




**WATER WORDS
THAT WORK**

Make a splash with your communications!



**Residential Stormwater Pollution Education and Outreach
Literature Review**
Prepared For
**Huron River Watershed Council and
the Alliance for Downriver Watersheds**
August 2016

Table of Contents

[Overview](#)

[Conclusions and Recommendations](#)

[Research Results](#)

[Question #1: What do surveys suggest about how knowledgeable residents are about the causes, consequences, and solutions to stormwater pollution?](#)

[Question #2: What percent of the population of residents are taking steps to reduce stormwater pollution already, and what has motivated them to take those steps?](#)

[Question #3: What is the likelihood that residents will take steps to reduce stormwater pollution, and are there barriers \(real or perceived\) that hold them back?](#)

[Question #4: How do residents prefer to receive tips and information from their local governments?](#)

[Question #5: How have municipalities collaborated in the past on stormwater outreach, and how did these efforts result in measureable impacts?](#)

Overview

The Huron River Watershed Council (HRWC) and the Alliance of Downriver Watersheds (ADW) has hired Water Words that Work, LLC to prepare a detailed demographic analysis of the local population and to survey residents about their stormwater knowledge and habits.

As part of this research, we conducted a literature review to determine if “off the shelf” social and market research can help you achieve your goals. We reviewed publicly available surveys, polls, focus group reports, campaign summary reports, and peer-reviewed academic papers.

With your approval, we explored this body of market research seeking answers to five key questions:

Question #1: What do surveys suggest about how knowledgeable residents are about the causes, consequences, and solutions to stormwater pollution?

Question #2: What percent of the population of residents are taking steps to reduce stormwater pollution already, and what has motivated them to take those steps?

Question #3: What is the likelihood that residents will take steps to reduce stormwater pollution, and are there barriers (real or perceived) that hold them back?

Question #4: How do residents prefer to receive tips and information from their local governments?

Question #5: How have municipalities collaborated in the past on stormwater outreach, and how did these efforts result in measureable impacts?

Conclusions and Recommendations

Here are the top conclusions:

- Residents are limited in knowledge and awareness of stormwater pollution and where stormwater goes. They have some knowledge of sources of stormwater pollution, but are unsure of what to do about it, or that their actions will matter.
- Residents are taking pro-environmental or pollution prevent behaviors, particularly when they are made aware there is a personal connection between their actions and keeping water clean. People are more motivated to take action when pollution prevention messages relate to values they care about.
- Residents are likely to take pollution prevention steps when barriers are removed, such as the knowledge their actions make a difference, keeping messages simple and personal, and having realistic expectations of what what people will do and when.
- Few residents get information about issues in their community directly from their local government. Urban and suburban citizens rely on a mixture of local newspapers and Internet to get their information.
- Collaborations among municipalities is becoming a more common way to tackle complex issues like stormwater management. Identifying what the important measures of success are for the collaborative and using different techniques to measure social marketing outcomes can help identify if outreach efforts are working or not, rather than relying on metrics to evaluate changes in water quality. That being said, it is challenging to find publicly available information about the collaborations successes and failures with outreach efforts.

Our top recommendations:

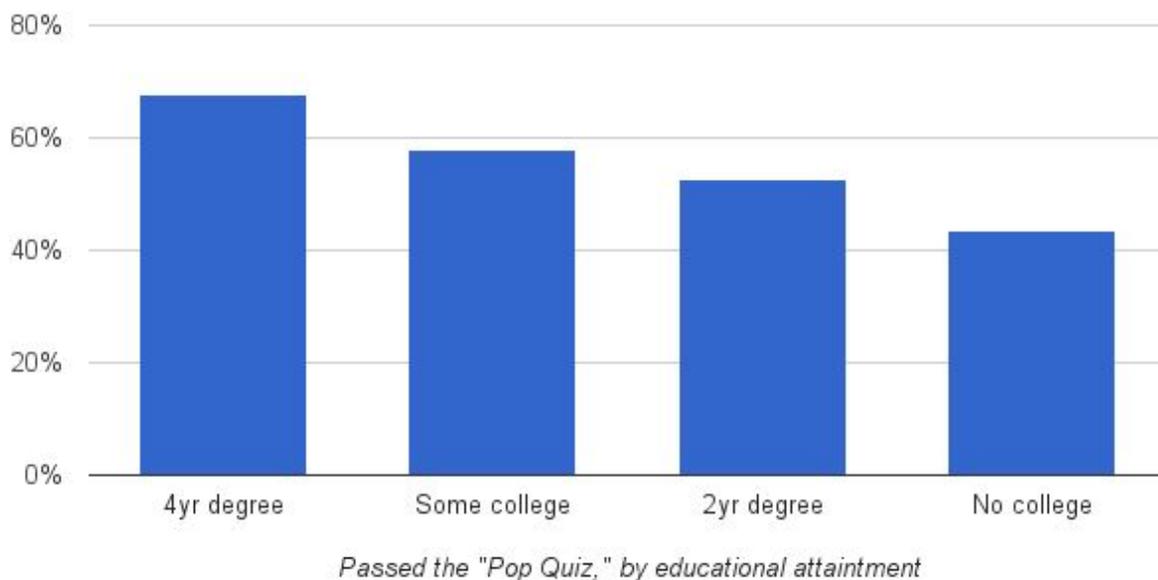
- Stormwater outreach messages from the ADW should include a personal connection between their actions and keeping water clean. Messages should relate to values they care about.
- Stormwater outreach messages need to inform residents that their individual actions do make a difference.
- The ADW should utilize outlets in addition to their own governmental ones to put messages out to the public. Additional mass media, Internet, and social media options should be considered.
- The ADW should consider how they will best measure their outcomes (what the criteria may be, how will it be measured) for reporting success on the permit requirements.
- The collaboration of the ADW should continue as working together is the best way to tackle something complex such as stormwater management, and outreach about this topic.

