

CONVENIENCE SURVEY 2009 REPORT:
**IMPACT OF STORMWATER MANAGEMENT
EDUCATION AND OUTREACH PROGRAMS**

By
Dr. Diane E. Schmidt
For
Oman Communications
and
City of Chico, CA
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EXECUTIVE SUMMARY

The City of Chico contracted for a brief convenience survey on water pollution to provide mechanism for monitoring the veracity of previous and continuing outreach activities. The 2008 survey had 14 questions and the 2009 survey had 8 questions. The 2009, was administered at three locations to receive feedback on program effectiveness: The annual *Home, Garden & Antique Show* (seven hours on March 21, 2009), Downtown Chico's *Thursday Night Market* event (four hours on May 15, 2008) and at the *Silver Dollar Fair* event (five and half days from May 22-26, 2008). The purpose of the convenience survey was to provide a snapshot of whether educational outreach messages administered in 2006 and continuing in 2009 are still continuing to promote the program goal. The program goal for educational outreach efforts was to promote best management practices (BMPs) for prevention of urban runoff pollution. The objectives included:

- Improving awareness of runoff pollution issues.
- Increasing knowledge about pollution prevention.
- Fostering behavior changes consistent with BMPs.
- Modifying or creating supportive attitudes for water quality protection.

The results of the survey indicate that the goal of the outreach program continues to be met and the objectives continue to be achieved. Exposure to past and present outreach activities is associated with knowledge and awareness of runoff issues and causes of creek pollution. In addition, knowledge of where runoff from yards, gutters, street, and roads ends up is associated with exposure to educational outreach activities. Further, self-reported changes in handling of yard, household, and garden waste and materials is also associated with exposure to educational outreach activities. In particular, television commercial, booths at public events, and the storm drain markers are especially related to knowledge, awareness, and positive changes in respondent engagement in targeted best management practices. In sum, past and present educational outreach activities promoting best management practices for handling chemicals and waste from the household, yard, and garden have been highly effective in increasing awareness, knowledge, and use of these best practices.

INTRODUCTION

The City of Chico contracted in 2008 and 2009 for a brief convenience survey on water pollution to provide snapshot mechanism for monitoring the veracity of previous and continuing outreach activities. The 2008 survey had 14 questions and the 2009 survey had 8 questions. The 2008 survey was administered in two locations to receive feedback on program effectiveness: Chico's *Thursday Night Market* event (four hours on May 15, 2008) and at the *Silver Dollar Fair* event (five and half days from May 22-26, 2008). The 2009 survey was administered at three locations: The annual *Home, Garden & Antique Show* (seven hours on March 21, 2009), Chico's *Thursday Night Market* event (four hours on May 14, 2009) and at the *Silver Dollar Fair* event (five and half days from May 20-25, 2009). The survey was offered to event attendees who passed by or stopped at the City of Chico *Storm Water Management Education and Outreach Program* (SWM EOP) booth staffed by Jennifer Oman, SWM EOP Coordinator. Give-aways including environmentally-friendly merchandise and a raffle were used as inducements to take the survey.

BACKGROUND

The purpose of the convenience survey was to provide a snapshot of whether educational outreach messages administered in 2006 and continuing in fall 2008-spring 2009 are still continuing to promote the program goal. The program goal for the previous educational outreach efforts was to promote best management practices (BMPs) for prevention of urban runoff pollution. The objectives included:

- Improving awareness of runoff pollution issues.
- Increasing knowledge about pollution prevention.
- Fostering behavior changes consistent with BMPs.
- Modifying or creating supportive attitudes for water quality protection.

As part of the Chico Urban Streams Alliance (CUSA) two *Public Knowledge of Water Quality Surveys* (2005 and 2007) were administered to a cross-section of Chico residents and an *Education and Outreach Program 2006* (EOP) was designed to address urban run-off issues. Based on goals set by the coalition of Chico USA, the focus of the questions and the EOP were to address:

POLLUTION RUNOFF FROM

Fertilizers
Pesticides
Herbicides
Cleaners
Animal waste

IMPROPER BEHAVIOR SUCH AS

Discarded cigarettes
Dumping trash in creek
Motor oil not recycled
Green waste in creek

The EOP involved the following activities over the 2006-2009 time periods (see Appendix A for full descriptions):

- Radio and television advertising.
- Posters and public murals.
- Internet site postings.
- Public events booths with give-away materials.

- Storm drain markers.
- BMP calendars.
- *Clean Creeks in the Classroom* program
- *Clean Water Business Partnership Program*

While the murals, storm drain markers, posters, and brochures are displayed in public spaces throughout the year, and the website is available online at all times, Oman Communications plans and implements a concentrated period of outreach annually in the spring. The calendar dissemination is the "kick-off" to the outreach effort (January through March - culminating at the *Home & Garden Show*), followed by a "blast" of messages via the radio and TV commercial broadcasts in April and May; the booth outreach at the *Home & Garden Show*, *Thursday Night Market*, and the *Silver Dollar Fair*; *Clean Creeks in the Classroom* program implementation in 3rd Grade classrooms March-May (the program is also implemented in the fall); and newspaper ads in May (2 newspapers are selected annually).

2009 CONVENIENCE SURVEY

While the previous surveys in 2005 and 2007 were conducted on random samples of Chico residents by telephone interviews, the 2008 and 2009 surveys were conducted with event attendees using a paper survey. Just as in 2008, for the 2009 survey respondents were self-selected and filled out the survey in the presence of Ms. Oman. Each respondent received, in return, a booth give-away prize in return for completing the survey.

The 2008 and 2009 Convenience Surveys are almost identical with a few exceptions. The total number of surveys completed in 2009 is 200, with most questions answered and very few missing or no answers. Most of the survey questions were derived from the survey in 2007 and included questions regarding awareness or knowledge of water drainage, runoff, and dumping issues, as well as questions about exposure to educational messages and behavioral changes related to viewing the messages.

Although the 2009 survey results cannot be compared with the results from the 2005 or 2007 surveys because the data were not collected in the same way, the results from the 2008 and 2009 surveys can be compared. To shorten the survey and improve clarity, a number of redundant questions in the 2008 survey were deleted for the 2009 survey to create a one-page survey instrument. In addition, the question in 2008 about the storm drain markers was an independent question (q11) and in the 2009 survey, the storm drain marker question was integrated with a list of educational message sources in question 6. An additional option regarding the Internet site was also added to the list of sources for outreach education messages (see Appendix B for a copy of the 2009 survey. Appendix C has an annotated Codebook for 2008 and 2009 data as they were merged for this project). Finally, the question concerning changes in activities to prevent pollution as a result of the outreach messages was reorganized in the 2009 survey to reflect the difference between what respondents do now to prevent pollution and what they no longer do. The available responses are basically the same; the order in which the respondents view them is different.

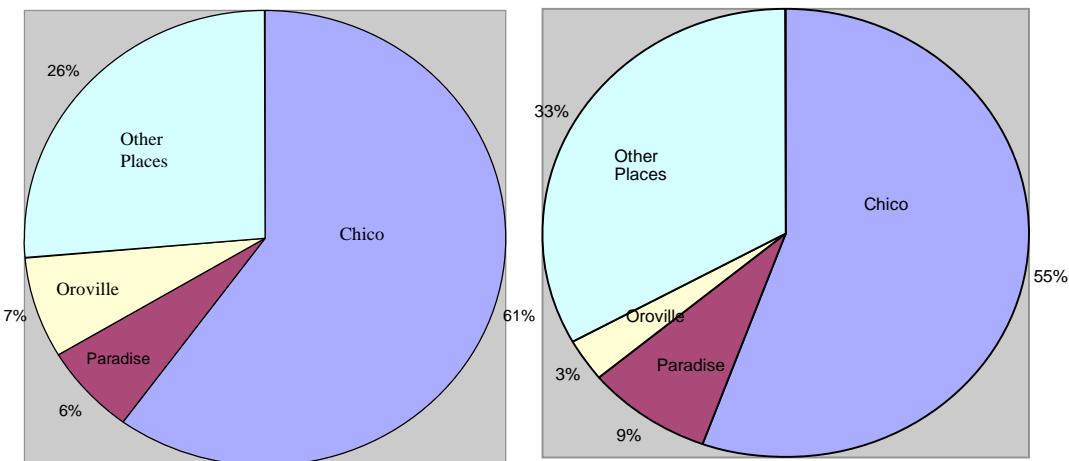
Snapshot of Respondents

The survey included only one demographic question which was the zip code of the respondent. As the Figure 1a shows, in 2008, 61 percent of the survey respondents are Chico residents, 13 percent are Paradise and Oroville residents, and the rest are from other places. As Figure 1b shows, in 2009, 55 percent of the survey respondents are Chico residents, 12 percent

are Paradise and Oroville residents and the rest are from other places. This shows that the results are based on predominately Chico resident opinions and the distribution of respondents between the two surveys is somewhat similar although there are more respondents from outside of Chico in 2009 than there were in 2008. To assure that the data were not skewed differently because of the slight reduction of Chico residents, the data were compared between the full and the Chico only data. There was no considerable difference in the distribution of responses.

Figure 1a: 2008 Zip Code Distribution of Respondents

Figure 1b: 2009 Zip Code Distribution of Respondents



Educational Messages

Both the 2008 and 2009 survey included one question to identify which respondents have been exposed to past or present educational outreach messages, and in what format they were exposed to these messages. Respondents were asked:

(2008 q10) (2009 q6) Which of the following messages about keeping our gutters and local creeks free from pollution (such as litter, auto fluids, pet waste, fertilizer, and/or pesticides) did you hear or see recently? (Check all that apply)

In this question for both the 2008 and 2009, respondents had 9 different media options to choose from and could list other messages viewed or seen. In the 2009 survey, the storm drain and Internet site options were added to the list. Most of those who checked the “other” option listed events such as Chico Clean up Day, Endangered Species Fair, or storm drain markers in their answers, in addition to identifying similar items to those listed. Using just the 9 media options found in both the 2008 and 2009 surveys, Figure 2 shows that 75 percent of the respondents viewed or heard 1-3 messages. This suggests that many respondents were exposed to multiple messages about keeping the creeks free of pollution. Although there was a slight increase in the percentage of those who did not see the messages, which is understandable given that the percentage of Other (non-Chico) respondents increased as well. It is encouraging that there is a persistent core of messages (1-3 educational sources) that respondents remember viewing or hearing.

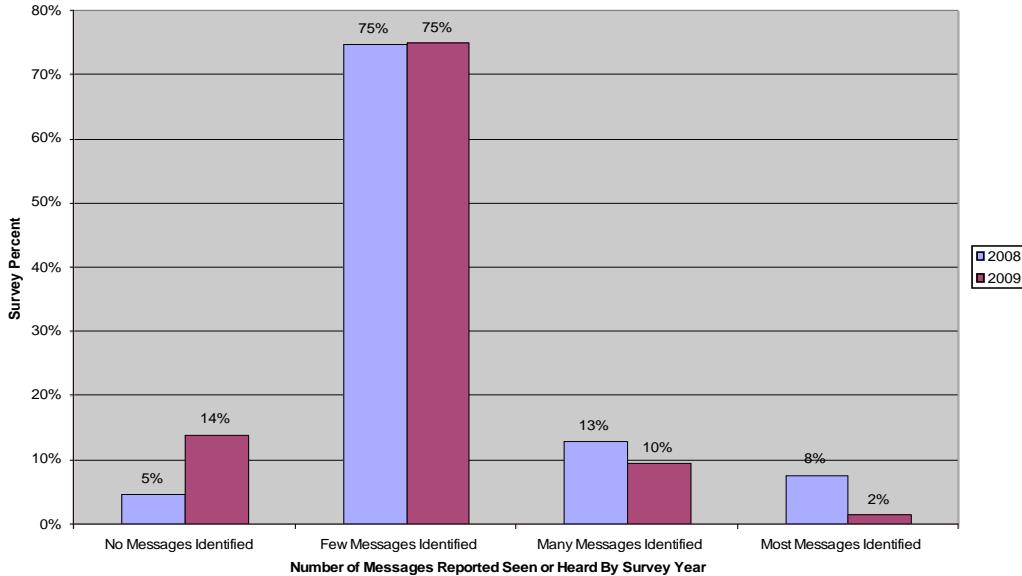
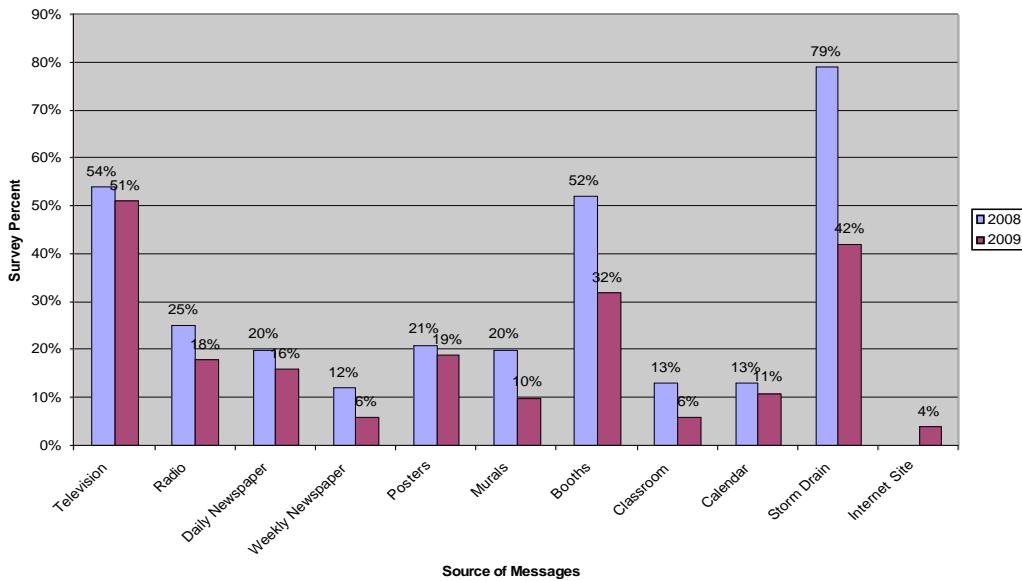
Figure 2: Educational Messages Viewed or Seen

Figure 3 shows the percentage of respondents who checked off each of the items on the list for each survey. The greatest exposure seems to have come from television, storm drain markers, and booths at public events as outreach sources. As Figure 3 shows, 51-54 percent of the respondents identified having seen or heard messages from television. Finally, 19 to 25 percent of the respondents identified seeing or hearing messages from the radio, daily newspapers, and posters.

