

**Northern Virginia Regional  
Commission**

[www.novaregion.org](http://www.novaregion.org)

*The Voice of Northern Virginia*

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In Grant Year 2016 (October 1, 2016 – September 30, 2017), the Northern Virginia Coastal Resources Technical Assistance Program was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality, through Grant # NA16NOS4190171 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended.

**Table of Contents**

Executive Summary..... 1

1 Introduction..... 2

2 Product Number One: Outcomes of Northern Virginia’s Coastal Resources Technical Assistance Program ..... 2

3 Special Project Report: Northern Virginia Clean Water Partners Regional Stormwater Education Campaign ..... 3

4 Benefits Accrued from Prior CZM Grants ..... 7

**Appendices**

A. Summary of Regional Stormwater Education Campaign ..... 13

B. Regional Stormwater Education

    Campaign Survey Results ..... 16



## **Executive Summary**

This report was produced, in part, through financial assistance from the Virginia Coastal Zone Management Program (CZMP), Virginia Department of Environmental Quality through Grant No. NA16NOS4190171 from the National Oceanic and Atmospheric Administration (NOAA). This report describes the technical assistance program conducted by the Northern Virginia Regional Commission (NVRC) through its Coastal Resources Management Program. The Coastal Resources Program at NVRC includes; coordination of regional programs that advance Virginia CZMP's interests in coastal resource management, public outreach, education and training, environmental impact and permit reviews, and technical assistance on coastal issues relevant to Northern Virginia localities.

This report fulfills the product requirements set forth in the FY 2016 Virginia Coastal Zone Management Program Grant, Task 46 (NOAA Grant # NA16NOS4190171) for:

- Product #1 – Annual Report – NoVA Coastal Resources Technical Assistance Program (55 %)
- Product #2 – Special Project Summary of Regional Stormwater Education Campaign (40%)
- Product #3 - Benefits accrued from prior CZM grants (5%)

## **1 Introduction**

The Northern Virginia Regional Commission's (NVRC) Regional Coastal Resources Program has been fostering an effective partnership among federal, state, and local governments in the region for over twenty years. Through its partnership with the Virginia Coastal Zone Management Program, NVRC has been conducting research on ongoing and new or emerging coastal issues affecting the region and providing technical and planning assistance to Northern Virginia localities on these issues since 1992.

The Virginia Coastal Zone Management Program awarded the NVRC a technical assistance grant of \$30,000 on October 1, 2016 to continue its Regional Coastal Resources Management Program through September 30, 2017. The general objectives of the Coastal Program in Northern Virginia include; promote the sustainable use of coastal resources, provide technical assistance to local governments and non-governmental organizations on emerging issues facing the coast such as water quality and coastal hazard planning, improve local capacity to protect, manage and restore coastal ecosystems, improve public access to the coast, serve as a forum for information exchange and coordination of planning among local, state, and federal stakeholders in the region. This report documents the outcomes of the technical assistance grant in FY16.

## **2 Product Number One: Outcomes of Northern Virginia's Coastal Resources Technical Assistance Program**

The Technical Assistance grant from CZM allows NVRC's Coastal Resources Management Program to conduct public outreach and education on coastal issues, coordinate regional programs that advance VA CZM's interests in coastal resource management and serve as a point of technical information exchange for local planning involving coastal issues.

Outcomes of the FY 16 grant include:

### ***Coastal Resource Planning and Technical Assistance***

The Technical Assistance grant allows NVRC to support the VA CZMP through serving as a member of the VA Coastal Policy Team, participation in the quarterly Coastal PDC meetings, and semi-annual Coastal Partners Workshops. The Technical Assistance grant also allows NVRC to participate in and support local and regional coastal planning initiatives in Northern Virginia such as Potomac Watershed Roundtable, Northern Virginia Urban Forestry Roundtable, and other and other special work groups as applicable. These meetings help to identify appropriate special projects and technical studies that would benefit technical assistance in the region as well as ensuring that local efforts may take advantage of or leverage other related initiatives taking place throughout the coastal zone. In FY16 NVRC staff coordinated or participated in and supported the implementation of the following initiatives:

- ***Coastal Planning District Commissions Planning Meetings***
  - October 19, 2016
  - May 24, 2017
- ***Virginia Coastal Policy Team Meetings/Coastal Partners Workshop***
  - November 16-17, 2016
  - January 18, 2017
- ***Local Implementation of Potomac Heritage National Scenic Trail***
  - June 12, 2017
- ***Forest Health Planning for Insect Pests: Local-Level Strategies for Northern Virginia Communities***
  - February 28, 2017

NVRC hosted a one-day workshop on managing forest pests to increase urban forest resilience.

NVRC also continues to participate in the EA/EIS and permit intergovernmental review process. Over the fiscal year, NVRC responded to 2 EA/EIS requests throughout the region as part of the intergovernmental review process.

***Residential Rain Gardens - Beautifying Your Yard for Clean Water (October 29, 2016)***



NVRC co-hosted one Beautifying Your Yard for Clean Water workshop on building small-scale rain gardens. Through the workshop, 40 participants learned how to design, build, landscape, and maintain small-scale residential rain gardens. The workshop was held at Fairlington Community Center Arlington, VA. These workshops have proven to be instrumental in providing technical expertise and resources to support the application of stormwater management practices on private properties. Over three-quarters of all participants who provided feedback stated that they will move forward with placing a rain garden on their properties. The presentations and other information pertaining to rain gardens can be viewed at [www.novaregion.org/raingardens](http://www.novaregion.org/raingardens)

**3 Special Project Report: Northern Virginia Clean Water Partners Regional Stormwater Education Campaign**

Polluted stormwater runoff is the number one cause of poor water quality in streams and rivers in Northern Virginia. To reduce the impacts of stormwater pollution, the Northern Virginia Clean Water Partners program aims to educate the public about the impact of stormwater runoff on water quality and change human behaviors in our cities and neighborhoods through Regional Stormwater Education Campaign.

The Northern Virginia Clean Water Partners is comprised of a multi-disciplined group of local governments, drinking water and sanitation authorities, and individual businesses working together to address the common issues surrounding pollution prevention, stormwater management, and source water protection. “Only Rain Down the Storm Drain” is the motto of the partnership.

The Regional Stormwater Education Campaign was initiated in 2003 to assist localities in leveraging funds to achieve common goals regarding stormwater education and outreach and promote consistent messages. NVRC held several meetings with the Partners to discuss and determine the high priority water quality issues for the region. Regional water quality impairments were the primary criteria used to determine the issues. The three high priority water quality issues identified by the Partners were bacteria, nutrients, and motor oil/chemical contaminants. These issues became the focus of the education and outreach campaign for 2016-2017. The campaign satisfies the Partners MS4 (Municipal Separate Storm Sewer System) Phase I and Phase II permit requirements for stormwater education and documenting changes in behavior.

Fifteen local jurisdiction members contributed financial and in-kind resources to the program in FY2016, for a total budget of \$100,000. The Partners met two times in FY16 to foster dialogue among the partners and the Department of Environmental Quality as well as to plan and implement campaign activities. Traditional media outlets (network television, radio, and print media) do not have the widespread viewer, listener, and readership that they did five years ago. People are increasingly consuming video on mobile devices through streamed content. Therefore, a multi-media, multi-device approach was taken this year.

In FY2016, educational ads featuring messages on the importance of proper pet waste disposal, over fertilization of lawns and gardens, and proper disposal of motor oil were distributed to the public via television, print, internet advertising and the Only Rain Down the Storm Drain website. Combining the cable TV ads with digital ads on premium-content websites throughout Northern Virginia, the Clean Water Partners were able to extend their campaign across multiple devices to reach Northern Virginians everywhere they consume video. In addition to the educational advertisements, public outreach events hosted throughout the Northern Virginia region also raised awareness and encouraged positive behavior change in residents. The educational ads featured the well-known national symbol of non-point source pollution; the rubber ducky.

From July 2016 through June 2017, the advertisements aired on 32 English language cable TV channels, and four Spanish speaking channels a total of 114,769 times. The networks were selected based upon research that shows they have the highest ‘reach’ to the target audiences.

These TV ads delivered 42,768,486 household impressions. The campaign also featured digital ads on premium content websites that promote the same messages as the cable TV ads. The digital ads delivered another 2,090,152 impressions.

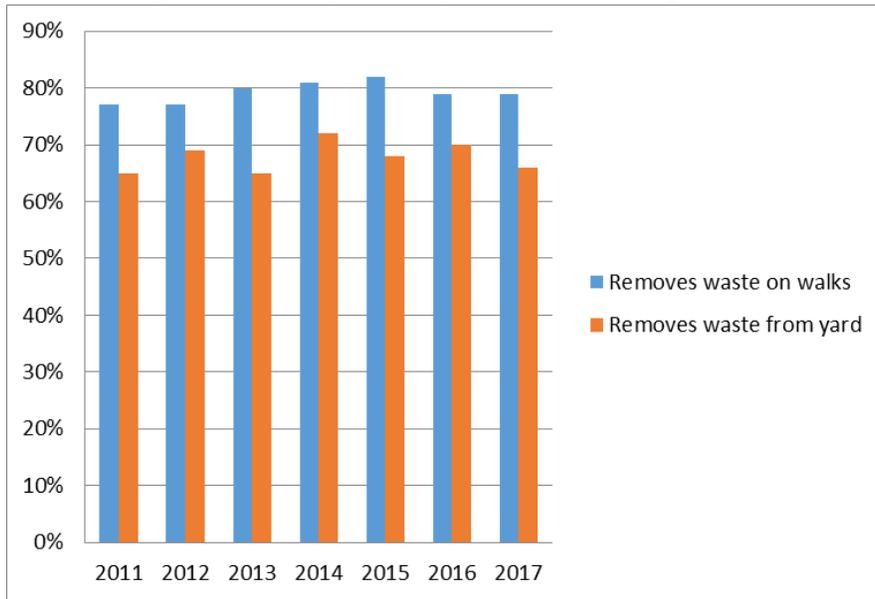
The Northern Virginia Clean Water Partners website [www.onlyrain.org](http://www.onlyrain.org) received 37,489 unique visits. These activities fulfilled the outreach and education requirements of the jurisdictions’ MS4 permits including requirement for each permittee to identify three high priority issues, determine the target audience for each high priority issue, and reach 20% of the target audience for each high priority issue. In total, 75% of the target audience for each issue was reached.

In May 2017, an online survey of 500 Northern Virginia residents was conducted by a research firm to determine the effectiveness of the ads, reveal any changes in behavior, and aid in directing the future efforts of the campaign. Some key findings include:

- Twenty-four percent of respondents recalled seeing the ad after watching the video. This is a significant increase from 2016 (16%).
- Of those who recalled the ads, 19 percent state they now pick up their pet waste more often, six percent state that they now properly dispose of motor oil, and 14 percent state they plan to fertilize fewer times per year.
- When shown the Storm Drain marker symbol, 62 percent of the respondents recognized it compared to 54 percent in 2013. This increase is statistically significant and indicates that awareness of the symbol has increased over time.
- Thirty eight percent of the respondents felt they were most prevented from taking action to protect clean water because they didn’t know what to do. This indicates that there is a need to educate people on what they can do to protect clean water.
- Ninety-five percent of respondents believe it is important for local governments to spend more money on protecting water quality indicating that public support remains strong for programs that improve the quality of water in streams and rivers and the Chesapeake Bay however the shifting demographics of the Northern Virginia region indicate that there continues to be a need to educate residents about what stormwater pollution is.

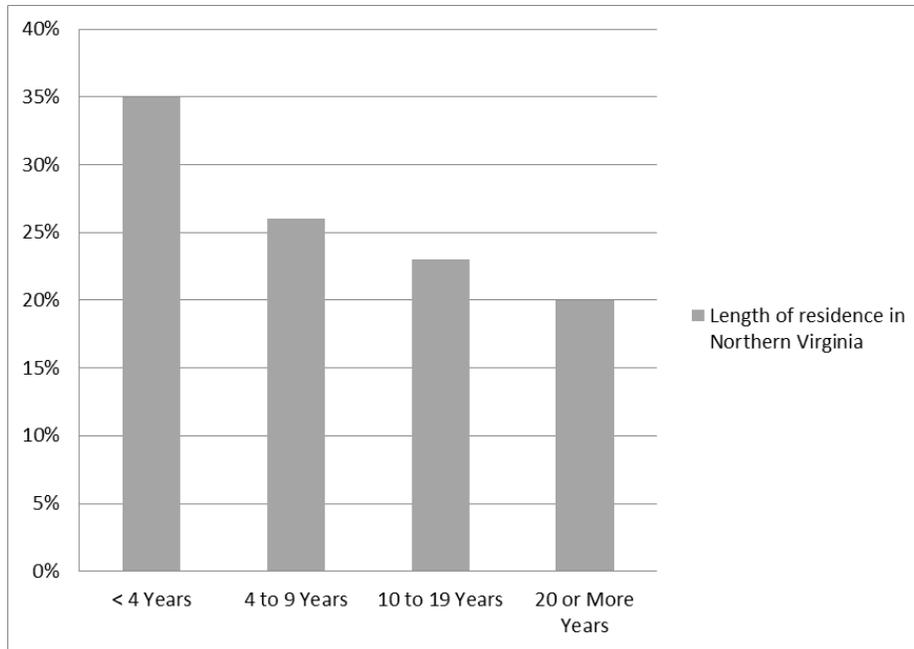
In addition to capturing responses to questions regarding the effectiveness of the campaign, the survey honed in on the current behaviors and attitudes of Northern Virginia residents as they relate to pet waste management, lawn care, and motor oil disposal. Responses to these questions support the development of future messages and targeted promotion.

For example, dog-owners are consistently more likely to pick up pet waste during walks than from their yard (Figure 1). While it is encouraging to see a majority of pet owners were motivated to pick up after their dog, the survey also showed that water pollution was not the main reason why - being a good neighbor is. This indicates that there is still room to educate pet owners that the waste is not lawn fertilizer and will cause water pollution. Crafting a message targeted towards removing waste from yards might be the next step for the Clean Water Partners.



**Figure 1. Percentage of pet owners who remove waste on walks vs. from their yards**

When asked “To the best of your knowledge, where do you believe storm water eventually ends up?” the majority of respondents understood that it runs off into local streams and ultimately the Chesapeake Bay. However, a sizeable amount either doesn’t know or thinks it ends up at a wastewater treatment plant. Figure 2 shows that this number significantly decreases based on the length of time the respondent has resided in Northern Virginia. This indicates that new residents might be targeted in future outreach efforts.



**Figure 2. Percentage of respondents who indicated that they either did not know where stormwater runoff ended up or thinks it goes to a wastewater treatment facility.**

Complete survey results are included as Appendix B.

NVRC staff prepared a summary for the campaign and distributed it to the Partners in August 2017. This report is included as Appendix A.

#### **4 Benefits Accrued from Prior CZM Grants**

The Technical Assistance grant from CZM has served as a foundation for the Northern Virginia Clean Water Partners project.

To reduce the impacts of stormwater pollution, the Northern Virginia Clean Water Partners aims to change human behaviors in our cities and neighborhoods through a public awareness and education campaign. The partnership is comprised of a multi-disciplinary group of local governments, drinking water and sanitation authorities, and individual businesses working together to address the common issues surrounding pollution prevention, stormwater management, and source water protection. “Only Rain Down the Storm Drain” is the motto of the partnership. By participating in the program, local jurisdictions have an opportunity to pool local outreach dollars to collectively target pollution-causing behaviors for greater impact at less cost and effort. In addition to taking advantage of the power of television and on-line media, the strategy provides for community engagement and the production of outreach materials that can be customized and used by each locality again and again. The primary goal of the partnership is to reduce stormwater-related pollution from entering local waterways.

To meet this goal, the Partners work together to:

- Educate the region's residents on simple ways to reduce pollution around their homes;
- Monitor changes in behavior through surveys and other data collection techniques; and
- Pilot new cost-effective opportunities for public outreach and education.

Members include stormwater program managers, Municipal Separate Storm Sewer System (MS4) Permit managers, communication directors, public information officers, water quality compliance specialists, and environmental planners. Membership is voluntary. However, the partnership provides a cost-effective means to meet mandatory state and federal stormwater requirements. By working together the partners are able to leverage their available funds to develop and place bi-lingual products with common messages and themes, thereby extending their individual reach.

The Annual Regional Stormwater Education Campaign was initiated in 2003 to assist localities in leveraging funds to achieve common goals regarding stormwater education and outreach and promote consistent messages for fertilizer and pesticide use, pet waste disposal, and motor oil recycling.

The 2015 campaign satisfied MS4 (Municipal Separate Storm Sewer System) Phase I and Phase II permit requirements for stormwater education and documenting changes in behavior. For more information visit [www.onlyrain.org](http://www.onlyrain.org)

Funds Leveraged since 2007: \$ 1,001,827

## **Appendix A**

### **Northern Virginia Clean Water Partners Summary of Regional Stormwater Education Campaign**



# Northern Virginia Clean Water Partners

## 2017 Summary

WORKING TOGETHER FOR HEALTHY STREAMS AND RIVERS

**Polluted stormwater runoff is the number one cause of poor water quality in streams and rivers in Northern Virginia.** When it rains, the water runs off streets, yards and parking lots and picks up pesticides, grass clippings, fertilizer, bacteria, and oil from driveways and parking lots. All of this pollution enters the storm drains on the street and is discharged directly to a stream. The runoff is not filtered or sent to a wastewater treatment facility.