Research Results

Question #1: What do surveys suggest about how knowledgeable residents are about the causes, consequences, and solutions to stormwater pollution?

In our research, we came across several surveys that identify the knowledge of residents about stormwater pollution. Results varied by geographic location and other demographics, but in general, residents in the United States have limited knowledge in particular about where their stormwater goes. They have more knowledge about what causes stormwater pollution, but are unsure of what can be done about it.

In a 2014 study commissioned by the U.S. Environmental Protection Agency, researchers found that 57% of U.S. adults could pass a basic 5 question multiple choice “pop quiz” that included questions about the definitions of “watershed” and “nonpoint source pollution.” Researchers found that residents who possessed a four year college degree were much more likely to pass the pop quiz than those who had never been to college:¹

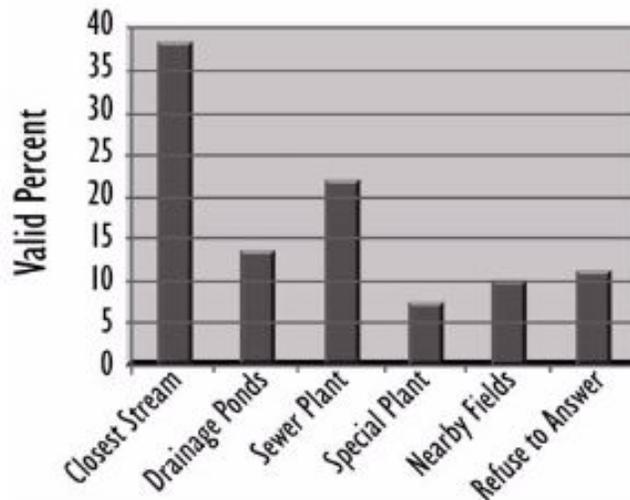


A survey by the North Carolina Division of Water Quality showed that “only over a third of North Carolina residents (37.6%) know that stormwater flows to the closest stream, lake or river and 13.2% believe it flows to drainage ponds, which may be a stormwater best management practice. However, 28.7% believe stormwater receives treatment at a special plant or the sewer treatment plant.”²

¹ Eric Eckl (2014), *National Waterways Literacy Baseline Assessment: Summary Report and Recommendations*, Water Words That Work, LLC. Retrieved from: <http://bit.ly/waterways-literacy>

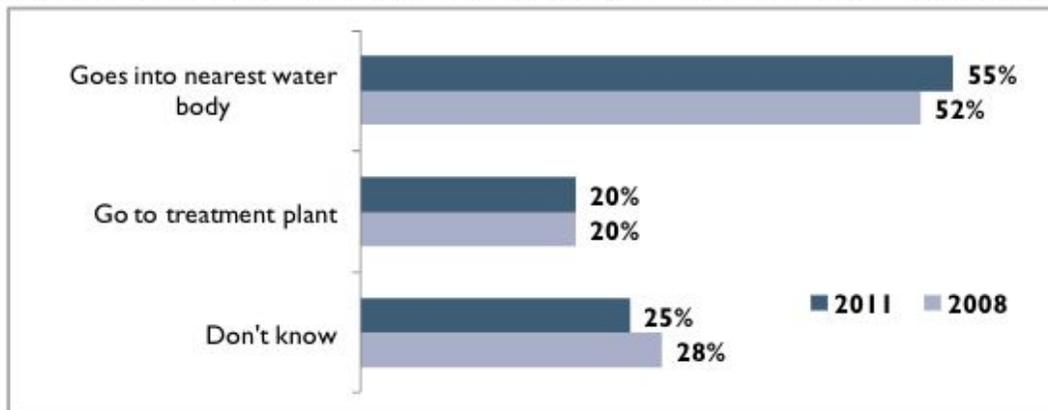
² Chrystal Bartlett (2005) *Stormwater Knowledge, Attitude and Behaviors: A 2005 Survey of North Carolina Residents*, North Carolina Division of Water Quality
Retrieved from: http://www.ncstormwater.org/pdfs/stormwater_survey_12506.pdf

Where Stormwater Goes



A survey for the Kitsap Peninsula Clean Runoff Collaborative showed that only about half of the respondents knew that surface runoff flows to water bodies untreated. One in 5 thought that surface runoff goes through a treatment plant, while 1 in 4 did not know.³

Water that runs off of streets, parking lots, roofs, and other hard surfaces drains into the storm drain system of ditches and pipes. To the best of your knowledge, what happens to that water that goes into storm drains? Base = 838 (2008), 802 (2011)



The report from North Carolina states that “Many surveys show a common misperception exists: many people believe stormwater is treated. They may not be sure where it is treated or how it is treated, but they feel sure that some treatment is being administered. This misperception persists even in states that do not co-mingle stormwater and sewer effluvia, like North Carolina.”²

³ Cunningham Environmental Consulting (2011) *Residential Stormwater Survey Public Attitudes, Awareness and Behavior*, Kitsap Peninsula Clean Runoff Collaborative

Retrieved from:

<https://cfpub.epa.gov/npstbx/files/Cunningham%20Environmental%20Consulting%202011.pdf>

HRWC ADW Stormwater Pollution Education and Outreach Literature Review

Water Words That Work, LLC

905 West 7th Street, Suite 201, Frederick, MD 21701

703.829.6732 waterwordsthatwork.com

A study by DHM Research for the Oregon Association of Clean Water Agencies identified that Oregonians have limited knowledge and awareness of stormwater. “Their low level of awareness means that the average person does not have a well-developed understanding of the relationship between drinking, sewer and stormwater. Nationally, more than three-fourths do not believe that stormwater runoff is the largest source of water pollution. Rather, a majority believe that industry is the largest source of water pollution.”⁴