Figure 3: Percentage of Respondents Reported Seeing or Hearing Messages By Source

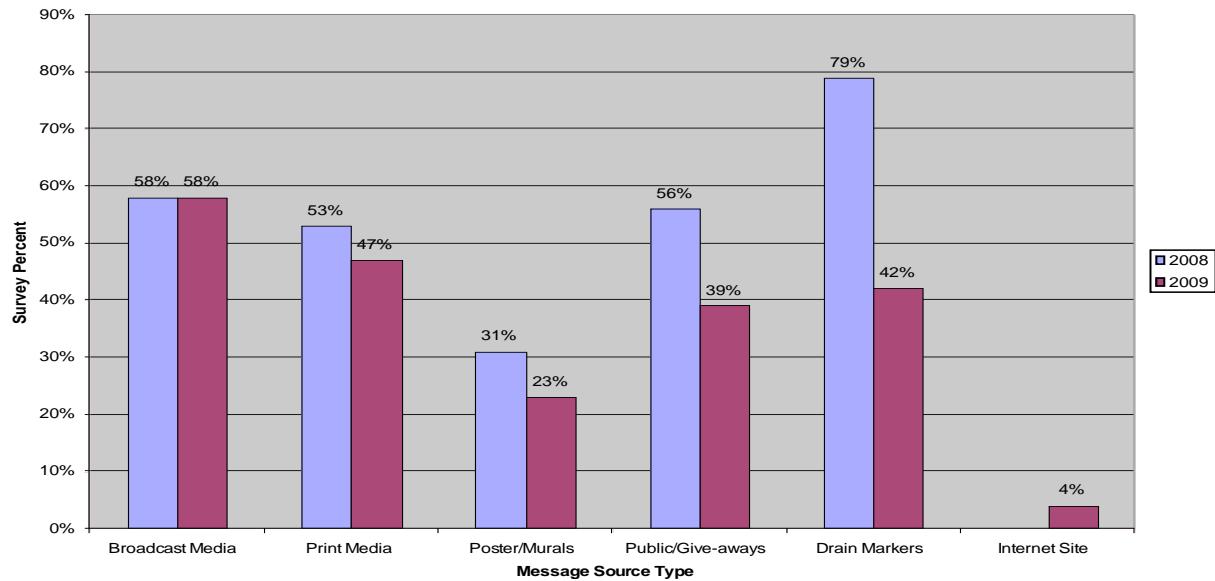
Although the percentage of respondents that reported having seen or heard messages at booths or saw the storm drain markers dropped in every category from 2008, booths at public events and the storm drain markers are still important components of the educational outreach plan. The drop from 2008 to 2009 in the percentage of respondents identifying that they had seen or heard the messages may be a result of the question wording. Although the question

wording stayed the same, the question asks the respondent to identify messages they had heard or seen *recently*. The word *recently* was perfectly appropriate for the 2008 survey when most each type of the messages were fairly new to the community. By 2009, the murals, posters, and storm drain markers, for example, would not necessarily be messages the respondent saw recently, but may have been seen within the last two years. Only the messages in Broadcast media, Print Media, and the Public Events have been routinely *recent* in characteristics. Ironically, many respondents (78 percent in 2009) did not choose *Booth at a public event* even though they all (100 percent) were administered the survey in a booth at a public event! The word *recently* is ambiguous enough as to suggest that some respondents may have seen or heard the messages, but did not indicate such because they did not do so *recently*. Perhaps the question should be changed so that respondents identify those messages they saw *recently*, with recently defined as within the past year, and then asked if they *ever* saw the messages. This is perhaps control for those respondents who thoughtfully distinguish between present and past in their interpretation of the question.

Alternatively, the drop in the percentage of respondents identifying storm drain markers as source may be result of change in how the question about storm drain markers was asked. In 2008, the respondents were asked specifically about the storm drain markers, whereas in 2009, it was at the end of an 11 item list. Nevertheless, the percentage of those respondents identifying storm drain markers as a source of information is still an impressive 42 percent.

Further, as seen in Figure 4, using data combined by type of media, messages seen through broadcast media were checked by 58 percent of the respondents. The percentage of respondents identifying print media ranged from 47-53. Public events were the sources for 39 to 56 percent of the respondents, and 23-31 percent of the respondents viewed or heard the messages through viewing posters or murals. Among the sources of outreach messages viewed or seen, broadcast media, print media, public events, and storm drain markers are the predominant media accessed by most of the respondents.

Figure 4: Percentage of Respondents Viewing or Seeing Messages By Message Type

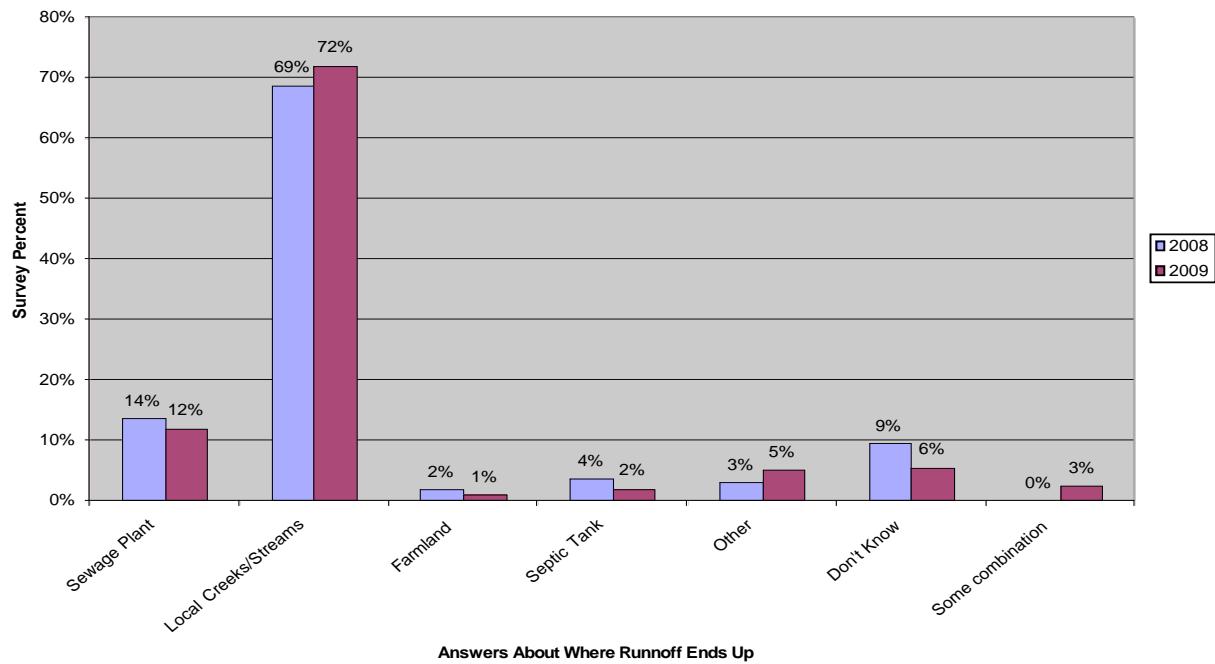


Awareness and Knowledge of Water Drainage and Runoff

Both surveys included two questions about the respondent's awareness and knowledge about where water drainage ends up in the community. The survey results suggest that most of the respondents correctly identified the difference between where runoff and waste water ends up. This is not surprising given the depth and breadth of outreach messages in the past and current programs.

Runoff water. Respondents were asked (*q1*) *In your opinion, where does most of the runoff water from your yard, gutter, street, or road end up?* Figure 5 shows the distribution of respondent opinion about where runoff water ends up. The survey shows an increase from 69 to 72 percent of the respondents correctly identified that the runoff ends up in the local creeks and streams. Less than 10 percent did not know where the runoff water went, and a few answered that it went into the ground water or some other combination of local creeks and other places¹.

Figure 5: Respondent Knowledge of Where Runoff Ends Up



More specifically and interestingly, as seen in Figure 6a, of those respondents who correctly identified that the runoff ends up in the creek, 60 percent of the respondents in 2009 report having seen a few messages (one to three message sources), which is up from 52 percent in 2008. Storm drain markers and the Internet site responses were not included in this comparative because the Storm Drain Marker and Internet site responses were not in the summary data for 2008.

¹ Some of the respondents failed to understand that they were to choose one response and they basically answered the question as though it said "check all that apply." We created a separate variable for those types of answers.

**Figure 6: Knowledge of Where Runoff Ends Up By Number of Outreach Messages Identified
(Does not include Storm Drain Markers and Internet)**

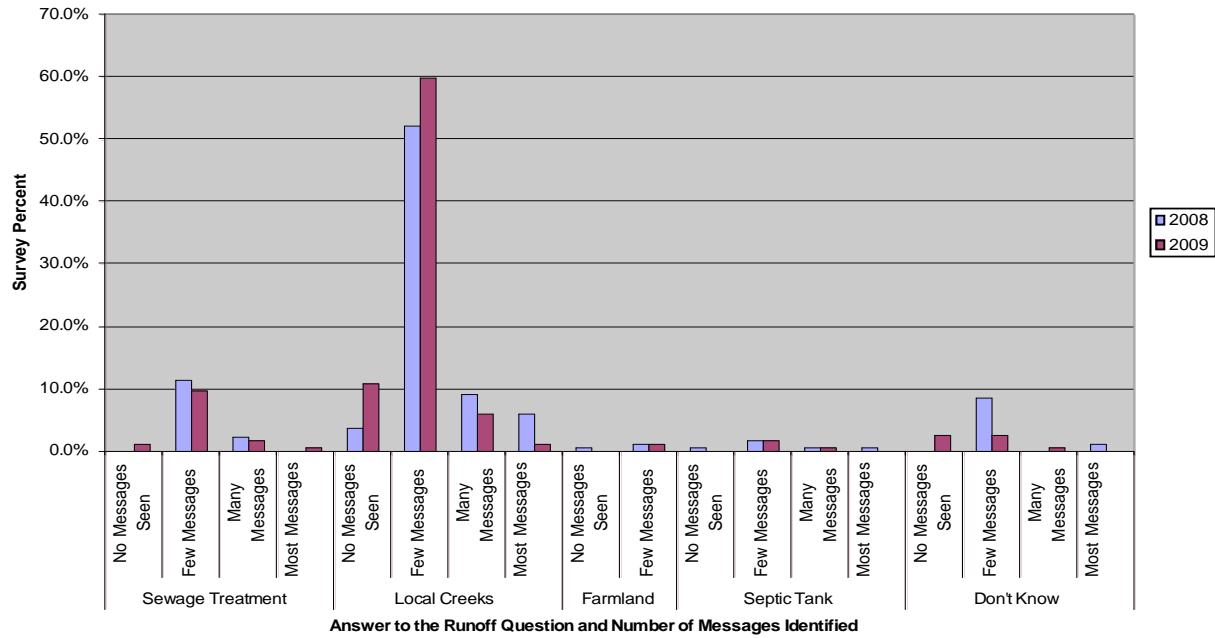
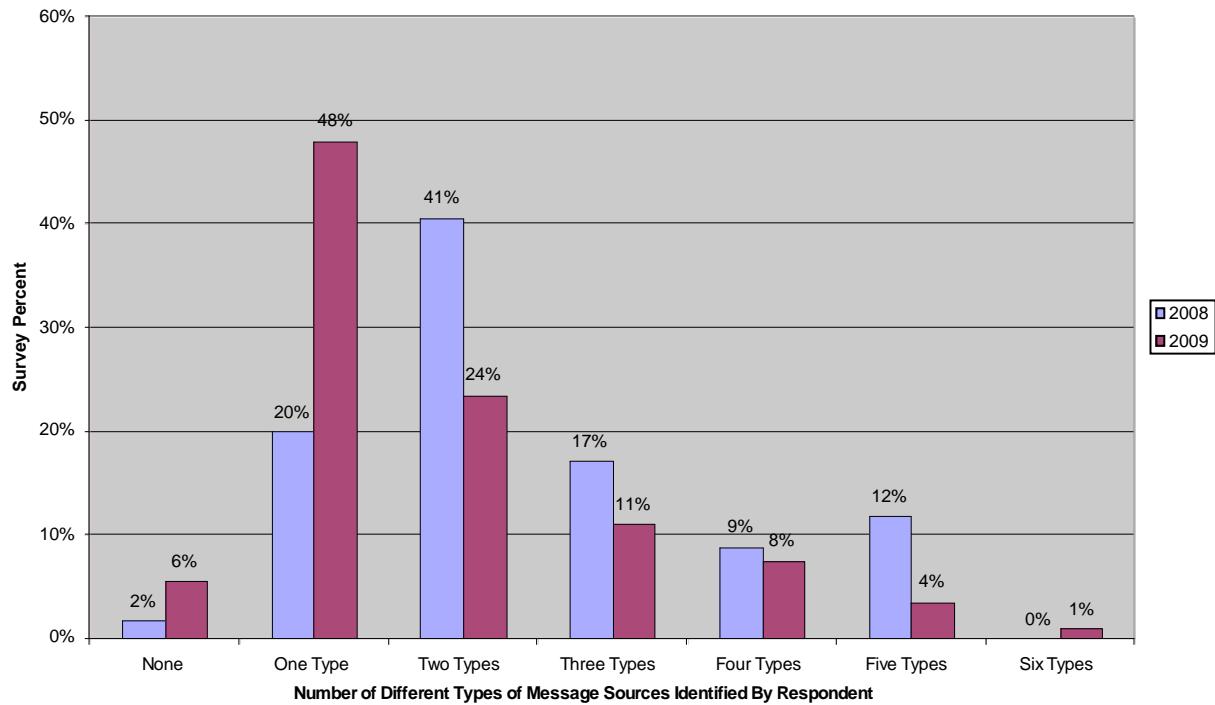


Figure 7 provides additional information about respondents by examining the type of media identified as the source of recent information about pollution. Close to 50 percent of the 2009 respondents identified one type of source, which is up from 20 percent in 2008.

