Stormwater Knowledge, Attitude and Behaviors:

A 2005 Survey of North Carolina Residents

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Acknowledgements

This survey was funded by a Section 319 Clean Water Act grant from the Environmental Protection Agency, administered by the N. C. Division of Water Quality. The instrument was developed by East Carolina University's Center for Survey Research in collaboration with the N. C. Department of Environment & Natural Resources. Data collection and analysis were performed by ECU's Center for Survey Research. The Division of Water Quality's Nonpoint Source Planning and Permitting sections, The DENR Offices of Environmental Education and Public Affairs, Drs. Bill Hunt and Deanna Osmond, North Carolina State University and Samantha Foushee, Project Manager, ECU Center for Survey Research provided special assistance. DENR's Creative Services department provided layout and composition.

Contents

1. Introduction 1
2. Literature Review 2
3. Method 8
4. Findings 9
5. Recommendations 19

Illustrations

1. Representation by County 9
2. Where Stormwater Goes 11
3. Stormwater Treatment by Gender 12
4. Grass Clippings Disposal to Storm Drains by Education 13
5. Monthly Fertilizers by Income 14
6. Soil Test by Age 14
7. Vehicle Wash Water Drains to Street or Driveway 15
8. Pet Waste Pickup by Gender 17

Maps

1. North Carolina Phase II Counties 19

Notes

Appendix A A-1
Survey Instrument

Appendix B B-1
Frequency Counts

Appendix C C-1
Cross-Tabulations

I. Water Quality C-1
II. Where Stormwater Goes C-15
III. Lawn Care C-21
IV. Vehicle Care C-37
V. Pet Waste C-51

Abstract

North Carolinians' awareness, perceptions and behaviors related to polluted stormwater runoff in North Carolina were measured using a 31-item phone survey administered in August and September of 2005. Findings indicate a slight majority perceive overall water quality in local streams, lakes and rivers as good and the greatest perceived water pollution threats are trash dumped into lakes and rivers by recreational users and the waste water from manufacturing and sewer treatment plants. Most respondents did not know that stormwater flows untreated to the closest stream, lake or river. Behaviors affecting stormwater pollution were also explored. Although slightly less than half of respondents fertilize their yards, most of them do not use a soil test to determine soil needs. Most North Carolina residents leave grass clippings on their lawns, wash their own cars and have their oil changed at commercial facilities. However, the majority of pet walkers do not dispose of pet waste properly, and small groups report dumping used oil into storm drains or onto grassy areas as well as over-applying fertilizer to their lawns.

Introduction

Stormwater runoff pollution, the dirty, untreated water resulting when rain or snow melt picks up pollutants en route to area streams, rivers or lakes, has been cited as the greatest threat to water quality in the United States. To address this problem, many states are administering the United States Environmental Protection Agency's "Phase II" federal stormwater program.

Under Phase II rules, entities that produce stormwater are regulated through permits. Permit holders are required to employ best management practices that prevent or reduce polluted stormwater runoff, conduct outreach and education, provide opportunities for public participation and perform good housekeeping practices within their own operations. The program is an extension of the Phase I National Pollution Discharge Elimination System implemented in 1990. North Carolina has issued over 100 Phase II permits to counties and cities.

Gathering baseline measures of state residents' knowledge of stormwater, their perceptions regarding water quality and the behaviors that negatively impact stormwater runoff will improve future state and local government outreach efforts. The benefits lay in knowing where to focus campaign materials and how best to frame issues for different target audiences. Additionally, the baseline levels provide a ruler by which the success of future campaigns can be assessed. Two additional, annual surveys will be administered to gather this data. The survey output will increase campaign effectiveness while providing valuable feedback on efficiency.

Literature Review

Surveys measuring pre and post campaign effectiveness are an old tool, but given stormwater's relatively new focus, they have only recently been used in this area. As a result, few comparable surveys are available for review. For this reason, the surveys used here should be considered in the broadest comparative sense. Statistically speaking, no comparisons are possible given the variety of instruments used, the times they were administered and the various vehicles used to deliver the instruments. However, anecdotal and empirical data have value – not just in the findings themselves but in the comparisons those findings make possible.

The majority of surveys were 'snapshots" in that they were only designed to be administered a single time. For this reason, trend analysis data were not widely available. All surveys gathered invaluable data, however, in that they captured different audiences' knowledge, perceptions and behaviors regarding water quality and stormwater runoff. This holds true despite the varying degrees of outreach done on polluted stormwater runoff in the communities that received surveys. North Carolina's residents have also been exposed to varying levels of stormwater outreach.

By gathering background knowledge on different states' outreach efforts, some crude reverse engineering efforts can also be made to determine the impact of specific outreach efforts. By applying lessons learned in other locations, North Carolina can avoid financial pitfalls, capitalize on others' success and, it is hoped, create the most effective and efficient stormwater outreach campaign possible for its regulated municipalities and state residents.

Threats to Water Quality

In South Carolina, a 2002 statewide phone survey showed residents perceived industry as a larger threat to water quality than cities (USC, 2002, p. 4). A 2003 survey of Tennessee residents found agriculture, automotive fluids and constructions runoff as the biggest perceived water quality threats (Gant & Daugherty, 2003, p. 8). Tennesseeans perceived a variety of commercial/industrial and individual activity as having negative impacts. Michigan's 1993 study showed Wayne County residents considered business and industry activity as having the greatest impact to local water quality (Wayne County, 1994, p. 37). Conversely, a 1998 Colorado survey revealed almost one fifth of residents do not consider automotive fluids – typically an individual waste product – as a water quality threat (ZumBrunnen, 1998, p. 2). Only Maine's 2004 survey of public employees showed an emphasis on individual activity. Respondents cited malfunctioning septic systems, automotive fluids, litter and incorrect household hazardous waste disposal as major causes of water pollution (Hoppe, 2005, p. 14).

The tendency for individuals to hold business, industry and large public enterprise responsible for water pollution is considered both a remnant of earlier outreach campaigns dating from over 20 years ago and a common human tendency to blame negative events on external sources. Twenty years ago, business, industry and large public facilities represented the largest water quality threats. Years of regulation applied to point source water pollution dischargers, however, has substantially reduced the contaminants these entities produce. Now, the EPA's research shows individual behaviors that create stormwater runoff represent the greatest threat to water quality.

Social psychologists have long noted that external impacts tend to be maximized over internal decisions when associated with negative outcomes. This tendency, known as 'self-serving bias,' is the tendency for humans to take credit for success but to blame external causes for failure (Bernstein et al, Chapter 17, 2003). When applied to social marketing efforts, the concept may play a role in many areas as diverse as weight loss (fast food), violent behaviors (media influence) and teen smoking (advertising). The probability of this concept playing a role with regard to individual perceptions of responsibility for stormwater is high. Regardless of the reason, the perceptions *are* reality in the minds of those who believe them. Attempts must be made to educate residents about the role they play and their responsibilities with regard to water quality.

Concern about water quality is widespread, but varies considerably in intensity. Few respondents in any state perceive water quality as excellent or poor; most respondents head for the middle ground and choose answers like 'fair' and 'good.' It appears that ratings are only partly associated with this concern. Most of Maine's public expresses concern about water quality, but feel their water is good (Hoppe, 2004, p. 14). Most Tennesseeans also rate their water as good, but residents of cities are more inclined to label its condition as "fair" (Gant & Daugherty, 2003, p. 1) and to express some concern about the future. However, nearly half of Michigan's Wayne County residents perceive their local river's water quality as poor (Wayne County Department of Environment, 1994, p. 36) due to business and industrial waste (Ibid, p. 37).

Significant differences with regard to age, rural/suburban/urban location and income were noted in some survey cross-tabulations. This suggests specific demographic groups, regardless of geographic location, experience some common impacts that influence how they rate their water quality and the degree of concern this rating evokes.

Awareness of Stormwater

An awareness of stormwater's contents, final destination and untreated status lays the foundation for the individual thought processes required for behavior change. Stormwater is a relatively new topic on the environmental outreach front and needs to 'start from scratch' in many respects.

Residents must be made aware of the link between their activities, the pollutants they generate and the stormwater path before effective behavior change attempts can begin. Knowledge is commonly accepted as a necessary but insufficient component for behavior change, because data – in and of itself – does not motivate behavior change. The inverse is also true, however. Without knowledge, the probability of success for behavior change is much lower.

Attempts to change behaviors without a foundation of knowledge can backfire. Castigating individuals for actions they were not aware could damage water quality and can create resentment. For this reason, establishing how much a population knows on the topic can guide outreach professionals as to what type of campaign – action or awareness – is needed for a given target audience. This approach also has the benefit of saving scarce funds.

Maine has done considerable public education on polluted stormwater and its impact on water quality (Hoppe, 2005, p. 2). In a Maine survey of public employees, respondents' top three choices from a list of potential severe impacts to local water quality included two non-point and one point source (pesticides, oil from cars and industrial discharges) (Hoppe, 2005, p. 14).

In a South Carolina survey of the state's residents, more than half of the respondents considered stormwater to have a great impact on water quality (University of South Carolina, 2002, p. 2). Only a little more than a quarter of South Carolina residents know stormwater is not treated (Ibid, p. 3), so their concerns may be attributed to other perceived sources of pollution. South Carolina residents are hardly unique in this regard; less than 50 percent of Colorado's state residents understand that stormwater is not treated before entering local water bodies (ZumBrunnen, 1998, p. 2).

Individual Behaviors

Reported behaviors varied widely across the surveys reviewed, in part due to the variety of the instruments themselves. While most surveys queried water quality perceptions and knowledge about stormwater's contents, destination and untreated status, few surveys measured individual behaviors.

Maine surveyed its public employees about erosion by asking questions about buffers and about using plants to cover bare spots in lawns. Erosion represents a serious problem to Maine waters, but only 6 percent of the general population considered it a source of water pollution in 2004 (Hoppe, 2005, p. 2). Actually, the 6 percent represented progress that can directly be attributed to Maine's outreach efforts; no one cited erosion as a water quality threat in 1996!

Both South Carolina and Tennessee collected data on yard fertilizing, pet waste and grass clippings. The two differed slightly with regard to automotive fluids; Tennessee considered them stand alone items (Gant & Daugherty, 2003, p. 10), whereas South Carolina grouped them into the larger household hazardous waste category (University of South Carolina, 2002, p. 15). In Tennessee, more rural dwellers report changing their own oil than their urban counterparts. The overall average reveals that a total of 20 percent of the population are considered "do-it-yourselfers" (Gant & Daugherty, 2003, p. 5). In 2003, a survey of Salt Lake County, Utah residents also showed that a quarter of residents changed their own oil, but 42 percent of them reported using commercial take-back programs (Dan Jones & Associates, 2003, p. B7).

Car washing can represent a stormwater threat when soap, brake dust and road dirt wash off of impervious surfaces, such as driveways, into streets, storm drains and the nearest water body. Almost one-quarter of Salt Lake County, Utah residents wash their vehicles at home. Of this number, over half (52 percent) reported they wash vehicles in their driveway (Ibid, p. B6). In Vermont's Chittenden County, where most residents wash their own vehicles, 68 percent reported they routinely wash vehicles in the driveway (Lake Champlain Committee, 2004, p. 2). Lower numbers appeared in Tennessee where only a quarter of car-washing residents reported washing vehicles in their driveways (Gant & Daugherty, 2003, p. 4).

Most surveys revealed pet waste pickup to be a problem; few respondents reported proper disposal. Close to one third of South Carolina's dog walkers reported that they rarely or never pick up dog waste (University of South Carolina, 2002, p. 23). Further analysis shows this state's females are more likely than males to properly dispose of pet waste (Ibid). Half of Tennesseans see pet waste as a source of water pollution (Gant & Daugherty, 2003, p. 8), but no data was gathered on how residents handle this waste product. In Salt Lake County, 41 percent of residents own pets, but few bag pet waste deposited in public places (as opposed to their own yards) for disposal (Jones & Associates, 2003, p. B7). Vermont's survey of Chittenden County residents showed that most residents don't dispose of pet waste regardless of whether the waste was deposited at home or on walks (Lake Champlain Committee, 2004, p. 2).

When over used, applied at the wrong time or in the wrong conditions, lawn fertilizers pose the threat of phosphorus and nitrogen runoff. Because herbicides and pesticides are often combined with fertilizers, the combined products often travel together in polluted runoff from yards and negatively impact both water and the wildlife within it.

One might assume that people who do not test their soil would be more likely to apply too much fertilizer. This is not always the case, per a survey performed in North Carolina, but the "low rate of soil testing by homeowners in all communities demonstrates the need to stress soil testing, both to individuals as well as lawn care companies" (Osmond and Hardy, 2002, p. 572). Fertilizer mistakenly applied to impervious surfaces poses the greatest threat because it runs off in greater quantities.

A third of South Carolina residents fertilize once per year, with rural residents showing the lowest frequency (South Carolina Department of Health and Environmental Control, 2002, p. 8). Less than a third consulted their local cooperative extension for soil tests, although females reported contacting the local extension service more frequently than males. A full 60 percent of Tennessee residents use fertilizer regularly, with 25 percent doing so four times a year (Gant & Daugherty, 2003, p. 4). Only 25 percent of those who report using fertilizer also used soil tests (Ibid, p. 3); cross-tabulations revealed residents with higher incomes and education levels tested their soil more than other groups (Ibid, p. 4). In Salt Lake County, Utah, close to half (49 percent) of residents report that they fertilize regularly (Dan Jones & Associates, 2003, p. B6), although no data were collected on soil testing. Minnesota residents of the Tanners Lake Watershed report a fertilization rate of 71 percent (Ramsey-Washington Metro Watershed District, 2002, p. 11), but no data on soil testing were collected.

Because yard waste can introduce excess nitrogen and phosphorus to water bodies via grass clippings and leaves, disposal practices are an important behavior to track. Knowing the percentage of "do-it-yourselfers" versus those who have their yards cared for by commercial enterprise can direct outreach efforts to the most efficient audience: the general public or trade professionals. Audience choice is heavily associated with media choice, so the same data can inform dissemination decisions.

In Salt Lake County, Utah, three quarters of county residents reported they mow their own grass, but no data were collected on clipping disposal (Dan Jones & Associates, 2003, p. B6). In South Carolina, 6 percent of residents dispose of their grass clippings in ditches and a small but troubling one percent burn clippings in ditches (S. C. Department of Health and Environmental Control, 2002, p. 12). Tennessee's survey revealed hardly any residents report disposing of lawn clippings in storm drains (Gant & Daugherty, 2003, p. 2, and in a survey of Minnesota's Tanners Lake Watershed, the majority (63 percent) of yard mowers reported they left grass clippings on their lawn (Ramsey-Washington Metro Watershed District, 2002, p. 7).