To reduce the impacts of stormwater pollution, the Northern Virginia Clean Water Partners came together to change human behaviors through a public education campaign.

### About the Partnership

The Northern Virginia Clean Water Partners is comprised of a group of local governments, drinking water

and sanitation authorities, and businesses working together to inform individuals about the pollution potential of common activities, so that individuals can take direct action to reduce pollution.

To meet this goal, the Partners work together to:

- Identify high priority water quality issues for the region;
- Identify the target audience(s) for outreach;
- Educate the region's residents on simple ways to reduce pollution around their homes;
- Monitor changes in behavior through surveys and other data collection techniques; and
- Pilot new cost-effective opportunities for public outreach and education.

Membership is voluntary and each member pays annual dues to fund the program. By working together

the partners are able to leverage their funds to develop and place bilingual educational products with common messages and themes, thereby extending the campaign's reach.

***Only Rain Down the Storm Drain*** is the motto of the partnership.

The 2017 campaign satisfied MS4 (Municipal Separate Storm Sewer System) Phase I and Phase II permit requirements for stormwater education and documenting changes in behavior.

For more information visit [www.onlyrain.org](http://www.onlyrain.org)



## 2017 Campaign Overview and Accomplishments

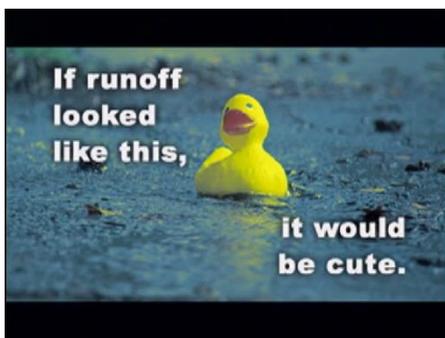
In 2017, the Northern Virginia Clean Water Partners selected the following three high priority water quality issues to focus on for the Campaign:

- bacteria,
- nutrients, and
- illicit discharge of chemical contaminants.

The Partners identified the target audiences for these issues as pet owners, homeowners with a lawn or garden, and home mechanics.

The Campaign used television, print, internet advertising and the Only Rain Down the Storm Drain website to distribute messages linked to specific stormwater problems, such as proper pet waste disposal, over fertilization of lawns and gardens and proper disposal of motor oil.

In addition to the multi-channel media campaign, partners participated in local events to raise awareness and encourage positive behavior change in residents. The television and internet ads featured the well-known national symbol of non-point source pollution; the rubber ducky.



<b>42,768,486</b>	Total household television impressions*
<b>2,090,152</b>	Total digital impressions (internet banner ads and in-stream video ads)
<b>114,769</b>	Number of times the ads aired from July 2016- June 2017
<b>37,489</b>	Visits to the <a href="http://www.onlyrain.org">www.onlyrain.org</a> website
<b>500</b>	Online Annual Survey Responses
<b>&gt;75%</b>	Percent of target audience reached

\* Impressions are the number of times an ad appeared on a single television or computer screen.

Throughout the campaign year, the Partners made the following efforts to educate the public and promote awareness of stormwater pollution:

- From July 2016 through June 2017, aired four Public Service Announcements on 32 English language cable TV channels, and four Spanish speaking channels a total of 139,225 times. The ads featured messages on the importance of picking up pet waste and general household stormwater pollution reduction measures aired
- The campaign also featured digital ads on Premium Digital Video websites that promote the same messages as the cable TV ads.

- Featured two full day, full page ads for Only Rain on the sign-in pages for Xfinity.com.



- Conducted an online survey of 500 Northern Virginia residents to determine the effectiveness of the ads, aid in directing the future efforts of the campaign, and to reveal any changes in behavior.
- Continued to update and maintain the Northern Virginia Clean Water Partners website.

# Annual Survey Highlights

Findings in the 2017 survey include:

- 24% of respondents recalled seeing the ad after watching the video. This is a significant increase from 2016 (16%).
- Of those who recalled the ads, 19 percent state they now pick up their pet waste more often, six percent state that they now properly dispose of motor oil, and 14 percent state they plan to fertilize fewer times per year.
- When shown the Only Rain Down the Storm Drain logo, 62 percent of the respondents recognized it compared to 54 percent in 2013. This increase is statistically significant and indicates that awareness of the logo has increased over time.
- The **four** channels that were most strongly associated with recall of the ad were Cartoon Network (43% of those who watched this channel recalled the ad), Animal Planet (36%), History Channel (34%), and National Geographic (32%). In fact, the highest numbers of impressions (2.8 million) were delivered on Cartoon Network.
- 38 percent of the respondents felt they were most prevented from taking action to protect

clean water because they didn't know what to do.

- The majority of respondents (64%) indicated that email newsletters with reminders and quick tips and/or online resources would help them take action to protect clean water.
- Interestingly, the number of respondents who prefer to receive information from online sources has decreased from a high of 57 percent in 2012 to 40 percent in 2016. Television (19%), newspaper and community newsletters were equally preferred information sources. This suggests that a future outreach effort might include reaching homeowners through their Community Associations.

## Understanding Behaviors

In addition to capturing responses to questions regarding the effectiveness of the campaign, this year's survey honed in on the current behaviors and attitudes of Northern Virginia residents as they relate to pet waste management, lawn care, and motor oil disposal. Responses to these questions support the development of future messages and targeted promotion.



## Main cause of water pollution...

Survey respondents ranked fertilizers and pesticides as the #1 cause of water pollution.



## Where stormwater goes...

79 percent of residents surveyed stated that stormwater goes to the Potomac River, the Chesapeake Bay, or to local streams.

**90%** stated the actions of individuals are important in protecting water quality in local streams, the Potomac River, and the Chesapeake Bay.

**70%** would be more likely to take actions to reduce the amounts of pollutants they personally put into storm drains, after learning that polluted water runoff is the number one cause of local water pollution.

**95%** believe it is important for local governments to spend more money on protecting water quality.

The most important reason dog owners are motivated to pick up their pet's waste is because "It's what good neighbors do". The number of respondents choosing "It causes water pollution" as the most important reason to pick it up has fluctuated but was the second most common reason in 2017.

Consistent with the past six years, almost a third of lawn and garden owners fertilize their lawns two or more times per year. An equal number never fertilize their lawns. Among those who fertilize once a year, 18 percent fertilize in the spring and only five percent fertilize in the fall. This suggests that there is room to educate residents of Northern Virginia that fertilizing in the fall is better for local waterways.

About half of the respondents reported using an herbicide to treat weeds in their lawn or garden.

Among those who fertilize their lawn, 75 percent have never had or were not sure if their soil had been tested for fertility or pH and fifty five percent reported using a slow release fertilizer.

Consistent with the past six years, the majority of respondents take their vehicle to a service station for oil changes (82%) or take used oil to a gas station or hazmat facility for recycling (11%). Three percent of Northern Virginians reported storing used motor oil in their garage, placing it in the trash or dumping it down the storm drain.



**Only Rain Down the Drain**

[www.onlyrain.org](http://www.onlyrain.org)

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### 2017 Northern Virginia Clean Water Partners

- Fairfax County | Arlington County | Loudoun County | Stafford County | Fairfax Water | City of Alexandria | Loudoun Water | City of Fairfax |
- Town of Herndon | City of Falls Church | Town of Leesburg | Town of Vienna |
- Town of Dumfries | Doody Calls | Northern Virginia Regional Commission | George Mason University | Virginia Coastal Zone Management Program | Fairfax County Public Schools | Prince William County Public Schools | Northern Virginia Soil and Water Conservation District



## **Appendix B**

### **Regional Stormwater Education Campaign Survey Results**

# **Northern Virginia Regional Commission 2017 Only Rain NVRC Survey**

## *Summary Report of Findings*

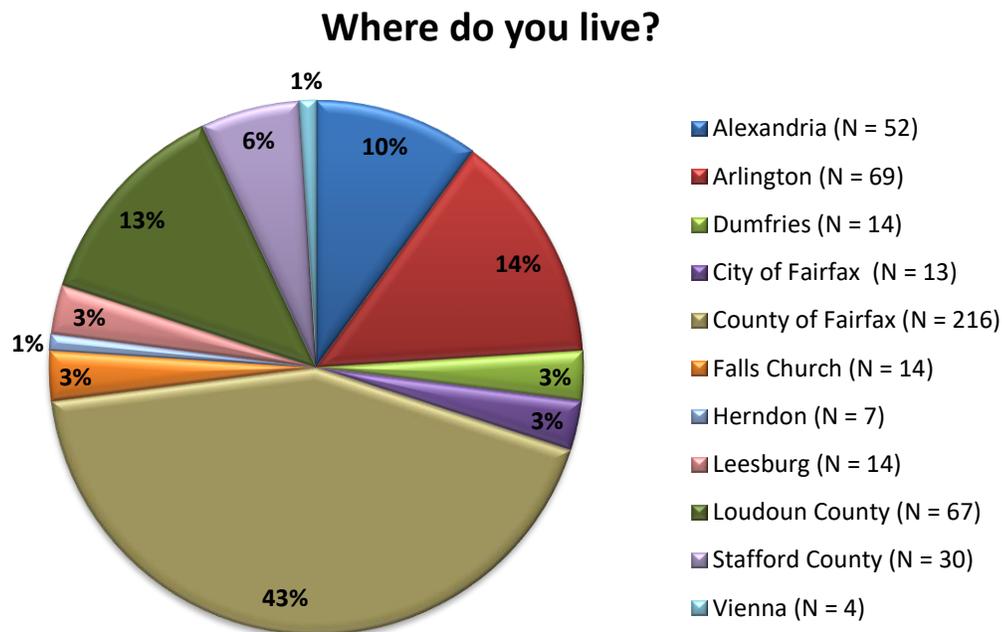
7/13/2017

**Amplitude Research, Inc.**

## Study Methodology & Respondent Characteristics

The Northern Virginia Regional Commission (NVRC) hired Amplitude Research, Inc. to conduct a survey of residents of northern Virginia to measure beliefs and attitudes related to pollution of the Potomac River and Chesapeake Bay.

Amplitude Research administered the study online beginning on June 5, 2017. In the end, 500 surveys were completed by web panelists who live in one of the areas of Virginia shown in the chart below. (In the legend, “N =” indicates the number of respondents in each city, county, or town.)



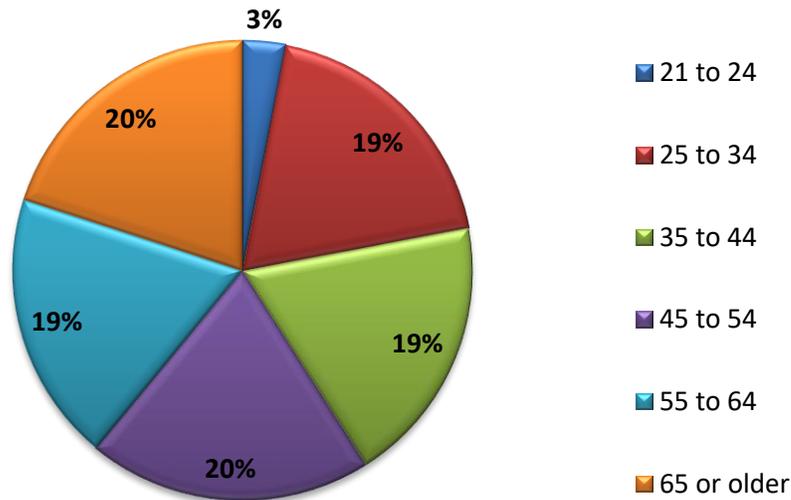
Later in this report, the results for some of the questions are “broken out” by area, in addition to presenting the results for the total sample. However, the specific areas listed above were grouped together into larger areas so that each larger area used for analysis had a reasonable number of respondents.

Residents from Leesburg and Loudoun County were combined into a single category labeled “**Leesburg / Loudoun**,” since the town of Leesburg lies within Loudoun County. Another category used for analysis was “**Dumfries / Stafford**,” since Dumfries lies just north of Stafford County. Although Dumfries is not located within Stafford County, it is closer to Stafford than to the other counties covered in the survey. (There were too few survey respondents living in Dumfries to examine the results for Dumfries separately.) The City of Fairfax, Falls Church, Herndon, and Vienna were combined with Fairfax County to create the category “**Fairfax Inclusive**,” since these cities and towns lie within the Fairfax County area. Although the City of Fairfax and City of Falls Church are distinct areas, their location falls within the larger area circumscribed by Fairfax County.

Alexandria and Arlington each had a sufficient number of respondents so that each of these areas can be examined separately.

The minimum age to participate in the survey was 21. As shown in the chart below, each age group was well represented in the survey. Although a small proportion were age 21 to 24, this category has fewer years than the other categories shown. For analysis purposes later in this report, the categories “21 to 24” and “25 to 34” were combined into the broader category of “21 to 34.”

### Which category includes your age?



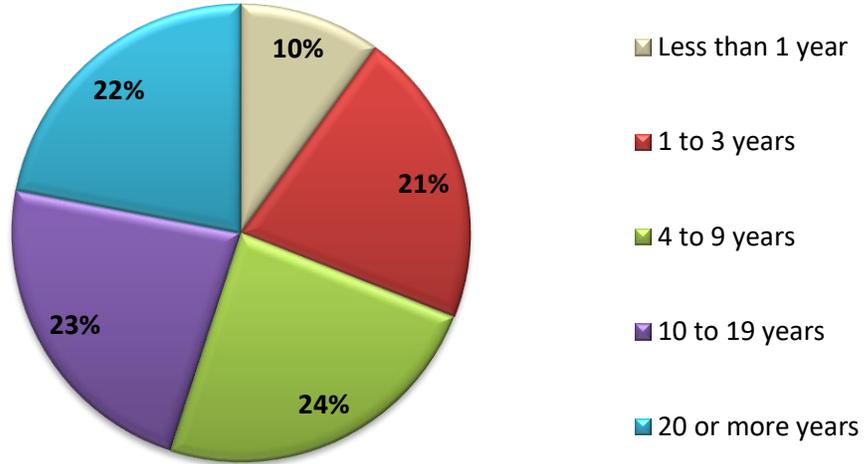
The survey respondents were split between males (48%) and females (52%), while approximately three-fourths (75%) indicated that they own their residence, and 25% reported renting.

The first chart on the next page shows how long respondents have lived in their current residence, and the second chart shows how long they have lived in northern Virginia. On the page after that, results are shown for the type of residence.

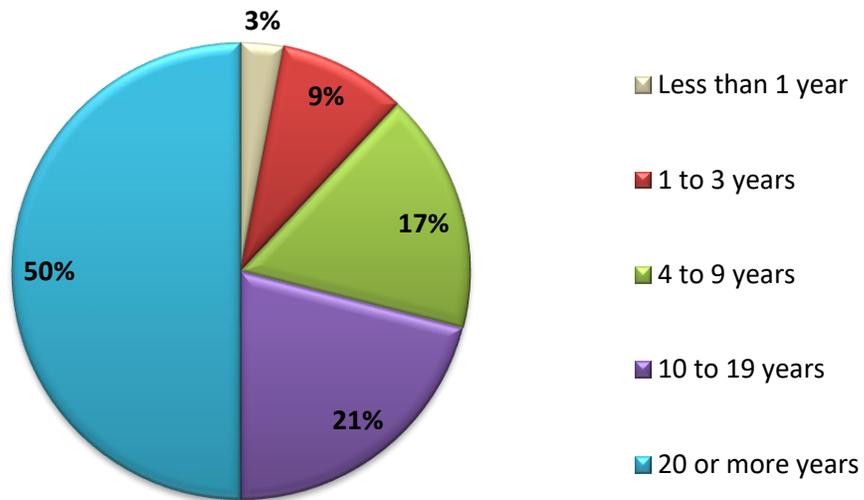
A survey was conducted in each year between 2011 and 2016 that included many of the same or similar questions, targeted the same geographic area, and had a similar demographic mix as in this 2017 study. Later in this report, comparisons between years are shown where appropriate. Initially, the title used for the study was “NVRC Resident Survey.” Starting in 2013, the study title was changed to “Only Rain NVRC Survey,” since a new question was added about awareness of the “Only Rain” logo.

In 2017, a minimum quota of 8% of the total sample was set for those who are of Hispanic heritage to ensure sufficient representation and to allow analysis of results specifically among Hispanic respondents.

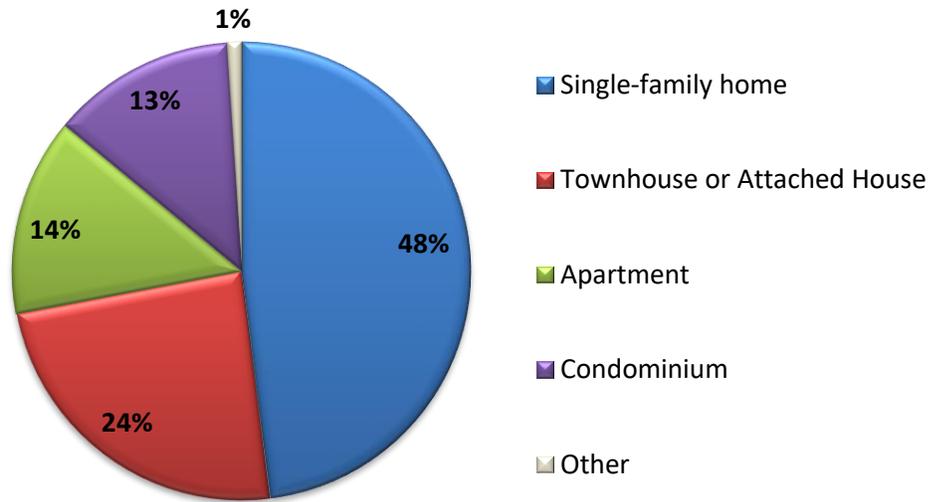
### For how many years have you lived in your current residence?