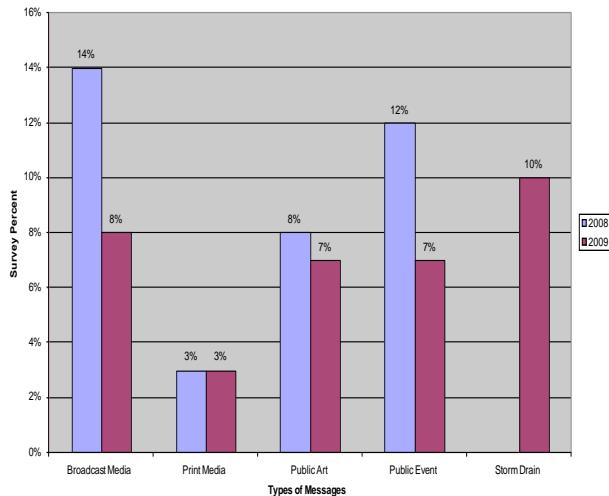
**Figure 7: Number of Different Types of Message Source Identified
(Broadcast, Print, Public Art, Events, Drain Markers, and Internet Site)**



Figures 7a-7c, break down the types of messages into the three most frequently mentioned types². These figures show that Broadcast Media is the predominant source of messages for those respondents who identified one to three types of media. After Broadcast media, Public Events and Storm Markers are the most prevalent sources mentioned.

Notably, in Figure 7a, the percentage of respondents identifying Broadcast Media as the only source increased substantially from 4 percent in 2008 to 22 percent in 2009.

Figure 7c: Percentage of Respondents Who Identified Three Types of Messages



More specifically Figure 7d shows that it is information from Television and Public Event Booths that dominate the memories of the respondents. Of those respondents that identified Television alone as the source, the percentage of respondents increased from 4 percent in 2008 to 18 percent in 2009. Of those respondents who identified Booths at Public Events as a single source of information, the percentage of respondents increased from 5 percent in 2008 to 9 percent in 2009. Clearly the media “blasts” prior to administering the survey in 2009 at the Public Event Booth appears to have had an

Figure 7a: Percentage of Respondents Who Only Identified One Type of Message

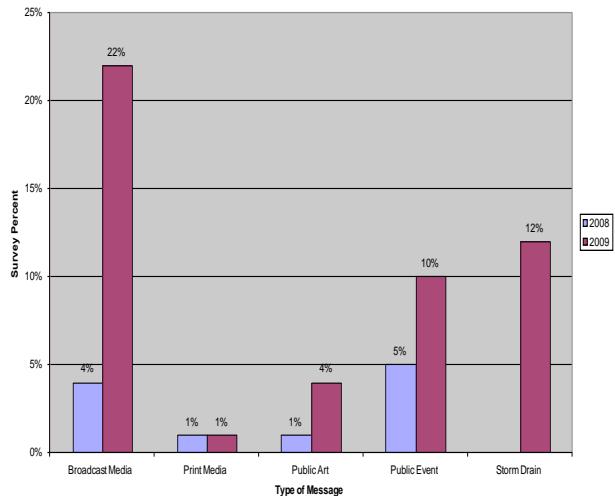


Figure 7b: Percentage of Respondents Who Only Identified Two Types of Messages

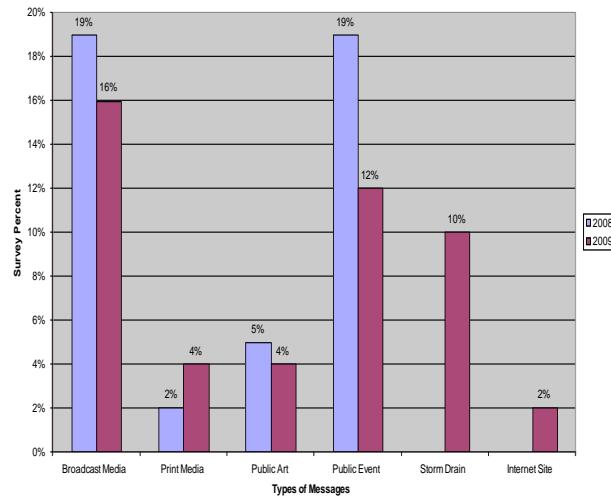
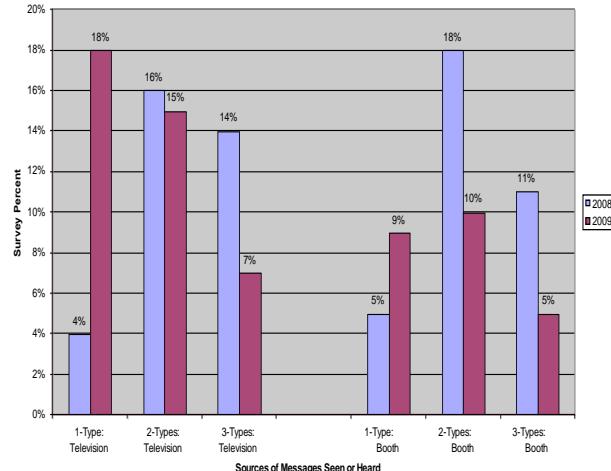


Figure 7d: Percentage of Respondents Who Saw or Heard Messages on Television or From a Booth at a Public Event and Who Only Identified One, Two, or Three Sources



² The Internet Site was not chosen by those respondents identifying One Type or Three Types. Only 7 respondents selected the choice of Internet Site as a source of their information about pollution.

important and durable impact on the recall of respondents about sources viewed or seen about pollution.

Now, how do these results relate to respondent knowledge about where water run-off ends up? Taking the results from analyses of Figures 7a-7d, Figure 8 shows a cross-tabulation between number of different types of messages viewed or heard by the respondent. Of those respondents who correctly identified local creeks as the place where run-off ends up, 36 percent or over a third of the respondents also identified one outreach source for information about pollution.

**Figure 8: Knowledge of Where Runoff Ends Up
By Number of Different Types of Message Source
(Broadcast, Print, Public Art, Events, Drain Markers, and/or Internet Site)**

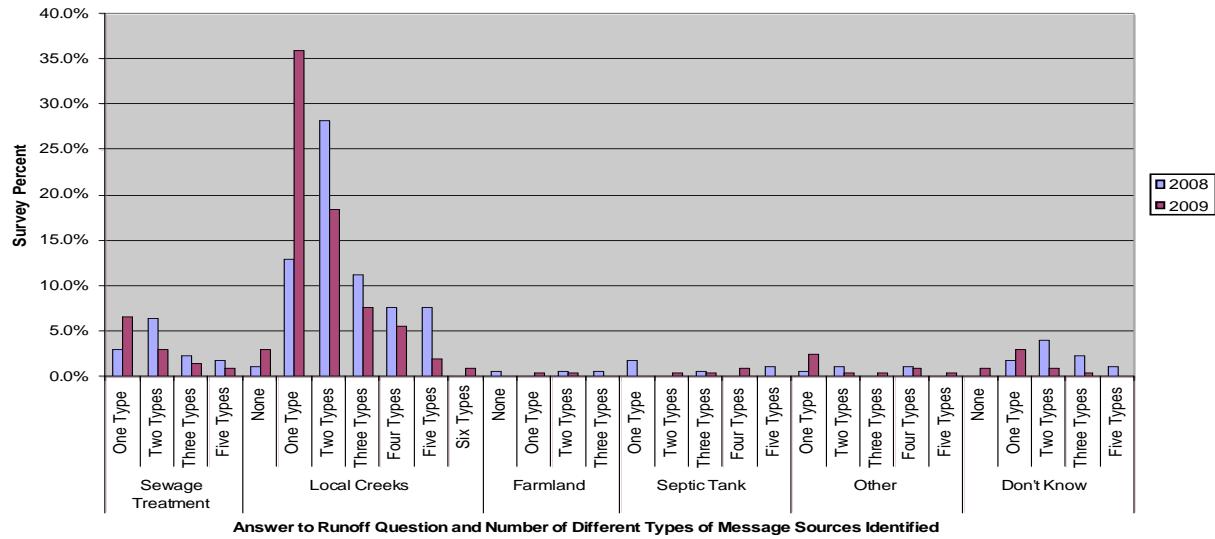
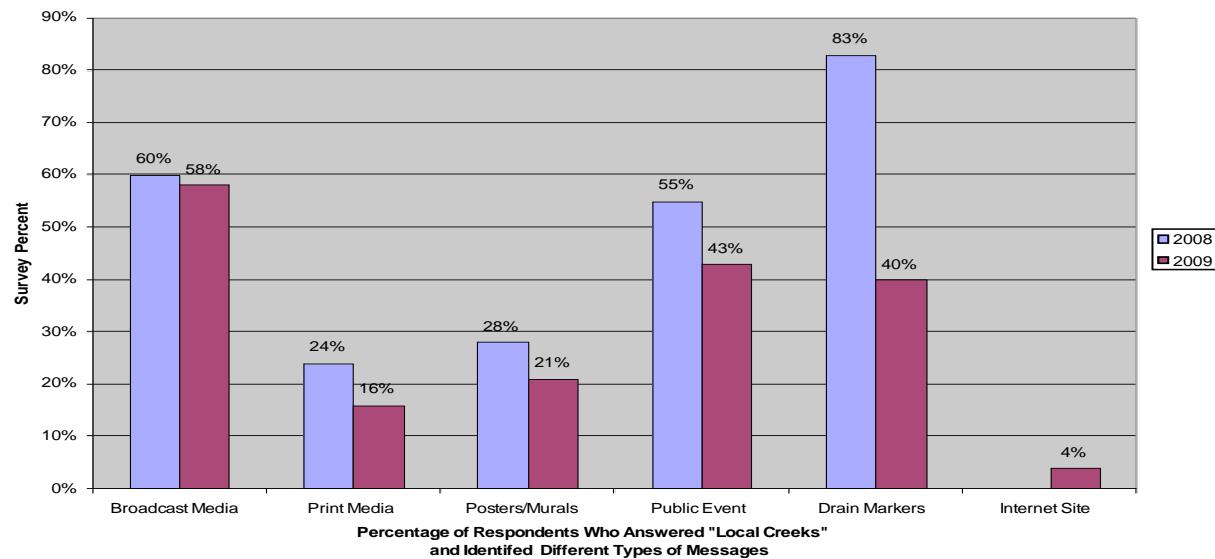


Figure 9 shows this same relationship from another perspective. Clearly respondents who answered that local creeks are where run-off ends up also identify Broadcast Media and Public Events as outreach sources of information about pollution of local creeks.

**Figure 9: Percentage of Respondents Answering "Local Creeks"
By Type of Outreach Message**



In sum, the data in Figures 6-9 are strong indicators of the veracity and durability of the effect of Broadcast Media and Public Events for increasing awareness and knowledge of runoff issues, and in particular, the data suggest that Television commercials and Booths at Public Events are the driving forces for creating a knowledge base within the community.

Waste water. Respondents were asked (*q2*) *In your opinion, where does most of the waste water from flushed toilets, kitchen sink, and bathtub drainage end up?* Figure 10 shows the distribution of the respondent opinion about where waste water ends up. The survey shows that over 76 percent of the respondents in each survey correctly identified that waste water goes into the sewage treatment or septic tank, while slightly over 20 percent incorrectly identified that the waste water went into the streams, creeks, or farmlands.

Figure 10: Respondent Knowledge of Where Waste Water Ends Up

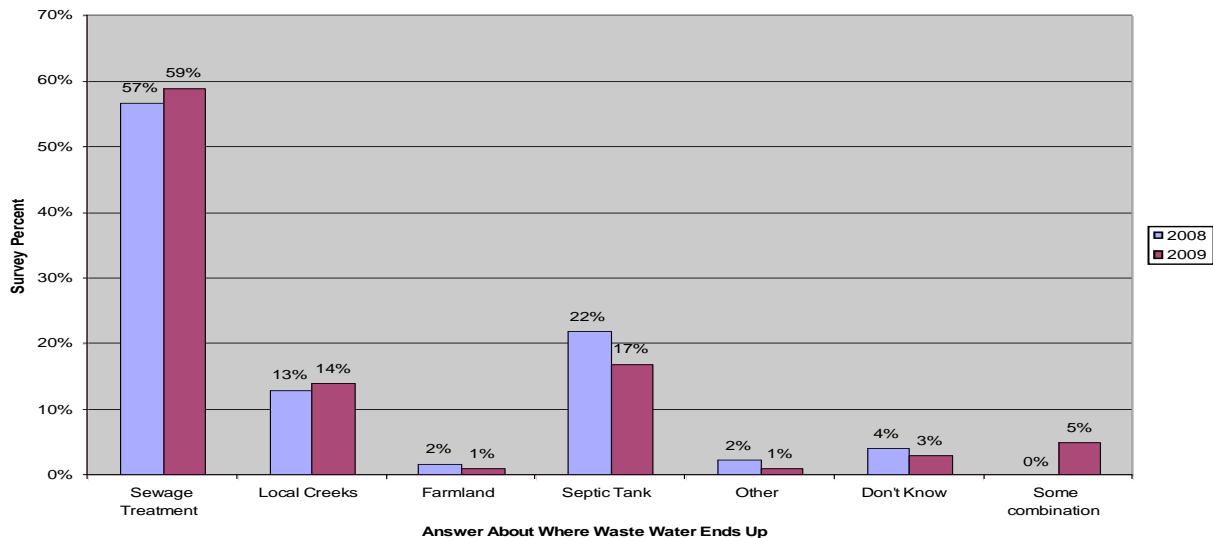


Figure 11 shows a closer examination of the relationship between knowledge of where waste water ends up and messages seen or heard. Over 60 percent of the respondents in 2009 correctly identified Sewage Treatment Plant and Septic Tanks as the place where waste water ends up who also identified seeing or hearing a few messages (1-3 reported).

