

Stormwater Community Research Results Across Eleven Western Washington Cities

March, 2010

Prepared by:

Kenneth Klima, Senior Research Director

Bret Buttenob, Research Analyst

Hebert Research, Inc.
13629 NE Bel-Red Road
Bellevue, WA 98005
(425) 643-1337
kklima@hebertresearch.com

Comparing Stormwater Community Survey Results Across Eleven Cities

Beginning in the summer of 2009 and extending through February, 2010, our Stormwater Community Survey Program at Hebert Research has surveyed 1500 residents in eleven cities in Western Washington representing a *Region* that includes areas north, east and south of Seattle. The margin of error for 1500 completed surveys is very low at $\pm 2.5\%$, which means the information is highly accurate. The cities that have participated include:

- Mill Creek
- Woodinville
- Mountlake Terrace
- Edmonds
- Kenmore
- Duvall
- Mukilteo
- Mercer Island
- Newcastle
- Lakewood
- Enumclaw

What follows is a summary of information that allows each city to see how it compares to the other participating cities within each of the three priority levels of information. Also included is a table summarizing the priorities for each city by question which provides a more detailed view of similarities and differences. Overall, the picture regarding what the public knows and does not know across all participating cities remains very similar.

Following the table, I offer information regarding public education and outreach programs—what elements contribute to effective programming. This material is not meant to be comprehensive in any sense of the word, but to concisely summarize what I consider to be key ideas in my studies in the area for effecting behavioral change. More can be added, but this is a good start. For many of you, this may be old information.

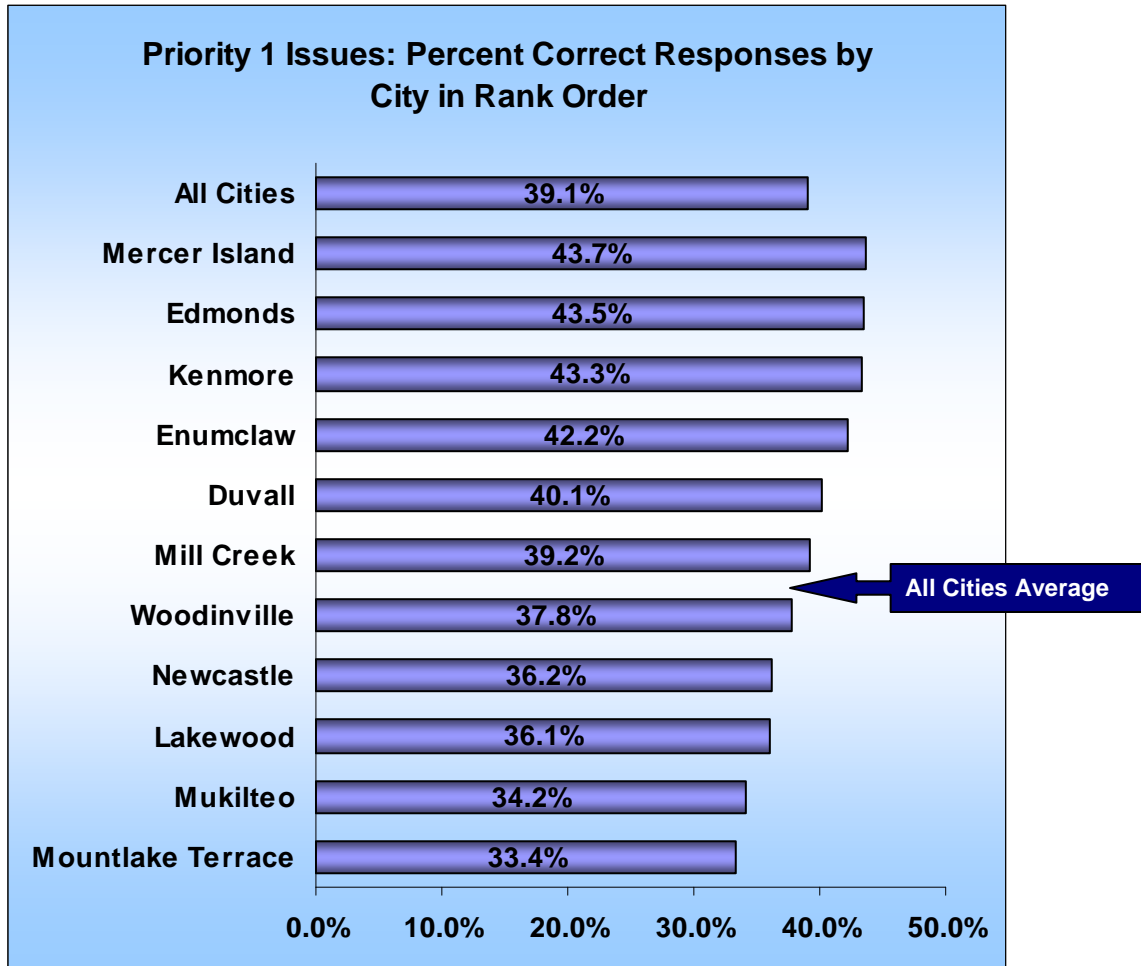
The survey data we developed provides a good foundation of understanding, but what is done with the results and the resulting impact on the environment is what matters most. Let me know if I can provide you with any additional information or help in any way.