### For how many years have you lived in Northern Virginia?



## Which of the following best classifies your current residence?



## Sampling Variability

While examining the survey findings, it is helpful to keep in mind that the results are based on a sample and are therefore subject to sampling variability, often referred to as “sampling error.” The degree of uncertainty for an estimate (e.g., a particular percentage from the survey) arising from sampling variability is represented through the use of a margin of error. A sampling margin of error at the “95% confidence level” can be interpreted as providing a 95% probability that the interval created by the estimate plus and minus the margin of error contains the true value. (The “true” value would be known only if everyone in the target market was surveyed rather than just a sample.) In addition to sampling variability, results may be subject to various sources of non-sampling error (e.g., non-response bias, respondent misinterpretation of question wording, etc.). The degree of non-sampling error is not represented by the sampling margin of error and is usually unknown.

For a “sample size” of 500 survey respondents, the “maximum” margin of sampling error for percentages from the survey is +/- 4.4 percentage points at the 95% confidence level. Here, “maximum” refers to the margin of error being highest for proportions from the survey near 50%, while the margin of error declines as percentages get further from 50%. For example, given the same sample size of 500 respondents, a result from the survey near 10% or 90% would have a margin of sampling error of +/- 2.6 percentage points.

The margin of sampling error increases as the sample size decreases. Thus, when a question is asked of only a subset of the total sample, the associated margin of sampling error is larger than that quoted above. Also, even if a question is asked of all respondents, when examining results for a particular subgroup, the margin of sampling error depends on the number of respondents in that subgroup. For example, the “maximum” margin of sampling error would be +/- 9.8 percentage points at the “95% confidence level” when based on a subgroup of 100 survey respondents. In some parts of this report, results are shown for subgroups that include a fairly small number of respondents, and caution is recommended when thinking about these findings.

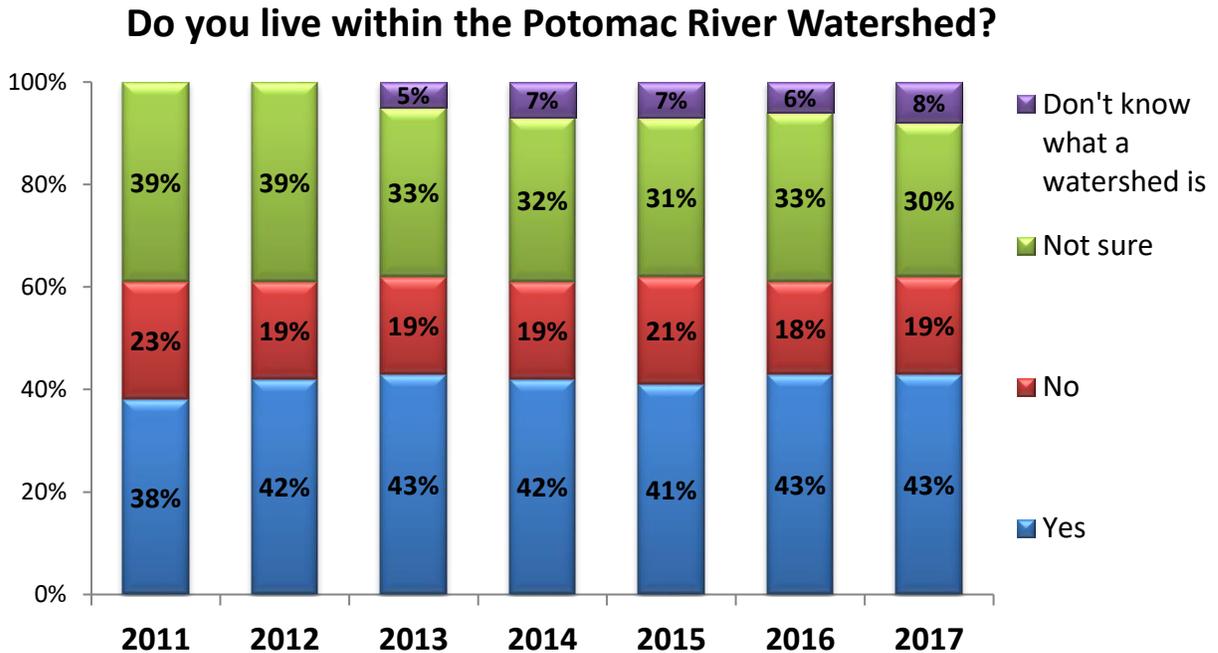
This suggests that results for different subgroups can be considered “similar” when the differences are small (i.e., small enough to be within the range of sampling error).

Results from different years can be considered similar when differences between the years are small. If the difference between two years is referred to as “statistically significant,” this essentially means that the difference in the survey results is large enough to be highly confident (i.e., at the “95% confidence level”) that there has been a real change. That is, a “statistically significant” difference in the survey results from one year to the next is larger than what would usually be expected from sampling error alone.

In this report, when a result from 2017 is described as “significantly” higher (or lower) than the result from a previous year, this means that the difference between these years is “statistically significant.” Also, when one subgroup is described as “more likely” (or “less likely”) than another subgroup to answer in a particular way, this is based on a statistically significant difference.

## Potomac River Watershed

- Early in the survey, respondents were asked if they lived within the “Potomac River Watershed.” As shown in the chart below, slightly more than four-in-ten (43%) in 2017 believed that they did in fact live within the Potomac River Watershed. Similar proportions held this belief in previous years.



- Nearly four-in-ten each year were not sure if they lived within the Potomac River Watershed or did not know what a watershed is. (The response option “I do not know what a watershed is” was first added in the 2013 survey.)
- When breaking the results out by area, as shown in the table below, Arlington had a significantly higher proportion answering “Yes” than Fairfax Inclusive and Dumfries / Stafford.

<b>Live Within Potomac River Watershed</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Yes	46%	59%	38%	48%	34%
No	11%	10%	22%	19%	27%
Not sure	35%	28%	31%	26%	32%
Don't know what a watershed is	8%	3%	9%	7%	7%

*N = number of respondents*

52

69

254

81

44

- As shown in the next table, those who have lived in northern Virginia for less than 4 years were less likely than others to say they live within the Potomac River Watershed.

<b>Live Within Potomac River Watershed</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>	<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Yes	29%	41%	47%	46%
No	23%	25%	14%	18%
Not sure	38%	27%	33%	28%
Don't know what a watershed is	10%	7%	6%	8%
<i>N = number of respondents</i>	61	83	103	253

- Those age 45 or older were more likely than others to believe that they live in the Potomac River Watershed.

<b>Live Within Potomac River Watershed</b>	<b>Age 21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Yes	29%	31%	54%	46%	56%
No	26%	24%	18%	12%	15%
Not sure	34%	37%	19%	37%	25%
Don't know what a watershed is	11%	8%	9%	5%	4%
<i>N = number of respondents</i>	109	96	99	95	101

- When examining the results by other subgroups, males were more likely than females and homeowners were more likely than renters to believe that they live within the Potomac River Watershed. Those of Hispanic heritage were less likely than others to hold this belief.

<b>Live Within Potomac River Watershed</b>	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	<b>Hispanic Respondents</b>
Yes	53%	34%	47%	31%	28%
No	18%	20%	18%	22%	25%
Not sure	23%	37%	29%	35%	32%
Don't know what a watershed is	6%	9%	6%	12%	15%
<i>N = number of respondents</i>	242	258	376	124	40

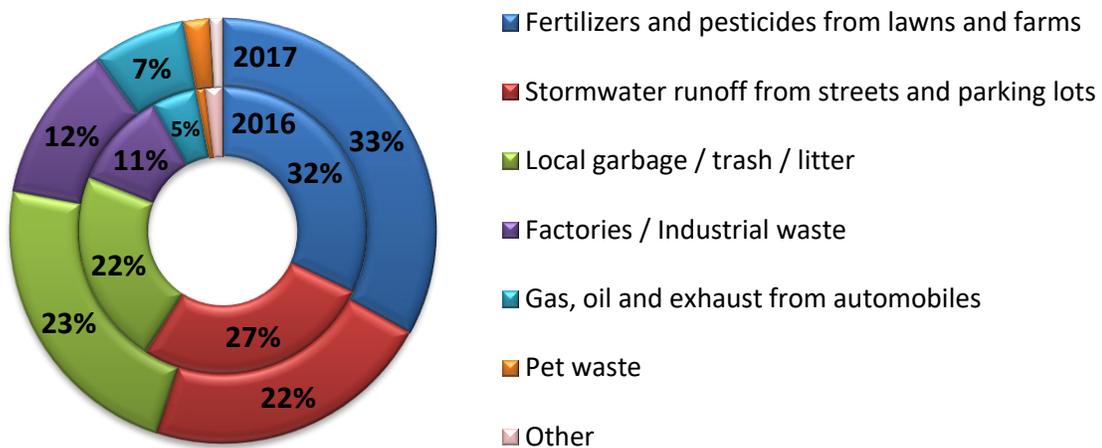
- Those living in an apartment were less likely than others to indicate that they live within the Potomac River Watershed.

<b><i>Live Within Potomac River Watershed</i></b>	<b>Single- family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Yes	47%	41%	30%	49%
No	20%	16%	25%	17%
Not sure	27%	35%	35%	26%
Don't know what a watershed is	6%	8%	10%	8%
<i>N = number of respondents</i>	242	118	71	65

## Beliefs About Local Water Pollution

- When asked what they thought was the “Number one” cause of pollution in local streams, the Potomac River, and the Chesapeake Bay, the most frequently selected response option was “Fertilizers and pesticides from lawns and farms.” A similar question was asked in past years, but there were several wording changes to the response options in the 2016 survey. (However, “Fertilizers and pesticides from lawns and farms” was still the option selected most often in previous years.)

### What do you think is the number one cause of pollution in local streams, the Potomac River, and the Chesapeake Bay?



- The proportion selecting “Stormwater runoff from streets and parking lots” was lower in 2017 than in 2016, but the difference was not quite large enough to be statistically significant.
- Tables on the next page (and following pages) show the results broken out by various subgroups of the total sample. For example, the proportion selecting fertilizers and pesticides from lawns and farms increased with time living in the area and age. Also, males and homeowners were more likely than others to select this item.

**Believed #1 Cause  
of Local Water  
Pollution**

	Alexandria	Arlington	Fairfax Inclusive	Leesburg / Loudoun	Dumfries / Stafford
Fertilizers and pesticides from lawns and farms	23%	31%	34%	40%	25%
Stormwater runoff from streets and parking lots	25%	36%	22%	15%	11%
Local garbage / trash / litter	19%	17%	24%	23%	32%
Factories / Industrial waste	21%	9%	11%	11%	14%
Gas, oil and exhaust from automobiles	12%	4%	6%	6%	11%
Pet waste	0%	3%	1%	4%	7%
Other	0%	0%	2%	1%	0%

*N = number of respondents*                      52                      69                      254                      81                      44

**Believed #1 Cause  
of Local Water  
Pollution**

**Have Lived  
in Northern  
Virginia  
< 4 Years**

**4 to 9 Years**

**10 to 19  
Years**

**20 or More  
Years**

	Have Lived in Northern Virginia < 4 Years	4 to 9 Years	10 to 19 Years	20 or More Years
Fertilizers and pesticides from lawns and farms	21%	24%	31%	38%
Stormwater runoff from streets and parking lots	23%	23%	22%	21%
Local garbage / trash / litter	26%	18%	25%	23%
Factories / Industrial waste	15%	18%	12%	10%
Gas, oil and exhaust from automobiles	10%	15%	5%	5%
Pet waste	3%	2%	3%	1%
Other	2%	0%	2%	2%

*N = number of respondents*                      61                      83                      103                      253

**Believed #1 Cause  
of Local Water  
Pollution**

	<b>Age 21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Fertilizers and pesticides from lawns and farms	15%	23%	33%	41%	52%
Stormwater runoff from streets and parking lots	20%	17%	24%	22%	27%
Local garbage / trash / litter	29%	32%	26%	17%	10%
Factories / Industrial waste	16%	19%	9%	8%	9%
Gas, oil and exhaust from automobiles	15%	7%	7%	5%	0%
Pet waste	4%	1%	0%	3%	2%
Other	1%	1%	1%	4%	0%

*N = number of respondents*      109                  96                  99                  95                  101

**Believed #1 Cause  
of Local Water  
Pollution**

	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	<b>Hispanic Respondents</b>
Fertilizers and pesticides from lawns and farms	40%	26%	37%	19%	22%
Stormwater runoff from streets and parking lots	25%	19%	22%	23%	18%
Local garbage / trash / litter	18%	27%	20%	30%	30%
Factories / Industrial waste	9%	15%	12%	14%	22%
Gas, oil and exhaust from automobiles	4%	10%	6%	10%	5%
Pet waste	2%	2%	2%	2%	3%
Other	2%	1%	1%	2%	0%

*N = number of respondents*      242                  258                  376                  124                  40

**Believed #1 Cause  
of Local Water  
Pollution**

**Single-  
family  
Home**

**Townhouse**

**Apartment**

**Condo**

Fertilizers and pesticides from lawns and farms	36%	35%	21%	28%
Stormwater runoff from streets and parking lots	19%	24%	22%	26%
Local garbage / trash / litter	20%	21%	34%	24%
Factories / Industrial waste	15%	8%	14%	9%
Gas, oil and exhaust from automobiles	7%	7%	6%	8%
Pet waste	1%	3%	3%	3%
Other	2%	2%	0%	2%

*N = number of respondents*

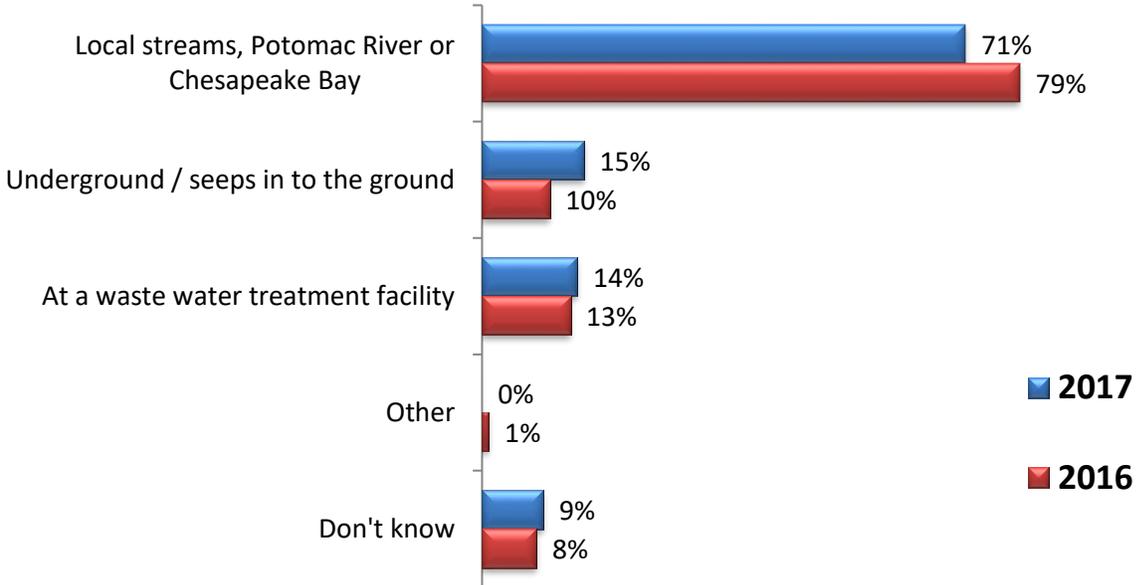
242

118

71

65

**"Stormwater" runoff is rain or other water that flows into the street, along the gutter and into the storm drain. To the best of your knowledge, where do you believe storm water eventually ends up?**



- “Local streams, Potomac River or Chesapeake Bay” was selected most often as where stormwater is believed to end up. Prior to 2016, this response option was shown as two options with “Local streams” separate, so the 2016 and 2017 results are not comparable to the past for this question. Results by various subgroups are shown below and on the next page. For example, those from Arlington were more likely than others to select local streams, Potomac River or Chesapeake Bay. Males were also more likely than females to select that response, while females and renters were more likely than others to select underground / seeps in to the ground. Those of Hispanic heritage were more likely than others to select waste water treatment facility.

