 |

Approximately 21% of respondents were under 40 years of age, 45% were between the ages of 40 and 60, and 34% of residents were older than 60 years. Twenty-five percent of respondents had completed some college, 30% graduated from a 4-year college, and 27% reported to have obtained an advanced degree. Only 19% of respondents had a high school education or less. Most respondents lived in communities having populations between 7,000 and 25,000 or 25,000 and 100,000 residents (64% of respondents). The demographic factors of state of residence, age, and community size most often influenced responses to questions addressing actions of respondents.

Citizens as Data Collectors

It is important to involve citizens in the collection of water quality data because it can help to educate the general public and increase awareness about water quality issues (Nerbonne & Nelson, 2004). Approximately 55% of respondents felt that involving citizens in collecting water quality information was very or extremely important. This

response is important because it indicates that New England residents realize that citizen participation is an important part of protecting water resources.

The demographic factors of state of residence, age, and community size were not significantly related to the importance of involving citizens in collecting water quality information. Gender was a significant factor: 62% of females vs. 50% of males felt that it was very or extremely important to involve citizens in collecting water quality information.

Citizen Actions

Citizens taking direct actions towards protecting and improving water quality is important because these actions indicate awareness of water quality issues and responses indicate that citizens may place a high value on protecting water resources. Almost half of surveyed respondents indicated that they had changed how often they watered their yard. Forty-three percent had changed the way they used pesticides, fertilizers, or other chemicals; 32% had pumped their septic system; and 28% had changed how their yard was landscaped (Table 2).

| Action | Changing Action, % |
|--|--------------------|
| Changed how often yard was watered | 49.4 |
| Changed use of pesticides, fertilizers, or other chemicals | 43.0 |
| Pumped septic system | 31.9 |
| Changed the way yard is landscaped | 28.4 |

These reported actions are high and encouraging because they show that a substantial portion of citizens desire to protect water resources, and, consequently, desires are translating into actions. Changing how often a yard is watered and changing use of pesticides and fertilizers may even be economically motivated (money-saving) actions for some residents. However, even if economics are not the primary motivation, the results indicate that the desire to protect water resources is worth the change in action for many people. The response to the septic system pumping question was excellent as the value reported is close to the actual percentage of residents that are on septic systems for sewage disposal (Wawrzynek & Mahler, unpublished data). Changing the way a yard is landscaped was the least popular action, which may be due to the cost and/or intensive labor involved.

Both state of residence and age had an impact on actions toward changing the way yards were watered. Residents of Massachusetts and Connecticut were most likely to change how often they watered their yard (Table 3). Urban states (MA, CT) are more likely to contain cities and communities that place restrictions on yard watering in an effort to conserve municipal water supplies. Conversely, residents of the more rural states of Maine and Vermont would be least likely to have yard watering restrictions explaining the lower percentage of change.

| Table 3. The Impact of State of Residence on the Percent of Residents Who Changed How Often They Watered Their Yard Based on Responses from the 2005 New England Water Issues Survey | |
|--|----------------------------------|
| State of Residence | Changing Yard Watering, % |
| Massachusetts | 56.6 |
| Connecticut | 54.1 |
| Rhode Island | 49.2 |
| New Hampshire | 46.9 |
| Maine | 39.9 |
| Vermont | 35.8 |

Age also influenced responses regarding changes in yard management. Residents older than 40 years were most likely to change how often they water their yard (Table 4) and their use of pesticides, fertilizers, and other chemicals. Respondents aged 30 years or less were least likely to change their approach to water use, pesticides, fertilizers, and other chemicals.

| Table 4. Impact of Age on the Percent of Residents Who Changed How Often They Watered Their Yard and Changed Chemical Based on Responses from the New England 2005 Water Issues Survey | | |
|--|------------------------------|-----------------------------|
| Age | Changed Yard Watering | Changed Chemical Use |
| | -----%----- | |
| < 30 | 26.8 | 23.2 |
| 30-40 | 47.8 | 35.5 |
| 40-50 | 53.7 | 45.3 |
| 50-60 | 53.0 | 49.3 |

| | | |
|------|------|------|
| > 60 | 50.9 | 45.8 |
|------|------|------|

Water Activity Participation

Research has shown that access to opportunities such as becoming a member of an environmental group helps citizens develop a greater sense of environmental responsibility for their community and increases their likelihood that they will engage in environmental/conservation actions (Barr, 2003). When asked about participation in specific activities, less than 12% of New England residents had participated in any of the activities listed in survey question three (Table 5). The survey respondents who had participated in one or more of the listed activities were 30% more likely to have changed actions to protect water resources (Table 2) than the 71% of citizens who had not participated in an activity noted in Table 5.

| Activities | Participating, % |
|--|-------------------------|
| Lake, river, or bay protection group | 8.2 |
| Town conservation commission | 4.9 |
| Volunteer water quality monitoring | 4.4 |
| Master Gardner program | 2.5 |
| Other water or environmental protection groups | 11.6 |

The demographic factor of community size affected respondent participation in lake, river, or bay protection groups. The rate of citizen participation was 12.2, 11.5, 11.4, 5.1, and 2.9% for community sizes of <3,500, 3,500 - 7,000, 7,000 - 25,000, 25,000 - 100,000, and >100,000, respectively. Even though the percentages of participating respondents in larger communities was less in smaller communities, the number of participating respondents in the large communities was actually numerically greater due to the higher population of potential participants.