Overall, the behavior findings reveal wide national disparities with regard to activities that impact stormwater. Many factors, including educational inputs, could be a factor in these results. The literature reviewed here shows rural or urban resident status appears to play a role in oil changing and pet walking behavior. Rural residents are less likely to walk dogs, wash vehicles on hardened surfaces and fertilize their yards, but some surveys found they are more likely to change their own oil. Urban dwellers have access to yard waste pickup, but few live with ditches in their yards. Urbanites are, however, more inclined to wash vehicles on driveways. Gender also appears to play a role. More women than men pick up pet waste for proper disposal. Some surveys show women are also more likely to use a soil test before applying fertilizer.

Compared to the other behaviors that introduce stormwater pollutants, improper motor oil disposal appears to occur rarely. This may be due to the large number reporting use of commercial oil change facilities rather than any outreach efforts. Although their numbers are small, home oil changers who report improper disposal still pose a threat. In North Carolina's survey, some questions exist about the reliability of the data – primarily due to the small numbers of respondents reporting the activity. Despite the low numbers, outreach efforts should continue due to the damage even a small quantity of waste oil can have on water quality.

One other question exists with regard to self-report data collected on this or any other negatively perceived behavior. Social psychologists have observed that these behaviors (e.g. littering, spanking children, drinking to excess, dumping used motor oil) are commonly under reported. There are many reasons for this behavior, but handling the end result can be problematic. Some researchers simply use the numbers reported; others may adjust them slightly up or down, still others use the numbers, but point out where the high risk of under reporting exists. The latter approach is employed with this survey instrument's finding.

While the body of stormwater survey literature is small, it holds great promise for the future. Many instruments were inspired by the Environmental Protection Agency's requirements for regulated entities to measure outreach programs. While surveys are not required, their increasing use bodes well for the field. The need for comparison data will no doubt increase homogeneity across instruments, as has been the case with many other research fields. The desire to compare data is often a strong enough motivation to inspire researchers to create the very datasets currently missing.

Method

Instrument

A 31-item survey instrument (see Appendix A) was created in partnership with East Carolina University's Center for Survey Research. It was designed to measure awareness, perceptions and behaviors related to water quality and polluted stormwater runoff in North Carolina. The same instrument gathered respondent data on gender, age, income, education and ethnicity. Respondents' telephone numbers were coded as urban, suburban or rural by the company who provided the sample of phone numbers.

Participants

Respondents for this survey were selected from a random sample of households with telephones in the state using random digit dialing. The sample of 11,200 telephone numbers was purchased from a reputable survey sampling company.

Procedure

Data for the survey were collected between August 2005 and September 2005. Over 11,000 calls were placed to capture 1,000 completed surveys. With a sample size of 1,000, the confidence level is 95 percent and the confidence interval is $\pm$ 3.1. Nine interviewers that were trained and employed by ECU's Center for Survey Research administered the survey. Interviewers used a computerized telephone assisted interview (CATI) software system.

Methodology

The data were compiled and analyzed by the ECU Center for Survey Research. After validity and reliability were established, data were analyzed using frequencies (see Appendix B) and cross-tabulations (see Appendix C). For all statistical findings, significance levels were set at $p \leq 0.05$.

A chi-square goodness of fit test showed a significant difference between the number of males and females in the sample compared to the expected number, which was based on 2000 Census data for the state. A significant difference was also noted between the sample and the population with regard to the race categories of African-American, Asian, White, Hispanic and Other. Data on age, household income and education levels could not be evaluated using this measure due to overwhelming differences in the categorization of the data in the survey instrument when compared to census data categories.

Cross-tabulations were performed on the survey questions that measured respondents' perceptions of overall water quality in area lakes, streams and rivers using all demographic data points: dwelling area, gender, race, education level, age, household income and retirement status.

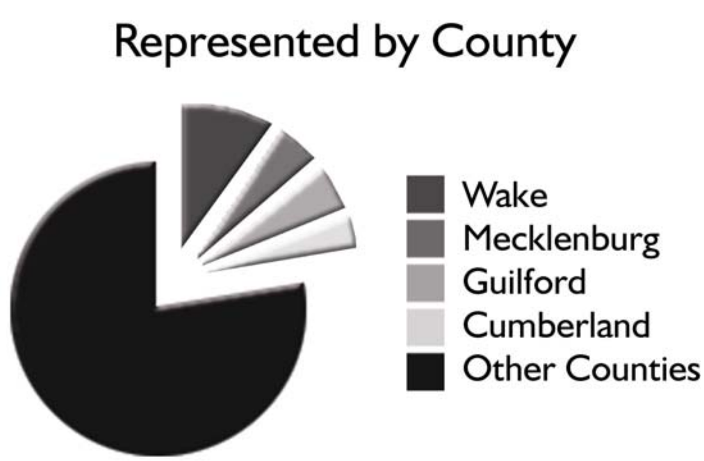
Some responses had abnormal amounts of missing data. Confidence intervals were calculated for each of these questions. Each yielded a confidence level of 95 percent with all of the intervals calculated at less than ± 4. Even with the missing data, the survey was still statistically sound.

The data were transformed for the water quality question in an effort to create fewer groups within the data. For example, 'excellent' and 'good' responses were combined to create the value 'Good/Excellent' and 'poor' and 'fair' responses were combined to create the value 'Poor/Fair.' 'Don't know' responses kept their original label and value.

Other survey questions were cross-tabulated with selected demographic data sets. Some of these analyses revealed statistically significant associations.

Findings

Demographic Data



The most represented counties in this survey are also North Carolina's most populous: Wake (9.4 percent), Mecklenburg (4.8 percent), Guilford (4.4 percent) and Cumberland (3.5 percent). Urban respondents made up 26.7 percent of the total, suburban respondents comprised 38.7 percent and 34.6 percent of respondents lived in rural areas. respectively.

The race categories reported by respondents, from largest to smallest, were: White (55.4), Black or African-American (17.1), Hispanic (9), Other (7.5), Asian (3.8), Don't Know (6.1) and Refused to Answer (1 percent).

Respondents reported age categories, from youngest to oldest, fell into the following percentage groupings: 18-24 years (10.8), 25-34 years (8.1), 35-44 years (31.3), 45-54 years (17.7), 55-64 years (13.7), 55-64 years (13.7), over 65 years (7) and Refused to Answer (1.0).

The household incomes reported showed that 12.1 percent of respondents made less than $12,000 annually. The other income categories, from lowest to highest, were: 12K-25K (13.9 percent); 25K-35K (12.3 percent); 35K-50K (13.9 percent); 50K - 75K (14.6 percent) and 75K-100K (7.9 percent). Only 7.2 percent of respondents reported earning more than 100K and 15 percent responded that they did not know their income. A total of 3.2 percent of respondents refused to answer.

Respondents' education levels were divided into the following categories, with percentages following: less than high school (4.2), some high school (23.5), high school graduate (10.1), some vocational or technical school (6.5), graduated from vocational or technical school (15.1), some college (5.9), two-year college graduate (15.4), four-year college graduate (7.9), and post-graduate (7.9).

Water Quality

More North Carolinians perceive the water quality of streams, lakes and rivers as Good (42.4 percent) than Fair (39.4 percent), with the minority (13.2 percent) rating water quality as Excellent. Urban dwellers were more likely to view water quality positively than their rural and suburban counterparts. With regard to gender, slightly more men than women rated water quality as "fair/poor" rather than "good/excellent."

Education played a slight but irregular role with regard to water quality perceptions. Quality perceptions were slightly more positive among those reporting postgraduate, vocational/technical and high school backgrounds.

Only the youngest respondents, those aged 18-24 years old, perceived water quality positively, but only by a slight margin.

Income did not play a significant role, but those in the highest income bracket viewed water quality most positively by a slight (0.7 percent) margin.

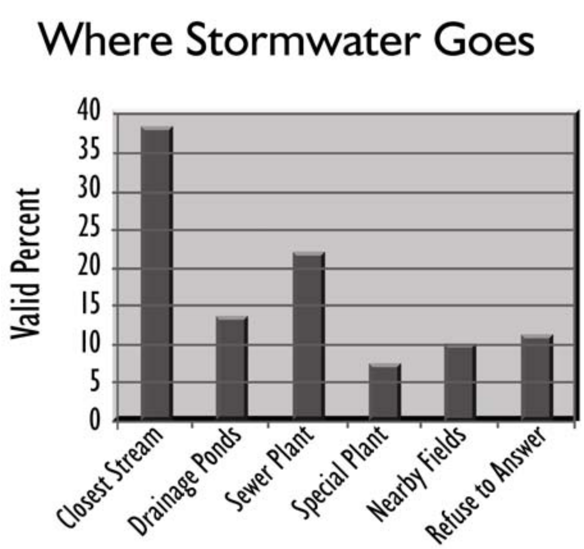
None of these findings were considered statistically significant, with the exception of retirees. Compared to non-retired residents, only retirees are significantly more inclined to rate streams, lakes and rivers as "good/excellent." This was the only demographic cross-tabulation with regard to water quality that registered as statistically significant.

Stormwater

Knowing where stormwater goes and what it contains forms the building blocks for behavior change. Unless residents know that their behaviors directly impact water quality, they have little reason to change their behaviors.

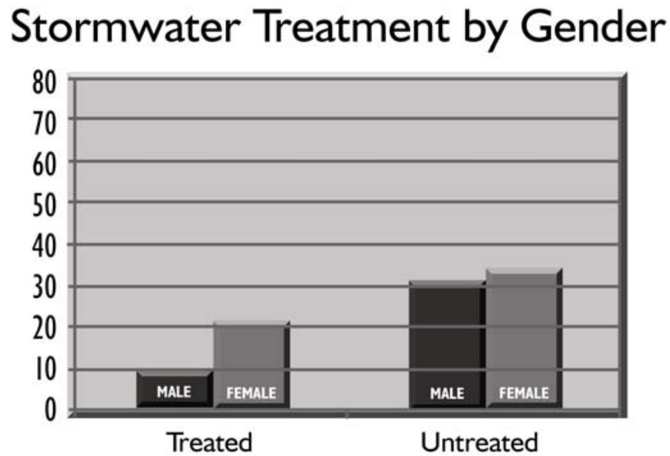
Unfortunately, many surveys show a common misperception exists: many people believe stormwater is treated. They may not be sure *where* it is treated or *how* it is treated, but they feel sure that some treatment is being administered. This misperception persists even in states that do not co-mingle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

Only over a third of North Carolina residents (37.6 percent) know that stormwater flows to the closest stream, lake or river and 13.2 percent believe it flows to drainage ponds, which may be a stormwater best management practice. However, 28.7 percent believe stormwater receives treatment at a special plant or the sewer treatment plant. Fields and yards was the destination chosen by 9.8 percent of respondents and 10.7 percent refused to answer the question.



When cross tabulations were performed using demographic attributes, both age and gender significantly impacted responses. If you combine the answer categories, you can separate the choices into two categories: 'treated" and "untreated." Respondents who chose "the city's regular sewer plant" or "a separate special sewer treatment plant" answers believe stormwater is treated. Those choosing one of three possible answers: "nearby fields and yards," drainage pond" and "closest stream, river or lake" were placed into the 'untreated category.

Using these groupings, the 'treated' category is comprised of 9 percent of men and 20 percent of women. In the 'untreated' category, women made up 34 percent of the total and men composed 30 percent.



Results for the single response "closest river, stream or lake" fell into the following gender categories: 19 percent male and 18 percent female.

When classified by age, respondents choosing the "closest river, stream or lake" answer fell in the following rank order, with percentages following: 55-64 years (42 percent), 35-44 years old (41 percent), over 65 (39 percent), 25-34 year olds (35 percent), 18-24 year olds (34 percent) and 45-54 year olds (32 percent).

When responses were grouped into the previously described "treated" and "untreated" categories, the following age rankings, from largest to smallest percentage, were found in the "treated" category: 18-24 year olds (36 percent), 45-54 year olds (33 percent), 25-34 year olds (32 percent), 35-44 year olds (31 percent), 55-64 year olds (30 percent) and respondents 65 years or more (18 percent).

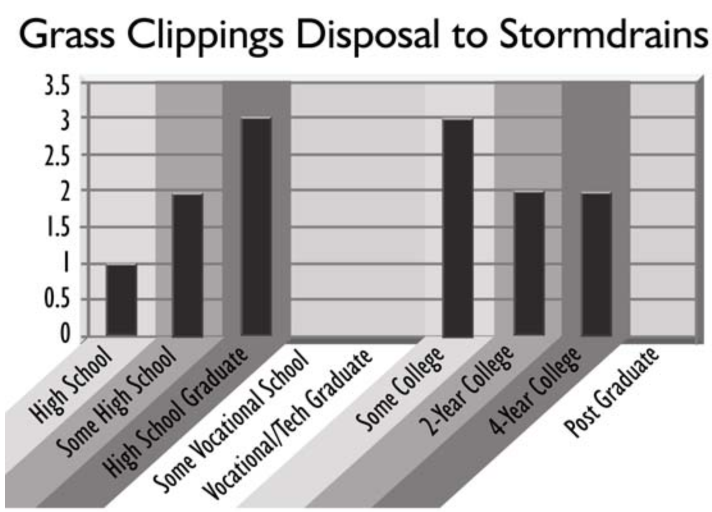
Age rankings in the "untreated" category, from largest to smallest percentage were: 55-64 year olds (63 percent), 18-24 year olds (62 percent) and – in a tie for fourth position - 25-34 year olds and 35-44 year olds (58 percent) and - in a tie for fourth position - 58 percent by the 25-34 and 35-44 year age groups. The 45-54 year olds took the final rank position with 58 percent of respondents choosing this answer.

Lawn Care

Few practices have the potential to impact stormwater to the degree of lawn care. If grass were harvested as a crop, it would represent one of the United States' largest commodities (USDA, 1992). Fertilizers, pesticides and herbicides can and do wash into creeks and streams, but the degree of impact they pose is still being studied (Schueler, T., 1995a, p. 35). Yard waste, like grass clippings and fallen leaves left in the street, can also wash into water bodies via storm drains where they introduce excess nitrogen and phosphorus. When the algae blooms they can induce die off, they use so much of the water's available oxygen fish kills can result. Since pesticides and herbicides are often mixed into fertilizers, these chemicals often accompany fertilizer in polluted stormwater runoff. Their presence poses additional risks to the flora and fauna that live in and around the receiving waters.

Most of North Carolina's survey respondents (96 percent) reported having a yard that they personally mow. When these same respondents were asked how they disposed of grass clippings, the majority (53.7 percent) reported leaving the clippings in the yard. This practice, known as grasscycling, reduces the need for fertilizer applications by returning nitrogen to lawns. It also protects local waters.