<b>Believed Destination of Stormwater</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Local streams, Potomac River or Chesapeake Bay	60%	91%	70%	69%	61%
Underground / seeps in to the ground	15%	9%	17%	11%	14%
At a waste water treatment facility	21%	13%	11%	16%	25%
Don't know	8%	0%	13%	9%	9%
<i>N = number of respondents</i>	52	69	254	81	44

<b>Believed Destination of Stormwater</b>	<b>Have Lived in Northern Virginia</b>			
	<b>&lt; 4 Years</b>	<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Local streams, Potomac River or Chesapeake Bay	67%	65%	72%	73%
Underground / seeps in to the ground	21%	19%	13%	12%
At a waste water treatment facility	25%	13%	17%	11%
Don't know	10%	13%	6%	9%
<i>N = number of respondents</i>	61	83	103	253

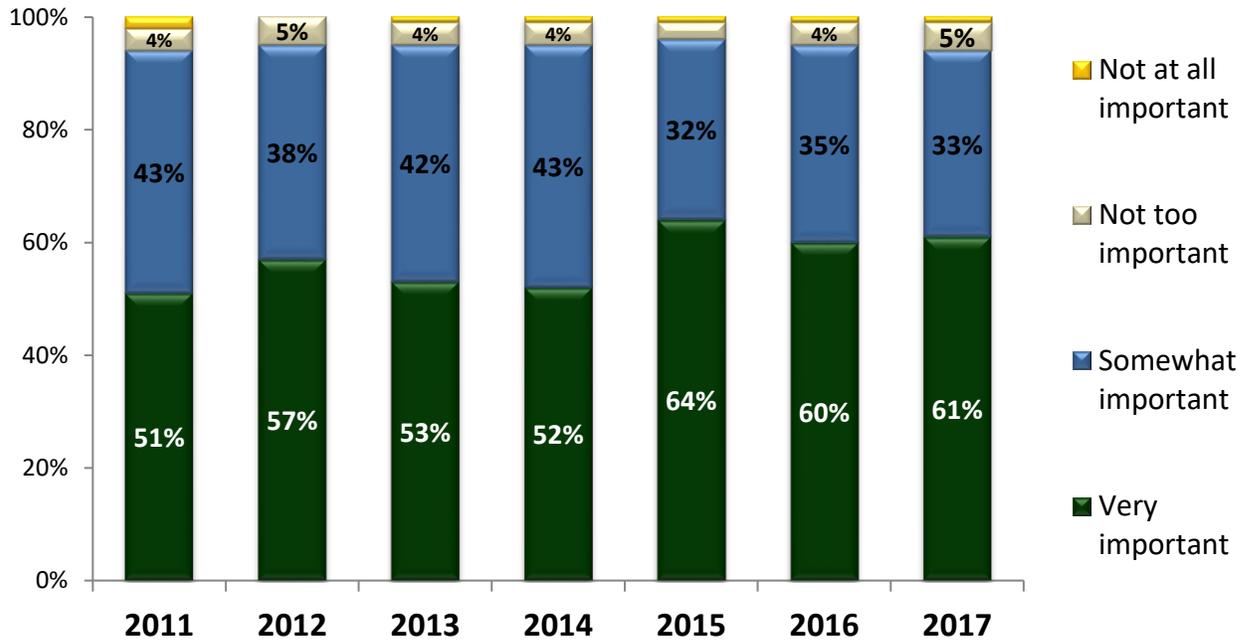
<b>Believed Destination of Stormwater</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Local streams, Potomac River or Chesapeake Bay	65%	68%	71%	73%	78%
Underground / seeps in to the ground	28%	17%	11%	11%	6%
At a waste water treatment facility	21%	16%	18%	9%	6%
Don't know	9%	11%	8%	7%	11%
<i>N = number of respondents</i>	109	96	99	95	101

<b>Believed Destination of Stormwater</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Ethnicity</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	<b>Hispanic</b>
Local streams, Potomac River or Chesapeake Bay	79%	63%	72%	69%	63%
Underground / seeps in to the ground	9%	20%	11%	24%	18%
At a waste water treatment facility	12%	17%	14%	15%	28%
Don't know	7%	11%	8%	14%	8%
<i>N = number of respondents</i>	242	258	376	124	40

<b><i>Believed Destination of Stormwater</i></b>	<b>Single- family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Local streams, Potomac River or Chesapeake Bay	69%	77%	66%	74%
Underground / seeps in to the ground	14%	10%	27%	11%
At a waste water treatment facility	14%	11%	21%	14%
Don't know	10%	6%	11%	9%
<i>N = number of respondents</i>	242	118	71	65

- When asked the question below, the proportion rating “Very important” in 2017 did not differ significantly from 2015 and 2016, but it was significantly higher than in 2011, 2013, and 2014.

**How important do you think it is for local governments to spend more money on protecting water quality?**



- The majority from each area felt it was “Very important” for local governments to spend more money on protecting water quality.

<b>Importance of Local Water Quality Spending</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Not at all important	4%	0%	1%	1%	0%
Not too important	6%	1%	4%	9%	2%
Somewhat important	17%	45%	34%	30%	36%
Very important	73%	54%	61%	60%	62%
<i>N = number of respondents</i>	52	69	254	81	44

- In each of the subgroups covered in the tables on the next page, a majority gave a rating of “Very important.”

<b>Importance of Local Water Quality Spending</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>			
		<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Not at all important	2%	2%	0%	1%
Not too important	6%	8%	1%	5%
Somewhat important	36%	30%	38%	31%
Very important	56%	60%	61%	63%
<i>N = number of respondents</i>	61	83	103	253

<b>Importance of Local Water Quality Spending</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Not at all important	2%	0%	2%	1%	0%
Not too important	4%	5%	3%	7%	4%
Somewhat important	36%	41%	32%	28%	29%
Very important	58%	54%	63%	64%	67%
<i>N = number of respondents</i>	109	96	99	95	101

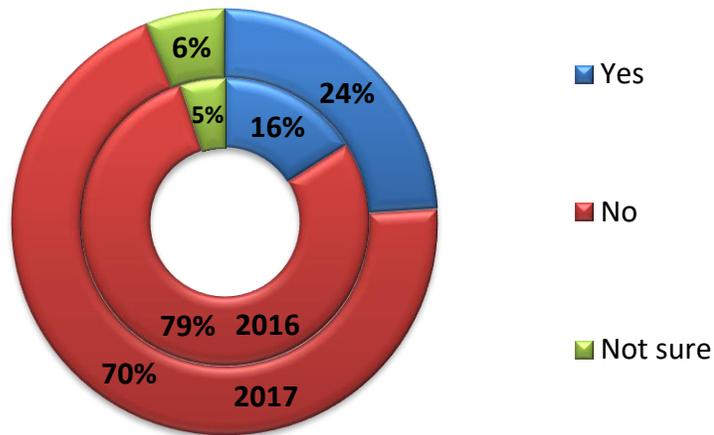
<b>Importance of Local Water Quality Spending</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Hispanic Respondents</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	
Not at all important	1%	1%	1%	1%	3%
Not too important	8%	1%	5%	2%	5%
Somewhat important	37%	30%	33%	33%	22%
Very important	54%	68%	61%	64%	70%
<i>N = number of respondents</i>	242	258	376	124	40

<b>Importance of Local Water Quality Spending</b>	<b>Home Type</b>			
	<b>Single- family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Not at all important	1%	1%	3%	0%
Not too important	6%	3%	2%	3%
Somewhat important	36%	27%	32%	35%
Very important	57%	69%	63%	62%
<i>N = number of respondents</i>	242	118	71	65

## Advertising

- In 2016 and 2017, a video of an advertisement featuring “rubber duckies” was presented in the survey, and respondents were asked if they had seen it on TV or the Internet. The proportion recalling it in 2017 (24%) was significantly higher than in 2016 (16%).

**Please view the video above. Have you seen this ad, or a similar one on TV or the Internet about reducing water pollution?**



- The proportion recalling the ad by area ranged from 12% to 32%, with Leesburg / Loudoun having a significantly higher result than Arlington. As shown on the next page, the proportion recalling the ad was sizeable for each subgroup, although males were more likely than females to report recall.

<b>Saw TV / Internet Ads on Reducing Water Pollution</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Yes	17%	12%	25%	32%	25%
No	73%	85%	68%	61%	73%
Not sure	10%	3%	7%	7%	2%
<i>N = number of respondents</i>	52	69	254	81	44

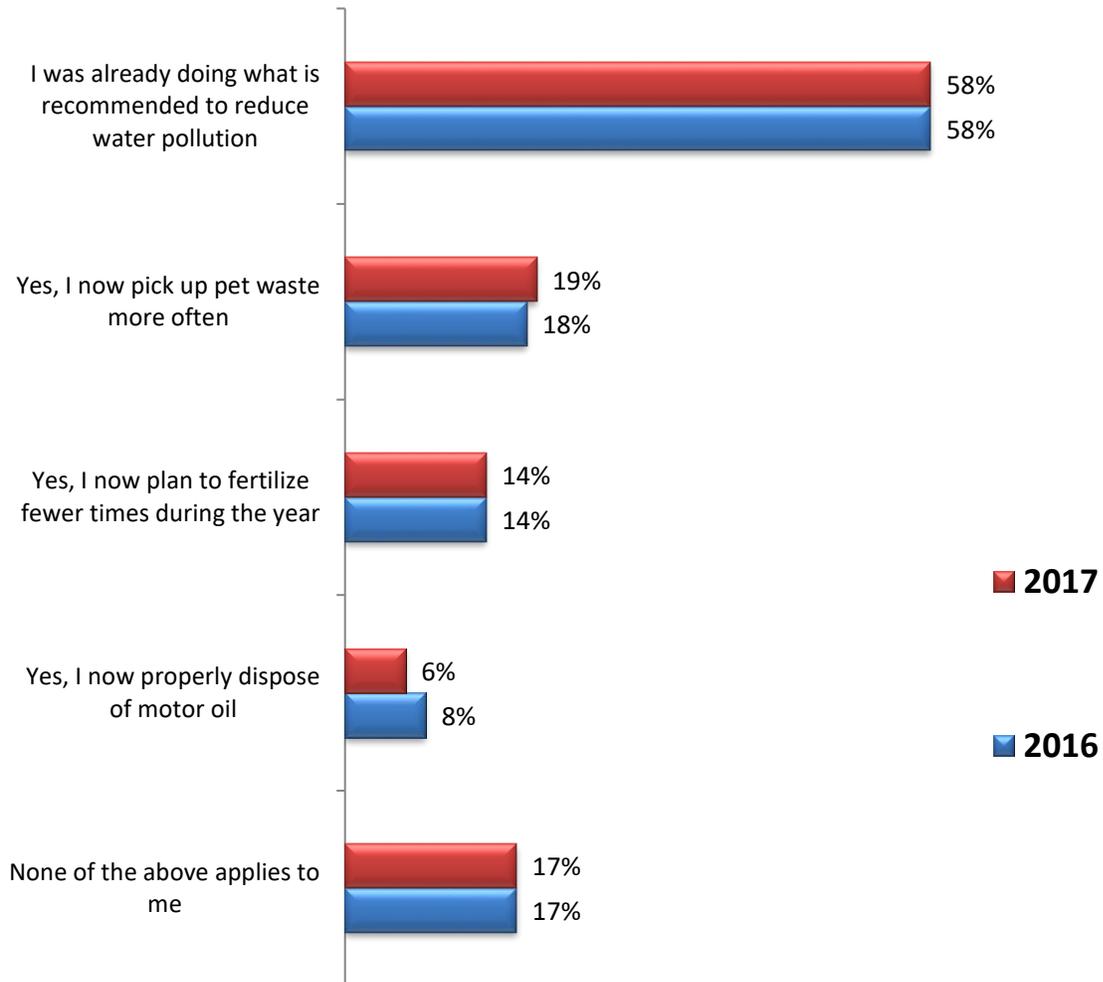
<b>Saw TV / Internet Ads on Reducing Water Pollution</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>			
		<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Yes	20%	28%	17%	26%
No	77%	64%	75%	68%
Not sure	3%	8%	8%	6%
<i>N = number of respondents</i>	61	83	103	253

<b>Saw TV / Internet Ads on Reducing Water Pollution</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Yes	31%	22%	22%	21%	21%
No	63%	73%	76%	72%	68%
Not sure	6%	5%	2%	7%	11%
<i>N = number of respondents</i>	109	96	99	95	101

<b>Saw TV / Internet Ads on Reducing Water Pollution</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Hispanic Respondents</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	
Yes	29%	18%	23%	26%	32%
No	66%	74%	72%	64%	50%
Not sure	5%	8%	5%	10%	18%
<i>N = number of respondents</i>	242	258	376	124	40

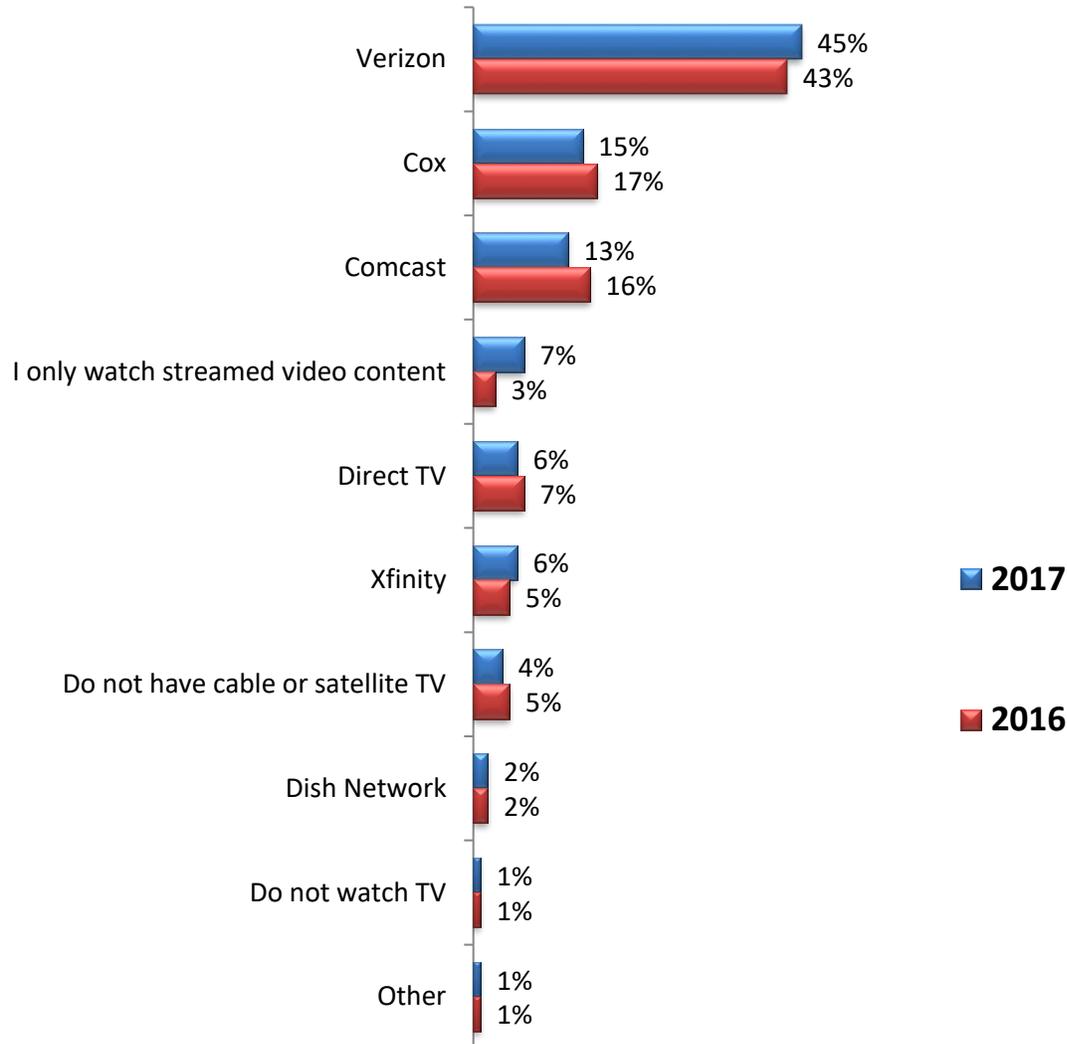
<b>Saw TV / Internet Ads on Reducing Water Pollution</b>	<b>Home Type</b>			
	<b>Single- family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Yes	27%	25%	24%	9%
No	68%	68%	68%	85%
Not sure	5%	7%	8%	6%
<i>N = number of respondents</i>	242	118	71	65

### Did seeing this ad make you take action on your property to prevent water pollution?



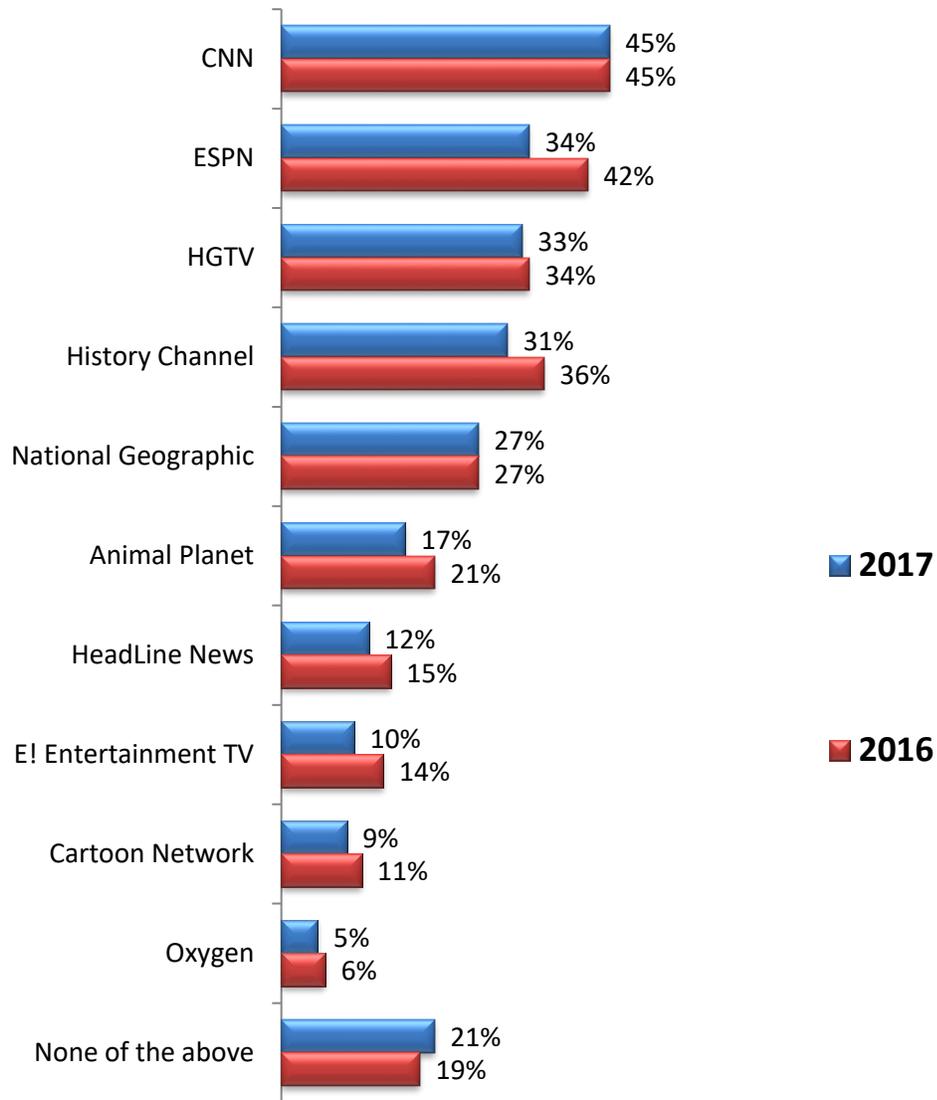
- The results for the question above were similar in 2016 and 2017. However, this question was asked only of those who recalled the advertising. Since the proportion recalling the ad was higher in 2017 than in 2016, the results above apply to larger number of respondents in 2017.