Ken Klima
Senior Research Director
425.643.1337
kklima@hebertresearch.com

Priority 1 Issues: Less than 50% Correct Answers

The initial report each city received gave the detailed results of the stormwater community survey for Priority 1, 2 and 3 issues for individual cities. Chart 1 below compares the percent correct responses for Priority 1 issues as identified in the original survey for each city. Across the region composed of all cities combined, the average number of correct responses for Priority 1 issues is 39.1% with a margin of error of $\pm 2.5\%$.

Chart 1: Percent Correct Responses for Priority 1 Issues



For the region composed of these eleven cities combined, the Priority 1 messages are:

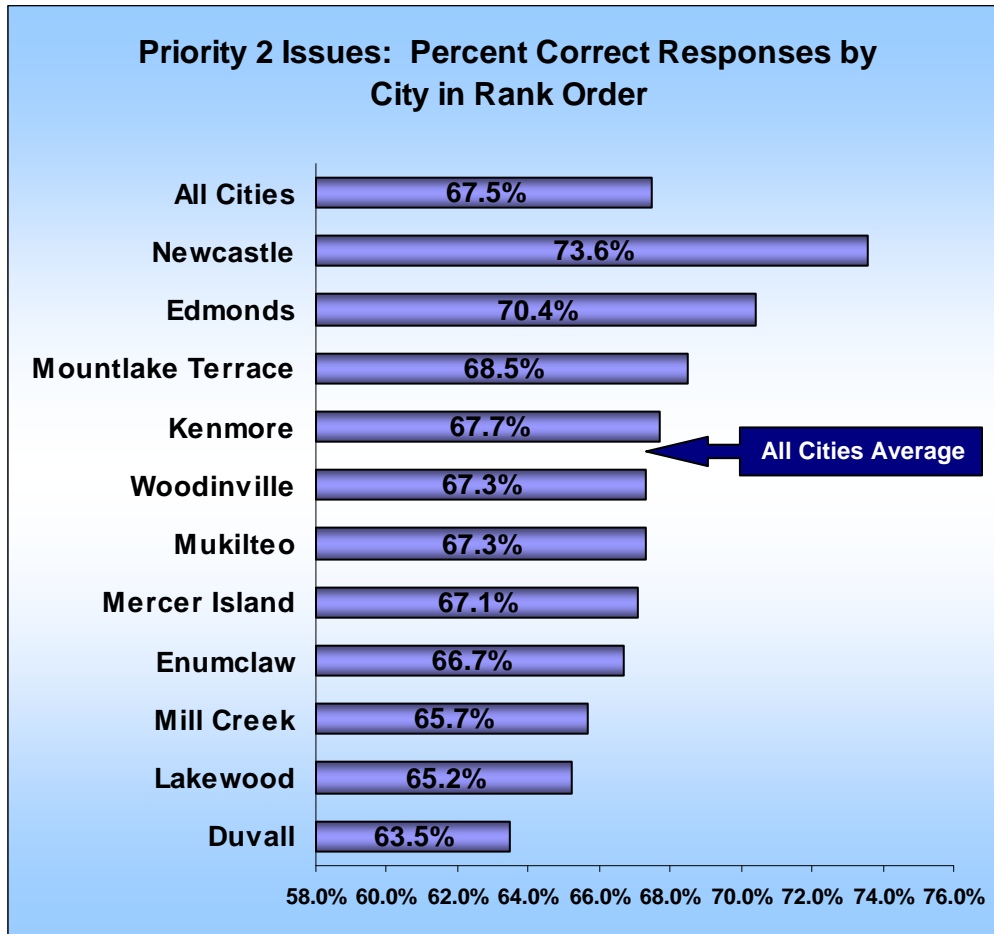
- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from entering the stormwater drainage system.*
- *Wash your car in an area where the soapy runoff will be absorbed by the ground or take your car to a commercial car wash. Soapy water should not be allowed to flow into the street or into a drainage ditch.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*

- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *The primary cause of pollution in stormwater runoffs is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Priority 2 Issues: From 50-80% Correct Answers

Chart 2 below compares the percent correct responses for Priority 2 issues as identified in the original survey for each city. Across the region composed of all cities combined, the average number of correct responses is 67.5% with a margin of error of $\pm 2.5\%$.