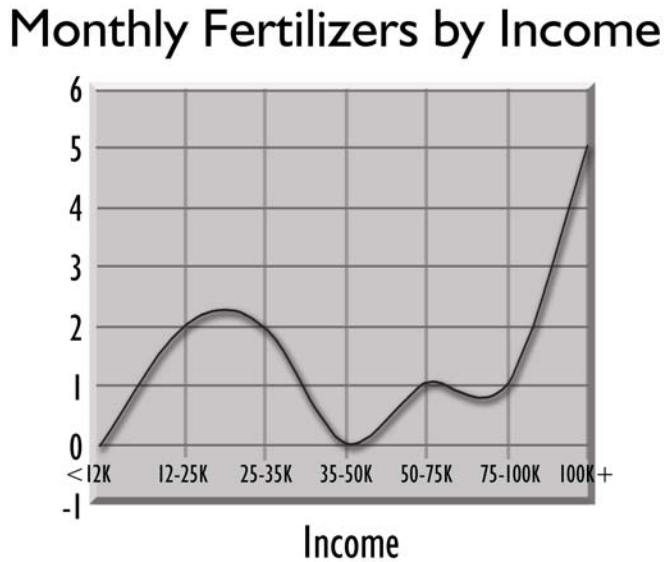
Mulching and composting yard waste, another water protective behavior, was the option chosen by 16.4 percent of respondents, but the second largest group of respondents (26 percent) stated that they collect grass clippings for disposal in the garbage. A small but troubling 1.5 percent report raking or blowing grass clippings into storm drains.



Grass clipping disposal methods appear to be significantly influenced by education level, but not in the intuitive sense. One might assume that higher levels of education are positively associated with more environmentally protective practices like grasscycling and composting. However, the only categories that did not report any storm drain disposal of grass clippings had either attended or graduated from a vocational or technical program or held a post graduate degree. All other educational levels reported small levels of storm drain disposal with the highest numbers appearing in high school graduates and those with some college.

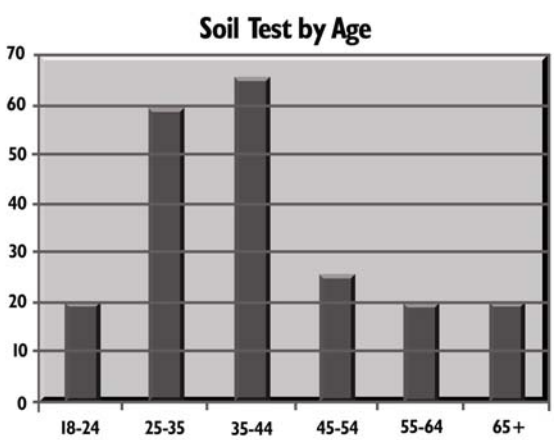
Because North Carolinians live in three distinct physiographic areas - the coast, the Piedmont and the mountains – planting, fertilizing and growing times vary statewide. Less than half, (39.1 percent), of state residents claim that they fertilize their own lawns. Of that group, most respondents (58 percent) report fertilizing their lawns once a year or less. The next largest group (36 percent) reported that they fertilized their yards two to three times per year. A troubling 5 percent reported applying fertilizer monthly, although no grass requires this much fertilizer.

Annual household income is significantly associated with the frequency of fertilizer applications. Survey results showed that those earning more than $100,000 per year report applying fertilizer monthly more than any other income level. The second group, made up of respondents who report applying fertilizer two to three times annually, were most likely to earn (in rank order) $50,000 to $70,000; over $100,000; and $35,000 to $50,000.



The age of respondents was also significantly associated with fertilizer applications. Here, we find the 35-45 year olds (12 percent) are more likely than any other age group to fertilize their lawns monthly. The youngest group, 18-24 year olds, was most likely to apply fertilizer "two or three times a year" with an overwhelming 85 percent choosing this response. The next largest groups were 35-44 year olds (63 percent), 45 to 54 year olds (43 percent) and those 65 years or older (35 percent).

Respondents aged 55-64 years were most likely to report applying fertilizer once per year (69 percent). They are followed in rank order by those aged 25-34 (64 percent), 65 years or older (59 percent) and 45-54 year olds (54 percent).



The best way to learn a yard's fertilizer needs is to conduct a free soil test available from the state's Department of Agriculture & Consumer Services. If respondents indicated they fertilized their own yard, they were also asked if anyone ever tested the soil. The majority (54 percent) responded that they did not use soil tests, but 44 percent of respondents did report testing their soil to determine fertilizer needs.

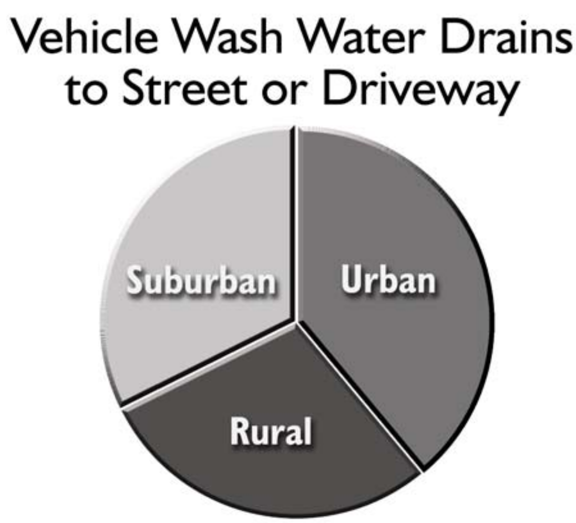
Soil testing for fertilizer levels was also significantly related to age. The respondents mostly likely to test their soil were aged 35-44 years, followed by those 45-54 years of age, and the third place was tied between 18-24 year olds and 55-64 year olds. Conversely, those least likely to test soil were over 65 years of age, followed distantly by the 25-34 year olds.

Vehicle Care

While a host of possible questions exist about vehicle care, this survey chose to explore two activities: washing and oil changing. When vehicles are washed at home, the soapy wash water and the brake dust and other road dirt it carries usually go to one of two places: a grassy area that absorbs water and its constituents or a driveway that serves as a connector for the gutter and storm drain system. Vehicles washed at commercial facilities do not present the same threat because state regulations require these facilities to use oil/grit separators.

In this survey, three quarters of respondents stated that they had a vehicle. Of that group, 40 percent stated that they washed their vehicles at home. The majority (56 percent) washed vehicles in the driveway, but 41 percent let soapy wash water flow into grass, dirt or gravel.

Where respondents live significantly affects the destination of soapy vehicle wash water. Half of urban dwellers reported letting soapy water drain into "the street or a driveway," whereas 40 percent of suburban dwellers and 29 percent of rural dwellers report the same practice. The inverse was also true: more rural dwellers (66 percent) let soapy car wash water drain into "the grass, dirt or gravel" than suburban (52 percent) or urban (47 percent) dwellers.



The majority of respondents (75 percent) who reported they owned a vehicle were asked if they changed their own oil. Of that group, less than a fifth (16.7 percent) reported doing so. The overwhelming majority (76.9 percent) reported using commercial oil change facilities.

Home oil changers dispose of oil in a variety of ways; no single disposal practice monopolized the responses. The most frequent answer (32.2 percent) was to place used oil with other garbage for disposal. Slightly more than one fifth report taking oil to a recycling facility. Two especially troubling findings cropped up next: 22 percent of respondents dump oil onto a designated part of their lawn and 20.6 percent pour used oil down storm drains. Although these numbers represent a fraction of North Carolina residents, the finding is troubling: one quart of oil can contaminate one million gallons of drinking water.

Race does appear to play a significant role in oil disposal practices, but respondent numbers – while representative – were quite low in some groups. For this reason, the following data should not be viewed as conclusively as the other findings presented here.

It is difficult to determine which factors are at play. Without knowing how long respondents have lived in the United States, much less North Carolina, it is impossible to tell if their disposal practices are a vestige of their country of origin or due to a lack of information on the topic. Residents may also be confused as to proper waste oil disposal practices. Not long ago, many municipalities and businesses all over the world viewed spraying waste oil onto dusty roads as an excellent dust suppression method.

Survey respondents' waste oil disposal choices in the survey were: recycling, placing with garbage, placing in a designated lawn area, dumping down a storm drain or "other." Asian respondents reported storm drain dumping in higher percentages than any other group, but a greater number of white respondents reported that they placed used oil in a designated lawn area. Every group but Asians cited recycling as their leading disposal practice. After recycling, the most frequently cited disposal method was "placing with garbage" followed by disposal in a "designated lawn area." A larger percentage of white respondents (8 percent) chose the "designated lawn area" response. The next largest group reporting this behavior (4 percent) chose "don't know" as their racial classification.

Although it may take longer to reach the stream, used oil disposed on lawn areas can negatively impact surface water supplies through runoff. At a minimum, the local groundwater supplies can be contaminated as the waste oil leaches its way through the soil.

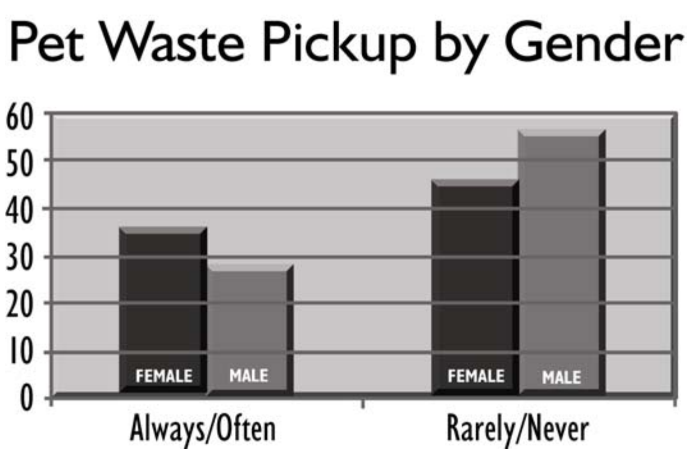
Pet Waste

Just like poorly maintained septic tanks, pet waste represents a microbial threat to water quality. Typically, one assumes that dogs are the pets to be walked, but that may not always be the case.

Research actually shows that cat and raccoon waste pose larger microbial threats (Schueler, 2000, p. 82), but until these species are routinely guided on walks over impervious surfaces – especially those near or surrounding water bodies – the focus remains on man's best friend.

Respondents who claim they walk their pets were asked how often they picked up their pet's waste. A significant relationship exists between reported pet waste disposal and dwelling area. As expected, urban and suburban dwellers reported more pet walking than their rural counterparts. Respondents claiming that they 'rarely" or 'never' picked up pet waste comprise 47 percent of urban pet walkers, 49 percent of suburban pet walkers and 59 percent of rural pet walkers. Those reporting they "always" or "often" picked up pet waste comprised 35 percent of urban dwellers, 34 percent of suburban dwellers and 27 percent of rural pet walkers.

Respondent age was significantly associated with pet waste pickup. North Carolina's youngest (18-24) and oldest residents (65 years and older) are most likely to report they "always" or "often" pick up pest waste. Two age groups tied for the 'least likely to pick up pet waste' category: 35-44 and 45-54 year olds. The next largest age groups in the 'least likely' category were 25-34 year olds and 55-64 year olds.



Gender also plays a significant role with regard to pet waste pickup. Women are more likely to report they "always" or "often" pick up pet waste (35 percent) than men (28 percent). Conversely, men were more likely to report they 'rarely' or 'never' picked up pet waste (57 percent) compared to women (46 percent). Respondents choosing the 'sometimes' answer were more evenly split along gender lines; slightly fewer females (11 percent) than males (13 percent) chose this answer.

Discussion

The study's findings represent a mix of intuitive and counterintuitive results, although no formal hypotheses were made. Assumptions that greater levels of education would be associated with more stormwater knowledge were proven to be false. Respondents' knowledge levels and water protective behaviors did not rise in association with formal education levels. Another assumption, that soil testers would apply less fertilizer, was not proven by the findings.

Some soil testers reported applying fertilizer monthly, although no lawns require monthly applications for good health. It was also assumed that higher income households would be less likely to self-apply fertilizer and instead use a lawn care service. However, many of North Carolina's most well-to-do homes report performing this service themselves.

It was also assumed that rural dwellers would be more inclined to change their vehicle's oil, but this was not the case. "Do it yourselfers" were evenly distributed throughout all dwelling categories.

Some assumptions were borne out by the survey's results. As with other surveys, women were most likely to dispose of pet waste properly. Urban and suburban dwellers reported higher levels of pet waste pickup than their rural counterparts. Urban dwellers were found to be more likely to wash their cars on impervious surfaces, such as streets and driveways, than rural dwellers. As assumed, rural dwellers were found to be most likely to have soapy water drain into a pervious area such as grass or gravel. Income, which was assumed to influence fertilizer application (albeit through professional services), was indeed found to play a role in North Carolina, although it was not the role expected. Instead of hiring services, North Carolina's wealthy respondents reported that they apply fertilizer themselves. They also reported that they fertilize more frequently than any other group.

Although no assumptions were made with regard to water quality, the findings were surprising. North Carolina's ranking as a high retirement destination state inspired this demographic question, but it was only associated with one perception. Only retirees rated water quality as "good" or "excellent." There were no correlations between water quality perception with regard to race, gender, income, education or dwelling area.

Recommendations

Survey findings can be used to strategize the mandated outreach and education to be conducted by Phase II designated communities. Demographic groupings are essential for efficiency when targeting media message content. It can also guide the media chosen to deliver those messages.

Logic demands that humans need motivation to change behaviors. With less than 50 percent of the population aware stormwater is not treated before entering local water bodies, awareness of this fact must be emphasized before, or in conjunction with, messages requesting behavior change. Residents must first understand the link between their behaviors and water quality before they can reasonably be expected to make voluntary changes in their daily activities.

In this survey, urban audiences were not shown to be any more aware of this link than anyone else surveyed. These findings are surprising because urban audiences were most likely to live in areas where EPA's Phase I program was already in progress. The program, which began in 1990, addressed sources of stormwater runoff that had the greatest potential to negatively impact water quality. As with the Phase II program, permittees are required to provide education and outreach to their communities. Census-defined 'urban' areas created the starting point for selection of Phase I communities, but other qualifications in addition to the census definition were applied in the selection process. For this reason, comparisons of Phase I communities and census-designated 'urban' area are problematic because the two are not 'like' items. Rather, Phase I communities comprise a subset of 'urban' communities.

Phase II communities also use census designations as their starting point, but as with Phase I, other requirements play a role in the designation process. Permit holders include communities with medium and large municipal separate storm sewer systems (MS4s) with populations of 100,000 or more and companies that fall into one of eleven categories of industrial activity, including construction activity that disturbs five or more acres of land. Proximity to sensitive waters and growth rates also play a role in the selection process.

Because the bulk of urban resident respondents live in Phase I communities, one might easily assume they would demonstrate higher levels of stormwater knowledge. However, given the fact that they do not demonstrate significantly higher levels of knowledge, the need for basic information campaigns in these areas still exists. Information campaigns conducted by both Phase I and Phase II communities should continue to feature basic information messages in tandem with messages encouraging water-protective behaviors.