## What TV service provider do you use?



- Verizon was selected most often (by 45% in 2017) as their TV service provider.
- Based on a separate analysis (not shown in chart), Verizon had the highest share in four out of five of the areas: 56% in Leesburg / Loudoun, 52% in Fairfax Inclusive, 44% in Arlington, and 30% in Dumfries / Stafford. However, Comcast had the largest share (40%) in Alexandria.
- One reason for adding the question above to the 2016 survey was to determine if recall of the ad differed by TV provider. Based on a separate analysis (not shown in chart), it turns out that TV recall was similar across providers. When looking at the providers with at least 30 respondents using the provider, the proportion recalling the ad was 29% among Verizon customers, 26% among Direct TV customers, 25% among Comcast customers, and 20% among Cox customers.

## Which channels have you watched in the past 30 days?

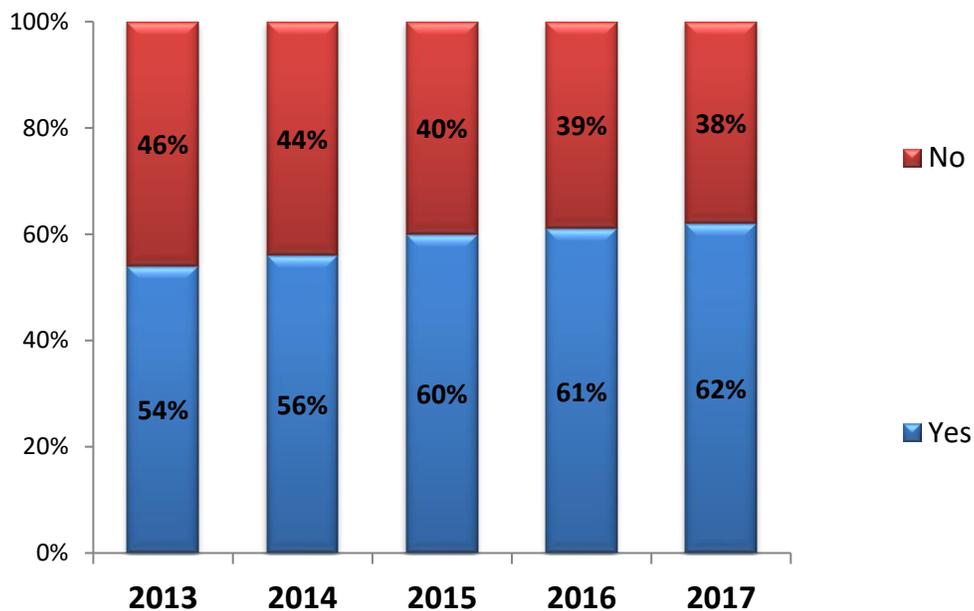


- CNN (45%) was selected most often as a channel watched within the past 30 days.
- One reason for adding the question above to the 2016 survey was to determine if recall of the ad differed by channels watched. Based on a separate analysis (not shown in chart), for four of the channels, their viewers were significantly more likely than others to recall the ad that was shown in the survey: Cartoon Network (43% of those who watched this channel recalled the ad), Animal Planet (36%), History Channel (34%), and National Geographic (32%).
- Among those who watched *none* of the channels above, only 13% recalled the ad.

- The logo below was shown to all respondents regardless of whether they had seen advertising or not, and more than half of the total sample recognized the logo. The difference between 62% in 2017 and 54% in 2013 was statistically significant. However, the 2017 result did not differ significantly compared to the results in 2014 through 2016.



**Have you seen the logo above anywhere?**



- Results for the question above in 2017 by subgroup are shown on the next page. Interestingly, awareness was significantly lower in Dumfries / Stafford. This was the case last year as well, and this suggests that there is room for increasing awareness in this area.

<b>Have Seen Logo</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Yes	73%	81%	62%	59%	27%
No	27%	19%	38%	41%	73%
<i>N = number of respondents</i>	52	69	254	81	44

<b>Have Seen Logo</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>	<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Yes	54%	69%	68%	60%
No	46%	31%	32%	40%
<i>N = number of respondents</i>	61	83	103	253

<b>Have Seen Logo</b>	<b>Age 21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Yes	66%	65%	57%	67%	57%
No	34%	35%	43%	33%	43%
<i>N = number of respondents</i>	109	96	99	95	101

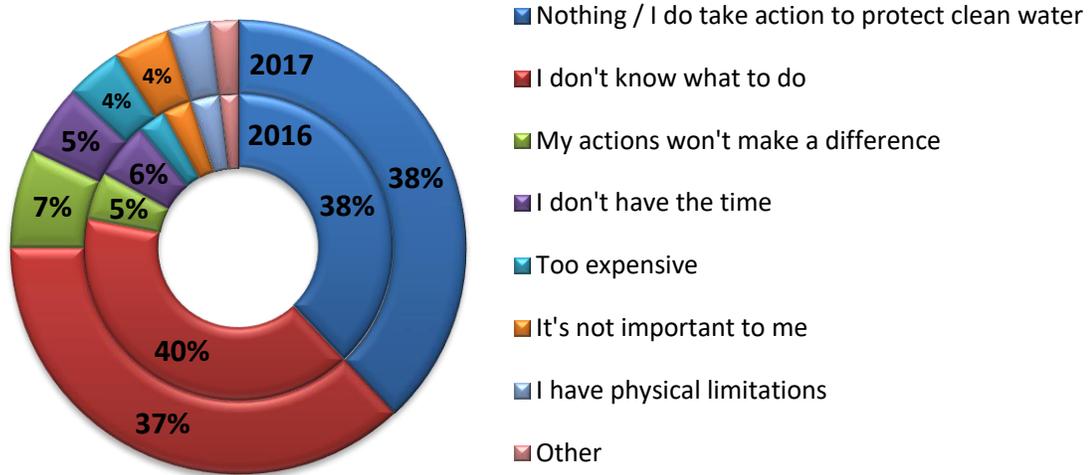
<b>Have Seen Logo</b>	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	<b>Hispanic Respondents</b>
Yes	68%	57%	64%	59%	63%
No	32%	43%	36%	41%	38%
<i>N = number of respondents</i>	242	258	376	124	40

<b>Have Seen Logo</b>	<b>Single-family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Yes	60%	67%	61%	65%
No	40%	33%	39%	35%
<i>N = number of respondents</i>	242	118	71	65

## Protecting Clean Water

- In 2017 and 2016, nearly four-in-ten (38%) felt nothing prevents them from taking action to protect clean water.

### What most prevents you from taking action to protect clean water?



- Females and renters were more likely than others to select “I don’t know what to do.” The proportion selecting “Nothing / I do take action to protect clean water” increased with age.

<b>Most Prevents Action</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Nothing	34%	47%	39%	36%	32%
I don't know what to do	29%	42%	38%	33%	36%
Won't make a difference	9%	7%	7%	1%	9%
I don't have the time	4%	3%	6%	6%	9%
Too expensive	6%	0%	4%	6%	7%
It's not important to me	8%	0%	2%	8%	5%
Physical limitations	8%	0%	3%	6%	2%
Other	2%	1%	1%	4%	0%
<i>N = number of respondents</i>	52	69	254	81	44

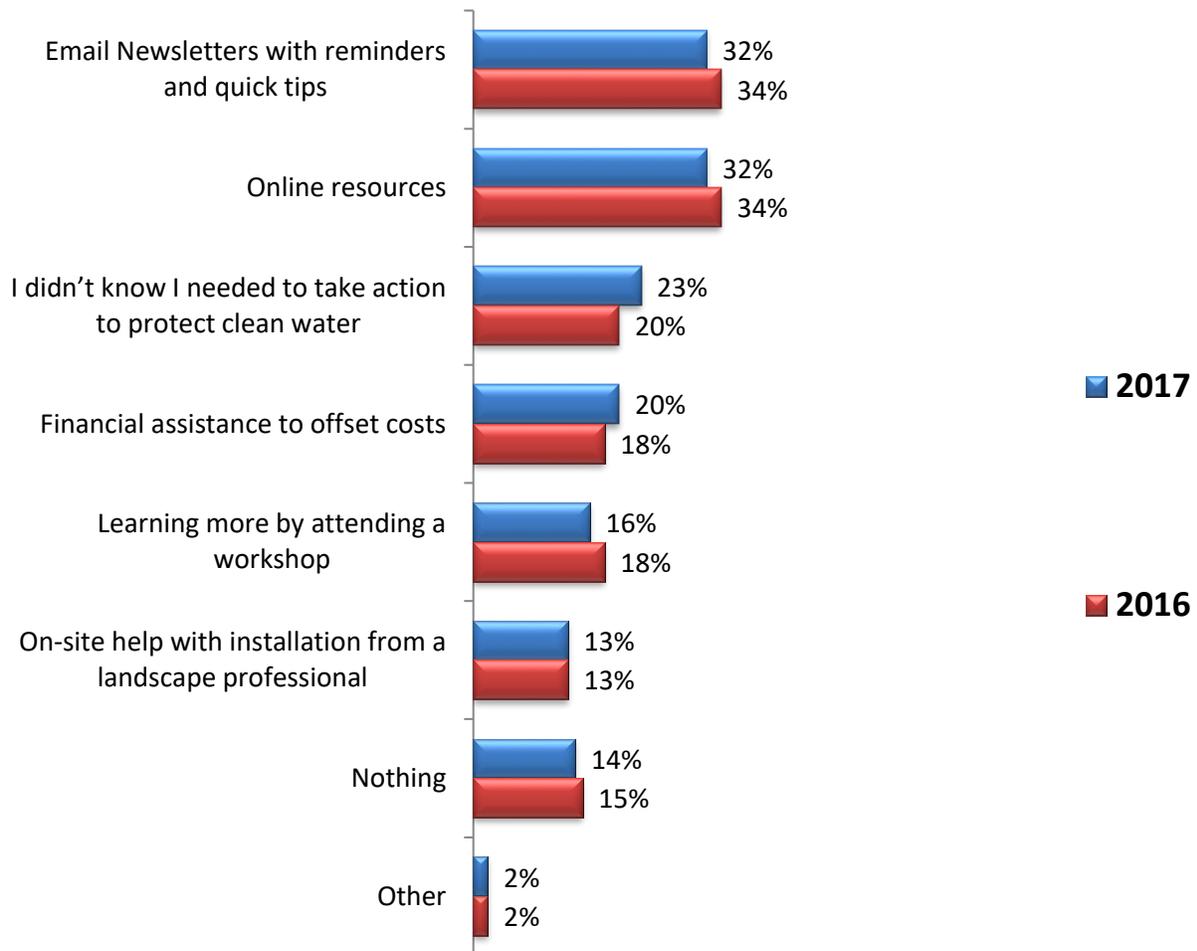
<b>Most Prevents Action</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>			
		<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Nothing	28%	36%	38%	42%
I don't know what to do	39%	35%	39%	36%
Won't make a difference	10%	7%	6%	6%
I don't have the time	5%	7%	7%	4%
Too expensive	3%	6%	6%	3%
It's not important to me	8%	4%	2%	3%
Physical limitations	5%	5%	1%	4%
Other	2%	0%	1%	2%
<i>N = number of respondents</i>	61	83	103	253

<b>Most Prevents Action</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Nothing	23%	26%	39%	51%	53%
I don't know what to do	45%	37%	43%	33%	26%
Won't make a difference	10%	10%	5%	3%	6%
I don't have the time	9%	7%	4%	4%	2%
Too expensive	5%	7%	5%	3%	1%
It's not important to me	4%	5%	2%	2%	5%
Physical limitations	4%	5%	1%	2%	4%
Other	0%	3%	1%	2%	3%
<i>N = number of respondents</i>	109	96	99	95	101

<b>Most Prevents Action</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Hispanic Respondents</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	
Nothing	41%	36%	42%	25%	25%
I don't know what to do	32%	41%	33%	47%	32%
Won't make a difference	8%	6%	7%	6%	8%
I don't have the time	6%	5%	6%	5%	12%
Too expensive	4%	5%	4%	4%	10%
It's not important to me	4%	3%	4%	3%	5%
Physical limitations	3%	3%	2%	8%	5%
Other	2%	1%	2%	2%	3%
<i>N = number of respondents</i>	242	258	376	124	40

<b>Most Prevents Action</b>	<b>Single-family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Nothing	40%	47%	20%	37%
I don't know what to do	35%	33%	45%	43%
Won't make a difference	6%	5%	11%	8%
I don't have the time	5%	4%	7%	8%
Too expensive	5%	3%	4%	2%
It's not important to me	4%	5%	1%	0%
Physical limitations	3%	3%	9%	0%
Other	2%	0%	3%	2%
<i>N = number of respondents</i>	242	118	71	65

## What would help you to take action to protect clean water?



- In 2017 and 2016, approximately one-third indicated that email newsletters with reminders and quick tips and/or online resources would help them take action to protect clean water.
- Results by subgroup are shown on the following pages.

