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Using a Survey Instrument to Determine Audience Preferred Delivery Methods for Water Quality in the Pacific Northwest

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Abstract

A 50-question survey was developed by the Pacific Northwest water quality team to document public awareness, aptitudes, attitudes and actions toward water quality in Alaska, Idaho, Oregon and Washington. Demographic data were also collected about the survey respondents. The statistically designed survey conducted in January 2002, was completed by over 50 percent of the 1,800 residents who were solicited for this study. Several questions in this survey were used to assess needs in the region. We are using the results of this survey to guide our water quality programming priority areas and delivery methods to our clientele for the next five years.

Introduction

The states of Alaska, Idaho, Oregon and Washington comprise a region known as the Pacific Northwest or Region 10 in the USA. This region consists of 920,600 square miles or 26 percent of the USA's land area. The population is approximately 11,400,000 people or 4 percent of the USA's population. Within this region are five land grant institutions: Northwest Indian College, Oregon State University, University of Alaska, University of Idaho and Washington State University. Water is considered the most important natural resource in the region.

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The land grant institutions in the region have a history of addressing high-priority water needs and issues. The five land grant institutions currently have over \$25,000,000 in grants and contracts associated with water resources. Many of the institution's water research programs are internationally recognized. In addition, these institutions have an outreach structure that places local educational opportunities within reach of all residents of each state. These institutions offer many degree programs that emphasize water resources. With so much water activity, it is important to have a coordination project that can effectively link research, extension and educational activities within and between institutions in the region.

The Pacific Northwest regional water coordinating team has been active for approximately four years. In that short period of time we have developed a tradition of working together well. We realize that as individual states we can not meet all the water research, extension and educational needs. However, working as a region we can pool our efforts, minimize redundancies, set regional priorities based on thematic areas, and efficiently and effectively meet the needs of people in the region. Our regional team has forged a strong working relationship with EPA Region 10 and improved our working relationships with USDA-NRCS, state and local agencies.

We plan to build on current working relationships and our solid foundation to take our programs to the next level. Our philosophy is to provide science-based information so that people can make decisions in their lives that will improve and/or protect water quality. Based on our 4 years of working together as a regional program we have made the following observations:

- Our region is a more effective and efficient unit than four or five separate state or tribal programs
- We work together better as a team than as individuals.
- A liaison position located at EPA Region 10 headquarters helps pull our states together into a team.
- Effective partnerships with EPA Region 10 and USDA-NRCS enhance all of our water programs.
- We use all partner logos on all of our products, sharing credit is effective and encourages stronger partnerships.
- Our regional water quality program contributes to the national water quality program.
- The national water quality program contributes to our regional program.
- Our future programming efforts are positively influenced by 4 years experience of working as a regional team.
- TMDL targets and watershed groups need our support.
- Sharing expertise throughout the region covers gaps due to loss of positions within states.
- Citizens of the region gain from the synergism of our team.

Surveys are considered a useful tool for both determining potential audiences and determining audience educational needs. Surveys also provide necessary base line data

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which can be used to assess outreach progress. We consider needs assessment surveys best educational practices (BEP).

The objectives of our study (BEP) were to: (1) design and conduct a needs assessment survey to document public awareness, aptitudes, attitudes and actions toward water quality and the environment and (2) develop base line data – to compare successes of future programs. This report summarizes the programming needs aspects of this study.

Materials and Methods

A 50-question survey was designed to assess public attitudes about water issues in the Pacific Northwest. Based on statistical advice, a target of 900 residents of the Pacific Northwest was set as the sample size population. Surveys were sent to residents of Alaska, Idaho, Oregon and Washington on a proportional population basis. Residents from each state were randomly selected from phone books and switchboard.com. Surveys were actually sent to 1,888 residents; however, 114 were returned by the post office as being undeliverable. Consequently, the actual sample population was 1,774. The survey process was designed to receive a completed survey return rate in excess of 50 percent. If more than 877 surveys were returned completed, then the sampling error can be assumed to be less than +/-5 percent (Dillman, 2000; Salant and Dillman, 1994). Three mailings were used to achieve this return rate. The first mailing, which took place in January 2002, included the water issues survey form, a business reply envelope and a cover letter that: (1) identified the survey's authors, (2) explained the purpose of the survey, (3) assured the respondent of anonymity, and (4) asked the respondent to fill out and return the survey via the enclosed business reply envelope. The second mailing occurred five weeks later (March 2002) and consisted of a postcard that stressed the importance of the survey, and to remind the respondent to fill out and return the survey sent out in the first mailing. Five weeks later (May 2002) the third mailing was sent to residents who did not respond to the first or second mailing. This mailing included a reminder letter, another copy of the water issues survey and a business reply envelope.

Survey answers were coded and entered into Microsoft Excell. The data was then copied to SPSS, a statistical software package (Norusis, 1986). Missing data was assigned the number nine on the coding system and excluded from the analysis. The data were analyzed at two levels using SPSS (Norusis, 1986). The first level of analysis was a basic data summary. This analysis showed both the total number and percentage of respondents that answered each question with a specific answer. The second level of analysis involved using cross-tabulation, or contingency tables, to isolate how specific subgroups of survey respondents (e.g., demographic groups such as gender and education level) related to specific questions. Significance was tested using chi-square distribution (Babbie, 1983). The significance level deemed valid in this study was 0.05. Statistics are not provided in the tables of this manuscript because they are secondary to the purpose of this paper. However, values in table 2, 3, 4, 5, and 6 differing by more that 5.0 percent should be assumed to be statistically different.