Basic information messages should also be targeted toward women because this group knows less about stormwater's destination and treatment status than their male counterparts. Media buys and participation in events that focus on women are efficient ways to reach this group.

Targeting messages by age group will also yield results, although the demographic breakdowns are not as discrete as was hoped. The groups with the lowest awareness of stormwater's untreated status are not linear; instead they jump from age group to age group. With more 18 - 24 year olds than any other age group thinking stormwater is treated, we need to devise and place messages that attract this demographic. Youth messages can be clearly defined, but what of the next group most in need of this information? They are 45-54 year olds whose media and message preferences do not overlap to a great degree (Paul, March 2003). The third group, 25-34 year olds, do share media choices and message preference with the first group (18-24 year olds), so messages that appeal to the first and third ranked groups could be created and distributed together for cost efficiencies.

With regard to lawn care, mass media messages should be used. With so many respondents mowing their own lawns, including a business-to-business campaign would be comprehensive, but if cost efficiencies are an issue, the single largest group is consumers. The majority of lawn mowers in North Carolina are "do-it-yourselfers," so point of purchase, broadcast and direct mail would reach this group most effectively.

Because education levels were not linearly associated with grass clipping disposal, reaching this audience through educational venues would be problematic. Residents who graduated or attended a vocational or technical school used the most protective practices, followed by those with post-graduate degrees. Some work may be done through educational institutions, but this is likely to yield lower outcomes given the wide distribution of the audience to be targeted.

Annual household income levels were positively associated with excessive fertilizer application, so messages should be placed in media targeted to higher incomes. Broadcast media can be used in this fashion, but print media is a more efficient way to reach those with high incomes. Because this audience values appearance (Schueler, 2000, p. 673), care should be taken to stress that fewer fertilizer applications could yield the same aesthetic outcomes they value so highly.

Soil testing was significantly associated with age, but the absence of a linear trend presents a challenge. Those aged 65 years or over were least likely to report using a soil test, followed by the 25-34 year olds, who were followed by 55-65 year old respondents. Audiences over 65 respond well to economic benefit messages due to the high number on fixed incomes, but this rhetoric is not as effective with those in the 55-65 year old age group, who respond better to lifestyle motivations. The 25-34 year old demographic is less likely to respond to economic and lifestyle messages, but more likely to respond to environmental benefits. Clearly, a mix of message appeals is needed to reach these different groups effectively.

Distribution also represents an efficiency challenge. Media choice preferences are most likely to be shared by similar age groups, so venues preferred by 55-65 year olds are more likely to cross over with the group aged 65 years or older. However, the messages most likely to be effective differ between these two groups. It may be that point of purchase appeals at retail fertilizer outlets work best because all groups purchase this product. This distribution method does not allow for custom messages for each age group, but does offer the advantage of being able to reach more of this audience than any other outlet.

Findings on vehicle care did yield some useful targeting data. Urban and suburban dwellers are most likely to wash cars on impervious surfaces, so efforts should be made to focus behavior change messages in these areas. Because direct mail and outdoor advertising (e.g., billboards, busses, bus shelters and kiosks) can be geographically targeted more easily than broadcast media (with the exception of cable), messages using these media will be most likely to reach their targets.

The advent of the $20 oil change decreased the number of do-it-yourself oil changers nationally and North Carolina is no exception. With only 16.7 percent of respondents changing their own oil, one might be tempted to focus on other, more prevalent behaviors. However, the incredible impact of dumping even small quantities of used motor oil in local streams, creeks and rivers makes this message too important to neglect.

The fact that race plays a role in oil disposal poses additional challenges. North Carolina's Asian community reports the highest numbers of oil dumping in storm drains; those most likely to dispose of oil on lawns are white. As the smaller group, targeting the Asian community is less problematic from a marketing standpoint, but the potential for complications surrounding racial targeting are so high that any benefits accrued may diminish in comparison. Targeting the self-described 'white' community represents an inverse challenge. They comprise the largest racial group in North Carolina, which suggest mass media as the best distribution point. However, the low numbers reporting this activity mean the audience will be so scattered that the cost may be wasteful given the return.

Pet waste messages pose a unique set of problems regardless of target. Because discussion of waste products is widely considered taboo in popular culture, careful message preparation is key to avoid losing the message in the provocative topic.

Targeting along geographic lines is the logical step given the findings. Just like their car-washing cohorts, urban and suburban residents are most likely to be surrounded by impervious surfaces. Pet walkers in these areas are also more likely to congregate in smaller areas. Even though urban and suburban audiences are more likely than their rural counterparts to pick up pet waste, they do so in low enough numbers that this message needs to be focused in this geographic area.

Rural dwellers are least likely to walk their pets and are also least likely to dispose of pet waste. However, this group is surrounded by more pervious surfaces that absorb the waste and they are more widely scattered geographically. As a result, they may present less of a water quality threat. For these reasons, messages about pet waste should be broadly distributed, but priority should be given to urban and suburban areas. A broadcast and outdoor media campaign augmented by point of purchase displays at pet care retail outlets and veterinarian's offices could deliver these qualities. Should a list be available, piggybacking on direct mail to dog owners from their veterinarians would be most effective and efficient.

The age of respondents was associated with pet waste disposal. North Carolina's youngest (18-24) and oldest (65 years +) pick up pet waste the most, so messages should be focused at the ages in between. Respondents aged 35-44 and 45-54 are least likely to pick up pet waste and share many of the same media preferences with regard to both outlet and message appeals. Here, a single campaign can be created for this large audience and distributed using mass media.

In addition to age and dwelling location, gender significantly influences pet disposal patterns. Just as women need more education about stormwater destination and pollutant contents, men need education on the negative impact of improperly disposed pet waste. How the messages are framed for these different groups is key. Women have been shown to respond more positively to health messages, but men are more inclined to respond to lifestyle messages. Appeals based on pet waste's impact on recreation, fishing and outdoor enjoyment may be most effective with male audiences. Distributing these messages through lifestyle oriented media such as point of purchase displays at retail sporting and recreation outlets may prove effective. Relationships should be created to allow messages to be distributed where these activities occur – at public lakes, rivers and other outdoor recreational areas.

In summary, this survey represents a road map of sorts for North Carolina's social marketing efforts with regard to stormwater. Although time limitations for a phone survey precluded asking every question desired, the questions used provide a wealth of material with regard to the messages needed and their most effective targets.

Two follow up surveys are planned for the years 2006 and 2007. These surveys will gather trend data on the questions asked in the 2005 instrument. They will also gather data on awareness and retention of social marketing efforts conducted in the interims between surveys. These data will allow North Carolina's stormwater social marketers to refine their outreach efforts in two major ways. Marketers can concentrate efforts where and to whom they are most needed. They can see where campaigns have produced positive changes and adopt the programs used in those areas. They will also be better equipped to measure message efficiency and effectiveness within specific demographic groups. Again, the strategy is to identify successful programs and administer them where needed.

The social marketing strategies recommended here did not consider cost to a great degree. As such, they represent an "ideal world" scenario. While such a world does not exist, the recommendations provide a framework for planning, fundraising and future cooperative efforts between government, business and community or interest groups focused on the same issues.

It is also important to realize the limitations of social marketing. As years of anti-littering, speeding and teenage smoking campaigns reveal, information is a necessary but insufficient ingredient to effect behavior change. While this realization does not negate the need for social marketing efforts in this or any other area, it does present the most realistic framework for evaluating campaign results. Human behavior is complex and in many respects still being explored. Social marketing messages are only one of many inputs influencing human behavior. The economy, natural phenomena, population changes and a wealth of other factors can and do influence behavior that impacts water quality.

For this reason, one can neither provoke nor prevent water quality changes based on any single input. That caveat aside, leveraging social marketing with other inputs presents the best scenario for success with regard to behavior change. The work required to increase knowledge about stormwater and motivate water-protective behaviors exceeds the grasp of any one survey or campaign. Only harnessing the multitude of forces affecting water quality can do that. The breadth and depth of work required is daunting, but the goal makes the effort worthwhile.

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Appendix A
Stormwater Questionnaire

Q3 My name is _____________ , and I'm calling from the East Carolina University Survey Center in Greenville. The State Department of Environment and Natural Resources has asked us to gather people's opinions about water quality in the state.

May I speak to a person in the home that is 18 years of age or older

No one lives in household that is 18 years old or older
No one at home right now that is 18 years old or older
Yes I have someone on the line that is 18 years old or older

Q3a After verifying that you have dialed the correct number and have the appropriate person on the phone, confirm age, restate mission, and continue.

This interview is completely voluntary and confidential. The survey will only take a few minutes, and if I come to any question that you would prefer not to answer, just let me know, and I'll skip over it. OK.

Q4 Interview Record Gender (Record gender of respondent. **Do not ask**.)
Male
Female

Q5 OK, my first question is about water quality in general. Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are.

poor

fair

good

excellent

Q6 OK, next can you tell me what county you live in? ________________________

Q7 What is your zip code? _____________________

Q8 Now, the next few questions are about sources of water pollution. I am going to read you a list of possible sources of water pollution, and for each one, I want you to tell me how important you think that item is as a source of water pollution.

So, the first item is. Wastewater from manufacturing plants.

Do you think that item is, very important as a source of water pollution, important, or not important? Would you say…

Very Important

Important

Not Important

Q9 How about wastewater from sewer treatment plants? Would you say it is...

Very Important

Important

Not Important

Q10 How about pollutants that wash out of the air like acid rain?

Very Important

Important

Not Important

Q11 How about rainfall runoff from yards, parking lots, and streets?

Very Important

Important

Not Important

Q12 How about rainfall runoff from farms and agricultural operations?

Very Important

Important

Not Important

Q13 How about dirt eroding from construction sites?

Very Important

Important

Not Important

Q14 And how about trash that gets dumped into lakes and rivers by boaters and other recreational users?

Very Important

Important

Not Important

Q15 OK, now what I want to do is find out, of all the sources of water pollution that I just ask you about, which one of those you think is the most important source of pollution.

So, I am going to re-read the ones that you said were important or very important, and if you could, tell me which ONE you think is the most important as a source of water pollution(which ONE contributes the most)

Interviewer Note: The program will only list the ones for you to read that were answered important or very important. The respondent will choose just one that is most important.

Q16 OK, now I have a few questions about how you handle jobs around the house like yard work. Do you have a grass lawn or yard that you mow?

Yes
No

Q17 When you mow your grass, what do you do with the grass clippings? Do you…

leave them in the yard
collect them and throw them in the garbage
rake or blow them into a drain
mulch or compost them
something else

Q18 Do you ever use fertilizer on your lawn?

Yes
No

Q19 About how often would you say you use fertilizer on your lawn? Would you say

Monthly
two or three times a year
once a year or less

Q20 Does anyone ever test the soil on your lawn to determine how much fertilizer is needed?

Yes

No

Q21 Now I would like to talk to you about taking care of your vehicle. First let me ask you.....Do you have a car/truck or other vehicle.

Yes

No

Q21a OK, I have a question about washing your vehicle. Do you wash your vehicle at home, or do you take it to a car wash,?

At home

Other, someone else washes it, or some other scenario

Take to a car wash

Q22 When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?

into the grass, dirt or gravel

into the street or driveway

varies, sometimes one, sometimes another

Q23 And now, a question about changing the oil in your vehicle, Do you change your own oil at home?

Yes

No

Q24 When you change your oil at home, how do you dispose of the used oil? Do you dispose of it....

In a designated lawn area

with other garbage (dumpster, placed in trash bags with other trash, etc

pour it down a storm drain

take it somewhere it can be recycled (recycle center, Jiffy Lube, gas station)

other

Q25 Now I have a few questions about your pet. Do you walk your pet

Yes

No

No Pets (Skip to Q26)

Q25a How often do you pick up their pet waste? Would you say..

Always

often

sometimes

rarely

never

Q26 Ok, the next thing I want to ask you about is storm water. Storm water Is all the water that collects on streets and parking lots after a rain storm and then runs into storm drains. Now, we've found that lots of folks don't really know that much about this---and that's OK. But if you had to pick one of the following options for where storm water runoff goes once it enters a storm drain, would it be that it goes to....

the city's regular sewer treatment plant

a separate special sewer treatment plant

nearby fields and yards

closest river, stream or lake

drainage pond

Q27 OK, we are just about done. So finally, just for categorizing purposes only, I'd like to ask you a bit about yourself. And remember, all your answers are completely confidential.

Are You Retired?

Yes

No

Q28 Which of the following categories would you say best describes your education level?

Less than high school

Some high school

High school graduate

Some vocational or technical school

Graduated from vocational or technical school

Some college

2-Year college graduate

4-Year college graduate

Post-graduate degree

Q29 Which of these categories best describes your age? Are You....

18-24

25-34

35-44

45-54

55-64

over 65

Q30 Just to insure a proper representation by race, would you classify yourself as Black or African-American, Asian, White, Hispanic, or of some other race?

Black or African-American

Asian

White

Hispanic

Other

Q31 Remember that none of this information can ever be associated with your name or household, can you tell me which of the following categories best describes your annual household income before taxes. Was it....

Less than $12,000

$12,000 to $25,000

$25,000 to $35,000

$35,000 to $50,000

$50,000 to $75,000

$75,000 to $100,000

over $100,000

Those are all the questions I have for you today.

Thank you for participating in this important survey.