<b>Help Take Action</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Email Newsletters with reminders and quick tips	33%	32%	34%	30%	25%
Online resources	37%	32%	31%	33%	34%
I didn't know I needed to take action to protect clean water	21%	19%	25%	22%	23%
Financial assistance to offset costs	25%	22%	20%	12%	20%
Learning more by attending a workshop	12%	13%	18%	17%	11%
On-site help with installation from a landscape professional	17%	12%	14%	10%	7%
Other	4%	1%	2%	1%	5%
Nothing	13%	13%	13%	16%	16%
<i>N = number of respondents</i>	52	69	254	81	44

<b>Help Take Action</b>	<b>Have Lived in Northern Virginia &lt; 4 Years</b>	<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Email Newsletters with reminders and quick tips	26%	33%	30%	34%
Online resources	41%	36%	40%	26%
I didn't know I needed to take action to protect clean water	34%	17%	24%	22%
Financial assistance to offset costs	26%	25%	19%	16%
Learning more by attending a workshop	20%	20%	14%	15%
On-site help with installation from a landscape professional	23%	18%	17%	6%
Other	3%	1%	2%	2%
Nothing	8%	8%	12%	18%
<i>N = number of respondents</i>	61	83	103	253

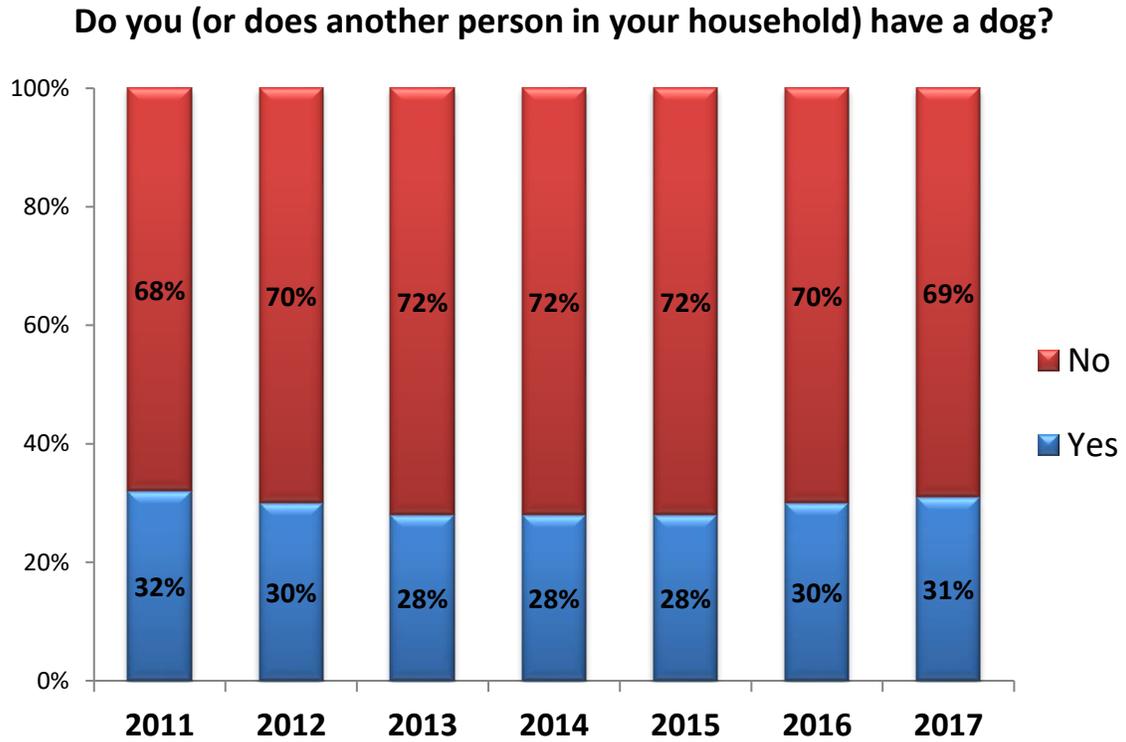
<b>Help Take Action</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Email Newsletters with reminders and quick tips	31%	20%	34%	41%	34%
Online resources	37%	30%	37%	33%	24%
I didn't know I needed to take action to protect clean water	27%	32%	21%	19%	16%
Financial assistance to offset costs	29%	25%	21%	9%	12%
Learning more by attending a workshop	20%	19%	14%	14%	13%
On-site help with installation from a landscape professional	17%	20%	12%	11%	3%
Other	2%	1%	3%	3%	1%
Nothing	7%	6%	13%	14%	29%
<i>N = number of respondents</i>	109	96	99	95	101

<b>Help Take Action</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Hispanic Respondents</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	
Email Newsletters with reminders and quick tips	30%	34%	33%	29%	28%
Online resources	31%	34%	32%	32%	48%
I didn't know I needed to take action to protect clean water	19%	27%	22%	27%	20%
Financial assistance to offset costs	17%	22%	19%	22%	25%
Learning more by attending a workshop	13%	19%	16%	17%	13%
On-site help with installation from a landscape professional	10%	15%	13%	13%	18%
Other	2%	2%	2%	2%	0%
Nothing	19%	9%	13%	15%	8%
<i>N = number of respondents</i>	242	258	376	124	40

<b>Help Take Action</b>	<b>Single-family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Email Newsletters with reminders and quick tips	29%	40%	30%	31%
Online resources	30%	40%	37%	22%
I didn't know I needed to take action to protect clean water	22%	19%	28%	28%
Financial assistance to offset costs	19%	19%	20%	22%
Learning more by attending a workshop	15%	18%	15%	18%
On-site help with installation from a landscape professional	16%	8%	14%	6%
Other	2%	3%	1%	2%
Nothing	15%	10%	14%	14%
<i>N = number of respondents</i>	242	118	71	65

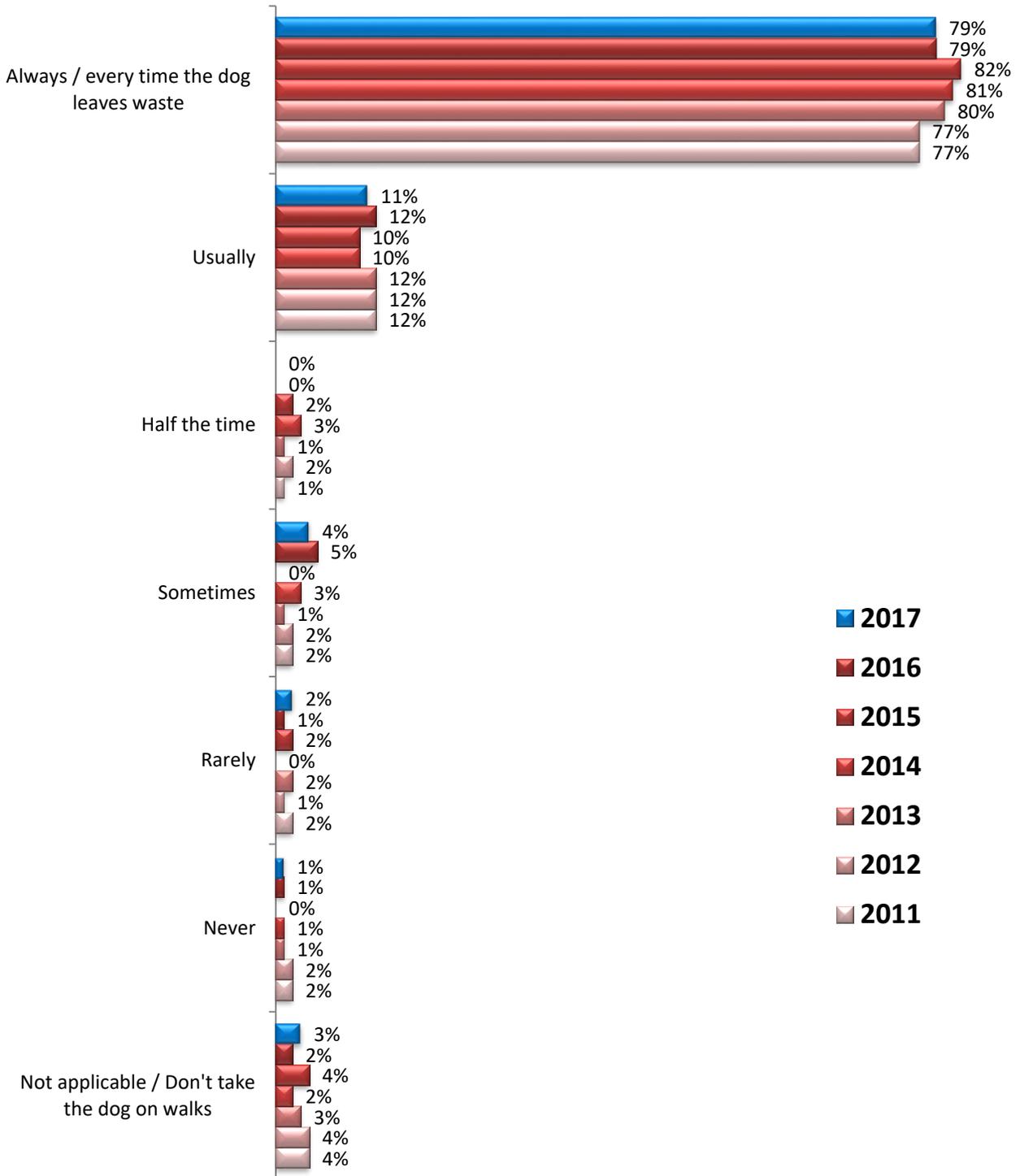
## Behavior Among Dog Owners

- More than one-fourth each year indicated that they have a dog (or someone else in their household has a dog).



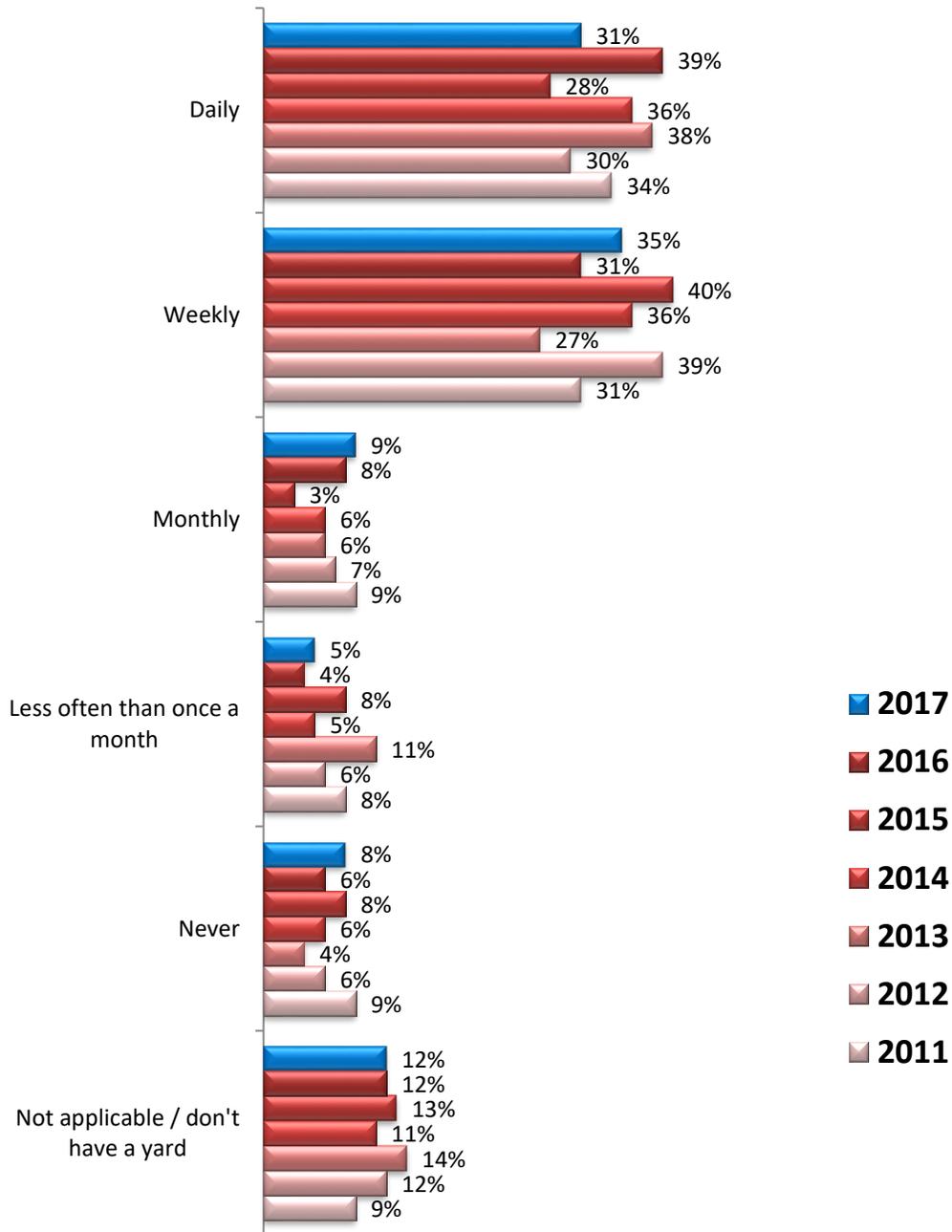
- On the following pages, results are shown for questions about how often dog owners pick up after their dogs and what motivates them to do so.

## When taking your dog(s) for a walk, how often do you pick up after your dog(s)?



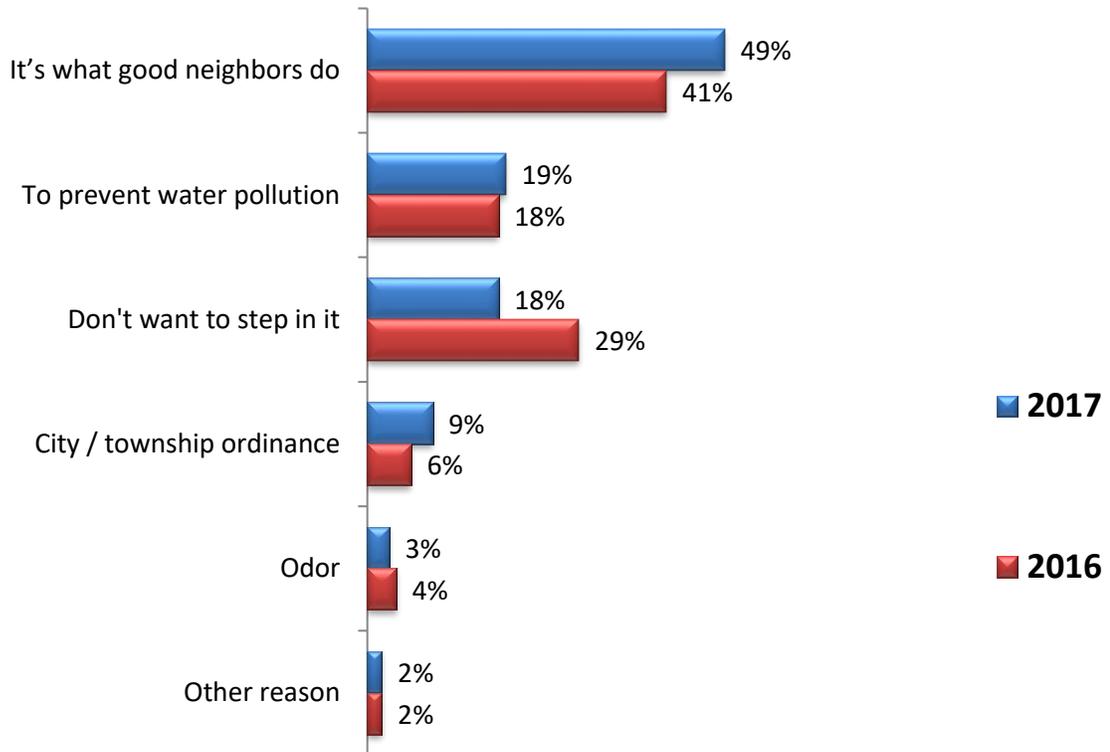
- Nearly eight-in-ten (79%) in 2017 indicated that they *always* pick up after their dog(s) when taking the dog(s) for a walk.

## How often do you (or does someone else from your household) remove dog waste from your yard?



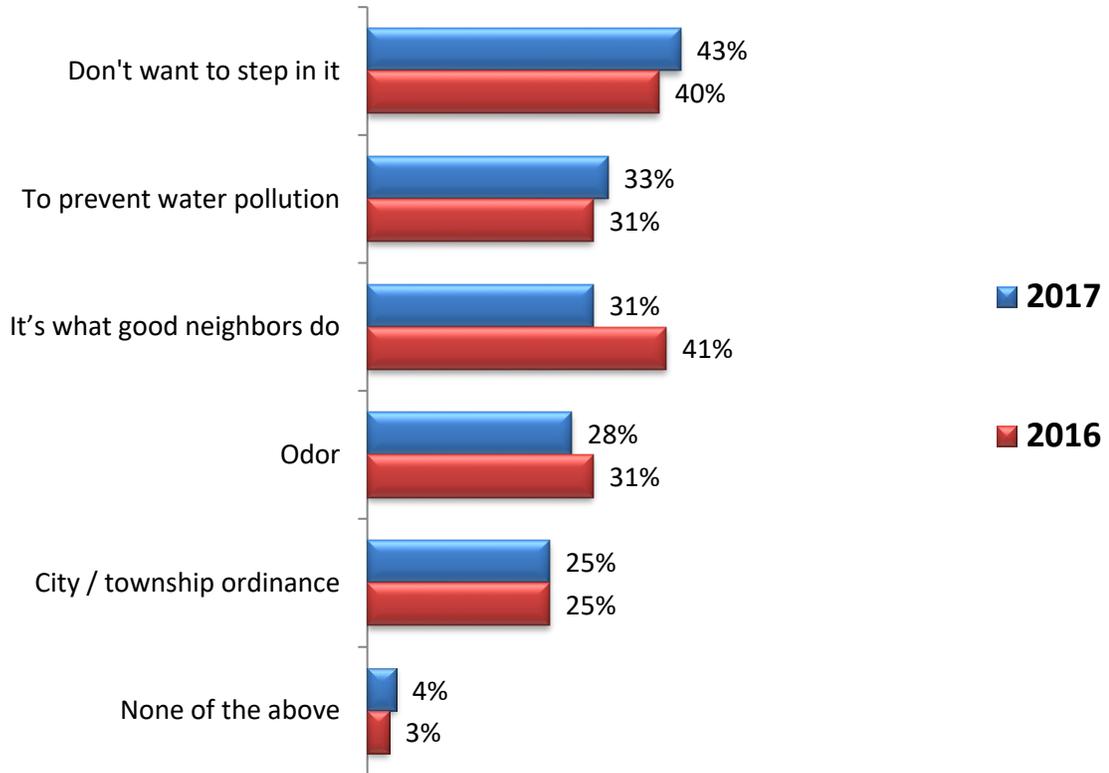
- In their own yard, the majority removed pet waste daily or weekly.
- There was some fluctuation from year to year in the proportions reporting daily and weekly removal of dog waste from their yard, but recall that this question was asked only of dog owners, and the sample size of dog owners is lower than the total sample size, while the margin of error is higher for a lower sample size.