Figure 11: Respondent Knowledge of Where Waste Water Ends Up By Number of Messages Identified

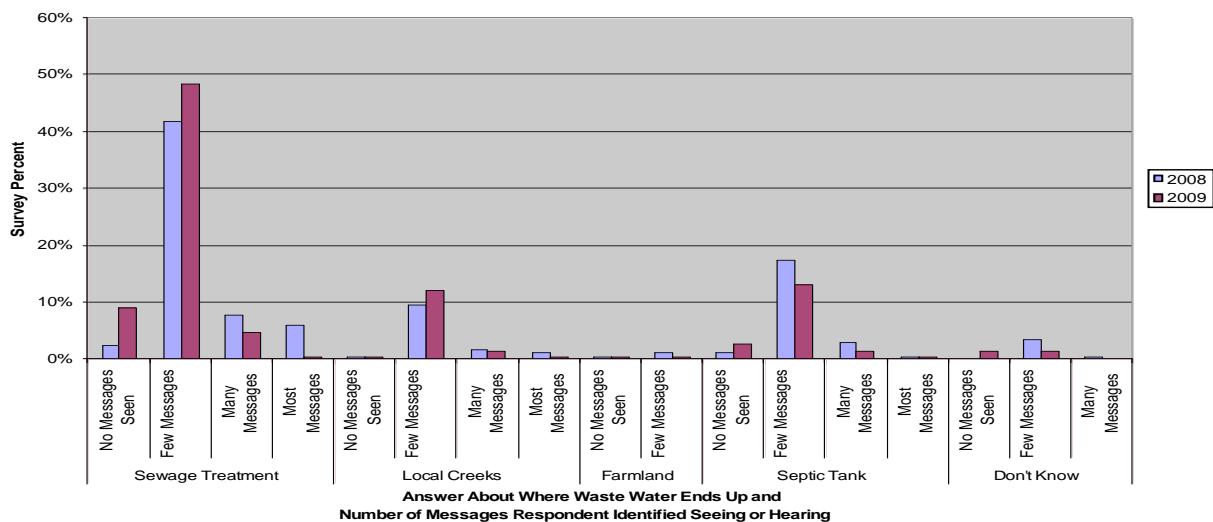
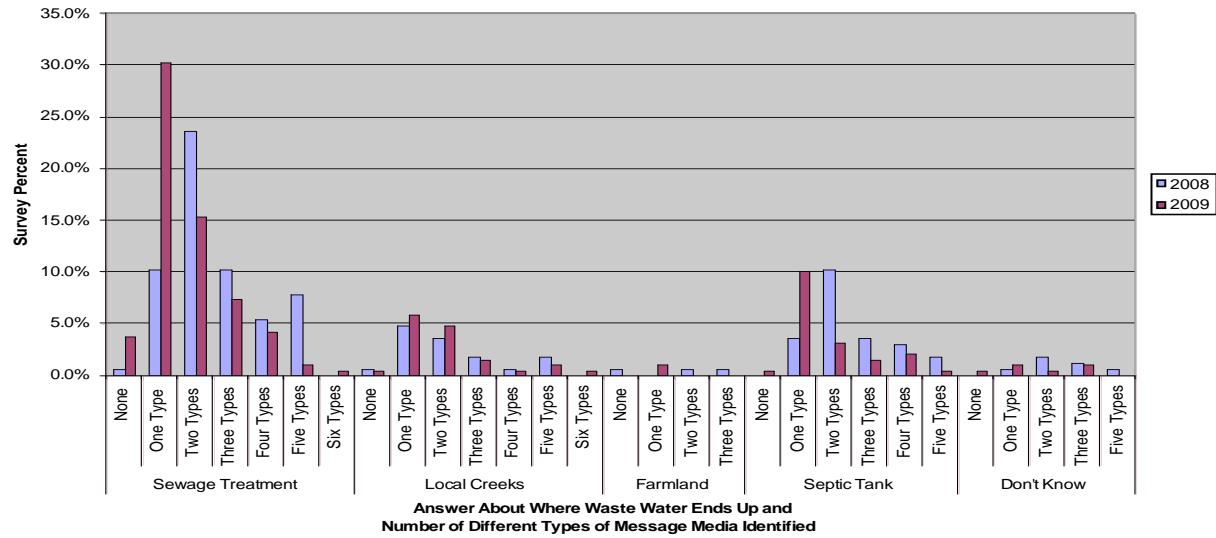


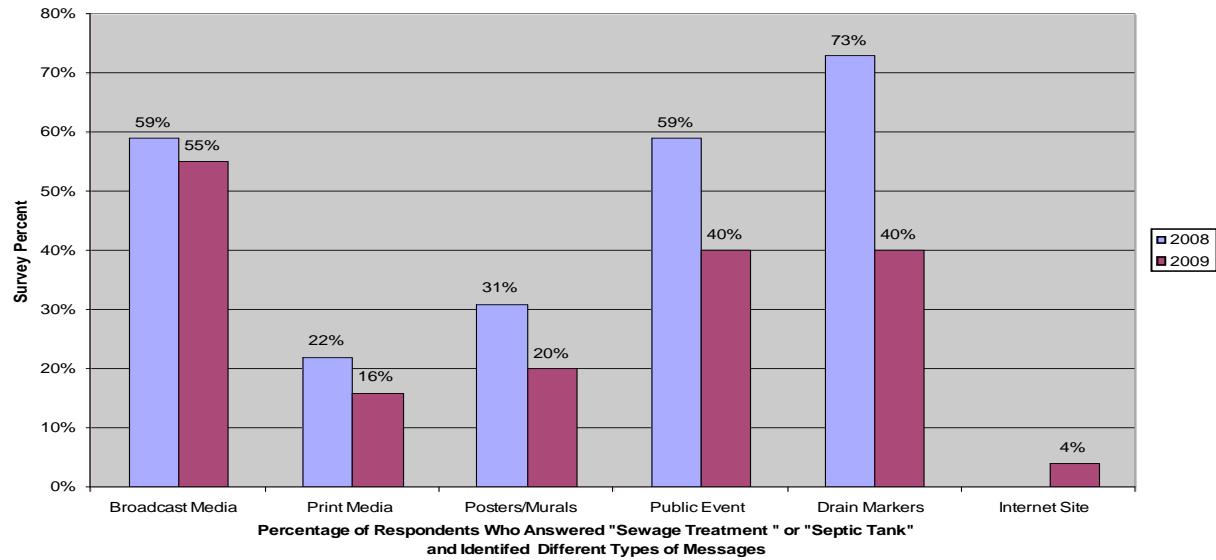
Figure 12 shows that of the different types of messages that respondents reported having seen, like the results concerning run-off, those respondents that correctly identified Sewage Treatment Plant and Septic Tanks also reported seeing a single type of outreach media. Over 40 percent of these respondents identified having one seen one type of message.

**Figure 12: Respondent Knowledge of Where Waste Water Ends Up
By Number of Different Types of Messages Identified
(Broadcast Media, Print Media, Public Art, Public Events, Drain Markers, and Internet Site)**



Finally, Figure 13 further refines the relationship between respondent knowledge of where waste water ends up and messages seen or heard. Of those respondents who correctly identified Sewage Treatment Plant or Septic Tank, over 50 percent continue to refer to Broadcast Media, and at least 40 percent identify either Public Events or Storm Drain Markers, as the sources of their information about water pollution.

**Figure 13: Percentage of Respondents Answering "Sewage Treatment" or "Septic Tank"
By Type of Outreach Message**



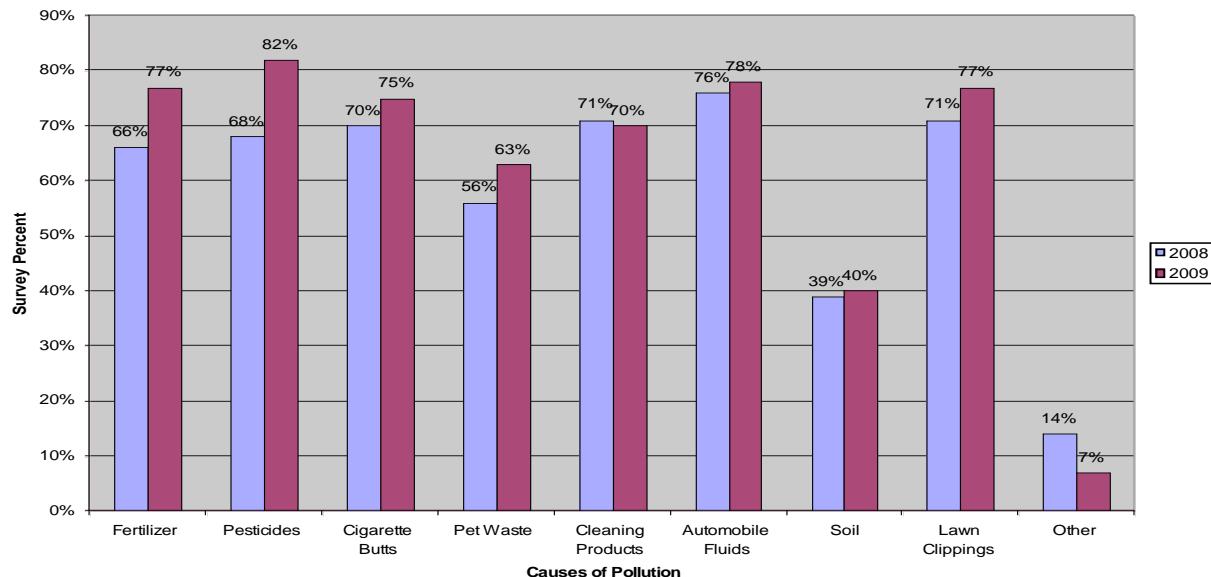
In sum, the data in Figures 10-13 provide additional evidence of the veracity and durability of the effect of Broadcast Media, Public Events, and Storm Drain Markers for increasing awareness and knowledge of waste water issues. These data validate the results in Figures 5-9 indicating that Broadcast Media and Public Events are important public outreach education tools, and particularly Television and Booths at Public Events as steadfast and effective components of an educational outreach program.

Awareness and Knowledge of Causes of Creek Pollution

The survey included questions that ask respondents to identify pollutants from a list as well as their opinions about particular items on the list. Various media outreach messages particularly targeted pollution from fertilizer, pesticides, cigarette butts, pet waste, cleaning products, automobile fluids, soil, and green waste. TV commercials focused on either pollution from pesticides and fertilizers, or automobile fluids, or general pollutants such as litter, pet waste, cleaning products (i.e. car washing). Radio commercials targeted general pollutants. These broadcast media messages were direct and used concrete language identifying the offending behavior or products. Alternatively, the newspaper ads, posters, murals, and booth events focused on more artistic, abstract, and creative messages about the harmful effects of pollutants. The survey results indicate both knowledge and awareness of materials known as pollutants, particularly those pollutants directly mentioned in the broadcast media messages. The results suggest a much larger percentage were knowledgeable or aware of pollutants which were repeatedly targeted in the outreach activities. Some of the less targeted items, such as soil and green wastes, had a smaller percentage of respondents who either recognized or thought of these items as pollutants for creeks and streams.

Identification of causes of creek pollution. Respondents were asked (*q3*) *Which of the following do you think causes pollution of our local creeks?* The respondents were then given a list of pollutants and asked to choose all those responses they thought causes pollution of local creeks. A summary of the results, as shown in Figure 14, indicates a large increase from 2008 to 2009 in the percentage of respondents that correctly identified pollutants in almost every response choice.

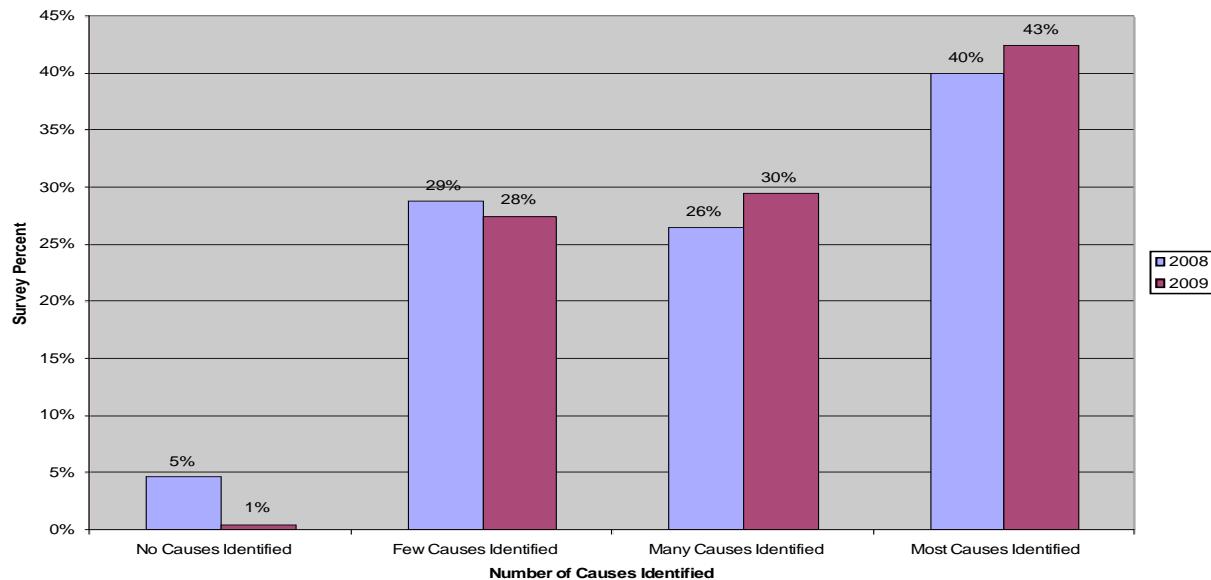
Figure 14: Percentage of Respondents Correctly Identifying Causes of Creek Pollution



Each of these response choices were expressly targeted in the broadcast media messages and indirectly targeted in the public art, public events, and BMP handouts. Over three-fourths (77 percent) of the respondents correctly identified fertilizer, pesticides, cigarette butts, automobile fluids and lawn clippings as pollutants. Almost two-thirds of the respondents identified pet waste as a pollutant. Over 70 percent of the respondents continued to identify cleaning products and 40 percent identified soil as causes of creek pollution.