Appendix B
Frequency Tables

Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	267	26.7	26.7	26.7
	Suburban	387	38.7	38.7	65.4
	Rural	346	34.6	34.6	100.0
	Total	1000	100.0	100.0	

May I speak to a person in the home that is 18 years of age or older?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes I have someone on the line that is 18 years old or older	1000	100.0	100.0	100.0

Record gender of respondent.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	600	60.0	60.0	60.0
	Male	400	40.0	40.0	100.0
	Total	1000	100.0	100.0	

Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	132	13.2	13.2	13.2
	Fair	394	39.4	39.4	52.6
	Good	424	42.4	42.4	95.0
	Excellent	29	2.9	2.9	97.9
	Refuse to answer	21	2.1	2.1	100.0
	Total	1000	100.0	100.0	

Wastewater from manufacturing plants - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	633	63.3	63.3	63.3
	Important	284	28.4	28.4	91.7
	Not important	61	6.1	6.1	97.8
	Refuse to answer	22	2.2	2.2	100.0
	Total	1000	100.0	100.0	

Wastewater from sewer treatment plants - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	633	63.3	63.3	63.3
	Important	277	27.7	27.7	91.0
	Not important	76	7.6	7.6	98.6
	Refuse to answer	14	1.4	1.4	100.0
	Total	1000	100.0	100.0	

Pollutants that wash out of the air (acid rain) - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	299	29.9	29.9	29.9
	Important	523	52.3	52.3	82.2
	Not important	143	14.3	14.3	96.5
	Don't know	1	.1	.1	96.6
	Refuse to answer	34	3.4	3.4	100.0
	Total	1000	100.0	100.0	

Rainfall runoff from yards, parking lots, and streets - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	247	24.7	24.7	24.7
	Important	458	45.8	45.8	70.5
	Not important	287	28.7	28.7	99.2
	Refuse to answer	8	.8	.8	100.0
	Total	1000	100.0	100.0	

Rainfall runoff from farms and agricultural operations - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	435	43.5	43.5	43.5
	Important	416	41.6	41.6	85.1
	Not important	128	12.8	12.8	97.9
	Refuse to answer	21	2.1	2.1	100.0
	Total	1000	100.0	100.0	

Dirt eroding from construction sites - importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	258	25.8	25.8	25.8
	Important	497	49.7	49.7	75.5
	Not important	234	23.4	23.4	98.9
	Refuse to answer	11	1.1	1.1	100.0
	Total	1000	100.0	100.0	

Trash dumped into lakes and rivers by boaters and other recreactional users – importance as a source of water pollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very important	674	67.4	67.4	67.4
	Important	260	26.0	26.0	93.4
	Not important	59	5.9	5.9	99.3
	Don't know	1	.1	.1	99.4
	Refuse to answer	6	.6	.6	100.0
	Total	1000	100.0	100.0	

Which of the sources that you indicated as important or very important do you think is the most important as a source of water pollution?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Manufacturing plants wastewater	309	30.9	30.9	30.9
	Sewer treatment plants wastewater	192	19.2	19.2	50.2
	Pollutants that wash out of the air (acid rain)	36	3.6	3.6	53.8
	Rainfall runoff from yards, parking lots, and streets	45	4.5	4.5	58.3
	Rainfall runoff from farms and agricultural operations	119	11.9	11.9	70.2
	Construction site dirt erosion	33	3.3	3.3	73.5
	Trash dumped into lakes and rivers	244	24.4	24.4	97.9
	Don't know	2	.2	.2	98.1
	Refuse to answer	19	1.9	1.9	100.0
	Total	999	99.9	100.0	
Missing	System	1	.1		
Total		1000	100.0		

Do you have a grass, lawn, or yard that you mow?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	961	96.1	96.1	96.1
	No	38	3.8	3.8	99.9
	Refuse to answer	1	.1	.1	100.0
	Total	1000	100.0	100.0	

When you mow your grass, what do you do with the grass clippings?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Leave them in the yard	469	46.9	53.7	53.7
	Collect them and throw them in the garbage	228	22.8	26.1	79.7
	Rake or blow them into a drain	13	1.3	1.5	81.2
	Mulch or compost them	143	14.3	16.4	97.6
	Something else	14	1.4	1.6	99.2
	Refuse to answer	7	.7	.8	100.0
	Total	874	87.4	100.0	
Missing	System	126	12.6		
Total		1000	100.0		

Do you use fertilizer on your lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	360	36.0	48.6	48.6
	No	375	37.5	50.6	99.2
	Refuse to answer	6	.6	.8	100.0
	Total	741	74.1	100.0	
Missing	System	259	25.9		
Total		1000	100.0		

About how often would you say you use fertilizer on your lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Monthly	21	2.1	5.8	5.8
	Two or three times a year	167	16.7	46.1	51.9
	Once a year or less	168	16.8	46.4	98.3
	Refuse to answer	6	.6	1.7	100.0
	Total	362	36.2	100.0	
Missing	System	638	63.8		
Total		1000	100.0		

Does anyone ever test the soil on your lawn to determine how much fertilizer is needed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	161	16.1	44.1	44.1
	No	198	19.8	54.2	98.4
	Refuse to answer	6	.6	1.6	100.0
	Total	365	36.5	100.0	
Missing	System	635	63.5		
Total		1000	100.0		

Do you have a car/truck or other vehicle?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	742	74.2	89.8	89.8
	No	84	8.4	10.2	100.0
	Total	826	82.6	100.0	
Missing	System	174	17.4		
Total		1000	100.0		

Do you wash your vehicle at home, or do you take it to a car wash?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At home	297	29.7	40.1	40.1
	Other, someone else washes it, or some other scenario	85	8.5	11.5	51.6
	Take to a car wash	356	35.6	48.0	99.6
	Don't know	1	.1	.1	99.7
	Refuse to answer	2	.2	.3	100.0
	Total	741	74.1	100.0	
Missing	System	259	25.9		
Total		1000	100.0		

When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Into the grass, dirt or gravel	188	18.8	56.8	56.8
	Into the street or driveway	128	12.8	38.7	95.5
	Varies, sometimes one, sometimes another	14	1.4	4.2	99.7
	Don't know	1	.1	.3	100.0
	Total	331	33.1	100.0	
Missing	System	669	66.9		
Total		1000	100.0		

Do you change your own oil at home?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	176	17.6	22.8	22.8
	No	592	59.2	76.8	99.6
	Refuse to answer	3	.3	.4	100.0
	Total	771	77.1	100.0	
Missing	System	229	22.9		
Total		1000	100.0		

When you change your oil at home, how do you dispose of the used oil?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In a designated lawn area	22	2.2	12.3	12.3
	With other garbage (dumpster, placed in trash bags, etc)	36	3.6	20.1	32.4
	Pour it down a storm drain	16	1.6	8.9	41.3
	Take it somewhere it can be recycled	91	9.1	50.8	92.2
	Other	10	1.0	5.6	97.8
	Refuse to answer	4	.4	2.2	100.0
	Total	179	17.9	100.0	
Missing	System	821	82.1		
Total		1000	100.0		

Do you walk your pet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	557	55.7	55.8	55.8
	No	263	26.3	26.4	82.2
	No Pets	178	17.8	17.8	100.0
	Total	998	99.8	100.0	
Missing	System	2	.2		
Total		1000	100.0		

How often do you pick up their pet waste?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	152	15.2	26.6	26.6
	Often	31	3.1	5.4	32.0
	Sometimes	68	6.8	11.9	44.0
	Rarely	145	14.5	25.4	69.4
	Never	156	15.6	27.3	96.7
	Refuse to answer	19	1.9	3.3	100.0
	Total	571	57.1	100.0	
Missing	System	429	42.9		
Total		1000	100.0		

Where would you say storm water runoff goes once it enters a storm drain?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The city's regular sewer treatment plant	152	15.2	21.3	21.3
	A separate special sewer treatment plant	53	5.3	7.4	28.8
	Nearby fields and yards	70	7.0	9.8	38.6
	Closest river, stream, or lake	268	26.8	37.6	76.2
	Drainage pond	94	9.4	13.2	89.3
	Refuse to answer	76	7.6	10.7	100.0
	Total	713	71.3	100.0	
Missing	System	287	28.7		
Total		1000	100.0		

Are you retired?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	266	26.6	32.0	32.0
	No	471	47.1	56.6	88.6
	Don't know	66	6.6	7.9	96.5
	Refuse to answer	29	2.9	3.5	100.0
	Total	832	83.2	100.0	
Missing	System	168	16.8		
Total		1000	100.0		

Which of the following categories would you say best describes your education level?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than high school	42	4.2	4.2	4.2
	Some high school	113	11.3	11.4	15.6
	High school graduate	233	23.3	23.5	39.2
	Some vocational or technical school	100	10.0	10.1	49.2
	Graduated from vocational or technical school	64	6.4	6.5	55.7
	Some college	150	15.0	15.1	70.8
	2-Year college graduate	58	5.8	5.9	76.7
	4-Year college graduate	153	15.3	15.4	92.1
	Post-graduate degree	78	7.8	7.9	100.0
	Total	991	99.1	100.0	
Missing	System	9	.9		
Total		1000	100.0		

Which of these categories best describes your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	108	10.8	10.8	10.8
	25-34	81	8.1	8.1	18.9
	35-44	313	31.3	31.3	50.3
	45-54	177	17.7	17.7	68.0
	55-64	137	13.7	13.7	81.7
	Over 65	170	17.0	17.0	98.7
	Don't know	13	1.3	1.3	100.0
	Total	999	99.9	100.0	
Missing	System	1	.1		
Total		1000	100.0		

How would you classify yourself?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black or African-American	166	16.6	17.1	17.1
	Asian	37	3.7	3.8	20.9
	White	537	53.7	55.4	76.4
	Hispanic	87	8.7	9.0	85.3
	Other	73	7.3	7.5	92.9
	Don't know	59	5.9	6.1	99.0
	Refuse to answer	10	1.0	1.0	100.0
	Total	969	96.9	100.0	
Missing	System	31	3.1		
Total		1000	100.0		

Which of the following categories best describes your annual household income before taxes?

		Frequency
Valid	Less than $12,000	86
	$12,000 to $25,000	99
	$25,000 to $35,000	88
	$35,000 to $50,000	99
	$50,000 to $75,000	104
	$75,000 to $100,000	56
	Over $100,000	51
	Don't know	107
	Refuse to answer	23
	Total	713
Missing	System	287
Total		1000

Sources of Water Pollution

Of the sources of water pollution, 93.4% of respondents thought that recreational trash was important/very important. 91.7% indicated that manufacturing wastewater was important/very important and 91% indicated that wastewater from sewer treatment plants was important/very important. These were the same top three issues that surfaced as the MOST important sources of water pollution (999 total).

What county do you live in?

County	Frequency	Percent	Valid Percent	Cumulative Percent
9999999999	12	1.2	1.2	1.2
Alamance	18	1.8	1.8	3.0
Alexander	2	.2	.2	3.2
Anson	3	.3	.3	3.5
Ashe	2	.2	.2	3.7
Avery	3	.3	.3	4.0
Beaufort	13	1.3	1.3	5.3
Bertie	4	.4	.4	5.7
Bladen	5	.5	.5	6.2
Brunswick	9	.9	.9	7.1
Buncombe	20	2.0	2.0	9.1
Burke	8	.8	.8	9.9
Cabarrus	23	2.3	2.3	12.2
Caldwell	10	1.0	1.0	13.2
Camden	2	.2	.2	13.4
Carteret	6	.6	.6	14.0
Caswell	3	.3	.3	14.3
Catawba	11	1.1	1.1	15.4
Chatham	9	.9	.9	16.3
Cherokee	3	.3	.3	16.6
Chowan	3	.3	.3	16.9
Cleveland	18	1.8	1.8	18.7
Columbus	8	.8	.8	19.5
Craven	16	1.6	1.6	21.1
Cumberland	35	3.5	3.5	24.6
Currituck	1	.1	.1	24.7
Dare	1	.1	.1	24.8
Davidson	18	1.8	1.8	26.6
Davie	4	.4	.4	27.0
Duplin	7	.7	.7	27.7
Durham	24	2.4	2.4	30.1
Edgecombe	12	1.2	1.2	31.3
Forsyth	44	4.4	4.4	35.7
Franklin	8	.8	.8	36.5
Gaston	15	1.5	1.5	38.0
Gates	3	.3	.3	38.3
Graham	1	.1	.1	38.4
Granville	7	.7	.7	39.1
Greene	2	.2	.2	39.3
Guilford	48	4.8	4.8	44.1
Halifax	4	.4	.4	44.5
Harnett	13	1.3	1.3	45.8
Haywood	7	.7	.7	46.5

County	Frequency	Percent	Valid Percent	Cumulative Percent
Henderson	8	.8	.8	47.3
Hertford	6	.6	.6	47.9
Hoke	9	.9	.9	48.8
Iredell	9	.9	.9	49.7
Jackson	2	.2	.2	49.9
Johnston	14	1.4	1.4	51.3
Lee	3	.3	.3	51.6
Lenoir	11	1.1	1.1	52.7
Lincoln	5	.5	.5	53.2
Macon	5	.5	.5	53.7
Madison	3	.3	.3	54.0
Mcdowell	4	.4	.4	54.4
Mecklenburg	56	5.6	5.6	60.0
Mitchell	2	.2	.2	60.2
Montgomery	1	.1	.1	60.3
Moore	9	.9	.9	61.2
Nash	10	1.0	1.0	62.2
New Hanover	16	1.6	1.6	63.8
Northampton	5	.5	.5	64.3
Onslow	21	2.1	2.1	66.4
Orange	5	.5	.5	66.9
Pamlico	2	.2	.2	67.1
Pasquotank	5	.5	.5	67.6
Pender	6	.6	.6	68.2
Perquimans	2	.2	.2	68.4
Person	5	.5	.5	68.9
Pitt	20	2.0	2.0	70.9
Polk	3	.3	.3	71.2
Randolph	13	1.3	1.3	72.5
Richmond	6	.6	.6	73.1
Robeson	17	1.7	1.7	74.8
Rockingham	13	1.3	1.3	76.1
Rowan	13	1.3	1.3	77.4
Rutherford	2	.2	.2	77.6
Sampson	18	1.8	1.8	79.4
Scotland	3	.3	.3	79.7
Stanly	2	.2	.2	79.9
Stokes	6	.6	.6	80.5
Surry	10	1.0	1.0	81.5
Swain	2	.2	.2	81.7
Transylvania	5	.5	.5	82.2
Union	19	1.9	1.9	84.1
Vance	10	1.0	1.0	85.1
Wake	94	9.4	9.4	94.5
Warren	4	.4	.4	94.9

County	Frequency	Percent	Valid Percent	Cumulative Percent
Washington	2	.2	.2	95.1
Watauga	5	.5	.5	95.6
Wayne	17	1.7	1.7	97.3
Wilkes	5	.5	.5	97.8
Wilson	15	1.5	1.5	99.3
Yadkin	4	.4	.4	99.7
Yancey	3	.3	.3	100.0
Total	1000	100.0	100.0	

What is your zip code?