However, a different study by Oregon State University of residents in the city of Corvallis found that about two-thirds (68%) of respondents knew that stormwater ran directly into waterways, with respondents in some City Wards much more knowledgeable than those in others. The survey found that that certain wards, perception of a stream nearby, and receiving information from the City were correlated with citizen knowledge of where stormwater goes.⁵

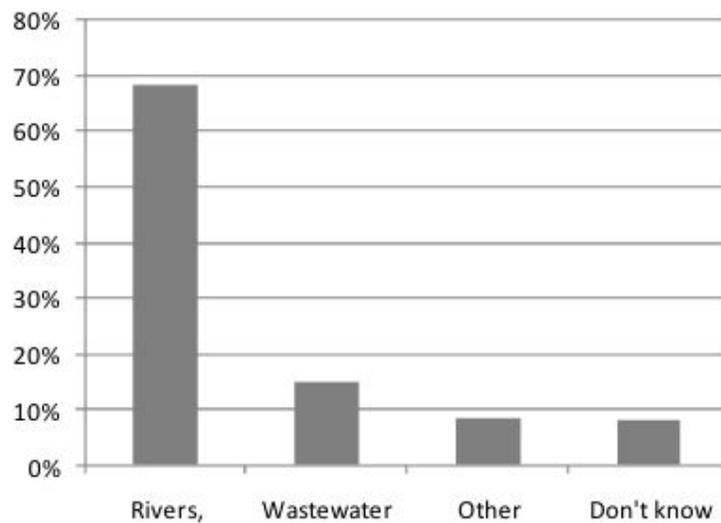


Figure 1: Knowledge of where stormwater ends up

In this study it seemed the perception that they “live near a stream” was highly correlated with people’s knowledge and corresponding response of where stormwater ends up. Three-quarters of the respondents reported that they “live near a stream”, although the way they measured nearness varied from minutes to miles. This finding is supported by research that shows that people who live closer to streams generally have higher environmental values, which also appears to be connected to environmental knowledge. In fact, future outreach efforts can use this perception as a foundation for requests in behavior change, and capitalize on the connection to waterways in Corvallis to show people how to improve their day-to-day practices that impact those streams and rivers.

The Kitsap Peninsula Clean Runoff Collaborative survey found that more than half of the respondents thought that certain activities do contribute significantly to water pollution. Only about 10% thought that these activities “did not contribute” at all to water pollution.

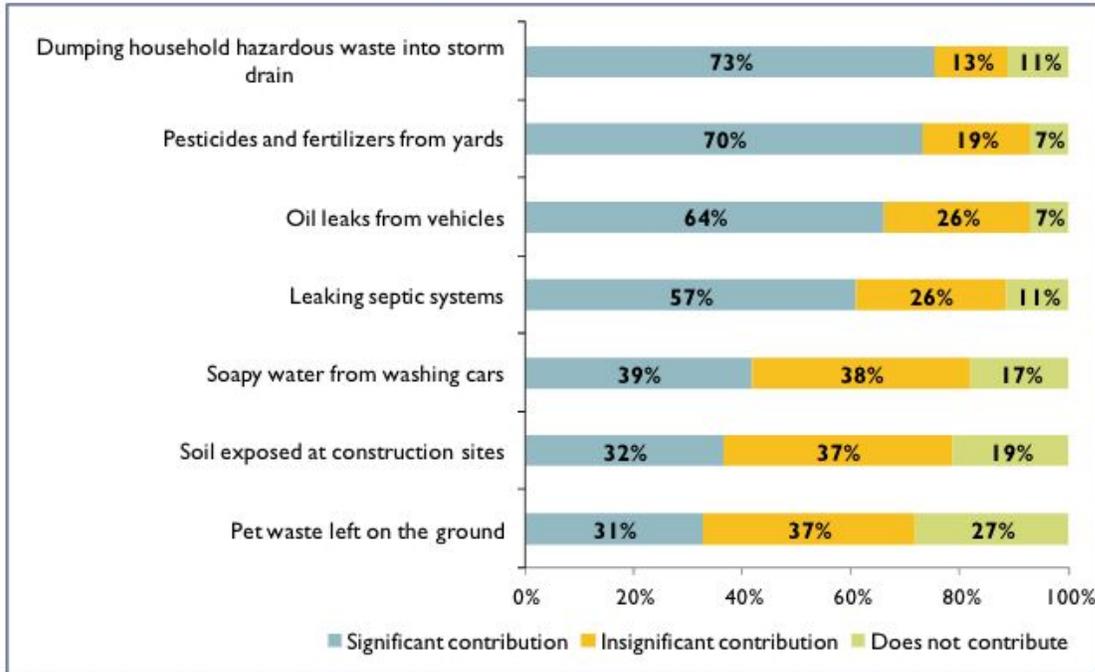
⁴ DHM Research (2014) *Research summary about stormwater behavior*, Oregon Association of Clean Water Agencies (ACWA)

Retrieved from: http://www.oracwa.org/pdf/dhm-acwa-stormwater-rpt_2013.pdf

⁵ Genie Bettencourt et al. (2010) *Stormwater Pollution Prevention Behavior of Corvallis Residents*, Oregon State University

Retrieved from: <https://www.corvallisoregon.gov/modules/showdocument.aspx?documentid=4617>