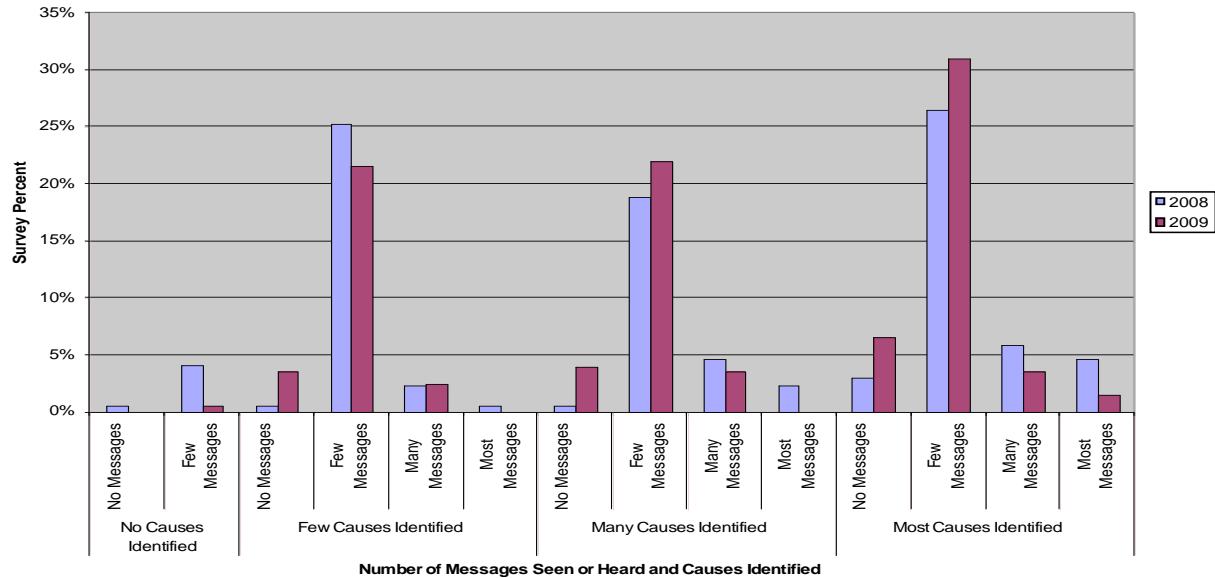
Another way to view respondent knowledge of pollutants is to examine the number of items correctly identified in q3. Figure 15 shows a notable drop, from 5 percent to 1 percent, of the respondents that were *unable* to identify any of the items from the list as pollutants. Almost all the respondents were able to identify at least a few items, whereas 43 percent of the respondents were able to identify most if not all of the items as pollutants. Both the categories of Many (4-6 causes) and Most (7-9 causes) showed increases from 2008 to 2009. This suggests that the respondents in the 2009 survey were more knowledgeable about causes of creek pollution than those in the 2008 survey.

Figure 15: Number of Causes of Creek Pollution Identified Correctly



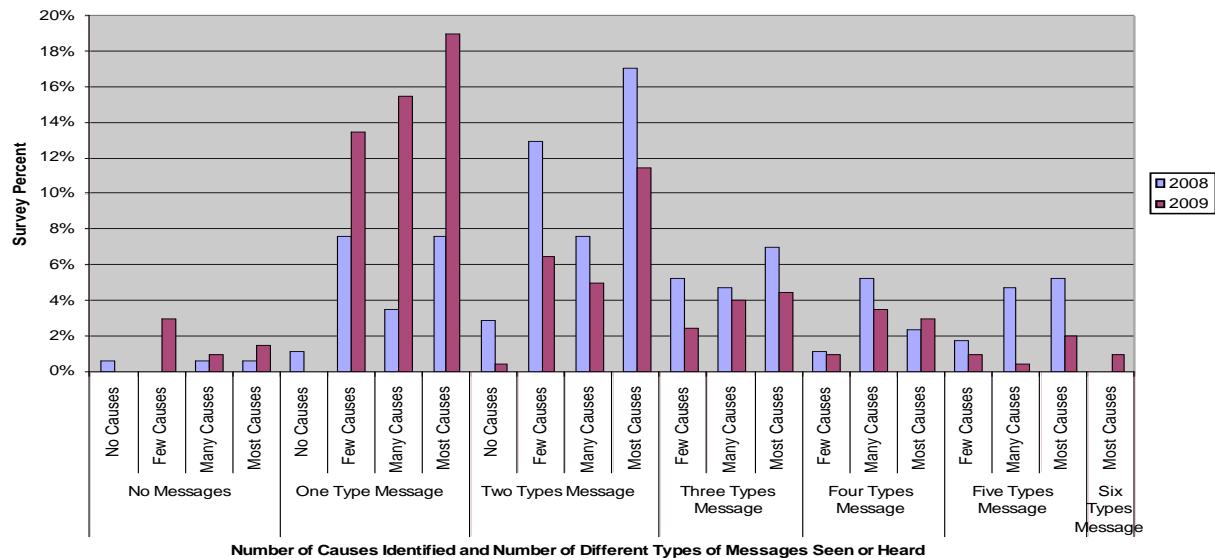
Educational messages and knowledge of causes. One way to indirectly examine the impact of exposure to outreach messages is to check the relationship between knowledge and exposure. Using cross tabulation, Figure 16 shows the relationship between q3 (knowledge) and q10 (2008) and q6 (2009) (messages). Among the 2009 respondents who reported seeing or hearing a few messages (1-3 reported), also can identify a few causes (22 percent), many causes (22 percent), and most causes (31 percent). There is a notable increase in the percentage in respondents who can identify many and most causes in 2009. Given that all these causes of creek pollution were direct and indirect targets of a variety of outreach messages, particularly of the television and radio media “blasts” just prior to administering the survey, the results suggest that the outreach messages have been and continue to be important educational and knowledge building tools in the community.

Figure 16: Exposure to Messages and Knowledge of Creek Pollution Causes



Finally, because it appears that just a few messages have had a very efficient and effective impacts on respond knowledge of creek pollution, Figure 17 show the cross-tabular relationship between how many types of messages respondents reported having seen or heard and how many causes they were able to correctly identify.

Figure 17: Percentage of Respondents Identifying Causes By Number of Different Message Types Seen or Heard



As suggested earlier, one type of message, usually television, booths at public events, and the storm drain markers, is associated with high levels of respondent knowledge about run-off and creek pollution. The data shows that one type of message is associated with 2009 respondents' who know a few causes (14 percent), many causes (16 percent), and most causes (19 percent). Markedly, the percentage of respondents who reported hearing or seeing the messages recently and who cannot identify any causes is nearly nonexistent in the 2009 survey. Without a doubt,

the outreach messages are creating a meaningful and durable knowledge base within the community.

Direct and Indirect Measure of Behavior Changes

The primary goal of the previous and current outreach programs was to promote best management practices (BMP) for preventing urban runoff, particularly by changing behavior through educating the public so that their behavioral choices are consistent with these practices. The survey included three questions which directly or indirectly identify respondent behaviors that exhibit best management practices. These questions include:

(q4) Do you consider the weather forecast before applying or having someone apply pesticides and fertilizers to your lawn, garden, or outside plants?

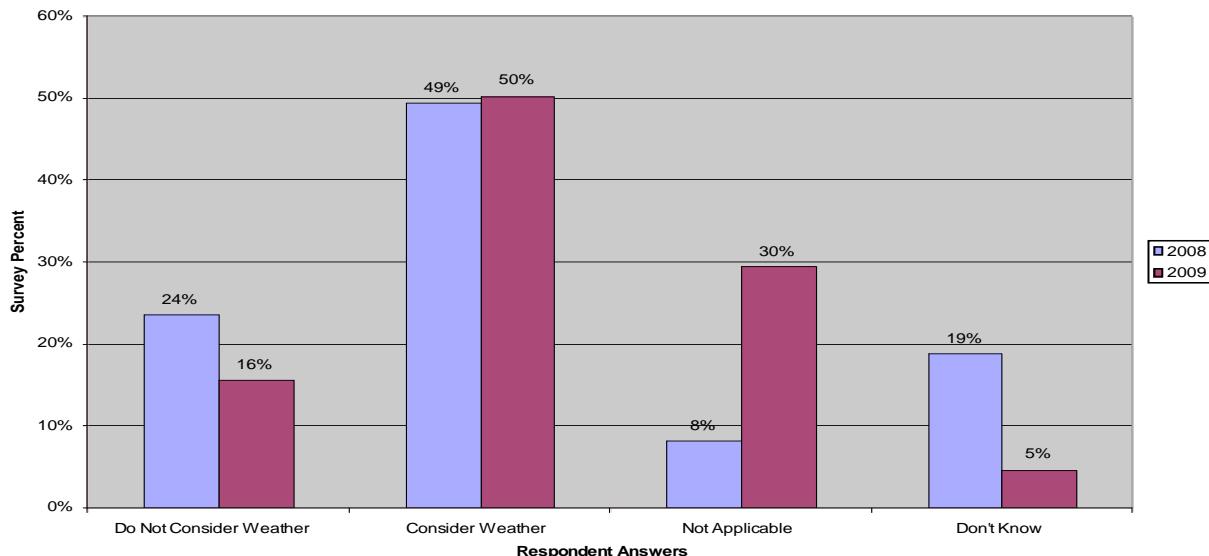
2008 (q5) Where do you wash your motor vehicle, lawn mower, camper, and/or RV? (Check all that apply)

*2009 (q5) Where do you wash your motor vehicle, lawn mower, camper, and/or RV **most of the time?***

(2008 q13) (2009 q7) Which of the following activities have you changed as a result of local messages about protecting our creeks and streams from water pollution within the past year? (Check all that apply)

Checking the weather. Proper use of pesticides and fertilizers has been the target of Broadcast Media outreach and of some public event outreach messages. One direct measure of whether behavior is consistent with BMPs is if the respondent checks the weather before applying lawn and garden care chemicals to minimize potential pollution through runoff due to rain (q4). As Figure 18 shows, half (50 percent) of all 2009 respondents of the respondents acknowledge that they checked the weather forecast before applying plant chemicals.

Figure 18: Percentage of Respondents Who consider the Weather Before Applying Chemicals



Only 16 percent of the 2009 respondents do not check the weather, which is down from 24 percent in 2008. Interestingly, the percentage of respondents who answered *Not Applicable* increased appreciably; this may be an indicator of a shift in housing choices, given that only home dwellers have lawns and gardens. Also of note, is the large decline in those respondents answering *Don't Know*, from 19 percent to 5 percent in 2009. This indicates that more respondents are demonstrating BMPs regarding use of fertilizers and pesticides in 2008 than 2009, and more are knowledgeable about the need to do so.

Washing vehicles. Run-off pollution from car washing (soap as a pollutant) has been the focus of a variety of high profile outreach messages, including Broadcast Media, Print Media, Public Art (posters and murals), and Public Events (especially the booths). Another direct measure of the effectiveness of these outreach messages in achieving BMPs is whether respondents are avoiding washing their vehicles where runoff could end up in the creeks through the gutters, as measured through q5 responses. As noted earlier, q5 was asked differently in 2008 with *Check all that apply* but in 2009 respondents were asked to choose one method they use **most of the time**. As seen in Figure 19a many 2008 respondents used the street (11 percent) or driveway (49 percent) to wash their vehicles; 35 percent of the respondents reported using a carwash, and only 13 percent reported using the lawn. In 2009 (Figure 19b), 37 percent of respondents reported using the driveway but only 4 percent use the street to wash their cars. While the survey data from 2008 and 2009 cannot be compared due to question wording differences, there appears to be a larger percentage of respondents who use carwashes (41 percent). Although respondents were not asked to provide additional methods, many treated the question as though it was a *Check all that apply* format.

Figure 19a: 2008 Where Respondents Wash Their Vehicles

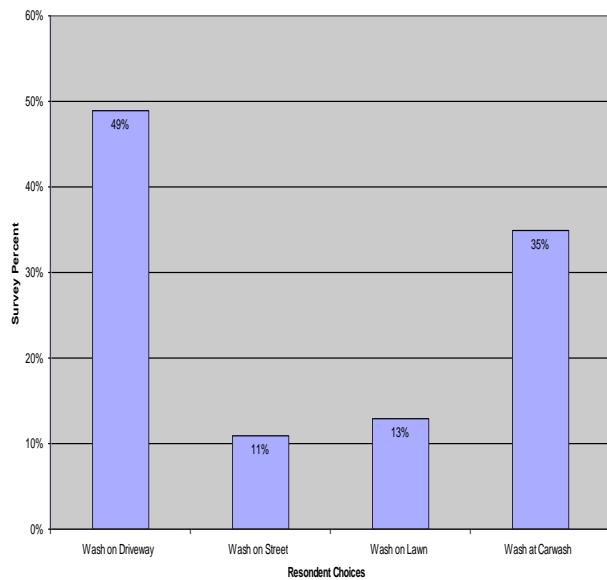
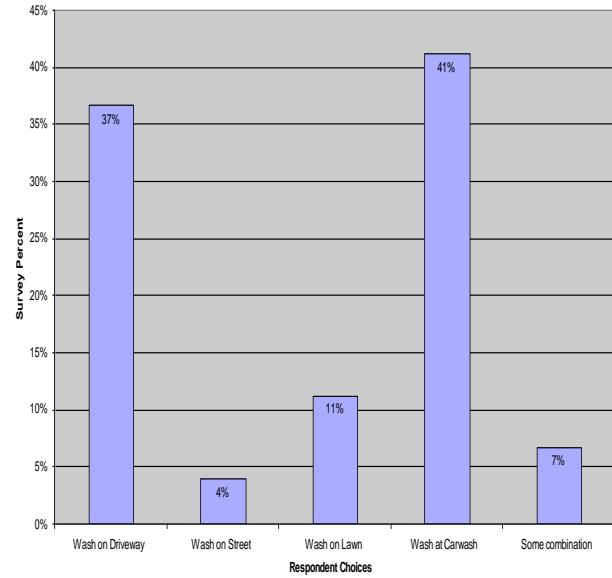


Figure 19b: 2009 Where Respondents Wash Their Vehicles



The reason the question was changed from 2008 was to force respondents into identifying which method they use the most. Clearly, many respondents use a combination of methods. Given the focus of the outreach messages on using the lawn and carwashes as best management practices, it is expected that the percentage of exclusive use of these places would be higher; it was neither in 2008 nor 2009. Perhaps the question should be divided into two parts where the first part asks

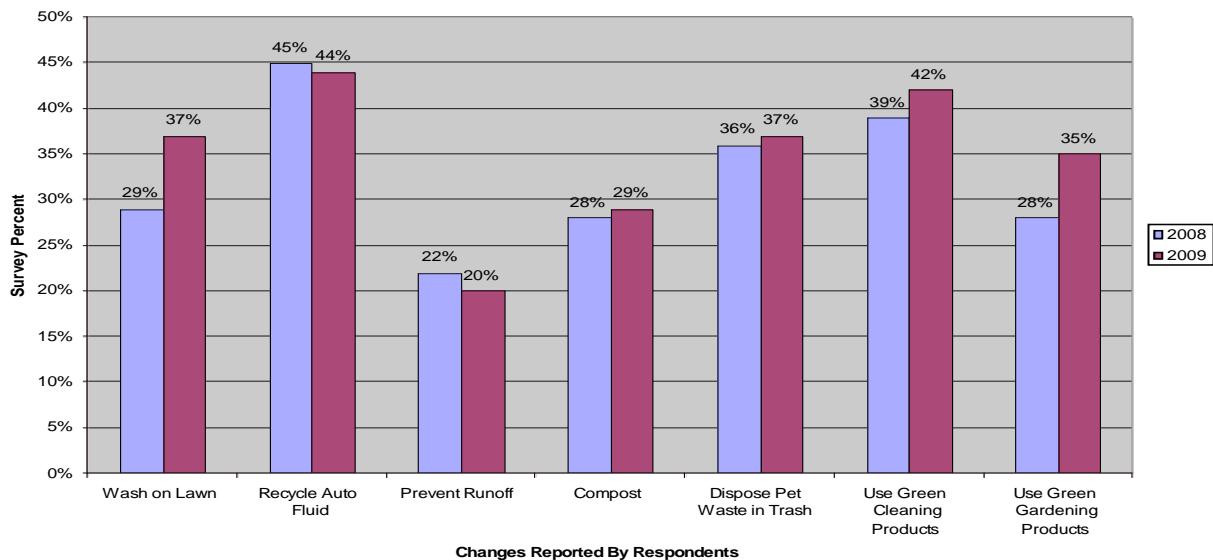
respondents where they wash their vehicles most of the time, and then the second part asks respondents to report where else they wash their vehicles.