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
27010	1	.1	.1	.1
27011	1	.1	.1	.2
27012	6	.6	.6	.8
27013	1	.1	.1	.9
27014	1	.1	.1	1.0
27017	2	.2	.2	1.2
27018	1	.1	.1	1.3
27020	1	.1	.1	1.4
27021	1	.1	.1	1.5
27022	1	.1	.1	1.6
27024	1	.1	.1	1.7
27025	1	.1	.1	1.8
27028	3	.3	.3	2.1
27030	4	.4	.4	2.5
27036	1	.1	.1	2.6
27041	1	.1	.1	2.7
27043	1	.1	.1	2.8
27048	2	.2	.2	3.0
27051	4	.4	.4	3.4
27052	1	.1	.1	3.5
27053	2	.2	.2	3.7
27055	1	.1	.1	3.8
27101	3	.3	.3	4.1
27103	3	.3	.3	4.4
27104	3	.3	.3	4.7
27105	2	.2	.2	4.9
27106	5	.5	.5	5.4
27107	4	.4	.4	5.8
27127	2	.2	.2	6.0
27203	2	.2	.2	6.2
27204	2	.2	.2	6.4
27205	2	.2	.2	6.6
27209	1	.1	.1	6.7
27214	1	.1	.1	6.8
27215	7	.7	.7	7.5
27217	5	.5	.5	8.0
27230	1	.1	.1	8.1
27235	1	.1	.1	8.2
27239	1	.1	.1	8.3
27249	1	.1	.1	8.4
27253	5	.5	.5	8.9
27263	1	.1	.1	9.0
27269	1	.1	.1	9.1

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
27278	1	.1	.1	9.2
27281	1	.1	.1	9.3
27283	1	.1	.1	9.4
27284	8	.8	.8	10.2
27285	1	.1	.1	10.3
27288	3	.3	.3	10.6
27292	4	.4	.4	11.0
27293	1	.1	.1	11.1
27295	3	.3	.3	11.4
27297	1	.1	.1	11.5
27299	2	.2	.2	11.7
27301	1	.1	.1	11.8
27302	2	.2	.2	12.0
27310	1	.1	.1	12.1
27312	5	.5	.5	12.6
27314	1	.1	.1	12.7
27316	1	.1	.1	12.8
27317	1	.1	.1	12.9
27320	4	.4	.4	13.3
27330	3	.3	.3	13.6
27341	1	.1	.1	13.7
27344	3	.3	.3	14.0
27357	1	.1	.1	14.1
27360	2	.2	.2	14.3
27361	1	.1	.1	14.4
27370	2	.2	.2	14.6
27379	1	.1	.1	14.7
27401	3	.3	.3	15.0
27403	6	.6	.6	15.6
27405	5	.5	.5	16.1
27406	2	.2	.2	16.3
27407	6	.6	.6	16.9
27408	1	.1	.1	17.0
27409	1	.1	.1	17.1
27410	5	.5	.5	17.6
27420	1	.1	.1	17.7
27425	1	.1	.1	17.8
27429	1	.1	.1	17.9
27435	1	.1	.1	18.0
27455	4	.4	.4	18.4
27491	1	.1	.1	18.5
27495	1	.1	.1	18.6
27501	2	.2	.2	18.8
27502	3	.3	.3	19.1
27503	1	.1	.1	19.2

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
27509	2	.2	.2	19.4
27510	1	.1	.1	19.5
27511	3	.3	.3	19.8
27513	5	.5	.5	20.3
27515	2	.2	.2	20.5
27516	1	.1	.1	20.6
27519	3	.3	.3	20.9
27520	3	.3	.3	21.2
27521	1	.1	.1	21.3
27522	3	.3	.3	21.6
27524	3	.3	.3	21.9
27525	3	.3	.3	22.2
27526	4	.4	.4	22.6
27527	1	.1	.1	22.7
27529	3	.3	.3	23.0
27530	4	.4	.4	23.4
27531	1	.1	.1	23.5
27534	1	.1	.1	23.6
27536	7	.7	.7	24.3
27537	3	.3	.3	24.6
27540	4	.4	.4	25.0
27541	1	.1	.1	25.1
27545	3	.3	.3	25.4
27546	4	.4	.4	25.8
27549	3	.3	.3	26.1
27552	1	.1	.1	26.2
27557	3	.3	.3	26.5
27560	5	.5	.5	27.0
27562	1	.1	.1	27.1
27565	1	.1	.1	27.2
27569	2	.2	.2	27.4
27571	1	.1	.1	27.5
27572	1	.1	.1	27.6
27573	1	.1	.1	27.7
27574	2	.2	.2	27.9
27576	1	.1	.1	28.0
27577	2	.2	.2	28.2
27581	1	.1	.1	28.3
27583	1	.1	.1	28.4
27587	9	.9	.9	29.3
27588	1	.1	.1	29.4
27589	2	.2	.2	29.6
27591	1	.1	.1	29.7
27592	3	.3	.3	30.0
27594	1	.1	.1	30.1

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
27596	2	.2	.2	30.3
27601	1	.1	.1	30.4
27602	1	.1	.1	30.5
27603	7	.7	.7	31.2
27604	5	.5	.5	31.7
27607	2	.2	.2	31.9
27608	1	.1	.1	32.0
27609	3	.3	.3	32.3
27610	5	.5	.5	32.8
27612	1	.1	.1	32.9
27613	4	.4	.4	33.3
27614	1	.1	.1	33.4
27615	2	.2	.2	33.6
27616	3	.3	.3	33.9
27617	2	.2	.2	34.1
27620	1	.1	.1	34.2
27701	3	.3	.3	34.5
27703	4	.4	.4	34.9
27704	1	.1	.1	35.0
27705	2	.2	.2	35.2
27707	4	.4	.4	35.6
27712	2	.2	.2	35.8
27713	2	.2	.2	36.0
27717	4	.4	.4	36.4
27801	1	.1	.1	36.5
27803	3	.3	.3	36.8
27804	1	.1	.1	36.9
27806	2	.2	.2	37.1
27809	1	.1	.1	37.2
27812	1	.1	.1	37.3
27814	1	.1	.1	37.4
27821	1	.1	.1	37.5
27822	1	.1	.1	37.6
27826	1	.1	.1	37.7
27830	1	.1	.1	37.8
27831	2	.2	.2	38.0
27832	1	.1	.1	38.1
27834	10	1.0	1.0	39.1
27839	1	.1	.1	39.2
27852	2	.2	.2	39.4
27853	1	.1	.1	39.5
27854	1	.1	.1	39.6
27855	2	.2	.2	39.8
27856	2	.2	.2	40.0
27858	10	1.0	1.0	41.0

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
27862	1	.1	.1	41.1
27863	3	.3	.3	41.4
27864	3	.3	.3	41.7
27865	1	.1	.1	41.8
27870	2	.2	.2	42.0
27873	1	.1	.1	42.1
27882	3	.3	.3	42.4
27886	5	.5	.5	42.9
27889	8	.8	.8	43.7
27893	6	.6	.6	44.3
27896	2	.2	.2	44.5
27906	1	.1	.1	44.6
27907	1	.1	.1	44.7
27909	4	.4	.4	45.1
27910	3	.3	.3	45.4
27920	1	.1	.1	45.5
27921	1	.1	.1	45.6
27922	1	.1	.1	45.7
27924	1	.1	.1	45.8
27926	1	.1	.1	45.9
27928	1	.1	.1	46.0
27932	2	.2	.2	46.2
27935	1	.1	.1	46.3
27937	1	.1	.1	46.4
27944	1	.1	.1	46.5
27962	1	.1	.1	46.6
27976	1	.1	.1	46.7
27980	1	.1	.1	46.8
27983	2	.2	.2	47.0
28001	1	.1	.1	47.1
28018	1	.1	.1	47.2
28020	1	.1	.1	47.3
28025	8	.8	.8	48.1
28026	1	.1	.1	48.2
28027	7	.7	.7	48.9
28031	2	.2	.2	49.1
28033	1	.1	.1	49.2
28036	1	.1	.1	49.3
28046	1	.1	.1	49.4
28051	1	.1	.1	49.5
28052	3	.3	.3	49.8
28054	4	.4	.4	50.2
28056	1	.1	.1	50.3
28073	1	.1	.1	50.4
28075	2	.2	.2	50.6

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28078	5	.5	.5	51.1
28079	1	.1	.1	51.2
28080	3	.3	.3	51.5
28081	4	.4	.4	51.9
28086	3	.3	.3	52.2
28088	1	.1	.1	52.3
28090	1	.1	.1	52.4
28092	2	.2	.2	52.6
28103	2	.2	.2	52.8
28104	5	.5	.5	53.3
28105	2	.2	.2	53.5
28107	1	.1	.1	53.6
28110	3	.3	.3	53.9
28111	1	.1	.1	54.0
28112	2	.2	.2	54.2
28114	1	.1	.1	54.3
28115	3	.3	.3	54.6
28119	1	.1	.1	54.7
28120	4	.4	.4	55.1
28127	1	.1	.1	55.2
28133	1	.1	.1	55.3
28134	2	.2	.2	55.5
28139	1	.1	.1	55.6
28144	3	.3	.3	55.9
28146	2	.2	.2	56.1
28147	5	.5	.5	56.6
28150	6	.6	.6	57.2
28152	3	.3	.3	57.5
28164	1	.1	.1	57.6
28166	1	.1	.1	57.7
28168	1	.1	.1	57.8
28169	1	.1	.1	57.9
28170	1	.1	.1	58.0
28173	6	.6	.6	58.6
28202	1	.1	.1	58.7
28204	1	.1	.1	58.8
28205	4	.4	.4	59.2
28208	2	.2	.2	59.4
28209	1	.1	.1	59.5
28210	4	.4	.4	59.9
28211	2	.2	.2	60.1
28212	2	.2	.2	60.3
28213	1	.1	.1	60.4
28214	1	.1	.1	60.5
28215	2	.2	.2	60.7

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28216	4	.4	.4	61.1
28217	1	.1	.1	61.2
28226	2	.2	.2	61.4
28227	2	.2	.2	61.6
28262	2	.2	.2	61.8
28265	1	.1	.1	61.9
28269	1	.1	.1	62.0
28270	1	.1	.1	62.1
28273	1	.1	.1	62.2
28277	3	.3	.3	62.5
28278	2	.2	.2	62.7
28301	3	.3	.3	63.0
28302	3	.3	.3	63.3
28303	7	.7	.7	64.0
28304	2	.2	.2	64.2
28305	1	.1	.1	64.3
28306	3	.3	.3	64.6
28307	2	.2	.2	64.8
28308	1	.1	.1	64.9
28310	1	.1	.1	65.0
28314	1	.1	.1	65.1
28315	1	.1	.1	65.2
28318	1	.1	.1	65.3
28320	1	.1	.1	65.4
28326	1	.1	.1	65.5
28327	2	.2	.2	65.7
28328	11	1.1	1.1	66.8
28329	1	.1	.1	66.9
28333	3	.3	.3	67.2
28334	2	.2	.2	67.4
28337	1	.1	.1	67.5
28339	2	.2	.2	67.7
28340	2	.2	.2	67.9
28344	1	.1	.1	68.0
28345	1	.1	.1	68.1
28348	6	.6	.6	68.7
28352	3	.3	.3	69.0
28356	1	.1	.1	69.1
28358	5	.5	.5	69.6
28360	1	.1	.1	69.7
28361	1	.1	.1	69.8
28364	2	.2	.2	70.0
28365	2	.2	.2	70.2
28366	2	.2	.2	70.4
28374	1	.1	.1	70.5

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28376	8	.8	.8	71.3
28377	1	.1	.1	71.4
28379	3	.3	.3	71.7
28384	3	.3	.3	72.0
28385	1	.1	.1	72.1
28386	2	.2	.2	72.3
28387	2	.2	.2	72.5
28390	3	.3	.3	72.8
28393	1	.1	.1	72.9
28394	1	.1	.1	73.0
28401	1	.1	.1	73.1
28403	2	.2	.2	73.3
28405	2	.2	.2	73.5
28409	2	.2	.2	73.7
28411	3	.3	.3	74.0
28412	5	.5	.5	74.5
28420	1	.1	.1	74.6
28423	1	.1	.1	74.7
28424	1	.1	.1	74.8
28425	1	.1	.1	74.9
28431	1	.1	.1	75.0
28433	2	.2	.2	75.2
28434	1	.1	.1	75.3
28441	1	.1	.1	75.4
28443	3	.3	.3	75.7
28445	1	.1	.1	75.8
28451	1	.1	.1	75.9
28453	1	.1	.1	76.0
28457	1	.1	.1	76.1
28458	1	.1	.1	76.2
28460	2	.2	.2	76.4
28461	1	.1	.1	76.5
28462	1	.1	.1	76.6
28463	3	.3	.3	76.9
28464	1	.1	.1	77.0
28466	2	.2	.2	77.2
28467	3	.3	.3	77.5
28468	1	.1	.1	77.6
28470	1	.1	.1	77.7
28472	1	.1	.1	77.8
28478	1	.1	.1	77.9
28501	2	.2	.2	78.1
28502	1	.1	.1	78.2
28504	4	.4	.4	78.6
28508	1	.1	.1	78.7

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28512	1	.1	.1	78.8
28516	1	.1	.1	78.9
28523	1	.1	.1	79.0
28526	2	.2	.2	79.2
28529	1	.1	.1	79.3
28532	4	.4	.4	79.7
28536	1	.1	.1	79.8
28539	3	.3	.3	80.1
28540	6	.6	.6	80.7
28541	1	.1	.1	80.8
28546	3	.3	.3	81.1
28547	2	.2	.2	81.3
28551	2	.2	.2	81.5
28557	1	.1	.1	81.6
28560	4	.4	.4	82.0
28562	4	.4	.4	82.4
28570	3	.3	.3	82.7
28572	3	.3	.3	83.0
28574	2	.2	.2	83.2
28578	1	.1	.1	83.3
28580	1	.1	.1	83.4
28584	1	.1	.1	83.5
28586	1	.1	.1	83.6
28601	4	.4	.4	84.0
28602	3	.3	.3	84.3
28604	1	.1	.1	84.4
28605	1	.1	.1	84.5
28607	3	.3	.3	84.8
28610	1	.1	.1	84.9
28612	1	.1	.1	85.0
28613	1	.1	.1	85.1
28618	1	.1	.1	85.2
28621	2	.2	.2	85.4
28622	1	.1	.1	85.5
28625	1	.1	.1	85.6
28626	2	.2	.2	85.8
28630	2	.2	.2	86.0
28633	1	.1	.1	86.1
28637	1	.1	.1	86.2
28638	1	.1	.1	86.3
28645	6	.6	.6	86.9
28650	1	.1	.1	87.0
28655	6	.6	.6	87.6
28659	3	.3	.3	87.9
28673	1	.1	.1	88.0

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28677	4	.4	.4	88.4
28681	2	.2	.2	88.6
28685	2	.2	.2	88.8
28701	1	.1	.1	88.9
28704	1	.1	.1	89.0
28705	1	.1	.1	89.1
28712	2	.2	.2	89.3
28713	2	.2	.2	89.5
28714	3	.3	.3	89.8
28715	3	.3	.3	90.1
28716	1	.1	.1	90.2
28717	1	.1	.1	90.3
28718	1	.1	.1	90.4
28722	1	.1	.1	90.5
28730	1	.1	.1	90.6
28731	1	.1	.1	90.7
28732	1	.1	.1	90.8
28734	3	.3	.3	91.1
28737	1	.1	.1	91.2
28742	1	.1	.1	91.3
28744	1	.1	.1	91.4
28745	1	.1	.1	91.5
28748	1	.1	.1	91.6
28751	2	.2	.2	91.8
28752	2	.2	.2	92.0
28754	3	.3	.3	92.3
28756	1	.1	.1	92.4
28762	1	.1	.1	92.5
28763	1	.1	.1	92.6
28768	1	.1	.1	92.7
28771	1	.1	.1	92.8
28772	1	.1	.1	92.9
28778	1	.1	.1	93.0
28779	1	.1	.1	93.1
28782	1	.1	.1	93.2
28786	3	.3	.3	93.5
28787	3	.3	.3	93.8
28791	1	.1	.1	93.9
28792	4	.4	.4	94.3
28801	2	.2	.2	94.5
28802	1	.1	.1	94.6
28803	1	.1	.1	94.7
28804	1	.1	.1	94.8
28805	1	.1	.1	94.9
28807	1	.1	.1	95.0

Zip Code	Frequency	Percent	Valid Percent	Cumulative Percent
28816	1	.1	.1	95.1
28880	1	.1	.1	95.2
28905	1	.1	.1	95.3
28906	2	.2	.2	95.5
99998	1	.1	.1	95.6
99999	44	4.4	4.4	100.0
Total	1000	100.0	100.0	

Appendix C
Crosstabulations

I. Water Quality
1. by Dwelling

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Area * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are*	1000	100.0%	0	.0%	1000	100.0%

Area * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
		Poor	Fair	Good	Excellent	Refuse to answer	
Area	Urban	31	95	126	8	7	267
	Suburban	45	158	161	14	9	387
	Rural	56	141	137	7	5	346
Total		132	394	424	29	21	1000

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.825(a)	8	.278
Likelihood Ratio	9.830	8	.277
Linear-by-Linear Association	5.432	1	.020
N of Valid Cases	1000		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.61.