Chart 2: Percent Correct Responses for Priority 2 Issues



For the region composed of these eleven cities combined, the Priority 2 messages are:

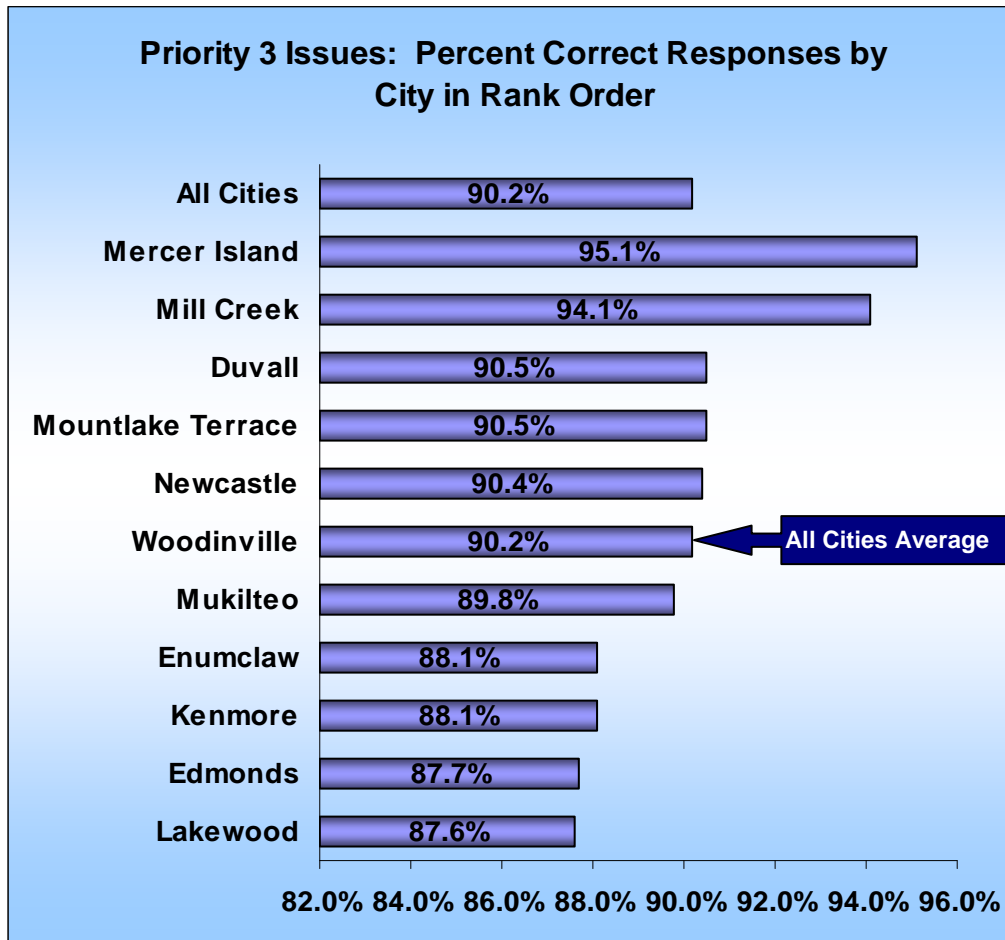
- *Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. Therefore, to reduce environmental pollution, the challenge to the community is to help keep stormwater runoff pollution free.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*

- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff. Hence, it is important to keep hard surfaces clean using acceptable cleaning techniques and, where possible, use pervious surfaces.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *Applying soap to oil and grease spots on outdoor concrete or asphalt and rinsing it off with a hose is not a good method for protecting stormwater runoff.*
- *Downspouts should be directed to areas on land where the runoff will be absorbed by the ground to avoid the water entering the stormwater system. Recycle used motor oil.*
- *A mulching lawnmower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*

Priority 3 Issues: Higher than 80% Correct Answers

Chart 3 below compares the percent correct responses for Priority 3 issues as identified in the original survey for each city. Across the region composed of all cities combined, the average number of correct responses is 90.2% with a margin of error of $\pm 2.5\%$. The percent of correct responses for Priority 3 issues shows more uniformity across all eleven cities compared to Priority 1 and Priority 2 issues. Issues on this list addressed respondent behaviors that were protective of stormwater quality. Whether respondents actually follow through with what they say they do is not known. At minimum, their responses indicate that a high percentage of the residents in each community knows the correct behavior regarding these issues.