## What is the most important reason to pick up after your dog(s)?



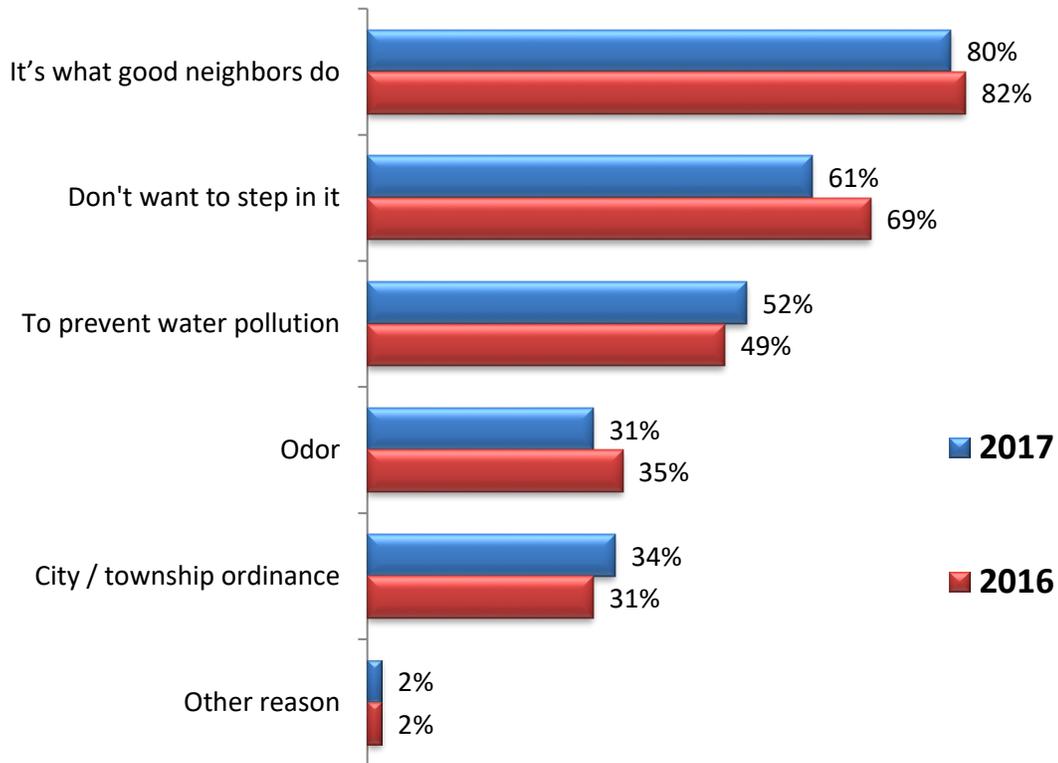
- When asked about the “Most important reason” for picking up after their dog(s), nearly half (49%) selected “It's what good neighbors do.”
- Nearly one-in-five (19% in 2017 and 18% in 2016) selected “To prevent water pollution” as the most important reason for picking up after their dog.

**What other reasons (if any) have motivated you to pick up after your dog(s)?**



- In addition to the *most* important reason for picking up after their dog(s) as shown on the previous page, respondents were also asked to select any other reasons that motivate them. As shown in the chart above, an additional 33% selected “To prevent water pollution” as a motivation. When combining results in the chart above with the chart on the previous page, a total of 52% in 2017 were motivated to pick up after their dog(s) in order “To prevent water pollution,” as shown on the next page.

### Most important + other reasons motivating dog owners to pick up after your dog(s):

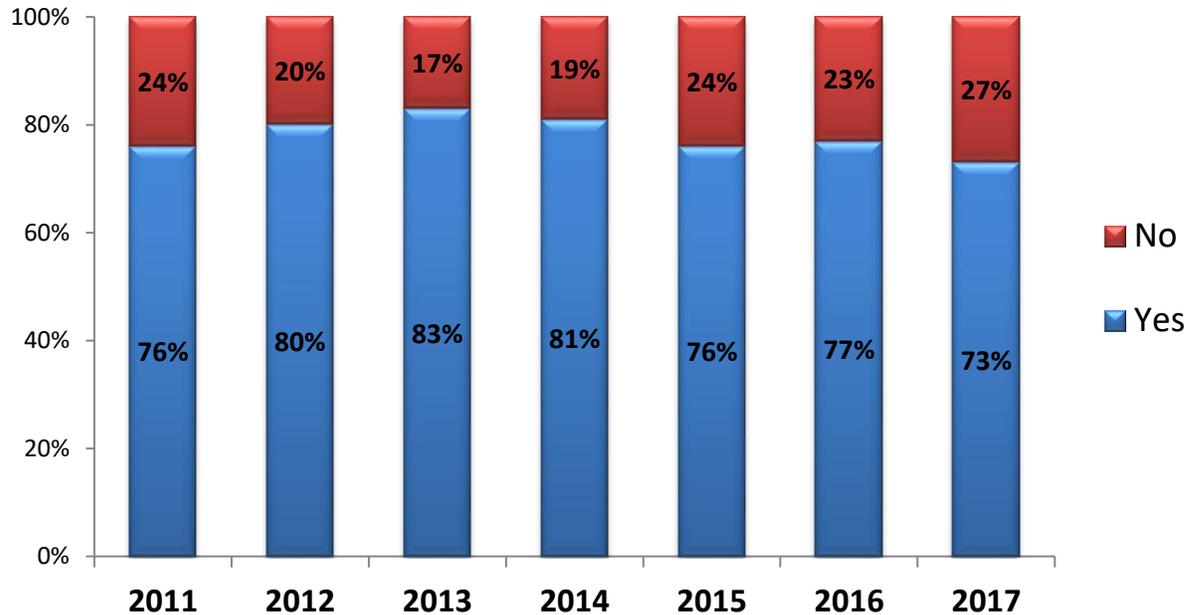


- While it is encouraging to see that approximately half (52%) were motivated to pick up after their dog by wanting to prevent water pollution, this also means that approximately half were not thinking about water pollution in this context.

## Behavior Related to Lawns & Gardens

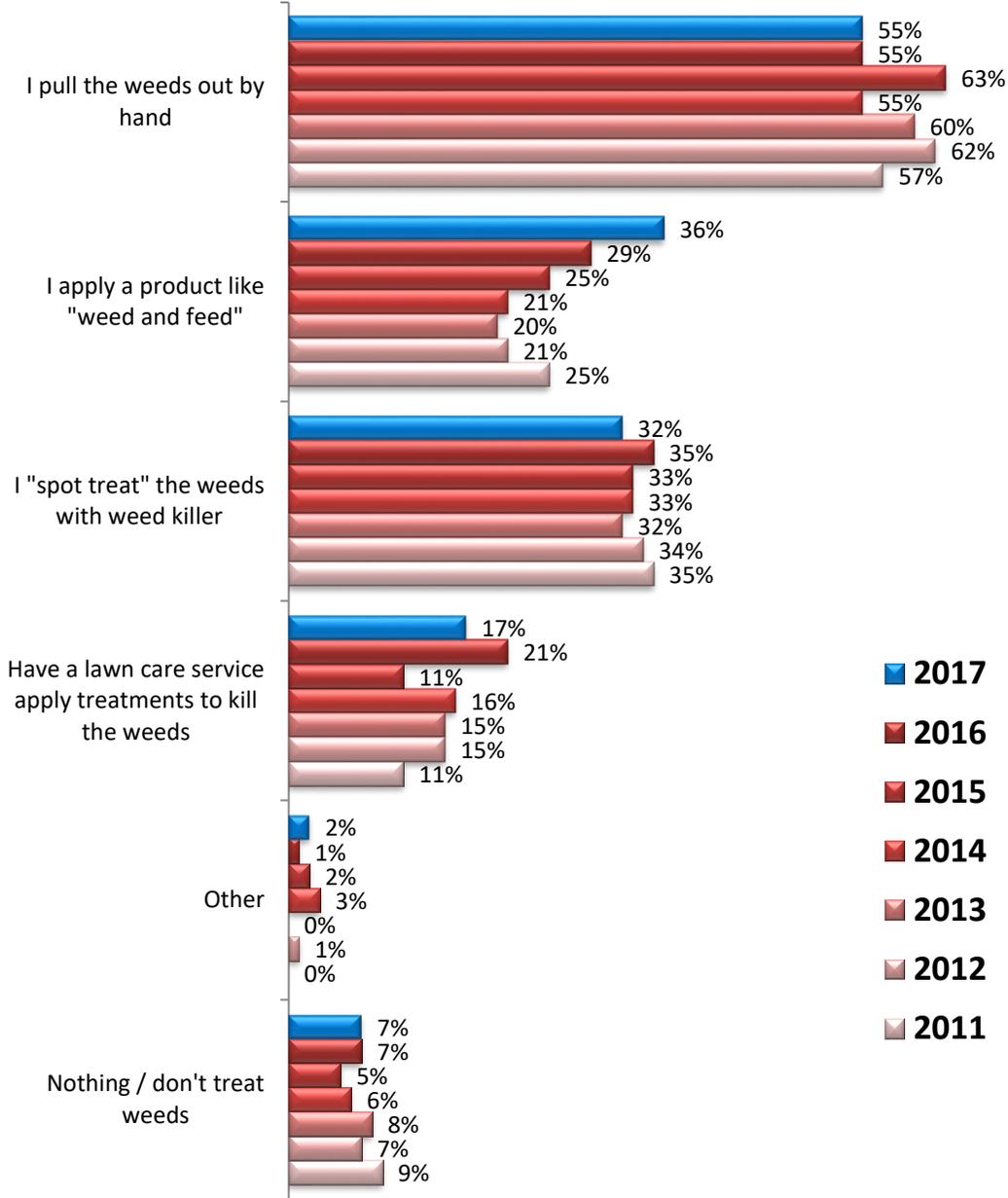
- Nearly three-fourths (73%) of the survey respondents in 2017 indicated that their current home has a lawn or garden.

### Does your home have a lawn or garden?



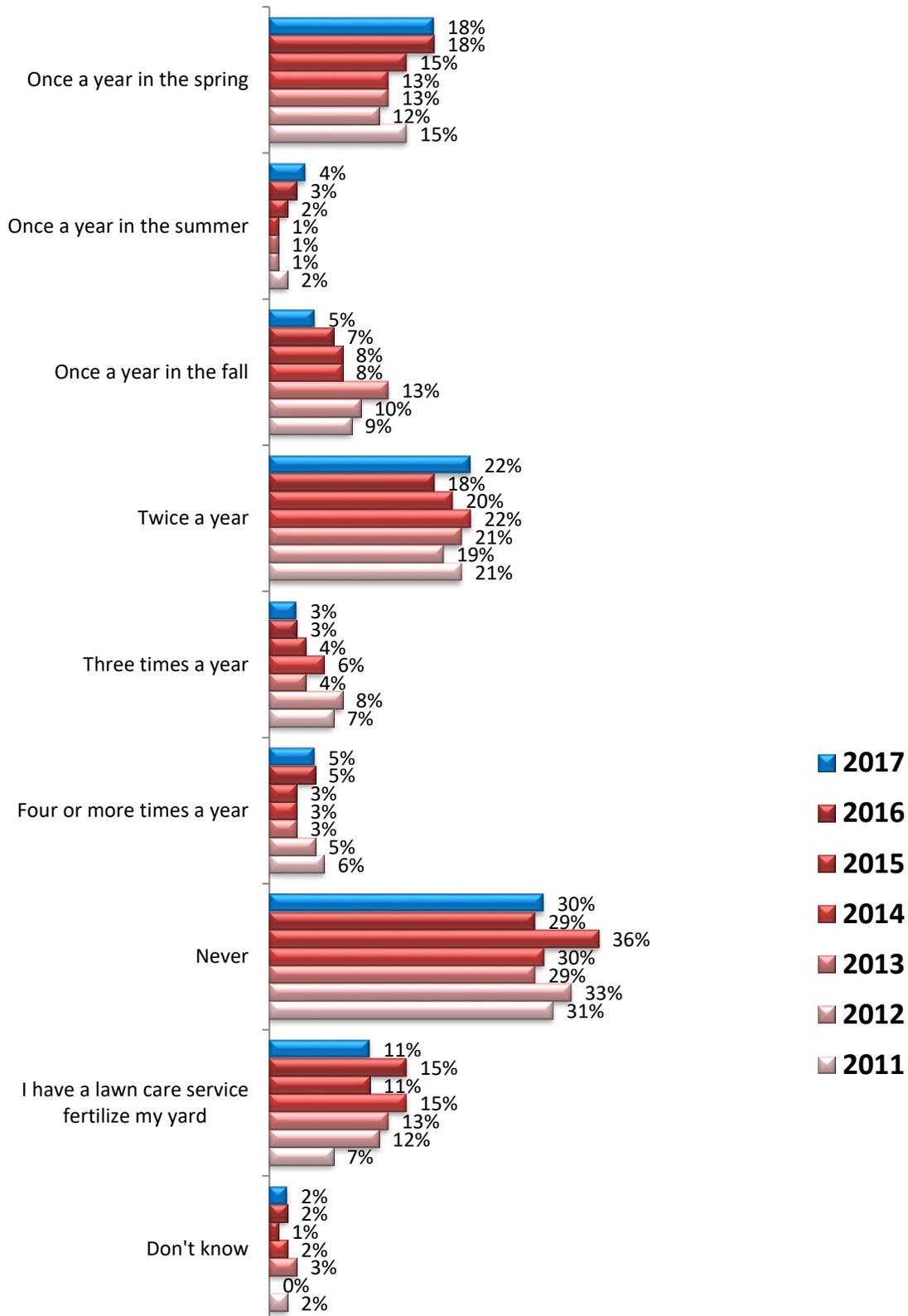
- In a separate question, of the respondents who have a lawn or garden, two-thirds (66%) in 2017 identified themselves as the primary person taking care of the lawn or garden. Several questions about lawns and gardens were then asked only of these respondents (i.e., primary person in the household who takes care of the lawn or garden).

## How do you treat weeds in your lawn or garden?



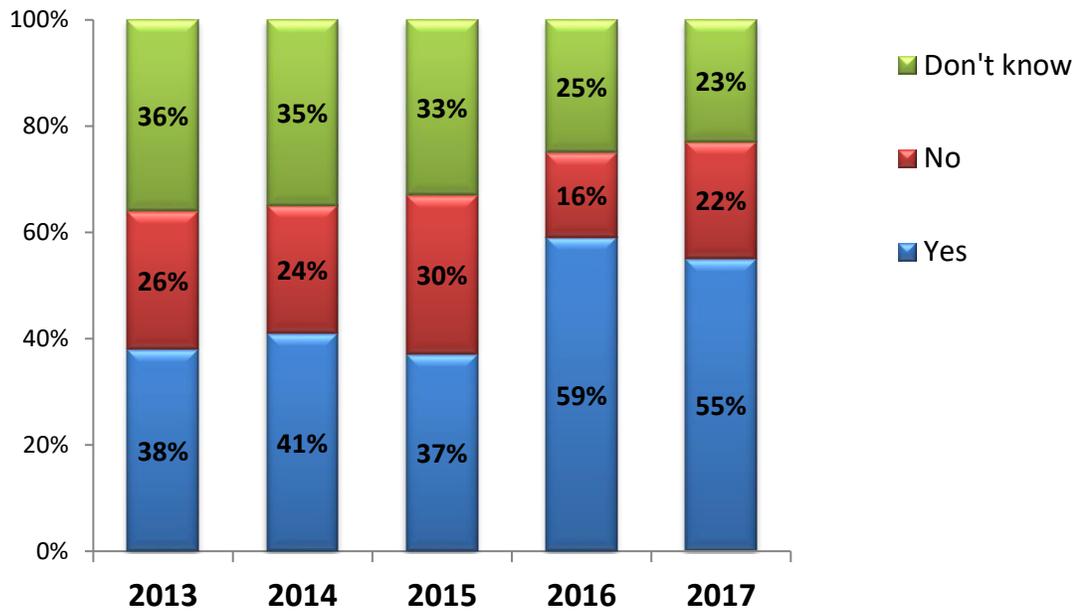
- When dealing with weeds, more than half (55%) in 2017 reported pulling them out by hand.
- However, it was possible to report more than one way of dealing with weeds. Slightly more than one-third (36%) in 2017 reported using “weed and feed.”
- On the next page, a chart shows how often northern Virginia residents fertilize their lawn.