Tell me whether you believe that these things from all residents in the region are a “significant contribution” to pollution in the local waterways, “may contribute an insignificant amount of pollution”, or “does not contribute” to pollution. Base = 802



When it comes to solutions to stormwater pollution, knowledge about what to do is limited. While many of the actions to prevent stormwater pollution are not difficult and some would say “common sense”, the lack of knowledge of what to do is perhaps a case of people feeling their actions don’t or won’t have an impact, among other influences. The DHM Research study specifically noted that “individual perceptions and behaviors related to stormwater are specific to the source, and need to be addressed as such.” Some examples:

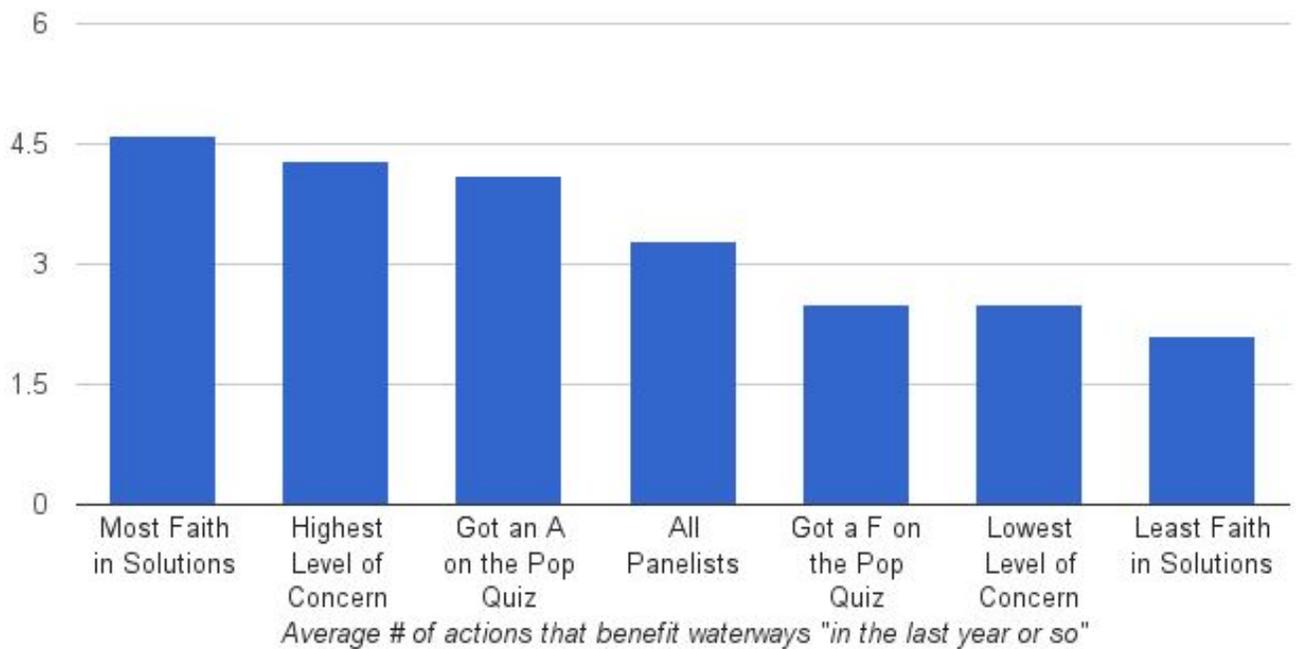
- *Pet waste: While most pet owners pick up their pet waste when out in the community, just one-quarter pick it up on a daily basis at home and one-third pick it up once a week or less. Many simply don’t believe it is impactful on water.*
- *Car washing: Evidence suggests that most car owners wash their car at home rather than at a commercial carwash because they perceive it as cheaper, less likely to damage the car, and more effective.*
- *Lawn and garden care: decisions about lawn and garden care are strongly influenced by cultural values and community standards. There is also a common assumption that if a product sold at a local home and garden store, than it must be safe to use.⁴*

Question #2: What percent of the population of residents are taking steps to reduce stormwater pollution already, and what has motivated them to take those steps?