Identified changes in behavior. Questions q13 in 2008 and q7 in 2009 require the respondent to identify changes in their practices occurring after they viewed or heard messages. In 2008, prior to answering the q13, respondents were asked if they have made changes in activities after view any message about local water pollution and 49 percent of the respondents answered yes. In 2009, respondents were given the question in the negative as a choice toward the end after a 13 item list of activities that were changed in q7. The choice to check or not *I did not make any changes*; only **10 percent of the survey respondents said they did not make any changes**, which implies that 90 percent of the respondents in 2009 made changes. While these two questions are clearly not comparable because of question placement and question wording differences, it is suggestive that most respondents made changes in their activities after hearing or seeing messages about causes of local creek pollution.

Questions 13 (in 2008) and question 7 (in 2009) ask respondents to identify changes in activities or practices they made after hearing or seeing local messages about creek pollution from a provided list; they were asked to check all that apply to them. In 2008, the list was somewhat random, and not grouped into any particular categories or order. Both new practices and curtailed bad practices were listed together. To determine the difference between new positive behaviors and negative behaviors no longer practiced, in 2009 the list of activities were reorganized along **Now I do** (new practices) and **Now I do not** (behaviors no longer practiced). The descriptions of the activities stayed the same for the most part, with a few grammatical changes in a few of the items in the list. One descriptive word change, from *environmentally-friendly* to *green*, was made to more closely mirror popular culture terminology.

As seen in Figure 20a, increases in the percentage of respondents reporting that they now use BMPs as a result of local messages about water pollution are exhibited in all but one activity. In 2009, a greater percentage of the respondents indicate that they wash vehicles on the lawn, prevent run-off, compost, dispose of pet waste in the trash, and use green gardening or cleaning products.

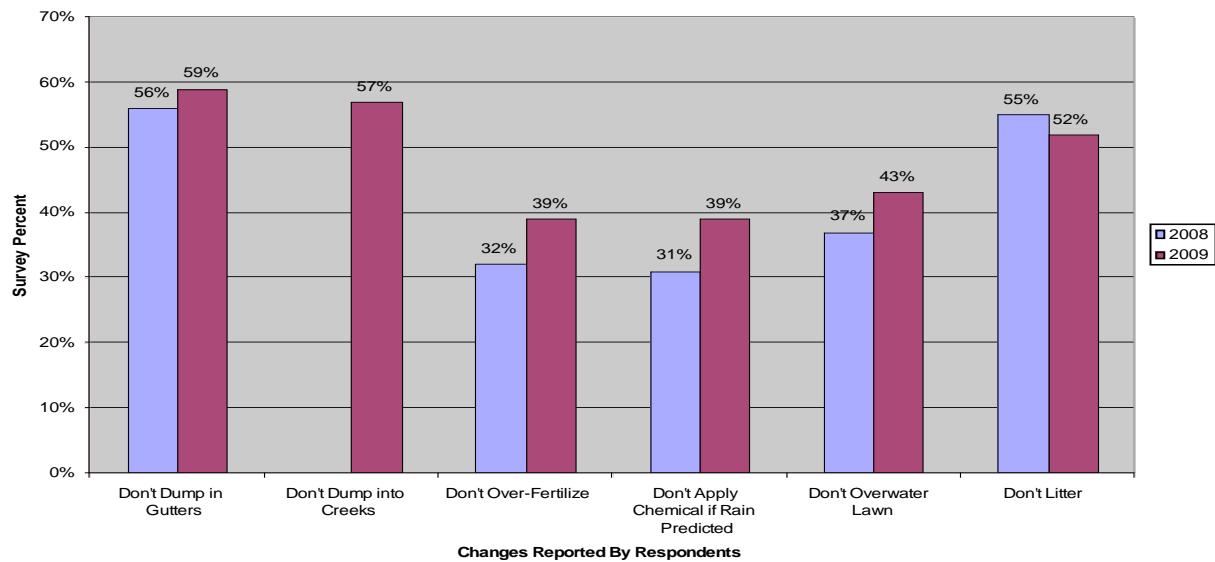
**Figure 20a: Self-Reported Changes As Result of Educational Messages:
Activities Respondent Does Now As A Result of Outreach Messages**



The greatest increases are found in the percentage of respondents who now wash their vehicles on the lawn (37 percent) and those who now use green gardening products (35 percent). This is particularly encouraging because fertilizers, pesticides, and vehicle washing were primary targets of most of the outreach messages. Clearly, the past and present outreach messages have resulted in self-reported changes in how respondents handle household, yard, and auto care pollutants which could result in runoff pollution of local creeks and streams.

Likewise, respondents also self-reported that they have also changed practices that cause pollution. A greater percentage of 2009 respondents (ranging from 39 percent to 59 percent) report that they *Do Not*, as a result of local messages about pollution, dump in gutters, over-fertilize, apply chemical if rain is predicted, or over-water lawns. The response *Dump anything into creeks or streams* was not in the 2008 survey. A lower percentage in 2009 report that they *Don't Litter* but that is somewhat understandable, given that admonitions against littering are well-founded within American culture and many respondents may have already chosen not to litter prior to hearing or seeing outreach messages about littering.

**Figure 20b: Self-Reported Changes As Result of Educational Messages:
Activities Respondent Does Not Do Now As A Result of Outreach Messages**

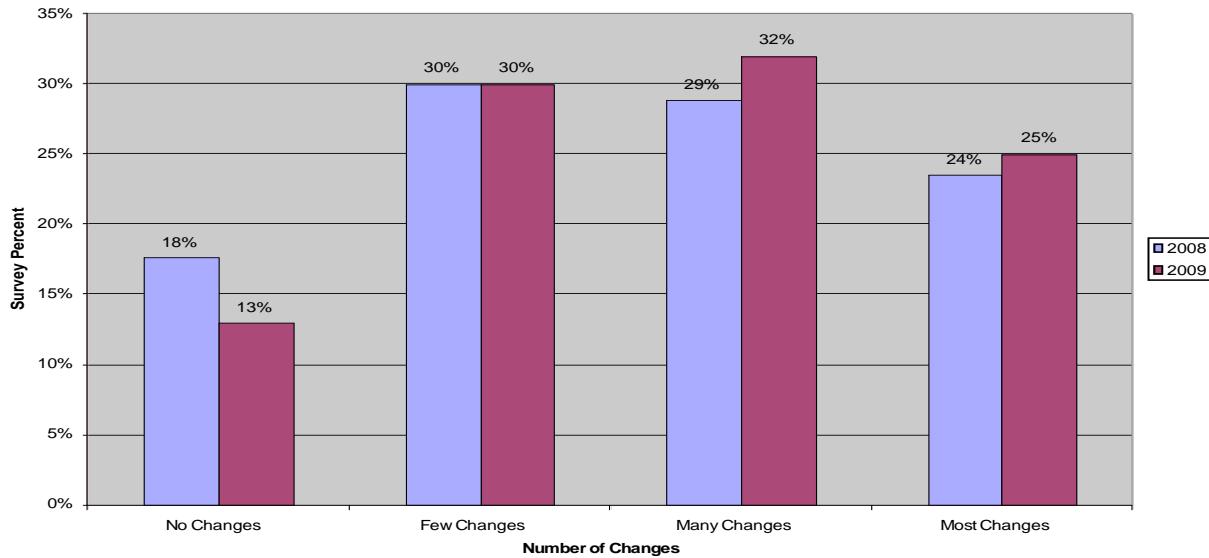


It might be expected that the percentage of the respondents who acknowledge changing to good habits or breaking old habits should be higher; and indeed it could be. One problem that is not immediately apparent but could be depressing the percentage of those who embrace BMPs is that the question does not distinguish between those who have the opportunity to change their activities, and those who do not. More specifically, respondents who do not own vehicles, have a lawn, have a pet, have a garden, or smoke would only be able to choose changes involving green cleaning products, dumping (gutters or creeks), and littering with trash. Alternatively, the question does not provide an opportunity for those who already engage in BMPs to indicate that they already use these practices. This situation provides such a respondent the choice of not marking these or saying they do these activities now when in fact, they already did them prior to hearing or seeing messages. The question clarity might be improved by providing the options of *Not Apply* and *Already Do or Never Did* (respectively) so that the survey responses can be clearly identified for respondent changes when such changes can be made.

Further examination of the data suggests that more respondents in 2009 claim to have made at least one change as a result of local pollution messages than in 2008. Figure 21 shows

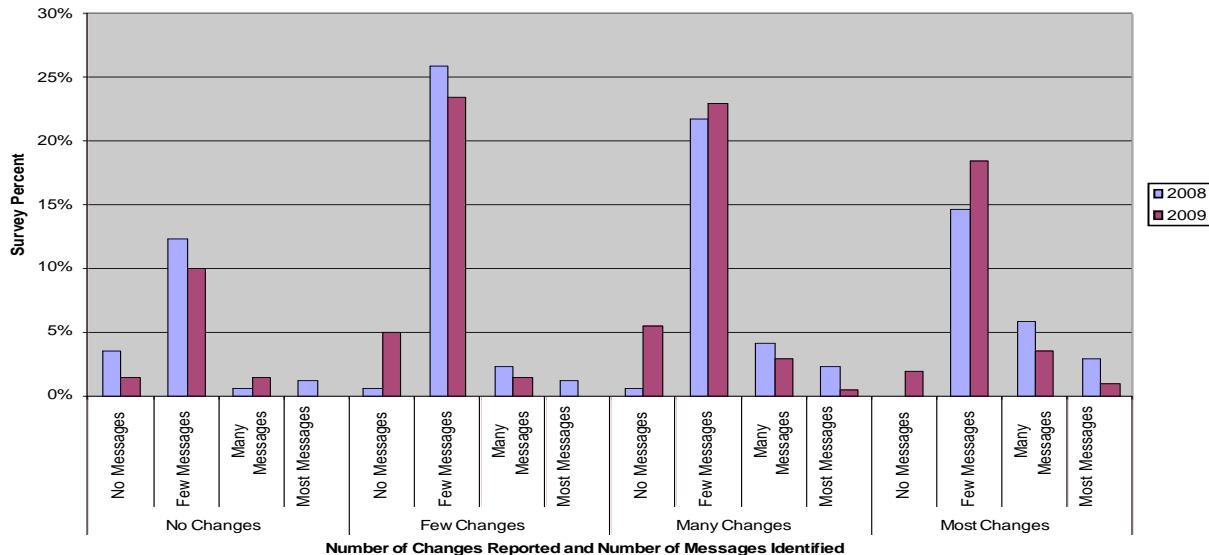
that in 2009 only 13 percent of the respondents report no changes, while 30 percent report 1-3 changes, 32 percent report 4-7 changes, and 25 percent report 8-13 changes in the direction of the outreach messages. These data show that 87 percent of the respondents report changes in the direction of the outreach messages regarding BMPs for prevention of pollution.

Figure 21: Percentage of Respondents Reporting Changes After Seeing or Hearing Messages



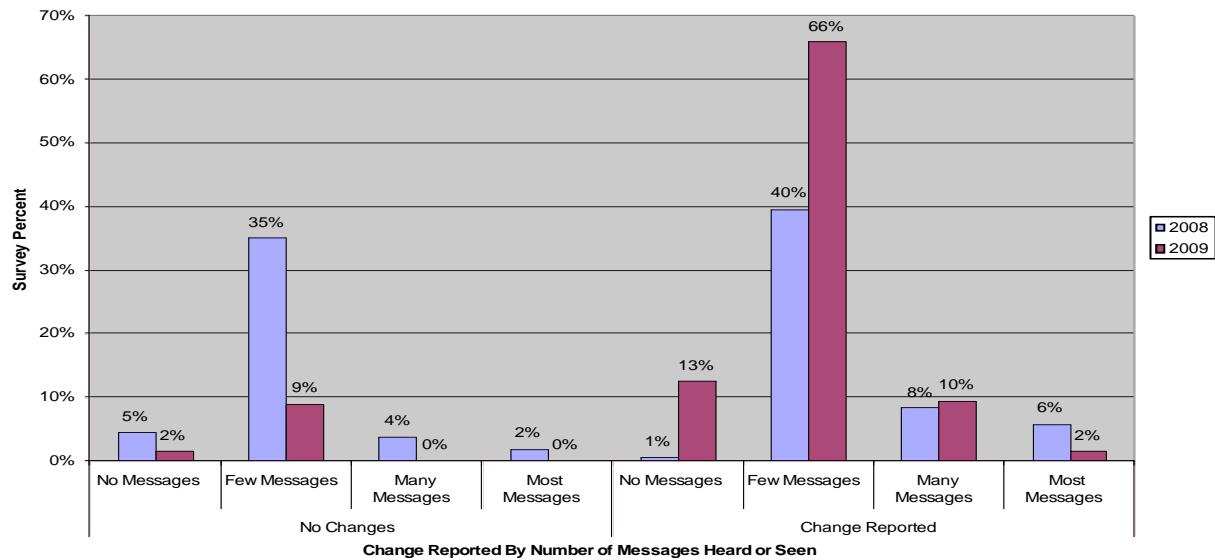
In a final examination of the veracity of the self-identified changes, Figures 22-24 shows the strong relationship between exposure to outreach messages (2008 q10) (2009 q6) and self-reported changes as a result of viewing those messages (2008 q13) (2009 q7). Figure 22 shows that 24 percent of those making 1-3 changes, 23 percent of those making 4-6 changes, and 19 percent of those making 8-13 changes also identified 1-3 messages in 2009. The percentage of respondents making *Many* and *Most* changes increased in 2009 from just a *Few* messages, while the percentage of those reporting no changes declined notably.