Directional Measures

			Value
Nominal by Interval	Eta	Area Dependent	.085
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.076

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.099	.278
	Cramer's V	.070	.278
	Contingency Coefficient	.099	.278
N of Valid Cases		1000	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

I. Water Quality

2. by Gender

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Record gender of respondent. * Based on your current knowledge, do you think the overall water quality of the river, streams and lake in your area are*	1000	100.0%	0	.0%	1000	100.0%

Record gender of respondent. * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
		Poor	Fair	Good	Excellent	Refuse to answer	
Record gender of respondent	Female	86	241	246	12	15	600
	Male	46	153	178	17	6	400
Total		132	394	424	29	21	1000

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.709(a)	4	.103
Likelihood Ratio	7.669	4	.105
Linear-by-Linear Association	.242	1	.623
N of Valid Cases	1000		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.40.

Directional Measures

			Value
Nominal by Interval	Eta	Record gender of respondent. Dependent	.088
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.016

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.088	.103
	Cramer's V	.088	.103
	Contingency Coefficient	.087	.103
N of Valid Cases		1000	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

I. Water Quality
3. by Retirement Status

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Are you retired? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are*	832	83.2%	168	16.8%	1000	100.0%

Are you retired? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

	Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
	Poor	Fair	Good	Excellent	Refuse to answer	
Are you retired?						
Yes	54	96	97	8	11	266
No	53	203	198	10	7	471
Don't know	4	29	30	3	0	66
Refuse to answer	4	9	14	1	1	29
Total	115	337	339	22	19	832

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.827(a)	12	.008
Likelihood Ratio	27.566	12	.006
Linear-by-Linear Association	.134	1	.714
N of Valid Cases	832		

a 5 cells (25.0%) have expected count less than 5. The minimum expected count is .66.

Directional Measures

			Value
Nominal by Interval	Eta	Are you retired? Dependent	.096
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.034

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.180	.008
	Cramer's V	.104	.008
	Contingency Coefficient	.177	.008
N of Valid Cases		832	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

I. Water Quality

4. by Education

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Which of the following categories would you say best describes your education level? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are*	991	99.1%	9	.9%	1000	100.0%

Which of the following categories would you say best describes your education level? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

	Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
	Poor	Fair	Good	Excellent	Refuse to answer	
Which of the following categories would you say best describes your education level?						
Less than high school	4	17	19	2	0	42
Some high school	14	42	47	5	5	113
High school graduate	29	83	112	4	5	233
Some vocational or technical school	10	51	35	3	1	100
Graduated from vocational or technical school	6	19	31	4	4	64
Some college	27	53	63	4	3	150
2-Year college graduate	12	25	19	1	1	58
4-Year college graduate	20	70	59	3	1	153
Post-graduate degree	9	29	37	2	1	78
Total	131	389	422	28	21	991

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.003(a)	32	.184
Likelihood Ratio	37.005	32	.249
Linear-by-Linear Association	3.576	1	.059
N of Valid Cases	991		

a 17 cells (37.8%) have expected count less than 5. The minimum expected count is .89.

Directional Measures

			Value
Nominal by Interval	Eta	Which of the following categories would you say best describes your education level? Dependent	.063
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.136

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.198	.184
	Cramer's V	.099	.184
	Contingency Coefficient	.195	.184
N of Valid Cases		991	

a Not assuming the null hypothesis.

I. Water Quality
5. By Age

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Which of these categories best describes your age? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are*	999	99.9%	1	.1%	1000	100.0%

Which of these categories best describes your age? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

	Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					
	Poor	Fair	Good	Excellent	Refuse to answer	Total
Which of these categories best describes your age?						
18-24	6	45	51	4	2	108
25-34	6	38	36	1	0	81
35-44	43	122	136	8	4	313
45-54	21	71	75	7	3	177
55-64	24	57	50	2	4	137
Over 65	30	53	73	6	8	170
Don't know	2	7	3	1	0	13
Total	132	393	424	29	21	999

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.957(a)	24	.105
Likelihood Ratio	35.304	24	.064
Linear-by-Linear Association	.159	1	.690
N of Valid Cases	999		

a 12 cells (34.3%) have expected count less than 5. The minimum expected count is .27.

Directional Measures

			Value
Nominal by Interval	Eta	Which of these categories best describes your age? Dependent	.127
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.080

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.182	.105
	Cramer's V	.091	.105
	Contingency Coefficient	.179	.105
N of Valid Cases		999	

a Not assuming the null hypothesis.

I. Water Quality

6. By Race

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
How would you classify yourself? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are	969	96.9%	31	3.1%	1000	100.0%

How would you classify yourself? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Crosstabulation

Count

	Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
	Poor	Fair	Good	Excellent	Refuse to answer	
How would you classify yourself?						
Black or African-American	27	63	66	6	4	166
Asian	3	14	18	1	1	37
White	69	218	229	11	10	537
Hispanic	9	29	43	6	0	87
Other	15	24	28	2	4	73
Don't know	7	25	23	3	1	59
Refuse to answer	0	5	5	0	0	10
Total	130	378	412	29	20	969

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.127(a)	24	.399
Likelihood Ratio	26.023	24	.352
Linear-by-Linear Association	.102	1	.750
N of Valid Cases	969		

a 16 cells (45.7%) have expected count less than 5. The minimum expected count is .21.

Directional Measures

			Value
Nominal by Interval	Eta	How would you classify yourself? Dependent	.029
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.042

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.161	.399
	Cramer's V	.081	.399
	Contingency Coefficient	.159	.399
N of Valid Cases		969	

a Not assuming the null hypothesis.

I. Water Quality

7. By Income

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
*Which of the following categories best describes your annual household income before taxes? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are*	713	71.3%	287	28.7%	1000	100.0%

Which of the following categories best describes your annual household income before taxes? * Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Cosstabulation

Count

	Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are					Total
	Poor	Fair	Good	Excellent	Refuse to answer	
Which of the following categories best describes your annual household income before taxes?						
Less than $12,000	20	28	29	6	3	86
$12,000 to $25,000	17	42	37	1	2	99
$25,000 to $35,000	11	36	37	3	1	88
$35,000 to $50,000	15	44	36	2	2	99
$50,000 to $75,000	13	42	46	2	1	104
$75,000 to $100,000	6	27	23	0	0	56
Over $100,000	3	20	27	1	0	51
Don't know	13	47	39	3	5	107
Refuse to answer	3	8	10	0	2	23
Total	101	294	284	18	16	713

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.466(a)	32	.200
Likelihood Ratio	38.501	32	.199
Linear-by-Linear Association	2.321	1	.128
N of Valid Cases	713		

a 19 cells (42.2%) have expected count less than 5. The minimum expected count is .52.

Directional Measures

			Value
Nominal by Interval	Eta	Which of the following categories best describes your annual household income before taxes? Dependent	.116
		Based on your current knowledge, do you think the overall water quality of the river, streams and lakes in your area are Dependent	.099

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.232	.200
	Cramer's V	.116	.200
	Contingency Coefficient	.226	.200
N of Valid Cases		713	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

II. Where Stormwater Goes

1. by Age

Where would you say storm water runoff goes once it enters a storm drain? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
Where would you say storm water runoff goes once it enters a storm drain?								
The city's regular sewer treatment plant	15	20	34	34	25	22	2	152
A separate special sewer treatment plant	1	5	8	17	13	9	0	53
Nearby fields and yards	6	13	9	15	8	17	2	70
Closest river, stream, or lake	15	27	55	49	53	67	2	268
Drainage pond	6	10	15	23	19	21	0	94
Refuse to answer	1	2	14	13	9	34	3	76
Total	44	77	135	151	127	170	9	713

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	61.498(a)	30	.001
Likelihood Ratio	62.473	30	.000
Linear-by-Linear Association	25.017	1	.000
N of Valid Cases	713		

a 9 cells (21.4%) have expected count less than 5. The minimum expected count is .67.

Directional Measures

			Value
Nominal by Interval	Eta	Where would you say storm water runoff goes once it enters a storm drain? Dependent	.214
		Which of these categories best describes your age? Dependent	.201

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.294	.001
	Cramer's V	.131	.001
	Contingency Coefficient	.282	.001
N of Valid Cases		713	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

II. Where Stormwater Goes
2. by Area

Where would you say storm water runoff goes once it enters a storm drain? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
Where would you say storm water runoff goes once it enters a storm drain?				
The city's regular sewer treatment plant	46	60	46	152
A separate special sewer treatment plant	17	19	17	53
Nearby fields and yards	17	22	31	70
Closest river, stream, or lake	66	112	90	268
Drainage pond	23	37	34	94
Refuse to answer	16	24	36	76
Total	185	274	254	713

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.811(a)	10	.298
Likelihood Ratio	11.550	10	.316
Linear-by-Linear Association	5.754	1	.016
N of Valid Cases	713		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.75.

Directional Measures

			Value
Nominal by Interval	Eta	Where would you say storm water runoff goes once it enters a storm drain? Dependent	.092
		Area Dependent	.106

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.129	.298
	Cramer's V	.091	.298
	Contingency Coefficient	.128	.298
N of Valid Cases		713	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

II. Where Stormwater Goes

3. by Gender

Where would you say storm water runoff goes once it enters a storm drain? * Record gender of respondent. Crosstabulation

Count

	Record gender of respondent.		Total
	Female	Male	
Where would you say storm water runoff goes once it enters a storm drain?			
The city's regular sewer treatment plant	103	49	152
A separate special sewer treatment plant	38	15	53
Nearby fields and yards	45	25	70
Closest river, stream, or lake	131	137	268
Drainage pond	64	30	94
Refuse to answer	62	14	76
Total	443	270	713

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.882(a)	5	.000
Likelihood Ratio	38.788	5	.000
Linear-by-Linear Association	2.091	1	.148
N of Valid Cases	713		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.07.

Directional Measures

			Value
Nominal by Interval	Eta	Where would you say storm water runoff goes once it enters a storm drain? Dependent	.054
		Record gender of respondent. Dependent	.230

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.230	.000
	Cramer's V	.230	.000
	Contingency Coefficient	.225	.000
N of Valid Cases		713	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

1. Grass Clippings

   a. by Dwelling

When you mow your grass, what do you do with the grass clippings? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
When you mow your grass, what do you do with the grass clippings?				
Leave them in the yard	98	192	179	469
Collect them and throw them in the garbage	63	91	74	228
Rake or blow them into a drain	3	4	6	13
Mulch or compost them	36	62	45	143
Something else	4	2	8	14
Refuse to answer	4	2	1	7
Total	208	353	313	874

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.120(a)	10	.128
Likelihood Ratio	15.020	10	.131
Linear-by-Linear Association	4.012	1	.045
N of Valid Cases	874		

a 6 cells (33.3%) have expected count less than 5. The minimum expected count is 1.67.

Directional Measures

			Value
Nominal by Interval	Eta	When you mow your grass, what do you do with the grass clippings? Dependent	.074
		Area Dependent	.105

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.132	.128
	Cramer's V	.093	.128
	Contingency Coefficient	.130	.128
N of Valid Cases		874	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

1. Grass Clippings
   b. by Education

When you mow your grass, what do you do with the grass clippings? * Area Crosstabulation

Count

	Which of the following categories would you say best describes your education level?									Total
	Less than high school	Some high school	High school graduate	Some vocational or technical school	Graduated from vocational or technical school	Some college	2-Year college graduate	4-Year college gradua te	Post-graduate degree	
When you mow your grass, what do you do with the grass clippings?										
Leave them in the yard	17	47	117	53	35	67	26	76	26	464
Collect them and throw them in the garbage	12	35	52	33	19	35	9	25	7	227
Rake or blow them into a drain	1	2	3	0	0	3	2	2	0	13
Mulch or compost them	2	12	19	7	6	23	16	30	26	141
Something else	1	1	3	0	0	3	0	2	4	14
Refuse to answer	1	0	1	0	0	2	0	1	2	7
Total	34	97	195	93	60	133	53	136	65	866

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	98.663(a)	40	.000
Likelihood Ratio	97.350	40	.000
Linear-by-Linear Association	23.445	1	.000
N of Valid Cases	866		

a 27 cells (50.0%) have expected count less than 5. The minimum expected count is .27.

Directional Measures

			Value
Nominal by Interval	Eta	When you mow your grass, what do you do with the grass clippings? Dependent	.235
		Which of the following categories would you say best describes your education level? Dependent	.240

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.338	.000
	Cramer's V	.151	.000
	Contingency Coefficient	.320	.000
N of Valid Cases		866	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

2. Fertilizer Use

a. by Dwelling

About how often would you say you use fertilizer on your lawn? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
About how often would you say you use fertilizer on your lawn?				
Monthly	9	8	4	21
Two or three times a year	50	72	45	167
Once a year or less	36	69	63	168
Refuse to answer	2	3	1	6
Total	97	152	113	362

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.295(a)	6	.158
Likelihood Ratio	9.247	6	.160
Linear-by-Linear Association	1.244	1	.265
N of Valid Cases	362		

a 3 cells (25.0%) have expected count less than 5. The minimum expected count is 1.61.