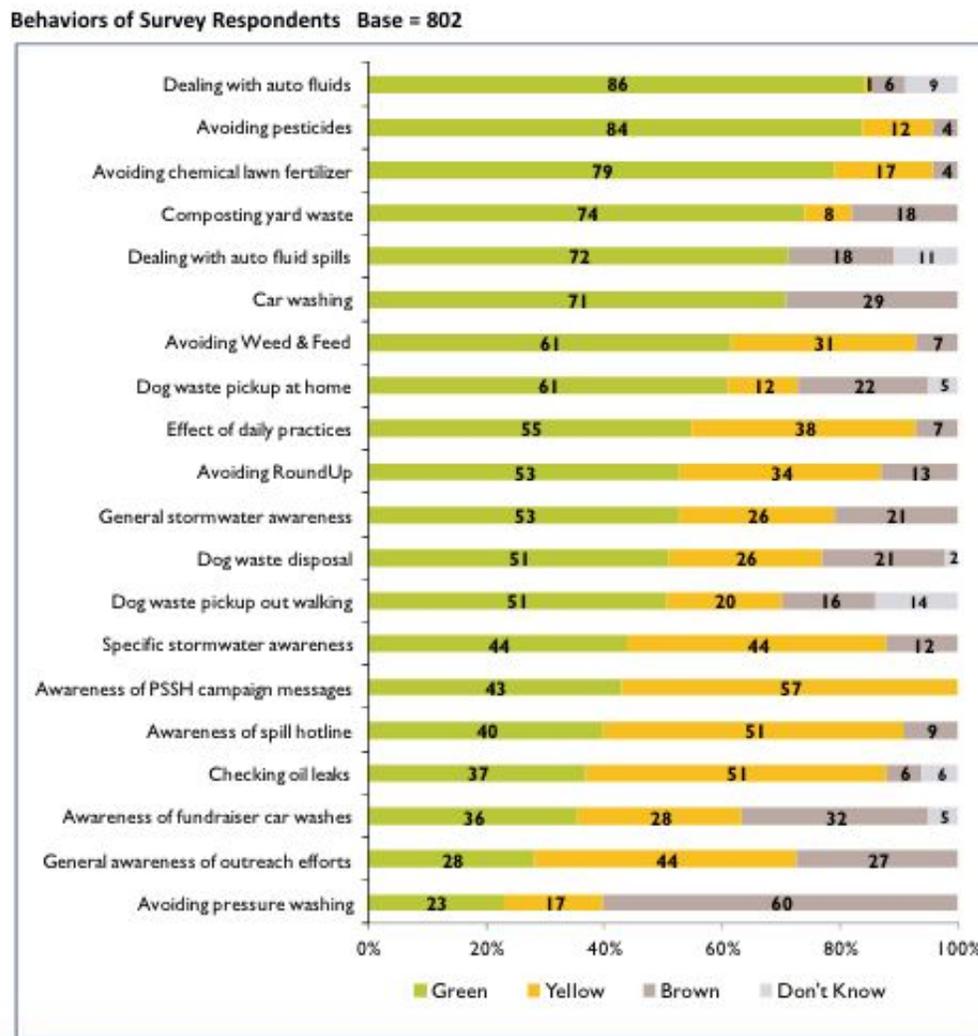
In the 2014 study, Water Words That Work, LLC found that upwards of 90% of Americans reported taking at least one action in the past “year or two” that benefits waterways. ¹

Action	% Checking that they remember doing this "in the last year of so"
Recycled glass, plastic, or paper waste instead of sending to a landfill	73%
Taken steps to conserve water in my yard or home	65%
Gone out of my way to dispose of household or automotive chemicals safely	49%
Purchased a product or service because it was better for the environment	44%
Avoided using chemicals or fertilizers in my lawn or garden	40%
Planted trees or shrubs with waterways in mind	19%
Voted for a candidate because of their environmental record or campaign promises	19%
Supported a local environmental organization with time or money	15%
Attended a public meeting about an environmental topic	9%
None of the above	7%

Although Water Words had determined that possession of a college degree was the strongest indicator of environmental knowledge, two attitudinal traits -- concern and confidence that the actions would make a difference -- had more influence over likelihood to participate in activities that benefit waterways.



The Kitsap Peninsula Clean Runoff Collaborative survey largely corroborated the Water Words' findings. They found that residents participate in simple behaviors more often than behaviors that were hard to understand or hard to do. The green bars show the percentage of residents that are already doing that behavior. The yellow and brown bars were identified as needing more work and is the focus of outreach efforts in the future.



Similar behaviors were reported by participants in EPA Nonpoint Source Pollution Focus Groups. Many people reported that they were already taking personal actions that prevent nonpoint source pollution (e.g., proper disposal of oil, solvents, and chemicals; elimination of pesticides and fertilizers), but were unaware that these actions actually addressed the problem of nonpoint source or stormwater pollution.⁶

Motivations to change stormwater behavior should be connected to other important values to residents. The EPA Focus Group report identified “messages linking nonpoint source pollution to adverse health

⁶ LISBOA, Inc. (2001) *EPA Nonpoint Source Pollution Focus Groups Final Report*, Environmental Protection Agency (EPA) Nonpoint Source Management Partnership (NSMP)
Retrieved from: <https://cfpub.epa.gov/npstbx/files/epanpsfocusgroup.pdf>

consequences seem to be both attention-getting, relevant and motivating, particularly to younger respondents.” Respondents generally agreed that a public awareness campaign targeting pollution prevention should include messages communicating both personal responsibility for the problem and personal actions that will ameliorate the problem. Respondents also remarked that messages describing this problem in more general terms (e.g., a community problem) would not convey that personal action is the desired outcome of the initiative.

This was also corroborated with a survey by DHM Research for the Oregon Association of Clean Water Agencies. Examples of what residents value are:

- *Drinking water: draw a connection between stormwater runoff and the quality and safety of drinking water.*
- *Children and pets: survey and focus group research has consistently shown that the safety of children and pets ranks in the top tier of concern for the use of chemical products in lawns, gardens, and in the home. This is particularly true with women.*
- *Saving money and discounts: for a segment of consumers, saving money is strong motivator. To change behavior, however, consumers must feel that they are not sacrificing effectiveness or convenience.*
- *Natural areas, wildlife habitats, green spaces and outdoor recreation: Oregonians place a high value on the environment and enjoying outdoor recreational opportunities. When possible, link stormwater projects to these key values.*⁴

A report of survey results in the Universities Council on Water Resources Journal of Contemporary Research and Education suggests that residents are willing to assist in efforts to improve the quality of local waterways. “In an effort to find out what situation would motivate them, respondents indicated they are “very likely” to become involved with water resource issues, especially in response to local media coverage of positive actions taken by residents to improve water quality. Respondents were less likely to become involved in response to media coverage of water pollution problems.”⁷ The survey by DHM Research emphasized that messages should “use a positive tone and focus on outcomes. This is more easily understood and resonates with the public. It also communicates a message that there is a plan for the future.”

To motivate people to take actions to prevent stormwater pollution, messages should be related to values they care about, identify personal actions that people can take, and show examples of people making a positive difference. This will show people that their actions will make a difference too.

Question #3: What is the likelihood that residents will take steps to reduce stormwater pollution, and are there barriers (real or perceived) that hold them back?