Figure 22: Percentage of Respondents By Number of Messages Identified and Number of Changes Reported



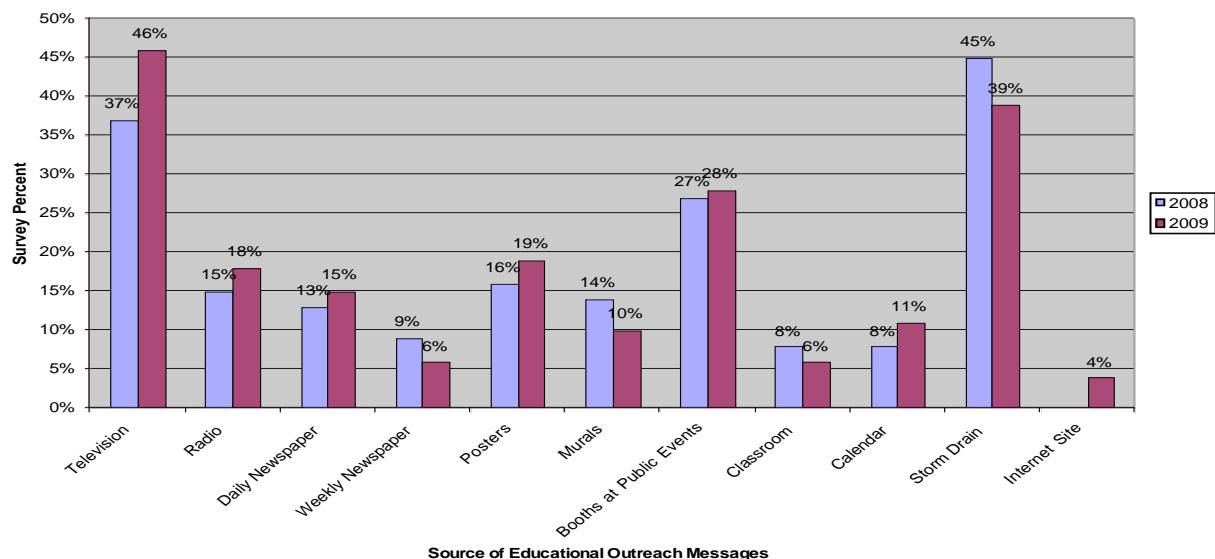
More specifically, according to the results in Figure 23, the percentage of respondents reporting making any changes at all increased from 40 percent in 2008 to 66 percent in 2009 for those respondents who identified having seen or heard only a few messages about protecting local creeks and streams.

Figure 23: Percentage of Respondents Reporting Change in Behavior After Hearing or Seeing Messages



More specifically and interestingly, among the types of messages heard or seen recently that are related to self-reported changes in behavior, the results in Figure 24 shows increases in the percentage of respondents reporting having made at least one change and who also reported having recently seen or heard outreach messages on television, radio, daily newspapers, posters, public events, and calendars. Nearly half of these respondents said they saw or heard television commercials, while 28 percent identified booths at public events.

Figure 24: Percentage of Respondents Who Reported Change By Source of Messages Reported Seen or Heard Recently



The storm drain markers, while showing a slight decrease (probably due to question placement as discussed earlier), still exhibit a strong presence, 39 percent. Ironically, despite that no ads were placed in daily newspapers, it seems that local news coverage of the outreach activities at public events is associated with those respondents who self-reported making positive changes to BMPs. Interestingly, while ads were placed in the weekly newspapers, the messages accessed on the Internet site (4 percent) are almost as strongly related as the messages in the weekly newspapers (6 percent) to those respondents who identified at least one change.

As noted earlier, the percentage of respondents having seen or heard any of the outreach messages may be depressed due to the inclusion of the word *recently* in the question. The question about changes made (q7) does not constrain respondents to their interpretation what is defined as *recent*; the question only limits the respondent to *within the past year*. Still, even that limitation may depress responses to murals and storm drain markers, which were placed in the community almost three years ago. As such, even given the possibility that the data may be a bit depressed due to time context ambiguities, the data in Figure 24 strongly supports the assertion that educational outreach activities are associated with not only increased public knowledge (Figures 14-17), but also with positive behavioral changes embracing the BMPs promoted by these messages, particularly those involving television commercials and booths at public events.

CONCLUSION

The purpose of the 2009 Storm Water Management Public Knowledge Survey was to provide an indicator of the veracity and durability of current and past educational outreach efforts for promoting best management practices for the prevention of urban runoff pollution. Although the results cannot be compared to 2005 and 2007 cross-sectional survey results, analysis of the 2008 and 2009 convenience survey results validates the conclusion from those studies that the educational outreach program has been highly efficient and effective in increasing the Chico community's knowledge base and support for best management practices for reducing and preventing urban run-off pollution of local waterways. A comparative of the 2008 and 2009 survey data suggest the educational outreach program has been and continues to be highly effective in improving awareness, increasing knowledge, and changing behavior consistent with best management practices for preventing pollution of waterways through the storm drain system from household, yard, and garden runoff. In particular, the data indicate a strong relationship between knowledge of causes of local creek pollution and exposure to past or current outreach activities. The 2009 survey results strongly support the effectiveness of timely outreach message placement, particularly through television commercials and booths at public events, as mediums for not only enhancing public knowledge about the causes of local waterway pollution, but also for stimulating changes in behavior that embrace best management practices for handling materials that contribute to water pollution through urban run-off.

While the survey provides an indication of the veracity of the outreach results, there are a few ways it can be improved for future monitoring. First, questions regarding issues particular to housing with yards, to owning pets, to having vehicles, parenting status, etc should include a response option of *Not applicable, Do not have (yard, etc)*. This should help distinguish between respondents who have the opportunity to utilize BMPs and those for whom the issues are irrelevant. Second, questions about outreach messages should give respondents a clear time period as well as an opportunity to acknowledge seeing or hearing the messages outside the time period. Given that some of the public art (murals and posters) and Storm Drain Markers have been fixtures within the community for over three years, it is reasonable that some outreach messages may have had an impact prior to the current year's outreach program activities. Giving the respondent an opportunity to recognize current and past outreach messages allows for an

examination of the longevity of those messages within the community. Third, q5 on where vehicles are washed should probably be a two-part question, where the respondents are asked what method they use most and then the respondents are asked if there is another method they use in addition. That will provide the opportunity for determining what methods are predominate, while satisfying the respondent's need for full disclosure of all the methods they use.

Finally, the modifications from 2008 to the 2009 survey format reduced the survey from two pages to one page by eliminating questions that could be confusing or perceived as redundant. This made the survey implementation easier; however, to create the suggested clarity in the question responses, such changes may lengthen the survey. Lengthening the survey not only increases the time it takes to fill-out the survey (thereby reducing its attractiveness to potential respondents) but also doubles the paper used to produce the survey. One way to solve both problems is to create a paperless survey through the use of e-surveys or web survey on laptops. Using a survey software program, such as *Survey Monkey*, set-up on two mini-laptops secured to the booth table, respondents could take the survey on the computers, eliminating the paper copy as well as solving the length problem (they will not see the length). To ensure an accessible survey tool, a number of paper copies can be held in reserve for individuals who are not interested in taking the survey using the computer, or for possible computer glitches that can and do occur with all computers and software programs at one time or another.

As complementary these benefits, using survey software can provide variety secondary benefits to enhance the quality of the date collected. First, using an e-survey will reduce recording errors due to respondents selecting more than one response when only one is expected. In addition to being more environmentally friendly, the e-survey will also reduce data entry errors which often occur in hand-entered data. If desired, an e-survey can also be used to expand the survey field from public events such as fairs and shows, to those who visit the website or experience the messages in other media forums. For fair or show attendees too busy to stop and take the survey, the survey can be sent electronically to a PDA, iPhone, or email address. Further, the survey could be launched at different times and the public could be encouraged in outreach messages to take the survey. Most web or e-survey software contains a confirmation response; to induce potential respondents to take the survey, coupon give-aways from local commercial vendors could be provided upon completion of the survey in that confirmation response. Finally, the web or e-survey can be produced in several languages; notably it is necessary to have the survey in English, but having the survey available in Spanish will diversify the respondents and be more reflective of the Chico population.

In sum, the 2009 survey, confirms the veracity and durability of the educational outreach activities by showing clear and convincing evidence that the activities impact knowledge, awareness, and behavior of those respondents exposed to these messages. The data also indicate a strong relationship between exposure to past or current outreach activities and self-reported changes in handling of household, yard, and garden waste. In particular, highly visual outreach activities, particularly television commercials, booths at public events, and storm drain markers are independently associated with knowledge and awareness of runoff issues.

APPENDIX A: OUTREACH MATERIALS DESCRIPTION AND TARGETS

TV Commercials – There are 3 commercials. One addresses related landscaping pollution causes, such as fertilizers and pesticides. The other addresses auto fluids, and the third one address general pollutants, such as litter, pet waste, car washing (soap, etc.). The commercials are broadcast in Spanish and English.

Radio Commercial – There is one radio commercial that addresses general pollutants, such as litter, cigarette butts, pet waste, car washing (soap, etc.). It is broadcast in Spanish and English.

Daily/weekly newspaper ads – General message (with image of car wash wastewater draining into the gutter). We have one ad that specifically targets the cigarette butt issue, “Keep your butt out of the gutter.” This ad also includes the general message, “Water that flows into the gutters drains directly to the creeks.”

Daily/weekly newspaper articles – We frequently benefit from articles that cover various topics (calendar project – which includes the general messages such as, “Water that flows into the gutters drains directly to the creeks” and “If it isn’t rainwater, it doesn’t belong in the gutter.”

Posters – 4 posters – Three of the posters contain the general messages with image of car wash wastewater draining into the gutter, image of oil spill on 1-Mile Big Chico Creek swimming area, and image of landscaping tools and toad in the back of work truck. One of the posters targets the cigarette butte issue and reads, “Keep your butt out of the gutter,” and “Water that flows into the gutters drains directly to the creeks.”

Murals – There is only mural remaining in downtown Chico. It conveys the general message of “Thank you for keeping Chico’s clean! Water in the gutters drains directly to the creeks.”

Booth at a public event – I convey ALL of the messages at the booth, but my main message is, “Water that flows into the gutters drains directly to the creeks.”

Information from 3rd Grade Classroom outreach - I convey ALL of the messages in the classroom presentations, but my main message is, “Water that flows into the gutters drains directly to the creeks.” The students receive calendars and detailed information regarding potential pollutants, litter, cigarette butts, pet waste, car washing (soap, etc.), fertilizers and pesticides.

Chico Clean Creeks Calendar – The outreach information is comprehensive and includes inspirational images of beautiful local urban creek scenes. Creek Watch Hotline information is listed in the calendar. The calendar refers readers to additional information sources for those who choose to educate themselves further. It also provides information on all of the City storm water management programs, such as the Clean Water Business Partnership Program and the Clean Creeks in the Classroom Program.

Internet website www.keepchicoclean.org - The website is comprehensive and includes images of all of the outreach programs, outreach materials downloads, TV and radio commercials in Quick Time files, Clean Water Business Partnership Program surveys and pledges, Creek Watch Hotline information for reporting illegal dumping, links to the Butte County Storm Water Management Program online. The website includes links to other sites that provide additional information for those who choose to educate themselves further.

Storm Drain Markers – The markers convey the simple message, “No Dumping – Drains to Creek.”

APPENDIX B: 2009 CONVENIENCE SURVEY

Thank you for participating in the City of Chico's survey on water pollution in our area. You are the solution to pollution!

1) In your opinion, where does most of the *runoff water* from your yard, gutter, street, or road end up?

- | | |
|--|--|
| <input type="checkbox"/> the city sewage treatment plant | <input type="checkbox"/> outlying farmland |
| <input type="checkbox"/> local creeks and streams | <input type="checkbox"/> a septic tank |
| <input type="checkbox"/> other _____ (please specify) | <input type="checkbox"/> Don't know |

2) In your opinion, where does most of the *waste water* from flushed toilets, kitchen sink, and bathtub drainage end up?

- | | |
|--|--|
| <input type="checkbox"/> the city sewage treatment plant | <input type="checkbox"/> outlying farmland |
| <input type="checkbox"/> local creeks and streams | <input type="checkbox"/> a septic tank |
| <input type="checkbox"/> other _____ (please specify) | <input type="checkbox"/> Don't know |

3) Which of the following do you think causes pollution of our local creeks? (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Fertilizer | <input type="checkbox"/> Pesticides |
| <input type="checkbox"/> Cigarette butts | <input type="checkbox"/> Pet waste |
| <input type="checkbox"/> Cleaning products | <input type="checkbox"/> Automobile fluids |
| <input type="checkbox"/> Soil | <input type="checkbox"/> Lawn clippings (green waste) |
| <input type="checkbox"/> Other _____ (please specify) | |

4) Do you consider the weather forecast before applying or having someone apply pesticides and fertilizers to your lawn, garden, or outside plants?

- | | | | |
|------------------------------|-----------------------------|-------------------------------------|--|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't know | <input type="checkbox"/> Doesn't apply |
|------------------------------|-----------------------------|-------------------------------------|--|

5) Where do you wash your motor vehicle, lawn mower, camper, and/or RV *most of the time*?

- | | |
|---|--|
| <input type="checkbox"/> On the driveway | <input type="checkbox"/> On the street |
| <input type="checkbox"/> On the lawn | <input type="checkbox"/> Commercial car wash |
| <input type="checkbox"/> Other _____ (please specify) | <input type="checkbox"/> Doesn't apply |

6) Which of the following messages about keeping our gutters and local creeks free from pollution (such as litter, auto fluids, pet waste, fertilizer, and/or pesticides) did you hear or see recently? (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Television commercial | <input type="checkbox"/> Radio commercial |
| <input type="checkbox"/> Daily newspaper ads | <input type="checkbox"/> Weekly newspapers ads |
| <input type="checkbox"/> Posters | <input type="checkbox"/> Murals (downtown Chico) |
| <input type="checkbox"/> Booth at a public event | <input type="checkbox"/> Information from my child's classroom |
| <input type="checkbox"/> Chico Clean Creeks Calendar | <input type="checkbox"/> Internet site (www.keepchicoclean.org) |
| <input type="checkbox"/> Storm drain markers with messages "No Dumping, Drains to Creek?" | <input type="checkbox"/> Other _____ (please specify) |

7) Which of the following activities have you changed as a result of local messages about protecting our creeks and streams from water pollution within the past year? (Check all that apply)

Now I do:

- Wash my vehicle on lawn or car wash.
- Recycle used automobile fluid.
- Prevent runoff from the lawn.
- Compost or mulch lawn-clippings.
- Dispose of pet waste in the trashcan.
- Use *green* cleaning products.
- Use *green* gardening methods.
- Other _____ (please specify)

Now I do not:

- Dump anything into gutters or drains.
- Dump anything into creeks or streams.
- Over-fertilize my lawn.
- Apply fertilizer or pesticides when rain is predicted.
- Over-water my lawn.
- Litter (e.g. cigarette butts and/or trash)
- Other _____ (please specify)

I did not hear or see any messages

I did not make any changes

8) What is your zip code? _____

APPENDIX C: 2008-2009 CONVENIENCE SURVEY CODEBOOK

2008 & 2009 Chico Clean Creeks Convenience Surveys: Complete Codebook for Merged Data
 By
 Diane E. Schmidt

Thank you for participating in the City of Chico's survey on water pollution in our area. You are the solution to pollution!