## Which of the following best describes how often you fertilize your lawn?

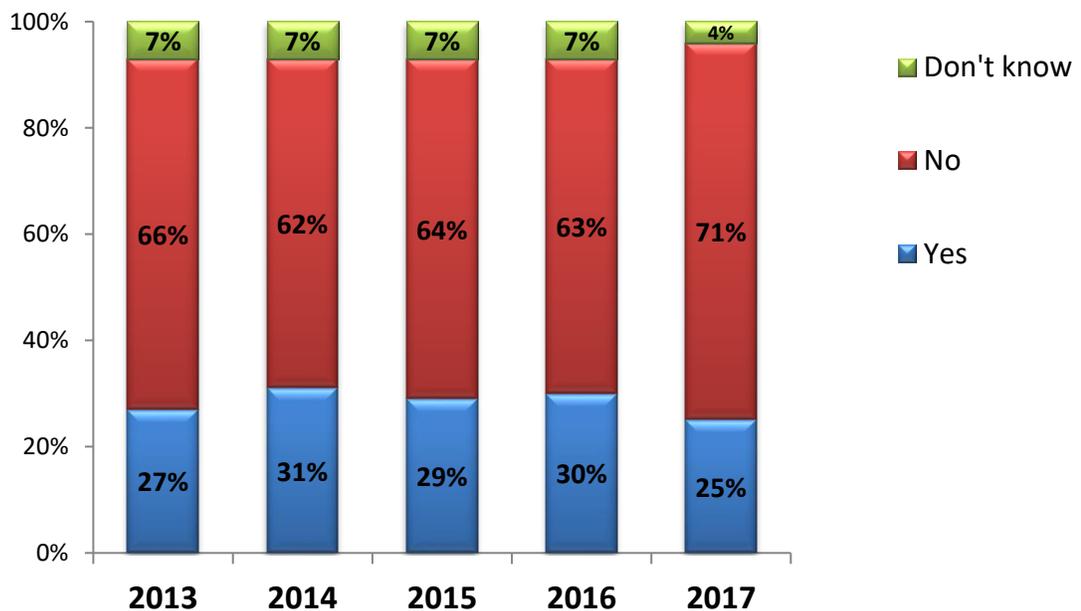


- The next two questions were first asked in the 2013 survey. These results are based only on those who fertilize their lawn (or have a lawn service fertilize their lawn) at least once a year. However, before 2016, the wording for the first question referred to “slow release N fertilizer.” In 2016, the “N” was removed, and this may have impacted the results.

### Do you use a slow release fertilizer?



### Have you ever had your soil tested for fertility or pH?



## Behavior Related to Changing Vehicle Oil

- When asked about changing the oil in their car or truck, eight-in-ten or more each year reported that they use an oil change service, while 11% in 2017 reported taking old motor oil to a gas station or hazmat facility for recycling. A small number of respondents selected other response options. Because the number selecting some response options was very small, the results are shown in the tables below, with the frequency (number of respondents selecting each response) and the percentage.

### 2017: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	410	82.0%
Take the old motor oil to a gas station or hazmat facility for recycling	57	11.4%
Store it in my garage	10	2.0%
Put it in the trash	6	1.2%
Dump it in the gutter or down the storm sewer	2	.4%
Other	5	1.0%
Don't own a car or truck	10	2.0%
Total	500	100.0%

### 2016: When you need to change the oil in your car or truck, what do you do with the old motor oil?

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	399	79.8%
Take the old motor oil to a gas station or hazmat facility for recycling	65	13.0%
Store it in my garage	9	1.8%
Put it in the trash	8	1.6%
Other	2	0.4%
Don't own a car or truck	17	3.4%
Total	500	100.0%

**2015: When you need to change the oil in your car or truck, what do you do with the old motor oil?**

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	54	10.8%
Store it in my garage	4	0.8%
Put it in the trash	3	0.6%
Don't own a car or truck	13	2.6%
Total	500	100.0%

**2014: When you need to change the oil in your car or truck, what do you do with the old motor oil?**

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	50	10.0%
Put it in the trash	5	1.0%
Store it in my garage	4	0.8%
Other	1	0.2%
Don't own a car or truck	14	2.8%
Total	500	100.0%

**2013: When you need to change the oil in your car or truck, what do you do with the old motor oil?**

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	427	85.4%
Take the old motor oil to a gas station or hazmat facility for recycling	57	11.4%
Put it in the trash	3	0.6%
Dump it in the gutter or down the storm sewer	2	0.4%
Store it in my garage	1	0.2%
Don't own a car or truck	10	2.0%
Total	500	100.0%

**2012: When you need to change the oil in your car or truck, what do you do with the old motor oil?**

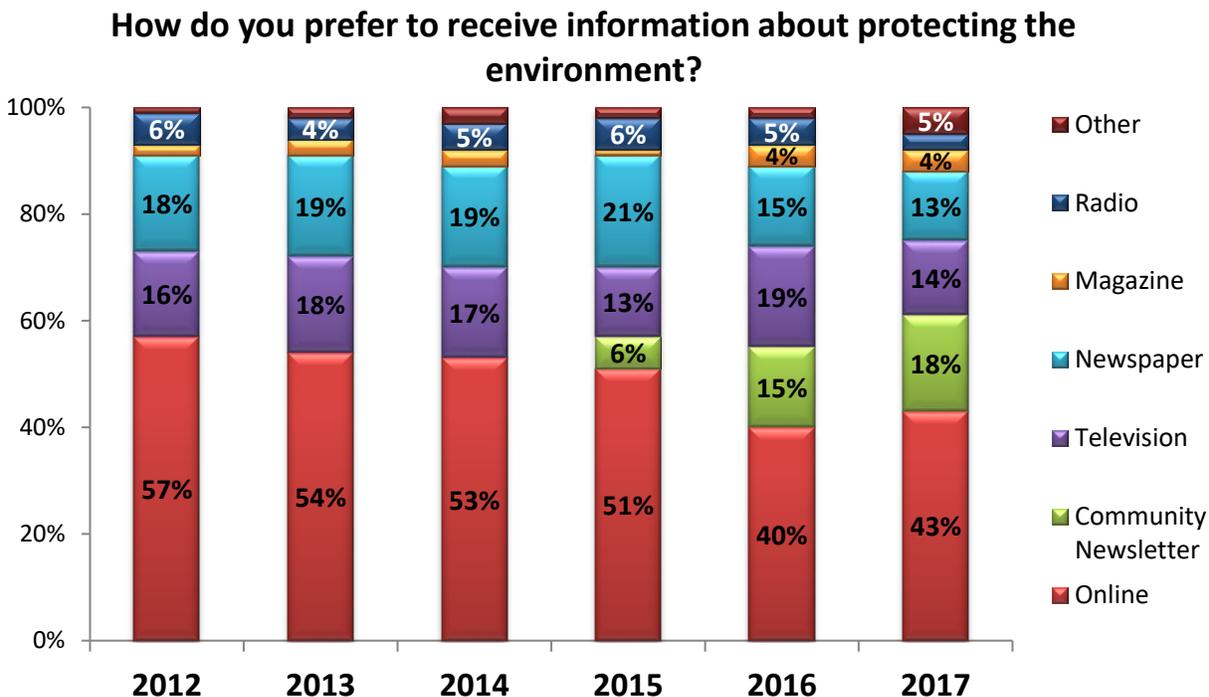
	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	426	85.2%
Take the old motor oil to a gas station or hazmat facility for recycling	49	9.8%
Store it in my garage	3	0.6%
Put it in the trash	2	0.4%
Other	2	0.4%
Don't own a car or truck	18	3.6%
Total	500	100.0%

**2011: When you need to change the oil in your car or truck, what do you do with the old motor oil?**

	<i>Frequency</i>	<i>Percent</i>
I don't change the oil myself / I take it to a garage / oil change service	413	82.6%
Take the old motor oil to a gas station or hazmat facility for recycling	60	12.0%
Put it in the trash	2	0.4%
Other	2	0.4%
Don't own a car or truck	23	4.6%
Total	500	100.0%

## Preference for Receiving Information

- The wording for the question below was changed in the 2016 survey. In previous years, the question was, “How do you prefer to receive information?” without a reference to protecting the environment. (“Community Newsletter” was first added as an option in 2015.)



- In each of the areas included in the survey, more preferred to receive information online than preferred to receive information from other particular sources, as shown below. This was true for other subgroups as well.

<b>Preference for Receiving Information</b>	<b>Alexandria</b>	<b>Arlington</b>	<b>Fairfax Inclusive</b>	<b>Leesburg / Loudoun</b>	<b>Dumfries / Stafford</b>
Online	54%	48%	43%	32%	38%
Community Newsletter	17%	16%	17%	25%	23%
Television	8%	15%	16%	15%	14%
Newspaper	13%	17%	13%	9%	16%
Magazine	4%	1%	3%	7%	7%
Radio	0%	1%	5%	1%	0%
Other	4%	2%	3%	11%	2%
<i>N = number of respondents</i>	52	69	254	81	44

<b>Preference for Receiving Information</b>	<b>Have Lived in Northern Virginia</b>			
	<b>&lt; 4 Years</b>	<b>4 to 9 Years</b>	<b>10 to 19 Years</b>	<b>20 or More Years</b>
Online	46%	37%	50%	41%
Community Newsletter	28%	24%	16%	15%
Television	8%	16%	13%	16%
Newspaper	10%	11%	9%	17%
Magazine	6%	7%	4%	2%
Radio	0%	4%	2%	4%
Other	2%	1%	6%	5%
<i>N = number of respondents</i>	61	83	103	253

<b>Preference for Receiving Information</b>	<b>Age</b>				
	<b>21 to 34</b>	<b>35 to 44</b>	<b>45 to 54</b>	<b>55 to 64</b>	<b>65 +</b>
Online	51%	49%	41%	41%	33%
Community Newsletter	18%	21%	22%	17%	14%
Television	13%	15%	15%	13%	17%
Newspaper	6%	4%	9%	17%	30%
Magazine	8%	5%	2%	2%	2%
Radio	2%	3%	4%	4%	2%
Other	2%	3%	7%	6%	2%
<i>N = number of respondents</i>	109	96	99	95	101

<b>Preference for Receiving Information</b>	<b>Gender</b>		<b>Homeownership</b>		<b>Hispanic Respondents</b>
	<b>Male</b>	<b>Female</b>	<b>Homeowners</b>	<b>Renters</b>	
Online	43%	43%	41%	49%	47%
Community Newsletter	14%	22%	20%	15%	17%
Television	16%	13%	14%	16%	20%
Newspaper	16%	11%	14%	10%	3%
Magazine	4%	4%	4%	2%	8%
Radio	3%	3%	3%	3%	0%
Other	4%	4%	4%	5%	5%
<i>N = number of respondents</i>	242	258	376	124	40

**Preference for  
Receiving  
Information**

	<b>Single-family Home</b>	<b>Townhouse</b>	<b>Apartment</b>	<b>Condo</b>
Online	43%	37%	48%	46%
Community Newsletter	15%	27%	10%	23%
Television	14%	17%	14%	13%
Newspaper	17%	9%	15%	6%
Magazine	5%	3%	4%	3%
Radio	2%	3%	3%	6%
Other	4%	4%	6%	3%
<i>N = number of respondents</i>	242	118	71	65

## Appendix: Questionnaire

### 2017 Only Rain NVRC Survey

#### **INTRODUCTION:**

Welcome, and thank you for participating in this important research survey.

S1. Are you:

- Male
- Female

S2. Which of the following categories includes your age?

- Under 18 **[END SURVEY]**
- 18 to 20 **[END SURVEY]**
- 21 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

S3. Do you own or rent your home?

- I own my home
- I rent my home
- Neither **[END SURVEY]**

S4. Do you live in the state of Virginia?

- Yes
- No **[END SURVEY]**

S5. Which of the following best describes where you live (county or city or town)?

- Alexandria
- Arlington
- Dumfries
- City of Fairfax
- Fairfax County
- Falls Church
- Herndon
- Leesburg
- Loudoun County
- Stafford County
- Vienna
- None of the above **[END SURVEY]**

S6. Which of the following describes your ethnicity? (Please select all that apply)

- African American / Black
- American Indian / Alaska Native
- Asian
- Hispanic / Latino
- Native Hawaiian / Pacific Islander
- White / Caucasian
- Other

Q1. Which of the following best classifies your current residence?

- Single-family home
- Townhouse or attached house
- Apartment
- Condominium
- Mobile home or manufactured home
- Cooperative
- Other

Q2. For how many years have you lived in your current residence?

- Less than 1 year
- 1 to 3 years
- 4 to 9 years
- 10 to 19 years
- 20 or more years

Q3. For how many years have you lived in Northern Virginia?

- Less than 1 year
- 1 to 3 years
- 4 to 9 years
- 10 to 19 years
- 20 or more years

Q4. Do you live within the Potomac River Watershed?

- Yes
- No
- Not Sure
- I do not know what a "watershed" is

Q5. What do you think is the number one cause of pollution in local streams, the Potomac River, and the Chesapeake Bay? (Please select only one)

- Factories / Industrial waste
- Fertilizers and pesticides from lawns and farms
- Local Garbage / trash / litter
- Gas, oil and exhaust from automobiles
- Pet waste
- Stormwater runoff from streets and parking lots
- Other: \_\_\_\_\_

Q6. "Stormwater" runoff is rain or other water that flows into the street, along the gutter and into the storm drain. To the best of your knowledge, where do you believe storm water eventually ends up?

- At a waste water treatment facility
- Local streams, Potomac River or Chesapeake Bay
- Underground / seeps in to the ground
- Don't know
- Other: \_\_\_\_\_

Q7. Do you (or does another person in your household) have a dog?

- Yes **[CONTINUE WITH Q8]**
- No **[SKIP TO Q11]**

Q8. When taking your dog(s) for a walk, how often do you (or someone else from your household) pick up waste after your dog(s)?

- Always / every time the dog leaves waste
- Usually
- Sometimes
- Rarely
- Never
- Not applicable / I don't take the dog(s) on walks

Q9. How often do you (or does someone else from your household) remove dog waste from your yard?

- Daily
- Weekly
- Monthly
- Less often than once a month
- Never
- Not applicable / don't have a yard

**[SKIP OVER Q10a/b IF NEVER OR NOT APPLICABLE IN BOTH Q8 AND Q9]**

Q10a. What is the most important reason to pick up after your dog(s)? (Please select only one)

- City / township ordinance
- Don't want to step in it
- To prevent water pollution
- It's what good neighbors do
- Odor
- Other reason
- None / no reason to **[SKIP TO Q11]**

Q10b. What other reasons (if any) have motivated you to pick up after your dog(s)? [PROGRAMMING NOTE: DON'T SHOW WHAT WAS SELECTED IN Q10a]

- City / township ordinance
- Don't want to step in it
- To prevent water pollution
- It's what good neighbors do
- Odor
- None of the above

Q11. Does your home have a lawn or garden?

- Yes **[CONTINUE WITH Q12]**
- No **[SKIP TO Q17]**

Q12. Are you the primary person who takes care of the lawn or garden?

- Yes **[CONTINUE WITH Q13]**
- No **[SKIP TO Q17]**

Q13. How do you treat weeds in your lawn or garden? (Select all that apply)

- I apply a product like "weed and feed" that contains weed treatment and fertilizer
- I "spot treat" the weeds with weed killer
- I pull the weeds out by hand
- I have a lawn care service apply treatments to kill the weeds
- Other
- Nothing / I don't treat weeds / leave the weeds alone

Q14. Which of the following best describes how often you fertilize your lawn?

- Once a year in the spring
- Once a year in the summer
- Once a year in the fall
- Twice a year
- Three times a year
- Four or more times a year
- Never **[SKIP TO Q16]**
- I have a lawn care service fertilize my yard
- Don't know

Q15. Do you use a slow release fertilizer in your lawn or garden?

- Yes
- No
- I don't know

Q16. Have you ever had your soil tested for fertility or pH?

- Yes
- No
- I don't know

Q17. What most prevents you from taking action to protect clean water?

- It's not important to me
- I don't have the time
- Too expensive
- My actions won't make a difference
- I don't know what to do
- I have physical limitations
- Nothing / I do take action to protect clean water
- Other: \_\_\_\_\_

Q18. What would help you to take action to protect clean water? (Select all that apply)

- On-site help with installation from a landscape professional
- Learning more by attending a workshop
- Online resources
- Financial assistance to offset costs
- Email Newsletters with reminders and quick tips
- I didn't know I needed to take action to protect clean water
- Nothing
- Other: \_\_\_\_\_

Q19. When you need to change the oil in your car or truck, what do you do with the old motor oil?

- I don't change the oil myself / I take it to a garage / oil change service
- Take the old motor oil to a gas station or hazmat facility for recycling
- Store it in my garage
- Put it in the trash
- Dump it in the gutter or down the storm sewer
- Dump it down the sink
- I don't own a car or truck
- Other

Q20. How important do you think it is for local governments to spend more money on protecting water quality?

- Not at all important
- Not too important
- Somewhat important
- Very important

----- Page Break -----

Q21. What TV service provider do you use?

- Comcast
- Cox
- Direct TV
- Dish Network
- Verizon
- Xfinity
- Do not have cable or satellite TV
- Do not watch TV
- I only watch streamed Video Content (ex. Netflix, Hulu, YouTube, Chromecast, etc.)
- Other

Q22. Which of these channels have you watched in the past 30 days? (Select all that apply)

- Animal Planet
- Cartoon Network
- CNN
- E! Entertainment TV
- ESPN
- HeadLine News
- History Channel
- HGTV
- National Geographic
- Oxygen
- None of the above

----- Page Break -----

Q23. Please view the video above. Have you seen this ad, or a similar one on TV or the Internet about reducing water pollution?

- Yes [**CONTINUE WITH Q24**]
- No [**SKIP TO Q25**]
- Not sure [**SKIP TO Q25**]

Q24. Did seeing this ad make you take action on your property to prevent water pollution?  
(Select all that apply)

- Yes, I now pick up pet waste more often
- Yes, I now plan to fertilize fewer times during the year
- Yes, I now properly dispose of motor oil
- I was already doing what is recommend to reduce water pollution
- None of the above applies to me



Q25. Have you seen the logo above anywhere? (Show Only Rain logo)

- Yes
- No

Q26. How do you prefer to receive information about protecting the environment? (Please select only one)

- Magazine
- Newspaper
- Community newsletter
- Online
- Radio
- Television
- Other: \_\_\_\_\_