It should also be noted that education level also affected residents' participation in lake, river, and bay protection groups. Participation in these groups increased with increasing education level (2.2% high school graduates vs. 12.2% college graduates). This is logical because it is more likely that residents with more formal education would have increased awareness of these activities and groups, and their importance and, therefore, are more

likely to participate in them. The increased affluence of college graduates may also result in more discretionary time that can be devoted to volunteer activities.

Learning Opportunities

Determining preference for the types of learning opportunities will help Extension determine the appropriate outreach activities that maximize the effectiveness of delivery, time, and monetary resources. Fifty-five percent of respondents indicated that they were interested in learning about water by reading printed fact sheets, bulletins, or brochures (Table 6). In addition, 43% were interested in reading a newspaper article or series, 42% would visit a Web site for information, and 37% were interested in television as a source for water resources information.

| Learning Opportunity | Willing to Use, % |
|--|--------------------------|
| Read printed fact sheets, bulletins or brochures | 54.7 |
| Read a newspaper article or series | 43.2 |
| Visit a web site for information and tips | 41.5 |
| Watch TV coverage | 36.9 |
| Watch a video of information | 15.1 |
| Learn how to conduct a home, farm, or workplace water practices assessment | 13.5 |
| Take part in a one time volunteer activity | 13.4 |
| Attend a fair or festival | 13.1 |
| Look at a demonstration or display | 12.2 |
| Attend a short course | 9.4 |
| Get trained for a regular volunteer position | 6.9 |
| Take a course for certification or credit | 5.4 |

Age significantly affected a resident's interest in obtaining water resources information from newspapers. In general, residents older than 40 years of age were more likely to read a newspaper compared to residents younger than 40 years of age (Table 7). The demographic factor of age also affected residents' willingness to visit a Web site for

information. Residents younger than 40 years of age were most likely to visit a Web site, residents greater than 60 were least interested, while residents between 40 and 60 were intermediate in interest level. This is most likely due to older residents being less familiar with the Internet. Consequently, older respondents rely on the more traditional media sources such as newspapers for water quality issue information.

Education level also affected residents' willingness to visit a Web site for water-related information. Residents claiming to have completed a bachelor or advanced college degree were more likely to visit a Web site than residents with less formal education (49% vs. 27%). Residents with more formal education are more likely to have Internet access at home or at work.

| Table 7. The Impact of Age on the Willingness of Residents to Use Newspapers and Web Sites for Water Resources Information Based on Responses from the 2005 New England Water Issues Survey | | |
|---|-----------------|-------------------|
| Age | Web Site | Newspapers |
| | -----%----- | |
| < 30 | 58.9 | 32.1 |
| 30-40 | 63.0 | 34.1 |
| 40-50 | 45.8 | 43.3 |
| 50-60 | 46.1 | 41.0 |
| 60-70 | 36.7 | 42.3 |
| > 70 | 21.2 | 50.4 |

Conclusion

It is encouraging that 50% of survey respondents had changed their yard watering practices and 43% had changed their use of pesticides. Working with those residents who have already changed their actions or are willing to change their actions may be a key to influencing residents who have yet to take action.

Only 12% of respondents indicated that they were actively participating in water quality or other environmental protection groups. This does not indicate that residents do not care about water resources issues, but rather may indicate that they are simply not aware of the types of opportunities available. Research shows that citizens are most likely to join these types of groups if they are visible as well as easily accessible. Therefore, the number of residents participating in these groups can be increased through outreach and programming that publicizes these groups and provides citizens with information on how

they can become involved. Education level also affected resident's involvement in water protection and environmental groups. The infrastructure for all citizens to become involved is already in place (e.g., watershed groups, voluntary monitoring, Master Gardeners, NEMO, etc), so the challenge becomes delivering this information in a user-friendly fashion to citizens without a college education.

The survey findings support many of the pre-existing educational efforts by Land-Grant Institutions (LGI) in the New England states; however, many of the findings presented in this article suggest both new foci and delivery strategies. The survey results have been presented to the LGI water quality coordinators in the region. In response to this information, Extension delivery of water programs is being modified and enhanced. An example is the increased availability of pdf-based materials on the regional Web site <<http://www.usawaterquality.org/NewEngland>>. The Extension coordinators have also developed a common set of messages that can be delivered across the six-state region that improve coordination and enhance educational programming.

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