Chart 3: Percent Correct Responses for Priority 3 Issues



For the region composed of these eleven cities combined, the Priority 3 messages are:

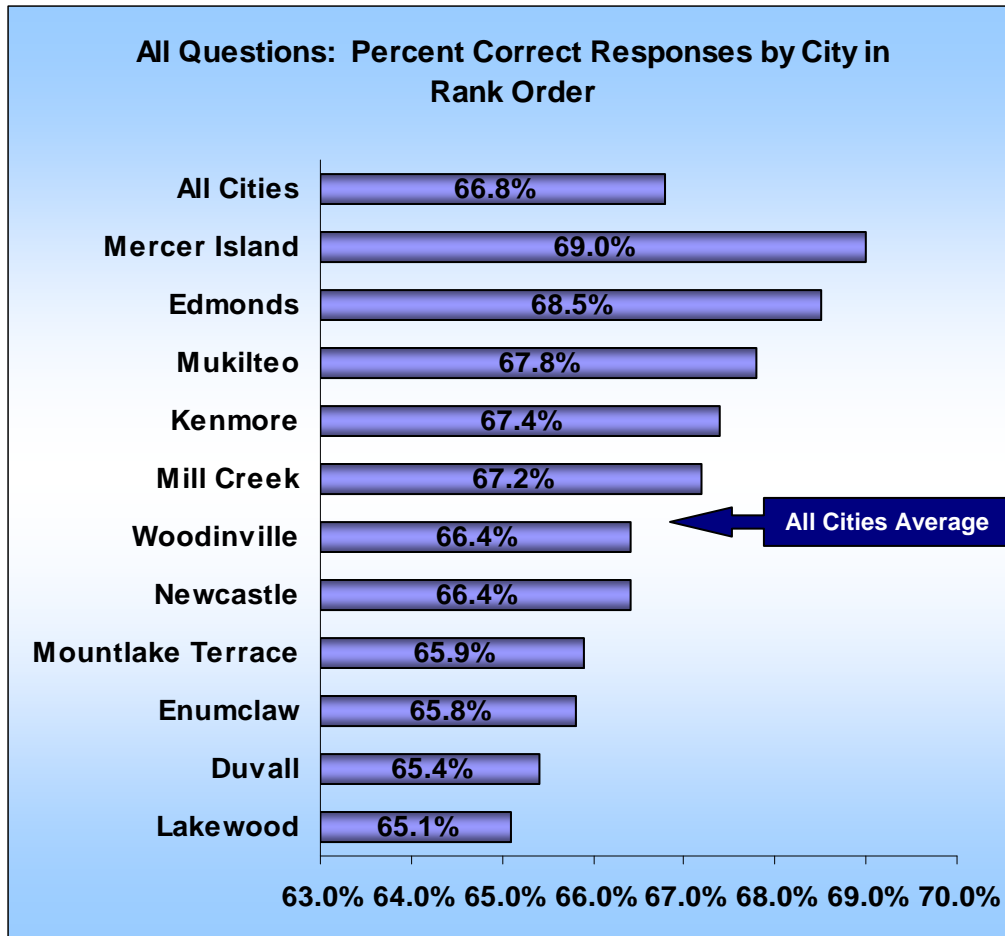
- *Recycle used motor oil.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Fix auto or truck oil leaks within three weeks.*
- *Pick up all pet waste when outside.*
- *Apply fertilizer at recommended rates.*

- *Apply insecticides or weed killer at recommended rates.*
- *Store containers holding oil or antifreeze under a roof or cover.*
- *Store all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

All Questions: Percent Correct Responses

Chart 4 below compares the percent correct responses across all questions for each city. Across the region composed of all cities combined, the average number of correct responses is 66.8% with a margin of error of $\pm 2.5\%$. The number of correct responses for each city falls within the range of the margin of error (64.3% to 69.3%) indicating that, while differences in knowledge were found between cities on the 27 stormwater issues tested, all residents in all cities showed a high similarity in their overall fund of knowledge.