⁷ Katie Giacalone et al. (2010) *Survey Says: Implications of a Public Perception Survey on Stormwater Education Programming*, Universities Council on Water Resources: Journal of Contemporary Water Research and Education, Issue 146, Pages 92-102
Retrieved from: http://ucowr.org/files/Achieved_Journal_Issues/146/10.pdf

The answers to this question relate to people's motivations. Citizens are likely to take steps to reduce stormwater pollution, if the consequence of not taking those steps will interfere with the values that are important to them. If that is not clearly communicated in the message, this can be a barrier to action.

The EPA Nonpoint Source Pollution Focus Group Final Report indicated that respondents were more likely to do something if it's related to adverse health consequences. One of the respondents said "People aren't interested unless something direct happens to them. Like if I drink the water, I'll get sick. If it doesn't happen to me, why would I be motivated?" Lack of a personal connection is a barrier that can be overcome.

Another barrier for action are messages that are too ambitious and try to communicate too much information and with too many requests. Participants in the EPA Focus Groups were quoted as saying:

- *Ads try to stick in twelve different things you can do. Why not just stick to one and tell us why we're supposed to do it. Don't just say 'don't so this.' Tell us what we're supposed to do.*
- *Too much information at once doesn't work. It needs to be a simple message, even if you're discussing a complex issue.*
- *You've got to state the problem and have a solution. It's almost one-to-one. If you see before and after results of what you're doing, it motivates you to do more.*⁸

A study published in Freshwater Science looked at different approaches to engaging citizens in managing stormwater runoff from their properties to protect the local creek. The results indicate that an additional barrier to participation was an unrealistic timeline of implementation. The study states:

*Participants need time to become familiar with and trusting such programs. Our findings indicate that this process best occurs through more interpersonal approaches. The project should be flexible and use an adaptive management strategy, so it can be adjusted to accommodate changing environmental, political, and social conditions.*⁸

Despite this particular project having generous financial incentives to help citizens, it was suggested that leaders of behavior-change projects with community participation have realistic expectations, and anticipate that there will be a portion of the population that will remain unengaged.

Water Words conducted a survey for the District Department of the Environment to evaluate, among other questions, what barriers might exist for homeowners to participate in a program to install stormwater best management practices at their homes. While some identified that cost was a barrier, what was more of a barrier was the lack of knowledge (or perceived lack of knowledge) of what to do and how to take care of their newly installed plants. The personalized assistance and handholding by technical experts emerged as being somewhat more important than the cost share-- even though the cost share component is also indispensable.⁹

⁸ Darren Bos and Helen Brown (2015) *Overcoming barriers to community participation in a catchment-scale experiment: building trust and changing behavior*, Freshwater Science, Vol. 34, No. 3 Pages 1169-1175

Retrieved from: <http://www.jstor.org/stable/10.1086/682421>

⁹ Eric Eckl and Valerie Damstra (2015) *RiverSmart Homes Research Final Report*, Water Words that Work, LLC. Retrieved from: <http://bit.ly/2bSfLYi>

The study by DHM Research grouped additional barriers to behavior change related to stormwater into broader categories, and offer the following recommendations for each barrier:

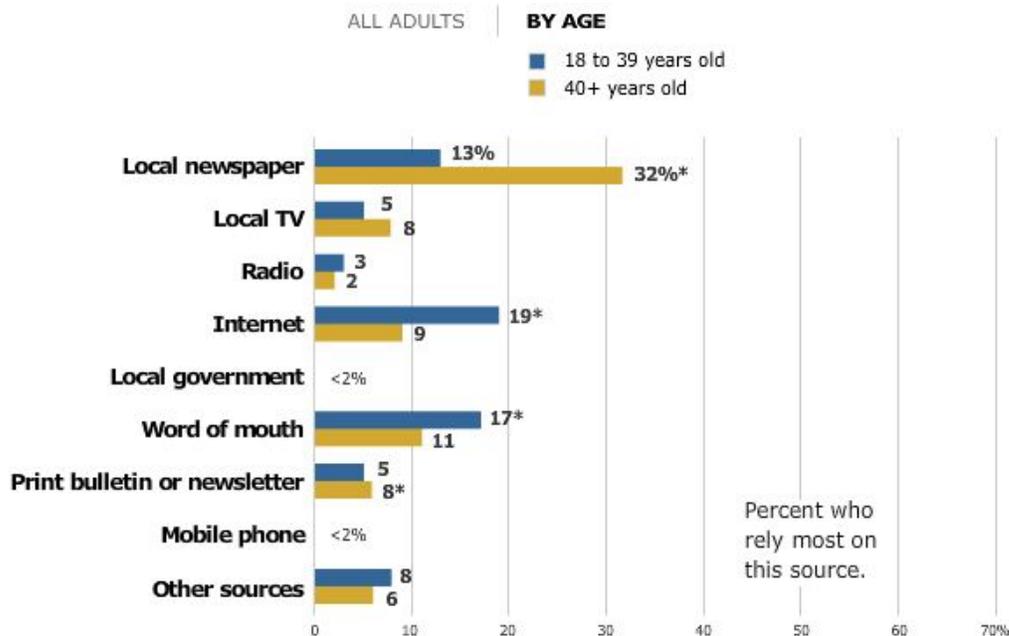
- *Inconvenience: Provide easy resources, such as information on websites and through retailers, instruction stickers on recycle bins, and clear and simple instructions on products. Inform residents about alternative products or services; make it available and easy to find. Message around how simple steps can make a difference.*
- *Lack of knowledge: Connect common activities to their direct impact on local rivers and streams (and less on general waterways). Mention specific rivers and streams as much as possible; highlight rivers and streams as a source for drinking water.*
- *Higher cost: A common perception is that alternative products or services cost more. Although cost is a key motivation for some, for most people it is not the primary driver of behavior change. Do not lead behavior change messages with mentions of cost or arguments that some alternatives cost less. Other benefits in tandem with saving money are more effective to change behaviors; link to those benefits first before addressing perceptions around costs.*
- *Perceived lack of impact: Messaging should continue to connect how individual behaviors impact local rivers and streams (rather than general bodies of water). Name specific rivers or streams as much as possible to connect closer to “home.” Be specific about the activity or preferred behavior, like picking up pet waste in the yard or reducing soapy water. Sometimes, simple suggestions that are easy enough to tackle are usually enough to persuade changes in behavior.*
- *Perception that product is less effective: Some people believe that less toxic products will not be as effective as chemical products. This is especially the case for household products. Do not lead behavior change messages by persuading residents of how alternative products and services are just as effective as products or services that use chemicals. Link to other benefits first, in particular ones that spark more emotion like the safety of children and pets.*
- *Mixed messages: Give simple and easy suggestions around behavior change. Partner with local community organizations, small businesses, and university ‘experts’ as messengers. Save government messengers to message around improving the health of the community, or public health. ⁴*