Directional Measures

			Value
Nominal by Interval	Eta	About how often would you say you use fertilizer on your lawn? Dependent	.061
		Area Dependent	.157

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.160	.158
	Cramer's V	.113	.158
	Contingency Coefficient	.158	.158
N of Valid Cases		362	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

2. Fertilizer Use

b. by Income

About how often would you say you use fertilizer on your lawn? * Which of the following categories best describes your annual household income before taxes? Crosstabulation

Count

	Which of the following categories best describes your annual household income before taxes?									
	Less than $12,000	$12,000 to $25,000	$25,000 to $35,000	$35,000 to $50,000	$50,000 to $75,000	$75,000 to $100,000	Over $100,000	Don't know	Refuse to answer	Total
About how often would you say you use fertilizer on your lawn?										
Monthly	0	2	2	0	1	1	5	2	0	13
Two or three times a year	3	3	8	15	22	10	20	17	5	103
Once a year or less	9	18	20	25	31	22	10	26	7	168
Refuse to answer	1	1	0	0	0	0	0	2	0	4
Total	13	24	30	40	54	33	35	47	12	288

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.962(a)	24	.017
Likelihood Ratio	42.453	24	.011
Linear-by-Linear Association	3.347	1	.067
N of Valid Cases	288		

a 20 cells (55.6%) have expected count less than 5. The minimum expected count is .17.

Directional Measures

			Value
Nominal by Interval	Eta	About how often would you say you use fertilizer on your lawn? Dependent	.259
		Which of the following categories best describes your annual household income before taxes? Dependent	.159

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.377	.017
	Cramer's V	.218	.017
	Contingency Coefficient	.353	.017
N of Valid Cases		288	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

2. Fertilizer Use

c. by Age

About how often would you say you use fertilizer on your lawn? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
About how often would you say you use fertilizer on your lawn								
Monthly	1	1	12	1	2	3	1	21
Two or three times a year	22	7	64	29	17	27	1	167
Once a year or less	3	14	23	36	42	46	4	168
Refuse to answer	0	0	2	1	0	2	1	6
Total	26	22	101	67	61	78	7	362

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	74.602(a)	18	.000
Likelihood Ratio	75.353	18	.000
Linear-by-Linear Association	16.321	1	.000
N of Valid Cases	362		

a 15 cells (53.6%) have expected count less than 5. The minimum expected count is .12.

Directional Measures

			Value
Nominal by Interval	Eta	About how often would you say you use fertilizer on your lawn? Dependent	.249
		Which of these categories best describes your age? Dependent	.302

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.454	.000
	Cramer's V	.262	.000
	Contingency Coefficient	.413	.000
N of Valid Cases		362	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

3. Soil Test

a. by Area

Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
Does anyone ever test the soil on your lawn to determine how much fertilizer is needed?				
Yes	50	63	48	161
No	45	89	64	198
Refuse to answer	2	2	2	6
Total	97	154	114	365

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.436(a)	4	.488
Likelihood Ratio	3.434	4	.488
Linear-by-Linear Association	.237	1	.627
N of Valid Cases	365		

a 3 cells (33.3%) have expected count less than 5. The minimum expected count is 1.59.

Directional Measures

			Value
Nominal by Interval	Eta	Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? Dependent	.027
		Area Dependent	.071

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.097	.488
	Cramer's V	.069	.488
	Contingency Coefficient	.097	.488
N of Valid Cases		365	

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care

3. Soil Test

b. by Age

Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
Does anyone ever test the soil on your lawn to determine how much fertilizer is needed?								
Yes	20	6	66	26	20	20	3	161
No	6	15	36	43	41	55	2	198
Refuse to answer	0	1	0	0	0	3	2	6
Total	26	22	102	69	61	78	7	365

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	84.142(a)	12	.000
Likelihood Ratio	65.126	12	.000
Linear-by-Linear Association	23.701	1	.000
N of Valid Cases	365		

a 9 cells (42.9%) have expected count less than 5. The minimum expected count is .12.

Directional Measures

			Value
Nominal by Interval	Eta	Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? Dependent	.357
		Which of these categories best describes your age? Dependent	.294

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.480	.000
	Cramer's V	.340	.000
	Contingency Coefficient	.433	.000
N of Valid Cases		365	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

III. Lawn Care
3. Soil Test
c. by Gender

Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? * Record gender of respondent.Crosstabulation

Count

	Record gender of respondent.		Total
	Female	Male	
Does anyone ever test the soil on your lawn to determine how much fertilizer is needed?			
Yes	97	64	161
No	121	77	198
Refuse to answer	6	0	6
Total	224	141	365

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.868(a)	2	.145
Likelihood Ratio	5.950	2	.051
Linear-by-Linear Association	3.286	1	.070
N of Valid Cases	365		

a 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.32.

Directional Measures

			Value
Nominal by Interval	Eta	Does anyone ever test the soil on your lawn to determine how much fertilizer is needed? Dependent	.095
		Record gender of respondent. Dependent	.103

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.103	.145
	Cramer's V	.103	.145
	Contingency Coefficient	.102	.145
N of Valid Cases		365	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

1. Washing
    a. by Dwelling

When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?				
Into the grass, dirt or gravel	34	69	85	188
Into the street or driveway	36	54	38	128
Varies, sometimes one, sometimes another	1	9	4	14
Don't know	0	0	1	1
Total	71	132	128	331

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.432(a)	6	.025
Likelihood Ratio	14.877	6	.021
Linear-by-Linear Association	1.951	1	.162
N of Valid Cases	331		

a 4 cells (33.3%) have expected count less than 5. The minimum expected count is .21.

Directional Measures

			Value
Nominal by Interval	Eta	When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? Dependent	.092
		Area Dependent	.173

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.209	.025
	Cramer's V	.148	.025
	Contingency Coefficient	.204	.025
N of Valid Cases		331	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

1. Washing
   b. by Gender

When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? * Record gender of respondent. Crosstabulation

Count

	Record gender of respondent.		
	Female	Male	Total
When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?			
Into the grass, dirt or gravel	109	79	188
Into the street or driveway	78	50	128
Varies, sometimes one, sometimes another	6	8	14
Don't know	1	0	1
Total	194	137	331

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.455(a)	3	.483
Likelihood Ratio	2.791	3	.425
Linear-by-Linear Association	.058	1	.810
N of Valid Cases	331		

a 2 cells (25.0%) have expected count less than 5. The minimum expected count is .41.

Directional Measures

			Value
Nominal by Interval	Eta	When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? Dependent	.013
		Record gender of respondent. Dependent	.086

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.086	.483
	Cramer's V	.086	.483
	Contingency Coefficient	.086	.483
N of Valid Cases		331	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

1. Washing
   c. by Age

When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?								
Into the grass, dirt or gravel	17	15	47	35	32	41	1	188
Into the street or driveway	15	5	52	19	19	15	3	128
sometimes one, sometimes another	1	2	5	4	1	1	0	14
Don't know	0	1	0	0	0	0	0	1
Total	33	23	104	58	52	57	4	331

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.304(a)	18	.015
Likelihood Ratio	25.624	18	.109
Linear-by-Linear Association	5.315	1	.021
N of Valid Cases	331		

a 16 cells (57.1%) have expected count less than 5. The minimum expected count is .01.

Directional Measures

			Value
Nominal by Interval	Eta	When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? Dependent	.180
		Which of these categories best describes your age? Dependent	.127

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.317	.015
	Cramer's V	.183	.015
	Contingency Coefficient	.302	.015
N of Valid Cases		331	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

1. Washing
   d. by Income

When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? * Which of the following categories best describes your annual household income before taxes? Crosstabulation

Count

	Which of the following categories best describes your annual household income before taxes?									Total
	Less than $12,000	$12,000 to $25,000	$25,000 to $35,000	$35,000 to $50,000	$50,000 to $75,000	$75,000 to $100,000	Over $100,000	Don't know	Refuse to answer	
When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street?										
Into the grass, dirt or gravel	20	26	14	24	16	9	14	27	8	158
Into the street or driveway	5	5	6	10	14	7	9	11	3	70
Varies, sometimes one, sometimes another	0	3	2	2	2	2	2	1	0	14
Don't know	0	0	1	0	0	0	0	0	0	1
Total	25	34	23	36	32	18	25	39	11	243

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.906(a)	24	.411
Likelihood Ratio	22.198	24	.567
Linear-by-Linear Association	.148	1	.701
N of Valid Cases	243		

a 19 cells (52.8%) have expected count less than 5. The minimum expected count is .05.

Directional Measures

			Value
Nominal by Interval	Eta	When you wash your vehicle at home, does the soapy water flow into the grass, or onto the street? Dependent	.214
		Which of the following categories best describes your annual household income before taxes? Dependent	.115

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.320	.411
	Cramer's V	.185	.411
	Contingency Coefficient	.305	.411
N of Valid Cases		243	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

2. Oil Change

a. by Dwelling

When you change your oil at home, how do you dispose of the used oil? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
When you change your oil at home, how do you dispose of the used oil?				
In a designated lawn area	2	10	10	22
With other garbage (dumpster, placed in trash bags, etc)	7	14	15	36
Pour it down a storm drain	3	6	7	16
Take it somewhere it can be recycled	15	44	32	91
Other	0	2	8	10
Refuse to answer	2	1	1	4
Total	29	77	73	179

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.730(a)	10	.239
Likelihood Ratio	13.030	10	.222
Linear-by-Linear Association	.565	1	.452
N of Valid Cases	179		

a 8 cells (44.4%) have expected count less than 5. The minimum expected count is .65.

Directional Measures

			Value
Nominal by Interval	Eta	When you change your oil at home, how do you dispose of the used oil? Dependent	.074
		Area Dependent	.227

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.267	.239
	Cramer's V	.189	.239
	Contingency Coefficient	.258	.239
N of Valid Cases		179	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

2. Oil Change

b. by Race

When you change your oil at home, how do you dispose of the used oil? * How would you classify yourself? Crosstabulation

Count

	How would you classify yourself?							
	Black or African-American	Asian	White	Hispanic	Other	Don't know	Refuse to answer	Total
When you change your oil at home, how do you dispose of the used oil?								
In a designated lawn area	2	0	9	2	3	6	0	22
With other garbage (dumpster, placed in trash bags, etc)	4	3	15	4	3	5	1	35
Pour it down a storm drain	2	4	2	3	2	2	0	15
Take it somewhere it can be recycled	6	1	72	4	6	2	0	91
Other	1	0	8	1	0	0	0	10
Refuse to answer	3	1	0	0	0	0	0	4
Total	18	9	106	14	14	15	1	177

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	85.618(a)	30	.000
Likelihood Ratio	74.064	30	.000
Linear-by-Linear Association	20.716	1	.000
N of Valid Cases	177		

a 33 cells (78.6%) have expected count less than 5. The minimum expected count is .02.

Directional Measures

			Value
Nominal by Interval	Eta	When you change your oil at home, how do you dispose of the used oil? Dependent	.354
		How would you classify yourself? Dependent	.347

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.695	.000
	Cramer's V	.311	.000
	Contingency Coefficient	.571	.000
N of Valid Cases		177	

a Not assuming the null hypothesis. b Using the asymptotic standard error assuming the null hypothesis.

IV. Vehicle Care

2. Oil Change

c. by Age

When you change your oil at home, how do you dispose of the used oil? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
When you change your oil at home, how do you dispose of the used oil?								
In a designated lawn area	5	1	12	2	1	1	0	22
With other garbage (dumpster, placed in trash bags, etc)	7	1	15	8	3	2	0	36
Pour it down a storm drain	2	2	7	4	1	0	0	16
Take it somewhere it can be recycled	5	12	22	23	14	13	2	91
Other	1	0	2	4	0	3	0	10
Refuse to answer	1	1	0	1	0	1	0	4
Total	21	17	58	42	19	20	2	179

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.218(a)	30	.101
Likelihood Ratio	45.841	30	.032
Linear-by-Linear Association	7.596	1	.006
N of Valid Cases	179		

a 31 cells (73.8%) have expected count less than 5. The minimum expected count is .04.

Directional Measures

			Value
Nominal by Interval	Eta	When you change your oil at home, how do you dispose of the used oil? Dependent	.336
		Which of these categories best describes your age? Dependent	.292

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.474	.101
	Cramer's V	.212	.101
	Contingency Coefficient	.428	.101
N of Valid Cases		179	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

V. Pet Waste Disposal

1. by Dwelling

How often do you pick up their pet waste? * Area Crosstabulation

Count

	Area			Total
	Urban	Suburban	Rural	
How often do you pick up their pet waste?				
Always	48	63	41	152
Often	5	14	12	31
Sometimes	23	26	19	68
Rarely	45	45	55	145
Never	25	67	64	156
Refuse to answer	2	10	7	19
Total	148	225	198	571

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.038(a)	10	.008
Likelihood Ratio	25.562	10	.004
Linear-by-Linear Association	9.107	1	.003
N of Valid Cases	571		

a 1 cells (5.6%) have expected count less than 5. The minimum expected count is 4.92.

Directional Measures

			Value
Nominal by Interval	Eta	How often do you pick up their pet waste? Dependent	.129
		Area Dependent	.167

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.205	.008
	Cramer's V	.145	.008
	Contingency Coefficient	.201	.008
N of Valid Cases		571	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

V. Pet Waste Disposal

2. by Gender

How often do you pick up their pet waste? * Record gender of respondent. Crosstabulation

Count

	Record gender of respondent.		Total
	Female	Male	
How often do you pick up their pet waste?			
Always	99	53	152
Often	19	12	31
Sometimes	37	31	68
Rarely	72	73	145
Never	96	60	156
Refuse to answer	16	3	19
Total	339	232	571

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.670(a)	5	.018
Likelihood Ratio	14.252	5	.014
Linear-by-Linear Association	.017	1	.895
N of Valid Cases	571		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.72.

Directional Measures

			Value
Nominal by Interval	Eta	How often do you pick up their pet waste? Dependent	.006
		Record gender of respondent. Dependent	.155

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.155	.018
	Cramer's V	.155	.018
	Contingency Coefficient	.153	.018
N of Valid Cases		571	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

V. Pet Waste Disposal
3. by Age

How often do you pick up their pet waste? * Which of these categories best describes your age? Crosstabulation

Count

	Which of these categories best describes your age?							Total
	18-24	25-34	35-44	45-54	55-64	Over 65	Don't know	
How often do you pick up their pet waste?								
Always	24	8	58	24	16	19	3	152
Often	3	2	18	3	3	1	1	31
Sometimes	14	5	20	14	6	8	1	68
Rarely	19	2	86	19	13	2	4	145
Never	16	16	46	36	27	15	0	156
Refuse to answer	4	0	13	2	0	0	0	19
Total	80	33	241	98	65	45	9	571

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	77.000(a)	30	.000
Likelihood Ratio	87.337	30	.000
Linear-by-Linear Association	1.204	1	.273
N of Valid Cases	571		

a 16 cells (38.1%) have expected count less than 5. The minimum expected count is .30.

Directional Measures

			Value
Nominal by Interval	Eta	How often do you pick up their pet waste? Dependent	.111
		Which of these categories best describes your age? Dependent	.126

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.367	.000
	Cramer's V	.164	.000
	Contingency Coefficient	.345	.000
N of Valid Cases		571	

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.