Chart 4: Percent Correct Responses for All Questions



Comparing Stormwater Community Results Across Eleven Cities

The survey results for the eleven cities have been merged together and are presented in Table 1 on the following page. The format is identical to the format in the original report provided to each city. All issues are ordered by the *Regional* combined scores consisting of the average percent of correct answers given by respondents in all eleven cities combined. The results for each city was weighted by population density and then averaged together to assure a proper proportionate representation of each city in the whole *Region*. Each cell in a column contains the percent of correct responses for residents living in the city and, beneath the percent, the rank for education for that city. The ranking of issues for each city is also shown with a color code as shown in the table to the left. The top rank item for education is colored bright green. Also a “1” appears underneath the percentage in the cell indicating rank number 1 for education. The least important issue is a magenta color with “27” appearing underneath the percentage in the cell.

Rank for Education
1
2
3
4-9
10-18
19-23
24
25
26
27

Results show remarkable uniformity in what people know from one city to another. The color coding reveals at a glance a quite similar ranking of issues at the top and bottom across all municipalities. The message is that people are very much alike regardless of where they live. While some differences between cities crop up, they are minor when compared to the overall picture of sameness across the cities in the prevalence of correct and incorrect understanding in the public’s mind. Cities may take advantage of this finding by pooling their resources and enjoying economies of scale in their educational programming.

With this information in hand, the next step is to take action to increase awareness, to expand understanding and to induce the public to engage in behavior that is more protective of stormwater quality. So, what is to be done?