Question #4: How do residents prefer to receive tips and information from their local governments?

The Pew Research Center has published a couple of different reports that identify how people prefer to learn about their local community more broadly, and how people get local news and information in different communities, respectively.

The studies did not ask about what source people would use most to get information about environmental topics or stormwater pollution directly. However, when people want to learn about community events, less than 2% rely on the local government for that information. Local newspaper, internet, or word of mouth were most popular. Some variation is seen with age, as people older than 40 rely more on the newspaper, while

people younger than this rely more on the Internet.¹⁰



* Indicates a statistically significant difference at the 95% confidence level.

Source: Local News Survey 2011, conducted January 12-25, 2011, by the Pew Research Center's Internet & American Life Project, the Project for Excellence in Journalism, and the John S. and James L. Knight Foundation. n=2,251 U.S. adults age 18 and older, including 750 cell phone interviews. Interviews were conducted in English and in Spanish.

PEW RESEARCH CENTER

Another survey found some variation in the number and variety of local news sources used, as well as the degree of "local news participation" and mobile news consumption. This variation appeared dependent on the type of community people live in (i.e. urban, suburban, small town, or rural).

It was discovered that urban residents:

- *Rely on a wider combination of platforms for information than others and are more likely to get local news and information via a range of digital activities, including internet searches, Twitter, blogs and the websites of local TV stations and newspapers.*
- *Most likely to be digital "news participators" who email local stories to others, post material on social networking sites, comment on news stories online, or contribute to online discussions on message boards.*
- *More likely to get news via mobile devices.*

Likewise, suburban residents:

- *More likely than others to rely on local radio as a platform (perhaps because of relatively longer commuting times)*

¹⁰ Pew Research Center (2011) *How people learn about their local community*, Pew Internet and American Life Project

Retrieved from: <http://www.pewinternet.org/2011/09/26/how-people-learn-about-their-local-community/>

- *Are heavy digital participators who comment and share the news.*
- *Rely mainly on the internet for information about local restaurants, businesses, and jobs. They look to television news for weather and breaking news.*¹¹

In the Stormwater Prevention Pollution Survey of Corvallis residents, it was noted that:

*Respondents who reported they had seen or heard information from the City of Corvallis about stormwater pollution prevention were significantly more likely to choose “river and streams” [when asked where stormwater ends up] than those who reported not seeing or hearing information. This implies that City outreach efforts are effectively educating people about how stormwater impacts rivers and streams.*⁵

It was not clear however what outlets the city used to present that information to residents. The insights from the Pew Research Center could help direct outreach efforts.

Question #5: How have municipalities collaborated in the past on stormwater outreach, and how did these efforts result in measureable impacts?

This was a more challenging question to answer, as there are several examples of groups that have collaborated on stormwater management issues, but demonstration of measurable results is hard to find.

A senior thesis project at Eastern Michigan University termed these collaborations as “intersectoral collaboration, as a means for delivering public services.”¹² This study used the lens of stormwater management as the public service, with a focus on stormwater education and outreach.

Measureable impacts of the Stormwater Work Group in this study were not demonstrated at the time of the research. However, the group did identify Measures of Success that they will use in evaluating future work.

¹¹ Pew Research Center (2012) *How people get local news and information in different communities*, Pew Internet and American Life Project

Retrieved from:

<http://www.pewinternet.org/2012/09/26/how-people-get-local-news-and-information-in-different-communities/>

¹² Robin Miller (2009) *Cooperation, Coordination, and Connection: Evaluating the Effectiveness of Intersectoral Collaboration through the Lens of Stormwater Management*, Eastern Michigan University Senior Honors Theses Paper 173

Retrieved from: <http://commons.emich.edu/cgi/viewcontent.cgi?article=1172&context=honors>