Revised Case Id (unique case number for merged data)

Case Id (original to 2008 and 2009)

Survey (either 2008 or 2009)

q1. In your opinion, where does most of the *runoff* water from your yard, gutter, street, or road end up?

1 € the city sewage treatment plant

2 € local creeks and streams

3 € outlying farmland

4 € a septic tank

77 € other _____

88 € Don't know

99 € No answer

q1-77 € (text specified) Type exactly as written

- all of the above
- city sewage & local creeks and streams
- city sewage & local creeks and streams, outlying farmland and septic tank
- depends on the town
- drains into unpaved area along curb
- ground
- in our yard
- irrigation ditch
- local creeks & essentially the ocean
- local creeks & lindo channel
- local creeks & outlying farmland
- no runoff
- plant, streams, farmland
- river
- Sacramento river
- soak in
- underground (lives in rural area and goes back into groundwater)
- water table
- we collect

q2. In your opinion, where does most of the *waste* water from flushed toilets, kitchen sink, and bathtub drainage end up?

1 € the city sewage treatment plant

2 € local creeks and streams

3 € outlying farmland

4 € a septic tank

77 € other _____ (please specify)

88 € Don't know

99 € No answer

q2-77 € (text specified) Type exactly as written

- all of the above
- city
- city sewage & local creeks and streams and outlying farmland
- city sewage & local creeks and streams and septic tank
- city sewage & local creeks and streams, outlying farmland and septic tank
- city sewage & septic tank
- grey water
- local creeks & septic tank
- local creeks septic tank
- plant and septic
- plant and streams
- Sacramento River
- septic tank

q3. Which of the following do you think causes pollution of our local creeks? (Check all that apply) (Each recoded to 0=not checked, 1=checked except q3-77 which is the specified message).

q3-1 € Fertilizer

q3-2 € Pesticides

q3-3 € Cigarette butts

q3-4 € Pet waste

q3-5 € Cleaning products

q3-6 € Automobile fluids

q3-7 € Soil

q3-8 € Lawn clippings (green waste)

q3-77 € Other _____ (please specify)

q3-77 (text specified) Type exactly as written

- all the above
- animal farmland runoff
- beer bottles/trash
- boat
- cans / bottles
- cars
- everything
- garbage
- grey water
- hospital waste
- human waste
- junk
- leaky septic
- litter
- most of the above
- motor oil
- oil
- parties
- people

- pollution
- rain and waste runoff
- smog
- toxic waste
- trash
- urine
- walmart
- yard waste

q3-88 € Don't know

q3-99 € No answer

q3sum. Which of the following do you think causes pollution of our local creeks? (Summary of all checked in q3 from q3-1 to q3-77). 0-9 causes.

q3sum recode: index of causes identified in q3sum.

- 0) € No causes identified
- 1) € Few causes identified (1-3)
- 2) € Many causes identified (4-6)
- 3) € Most causes identified (7-9)

q4. Do you consider the weather forecast before applying or having someone apply pesticides and fertilizers to your lawn, garden, or outside plants?

0 € No

1 € Yes

66 € Not applicable

77 € Other _____ (please specify)

88 € Don't know

99 € No answer

q4-77 € (text specified) Type exactly as written

- don't use those products
- no chemicals
- sun burning grass
- use no chemicals

2008 q5. Where do you wash your motor vehicle, lawn mower, camper, and/or RV? (Check all that apply). (Each recoded to 0=not checked, 1=checked except q5-77 which is the specified place).

q5-1) € On the driveway

q5-2) € On the street

q5-3) € On the lawn

q5-4) € Commercial car wash

q5-5) € Don't have a motor vehicle, lawn mower, camper, or RV

q5-77) € Other _____ (please specify)

q5-77 (text specified)

- gravel
- gravel pasture
- none of the above
- we don't

q5-88) € Don't know

q5-99) € No answer

2009 q5. Where do you wash your motor vehicle, lawn mower, camper, and/or RV *most of the time?*

- q5-1) € On the driveway
- q5-2) € On the street
- q5-3) € On the lawn
- q5-4) € Commercial Car Wash
- q5-77) € Other _____ (please specify)
 - driveway & commercial car wash
 - driveway & on the street and commercial car wash.
 - driveway and doesn't apply
 - driveway commercial car wash
 - driveway on the lawn
 - gravel
 - in the field
 - lawn & commercial car wash
 - sink
 - street & commercial car wash

q5-88) € Don't know

q5-99) € No answer

q5-555) € Some combination, multiple answers chosen

- driveway & commercial car wash
- driveway & on the street and commercial car wash.
- driveway and doesn't apply
- driveway commercial car wash
- driveway on the lawn
- lawn & commercial car wash
- street & commercial car wash

2008 (q10) (2009) q6. Which of the following messages about keeping our gutters and local creeks free from pollution (such as litter, auto fluids, pet waste, fertilizer, and/or pesticides) did you hear or see recently? (Check all that apply)

(Each recoded to 0=not checked, 1=checked except q6-77 which is the specified message).

- 2008 q10 & 2009 q6-1 € Television commercial
- 2008 q10 & 2009 q6-2 € Radio commercial
- 2008 q10 & 2009 q6-3 € Daily Newspaper ads
- 2008 q10 & 2009 q6-4 € Weekly Newspapers ads
- 2008 q10 & 2009 q6-5) € Posters
- 2008 q10 & 2009 q6-6 € Murals (downtown Chico)
- 2008 q10 & 2009 q6-7 € Booth at a public event
- 2008 q10 & 2009 q6-8 € Information from my child's classroom
- 2008 q10 & 2009 q6-9 € Chico Clean Creeks Calendar
- 2008 q11 & 2009 q6-10 € Storm drain markers with messages "No Dumping, Drains to Creek?"**
- 2009 q6-11 € Intenet site (www.keepchicoclean.org). (*this was not in the 2008 survey*)
- 2008 q10 & 2009 q6-77 € Other _____ (please specify)
- 2008 q10 & 2009 q6-77 € (text specified) Type exactly as written
 - BEC
 - bumper sticker

- Chico Clean-up day
- dog-fite disability group
- drains
- education - BA in Parks and Rec
- educational TV
- Endangered Species Faire
- Fair
- gutters at work
- no text
- none
- none - no one cares
- none of this. No publicity.
- none, needs more media. Definitely out of sight out of mind.
- Occasional newspaper announcement
- plaques
- plaques on curbs
- refrigerator magnets
- school
- Scott Itamora
- sidewalk medallion
- sidewalks
- Silver Dollar Fair
- storm drain markers in parking lots
- storm drain sign
- street symbols
- swpp class

2008 q10 & 2009 q6-88 € Don't know

2008 q10 & 2009 q6-99 € No answer

*** The storm drain marker question in 2008 was separate from this list.*

2008 q11. Have you seen any storm drain markers with messages such as "No Dumping, Drains to Creek?"

- 1) € Yes
- 0) € No
- 88) € Don't know
- 99) € No answer

2008 q10 & 2009 q6sum. Which of the following messages about keeping our gutters and local creeks free from pollution. Summary of all checked in 2008 q10 & 2009 q6 from 2008 q10 & 2009 q6-1 to 2008 q10 & 2009 q6-77). 0-10 messages.

2008 q10 & 2009 q6sum recode: index of messages identified in 2008 q10 & 2009 q6sum.

- 2008 q10 & 2009 q6-0 ∈ No messages identified
- 2008 q10 & 2009 q6-1 ∈ Few messages identified (1-3)
- 2008 q10 & 2009 q6-2 ∈ Many messages identified (4-6)
- 2008 q10 & 2009 q6-3 ∈ Most messages identified (7-10)

2008 q10 & 2009 q6bd. Recode of 2008 q10 & 2009 q6-1 and 2008 q10 & 2009 q6-2. TV and radio commercials. 0=not checked, 1=checked.

2008 q10 & 2009 q6prnt. Recode of 2008 q10 & 2009 q6-3 and 2008 q10 & 2009 q6-4. Daily and weekly newspaper ads. 0=not checked, 1=checked.

2008 q10 & 2009 q6art. Recode of 2008 q10 & 2009 q6-5 and 2008 q10 & 2009 q6-6. Posters and Murals. 0=not checked, 1=checked.

2008 q10 & 2009 q6pe. Recode of 2008 q10 & 2009 q6-7 through 2008 q10 & 2009 q6-9. Public event, classroom, and calendar. 0=not checked, 1=checked.

2008 q11 & 2009 q6drn. Recode of 2008 q10 & 2009 q6-10. Storm drain markers. 0=not checked, 1=checked.

EOPsum. Summary of messages identified in 2008 q10 & 2009 q6bd, 2008 q10 & 2009 q6prnt, 2008 q10 & 2009 q6art, 2008 q10 & 2009 q6pe, 2008 q10 & 2009 q6drn.

- 0) ∈ No Messages marked.
- 1) ∈ One type message seen.
- 2) ∈ Two types messages seen.
- 3) ∈ Three types messages seen.
- 4) ∈ Four types messages seen.
- 5) ∈ Five types messages seen.

q7. Which of the following activities have you changed as a result of local messages about protecting our creeks and streams from water pollution within the past year? (Check all that apply) (Each recoded to 0=not checked, 1=checked except q7-77 which is the specified message).

Now I do:

2008 q10.2 ∈ Wash your vehicle on the lawn, or at a car wash, instead of in the driveway

2009 q7-1 ∈ Wash my vehicle on lawn or car wash.

2008 q10.3 ∈ Recycle used motor oil or other automobile fluid. &

2009 q7-2 ∈ Recycle used automobile fluid.

2008 q10.7 ∈ Preventing runoff from the lawn through landscaping design &

2009 q7-3 ∈ Prevent runoff from the lawn.

2008 q10.8 ∈ Composting or mulching lawn-clippings and other green waste. &

2009 q7-4 ∈ Compost or mulch lawn-clippings.

2008 q10.9 ∈ Picking up after your pet and disposing of the waste in the trashcan. &

2009 q7-5 ∈ Dispose of pet waste in the trashcan.

2008 q10.11 ∈ Use environmentally-friendly cleaning products. &

2009 q7-6 ∈ Use green cleaning products.

2008 q10.12 ∈ Use environmentally-friendly gardening methods.&

2009 q7-7 ∈ Use green gardening methods.

2009 q7a-77 ∈ Other _____(please specify)

2009 q7a-77 € (text specified) Type exactly as written

- all
- Don't use much water and no cleaning agents.
- I'm already an environmental consultant so you're preaching to the choir.
- I've always recycled.
- never did
- Not very much info to the public.
- We already do all these things
- we can no longer walk in lindo channel because of homeless campers.

2008 q13-77 € (text specified) Type exactly as written

- (Note - the word "local" was crossed out
- didn't have to care about environment
- don't get info in Paradise - Outreach would be great. We are all on septic
- live in trailer park
- n/a
- no text
- none
- none didn't do already
- use organic
- using less energy
- We already do this

Now I do not:

2008 q10.1 € Never dumping anything into gutters or storm drains &

2009 q7-8 € Dump anything into gutters or drains.

2009 q7-9 € Dump anything into creeks or streams. (*this was not in the 2008 survey*)

2008 q10. 4 € Not over-fertilizing your lawn.&

2009 q7-10 € Over-fertilize my lawn.

2008 q10.5 € Never applying fertilizers or pesticides when rain is predicted.&

2009 q7-11 € Apply fertilizer or pesticides when rain is predicted.

2008 q10.6 € Not over-watering your lawn. &

2009 q7-12 € Over-water my lawn.

2008 q10. 10 € Never littering (e.g. cigarette butts and/or general trash)&

2009 q7-13 € Litter (e.g. cigarette butts and/or trash)

2009q7b-77 € Other _____ (please specify)

2009 q7b-77 € (text specified) Type exactly as written

- never
- never did, yuck!
- never have
- take stuff to dump and hazardous waste recycling

2008 q10.99 & 2009 q7-99) € No answer

2009 q7a-0) € I did not hear or see any messages (*this was not in the 2008 survey*) (this was invalid. Only 2 respondents marked this correctly, 12 checked this box but then marked at least one of the items in the list above.)

2009 q7b-0) € I did not make any changes

2008 q12. Have you changed any of your household, yard, or automobile care activities within the past year as a result of any message about local water pollution?

- 1) € Yes
- 0) € No
- 88) € Don't know
- 99) € No answer

2008 q12 & 2009 q7b-0: Recoded but not used due to question wording differences.

- 0)= No change
- 1)= Change

2008 q13 & 2009 q7sum. Which of the following activities have you changed as a result of local messages about protecting our creeks and streams from water pollution within the past year? (Summary of all checked in q7 from 2008 q10. & 2009 q7-1 to 2008 q10. & 2009 q7-77, excluding q7-9 because it was not in the 2008 survey. 0-12 changes.

2008 q13 & 2009 q7sum recode: index of changes identified in 2008 q13 & 2009 q7sum.

- 0) € No changes identified
- 1) € Few changes identified (1-3)
- 2) € Many changes identified (4-7)
- 3) € Most changes identified (8-13)

2008 q13 & 2009 q7Change: Recode for 2008 q13 & 2009 q7 change or no change.

- 0) € No changes identified
- 1) € Changes identified

2008 q14 & 2009 q8. What is your zip code? _____

2008 q14 & 2009 q8-recode. Recoded zip code.

- 1) € Chico (95926, 95927, 95928, 95929, 95973)
- 2) € Paradise (95967, 95969)
- 3) € Oroville (95966)
- 4) € Other places