Table 1. Stormwater Community Survey Results for Eleven Cities

Rank for Education	Question	% Correct Responses by Area											
		Regional	Duvall	Edmonds	Enumclaw	Kenmore	Lakewood	Mercer Island	Mill Creek	Mountlake Terrace	Mukilteo	Newcastle	Woodinville
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. D	30.3% 1	30.4% 1	31.8% 1	32.4% 1	36.6% 2	31.7% 3	26.5% 1	31.8% 2	23.3% 2	22.8% 1	31.4% 3	30.7% 1
2	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. D Adopt	32.6% 2	36.8% 3	37.1% 2	42.4% 4	36.2% 1	33% 4	35.2% 2	24.9% 1	21.4% 1	38.9% 4	19.2% 1	33.3% 2
3	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. D	37.2% 3	48.9% 7	40.8% 3	48.3% 8	46.3% 6	30.0% 2	49.1% 5	39.6% 3	30.3% 4	33.1% 2	29.9% 2	34.4% 3
4	21. Sediment or dirt in stormwater is natural and not regarded as pollution. D	41.3% 4	38% 4	52.6% 6	46.3% 6	43.8% 3	50.7% 8	49.2% 6	44.1% 5	29% 3	36.8% 3	33.6% 4	36% 4
5	5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. D	41.6% 5	40.4% 6	43.8% 5	39.4% 3	44.2% 4	35.5% 5	47.7% 4	44.1% 6	41.3% 6	39.2% 5	46.9% 7	37.6% 5
6	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. D	44.1% 6	36.7% 2	55.1% 7	36.6% 2	45.3% 5	27.5% 1	57.5% 9	40.5% 4	41.6% 7	53.9% 7	45.9% 5	50.9% 7
7	19. Grass clippings and leaves are not regarded as harmful in stormwater. D	47.9% 7	49.2% 8	43.3% 4	43.8% 5	50.7% 7	53.4% 9	40.7% 3	49.2% 7	47% 8	53.5% 6	46.7% 6	41.5% 6
8	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. A	54.1% 8	39.8% 5	59.6% 9	52.3% 10	62.1% 10	46.5% 6	56.6% 8	50.6% 9	53.9% 8	59.5% 8	56.2% 8	58.6% 9
9	6. All water going into stormwater drains on the street is treated before being discharged into the environment. D	58.2% 9	59.6% 11	61% 11	56.2% 11	58.3% 9	58.1% 11	67.7% 14	50% 8	56.3% 10	67.2% 12	57.7% 9	59.6% 10
10	29. An illicit or unlawful stormwater discharge is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. A	58.4% 10	66.4% 16	60.8% 10	48.2% 7	57% 8	66.8% 12	60.1% 11	67.6% 13	37.6% 5	63.5% 9	58.4% 10	59.7% 11
11	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. A	59.5% 11	52.3% 9	72.8% 14	51.7% 9	62.2% 11	48.7% 7	78.7% 20	57.1% 10	64.2% 11	64.6% 10	67.8% 12	53.9% 8
12	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. A	63.5% 12	64.5% 14	59% 8	60.4% 12	63.8% 12	57.1% 10	66.3% 12	62.8% 11	67.8% 14	68.7% 15	70.6% 15	64.9% 13
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. D	66.1% 13	62.4% 12	74.1% 15	60.5% 13	64.5% 13	69.9% 14	59.5% 10	70.4% 15	66.8% 13	68.2% 13	62.7% 11	60.5% 12
14	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. D	70% 14	59% 10	80.3% 21	75.8% 16	69.5% 15	70.4% 15	76.4% 17	72.7% 17	83.7% 20	68.6% 14	70.4% 14	71.9% 16
15	27. Carpet shampoo wastewater can be safely added to a stormwater drain. D	70.7% 15	63.9% 13	76.2% 17	76.9% 18	66% 14	73.1% 17	56.2% 7	75.7% 19	70.6% 15	85.2% 21	70% 13	69.8% 14
16	10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. D	71.9% 16	65.4% 15	79.2% 19	77.2% 19	71.9% 16	71.1% 16	76.7% 18	70.8% 16	73.5% 16	74.2% 16	74.9% 18	71.8% 15
17	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. A Adopt	73.3% 17	69.2% 17	72.3% 13	71.1% 14	79.4% 18	88.4% 24	66.5% 13	65.4% 12	84.9% 21	66.1% 11	72.9% 16	82.3% 20
18	23. Using a mulching lawnmower reduces the need to fertilize a lawn. A	74.1% 18	89.6% 23	79.3% 20	81.4% 20	75.7% 17	69.8% 13	73.9% 15	69.3% 14	81.9% 19	75.2% 17	73.6% 17	75.9% 17
19	9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. A	77.9% 19	70.1% 18	69.7% 12	83.7% 22	82.4% 19	75.7% 18	75% 16	75.6% 18	81% 18	77.1% 18	79.5% 19	78.8% 18
20	13. My household recycles all used motor oil. A Adopt	80.4% 20	77% 19	76.1% 16	75% 15	91.2% 25	83.7% 20	86.5% 21	87.4% 20	66.7% 12	79.9% 19	83.9% 20	82% 19
21	12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. A Adopt	83% 21	88% 21	77% 18	76.5% 17	85.6% 23	86.9% 22	78.6% 19	88.6% 21	93.3% 23	83.8% 20	85.8% 21	84.2% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. A Adopt	88% 22	89.5% 22	89.4% 22	84.1% 23	86% 24	86.7% 21	96.3% 24	90.5% 22	78.7% 17	91.8% 25	88.7% 23	94.1% 25
23	8. When I am outside with my pet, I always pick up my pet's waste. A Adopt	88.9% 23	84.9% 20	89.6% 23	82.2% 21	84.9% 21	88.3% 23	95.3% 22	94.2% 23	93.1% 22	85.9% 22	95.8% 26	86.5% 22
24	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. D Adopt	91.3% 24	92.8% 24	91.8% 25	94.2% 26	85.2% 22	83.5% 19	96.3% 25	98.4% 26	98.1% 25	89% 24	91.3% 24	89% 23
25	25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. D Adopt	91.5% 25	97% 25	91.1% 24	92.1% 24	83.3% 20	89.7% 25	95.8% 23	96.9% 25	98.7% 27	88.8% 23	88.4% 22	89.4% 24
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. A Adopt	93.9% 26	97.7% 27	93.1% 26	92.7% 25	93.7% 26	90.0% 26	97.2% 26	96.8% 24	98.5% 26	95.8% 26	93.1% 25	98.6% 27
27	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. A Adopt	94.8% 27	97.3% 26	93.8% 27	94.3% 27	95% 27	91.1% 27	98.3% 27	99.7% 27	97.2% 24	98.1% 27	96.5% 27	97.7% 26

Bringing about Behaviors That Are More Protective of Stormwater Quality

When it comes to engineering behavioral change, the old linear model of public education has been found to fail the test of real life experience. We used to think that simply increasing the public's awareness of the causes of a problem and increasing the public's understanding of how to solve it would logically lead to positive behavioral change. In other words, by spreading the right information in word alone, people would change and follow through with appropriate action that solves problems. Passing out information alone simply has not lead to documented improvements in behavior nor measurable improvements in stormwater quality to any acceptable degree.

I know every municipality wants to do a great job of improving the quality of stormwater runoff and that their effort is constantly being eroded by a lack of sufficient funding and other demands. This points to the necessity that, whatever is done, be done as efficiently and as effectively as possible.