Results and Discussion

The water issues survey achieved a return rate of 52.3 percent (928 surveys either fully or partially completed and returned out of 1,774). The individual state response ranged from 50.6 to 57.6 percent (Table 1). Fifty-six percent of the survey respondents were male. Over 32 percent of the survey respondents lived in communities of more than 100,000 people. Conversely, 18 percent of the respondents lived in towns with less than 7,000 people. Thirty-five percent of the respondents had lived in the Pacific Northwest all of their lives. Ninety-one percent of survey respondents were high school graduates. Overall, the demographics of the survey respondents (except for gender) closely reflected the actual demographics of the region. Consequently, when coupled with low sampling error, the results of this survey should be an excellent instrument to assess literacy on water issues in the region.

Table 1. Statistical data about the Pacific Northwest water issues survey sample size and completion rate by state.

State	Sample size	Completed	Return rate (%)
Alaska	232	120	51.7
Idaho	278	160	57.6
Oregon	506	256	50.6
Washington	758	392	51.7
Total	1,774	928	52.3

When the survey was conducted there were only seven national water quality theme areas (water conservation, management, quantity and policy were later split into two themes). Approximately 32 percent of survey respondents were identified as rural. Based on the survey, a significant portion of the rural residents living in the Pacific Northwest wanted more information about three water quality theme areas: (1) drinking water and human health, (2) water quantity and policy, and (3) watershed management (Table 2). Almost 75 percent of the rural residents identified the need for more information about drinking water and human health. Almost two-thirds of rural residents wanted more information about water quantity and water policy. Almost half of rural residents wanted more information on watershed management. It is also important to note that when rural and urban responses were added together, drinking water and human health, water quantity/policy, and watershed management ranked as three of the top four water quality areas of interest. Conversely, there was little demand for additional information on nutrient and pesticide management and animal waste management by either rural or urban audiences.

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Table 2. Responses to the question: “Would you like to learn more about any of the following water quality issues?”

Area of interest	----- Respondents wanting to learn more -----	
	Rural	All
	----- % -----	
Drinking water	74.2	48.8
Water quantity / policy	66.2	31.9
Watershed management	48.5	27.3
Pollution prevention	26.2	30.2
Environmental restoration	20.4	27.4
Nutrients and pesticides	18.4	22.3
Animal waste management	14.3	16.5

Rural residents prefer to be educated about water quality through radio, television, newspapers and printed fact sheets (Table 3). Workshops and short courses as educational tools to learn about water quality are not popular with rural audiences in the region. This is very important because workshops and short courses are traditional methods used by Extension to educate the public. Based on this information the regional water quality coordinating team needs to seriously consider changing or modifying our traditional delivery methods if we want to increase or even reach our target audience. Most rural residents in the region have obtained water quality information from television and newspapers (Table 4). Environmental agencies and environmental groups have also been widely used sources for water quality information. Thirty-six percent of rural residents in the region have obtained water quality information from Extension.

We were also interested in the demographic factors of clientele age and community size on the impact of Extension meeting water quality information and education needs. It appears that older residents are more likely than younger people to get water quality information from Extension (Table 5). Extension has a much greater water quality impact (reach) in smaller communities than in larger cities (Table 6).

Table 3. Responses to the question; “If you had the following methods of learning opportunities available, which (check up to three) would you likely take advantage of for water quality learning opportunities?”

Learning method	----- Respondents -----	
	Rural	All
	----- % -----	
Radio	63	51
Television	62	55
Newspaper	62	54
Printed fact sheets	59	53
Internet (web sites)	29	41
Demonstrations or displays	26	21
Workshops (2–3 hours)	8	20
Short courses (1 day)	4	18

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Table 4. Responses to the question: “From which of the following sources have you received water quality information?”

Water quality source	Receiving information	
	Rural	All
	%	
Newspapers	72	68
Television	53	59
Environmental agencies	44	51
Environmental groups	40	46
Extension	36	28
Universities	20	25
Schools	15	20

Table 5. The influence of age of respondent on the source of information residents in the Pacific Northwest use for water quality.

Information source	Age			
	< 40	40–49	50–59	> 60
	%			
Television	55	55	55	70
Newspapers	58	68	68	80
Environmental agencies	42	56	50	57
Extension	15	30	32	37

Table 6. The influence of community size on the type of information source residents in the Pacific Northwest use for water quality.

Information source	Community size			
	> 100,000	25–100,000	7–25,000	< 7,000
	%			
Newspapers	60	60	64	57
Extension	25	25	29	42

Based on the information provided in the previous tables, our regional water quality team is making the following three major modifications in our regional program:

- Programming will be concentrated in three national water quality theme areas: (1) drinking water and human health, (2) water quantity/policy, and (3) watershed management.
- We will think outside the traditional box when it comes to program delivery. The traditional two to three hour and one-day workshops will be de-emphasized. We will emphasize printed fact sheets, satellite conferences, Internet delivery, and concentrated regional hands-on learning opportunities. We will also try public service announcements on television and place more emphasis on newspapers and radio.
- We will use several strategies that are currently under development to increase our penetration into younger audiences, be more successful in rural areas, and use mass media to have a greater impact in suburban and urban areas.

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