HRWC ADW Stormwater Pollution Education and Outreach Literature Review

Water Words That Work, LLC

905 West 7th Street, Suite 201, Frederick, MD 21701

703.829.6732 waterwordsthatwork.com

Appendices
Appendix A – Measures of Success

<p>ADOPT-A-STREAM PROGRAMS</p> <ul style="list-style-type: none">• Track the number of participants in Adopt-A-Stream programs.• Water quality at Adopt-A-Stream sites.• The quantity of trash and debris removed by Adopt-A-Stream volunteers. <p>ATTITUDE SURVEYS</p> <ul style="list-style-type: none">• The number of citizens solicited to complete surveys.• The number of completed surveys.• A survey of citizens gauging change in attitude/behavior after stormwater education activities are held. <p>COMMUNITY HOTLINES</p> <ul style="list-style-type: none">• The number of hotlines established to handle stormwater-related concerns.• The number of calls received by hotlines.• The number of problems/incidents remedied as a result of hotline calls. <p>REFORESTATION PROGRAMS</p> <ul style="list-style-type: none">• The number of volunteer tree planters.• The number of trees planted.• The number of acres planted with trees. <p>STAKEHOLDER MEETINGS</p> <ul style="list-style-type: none">• The number of meetings held.• The number of attendees.• The number of actions taken as a result of stakeholder meetings. <p>STORM DRAIN STENCILING</p> <ul style="list-style-type: none">• The number or proportion of drains stenciled.• The number of stenciling volunteers.• The number of drains stenciled.• Changes in water quality at outfalls of stenciled areas. <p>STREAM CLEANUP AND MONITORING</p> <ul style="list-style-type: none">• The number of stream cleanups.• The number of cleanup participants.• The quantity of waste collected as a result of cleanup efforts.• The number of stream miles cleaned.• Water quality at the stream cleanup sites. <p>VOLUNTEER MONITORING</p> <ul style="list-style-type: none">• The number of volunteers participating in monitoring programs.• The frequency of monitoring in the watershed.• The number of volunteer monitoring stations established in the watershed.• The number of volunteer monitoring training sessions held.• The number of actions that were taken as a result of the monitoring data collected by volunteers. <p>WATERSHED ORGANIZATION</p> <ul style="list-style-type: none">• Whether or not a watershed organization was established.• The number of participants in the watershed organization.• The number of actions taken as a result of the watershed organization. <p>WETLAND PLANTINGS</p> <ul style="list-style-type: none">• The acres of land planted.• The number of volunteers that participated in planting.• The number of planting events held.

Source: Eastern Michigan University and City of Ypsilanti Stormwater Management Program, 2006

A study done for the Stormwater Work Group in Puget Sound suggests that “the effectiveness of public education campaigns is typically measured in terms of behavior change, rather than the ultimate impact of the project on stream health.”¹³

In the language of social marketing, measures of effectiveness are typically done for outputs rather than outcome. Using an example of fundraiser car washes, which can result in hundreds of gallons of untreated water going into storm drains, there are multiple points in a simple model of behavior change where the effectiveness of public education and outreach programs can be tested:

¹³ Leska Fore (2013) *Effectiveness of Public Education and Outreach Programs for Reducing Impacts of Stormwater on Rivers and Streams*, The Stormwater Work Group, Puget Sound Ecosystem Monitoring Program, Washington Department of Ecology, and The Association of Washington Cities

Retrieved from:

http://www.ecy.wa.gov/programs/wq/psmonitoring/ps_monitoring_docs/SWworkgroupDOCS/PublicEducationWhitePaperFinalApril2013.pdf

HRWC ADW Stormwater Pollution Education and Outreach Literature Review

Water Words That Work, LLC

905 West 7th Street, Suite 201, Frederick, MD 21701

703.829.6732 waterwordsthatwork.com

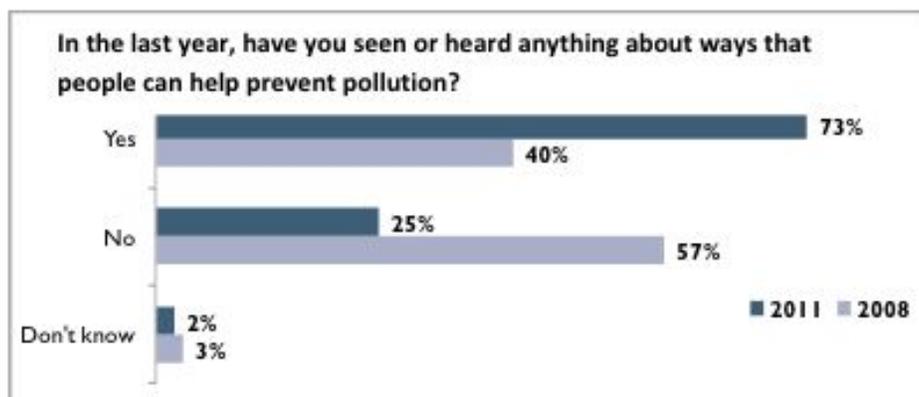
Example of Social Marketing Model for Fundraiser Car Washes



Figure 1. Social marketing model with example activities for fundraiser car washes.

Surveys of people before and after can help detect behavior change, with the caveat that self-reported data can be overly optimistic. It can also be hard to correlate a change in stream health with the effectiveness of public outreach as well, because there are so many other influences in the watershed. This study suggests using intermediate outcomes because they avoid self reporting bias and provide an objective measure of effectiveness. Examples of intermediate outcomes in this case would include counting the number of car washes that use kits to prevent waste water from going down the drain.

The Kitsap Peninsula Clean Runoff Collaborative utilized the survey approach to evaluate the effectiveness of their stormwater outreach programs. They conducted a benchmark survey in 2008 and then again in 2011 to gain a better understanding of how local and regional stormwater outreach programs influence residential awareness, activities and behaviors. Their efforts did result in increased awareness and changes in attitudes and behaviors among the Kitsap Peninsula residents, particularly in areas targeted by the group's stormwater outreach programs.



Respondents reported increased awareness of stormwater messages, as well as an increase in recognition of their “Puget Sound Starts Here” campaign, increased pickup and disposal of pet waste by targeted dog owners, improved home car washing behaviors, increased awareness about who to call about a spill, and changed attitudes towards fundraiser car washes. ³