David Galvin, who is now the Program Manager of the Hazardous Waste Management Unit in King County, made a presentation a few years back regarding watershed stewardship, public education and outreach and the information he offered bears repeating. The following key points are based on his presentation with some further clarification and elaboration on my part:

1. Nonpoint public education and outreach programs need to follow a clear, well-laid plan focusing on a single issue. Galvin: "Most successful projects stick to one subject, focus small, follow-up repeatedly, and stay as specific as possible."
2. To determine what is to be done, start with a defined problem for a defined target group (your "target market") and work backward. What is the outcome you want to see in the environment (e.g., the exact level of a target contaminant in an urban stream)? Thinking backward, what must be happening or what must people in the community be doing, step by step, to bring about that outcome? The real-world environmental condition is the outcome, the goal. The outcome should be measurable. Establish a baseline before your programming begins. Then gather data on the outcome throughout the program's operation and at the end-point to evaluate the success of your efforts. Real improvements in the real world (better numbers showing improved water quality) equate to achievement and success.
3. Follow a defined program development logic. The Water Environment Research Foundation (Betty Elzufon, 2000) offered the following program development sequence:
 - Define the problem to be addressed and gather data regarding its prevalence
 - Identify the causes, sources, reasons for the problem
 - Generate alternative solutions to reducing or eliminating the problem
 - Evaluate the solutions regarding their functionality for being implementable and likelihood of achieving measurable improvements in the identified problem
 - Determine the potential load reduction in pollutants to be expected from implementing the best solution(s) and establish a goal for pollutant reduction

- Implement the program
- Collect data on changes in pollutant levels over time as the program is administered
- Evaluate the reduction in pollutant levels in comparison to the goal for the program
- Based on the resulting changes in pollutant levels, modify the program activities to increase program effectiveness

Galvin notes that while this is a very logical process, very few programs he found in his 2005 review actually applied it.

4. In planning your public education and outreach program, employ the methods of social marketing which involve: a) understanding how your target market sees the world, b) identifying and eliminating the issues that deter people from being more protective of stormwater quality, and c) using different psychological/motivational program approaches that offer the best opportunity for bringing about behavioral change. These psychological/motivational approaches include:

- providing the means by which people can *make a personal, public commitment* to act in ways in the future that are more protective of stormwater quality,
- using social norms marketing which means you *communicate the behavior that most environmentally-minded people engage in to protect stormwater* as a way of motivating others to emulate the same behavior,
- employing *reminder messages or repeated prompts* to reiterate the desirable behavior to the target audience at different times as a way of helping people to integrate it into their thinking and their behavior,
- offering *tangible incentives* or rewards to residents which they use or enjoy as a way to overcome obstacles in the way of them acting in a way that is more protective of stormwater quality and sticking with the new behavior.

5. In the 2001 Water Environment Research Foundation (WERF) report, Elzufon offered the following ways of measuring public education and outreach programs from easy and inexpensive at the top of the list to very difficult and costly at the bottom:

- Design and implement a nonpoint source control program
- Assess increased awareness of pollution-related issues
- Identify changes in behavior which are meant to reduce pollution
- Examine the reduced levels of the target pollutants coming from the target source(s)
- Assess the improved quality of stormwater discharges
- Determine how the environment has improved as a result of the program (e.g., are fish stocks healthier?)

The further down the list, the closer you are to the final outcome of an educational and outreach program—bringing about an environment that is healthy for life.

Soap

Our community surveys in eleven cities point to low awareness over issues related to soap entering the stormwater system. People washing their vehicles where the soapy water runs into a drainage ditch or storm drain is part of the problem. If you are contemplating a public education and outreach program to address this issue, here is some information that may help.

Brown Bear Car Wash has a number of locations in Pierce, King and Snohomish Counties. On their website, Brown Bear has a short video explaining how washing a car at home can harm the environment. The soapy water at Brown Bear is not sent to storm drains but is instead reclaimed, passed through oil water separators, and then discharged into the sanitary sewer system for additional treatment before being released into Puget Sound. One of the obstacles to car owners washing a car at a commercial car wash is the cost. I have spoken to Brown Bear and they are very amenable to offering substantial savings to the residents in your city on a continuing basis. They are willing to work with you in an ongoing program to effect real change. Effectiveness is not achieved in a one-shot effort, as Galvin noted, but requires repetition. This program offers you a genuine opportunity for bringing about real, positive change.

As part of your public education and outreach campaign, you can create a coupon showing the city name and, using the social marketing approaches mentioned above in this report, communicate to your residents a motivational message to keep car-wash soap from entering storm drains. As a means of helping your residents to do that, you include a coupon. The incentive to use the coupon must be large enough to motivate action. How about a Free car wash? Talk to Brown Bear. They are willing to seriously invest in this effort. They have several program ideas for you to consider in working to keep car wash soap out of storm drains. These ideas include a way of tracking how many people actually use the coupons to help you with your program evaluation.

Keep in mind that the size of the discount makes a great difference. It has to be large enough to make people take notice. A discount that is too small and is not perceived by the target market as a genuine “deal” provides little motivation to change. It becomes an “incentive” only when it is large enough so that people will value it and use it. With a strong incentive delivered through a strong social marketing message, and being repeated over time, your program will have a great chance at success. A Free car wash is a good beginning, but no business can offer that on an ongoing basis and have any hope of surviving. Brown Bear, however, has a few ideas for you to consider on keeping the program alive on an ongoing basis and making the program a win for everyone.

To explore this program in more detail, call **Steve Palmer at Brown Bear, 206-274-2617**, and mention my name, Ken Klima, and Hebert Research. Steve is a good guy and will be glad to give you the information and work with you to make your program a success. They have done similar programs in the past so, they know how it goes. You can benefit from their experience.

STORMWATER COMMUNITY SURVEY

QUESTIONNAIRE

V3.1

Hello, my name is _____ and I am calling on behalf of the city of _____.

[IF SPEAKING TO A CHILD] May I speak to someone who is at least 18 years of age? Thank you. **[RE-INTRODUCE YOURSELF]**

Hello, my name is _____ and I am calling on behalf of the city of _____ . We are asking citizens about an important environmental issue and we would like to include your opinions. All your answers are strictly confidential and will not be connected to your name.

S1. [SCREENING QUESTION] Before we actually begin, I need to verify your city. What city do you live in?

- | | |
|----------------|--|
| 1. Survey city | |
| 2. Other City | [THANK AND POLITELY DICONTINUE] |
| 3. Don't Know | [THANK AND POLITELY DICONTINUE] |
| 4. Refused | [THANK AND POLITELY DICONTINUE] |

1. What is your age? **[RECORD NUMBER]**

2. Great, thank you. My first question is about the water in our area. I'd like you to rate your perception of the overall quality of the water in our rivers, wetlands and lakes and in Puget Sound. By "quality of water" I mean how free it is from pollution. Rate it on a 0 to 10 scale where "0" means the water is "extremely polluted" and 10 means the water is "extremely clean." **[RECORD NUMBER]**

[READ]

Now, I'm going to read a number of statements to you regarding stormwater. Some of these statements may be true, they all may be true or they all may be false. If you believe that a statement is true, please say "Agree." If you believe the statement is false, say "Disagree." If you are not certain about the statement and need more information, you can answer with "need more information." If the question does not apply to you or your family, say "Doesn't Apply." Here is the first one. Do you Agree, Disagree or need more information about the following statement:

Responses for each:

1. Agree
2. Disagree
3. Need more information
4. Uncertain, Don't Know
5. Refused
6. Doesn't Apply

NOTE: A letter follows each statement below indicating the correct answer for that statement, an **A** for “Agree” and a **D** for “Disagree.” When the word **Adopt** appears, it means the statement deals with whether respondents have “adopted” the desirable behavior mentioned in the statement. The combination of **A Adopt**, then, means the question deals with behavior and the desired response is **Agree**—which equates to the respondent saying that he or she engages in the desired behavior mentioned in the statement.

3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**

4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**

5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**

6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**

[ROTATE Q7-Q28] [NOTE: These questions will be asked in a random order to prevent sequencing bias.]

[AFTER ASKING THE NEXT NINE QUESTIONS, SAY: You are doing really well. We are halfway through and I'll try to get through this as quickly as I can. Here's the next one, do you Agree, Disagree or Need More Information about this statement.]

7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**

8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**

9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**

10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**
11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**
12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**
13. My household recycles all used motor oil. **A Adopt**
14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**
15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**
16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**
17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**
18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**
19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**
20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**
21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**
22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**
23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**
24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**
25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**
26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**
27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**

28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**

29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**

30. If you witnessed someone pouring a gallon of used paint thinner into a stormwater drain, which agency would you call first to report it: **[READ 1-5]**

1. The Washington Department of Ecology
2. The police department
3. The city Public Works Department **A**
4. 911
5. Need more information
6. I would not report it
7. Don't Know
8. Refused

That concludes our survey. I want to thank you very much for your time and cooperation. You have been very helpful. Have a good day!

POSTCODE GENDER:

1. MALE
2. FEMALE

DATE: _____ INTERVIEWER: _____